

**Story of the
Western Pacific
Railway**

**Compliments of
The Denver & Rio Grande
Railroad Company**



Digitized by the Internet Archive
in 2015

<https://archive.org/details/storyofwesternpa00west>



MARKET STREET FERRY

Story of the Western Pacific Railway

BEFORE September, 1909, there will be in operation between San Francisco and Salt Lake City a new Pacific railroad, the most remarkable in point of construction and earning power which the West has ever seen or is likely to see—the Western Pacific. The mere building of a line through a section of the country that in many parts has received no addition to its transportation agencies since the first Pacific road was opened, forty years ago, would be noteworthy. In the case of the Western Pacific, however, a more significant feature is found in the fact that the new line is a road of the most improved standard construction, built with a view to the greatest permanency and ultimate economy, resulting in increased earnings, that engineering skill

can insure. It shows that the pioneer period of railroading is at an end in the west, and that the transportation business in this part of the country has reached the same settled and definite basis on which it rests in the eastern states.

In California a part of the new road is already in operation and the completed line will be open to traffic early in 1909. The need of a new line between San Francisco and the great coal and iron territories of Utah and Colorado has long been unquestioned. The whole Pacific coast region, and particularly the fruit and grain-growing sections of California, has been growing at a tremendous rate and the volume of both its outgoing and incoming freight has been limited only by the



THE OAKLAND FERRY SLIP WITH LIGHTHOUSE

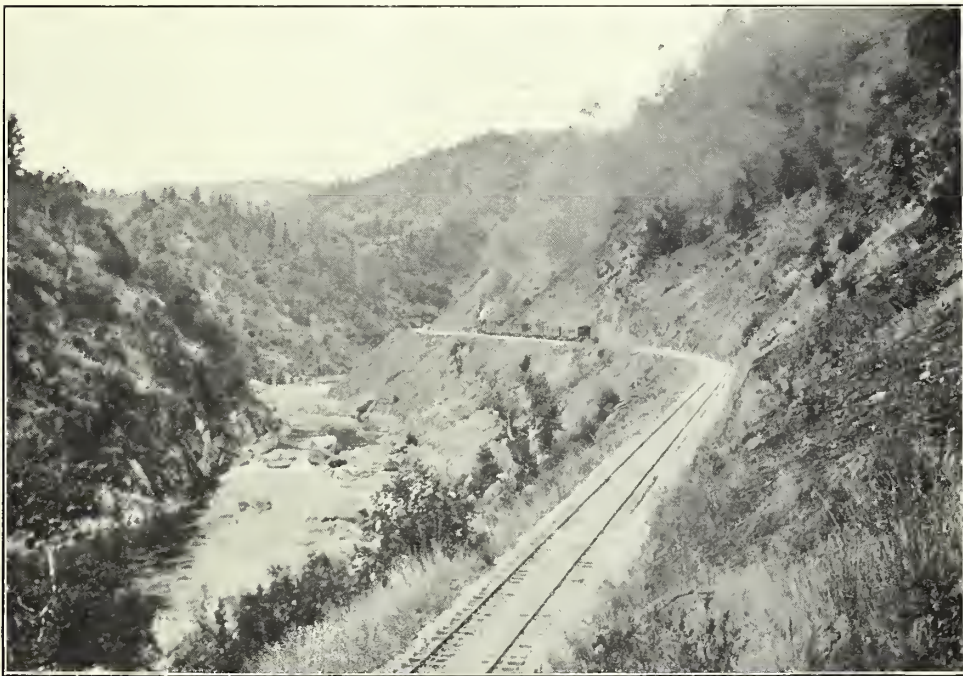
carrying capacity of its transportation lines, while its traffic possibilities have been far beyond the limits of these existing facilities.

No doubt some of the delay in solving this particular transportation problem came from the belief commonly held, and voiced by Collis P. Huntington many times in the statement that it was impossible to build a road through the western mountains on the standard of grades and general construction adopted by the old and prosperous eastern lines. What he declared impossible a few years ago is actually attained to-day on the new Western Pacific line. From its western terminus at San Francisco to its eastern end at Salt Lake City, where as a part of the Gould system it joins the Denver and Rio Grande Railroad, thus affording a western outlet to that road, its location and construction are such as to set a new record for western railroad building and to assure

immediate profitable operation such as has never been possible in the beginning of any other western line.

*Three Engineering
Essentials*

In the judgment of engineers, western railroad construction has three essentials; low grades, permanent construction, and freedom from snow. The road most closely conforming to these requirements would be most successful in accomplishing its final purpose, that is, in combining large earnings



