

ting on the caps and stringers. It was no uncommon thing for the framers to be up to the pile drivers as the last pile was being driven, with the bricklayers entering the bridge at one end as the last stringer was being laid at the other. The stringers were laid in pairs, 9 x 15 inches under each rail in one span, and in threes 6 x 15 under the adjoining span, resting 12 inches on the cap piece, bolted together longitudinally with splice plates 24 inches long, $2\frac{1}{2}$ x $\frac{1}{2}$ inches, and the whole drift bolted onto the cap.

The larger structures were built mostly after the rails were laid, a temporary structure having been used for the track-laying, and the permanent materials, iron and stone, being brought to the front by the railway itself. All the larger bridges are intended to be an iron superstructure, resting upon stone piers and abutments. These are not numerous on the prairie section, the most important being the one over the South Saskatchewan, at Medicine Hat, which is 1000 feet in length, 45 feet above the water, and consists of three spans of 217 feet each, two of 30 feet, and a draw 300 feet in length. The piers and abutments of this are Winnipeg limestone.

Between Calgary and the summit the Bow River is crossed eight times, requiring bridges, all of which are iron girders resting upon stone abutments, varying from 400 to 800 feet in length, and altogether on this section there are over 13,000 lineal feet of first-class bridges, or over $2\frac{1}{2}$ miles in total length.

The track-laying gang was the one that attracted the most attention, and their progress could be most directly gauged, and formed, as it were the basis upon which the daily advance of the whole work was estimated. In 1882 the average day's work varied from 2.28 miles per day, in October to 3.22 miles, in August for the seven weeks ending Sept., 47, or in 42 consecutive working days, they completed on an average 3.21 miles per day. The greatest length laid in any one day was 4.10 miles, and on three occasions the daily progress was 4 miles. The best record was a mile in 35 minutes. Remarkable as this progress was, unexampled in any previous railroad experience, it was exceeded in 1883. The greatest day's work was July 28, when 6.38 miles were laid, and the greatest month's progress, also July, when 92.35 miles of main track were laid, besides 5.11 miles of side track, or 97.46 miles altogether. In the first six working days of July, from the 2nd to the 7th inclusive, 25.86 miles of railway were completed in one week, or an average of 4.31 miles per day. Towards the last of Messrs Langdon, Shephard & Co's contract, in 48 working days the track-laying gang laid and finished 166.38 miles, or an average for the whole time of 3.46 miles per day, exclusive of the sidings which were laid about every ten miles. The track-laying gang were kept in large boarding cars, built in two stories; in the upper one the men slept, and in the lower they lived and messed. Each car afforded sleeping accommodation to 80 men. These cars, with the necessary cooks, inspectors and workshop cars, formed a permanent train and were always left at the front. The rails, $57\frac{1}{2}$ lbs. to the yard and 30 feet long, were about half from the Prussian works of Krupp, and the remainder English. They are of the ordinary flat foot pattern, and were mostly brought up from Montreal by rail, *via* St. Paul and Winnipeg, a railway journey averaging 1500 miles.

After being landed in this country, they were taken up, according to convenience, and stacked ready for use at construction depots, which were placed about 100 miles apart, and where all the material for the track was sent as near to the work as possible. From these construction depots trains were sent to the nearest siding to the front, taking an accurately adjusted supply of rails, ties, and other requirements for one mile of track. These trains consisted of 20 flat cars; the ties, or sleepers, of which there were 2,640 to a mile, were loaded 300 to a car; the rails were loaded 30 pairs to a car, besides 5 boxes of spikes, weighing 1 cwt. each, 60 pairs of fish-plates and one box of bolts.

By this arrangement there were no surplus materials left scattering along the line, no redundancy of supplies in one place and no scarcity in another. The working construction trains brought up these materials from the nearest siding to the end of the track. The ties were here loaded into carts and carted along the side of the line to where they were worked, distributed, spaced and lined for a considerable distance ahead of the track-layers. The rails were unloaded on each side of the track in equal quantities. The engine then went back, and a trolley drawn by horses was run up, on which 15 pairs of rails were loaded with the necessary fish-plates, bolts and spikes. When the trolley reached the last rail laid, a pair of rails were taken off, laid in place, gauged, and the trolley run forward. A gang followed, linking on the fish-plates, then three gangs of spikers, the first gang spiking the ends and the centre, and the others following till the whole was spiked. When the last rail was laid a second trolley was brought up, and the first thrown off the rails to let it pass, then replaced and sent back for another load. On the 7th July, when the six miles were laid, there were 24 men to handle the iron—that is, 12 unloading it from the cars and 12 to load the trollers. It took the same number to lay it down in the track. The total number of rails laid that day was 2,120, or 604 tons; 5 men on each side of the front car handed down 1,060 rails, whilst the two distributors of angle plates and bolts handled 2,120 rails, 4,240 plates and 8,480 bolts.

These were followed by 15 bolters, who put in on an average 565 bolts each; then 32 spikers, with a nipper to each pair, drove 63,000 spikes, which were distributed by 4 peddlers. The lead and gauge spikers each drove 2,120 spikes, which, averaging 4 blows to a spike, would require 600 blows an hour for 14 hours. There were 16,000 ties or sleepers unloaded from the trains and re-loaded into waggons by 32 men, and 33 teams hauled them forward onto the track, averaging 17 loads, of 30 sleepers to each team. On the track 8 men unloaded and distributed them and 4 others spaced them, 20 others spaced and distanced the joint ties, and 20 others arranged and adjusted displaced ties immediately in front of the leading spikers. Four iron car boys and six horses hauled the iron to the front.

When the great distance over which all this material was brought is taken into account, with the immense daily demand, continued without intermission week after week, it will appear to have been no small feat to have kept all this moving to the front so regularly and with such punctuality that during the two seasons the longest delay for material that ever occurred was not over three hours' duration. At points about 130 miles