CANTILEVER BRIDGE, (1,800 FEET SPAN) ACROSS THE ST. LAWRENCE RIVER, NEAR QUEBEC, CANADA.

Since 1890 the Forth Bridge, Scotland, has stood unrivalled as the greatest girder span in the world—1710 feet. This pre-eminence, however, will soon be lost, for a cantilever bridge is now being erected across the St. Lawrence, with a main span 90 feet longer than that of the Forth Bridge. In the fine panorama view shown, Fig. 1, it will be seen that the bridge is of cantilever structure, the central span of which extends almost from bank to bank of the river, and is 1800 feet long from centre to centre of piers, with a central suspended girder 675 feet long and 130 feet deep at middle, connected at ends to cantilever arms 526 ft. 6 in. long, whilst the anchor spans are each 500 ft., and the approach spans 210 feet long.

It is designed to carry two lines of railway, two trolley lines, two highways and two sidewalks. The sidewalks are carried on the outside of the trusses by cantilever extensions of the cross girders. The balance of the traffic is carried between the trusses, which are placed 67 feet apart.

clearly the main characteristics of the structure. The clear headway provided is attained without an excessive length of approach viaduct and with a gradient not exceeding one per cent.

The height of the post over each river pier is 315 feet, corresponding to about 350 feet above the level of ordinary high water. This post is ten feet wide by four feet in depth, and rests at its lower end on a pin 24 inches in diameter. Pin connections have been used throughout, the usual size of the pins on the main and anchor spars being 12 inches, though, as stated, the main pins over the main piers are double this. The main eye-bars are naturally of exceptional dimensions, being generally 15 inches or 16 inches wide, and it is also proposed to use some 18 inches wide. The main cords are 54 inches deep and 68 inches wide; whilst the vertical posts measure from 40 inches to 48 inches in width, according to their situation. The cross-girders carrying the roadway are 10 feet deep. No castings

Fig. 3.—Main Connection Over Pier.

The bridge is being built for the Quebec Bridge and Railway Company, of which the Hon. S. N. Parent is president, and Mr. E. A. Hoare the chief engineer, whilst Mr. Theodore Cooper is acting as consulting engineer. The site selected is some six miles above Quebec, at a point where the river narrows to less than 2000 feet at low water. From this point up stream to Montreal, a distance of 165 miles, there is no bridge now existing, whilst below Quebec the river widens out so much as to make the bridging of the river below the city very improbable; so that this bridge will, when finished, be the only one between Montreal and the sea, a distance of nearly 1000 miles. It will afford direct connection between the Great Northern Railway of Canada, the Quebec and St. John Railway, and the Canadian Pacific Railway, on the one side, and the Grand Trunk Railway, the Intercolonial line and the Quebec Central Railway on the south side of the river. The bridge will also form a link in the projected Grand Trunk Pacific trans-continental line.

A diagram of half the main and the whole of one anchor span of the bridge is represented in Fig 2, which shows

are being used for any part of the bridge, even the main shoes and pedestals being built up of rolled plates and angles.

In Fig. 3 is represented the bearing for one of the river piers, with the pin-plates for the vertical and inclined members already in position. The total weight here represented is stated to be 537,000 lbs. The heavy weights and large dimensions of the pieces of the bridge has occasioned some trouble in transport. The false work for the erection of the south anchor is shown in Fig. 4. The central portion is of timber and will carry the floor of the bridge, over which materials will be delivered to the traveller. The outer portion is of steel, and is built in groups of four columns under each panel point, which are thoroughly braced together. At the top of these columns is fixed a steel floor, on which will be laid the lower chords of the bridge. The traveller shown in the extreme right is used for erecting the false work only, that to be used in the erection of the main structures being represented on the left. This latter "straddles" the bridge, and is carried on metal girders fixed on the false work in the case of the