water from the hot well to the heater, while one of the other pumps takes its water from the heater and delivers same to the boiler, the third pump being held as a spare. The pump connections are so arranged th at any of the three machines may be used either for supplying the heater or delivering to the boiler, and hence the equipment is extremely flexible.

The heater discharge is equipped with a thermometer, and a similar device has been placed on the outlet of the condenser, so that the highest possible temperatures may be continuously maintained. The steam delivered to the heater is the exhaust from the feed pumps and condenser, and is just sufficient at full load to give a feed temperature a little over 200 degrees Fahrenheit.

All low pressure piping was supplied by the Garth Company, of Montreal, while the high pressure lines, which consist of extra heavy pipe, flanges, and fittings, put together with copper gaskets, were supplied by the Walworth Company, of Boston, Mass. A new 50 light constant current transformer, with full complement of lamps and absolute cutouts, was furnished by the Canadian Westinghouse Company, Hamilton, Ont., who also supplied the arc and generator switchboards.

Pending the installation of a second direct connected unit, the old boilers, the Brown engine, and the S.K.C. generator are being retained, but when the times comes for the change, this belted equipment will be discarded, and a new engine designed for working on 150 pounds initial pressure will be installed.

As the plant stood before the present changes were commenced, the engine room was completely filled, and hence, to put in the new unit, the Wheelock engine had to be taken out. The new installation has been made throughout with the idea in mind that future enlargements will not in any way whatsoever disturb the existing equipment, and this will be appreciated as a very desirable condition of affairs, and directly opposite to that which existed a year or so ago.

The new engine and generator were put into commission on December 12th, 1906, and the official tests were made in March of the present year. When operating at its most economical point, the engine developed an indicated horse-power on approximately 13 1-2 pounds of steam per hour. This is with a boiler pressure of 160 pounds and a 27 inch vacuum in the condenser. This remarkably high vacuum for a condenser of this type is made possible through the general arrangement of the exhaust piping, and it is being maintained continuously.

Mr. K. L. Aitken, consulting engineer, of Toronto, had charge of the recent remodelling and enlarging of the Barrie equipment.

SPECIFICATIONS FOR PORTLAND CEMENT FOR THE BUILDER.

For the benefit of our readers, we publish herewith the specifications governing Portland cement, which have been compiled by the Michigan Technical Laboratory, Detroit, Mich. They are designed to meet the requirements of the general building public and are as follows:

1. Tests: All tests shall be made in accordance with the methods prescribed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, reported January 21st, 1903, and amended January 20th, 1904, except in the following particular:—

(a) The boiling test, hereinafter described, shall be substituted for the "steam" test.

2. Acceptance: The acceptance or rejection of a cement shall rest with the chief engineer, and shall be based upon the following requirements:

3. Specific Gravity: The specific gravity of the cement shall be not less than 3.10.

4. Fineness: It shall leave a residue of not more than 8 per cent. by weight on the No. 100, and not more than 25 per cent. on the No. 200 sieve.

5. Time of Setting: It shall develop initial set in not less than twenty minutes, and must develop hard set within ten hours.

6. Tensile Strength: Briquettes one inch square in cross section shall develop not less than the following tensile strengths and shall show no retrogression in strength within the periods specified:

Age.	Strength.
24 hrs. (in moist air)	175 lbs.
7 days (1 day in moist air, 6 days in water)	500 lbs.
28 days (1 day in moist air, 27 days in water)	600 lbs.
ONE PART CEMENT, THREE PARTS STANDARD SAND.	
7 days (1 day in moist air, 6 days in water)	170 lbs.
28 days (1 day in moist air, 27 days in water)	240 lbs.

7. Soundness: Two pats of neat cement of normal consistency, about 3 inches in diameter, one-half inch thick at the centre and tapering to thin edges, and a ball of the same material about 1 1-4 inches in diameter, shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature, and observed at intervals for at least 28 days.

(b) A pat is kept in water maintained as near 70 degrees Fahr. as practicable, and observed at intervals for at least 28 days.

(c) The ball is placed in water at normal temperature, which is gradually (in about half an hour) raised to boiling and maintained there for three hours.

The pats to pass the requirements satisfactorily, shall remain firm and hard and show no signs of distortion, blotching, checking, cracking or disintegration. The ball when removed from the water shall show no signs of checking, cracking or disintegration.

8. Chemical Requirements: The cement shall not contain more than 1.75 per cent. of anhydrous sulphuric acid (SO_3), nor more than 4 per cent. of magnesia (MgO).

THE SIPHON UNDER THE HUDSON AT STORM KING.

In fifteen years New York City will be drawing its water from the great Ashokan reservoir, in the heart of the Catskills. The water will be brought to the city by a huge concrete and steel aqueduct, 100 miles long, and the largest in the world. The most striking feature of this aqueduct will be the stupendous siphon under the Hudson at Storm King This is a feat of tunneling that puts to blush all the tunnels around New York City. The subways under the Hudson now constructing go down about ninety feet below the water; but the Storm King siphon will be sunk 650 feet below the surface of the water and 1,100 feet below the aqueduct gradient. If this were built on the air pressure principle, used in the East River tunnels, all the workmen would perish from the pressure as soon as the work had gone a little below 100 feet under the water. As the engineers found it would be necessary to go below the fatal limit at Storm King, they decided to build a tunnel or siphon so far down below the river bottom that it would be in solid rock and not allow water to leak in. Going down over 600 feet, they calculate that little or no water will come in, and therefore they will not have to do the work or dig under pressure from compressed air.—C. H. Cochrane, in the Broadway Magazine.