RUNNING THROUGH THE SIERRAS

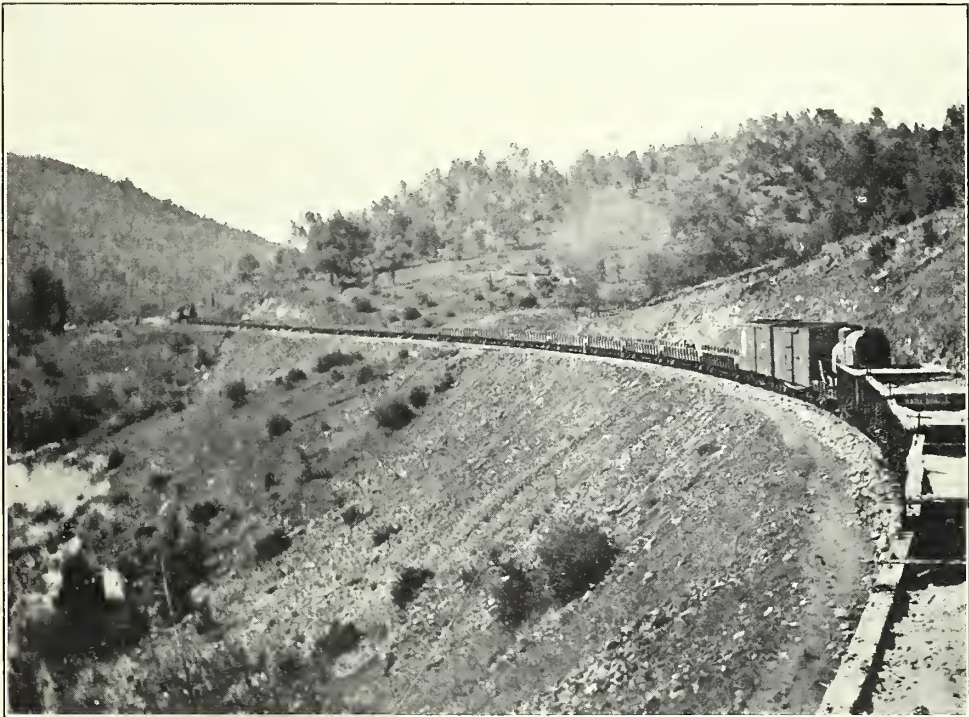
with cheap operation and maintenance. In all three of these essentials the Western Pacific leaves nothing to be desired.

The maximum grade of the new road in no case exceeds one per cent, that is, a rise of 52 feet to the mile. Westbound for 80 per cent of its length the heaviest grade is only four-tenths of one per cent, or about 20 feet to the mile. The superiority of the Western Pacific over the other Pacific lines in the country in this respect is shown by the following table:

Name of R. R.	Highest summits Feet.	Maximum gradient in feet per mile.		Total ascent in ft. overcome.	
		E. bound.	W. bound.	E. bound.	W. bound.
Canadian Pacific...	2 summits	242-4.58%	116-2.2%	17163	16428
Winnipeg to Vancouver	5299 4308				
Great Northern...	3 summits	116-2.2%	116-2.2%	15987	15305
	5202 4146 3375				
Northern Pacific...	3 summits	116-2.2%	116-2.2%	18337	17643
	5569 5532 2849				
Union Pacific—Central Pacific, Omaha to San Francisco.....	3 summits	116-2.2%	105-2%	18575	17552
	8247 7017 5631				
Union Pacific—Oregon Short Line, Omaha to Portland.....	5 summits	106-2%	116-2.2%	18171	17171
	8247 6953 3537 3936 4204				
Santa Fe.....	6 summits	175-3.3%	185-3.5%	34126	33543
	7510 7453 6987 7132 2575 3819				
Western Pacific....	2 summits	52.8-1%	52.8-1%	9385	5076
	5712 5018				

The real significance of these figures to the person who is interested in them less as the expression of an engineering triumph than for their bearing on the financial success of the road, may best be expressed as follows: as a result of its easy grade, the Western Pacific will be able

to haul as heavy a train over the summit of its line with one locomotive as the best of other existing lines handles with three. There is a tremendous saving not only in the cost of operation, but in maintenance and cost of equipment as well. From this point of view alone the Western Pacific can show a larger net earning for an equal amount of traffic than can any other line, since it can move the traffic more cheaply—an advantage which is strongly accentuated as other features are considered.



SINGLE LOCOMOTIVE HAULING 28 LOADED CARS ON HEAVIEST GRADE

*Built But Once
and Built
to Last*

The importance of so building a road that it need be built but once has been strikingly taught by the later experiences of the old Pacific lines. On them of recent years, in reducing grades, strengthening bridges, eliminating curves and in other respects reaching a condition of increased efficiency and increased earnings, hundreds of millions of dollars have been expended which might have gone into the pockets of stockholders had these roads been built with the thoroughness of construction that characterizes the Western Pacific. This of course is no reflection on the creators of the earlier Pacific roads. When these lines were pushed across the continent the building of any kind of road through the unsettled western

country was a remarkable feat. Financial success was problematical. If the roads had not been built cheaply and hastily they could not have been built at all. But now the situation is very different. The financial success of the new road is assured by traffic conditions. Even the approximate freight earnings of this new line during its first year of operation may be estimated with reasonable accuracy. The wisdom and safety of the investment necessary for the most improved and most permanent form of construction have been demonstrated. The best location, both from an engineering and from a traffic viewpoint, has been indicated



STEEL AND CONCRETE BRIDGE NEAR OROVILLE, CAL.

by years of investigation of routes and resources. The builders of the Western Pacific have been fortunate in that they were able to profit by the accumulated experience of forty years of Pacific railroad operation.

