The double-deck feature in bascule bridge construction is said to be out of the ordinary and it is reported that there is no other bridge of the bascule type containing a double deck that is quite as large, although there are a few single-deck bascule bridges under construction that are considerably larger than this one.

There are long approach viaducts on both sides of the river for the electric railway, to enable it to cross the bridge on the upper deck.

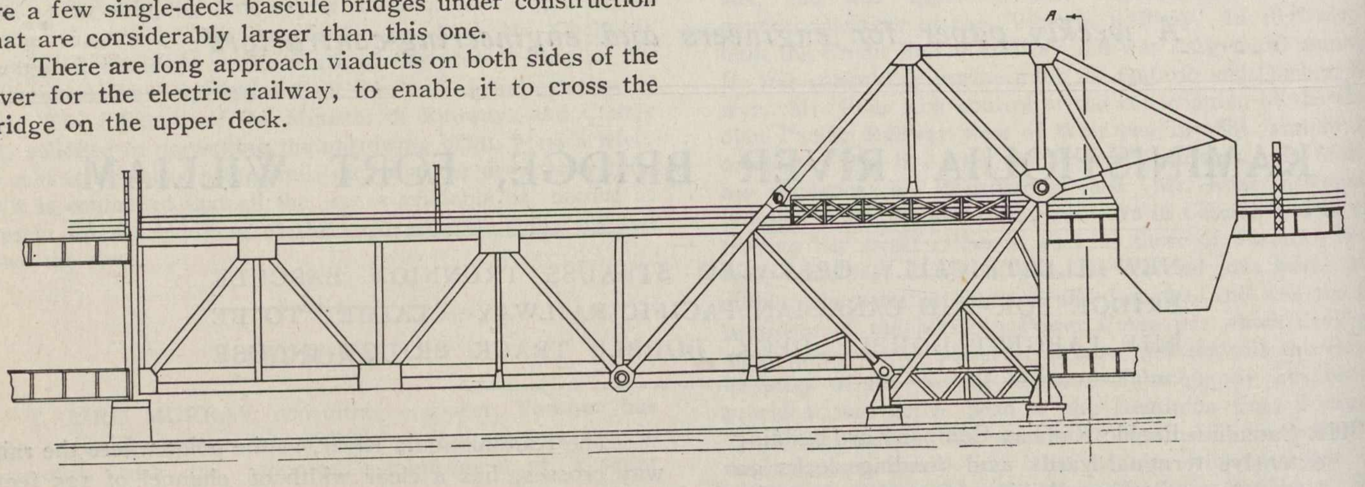

Fig. 2.—Kaministiquia River Bridge, showing General Elevation Diagram.

The construction of the bridge is rather out of the ordinary, as an inspection of the accompanying illustrations will show. The main span is pinioned on a main trunnion at the forward end of the triangular tower. It is for this reason that it is called a heel trunnion type. On the top of the tower a cantilever counterweight arm is trunnioned, the counterweight overhanging the right end of the bridge, the opposite end being connected by a connecting link with pins at both ends to a point along the lower part of the span member, as indicated.

As the main span turns on the main trunnion, the counterweight cantilever at the same time moves through a similar angle, as the pins are so located as to form a parallelogram. The counterweight on the outer end of the counterweight arm is a solid mass of concrete, of such weight as to maintain the main span in equilibrium at all times, the only power required to raise the span being that necessary to overcome the friction of the parts.

The bridge was erected in the open position by means of a wooden erection tower 125 feet high. A derrick on top of this tower took the steel from the cars at the bottom and landed it in place. The placing of the concrete for the counterweight was carried on simultaneously with the erection of the steel, so as to balance the structure at all times. On account of the size of the structure, the available space for the concrete was small, and it was necessary to make concrete weighing as much per cubic foot as possible. Good results were obtained by using iron ore in place of stone in the aggregate, and concrete was obtained weighing about 175 lbs. per cubic foot. This concrete had such great tensile strength that most of the reinforcing ordinarily used in these counterweights was omitted. There was occasion to remove some of this concrete afterward, and it was found to be so tough that the only way it could be removed was by blasting.

Method of Operation.—The operation of the bridge is as follows: Pinned to the front of the triangular towers on each side are operating struts, on the lower end of which are long racks each engaging at the outer end with a pinion. This pinion is connected through gearing to an 85-h.p. motor fitted with solenoid brakes. These two motors are mounted on the towers as indicated in the illustration. The motors, when operating, revolve the pinion, which moves along the rack on the lower face of the operating strut. This action lifts the span. As the bridge moves up, the motors move through the same angle, which in the highest position is 80 degrees.

At the outer end of the span there are two lock motors of 5 h.p. each. These operate the locks through worm gearing. There is also a 3-h.p. motor geared to a crank disc to operate an emergency brake.

When the bridge is closed and ready for traffic, the lock signal switch and the bridge signal switch are both closed, and the contacts in the circuits of the main operating motors and the lock motors are open. To open, the

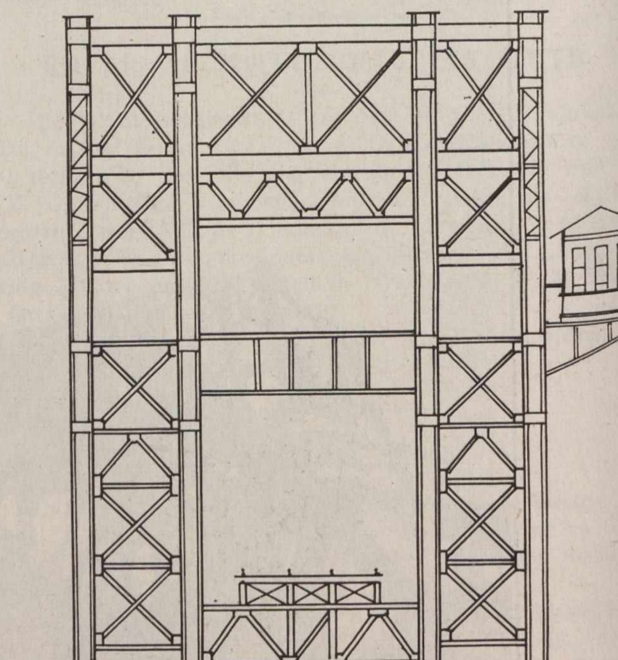

Fig. 3.—Kaministiquia River Bridge—Section A-A (Fig. 2).

danger signal is first set. The action of so doing energizes the contactor points of the lock motor, causing them to close, when, by the closing of the lock motor circuit breaker by the operator, the locks are withdrawn. The lock moving out, automatically changes the light in