

cause the air compressor, which takes about 50 horse-power, is thrown on or off suddenly by the automatic regulator, and yet the speed is so uniform as to appear to be perfectly steady. Salt water is pumped from the river to cool the cylinders of the gas engines and the air compressor in warm weather, and in the winter, while the steam heating boilers are needed, fresh water will be used and the heated water will be fed into the boilers by the feed pumps. This method avoids the use of city water in summer.

The Taylor Gas Producer.

The gas producers are of the Taylor automatic type, with economizers, furnished and installed by Messrs. R. D. Wood & Co. of Philadelphia. The essentials of a gas producer are complete combustion of its carbon, uniformity in quality of gas, ease and continuity of operation. The operation consists of combustion of the coal within an atmosphere containing insufficient oxygen to completely burn it. For a successful producer the conditions may be summarized as follows:

1. A deep fuel bed carried on a deep bed of ashes; the first to make good gas and the second to prevent waste of fuel.
2. Blast carried by a conduit through the ashes to the incandescent fuel.

it may be said that the settling is more from the walls to the center. There is nothing to burn out, for the top of the iron work is six inches below the fire, and the lower part of the producer is nearly cold. There is nothing to wear out, for all the parts are heavy castings, and in ordinary working the table revolves only three or four times in a day.

Details of the Producer Plant.

The producers as well as the engines are in duplicate. They are 7 feet in diameter by 15 feet high, and are fitted with a bucket fuel elevator and Bildt automatic feeders. The gas passes from the producers into the vertical economizers, where it is cooled by giving most of its heat to warm the blast of air used in making more gas. The air draft is produced by a Korting steam blower, the steam being supplied by the small upright boiler in the corner of the house. In summer this is the only steam required about the plant. The gas enters at the top of the economizer and passes out through a wash box below. The air is drawn up from the bottom of the economizer, passing out near the top, where the hot gas enters. The wash box removes a large part of the tar and acts as a seal to prevent the gas in the holder from passing back into the producer. From the

