

torque. All brakes are released by a solenoid and held in release when the motor is taking current. Means are provided for releasing the brake mechanically when the bridge is to be operated by hand.

The controller for operating the motors is of the standard drum reversing type, and is of sufficient capacity and resistance to control the motors properly without injury and without shock to the machinery when starting the motors and bringing them up to speed. It is capable of reducing the starting torque to 35% of the nominal rated torque.

A foot switch with spring release is located near the controller so as to enable the operator to keep the motor brake released after shutting off the current, if it be desired to allow the bridge to coast.

The switchboard is large enough to locate meters, switches, circuit breakers and fuses without crowding, so that each device can be safely and quickly reached and operated.

Signal lights, meeting the requirements of the Dominion Government for bridges over navigable streams, are provided on the moving leaf and also on the abutments on each side of the channel.

On the north end of the bridge two contacts are provided, one to operate the chain barrier and the other for the two pier lights on this abutment. These contacts link up the operator's house with two solenoid relays which in turn engage a separate power service for the north abutment chain barrier and lights.

For emergency operation there will be installed a two-cylinder, vertical, self-contained gasoline engine capable

dry, weighed 173 lbs. per cubic foot. The proper proportions, in order that this unit weight might be obtained, were determined only after considerable experimenting. Consideration had to be taken of the fact that a part of the water used in mixing the concrete united chemically with the cement, and part was given off in evaporation while the concrete was setting. Experiments showed that one cubic foot of concrete lost about four and one-half pounds in weight during the first ninety days, and that

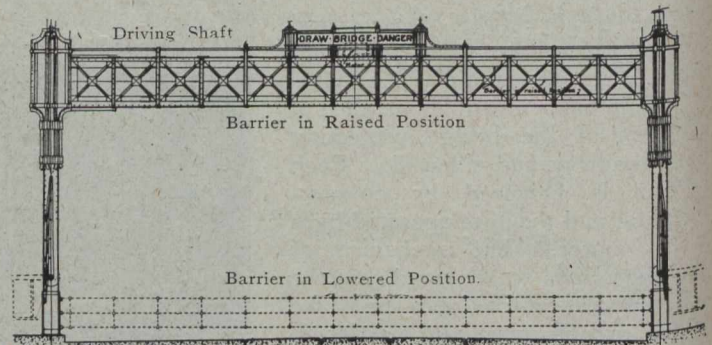


Fig. No. 6—End Elevation Showing Chain Barrier

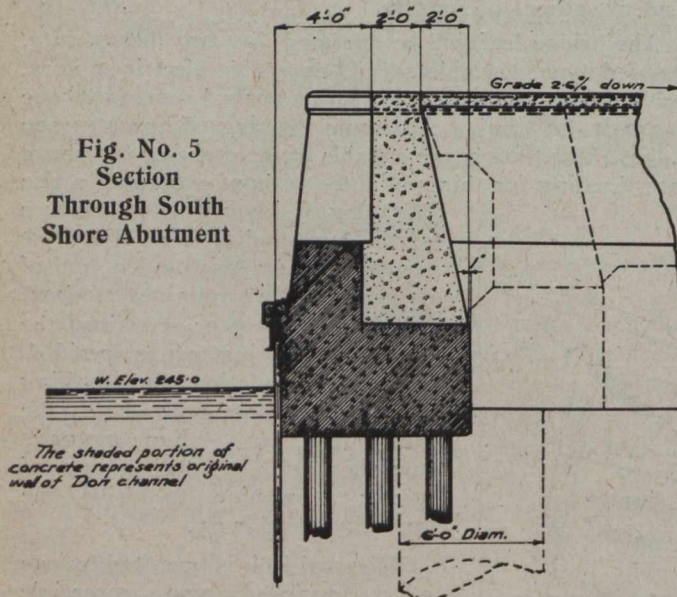
the proper proportions of stone to iron ore, in order to obtain a weight of 173 lbs. per cubic foot of dry concrete, were 1 to 3 by weight.

Adjusting compartments, capable of holding 65 cu. ft. blocks of concrete when half-filled, were left in each counterweight. According to the centre of gravity calculations, the weight of the counterweight proper plus the weight of these additional blocks was just sufficient to balance the moving leaf. In case the unit weight of concrete varies, there is a working margin of approximately six tons in the adjusting compartment of each counterweight. The total weight of each counterweight is approximately 700,000 lbs.

The assembly of the steel has been completed, and riveting gangs are rapidly covering their end of the work. One concrete counterweight has been poured and the forms are being constructed for the other. The operating machinery is partially installed, and the operator's cabin and machinery enclosure are well under way. As can be seen by the photographs, the bridge is being erected in its open position.

The substructure, including trunnion piers, shore abutments and retaining walls, were built by the Harbor Commission's construction department. The contract for the superstructure was awarded to the Dominion Bridge Co., Limited, whose tender was lowest. The concrete counterweights are a sub-contract to the Raymond Construction Co., Limited, Toronto. Robt. W. Hunt & Co. Limited, attended to the mill, shop and field inspection.

Fig. No. 5
Section
Through South
Shore Abutment



of developing 18 h.p. when operating at a speed of 800 r.p.m. The engine will be started by compressed air. Dust-covers and guards are placed over all gears in the machinery enclosure.

The operator's cabin and machinery enclosure is erected on the steel superstructure above the roadway. Hatchways were provided in the floor of the cabin for the removal of parts requiring repairs.

Counterweights

The counterweights consist of concrete composed of one part of portland cement, three parts of sand and five parts of broken stone, gravel and iron ore. The stone and iron ore were so proportioned that the concrete, when

Estimates of the Federal Department of Railways and Canals include \$500,000 for construction of the Trent Canal; \$1,860,000 for the Welland Canal; \$43,000 for improvements to the Ontario-St. Lawrence Canal; and \$700,000 for construction work on the Quebec Bridge.

Toronto is going to get \$150,000 for the continuance of the Dominion Government's part of its contract in regard to the Toronto harbor work. Though the delegation which was in Ottawa a week ago, urging that the government live up to its share of the covenant, did not get much encouragement then, it is learned that the subject has since been before the Cabinet and that the justice of the city's claim is conceded. The supplementary estimates, it is understood, will provide \$150,000 to be applied mainly to the protection of the work already done by the city and the government, so as to prevent it being damaged by ice or storms.