No. 819,661. PATENTED MAY 1, 1906.

L. P. LOWE.

METHOD OF MANUFACTURING GAS.

APPLICATION FILED APR. 7, 1904.

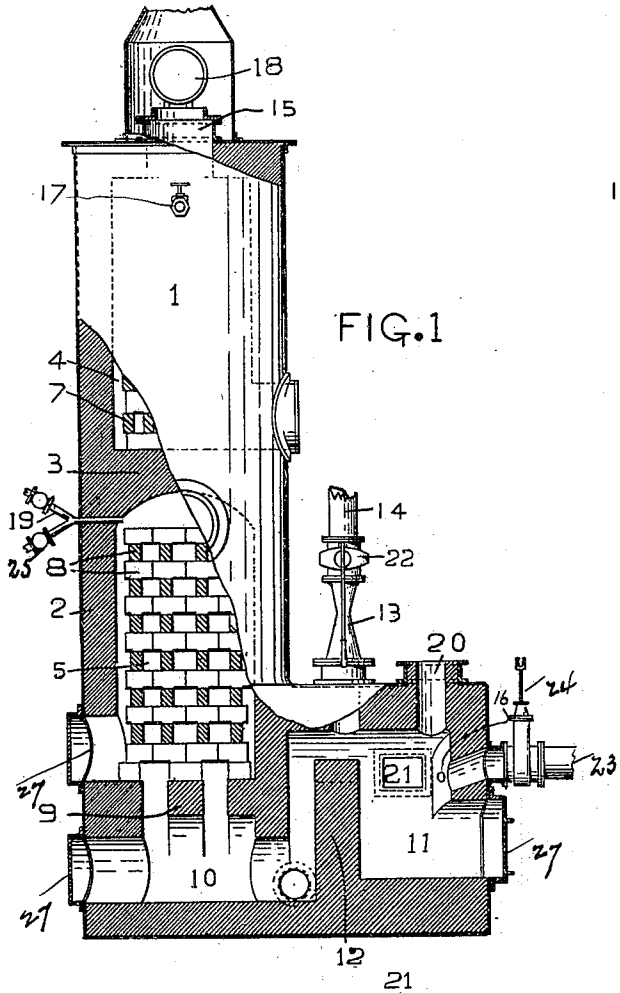

FIG. 1

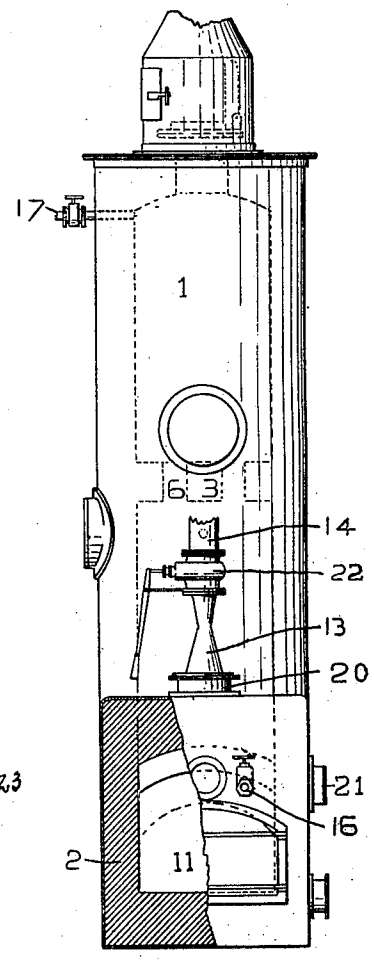

FIG. 2

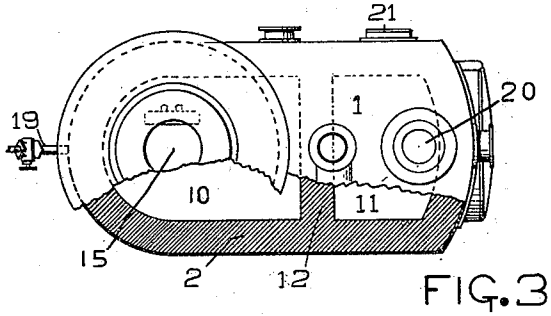

FIG. 3

WITNESSES:

F. W. Horne

Bessie Gorfinkel.

INVENTOR.

L. P. Lowe

BY F. W. Wright.

ATTORNEY.

UNITED STATES PATENT OFFICE.

LEON P. LOWE, OF SAN FRANCISCO, CALIFORNIA.

METHOD OF MANUFACTURING GAS.

No. 818,061. Specification of Letters Patent. Patented May 1, 1906.

Application filed April 7, 1904. Serial No. 201,970.

To all whom it may concern:

Be it known that I, LEON P. LOWE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in the Method of Manufacturing Gas, of which the following is a specification.

My invention relates to an improved method of manufacturing gas, from oil especially, more economically than heretofore.

In practicing this invention I employ the apparatus herein illustrated and described, which forms the subject of a separate application filed of even date herewith.

In the accompanying drawings, Figure 1 is a broken side elevation of the apparatus. Fig. 2 is a broken front view of the same. Fig. 3 is a broken plan view.