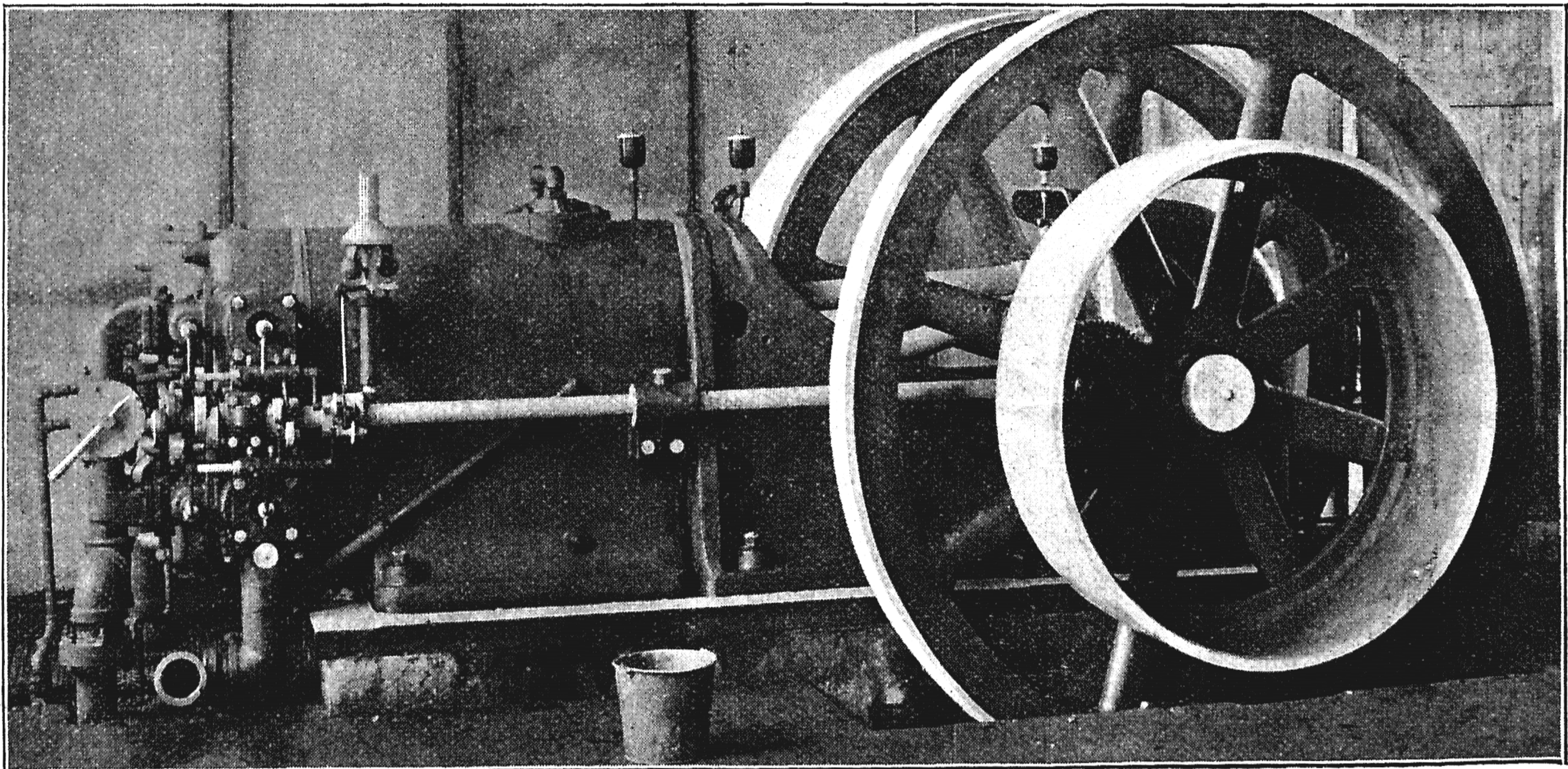


Fig. 5.—One of the Large Otto Gas Engines No. 12.
THE OTTO GAS ENGINE WORKS, PHILADELPHIA, PA.

3. Visibility of the ashes, and accessibility of the apertures for their removal, arranged so that operator can see what he is doing.

4. Level, grateless support for the burden, insuring uniform depth of fuel at all points and consequent uniformity in the production of gas.

In this producer, shown in Fig. 9, there is no grate to waste coal through, and there is practically no waste in cleaning. The deep ash bed permits the coal to burn up clean, and in practice the carbon is frequently gasified so that less than one-half of one per cent. of the original carbon remains in the coal. Any clinkers that will pass through a six-inch space will be discharged from the producer in regular grinding without any manipulation or waste of fuel, and this distance may be increased if desired. Cleaning is done without stopping the producer for a moment and the quality of the gas is only slightly injured for a short time, hence the producer is practically continuous, and at the same time it is just as perfect an apparatus when used intermittently. By the use of the test or sight holes in the walls, the attendant always knows when to grind down his ashes and when to stop. In grinding down the ashes the settling of the fuel is active next to the walls or

wash box the gas passes to the base of the large vertical scrubber, which is of the character usually found in gas works. Its compartments are filled with coke wet by sprays of water. The purpose of the scrubber is to remove ammonia, and most of the tar and sulphur from the gas. The remainder of the tar is removed in the purifier, a rectangular box filled with specially prepared material; this also removes more of the sulphur. The purification is not complete, but the gas is clean enough for use in the engines when it leaves the purifier and passes into the gas holder for storage until it is drawn through the main to the engines. The gas holder is 18 feet in diameter by 12 feet deep, floating in a steel tank 19 feet 6 inches in diameter by 12 feet deep. It stores a supply of gas sufficient for about ten minutes running and serves to balance irregularities in the consumption and mixture of the gas. A drip pot receives all the tar drained from the producer plant and discharges the surplus automatically into the sewer. Water is carried from the tops of the producers into the gas holder tank in winter to prevent freezing. The coal is elevated from the ground, where it is delivered by hopper cars on a trestle, and is stored in a bin elevated about 30 feet, from which it runs by gravity into the automatic feed attachment, which dis-