Fig. 1 shows the general layout of the new dam and its position relative to the old structure.

In order to give a greater latitude for operations and to increase the amount of water which may be safely carried over at plug stages there are four openings in the section of the dam adjacent to the mill and five at the opposite end, as the drawing illustrates. These openings have a crest whose elevation is 3 feet lower than that of the remainder of the still-way.

Fig. 2 shows a section of the dam and Fig. 3 gives a general view showing the first section of the proper dam completed. A section of the old wooden dam is shown in the foreground with 2 feet of flash boards in place, in order to maintain the operating head at the mill wheels.

Fig. 4 is a view looking west from the top of the eastern bank of the river and shows clearly inner cofferdam unwatered and excavation for the foundations of the dam in procedure.

The dam was designed and constructed for Miller Bros., Limited, of Montreal, by Walker & Company, Limited, also of Montreal. Mr. W. F. Farley, A.M.Am.Soc.C.E., was responsible for the details of design and Mr. F. E. Cushman superintended the construction, both under the direction of Mr. G. R. Heckle, M.Am.Soc.C.E., who has courteously supplied us with the information and illustrations forming this article.

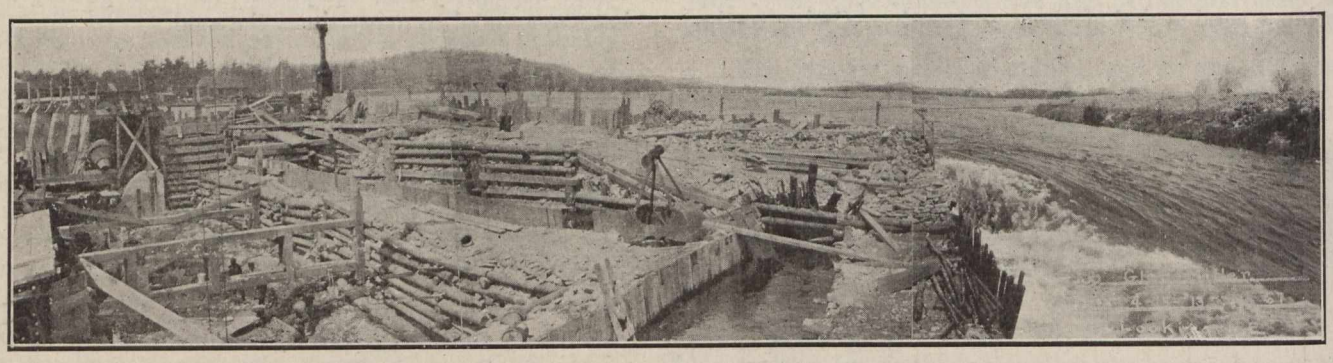

Fig. 4.—General View, Showing Method of Procedure.

THE EFFICIENCY OF THE AUTOCLAVE TESTS FOR CEMENT.

A greater part of the volume of the consideration which has been given throughout the past year to the application of Portland cement, has dealt with the so-called Autoclave or high pressure steam test as specified for construction work on the Delaware Lackawanna and Western Railway. The attention which this method has received from engineers, cement manufacturers and various technical and scientific associations crystallized into a most important discussion at the convention of the American Society of Testing Materials at its meeting in Atlantic City last June. A paper entitled "The Results Obtained with the Autoclave Tests for Cement," was presented by Mr. H. J. Force, chemist and engineer of tests for the above company and the lengthy discussion which followed his outline of the latest results obtained in the laboratories of the road has added somewhat to the information on the subject although no basic conclusions were arrived at, but rather a clear intimation displayed that no results yet obtained have been sufficiently authoritative as to demonstrate its value. And although the discussion of the test has not been allowed to become dormant, the consideration given it has not disclosed many opinions favoring it, other than the few expressed at that time.

The paper was considered one of the most interesting of the meeting, the discussion following it was unusually thorough.

As described by Mr. Force the autoclave test is made as follows:—

Three neat briquettes are made up, using water which gives a normal consistency on the Vicat needle of from 7 to 10 mm. The briquettes are kept in the damp closet for twenty-four hours, at the expiration of which time they are removed from the molds and placed in the autoclave. Sufficient water is added to partly or wholly cover the briquettes, and the instrument closed. The burners are of sufficient size to raise the pressure to 295 lb. in not more than one hour and this pressure is maintained for one hour longer, or a total time of two hours. The pressure is then gradually released, the briquettes are taken out and placed in the moist closet for one hour. They are then broken in the standard cement testing machine in the usual manner. The results from the various mills are the average of three briquettes.

TABLE 1—RESULTS OF TESTS ON CEMENT FROM MILL 3

Number of cars represented	Autoclave test: Tensile strength, neat, at 24 hr., lb. per sq. in.	Autoclave test: Tensile strength, lb. per sq. in.	Autoclave test: Change in tensile strength, per cent: Increase	Autoclave test: Change in tensile strength, per cent: Decrease	Autoclave test: Expansion, per cent	Tensile strength of 1:3 briquettes, lb. per sq. in.: 7 days	28 days	3 months	6 months
1.....	318	40	....	87.39	5.58	332	382	...	...
1.....	297	487	64.00	....	0.75	372	447	...	...
2.....	330	597	80.90	....	0.25	347	390	448	422
1.....	375	472	26.00	....	0.53	295	387	...	...
3.....	392	387	....	1.27	0.41	326	350	432	482
1.....	300	305	1.66	....	1.02	315	397	...	...
1.....	405	528	30.37	....	0.31	346	408	431	...
2.....	392	513	30.89	....	0.10	352	457	450	...
5.....	335	205	....	28.80	1.28	357	...	...	...
Av'ge	349	393	38.96	39.15	1.13	338	402	440	452

A 1 x 6-in. expansion bar is made up with the briquettes and at the end of twenty-four hours is measur-