long on the crest, spans the river, forming a storage reservoir of 21,100 acre-feet capacity. From the reservoir a pressure tunnel carries the water direct to the power station and turbine, some 4¼ miles below, driving generators of a maximum capacity of 15,000 horse-power.

An agreement covering this project has been issued in accordance with the strict conditions of the water power regulations, which provide for the immediate commencement of construction operations in accordance with plans which have just been accepted and approved by the Dominion Water Power Branch. The agreement provides that at least 2,000 horse-power must be developed and made available for use by July 15th, 1919; that the continuous beneficial operation of the plant and the carrying on of the whole business arrangement must be acceptable to the Dominion Government; that control of rates to consumers of power and the rental to be charged for the privileges granted shall be under the control of the Government and subject to periodic revision. The taking over of the plant by the Government is also provided for, should the public interest demand such a course in the future.

## EXPERIMENTS ON THE FLOW OF WATER THROUGH SLUICEWAYS.

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THE experiments described in this article were performed in the Hydraulic Laboratory of the University of Toronto by Mr. N. E. D. Sheppard, B.A.Sc., as a thesis investigation of the flow of water through sluiceways formed by piers of different designs.

**Purpose of the Experiments.**—The flood discharge of the Ottawa River is given as 193,000 cu. ft. per second, the mean flow, 46,000 cu. ft. per second, and the minimum flow 11,000 cu. ft. per second at Ottawa. The design of a dam to render available the power of such a river which, at the same time, will not cause excessive flooding of the lands upstream during a period of high discharge and will permit large quantities of ice to pass without causing jams is a problem that merits considerable study.

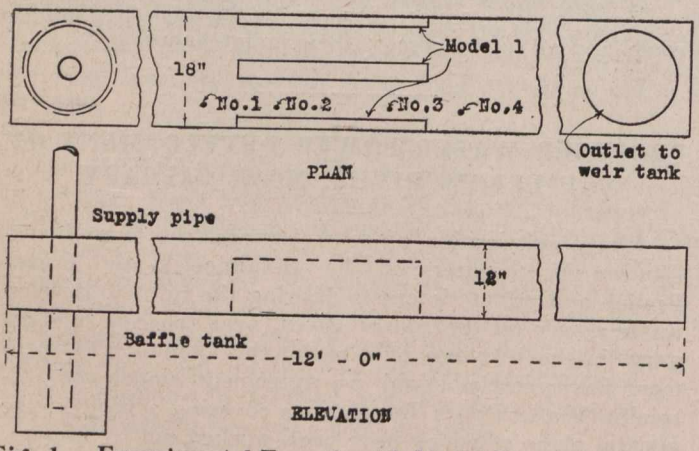


**Fig. 1.—Experimental Trough with Model No. 1 in Place.**

A dam of the sluice and pier type to suit these conditions might be built with piers of a number of different forms in horizontal cross-section. In the experiments about to be described model piers of three different designs were considered. Model 1 (Fig. 1) was a rectangular pier with side and end faces vertical. Model 2 is shown in Fig. 2. By its form this pier causes a gradual reduction in the clear waterway through the dam and has, therefore, a decided advantage from an hydraulic standpoint over model No. 1. This design was one considered by the Chaudiere Dam Commission and rejected by them on account of certain local conditions. Model No. 3, shown in Fig. 3, is similar in some respects to model No. 2, but has a form that will cause a more sudden change in the velocity of the water as it enters the sluiceway. The piers of the Chaudiere Dam at Ottawa are similar in design and proportions to this model, all linear dimensions of these piers being fifteen times the same dimensions of the model.

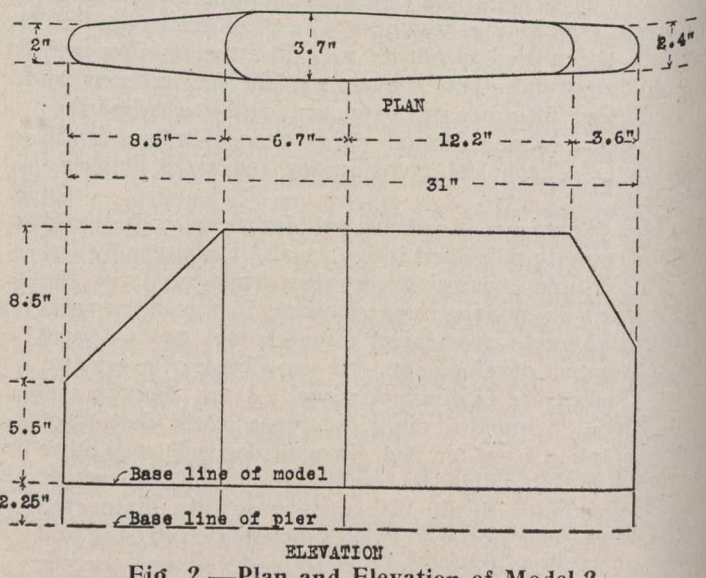


**Fig. 2.—Plan and Elevation of Model 2.**

**Equipment for Experiments.**—All the models are of the same thickness and length. Model 1 was of timber, 2 and 3 of plaster of Paris smoothly finished, and all were coated with shellac. For the experiments they were set up in a galvanized iron trough 18 inches wide, 12 inches deep and 12 feet long. Fig. 1 shows the position of model 1 in the trough. It will be noticed that one com-

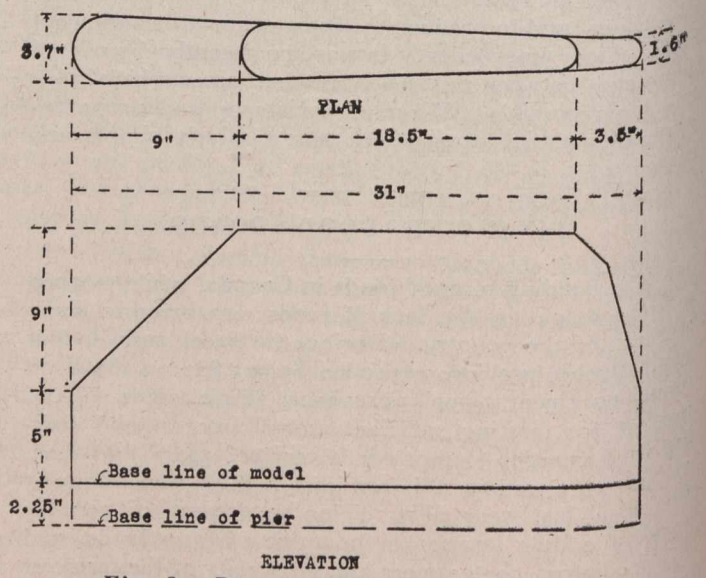


**Fig. 3.—Plan and Elevation of Model 3.**