## THE LITTLE SALMON RIVER VIADUCT. NATIONAL TRANSCONTINENTAL RAILWAY.

In recent issues of *The Canadian Engineer* there was described the new Red River bridge for the National Transcontinental Railway. This bridge includes a bascule span

Fig. 1.—General View of Viaduct.

and is a most interesting structure. The Little Salmon River viaduct for the National Transcontinental affords another interesting example of bridge work on the new railway. Mr. R. F. Uniacke, the bridge engineer for the Transcontinental, has described the structure very fully in a paper before the Canadian Society of Civil Engineers. An abstract of the description is given below:

The Act of Parliament, authorizing the construction of the eastern division of the National Transcontinental Railway, provides for a location from its eastern terminus (Moncton) through the central part of the province of New

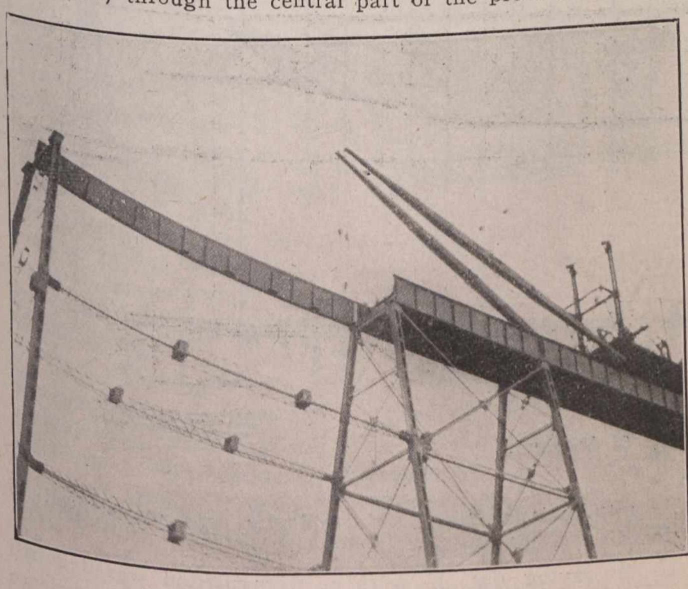

Fig. 2.—100-Foot Girder in Place.

Brunswick, and through the province of Quebec by the shortest available route to the city of Quebec.

The engineers of the Transcontinental Railway had located two lines, one known as the River route, following the St. John River, north from Fredericton, and the other the Central route; the latter was adopted as fulfilling more closely the provisions of the Act. That a line of railway has now been constructed along this route having a ruling point four compensated grade, with a maximum curvature of six degrees, is owing in a large measure to the advance in modern bridge and high viaduct construction. The valley of the Little Salmon River, 185 miles from Moncton, presented one of the obstacles to be overcome, as the grade development showed a crossing over 4,000 feet long, with a height of 200 feet above the water line.

The line approaches the west end of the structure with a six degree curve through a rock cutting and crosses on a tangent bearing N. 10°—27 ft. W., the grade rising 0.40 ft. per hundred. The layout consists of twenty-four towers 58 ft. 9 in. centres and twenty-five intermediate spans 100 ft. 3 in. c. to c., the end spans being 100 ft. 10½ in. centre of bent to outer end of steel; all the tower spans are alike and also the intermediate spans, except that the masonry ends are extended to give the required bearing. The towers and bracing are made alike as much as possible,

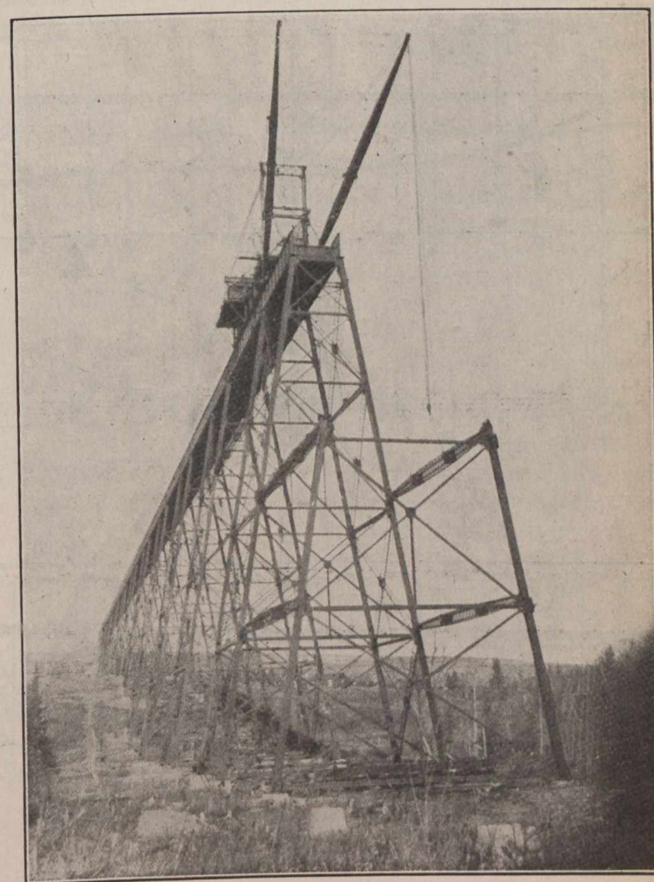

Fig. 3.—View of Erection.

necessitating one set of templates only for the spans and parts of towers which duplicate each other. A through girder system of construction was adopted, the girders being spaced 17 ft. 6 in. c. to c., while the floor beams with gussets were spaced 14 ft. c. to c., along the plate girders. The east end span is on a spiral to a 6 deg curve and in consequence the girders are deflected at this abutment 1 ft. 3 in. off the tangent to the structure produced. There were several reasons which led to the adoption of a through girder system. In high trestle construction where the use of falsework is out of the question, the most economical layout is that on an intermediate span as long as could be handled with a well designed traveller working from grade, so as to reduce the number of high towers, their pedestals and foundations. Spans of 60 ft. with 40 ft. towers are generally employed where deck girders are used, spaced 9 ft. c. to c., and bridge ties resting on the top flanges. Owing to the through girder system having a spacing of girders 17 ft. 6 in. c. to c., spans of 100 ft. are handled, since the bear-