APPARATUS FOR GENERATING GAS.


To all whom it may concern:

Be it known that I, Horton Batchelor, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Generating Gas, of which the following is a specification.

This invention relates to an apparatus for generating gas and it has for its object the provision of an improved device of this character constructed in such manner as to efficiently generate a water gas with a minimum of waste and with the greatest economy. As the result in chemical combinations is secured when the elements to be combined are first finely divided and reduced to as homogeneous a condition as possible so when it is desired to secure a decomposition or a dissociation it is equally as desirable that the material be brought to the point at which such action is to take place, in as homogeneous a condition as possible. To this end I contemplate providing a highly heated mass and bringing into contact therewith a spray of heated water and finely divided coal dust in a thoroughly mixed and homogeneous condition, wherein the utmost efficiency of the apparatus is attained and the results are rendered certain and uniform. Furthermore, since all of the material strikes the heated mass in such condition that the heated mass may act most efficiently thereon, it follows that a minimum of residual will result and great efficiency will be secured.

The apparatus shown in the accompanying drawing is intended merely to illustrate more or less diagrammatically means for carrying out the several operations hereinbefore outlined but it is to be understood that the invention is not limited to the employment of any specific type of apparatus for many modifications may be resorted to without departure from the invention.

In the accompanying drawing:

Figure 1 is a sectional perspective view of one of the main generators, and

Figure 2 is a side elevation of a battery showing two of said main generators and a centrally arranged receiver generator.

Like numerals designate corresponding parts in both of the figures of the drawing.

Referring to the drawing and particularly to Figure 2, it will be seen that a battery consists of two main generators 5 and a central receiver generator 6. The main generators 5 are connected by pipes 7 with the receiver generator 6 and these pipes are provided with valves 8, the purpose of which is to render it possible to connect the main generators to or disconnect these generators from the receiver generator. Each generator is provided with a stack 9 having a valve 9 placed therein. In each of the main generators a heating element indicated as a gas burner 10 is provided which is supplied with gas through a valve pipe 11 and the purpose of which burner is to periodically heat a mass of fire-proof material 12. This may be of any suitable nature, but I prefer to use fire-proof clay containing about 30% of saw-dust, the saw-dust being mixed with the fire-clay and the whole then baked and the resultant mass broken to the desired degree of fineness. Nozzles 13 project through the walls of the main generators 5 and serve the purpose of directing upon the mass 12 a spray of hot water and finely powdered coal dust, the water and coal dust being thoroughly mixed to constitute a homogeneous and uniform mixture which, when it strikes the heated mass 12, is converted into water gas. Slight openings 14 are provided in the walls of the generator and I preferably provide grates 15 and 16 to thereby constitute within each of the main generators an upper decomposition chamber 17 and a lower decomposition chamber 18. At 19 and 20 I have indicated handles for shaking the grates, if desired, this latter being merely for the purpose of precipitating into the ash-pit 21 such ash as may accumulate within the mass 12. Man-holes 22 and 23 are provided for the purpose of cleaning out the decomposition chambers when desired. Since most of the ash accumulates adjacent the nozzle the grate 16 further serves to support the mass of fire-proof material in upper combustion chamber 17 so that the mass in lower chamber 18 may be removed and washed or otherwise cleansed without the necessity of taking out all of the mass.

In operation only one of the main generators is used at a time, that is, while one is being used to generate gas the other is having its mass 12 heated by the burner 10 and vice versa, and when the burner 10 is in operation the generator with which it is associated is cut off from communication.
with the receiver generator 6 by means of valve 8 and when the burner is in operation valve 9 of stack 9 is opened to provide the necessary escape for the products of combustion. In construction the receiver generator is substantially like the main generator 5 except that it has no intermediate grate 16 but is entirely filled with a fire resisting mass 12. Since highly heated gas from one or the other of the generators 5 is constantly passing through the receiver generator 6 it follows that the mass 12 therein is maintained in a heated state. A discharge pipe 24 leads from the receiver generator 6 to any desired point but preferably through devices arranged to absorb the heat and utilize the same. In the production of the most efficient results it is desirable that the water and coal dust be combined in predetermined proportions, these proportions being determined by the carbon content of the coal rather than by its volume. It is, therefore, to be understood that the mixture delivered through the nozzles is in predetermined proportions, preferably in the proportions of 149.79 lbs. of water to 100 lbs. of carbon content of the coal. The coal is in a finely divided or powdered condition and consequently mixes uniformly with the water so that the action of all parts of the spray is uniform. I have found that by combining the hydro-carbon with the water in the proportions stated all of the water will be decomposed and consequently a minimum of residual is the result.

Having described my invention, what I claim is:

A gas generating apparatus comprising a pair of main generators, a mass of fire resisting material in each of said generators, a heating element for said mass in each of said main generators, a receiver generator, means for establishing or cutting off communication between either of said main generators and said receiver generator at will and a fire resisting porous mass within said receiver generator and in the path of the gases discharged by either of the main generators whereby the discharge of hot gases from one main generator will maintain the porous material in the receiver generator in a highly heated condition while the other main generator is being charged.

In testimony whereof I affix my signature.

HORTON BATCHELOR.