

The total load carried by the hanger chains while lifting the span was 5,147 tons. The supporting girders, hanger chains, jacks and jacking girders and all their connections were designed throughout to carry this lifted load plus 20 per cent. impact.

The work of hoisting was done by eight 1,000-ton hydraulic jacks, placed two at each corner of the span, as shown in Fig. 3. These jacks were operated under a pressure of 4,500 lbs. per square inch, the water being supplied to them by a pair of direct-acting double-plunger pumps operated by compressed air and located on the centre line of the bridge floor at the ends of the cantilever arms. Valves placed in the feed pipe lines in front of the pumps controlled the water supply sent to each corner of the span and by this means and with the aid of an indicator, which showed any difference in elevation between the two sides of the span, the span was kept approximately level. Another set of

valves with a similar indicator attachment was located in front of each set of jacking girders and controlled the water supplied to each separate jack and by means of which the jacking girders were kept horizontal.

At 8.30 a.m. the tide had dropped sufficiently to make the pins bear at the ends of the slotted holes in the hanger links and the links themselves had straightened out. At 9.00 a.m. the tide had fallen about a foot and a half further, and the first jacking operation was commenced. Each operation of the jacks lifted the span 2 ft. During the lifting or upward

stroke the 12-in. pins engaged the hanger chains through the diaphragms in the upper jacking girders. At the finish of the stroke the pins were entered in the diaphragms of the lower jacking girders to engage the hanger chains. The upper pins were then removed, the jacks and upper girders lowered, the upper pins again entered, the lower pins removed, and the jacks

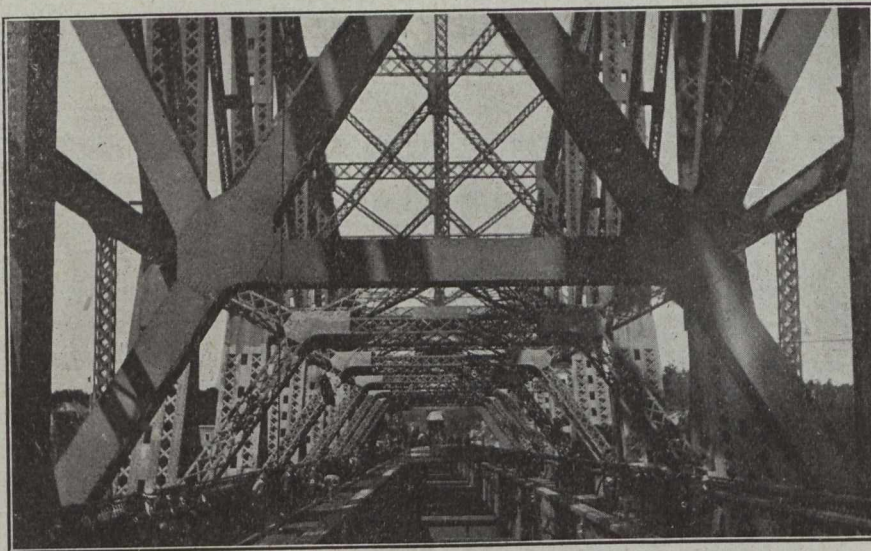
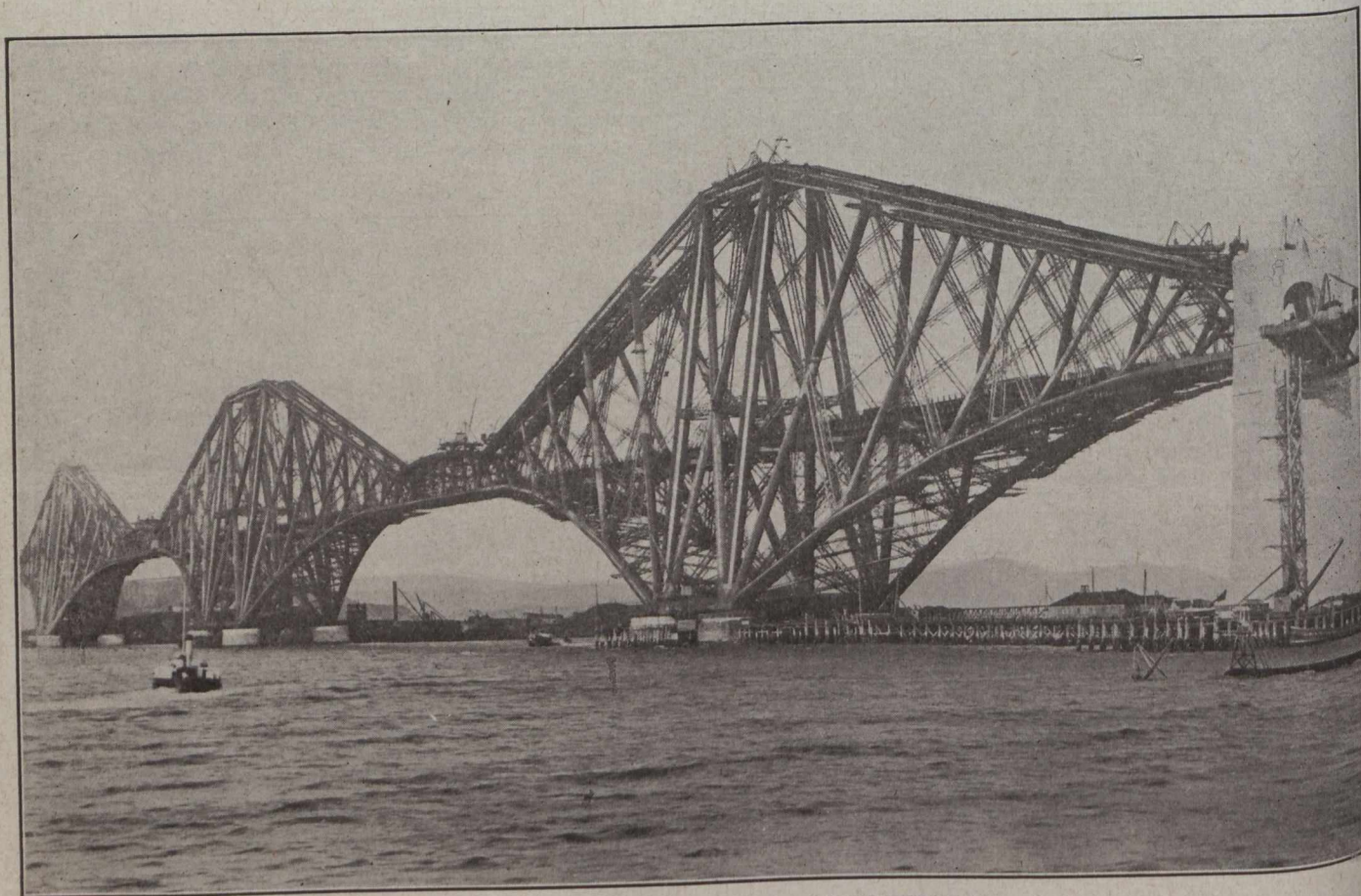


Fig. 9.—View Taken Looking Along the Floor of North Cantilever Arm.



FORTH BRIDGE NEARING COMPLETION.

As so many comparisons have been made between the Quebec and the Forth Bridges the accompanying picture will be of interest. Notice the short suspended spans in the Forth Bridge made possible by the use of Inchgarvie, a small island in the middle of the river, which formed a natural pier. The Forth Bridge is 5,349 feet long between approaches, cost about \$17,000,000, contains 54,000 tons of metal and about 250,000,000 tons of masonry.