As previously mentioned, the weight of the span as lifted was 5,080 tons. The total load on the six scows, however, was 5,753 tons, or about 959 tons per scow, as the material between the scows and the span weighed 673 tons. This consisted of 73½ tons of track stringers, 1 ton of shims between floor beams and stringers, 327 tons of track girders, 10½ tons of track girder bracing, 211 tons of staging posts and hitch channels, and 50 tons of timber.

The elevation of the beds of the scows was high enough to ensure that the scows would be emptied through the bottom valves during the last low tide before floating the span into position. The water drained out about as fast as the tide fell, as each interior area of the scows had unobstructed access to a valve.

Just before the span was lifted off the end supports, the load was nearly all taken by the scows, and the span could have been easily displaced from its position by the current and wind, unless it was anchored against their combined effect. It was considered desirable to prevent this shifting off before the actual moment of starting arrived, inasmuch as it might have happened that after deciding to raise the span preparatory to moving out, a change in the weather conditions might have made it desirable not to proceed on the journey and the span would have had to have been returned again to the staging bents, to await the next favorable opportunity for making a trial.

To keep the span in its position until the final decision to float away was made, timber bents were placed between the lower end panel points and the adjacent scows and also bents on the shore side of the span, against which the scows guided themselves as the span was raised on its supports.

In order to float the span a high-tide elevation of at least 92 feet was required, and, in order to drain the scows, a previous low tide elevation of not more than 82 feet. The bottom of the scows were at elevation 83 feet, and the bed of the river over the course the scows were to take was cleared off to elevation 82. Inasmuch as elevations of high and low tide may vary 2½ feet at the erection site of the suspended span, a tide would have been preferred whose elevations as given by the tide tables would have been 94.5 feet at high tide and 79.5 feet at low tide. The tides of September 3rd met those conditions better than the tides of any other day of this month, but the hoisting arrangements were not completed in time to take the opportunity. The tides of the 15th to 19th were the next most favorable, and had not the span been floated some one of those five days, about two weeks would have had to elapse before elevations would have re-occurred suitable both to drain the scows and to float the span.

Elaborate preparations were made to foretell the weather conditions. A full statement of meteorological conditions was received and carefully studied twice each day. Telephone communication was obtained at 10 a.m. and at 10 p.m. each day with the Toronto Observatory. Barometric observations were also taken daily.

The appearance of the sky and the velocity and direction of the wind just before starting, were also well considered before deciding to start. It was estimated that any winds which would exert a greater pressure than 2 lbs. per square foot could be foreseen, and in that event no start would have been made. The current velocity at the bridge site is a maximum at one hour before high tide, and flows westward at a rate of 6.3 to 7.3 miles per hour. At high tide the current velocity is less by about 1 mile per hour. The change of current from a westward to an eastward direction, when the velocity is zero, occurs about 1 hour after the time of high tide.

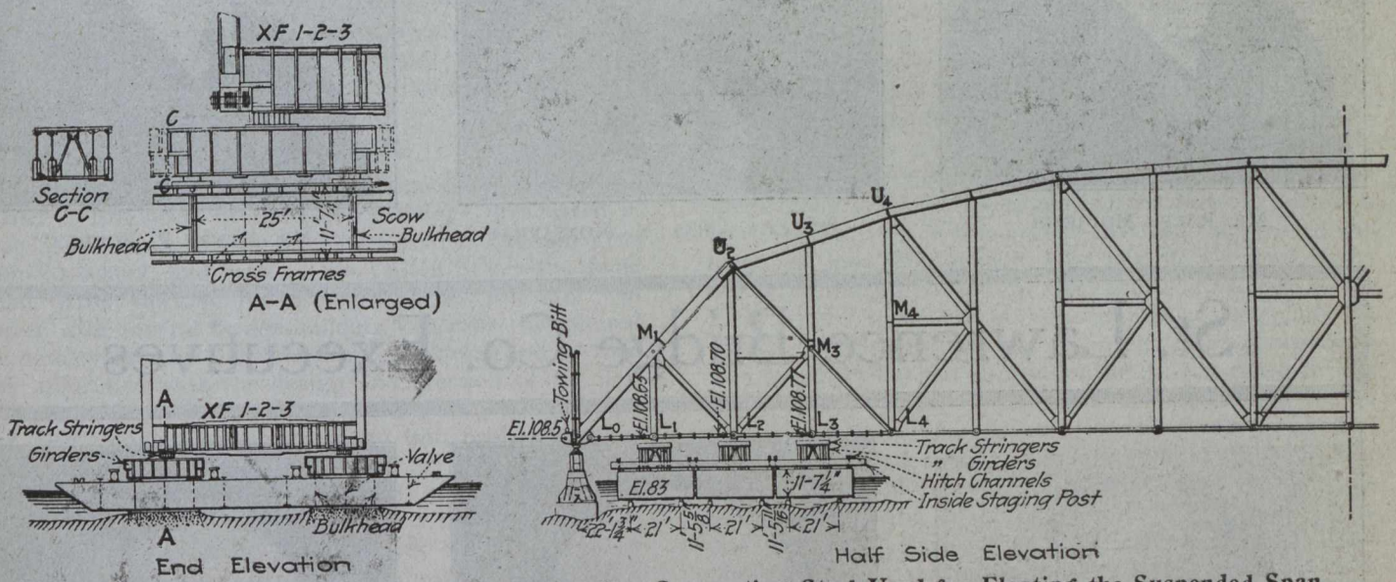

Fig. 11.—Details of Scows and the Intermediate Sup porting Steel Used for Floating the Suspended Span

QUEBEC BRIDGE EQUIPMENT

E. C. Kerrigan, chief draftsman of the St. Lawrence Bridge Co., has supplied the information for the following partial list of equipment used in building the Quebec Bridge:—

Hoisting equipment, including hydraulic jacks, pumps, valves, piping and safety jacks, by the Watson-Stillman Co., Aldene, N.J.

Locomotive cranes, by the Bay City Iron Co., Bay City, Mich.

Wire rope, by the Dominion Wire Rope Co., Limited, Montreal.

Motors, by the Canadian General Electric Co., Limited, Toronto.

Electric hoists, by Mead-Morrison Manufacturing Co., Cambridge, Mass.