VICTORIA JUBILEE BRIDGE.

The Grand Trunk's New Structure at Montreal.

On May 4 last work was begun on the replacing of the famous tubular Victoria bridge over the St. Lawrence River at Montreal, by truss spans, to be known as the Victoria Jubilee Bridge. Work has proceeded so satisfactorily that the masonry of the abutments & 18 piers has been completed. One span of the superstructure at the west end of the bridge is in place & the larger part of the material for the remaining spans is manufactured and ready for erection.

It has been popularly supposed that Robert Stephenson, the famous English engineer, designed the Victoria bridge, but the late Myles Pennington, in his "Railways & Other Ways," says that while Stephenson was the consulting engineer, to Alex. M. Ross must be given the credit of being the suggester, planner & designer of the structure. Mr. Ross had been connected with many railways & public works in Great Britain before he visited Canada. He came here on behalf of English capitalists in 1852. John Young, Commissioner of Public Works for Quebec, pointed out to Mr. Ross the importance of bridging the St. Lawrence. Mr. Ross, after inspecting the locality, suggested the construction of an iron tubular bridge, & returned to England in the fall, carrying with him soundings & plans of the bridge as designed & located by him. In August, 1853, a complimentary dinner was given to Robert Stephenson at Montreal, when he acknowledged that an abundance of information had been brought to him in England by his esteemed friend Ross, & that he was able to get a good idea of what the bridge was to be before he came to Canada. He added that it was one of the proudest days of his life when he was called to confer with the engineers of the G.T.R. on bridging the St. Lawrence.

The construction of the bridge was an undertaking of great engineering & practical difficulties, but money, perseverance & skill overcame them all. Mr. Pennington gives some idea of the discouragements which were met with. The contractors had to contend with a roaring rapid 2 miles wide, shoves of ice from 3 to 7 ft. in thickness & from 15 to 20 square miles in extent, coming along slowly but surely, with a pressure of millions of tons. Before building a cofferdam wherein to erect a stone pier it was necessary to put down above the site mooring cribs to hold barges & steamboats in position while the building of the cofferdam was in progress. One winter a large staff was employed cutting holes in the ice & putting down wooden cribs which were weighted with heavy blocks of stone. This was done to save time in spring, but when the ice shove came it cleared away all the cribs & carried the stone into the very spot where the cofferdam was to be erected. Thus the whole winter's work, instead of being of any advantage, was attended with very much loss, both in time & money, for in the spring new cribs had to be put down, & the stones strewn over the bottom of the river had to be fished up one by one before the building of the cofferdam could be commenced. The stone for the first pier was laid July 22, 1854, by Sir Cusack Roney. On November 24, 1859, Vice-President Blackwell of the G.T.R., Attorney-General Cartier, of Quebec; Jas. Hodges, Superintendent of the bridge construction; A. M. Ross, Engineer; W. Shanley, Major Campbell, Messrs. Gzowski, Macpherson, Forsyth, Captain Rhodes & others were the first to cross the St. Lawrence by the new bridge. Mr. Blackwell was on his way to England to attend the Grand Trunk meeting, & was able to report himself as coming via Victoria Bridge. On August 25, 1860, the last stone was laid & the last rivet driven by the young Prince of Wales, on which occasion a grand banquet was given near the bridge, at which addresses were delivered by the Prince, the Duke of Newcastle & others. To commemorate the event Mr. Blackwell presented a gold medal to the Prince & bronze medals to the officers of the G.T.R. The bridge cost $7,000,000, which sum has been largely augmented by the cost of alterations & repairs.

The tubular form of bridge, then already in use for the railway bridge over the Menai Straits in Wales, was adopted. The tubes were constructed of boiler iron & were 16x20 ft. in sectional area, with a simple plate floor & roof, instead of the cellular construction adopted in the Menai Bridge. The bridge is 9,144 ft. long, the total length of the ironwork being 6,592 ft. There are 24 piers & 2 abutments, containing 100,000 cu. yds. of masonry, the thickness of the piers at the water line being 18 ft., except for the 2 piers of the channel span, which are 28 ft. wide. There are 25 spans, 24 of these ranging from 242 to 247 ft. in length, and the centre or channel one having a length of 330 ft. The height from the water to the bottom of this tube is 60 ft., & the bridge has a grade of 1 in 130 from each end to this span. The total weight of iron in the tubes is 9,044 tons, & the area for painting in each coat was 32 acres. The greatest depth of water is 22 ft., & the average rate of the current is 7 miles an hour. The contractors for the bridge were Peto, Brassey & Betts. Fig. 1 is a general view of the bridge. Fig. 2 shows in more detail some of the end spans, with the iron casings of the ends of the tubes, which form refuges for the trackmen. It also shows the side openings for ventilation.