In spite of the fact that this new line has from the beginning adhered to the most exacting standard, driving a tunnel where a tunnel meant a lower grade or a shorter line, and putting in steel bridges and viaducts capable of carrying the heaviest loads, its construction has not been unduly expensive. True, its cost will come close to \$60,000 a mile; but this is low as compared to the initial cost of other lines plus the tremendous expense of later improvements which still leave them far behind the Western Pacific in efficiency. It is one thing to build a

road right at the start, but something entirely different, and decidedly less desirable from the investor's point of view, to build a road cheaply and to continue to make costly improvements which never can make it equal to a road well built in the beginning. Various western lines, at heavy expense, are now increasing the weight of rails used. The Western Pacific is installing at the beginning rails of the highest standard used on the western roads. Roughly, it may be said with truth that every dollar spent in improved construction in the building of a road means a saving of two dollars later on—a sufficient indication of the wisdom of the course that is being followed.

*Little Snow;
No Snowsheds* To those unfamiliar with railway operation the importance of a snow-free line, the third great factor in commercial success, may seem relatively slight. Those who so regard it do not understand western conditions, where the maximum snowfall may be fifteen or sixteen feet, thus impeding or entirely blocking traffic for days at a time during the winter season. In reality the success of the engineers of the Western Pacific in achieving a line practically free from snow is not only monumental in itself, but of tremendous importance from the commercial point of view. There will not be a single foot of snowshed on the whole line of the Western Pacific. None will be necessary. By and large, snowsheds cost more per mile than a railroad itself. On one of the most important Pacific lines the cost of snowsheds is given as \$75,000 a mile. There are forty miles of these sheds, and the cost of maintenance and protection from fire during the summer months is a heavy item in operating expense. All this expense, whether it be the initial charge for construction or the further charge for maintenance, the Western Pacific avoids. Throughout the whole line, the cost of keeping the tracks clear from snow, the cost of operating snowplows and the loss from the traffic delays, will be reduced to an extent that will remove these items from comparison with other Pacific roads. The difference in this respect between America's newest Pacific line and its nearest competitor is shown by the following figures:

Snowfall During Winter of 1906-1907.		
	Western Pacific (Beckwourth Pass)	Nearest Competing Line (Summit)
Dec.	8 in.	40 in.
Jan.	13 "	96 "
Feb.	none	148 "
Total for three worst months	21 in.	284 in.

*Scenic Line
of America*

There is another advantage in eliminating snowsheds which will be keenly appreciated by passengers who have suffered the monotony of riding through mile after mile of these structures—that is, the enjoyment of an unobscured view from the car windows. In the very nature of the case, snowsheds usually are placed on those portions of the line where the view if unobscured would be most attractive. To be able to do away with them on a road that traverses some of the most beautiful and unusual scenic regions of the continent is certain to recommend it to travellers. The Denver and Rio Grande admittedly passes through the most wonderful scenery of any railroad in the country. But the new Western Pacific, a part of the same system, will be a close second in this respect. The two together will form the most continuously beautiful line of travel from Denver to San Francisco which can ever exist in this country. The advantages of a snowless and snowshedless line in reducing the cost of operation and in attracting travel—particularly tourist travel to California, which has its greatest volume in the winter months—therefore are entitled to rank with those of low grades and model construction.

In these three great factors of success from an engineering point of view, the Western Pacific excels not only every existing line, but also any that may be built in the future, since it should be remembered by those unfamiliar with the western country that its physical limitations due to its rugged character limit the number of possible routes to a scant half-dozen.

Freight Traffic

Entirely aside from its advantages of construction and equipment, the success of a railroad as a commercial enterprise depends on its traffic. It is conceivable that a road might be built which would be a model in the opinion of engineers, but which, as viewed by investors, would be a failure because of inability to earn dividends. In forming any judgment as to the future of this new Pacific road, it is essential to inquire into its traffic possibilities. Good roadbed, low grades and freedom from curves, assuring fast time, together with the uninterrupted views which it gives of some of the most remarkable scenery in the country, and an uninterrupted freight service, assure the Western Pacific, in conjunction with the Denver and Rio Grande, a heavy passenger traffic.

How is the new road situated in regard to freight, the great payer of fixed charges and earner of dividends? One of the most profitable lines ever built was constructed in the following manner: A map of the territory which it was to serve was marked in colors varying in density according to the volume of freight

production. Through the center of the most densely colored section the track was laid. "There was something doing every minute," said an official of the line. "No road ever paid better." The principle then established of following the line of maximum freight production has been adopted by the Western Pacific. At its western end the problem was simple. California's great garden produces every year far more fruit, that most profitable freight, than existing lines can handle. Much of it rots on the ground for very lack of transportation, and railroad men frankly admit their inability to handle the present product. Not only



IN THE HEART OF THE MOUNTAINS. SHOWING EASY CURVATURE

is this the case, but this product will increase greatly with every increase of transportation facilities. California, with practically the area of France, and even greater productive ability, to-day has less than one-fifteenth the population of that country. Even with the Western Pacific in full operation it will not be possible to care for the potential traffic, and the road's tonnage will be limited only by its capacity.

Northward, along the line of the new road, are the great timber, mining, and cattle industries. Of timber alone there are more than 100,000,000 car-loads in the country tributary to the Western Pacific—a mine of wealth in itself, capable of paying the initial cost of construction

and of meeting interest and dividend charges for unnumbered generations. For much of its course the line is a pioneer, the first railroad to reach sections which have long been crying for transportation of a modern sort and waiting to yield a harvest of gold in exchange for it. Commercialism—the dividend—has to do not with possibilities, but actualities, which in this case may be obtained from the figures of town, county and state reports.

