Floor beams, stringers and lateral bracing were then put into place and bolted. When the half of the first span was completed, a traveler was erected upon it. This was designed as a stiff-leg derrick supported on small trucks and running on 2 rails spaced about 35 feet centres.

A narrow-gauge track was then laid on the up-stream side, between the traveler and up-stream girder, and upon it trucks were loaded from teams by the unloading derrick. The traveler picking up the steel from the trucks placed the remainder of the steel in the second half of the first span.

The splices were then lightly bolted, the falsework removed, and placed between Piers Nos. 1 and 2. This being done, the traveler was moved on half a span, being then in a position to erect the first half of the second span.

This procedure was adopted throughout, quickly and successfully.

Riveting followed on after the first span was erected. Compressed air was used, steam being supplied to the engine by the boiler of unloading derrick.

Traffic is being maintained during the erection of the new bridge by a temporary structure placed about 100 ft. east of the present bridge.

The contract for the substructure was carried out by Mr. R. Brouder, Hull, Que., and the superstructure by the Dominion Bridge Co., of Montreal and Ottawa. The total cost of the work was about $80,000.

The bridge was designed under the direction of Mr. Archibald Currie, the late city engineer of Ottawa, and the construction work was supervised by Mr. Frank C. Askwith, acting city engineer. Mr. Robt. Henham was the resident bridge engineer, and Mr. Allan McKillop his assistant.

We are indebted to Mr. L. McLaren Hunter, of the city engineer's office, Ottawa, for these particulars.

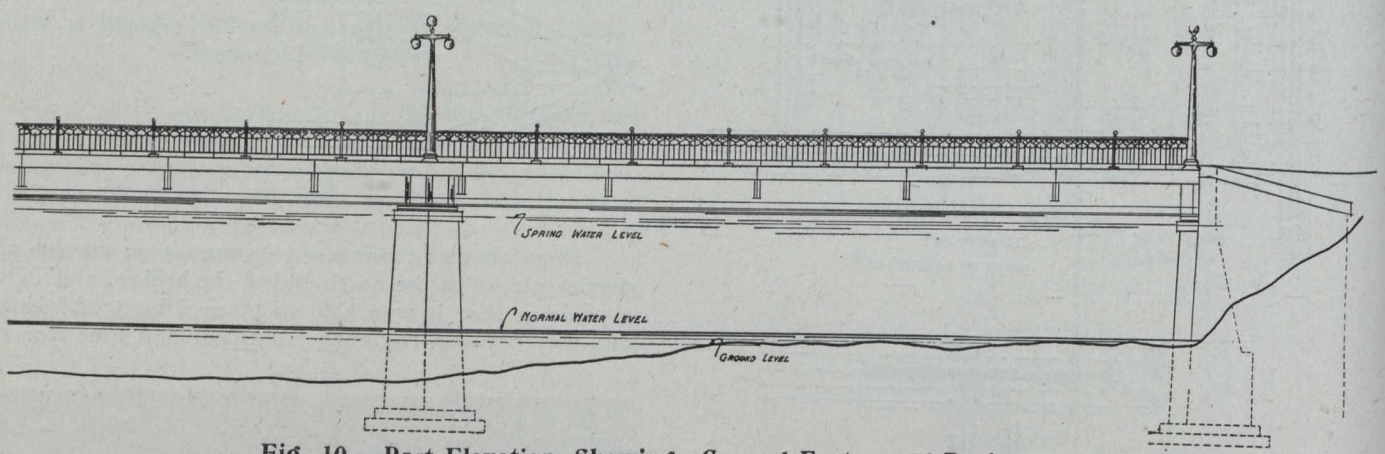

Fig. 10.—Part Elevation, Showing General Features of Design.

PUBLIC PROTECTION AT RAILWAY CROSSINGS.

THE annual meeting of the Illinois Electric Railways Association was held in Chicago in January. An interesting report on highway crossing protection was presented by one of the committees. Crossing signals are therein stated to perform two functions. They designate the location of crossings and announce the approach of trains to the crossings. Among the more common types now available for installation on electric railways are the simple illuminated crossing sign, the intermittently illuminated sign, which gives repeated flashes of light, the signal with moving parts, imitating the waving or swinging of a red blade or flag, and various combinations of these aspects, all designed to be arrestive. Combined with these visible indications are audible indications, such as bells, gongs and sirens.

The prime requisite in a highway-crossing signal is reliability. The signal should be so controlled that the train passing certain limits by virtue of being within a certain section, will cause itself to be announced at the crossing. There are two forms of such control, intermittent and continuous. With the former the electrical signal release is actuated either by the passage of the car wheels or the trolley wheel past some setting device. In the continuous type control is obtained with track circuits, in which are connected interlocking relays that in turn energize the crossing bells and lamps whenever a car is passing through or standing within the block. A second feature of importance in highway crossing protective apparatus is continuity of signalling. For example, if more than one train should enter the ringing limits at one time, and, later, one should pass out, or both stop for some time, and then proceed across the highway, the signal must warn against the last, as well as the first crossing. Thus car counting devices are an important feature in the intermittent scheme of control. It is important so to arrange the device that if several cars are near the crossing simultaneously the bell will continue ringing as long as there is one car inside the control zone.

As to signal costs, the committee found that the average cost of installing a single-track warning signal, exclusive of the cost of the signal itself, was $110, ranging from $90 to $150. One man could maintain from 15 to 50, the average being about 44. One road, having a total of 29 signals, maintained them at a monthly cost of 65 cents per bell, the data being collected over a year's operation. Another road with 64 signals reported the cost as $2.86 per signal per month, while some roads reported as high as $7 per signal per month. Of these two roads the one with the smaller up-keep cost had somewhat fewer than one-third the number of operations of the road having the maintenance cost of $2.86, showing that the maintenance cost per operation does not differ greatly. The average maintenance cost, from all the replies received, was $3.25 per bell per month, which appears to be higher than it should be.