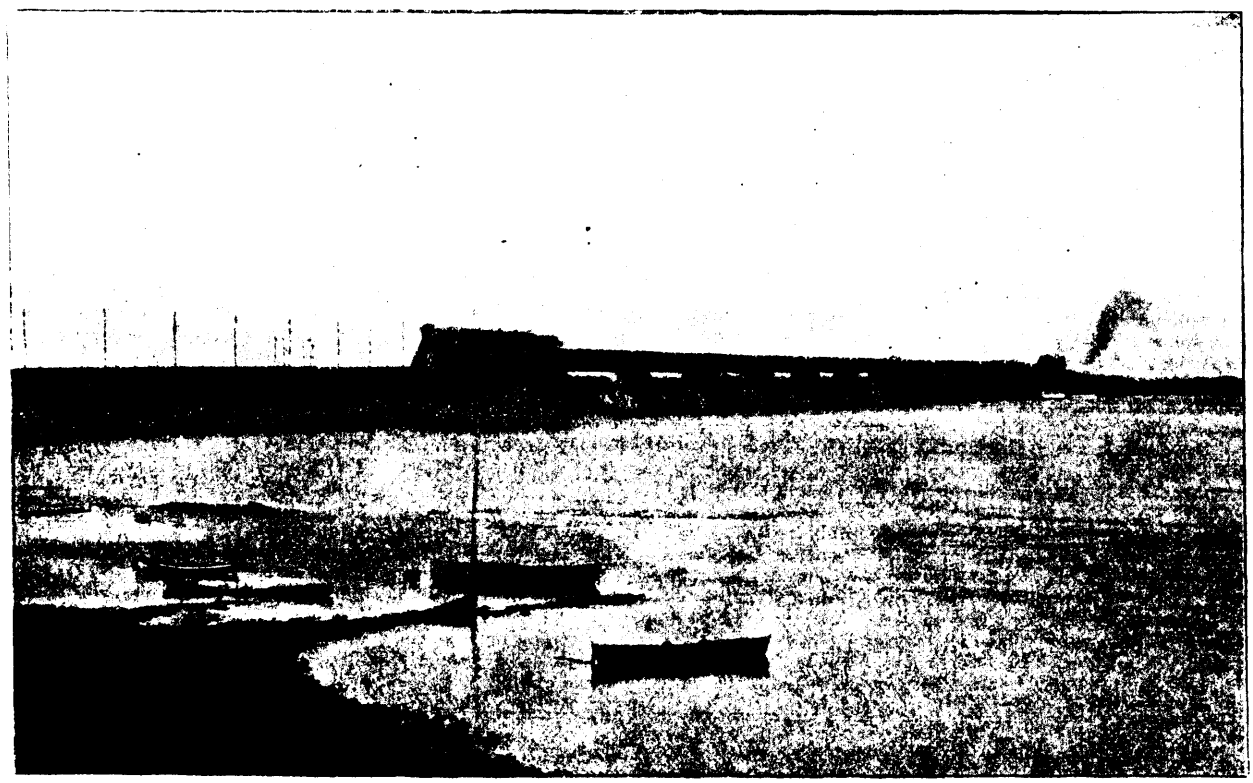

FIG. 1.—THE VICTORIA TUBULAR BRIDGE.

The smoke and gases from the locomotives in this long iron tunnel made the atmosphere very foul, and within recent years a strip of the plating along the centre of the roof was removed, the roof being reinforced by riveting angle irons along each side of the opening. Rust & corrosion (from the products of combustion, damp, & the drippings of brine from refrigerator cars) have made inroads upon the ironwork, & while these did not reach such an extent as to impair the safety of the structure, yet they, in conjunction with the incapacity of the single track bridge to provide properly for all the traffic, led the Company to decide upon erecting a new superstructure, which has been designed under the direction of the Company's Chief Engineer, Jos. Hobson, to whom THE RAILWAY & SHIPPING