Engine Co.; sand-washer by F. S. Henning; riveted steel intake pipe by Francis Hankin & Co.; reinforcing steel by Trussed Concrete Steel Co. The contractor used "Rogers" cement and a Wettlaufer mixer.

It is interesting to note that the actual cost of the entire work totals within a few hundred dollars less than the engineer's advance estimate.

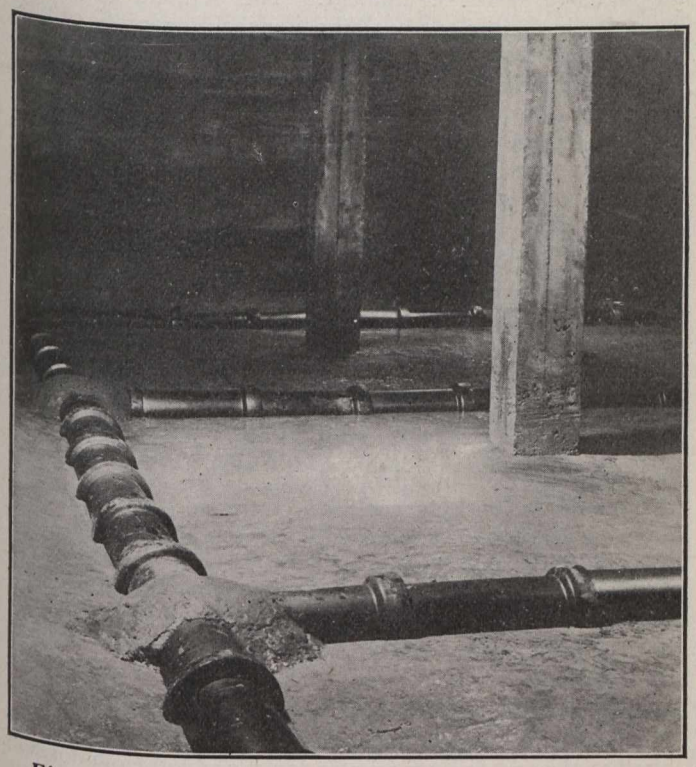

Fig. 8.—Split Tile Laid in Gutters to Carry Filtered Water to Pure Water Reservoir.

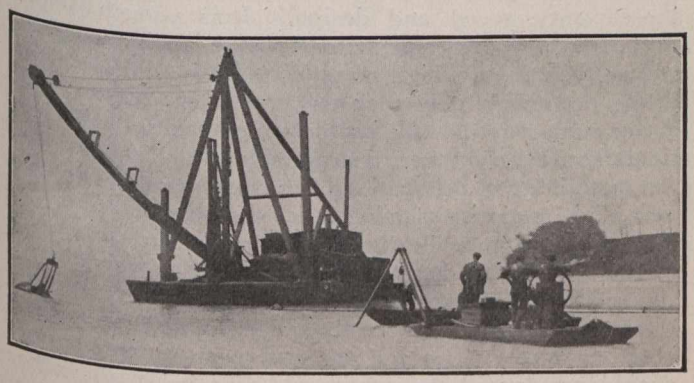

Fig. 9.—Dredging Channel for Intake. Ninety-foot Section of Pipe Being Floated into Position.

The plant was designed by and constructed under the supervision of F. W. Thorold & Co., consulting engineers, Toronto, to whom we are indebted for the photographs and for much of the information given in this article. H. O. Waddell, B.A.Sc., was resident engineer.

The quantity of petroleum entering the markets of the world in 1914 amounted to 400,483,489 barrels, according to statistics compiled under the supervision of J. D. Northrop of the United States Geological Survey. Of this output the United States is credited with 66.36 per cent., representing in quantity a trifle less than double the output of all the other oil producing countries combined. Changes in rank during the year affected only Japan and Peru, the former superseding the latter by a narrow margin.

TEST BORING DATA, SHOAL LAKE AQUEDUCT.

IN our issue of August 12, 1915, the contract prices were given, together with the latest estimate of the total cost of the Winnipeg-Shoal Lake aqueduct. It was pointed out that the present computation indicates a saving of $1,860,000 over the original estimate, speaking well for the administrative and executive efficiency of the Greater Winnipeg Water District organization.

In our issue of June 4, 1914, we published some cost data relating to the equipment and operation of the wash boring parties that took to the field in November, 1913, in charge of Douglas L. McLean, under the direction of W. G. Chace, the District's chief engineer. These valuable tables of equipment and cost data, furnished by Mr. McLean, may now be supplemented by another useful classification of hand auger work as follows:—

Table I.—Hand Auger Test Boring Cost Data.

(Small "Empire Drill" earth auger without casing used as hand auger).

	Totals.
Number of holes	29.0
Frost depth in feet, 1	55.9
Peat depth in feet, 2	234.1
Sand and gravel depth in feet, 3	0.9
Clay depth in feet, 4	409.7
Total depth in feet of 1, 3, 4	465.5
Total depth in feet of 2, 3, 4	644.7
Number of men per day or man-days	65.8
Cost per day	$208.66

Work done from February 4-28, 1914—	Feet.
Average depth frost per hole	1.93
(This is frozen peat and water.)	
Average depth of peat per hole	8.07
Average depth sand and gravel per hole	.03
Average clay depth per hole	14.10
Average total depth	22.20
Average cost per foot run, 1, 3, 4 (cts.)	44.8
Average cost per foot run, 2, 3, 4 (cts.)	32.4
Average cost per man-day	3.175
Average man-days per hole	2.27
Average man-days per foot run, 1, 3, 4	0.141
Average man-days per foot run, 2, 3, 4	0.102
4-man gang—	
Average cost per day	12.70
Average bored, 1, 3, 4 feet per day	28.4
Average bored, 2, 3, 4 feet per day	39.2

These holes were about 2,000 ft. apart and considerable time was required transporting outfit and travelling to camp.

Table II.—Hand Auger Test Boring Cost Data.

(Hand operated rod and pipe augers used).

	Total.	Totals to April 22.
Number of holes	396.0	370.0
Frost depth in feet, 1	759.6	759.6
Peat depth in feet, 2	2,608.9	2,490.9
Sand and gravel depth in feet, 3	59.3	59.3
Clay depth in feet, 4	3,530.8	3,352.3
Total depth in feet, 1, 3, 4	4,349.7	4,171.2
Total depth in feet, 2, 3, 4	6,199.0	5,902.5
Number of men per day, man-days	245.9	236.9
Cost per day	$690.10	$662.70