veyed from this reservoir or air chamber by the small pipe marked *D*, and the depleted water rises to the surface through the main shaft to the tail race. The pressure of the air in the chamber is measured by the difference of level between the surface of the water in the chamber and that in the tail race. In the Magog compressor the average water column measures 120.5 feet, which is equivalent to a gauge pressure of 52 lbs. The diameter of the water supply pipe is 5 feet 6 inches. The diameter of the tank at the inflow is 12 feet. The diameter of the headpiece carrying the air-tubes is 4 feet 8 inches. The internal diameter of the downflow pipe is 3 feet 8½ inches The air-compressing chamber has a diameter of 17 feet, and an average height of 6 feet from the base of the downflow pipe. The compressor was constructed to drive six double engines, the cylinders of which measure 12 in. x 8 in. diameter.

METHODS OF TESTING.

The following methods were employed in testing the efficiency of the compressor: The quantity of water which passed through the compressor was measured in the tail-race by means of an electrical recording current meter, which has been carefully rated. The section of the tail race where the measurements were made was nearly rectangular, and had a width of 12 feet. The depth of the water, which, of course, varied with the discharge, ranged from three to nearly four feet. The measurements were made in four equally spaced vertical sections and at three points in each section. The air delivered was measured by anemometers placed in a discharge pipe, the area of which was gradually enlarged to about one square foot, at which area the velocities were sufficiently reduced to admit of measurement. Measurements were made at points uniformly distributed throughout the section, and each series of readings extended over one hour. For each trial the measurements of water discharge and air delivered were made simultaneously. The anemometer employed has been very carefully calibrated for these trials. Two of the driven engines were indicated, but it was found that they were so wasteful and leaked so badly that no idea of the efficiency of the whole plant could be formed by comparing the indicated horse-power with the available power of the waterfall.

The results of the tests are presented in the annexed tabular form. Column I. gives the number of the trial, for convenience of reference. The trials 1 to 3 were made on August 7th, and 4 to 6 on August 13th, 1896, after some minor changes had been made in the details of the compressor. Column IV. gives the horse-power actually expended by the falling water on the air compressor, and Column VII. the horse-power of the compressor. The efficiency (Col. VIII.) is the ratio of the actual compressor horse-power to the horse-power available in the water fall. It will be seen that the efficiency varied from trial to trial, and that where the quantity of water used was small, the efficiency was large. It will also be observed by comparison of trials 1 and 5—in which cases the quantities of water used were nearly the same—that the efficiency was greater in the latter case. This was owing to the fact that improvements were made in the details of the compressor in the interval. By reference to Columns IX., X. and XI., it will be seen that the air was isothermally compressed, which is a very marked advantage of this compressor, as the best mechanical compressors now in the market lose a large percentage by heating the air during compression, such heat being afterwards to aily wasted if transmitted to any considerable distance through a pipe line.

Taking the most favorable conditions of working in this experimental installation as being the fairest estimate for probable future plants, the efficiency is seen to be 62 per cent. The very marked increase of efficiency with the use of a relatively small quantity of water points clearly to the possibility of an increased efficiency in future installations. It ought also to be mentioned that in a comparison which was made, when the compressor was working at nearly its full capacity, of the amount of air taken into the compressor at the air inlets with that discharged from it, it was found that there was a loss of about 20 per cent. This accounts for the smaller efficiencies obtained when larger quantities of water were used, and shows that if this loss can be made good, an efficiency of at least 60 per cent. will be obtained under all conditions of working.

C. H. McLeod, M.E.

RESULTS OF TRIALS OF THE TAYOR HYDRAULIC AIR COMPRESSOR AT MAGOG, P.Q., ON AUGUST 7TH AND 13TH, 1896

No of trial.	Quantity of water discharged in cubic feet per minute.	Available head in feet.	Available horse-power.	Quantity of air delivered in cubic feet per minute at atmospheric pressure.	Pressure of air in compressor.	Actual horse-power of compressor.	Efficiency of compressor.	Temperatures. External air.	Temperatures. Water	Temperatures. Compressed air
I.	II.	III.	IV	V.	VI	VII.	VIII	IX	X	XI
1	6.122	21 4	247 7	1,377	52	132 5	53 5	79	75 2	75 2
2	5.504	21 9	228.0	1,363	52	131.5	57 5	83	75 5	75 5
3	4.005	22 3	168 9	1,095	52	105 3	62.4	80	75 6	75 6
4	7.662	21 1	305 9	1,616	52	155 4	50 8	75	80.0	80 0
5	6,312	21 7	260 0	1,506	52	144 8	55 7	77	80 0	80 0
6	7,494	21.2	299.8	1,560	52	150.2	50 1	75	80 0	80 0

(Signed) C H. McLeod.

WHAT THE WORLD BUYS FROM CHEMNITZ.

A large market for German hosiery is the Orient. This embraces Turkey, Greece, Roumania, Bosnia, Herzegowina, Servia, Bulgaria, Asia Minor, Arabia, Persia, and in fact China and Japan are also sometimes included in this term. Low priced grades, with as much weight as possible, find the easiest sales. These are required in brown cotton, all kinds of natural imitation mixtures, vigogue, and low merino; the quality is not important, providing the article has plenty of weight. Some coarse striped hose and half-hose are also used, and Turkey takes a few goods with loud cheap embroidery, worked in the national colors and figures. Shirts and pants, in plain styles, are used to match the hosiery.