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PATENTED APR. 10, 1906.

L. P. LOWE.  
APPARATUS FOR MAKING GAS.  
APPLICATION FILED MAR. 27, 1905.

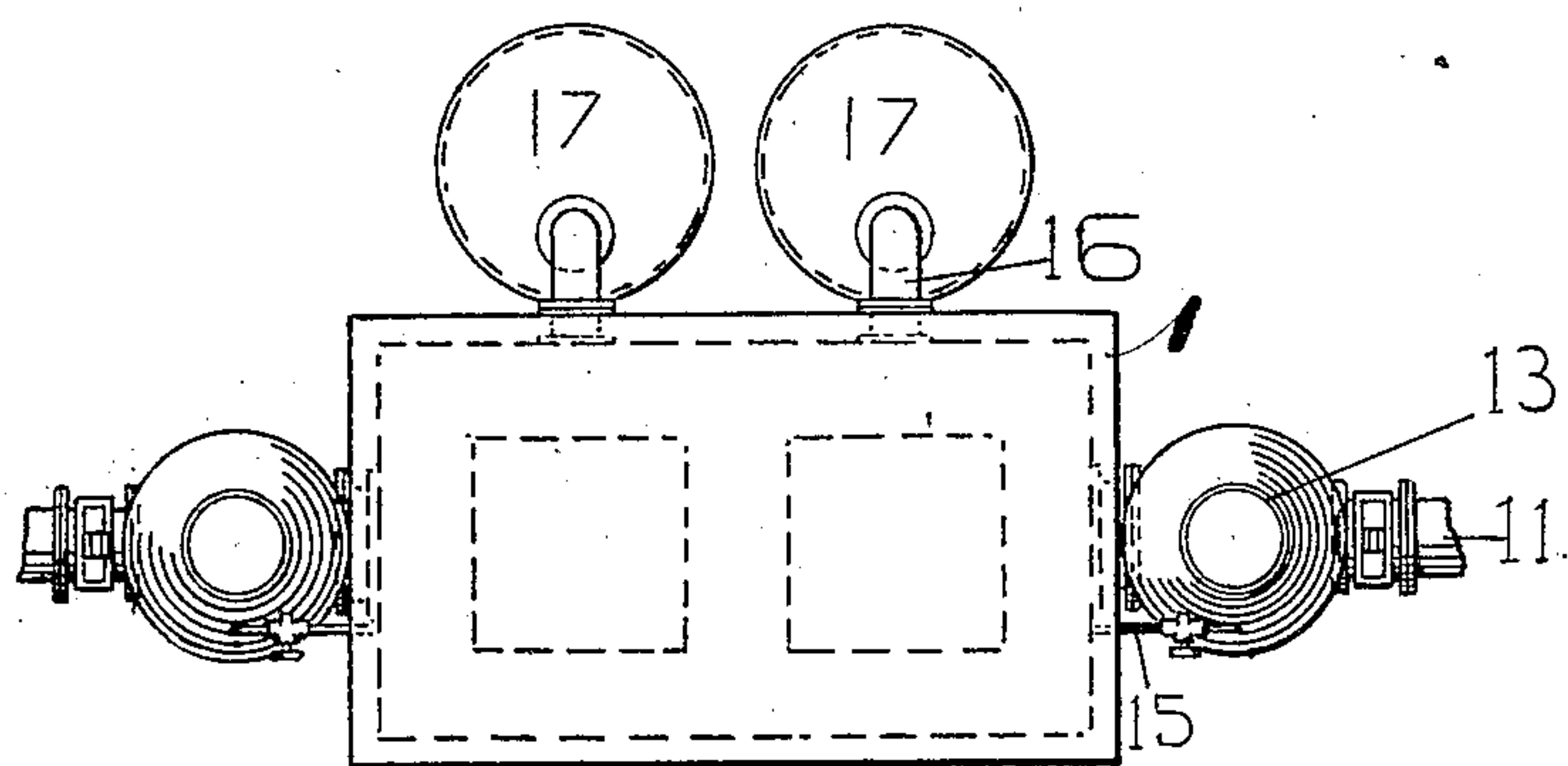
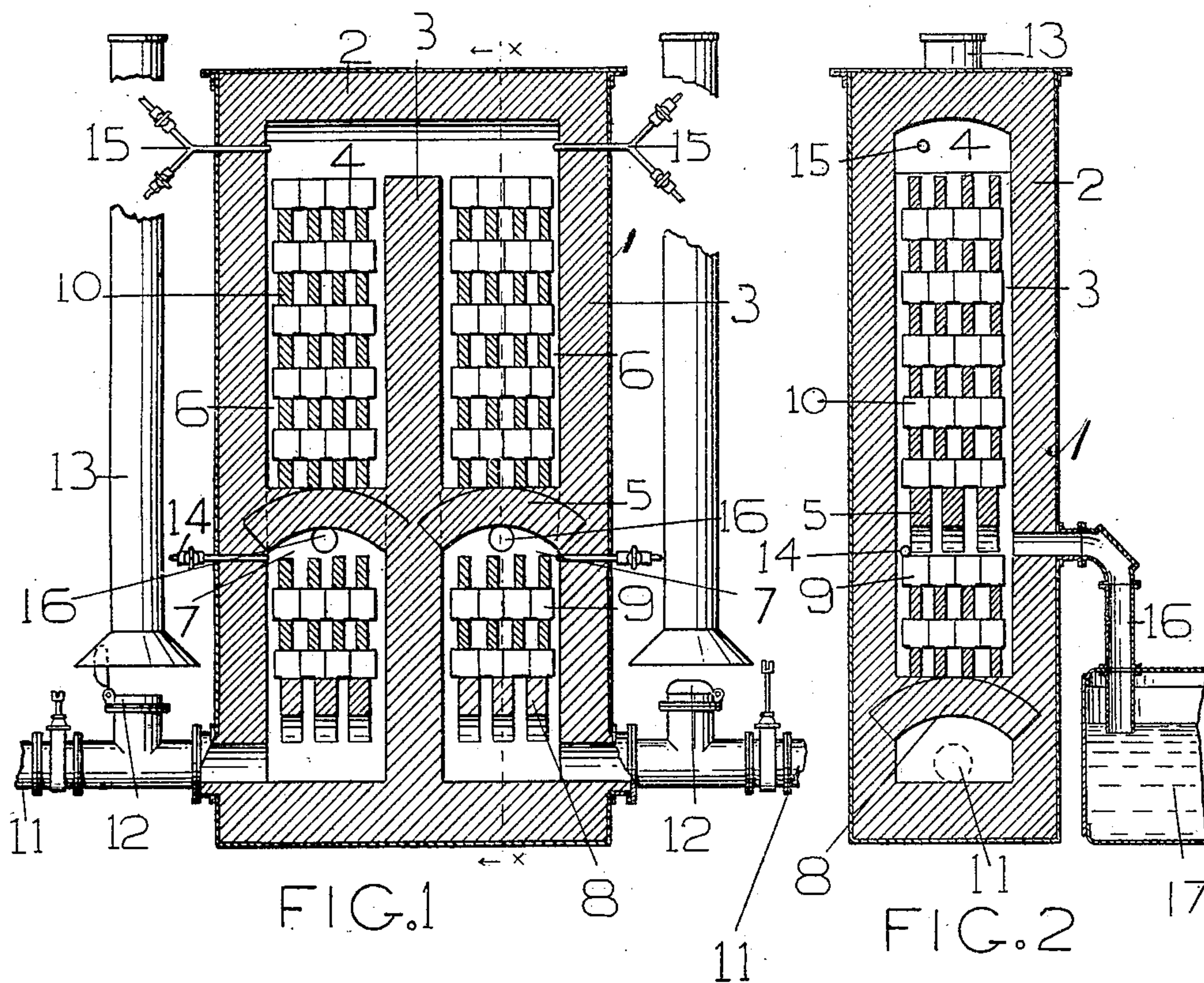