California's Great Freight Production California's timber production in 1906 was 1,348,000,000 feet, worth \$20,726,000, and there are millions of acres of practically virgin forest still within the State. Its mines, in 1906, produced gold to the amount of \$18,832,000, and silver to the amount of \$1,027,000. Some of the most productive gold-fields of the State are in the territory traversed by the Western Pacific.

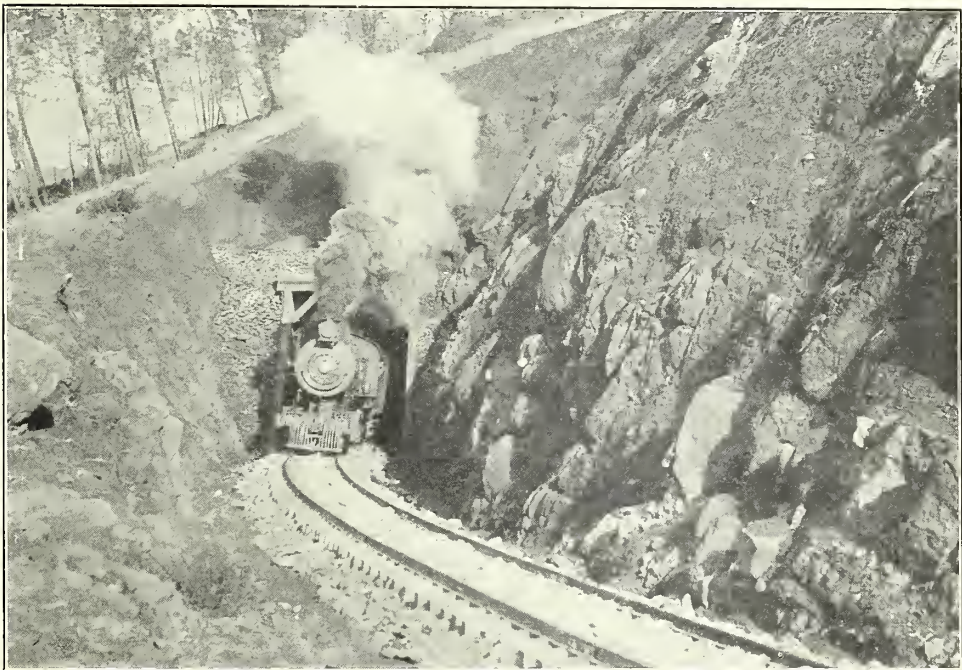
There are also to be considered the manufactories of the State, which use raw material to the value of over \$125,000,000 annually, and turn out over \$360,000,000 in products. These manufacturing industries are largely concentrated in San Francisco, Oakland, Stockton and Sacramento, all of which cities the Western Pacific serves.

All this is without consideration of the agricultural product of the State, which is greater in value than all the others combined. More than 90,000 carloads of fruit, wine, and vegetables alone are shipped from the State annually, and the trade in these products is increasing by leaps and bounds. There is also a heavy traffic, not covered by these figures, which is wholly within the State, from the producing points to the distributing centers, and especially to the port of San Francisco, which in 1907 shipped abroad \$33,000,000 of goods and in 1906 nearly \$40,000,000. The imports into San Francisco, which for the most part are distributed by rail to interior destinations, were \$54,000,000 in 1907 and over \$44,000,000 in 1906.

Rich Country Along Line It is possible, however, to obtain more detailed figures on the traffic yielded by the regions which the Western Pacific reaches. In California the road touches or crosses the counties of Lassen, Plumas, Sierra, Nevada, Butte, Placer, Yuba, Sutter, Sacramento, San Joaquin, Santa Clara, Alameda, Contra Costa, and Solano. These counties include the portions of the Sierra, the valley, and the bay regions directly tributary to the road. In addition, its connections in the south will open to it the San Joaquin valley, embracing the counties of Fresno, Kings, Madera, Merced, Stanislaus, Tulare and Kern, the trade of which passes naturally through Stockton.

In the year 1906 the products of these counties shipped out of the State included 4,781,000 boxes of fresh fruit, 118,519,000 pounds of other orchard and garden products, 2,207,000 gallons of wine and brandy, 5,662,000 pounds of wool and 1,000,000 bushels of grain, besides dairy and poultry products in large amounts.

These figures do not by any means represent the entire product of the counties mentioned, but merely that portion which was reported as shipped beyond the boundaries of the State. Even on this point they



A SIERRA TUNNEL

are not a complete representation of the traffic produced by the district covered. For example, those portions of the products first shipped to one of the several distributing points within the State and then trans-shipped to destinations in another State are in large part not included, or are credited as products of the place of trans-shipment. Nor do these figures take any account of the traffic wholly within the State. The traffic possibilities of the territory directly reached by the Western Pacific may be better indicated by figures showing some of the products of the first group of counties enumerated—those adjacent to the main line of the road. These included in 1906, among other articles,

1,285,000,000 pounds of green fruit, 355,000,000 pounds of dried fruits, 14,000,000 bushels of grain, 1,000,000 tons of hay and alfalfa, 2,000,000 cases of canned fruits and vegetables, 13,000,000 gallons of wine and beer, 53,000 tons of sugar beets, 12,000,000 pounds of butter and cheese, 158,000,000 feet of lumber. In addition, the manufactories of the counties named turned out in 1906 products of various kinds to the value of \$67,500,000.

