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Contents of this issue on page 3

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PROVENCHER BRIDGE, ST. BONIFACE, MAN.

GENERAL DESCRIPTION OF DOUBLE-LEAF BASCULE BRIDGE TO BE ERECTED OVER THE RED RIVER BETWEEN ST. BONIFACE AND WINNIPEG.

TENDERS have been called for the supply and erection of the superstructure for a bridge to cross the Red River between Provencher Avenue, St. Boniface, and Water Street, Winnipeg. The superstructure is to be a double-leaf, Strauss trunnion, bascule bridge, spanning a 105-foot channel on a 60° skew. The bascule span is to consist of two through girder-spans, the main trunnions of which are supported on two trunnion posts for each girder. The construction further includes two towers, in addition to reinforced concrete counter weights, supported from the tail ends of the girders and maintained in a horizontal position during the operation of the bridge by means of structural steel counter weight lengths.

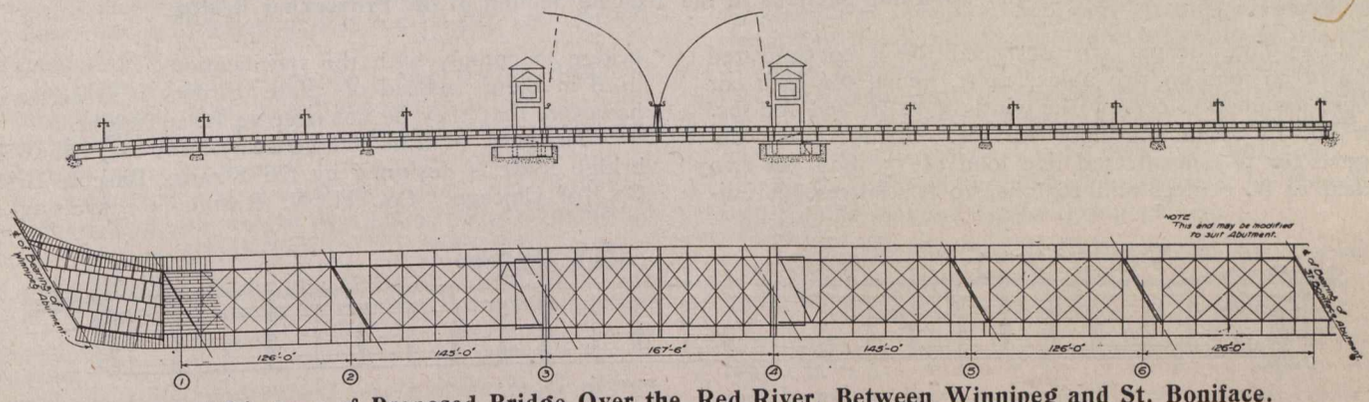

Fig. 1.—General Diagram of Proposed Bridge Over the Red River, Between Winnipeg and St. Boniface.

The live load uplift is taken by supports in the front and by supports in the rear connected to the approach spans.

The machinery for the operation of the bridge embraces trains of gears operated by electric motors and actuating operating pinions, one for each girder, engaging segmental cast iron racks bolted to the tail ends of the girders. The motive power is to consist of 4 electric motors for general operation of the bridge and additional motor for the operation of the centre locks. They are to be series wound and of the enclosed railway type. Each motor is to be furnished with a brake held in the set position by a spring strong enough to overcome about 135 per cent. normal motor torque and to be released by enclosed solenoids and held automatically in release. The equipment is also provided with a hand-brake. The control of the leaf motors and of the centre lock motor will be quickly interlocked with each other in such a way that it will be impossible for the operators to start the leaf operating motors until the locks have actually been released; also in closing it will be impossible for the operator to close the locks until the bridge has been completely closed. This interlocking is accomplished, not by mechanically locking levers, but by preventing the operator to get current into his motors until the preceding motion has actually been performed. An automatic cut-off will throw the circuit-brakers out on the operating motor circuits and set their brakes when the bridge reaches nearly its open or its closed positions. The electrical equipment is so designed that each leaf can be operated from its adjacent operator's house. The centre lock mechanism is to be operated from one of these also.

Reinforced concrete counter weights will be used, and, as stated, will be connected to the tail ends of the bascule girders. Each will be in the form of a monolithic concrete block, with recesses for additional material for adjustment, and will be supported on a structural steel frame. The concrete mix will be 1 of Portland cement: 8 of sand and crushed stone, and will weigh about 148 lbs. per cubic foot. Altogether there will be about 2,338 cu. yds. of concrete, including reinforcement in the counter weights.

The bridge floor will have a clear width of roadway of 44 ft. between the main girders. Two sidewalks, each 19 ft. in width, will be carried on steel brackets outside of the main girders. The bridge will be provided with two lines of car tracks, spaced 11 ft. 9 in. from centre to centre of the tracks, and it will provide head room to suit the trolley wires being placed 18 ft. from the top of the rails. The dead load will thus consist of the weight of the steel in the girders, floor system, hand-rails, laterals, etc., the weight of concrete in sidewalks and floor and the weight of pavement, rails, etc. The