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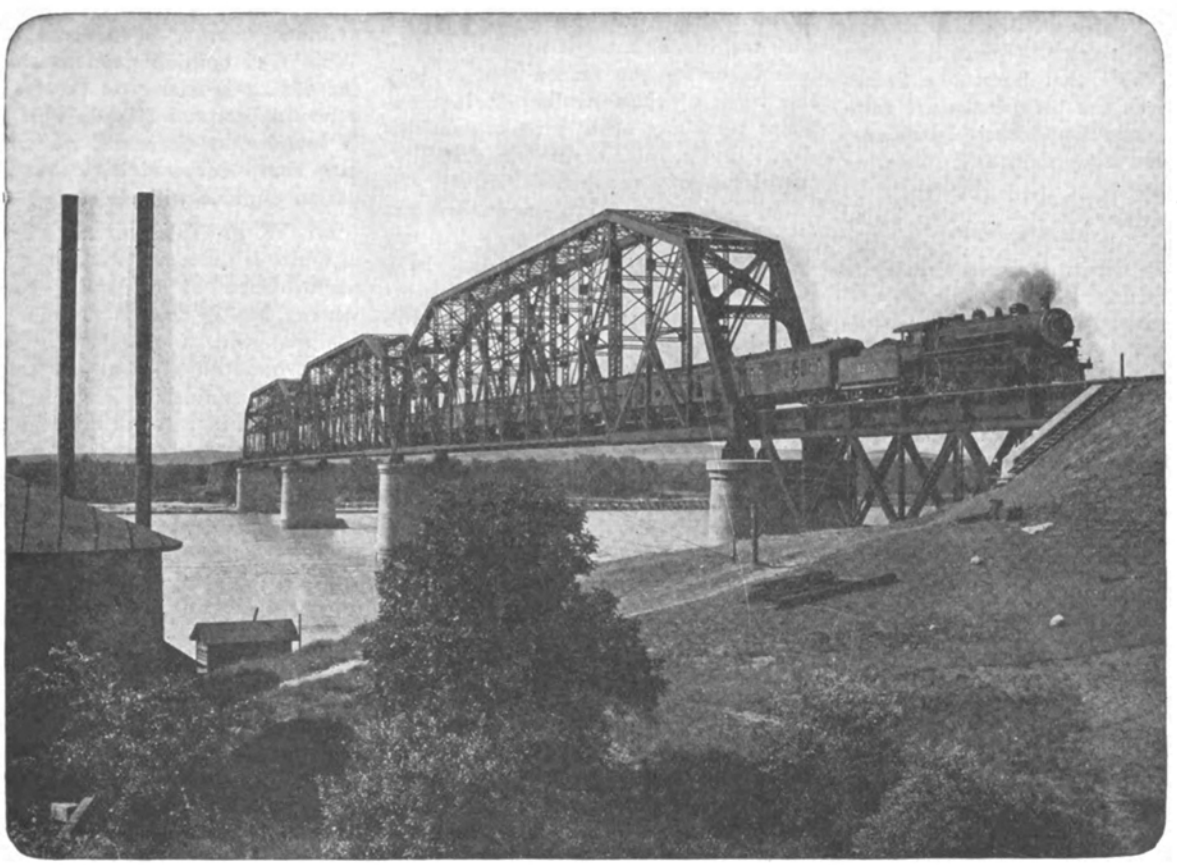
From Lake Michigan to Puget Sound.

In May of the present year, a new daily transportation service was inaugurated between the Great Lakes and the Pacific coast, beginning at Chicago in the east, passing through Milwaukee, St. Paul, Minneapolis, Aberdeen and Seattle to Tacoma in the West. The route is known as the Chicago, Milwaukee & St. Paul, and the Chicago, Milwaukee & Puget Sound Railways. The railroads are 3,277 miles in length, and they hold the record in railroad construction, the building of these great roads only occupying a little less than three years. With the numerous branches already in operation, the tracks extend to nearly 9,000 miles. There are nearly 3,000 locomotives in operation, and the general equipment is of the best. The daily special trains that we refer to are known as the "Olympian" and the "Columbian." They are steel constructed trains from end to end, and are the first complete steel trains to be operated between Chicago and Puget Sound.

The accompanying illustration shows the superb steel bridge which crosses the Missouri River at Mobridge, ninety-eight miles west of Aberdeen, S. Dak. This is the point where the two divisions of the great railway meet. The bridge is one of the most notable structures of its kind in the world. There are three towering spans, each 425 ft. in length, rising to a height of 65 ft. above the rails, and four massive piers of solid masonry, that raise the superstructure 55 ft. above the river. The bridge is the heaviest that has yet been constructed across the Missouri River.



STEEL BRIDGE, MISSOURI RIVER, MOBRIDGE, S. D.

As may be expected, the opening of this fine railway through a beautiful and fertile country, rich in natural products, has been marked by a growth in cities and towns that is without a parallel in rapid progress in the newly opened regions of the Northwest, and bids fair in a few years to rival the clustered industrial centers of the East. The present year has in many respects been the most remarkable in this rapid growth, owing largely to the magnificent and vast areas that have blossomed into wheat fields and which a few years ago were vast treeless wildernesses, but are now teeming with life and energy. A particularly pleasant feature is the number and, what may be called, rural elegance of the tree-embowered homesteads that breathe so eloquently of that spirit of thrift and industry, combined with a love of the artistic, which is such an admirable feature of the character of the American people.

Apart from the beneficent utility of the new railway with its growing chain of expanding cities and broadening belt of happy farms, the road passes through scenes of unsurpassed beauty in natural scenery. There are long stretches of flower-spangled prairies where the cattle wander at will almost the entire year.