Mineral Wealth Tapped by Road The total mineral product of California for 1906 was \$46,776,000. Of this amount the fourteen counties embraced in the territory directly traversed by the Western Pacific Railway produced \$9,713,000. It is estimated that over \$50,000,000 has been taken from the gold-bearing gravel beds at Oroville, and lands which a few years ago could be purchased for from \$10 to \$50 an acre now sell at from \$1,500 to \$2,000 an acre.

Quartz and hydraulic mining is an important industry in Sierra, Plumas and other mountain counties. In Plumas are located such famous gold producers as the Plumas Eureka, from which \$12,000,000 has been taken, the Green Mountain, which has yielded \$7,000,000, the Crescent, Cherokee and Gold Stripe. The gold mines of Sierra County have yielded \$190,000,000. There are also extensive copper and iron deposits, which are awaiting adequate transportation facilities to make their development profitable. The copper deposits of this region are the continuation of the Shasta belt, on which are situated farther north the famous Keswick, Bully Hill and other properties, producing about \$5,000,000 annually. The same section of the State which contains the richest mineral resources tributary to the road likewise contains the greater part of the standing timber in the Western Pacific territory.

Nevada's Prosperous Future Assured From the summit of the Sierra to Salt Lake City the Western Pacific draws a line across Nevada and western Utah. Nevada is rich in mineral resources, and some of its most promising districts lie along the route of the new road. Deposits of sulphur, borax and salt, gold, silver and copper, occur along the line between the border of California and that of Utah. Moreover, irrigation has proved that the soil of Nevada is as rich as any in existence. In the Truckee-Carson river country, where an irrigation project of the United States Government is reclaiming some 350,000 acres of land, the beginnings of a prosperous agricultural community have already sprung up. The country which is traversed by the Western Pacific is as rich in soil potentialities as any in Nevada.

When the Western Pacific is in operation the value of the country will be realized upon. The mines, which communication will make it profitable to develop, will send their train-loads of ore eastward to the smelters in Utah, while the mining communities themselves will furnish markets near at hand for the lumber and farm products of California, and their presence will encourage the further development of grazing and irrigation. New developments like those of Goldfield and Tonopah may take place in the northern regions of the State.



A BIT OF HEAVY CONSTRUCTION, SHOWING ALIGNMENT

Few people realize the rate at which Nevada has grown, despite her lack of railroad transportation. During the decade ending with 1906, the sales of public lands in Nevada amounted to over 1,600,000 acres. The 1907 wool crop of the State was 6,000,000 pounds, one-half that of California, and its value was more than \$1,250,000. The manufacturing industries of Nevada use raw material to the value of over \$1,600,000 and their product amounts to over \$3,000,000 yearly. These industries have tripled since 1900. The gold production of the State in 1906 was

\$9,278,000. ranking after Colorado, Alaska and California. The previous year it was \$5,359,000. There was also a silver production of \$3,525,000, exceeded in amount only by Montana, Colorado, Utah and Idaho.

Westbound Freight Will Test Capacity In addition to the freight produced, there is also the freight needed—a tremendous item. Could the west get it, it would to-day be importing from the east many times its present consumption. Here again it is not a question of the needs of the west, but of the handling capacity of the existing lines. It is a highly conservative estimate that from the day on which it opens



WESTERN PACIFIC CROSSING SOUTHERN PACIFIC BY
STEEL AND CONCRETE BRIDGE

the Western Pacific will begin with earnings of more than \$9,000 a mile, a record unique as compared with any other western line.

An important element of strength in the Western Pacific will be its connection with the other lines of the great Gould system. From the eastern members of this system, connecting the great freight-producing centers, the Western Pacific will receive a large volume of traffic, together with its share of business from other roads. The growth of the Pacific coast will be its growth, and no other section of the country is advancing in population, wealth and products at half the pace of those States included in the Pacific group.

*Western Pacific's
Fine Terminals*

A truth that is far more widely appreciated among railroad managers to-day than it was a generation ago is that a road cannot succeed without adequate terminals.

At San Francisco the Western Pacific holds exceedingly valuable terminal properties on both sides of the Bay. On the San Francisco side it has 269 acres, of which those devoted to the local freight terminal, 53 acres in all, are in the heart of the city, only seven blocks from the City Hall. Connecting with this is the waterfront equipment of storage yards and docks comprising 216 acres. On the Oakland side there are 361 acres, and between the two lies the most direct passage across the bay. Indications of careful foresight and planning, the expression of financial and engineering acumen, appear in the arrangement of these terminal facilities and in the wise provision for accommodating future growth in traffic.

Along this busy waterfront are gathered vessels from all the seven seas, bringing the products of the Orient, the Pacific Islands, golden Alaska, and far-off Australasian lands, to receive in exchange the grain and machinery and other manufactures of America, brought westward by the railroads. As varied they are as the early ships of the Argonauts which anchored here in '49, if not as picturesque.

