

the air for the combustion of the fuel passes from the saturator to the bottom of the producer. A central collecting bell is suspended from the top and keeps the fuel at a uniform level. One or two charging hoppers are provided, either in the centre or one on each side of the bell. The bottom of the producer is closed by a water seal, which permits of cleaning and removal of ashes without interrupting the continuous operation of the plant. The air and steam, in passing upward through the incandescent fuel combines with the carbon in the formation of gas.

*Saturator.*—The saturator is a water jacketed pipe or vessel in which water is maintained at a constant level. The gas, as it passes from the producer, is hot; the saturator not only reduces the temperature, but the entering air in its passage through the saturator on its way to the bottom of the producer, comes in contact with the heated water, and picks up a certain amount of steam vapour, which on its course through the fire increases the calorific value of the gas there being formed.

In some cases the separate saturator is dispensed with and an evaporator attached to the top of the producer which supplies the necessary steam.

*Hydraulic Box.*—From the saturator the gas passes to the hydraulic box which acts as a seal and prevents the gas from backing up into the producer. It is provided with an inclined water trough which permits the removal of accumulated dust; the gas then enters the coke scrubber.

*Coke Scrubber.*—This is a cylindrical steel shell filled with coke through which a small quantity of water trickles. The gas is here cleaned of any tarry products it may contain, and is cooled to atmospheric temperature, and finally, before reaching the engine, the gas passes through the sawdust scrubber.

*Sawdust Scrubber.*—This is fitted with trays filled with sawdust or other similar material which exposes the gas to a very large surface, and removes the last vestige of fine ash or other solid matter which may have been carried over.

Under some circumstances the sawdust scrubber is not necessary, the gas being sufficiently clean after leaving the coke scrubber for engine use.

*Starting.*—To start the plant a small hand blower is used, the fire is started in the generator, and coal added. The atmospheric valve is opened, and the blower used until the fuel becomes incandescent, and in a condition to give off gas (which usually takes from 10 to 15 minutes) when the atmospheric valve is closed and the gas allowed to pass through the apparatus. The engine is then started, and the production of the gas becomes automatic; the suction stroke of the engine furnishes the draft through the fuel and