WINNIPEG-SHOAL LAKE AQUEDUCT CONSTRUCTION.

THE progress made this season on the construction of the Shoal Lake Aqueduct for the Greater Winnipeg Water District has been very gratifying. The percentage required by contracts for completion this year is 18 per cent. This comprises about 16 miles of aqueduct, and it was recently stated by Mr. S. H. Reynolds, chairman of the District, that by November 1st practically 16 miles of the aqueduct would be finished. As the construction of the aqueduct proper began only last spring, there has evidently been good progress made despite some unfavorable weather conditions.

2.3 miles of 48-inch cast-iron pipe to McPhillips Street reservoir. It is a gravity system throughout, with a difference of elevation of 294 feet.

Preliminary work in 1913 involved an immense amount of survey and topography work through practically undeveloped country for almost the entire length of the proposed line, in addition to soundings at Indian Bay and test borings along the line. In 1914 the line was cleared, the railway built, and the Falcon River diversion dyke and channel partly constructed. These works were separately described in our issue of April 29th, 1915.

The greater part of the present season's operations have related to the aqueduct itself, several sections of which are illustrated in the accompanying views. For

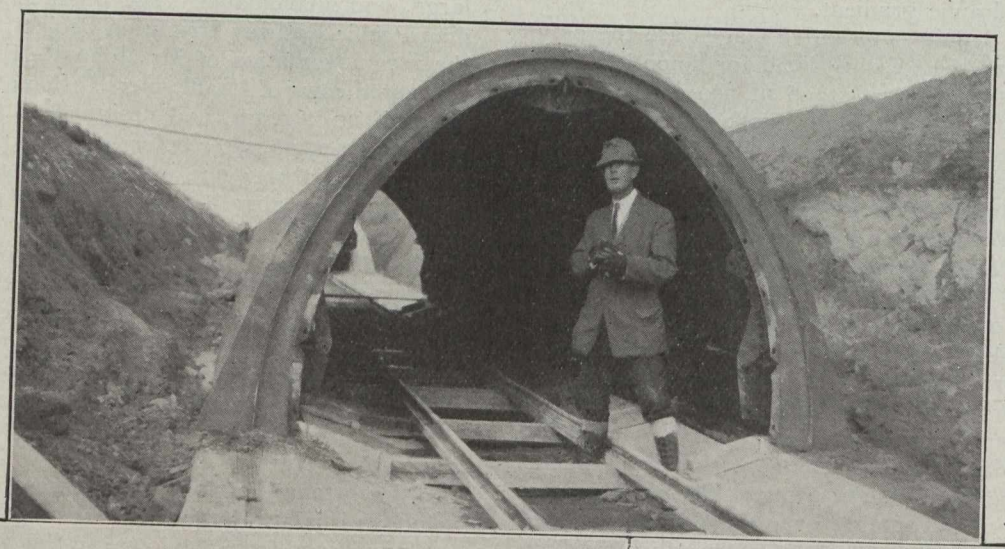

Fig. 1. Section of Open-flow Aqueduct.

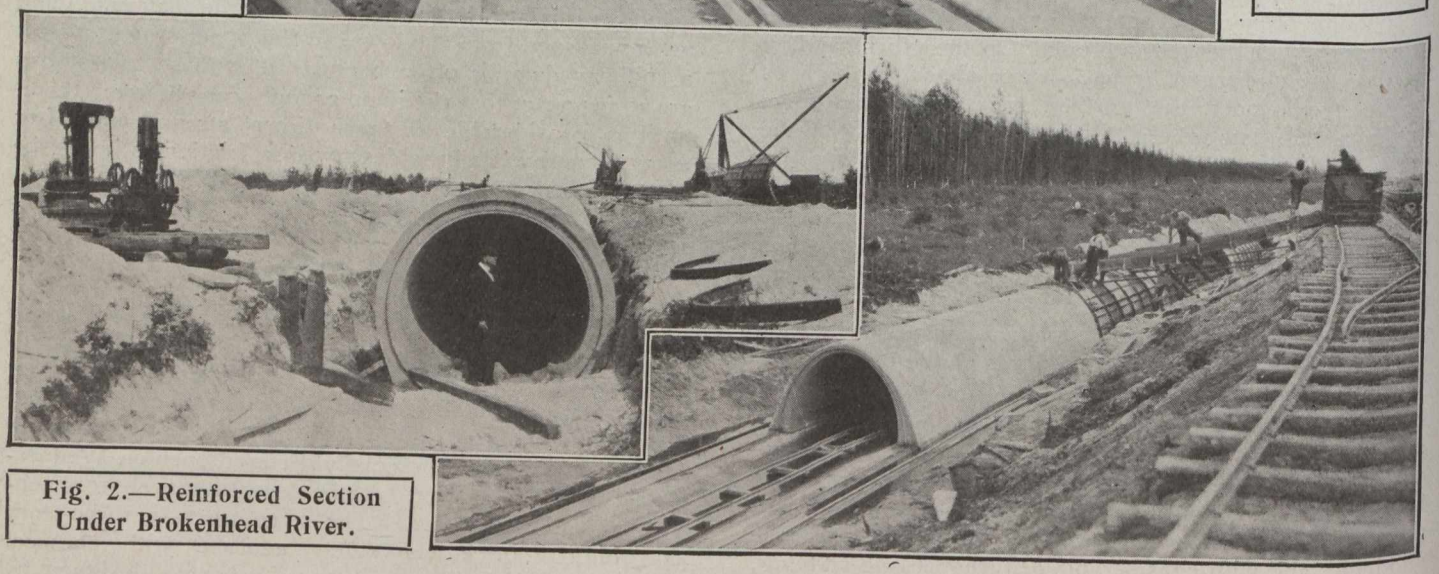

Fig. 2.—Reinforced Section Under Brokenhead River.

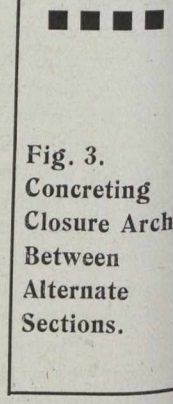

Fig. 3. Concreting Closure Arch Between Alternate Sections.

The whole project has been fully described in *The Canadian Engineer*. Our issues of September 11th, 1913, and October 23rd, 1913, outlined the scheme in full and summarized the engineers' report on the suitability and availability of Shoal Lake water supply. The undertaking comprises over 100 miles of permanently constructed railway from Winnipeg to Shoal Lake, a diversion dyke and channel to bar Falcon River from the mouth of the intake in Indian Bay, about 85 miles of cut-and-cover aqueduct leading to Transcona, where a large reservoir is to be constructed when future requirements warrant it, 9.8 miles of 60-inch steel pipe to the Red River in Winnipeg, a tunnel beneath the river, and

the most part it is of solid concrete. Fig. 1 shows a section of open-flow aqueduct in a trench of moderate depth, with the end bulkheads and the outside forms removed. Owing to considerable variation in gradient the cross-section varies accordingly, ranging, in fact, from a section 10 feet wide and 9 feet in height (used at the deep summit cut, near Indian Bay) to one 5 feet wide and 5 feet high, where there is a maximum gradient. The invert is constructed first, and upon it a series of alternate 45-foot sections of the arch are poured and followed later by the closure sections of similar length. As shown in Fig. 1, a track is laid upon the invert and through the arch. Upon it a car trans-