It was the prospect of overseas trade, added to their military importance, that led the Federal government to aid in the construction of the early Pacific lines. Nobody gave much thought to the possibilities of traffic development along the lines themselves that would be stimulated by their construction. The export and import trade of the Pacific coast is of vastly greater importance to-day than it was in this earlier period, and is certain to expand with the expansion of American interests in the Pacific, but the growth of traffic originating in local territory has been so marvellous that it has relegated the foreign trade to the background in the calculations of railway builders and managers.

*Making of
New Road*

A railroad in the making, particularly a western railroad like the Western Pacific, which marks a new epoch in railway construction, is one of the most tremendous undertakings that this land of great enterprises can show. Scattered along the line as it gradually takes form are many camps and many men, all of them under the guidance of the chief engineer, a sort of omnipotent mentality who knows every foot of a thousand-mile course more thoroughly than the average man knows his parlor floor. To go with him along the line, to visit the scenes of a thousand activities, a thousand battles that are being fought and won, is to sense in the highest degree the romance of railroad building, tempered and in-

spired by the necessity of building right. In the case of the Western Pacific there has been added to this the necessity of building permanently, for the first time in the history of western railroading. The tremendous sums which have been spent on the rebuilding of other Pacific lines, sums which had they been built right at first might have been returned to investors, have taught their lesson. The ideal which Huntington scorned as impossible, while admitting that if attainable it would mean a line surpassing all others, has been attained in the Western Pacific.



STANDARD CONCRETE CULVERT

Out from San Francisco the road runs easterly and then turns to the north, skirting on the east the half-submerged "tule lands" and following a direct line from Stockton to Sacramento, Marysville and Oroville. This part of the line has been designed to tap the richest of California's great valleys, producing annually millions of tons of freight which cannot be handled by existing lines. From Sacramento to the south are broad and productive valleys, rich in freight and offering little in the way of difficult problems to the railroad engineer. North of Oroville, stretching across the eastward route, loom the Sierras—mountains so forbidding and rough that in the length of a thousand miles

the passes through which a railroad may go can be counted on the fingers of one hand. To follow the line of the railroad through this country as did the writer, by wagon, on horseback, and afoot, to meet the men who are forcing nature to retreat and to yield a line which will be the finest that the west has ever seen, which will carry over its track innumerable tons of waiting freight, is to get at the very root of the greatest romance of all, the romance of commercial achievement.



STRAIGHT LINE SHOWING HEAVY ROCK BALLAST

*Oroville, the
"City of Gold"*

From Sacramento to Oroville the line runs up that part of the Sacramento valley watered by the Feather River, one of the greatest fruit-growing sections of the country. This portion of the line south from Oroville to Oakland is the part first opened to traffic, producing an important income even before the road is finished. Oroville itself for more than half a century has been the southern gateway for all the trade of the wonderfully rich country of the Feather River, and is the point through which most of its supplies come. Strangely enough, until the coming of the Western

Pacific, Oroville has never been located on a through railway line. The Southern Pacific has a spur running northward from its main line to Oroville, but that has been all that the town has had in the way of steam transportation facilities. The Western Pacific, seeking to serve this important traffic-producing region, has swung north of the Southern Pacific, reaching into new territory, not to cross the older line until midway across Nevada. One reason for following this route is shown by the fact that in the territory tapped there is, at a conservative estimate, more than 100,000,000 carloads of timber alone.

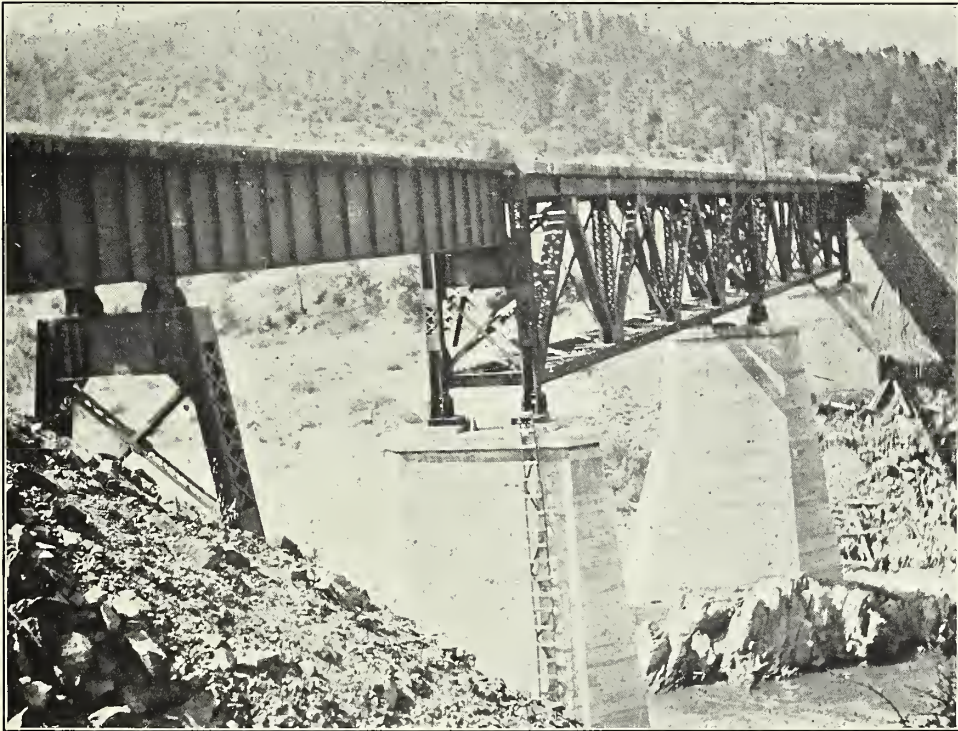
"City of Gold" is the literal equivalent of Oroville; and city of gold it really is. Shiced, hydrauliced, mined in every possible way from the earliest times, this city on the gold-bearing Feather River is still one of the greatest gold producers in the country. But it is a sad spectacle for the landscape gardener. Girt around by green orchards and ranches, its midst is a bare waste—mending heaps of bare brown hills of dirt and gravel piled up by the dredges which can pay good returns by chewing up the soil at the rate of 2,000 yards a day, with a yield of twenty cents a ton in gold. Eating up the country as they go, these huge monsters leave behind them only a macerated mess of barrenness. Watching the huge scoops as they draw in the earth, one sees old diggings, tunnels and shafts, ruthlessly torn away—the memories of former searchers for wealth. But as one man said, the commercial instinct cropping up, "it's a great country for freight."