Perhaps the most remarkable feature of the scenic wonders along this road are the sudden transitions from the purely pastoral and quietly picturesque to the sublimely grand and terrible. From the apparently boundless prairie the eye is suddenly confronted with towering peaks and precipitous canyons, the appalling sublimity of the mountain ranges cleft by gorges where tumultuous torrents boil and thunder from cataract to cataract, and the mind is never weary of contemplating the ever-changing and ever-awful panorama of the marvelous profusion of forest and stream and cliff and canyon. Nowhere in the world is there such wealth of coloring. In the valleys there is the amazing luxuriance of Brazilian forests. Sombre-hued trees are wreathed with scarlet climbers that burst like flames of fire. Even the bare rocks are rainbow hued, striped and barred with russet and blue and gold, and glittering into iridescence as if a million gems were scattered along their broad breasts.

Nor is the human element wanting in this weird wilderness. The copper-colored Indian and the white settler—the Indian, calm-faced and colossal, the white man, white-browed and keen-eyed—may be seen side by side. The touches of the white man's hand may be seen here and there, the clang of machinery may be heard occasionally mixing its music with the sound of waterfalls and the multitudinous murmurs of the interminable forests. The passing train seems to have an endless attraction for the settler and the Indian alike. To the settler doubtless it brings visions of the homeland. One can imagine that in the eager faces that look out of the car windows there is something of the "touch of a vanished hand and the sound of a voice that is still" that stirs the hearts of those who have wandered into a far country, while to the poor Indian there is a vision of the immensity of the white man's power and of his own insignificance in the grand march of human progress, as manifested in the triumph of steam, and the resistless power of mind over matter.

Even the skies seem to have a burnished beauty unknown elsewhere. The clear vault of heaven seems higher. The blue glory of the East is clarified into amethyst fading from sapphire to cobalt as it approaches the horizon. As one approaches the calm, broad ocean of the West, the scenery seems, if possible, to increase in magnificence. Probably the most remarkable vision in this vast wonderland is the view of Mount Tacomo, the highest peak in the United States outside of Alaska. A sunset view of this snow-clad, glacier-crowned mountain is something that would require the hand of an Oriental poet to describe. Rising to an altitude of three miles into the golden sunshine, white-capped, broad-based, conical-shaped, it is a revelation unparalleled in dazzling splendor. In the light of the setting sun the base is barred with crimson and green, fading into saffron and yellow, and suddenly flashing into a myriad of flames of crystalline splendor like the fiery flashes of some finely fashioned diamond magnified into measureless magnitude.

The Mallet Compound.

The Mallet compound locomotive is by no means a favorite type of power with train men, but it is forcing its way into favor for the reason that it does the work of train hauling at less expense than any other type of locomotive. Engineers and firemen handling this form of locomotive are allowed from 25 cents to $1 a day above the wages paid for working consolidation locomotives, but on most roads where such engines are used, there is no competition among the men to secure the higher-paid occupation.

In the report submitted to the Traveling Engineers' Association on the Mallet compound in road service and the discussion that resulted, a good case was made out for that form of engine. The information brought out concerning the working of Mallet compounds convinces us that locomotives of that form are destined largely to take the place of consolidation or other powerful forms of freight-hauling power. Most of the Mallets in use have been designed for pushing service, and have comparatively small driving wheels, which adapts them for slow moving and puts them at a decided disadvantage when placed upon road service. In the report referred to, particulars were given of the performance of Mallet locomotives used for road service on the Great Northern, the Santa Fe, and the Chesapeake & Ohio. On the Great Northern the performance of these engines was decidedly more economical than that of consolidation engines, although the Mallets have driving wheels only 55 ins. diameter. Those used by the Santa Fe do better road work than any others because they have driving wheels 69 ins. diameter, which enables them to make good mileage speed with moderate piston speed. A compound locomotive of any kind labors under a great disadvantage when the piston speed is high. Comparative tests were made on the Great Northern between a Mallet and a consolidation without the findings being given. But it was reported that the Mallet caused considerably less shock to the train than the consolidation in passing over grades, because both units of the Mallet never slip at the same time, and the slack of the train does not run up as in the case of a consolidation engine. The consolidation engine had the faculty of running a train over a grade faster than the Mallet, a peculiarity that might be expected.

The Santa Fe mechanical department has adopted a very sensible policy in trying to reduce the natural prejudice of enginemen to the Mallet compound. Every convenience that could be devised to help the enginemen was introduced, including air operated fire doors, bell ringers, reverse levers and cylinder works, also coal passers. Weight of opinion goes to show that the Mallet is easier on the track than consolidation and Mikado types, and it is found that they will go with ease into sharp curve sidings that consolidation engines will not enter.

Mr. W. F. Walsh, of the Chesapeake & Ohio, is quite enthusiastic about the performance of a Mallet compound which he is using. This engine, equipped with a superheater, consumes about one ton of coal per trip more than a consolidation engine, but does 50 per cent. more work between repairs. He says the average speed of a Mallet is about the same as that of a consolidation, both being able to reach a speed of forty-five miles an hour. The firemen on the Chesapeake & Ohio consider it takes less exertion to fire a Mallet than any other form of locomotive.

We have devoted considerable space to this report on the Mallet compound, which is practically two locomotives handled by one set of men, because reports have reached us that engineers and firemen in certain quarters are scheming to make a combined effort to oppose the use of Mallet engines in road service. We dislike to see the manual labor or the responsibilities of enginemen increased, but we earnestly advise the men who occupy these positions to refrain from any combined agitation against this most highly developed type of motive power. Railway managers are pushed to their wits' end in securing the revenue that enables them to send out the pay car regularly. Near-sighted legislators are constantly striving to have laws