Referring to the drawings, 1 represents an L-shaped casing lined with refractory material 2. The upright member is divided by arches 3 into upper and lower chambers 4 and 5, said arches being spaced from each other, as shown in dotted lines at 6 in Fig. 2, to permit the gases to pass between the two chambers. In said chambers 4 and 5 are piles of refractory material 7 8. The lower pile 8 of refractory material is supported by arches 9 above a chamber 10, which communicates with a combustion and coking chamber 11 over a wall 12, extending transversely near the end of said chamber 11 next to said chamber 10, the top of said wall being arched, as shown, and approaching closely to the arched roof of said combustion and coking chamber.

13 is a jet-exhauster located upon the top of the combustion-chamber over the arched wall, leading to an auxiliary flue 14.

15 is the main flue, leading to the stack 28 and controlled by the valve 18.

16 is an oil-inlet for supplying oil for combustion to be burned at the top of said combustion and coking chamber.

17 is a steam-pipe at the top of the chamber 4, 19 an oil-inlet at the top of the chamber 5, 25 being the steam-supply pipe for injecting said oil, and 20 a gas-outlet.

21 is the door for the coking-chamber.

22 is a valve on the jet-exhauster 13.

23 is an air-supply pipe leading to the chamber 11 and controlled by a valve 24. 25 represents manholes leading to the various chambers in the structure.

The operation of the apparatus is as follows: Oil is admitted into the combustion-chamber through the oil-supply 16 and is burned therein, the products of combustion passing through two chambers 5 4 and thoroughly heating the refractory material therein and escaping up the flue 15. After said refractory material has been sufficiently heated the oil-supply and the air therefor are cut off. The valve 18 is also closed and steam is admitted through the steam-pipe 17 at the top of the chamber 4, and at the same time oil is admitted through the pipe 19 at the top of the chamber 5. The steam is thus thoroughly superheated, and the oil and superheated steam passing through the piles of refractory material in the chamber 5 are disassociated and recombine as carbon-monoxid, hydrogen, and hydrocarbon gases, escaping by the gas-outlet 20 to an ordinary seal. The process thus far described, however, is not new; but in practicing the above method of gas-making when this alternate process of heating the refractory material and gas-making has been completed a deposit of carbon is formed upon the refractory material in the chamber 5. It has heretofore been the practice to burn off this carbon in the first part of the operation of reheating. This gives rise to a disagreeable smoke, which is objectionable to persons living in the neighborhood. Moreover, it is a waste of heat values. I therefore adopt the following method of disposing of this carbon deposit: After the operation of gas-making has been concluded the steam and oil supply are shut off, the valves 22 and 18 are opened, the jet-exhauster 13 is put in operation, and a current of air is caused to pass down through the upper pile of fire-brick. This air becomes intensely heated, and the result is that upon reaching the lower pile of fire-brick upon which is deposited the carbon the carbon is ignited by the air and is burned off, the combustion being perfect, and the products of the combustion escaping through the auxiliary flue 14. By this means not only are the above objections avoided, but I retain the heat of combustion of the carbonaceous deposit for subsequent recovery in the opposite direction in which it was generated.

Instead of a jet-exhauster any other preferred means may be used for creating the current of air to burn up the carbon.

The following is another important step in my process of manufacturing gas: The tarry and carbonaceous residues from gas-making

have heretofore been used for feeding furnaces; but the following is a more economical way of utilizing the same. Said residues are collected and placed in the lower portion of the coking-chamber 11 through the door 21, and when the oil is burned in the upper portion of said chamber for heating the piles of refractory material the residues are coked by the radiant heat from the arch of the coking-chamber and also by the gases arising during the heating of said residues, as in the beehive process of making coke from bituminous coal. The gas thus formed is burned to assist in the heating of the refractory material during the heating part of the operation, and during the gas-making part thereof it is recovered and added to the other manufactured gases. Evidently this utilization of these residues is more economical than that heretofore made.

I claim—

1. The method of manufacturing gas which consists in passing highly-heated products of combustion through a chamber having therein loosely-piled refractory material to highly heat the same, then shutting off the supply of air and fuel and passing steam and hydrocarbonaceous material through said highly-heated refractory material in the opposite direction, to make gas, then shutting off the supply of gas-making steam and hydrocarbonaceous material and causing a current of air to pass in the same direction as the last through said loosely-piled refractory material to burn off the carbonaceous deposits and utilize the combustion thereof to heat the refractory material, and then repeating the process of heating up preparatory to gas-making, substantially as described.

2. The process of making gas which consists in passing highly-heated products of combustion through two chambers in succession furnished with loosely-piled refractory material to highly heat the same, then shutting off the air and fuel and passing in the opposite direction steam through both chambers and hydrocarbonaceous material through the second chamber to make gas, then shutting off the gas-making steam and hydrocarbonaceous material and passing air through said chambers to burn off the carbonaceous deposit and utilize the combustion thereof to heat the refractory material, and then repeating the process of heating preparatory to gas-making, substantially as described.

3. The process of making gas which consists in burning oil to heat refractory material preparatory to gas-making, simultaneously utilizing the heat of the combustion of the oil to coke carbonaceous material, burning the gas produced by said coking to assist in heating the refractory material, and then using said highly-heated refractory material to make gas, substantially as described.

4. The process of making gas which consists in burning oil to heat refractory material preparatory to gas-making, simultaneously utilizing the heat of the combustion of the oil to coke carbonaceous material, burning the gas produced by said coking to assist in heating the refractory material, using the heat of the refractory material to make gas and adding thereto the gas obtained from the coking of the carbonaceous material, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

L. P. LOWE.

Witnesses:
FRANCIS M. WRIGHT,
BESSIE GORFINKEL.