Northward on the foaming Feather River, three miles above the city, there is a great steel bridge, indicative in its solidity of the whole road, and at the bridge is a station called Bidwell. It is named after the old pioneer, scout and Indian fighter, General Bidwell. One may wonder at the solidity and permanence of this bridge, typical of the whole line. But the wonder disappears when the wrath of the Feather River is known—the wrath capable of tearing down any wooden structure above its course. With the melting of the winter snows it mounts by feet to the point which an engineer described as one "unsafe for anything but steel."

*"Perfection of
Construction
Methods"*

The further one traverses the line of the Western Pacific, the more one realizes the perfection of the construction methods employed, its inevitably low cost of operation and its wealth of potential freight. Up the North Fork of the Feather River, and then eastward on the east branch to the junction with the Middle Fork, is a country teeming not only with freight and riches, but with romance. There is Rich Bar, once the stampeding ground of gold seekers on the Feather River, which within its small confines held

a warring, brawling population of 3,000 persons. They are gone now, and the boisterous camp of early years is a peaceful ranching country. Scores of "flats," as they are called, mark the course of the river, with level farming territory, and mountains rising on each side in scenery which in its variety and continuity is excelled along no railroad in the country. For the greater part of its course on the North fork the railroad follows the left bank of the rushing stream. The old Indian trail



BUILT TO LAST. AN EXAMPLE OF WESTERN PACIFIC
BRIDGE CONSTRUCTION

followed the right bank. Naturally one would expect that the railroad too would follow it instead of the other, where before it came, passage was impossible even for a man on foot. But in these gulches and canons the snow may vary many feet on the two sides, and so the Western Pacific, looking for a snow-free route, chose the sunny side. As a result there will be no impeding of traffic, and no monotonous runs through snowsheds to weary travellers and to entail great initial expense and resultant cost of upkeep. The wonderful scenery will spread before the traveller's eye unbroken by the blur of snowsheds.

There is Dutch Bar, too, on the way up the river. Once a thickly populated and famous mining camp, it has now only a few hundreds of residents. But the change in population has been a change in production, and to-day the district is teeming with potential freight waiting for the coming road. Far up in the Sierras the line leaves the northward bearing North Fork for its east branch, and finally, in Plumas County, to follow the Middle Fork, and thus eastward. Here valley follows valley of wonderful fertility, girt around by rich timber, mineral, grazing and agricultural districts. Spring Garden, American, Indian, Mohawk and Sierra—these are but a few of the valleys waiting for the railroad to move their freight. In Spring Garden valley, by the combination of a mile-long loop and a 7,300-foot tunnel, the engineers have maintained the standard of a one per cent maximum grade and a snow-free route.

One of the problems to be solved in this mountain country of swelling and shrinking streams is that of drainage—the question of successfully disposing of the water rushing down the mountain sides in such a way as best to protect the roadbed. In the past, as every traveller knows, these streams have been carried directly under the roadbed through culverts or similar construction. But on the Western Pacific, with permanency and safety always in mind, a different method has been employed, ingenious in its conception. Instead of carrying straight down the devastating mountain streams with their impinging heads, which more often than anything else bring washouts and consequent losses, the engineers have used the best modern practice. The water is still carried under the roadbed, as it runs along the mountain side. In the first place, however, it is diverted, that is, carried to one side before it is allowed to run out through a culvert; and second, before being brought to the point of discharge, its grade is carried level, thus reducing its force to a minimum and eliminating the danger of washouts.

Beyond Mohawk valley, in a territory of surpassing richness and beauty, the line crosses Sierra valley to Beckwourth Pass and thence to western Nevada. At the northeast corner of this valley, a tract of some 67,000 acres underlain by water easily reached by means of artesian wells, and capable of great production, lies Beckwourth Tunnel, 6,006 feet in length, giving onto the eastern slope of the Sierras into Long Valley.

At the eastern end of the tunnel is a station called Rainbow. The naming of it is in itself a pretty piece of romance. Its many problems, now happily solved, gave to the chief engineer considerable worry. On

one gray rainy afternoon, when things were all at sixes and sevens, as he was coming over the line of the tunnel he saw at its eastern end a rainbow, apparently touching the earth almost at the eastern portal. From that auspicious event came the name of the station.

