seven days test, in some cases where work would be held up for want of cars, but always at the contractor's risk and subject to the 28 days tests; in no case where this has been allowed has the result proved a mistake in judgment. A cement sampling record slip is enclosed in the sealed sample case giving all information as to shipment. Copies of the final test record are furnished to the district engineer as well as to the mills for comparison with the manufacturer's tests, and the records are compiled in loose leaf books for future reference.

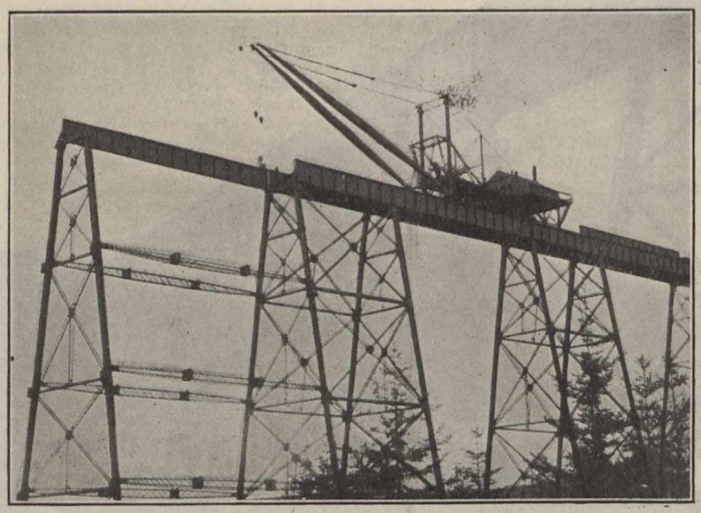

Fig. 4—100 ft. Girder in Place.

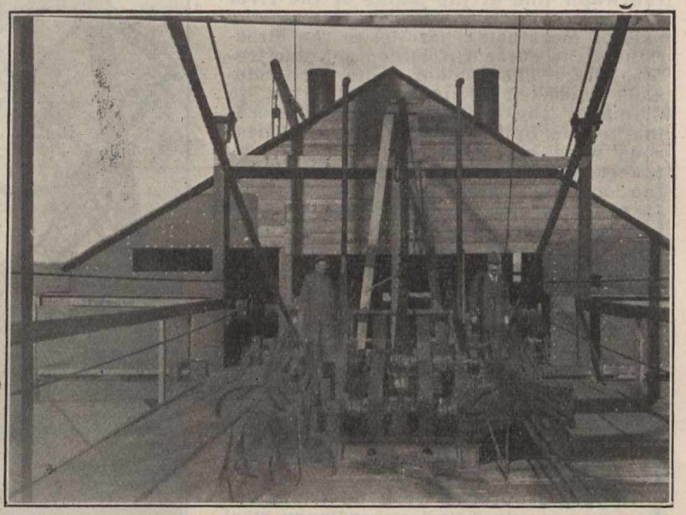

Fig. 5—Working Platform of Traveller.

By means of these records and a system of reports from the field inspectors of the arrival of cars, it is an easy matter to trace any car and identify its contents after being piled in the cement storage house at the bridge site.

DESIGN.—The Dominion Government specifications were strictly adhered to in the proportioning of the members. The compression members were figured for the pin ended formula of these specifications. In the tension members of the towers a limiting length of 200 l/r was used to avoid sagging of members, to make them capable of resisting compression and to give initial stiffness. The use of bulb angles in the sway bracing of towers makes a very stiff and economical section and avoids breakages in shipment, the great fault in box laced section of light angles. Traction and wind were figures as called for in the specifications.

The posts viewed from the stress sheets do not appear to be economical, because of their relatively small radius of gyration when compared with a built up channel section; but the saving in weight of details and simplicity in shop work fully compensates for the extra main material. In the light of column tests it is reasonable to expect that the reduction in unit stresses for the increase of radii length would not be justified by practical tests. The metal is used mostly in directly resisting the primary stresses, as very little is required for secondary purposes (viz., lattice tie plates, etc.), and in this way a stronger column is obtained. The section used has also the advantage of continuous webs in each direction, which are geatly superior to the easily bent lattice bars, and moreover the interior of the column is much more accessible to the paint brush for shop and field coats. The section is symmetrical on both axes, having therefore its centre of gravity in the centre of the section, and no eccentric loading is induced from the girders. The small amount of redundant metal means uniformity of stress in the columns, and simplicity in the make up will decrease the cost of maintenance.

TENDERS.—In calling for tenders for the steel work our usual practice was followed of furnishing bridge companies with a general design and details of girders and towers, together with a printed form of tender in which was filled in the estimated weights of steel, and number of feet b.m. of timber in the floor. With this system all bridge companies bid on the same basis, and are not required to make a single drawing to submit with tenders, but merely to fill in the unit prices for steel and timber erected in place, and to carry out the amounts on the estimated quantities furnished, viz., steel 14,000,000 lbs., timber 520,300 ft. b.m. After the tender is awarded the bridge company submits stress sheets and details for approval before ordering the material from the mills.

FLOOR.—The rails were directly supported by 8 in. x 12 in. x 14 ft. bridge ties resting on the steel stringers, every fourth tie being 16 ft. long to support the plank footway placed outside the guard timber for the convenience and safety of the section men. An outside guard timber 8 in. x 9 in. dapped 1 in. over the ties, which were spaced four inches apart in the clear, the ties were secured to the stringers by ¾ in. hook bolts, and the guard timbers bolted through the tie with one ¾ in. bolt in every fourth tie. A steel guard rail 60 lbs. to the yard will be placed inside the gauge line, and 8 ins. therefrom in the clear, these guard rails coming together at the centre of the track one rail length beyond the end of the bridge and being protected by a cast steel point fitting the rail section and spiked to the road bed ties.

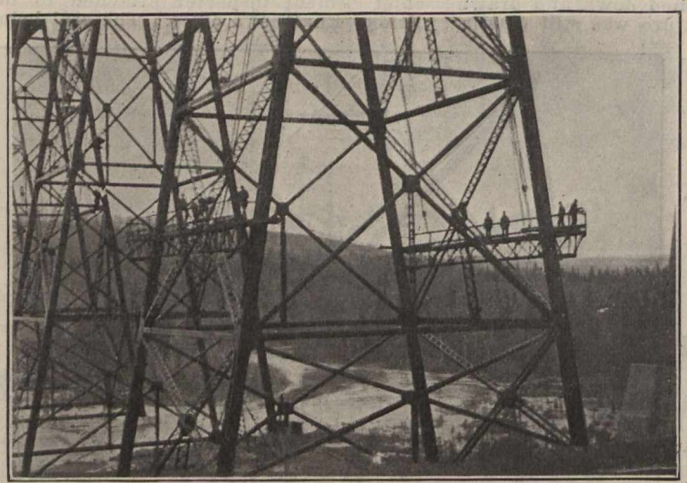

Fig. 6—Rivetting Galleries.

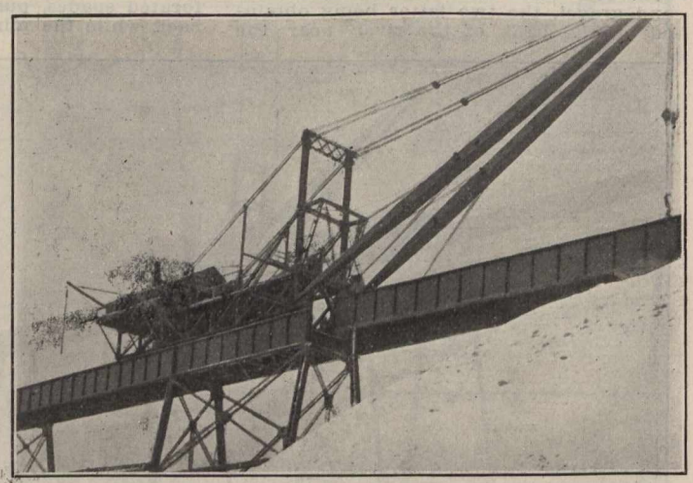

Fig. 10—Placing Last Girder Span.

ERECTION.—Actual erection began July 27, 1910; the steel was all assembled and last span swung Feb. 8, 1911, and all riveting and painting fully completed by Aug. 19, 1911. Material was unloaded at a siding at the west end and handled by a two boom derrick car in the storing yard. A light standard gauge locomotive with lorry cars handled the material from the storage yard to end of steel. The main feature of the