Once over the Sierras the engineering problems, while perhaps not so spectacular, have nevertheless afforded ample opportunity for the finest display of engineering skill in railroad construction to be found in the west to-day. Conditions have been so skillfully met that the Western Pacific, as it stretches across eastern Nevada and Utah, easily surpasses in permanency, easy curvature and low grades any other of



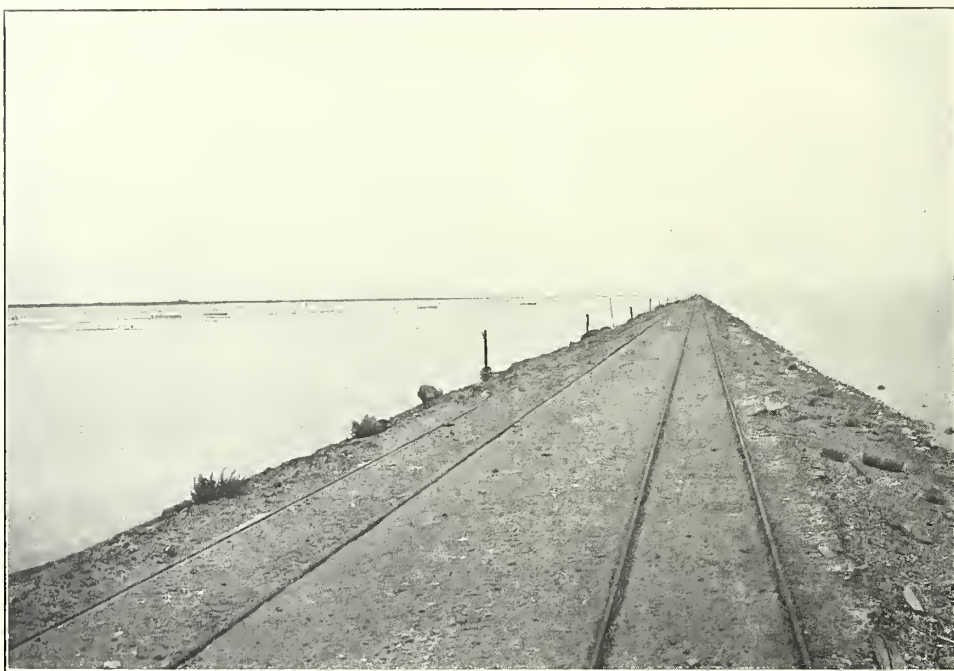
TYPE OF PLATE GIRDER BRIDGE

the existing lines. Evidences of the most careful and far-seeing constructive skill are everywhere apparent, as, for example, in the long stretch of level track across the Salt Lake Desert on which trains can maintain a speed of 70 miles an hour.

From its passage through the Sierras, the Western Pacific continues its course toward the east to the north of the Southern Pacific until running somewhat south of east it crosses that road at Palisade in Nevada. Thence it is always to the south of the older road, running in nearly a straight line from that point to Salt Lake City.

Just west of the state line, between Nevada and Utah, lies the great Flower Lake Pass Tunnel, so named, apparently, because there is a mud lake there. At the edge of the desert the road meets the Delle pipe

line which brings water from the mountains to supply the locomotives. From the eastern end of this mile-long tunnel, on which occurs the highest elevation of the line, the road dips down into the great Salt Lake Desert, and runs eastward to Salt Lake City. On this section occurs what is probably the longest stretch of straight and level track in the West. Running across the desert it lies straight and flat for nearly forty-five miles—the first road to penetrate this stretch of salt and sand. Here is another romance—that of the Desert, and another commercial factor—the great



LONG LEVEL STRAIGHTAWAY STRETCH CROSSING GREAT
SALT LAKE DESERT

salt beds. For twenty miles the road crosses them—beds of solid salt which, now some eight feet deep on the average, used to be a thousand feet below the surface of that now comparatively shrunken body of water—the Great Salt Lake. Until the coming of the Western Pacific no engineers had dared to attempt the crossing of this desert—a weirdly fascinating region with its wonderful colors of sunrise and sunset.

*At Salt Lake
City Terminus*

Around the southern end of the lake the line moves into Salt Lake City, 923 miles by the road from the bay of San Francisco. Throughout its length it is marked in a wonderful manner by a construction new to that territory.

It is a road built right in the beginning, with such grades, easy curvature and absence of snow as to give it an advantage over all others.

In the care and study which have been given to its location, in the thoroughness with which the engineers and constructors have done their work of providing speed, safety, and economy of operation, together with its assured tremendous earnings, the Western Pacific represents the latest word in American railroading. And finally, in addition to all its wonderful features, calculated to make it the most profitable line which the west has ever known, there is this important one. It is not a struggling, independent line, but a part of a great railway system, stretching out across the continent and uniting its great freight-producing sections.

Aside from its assured position, because of the freight in sight, its perfect construction, the proportionately large earnings assured, and the cheapness of operation, the growth of the Western Pacific from this remarkable beginning will in a large part be the growth of the Pacific coast. No other section of the country is advancing in population, wealth and products at half the pace of those States included in the Pacific group, and as a result no other road has such an assured initial income or such a promising future as the Western Pacific.