FIG. 3

Witnesses

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## APPARATUS FOR MAKING GAS.

No. 817,648.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed March 27, 1905. Serial No. 252,224.

*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 Apparatus for Making Gas, of which the following is a specification.

This invention relates to improvements in apparatus for generating gas from oil, the object of the invention being to provide an apparatus of this character in which the fuel shall be utilized to the best advantage and which will be durable in operation from the fact that the parts which are raised to the highest temperature in the process of making gas are subjected to the least stress in supporting other parts.

In the accompanying drawings, Figure 1 is a broken vertical section, certain pipes being shown in side elevation, of the apparatus. Fig. 2 is a transverse vertical section thereof on the line A A of Fig. 1. Fig. 3 is a plan view.

Referring to the drawings, 1 represents a casing lined with refractory material 2, the interior of said casing being divided by a wall 3 into two chambers connecting at the top, where they form a common combustion and generating chamber 4, each of said two chambers being again divided horizontally by arches 5 into an upper chamber 6 and a lower chamber 7. In each chamber 7 are a number of arches 8, which support loosely-piled refractory material 9, and the arches 5 also support loosely-piled refractory material 10 in the upper chambers 6.

Into the bottom of each lower chamber 7 air can be introduced by a pipe 11, and from said bottom the products of combustion can escape through a valve 12 up a stack 13. Also into the top of each chamber 7 steam may be introduced by a pipe 14. Oil is introduced above each chamber 6 by a pipe 15. The gas generated may be taken out from the top of each chamber 7 by a pipe 16 leading to a washer 17.

The operation of the apparatus is as follows: In the preparatory part of the process the two chambers are thoroughly superheated by introducing air and oil through either or both of the pipes 15 and passing the products of combustion alternately in opposite directions therethrough. Supposing that in the last stage of the preparatory proc-

ess the flow of the air and products of combustion was in the direction up the left-hand chamber and down the right-hand chamber, the air, oil-pipe, and stack valves are closed and steam is introduced on the left. Then the oil-pipe on the left is opened. The steam, being thoroughly superheated, is commingled with the oil-vapor in the generating-chamber 4 and the commingled steam and oil-vapor pass down through the highly-superheated material in the chamber on the right and form a fixed gas, said gas passing out through the gas-pipe 16 on the right. After the heat is too low to make gas the steam and oil are shut off from the chamber on the left, the flue 12 on the left is opened, air is introduced by the air-passage 11 on the right, and the oil is admitted on the right. The air passes up the right-hand chambers 7 and 6, becomes thoroughly heated, and commingles with the oil introduced in the combustion-chamber 4, producing perfect combustion of said oil, the products passing down the chambers 6 and 7 on the left and out through the flue and the stack. After the loosely-piled refractory material in the left-hand chambers 6 and 7 has been sufficiently heated the air is shut off, the stack-valve on the left is closed, and steam is introduced in the place of the air by the steam-pipe on the right, which passing through the loosely-piled refractory material in the upper right-hand chamber 6 becomes superheated and mixes with the oil introduced at the top of said chamber, forming gas which is fixed by passing down through the loosely-piled refractory material in the upper left-hand chamber 6, the fixed gas passing off by the gas-outlet 16 to the washer. When the heat becomes too low to make gas, the same operation is repeated from the left-hand side.

The advantages of the above construction are, first, the interior of the casing being divided vertically into two chambers, on each side of the central wall, each of which chambers contains refractory material, and the products of combustion being taken out below the lowest chamber, the gas-outlet may be located at the top of the lowest chamber, so that only the portion of the refractory material above said outlet is used for making gas, while at the same time the residual heat of the refractory material in the lower chamber which is not sufficiently high to make gas can be utilized to heat the air of combustion



for the next heating stage of the operation. Thus the heat value of the fuel is utilized to the greatest extent. Secondly, this construction enables the heat to be the greatest at the top of the pile of refractory material, where it has to undergo the least stress in supporting other refractory material, the heat being nearly all extracted at the lower end, so that the wear due to the disintegration of the refractory material under stress at an excessive temperature is avoided, said material having then only to support its own weight. For the above reasons the lower arches may, if desired, be dispensed with.

I claim—

1. In an apparatus of the character described, the combination of a casing, a wall extending from the bottom of the casing to a point near the top thereof and dividing the interior of the casing into two compartments, loosely-piled refractory material in each compartment, a flue and an air-blast selectively connected with the bottom of each compartment, a gas-outlet pipe connected with the interior of the casing at a point adjacent to a mediate point of each compartment, a steam-pipe connected thereto at a mediate point thereof, and an oil-pipe discharging into the combustion and generating chamber at the top of the casing, substantially as described.

2. In an apparatus of the character described, the combination of a casing, a wall extending from the bottom of the casing to a point near the top thereof and dividing the interior of the casing into two compartments, means for dividing each compartment into upper and lower chambers, loosely-piled refractory material in each of said four chambers, a flue and an air-blast selectively connected with the bottom of each lower chamber, a gas-outlet pipe connected with the interior of the casing at a point adjacent to the top of each lower chamber, a steam-pipe connected thereto at a point below each upper chamber, and an oil-pipe discharging into the

combustion and generating chamber at the top of the casing, substantially as described.

3. In an apparatus of the character described, the combination of a casing, a wall extending from the bottom of the casing to a point near the top thereof and dividing the interior of the casing into two compartments, an arch in each compartment dividing the same into upper and lower chambers, loosely-piled refractory material in each of said four chambers, a flue and an air-blast selectively connected with the bottom of each lower chamber, a gas-outlet pipe connected with the interior of the casing at a point adjacent to the top of each lower chamber, a steam-pipe connected thereto at a point below each upper chamber, and an oil-pipe discharging into the combustion and generating chamber at the top of the casing, substantially as described.

4. In an apparatus of the character described, the combination of a casing, a wall extending from the bottom of the casing to a point near the top thereof and dividing the interior of the casing into two compartments, an arch in each compartment dividing the same into upper and lower chambers, loosely-piled refractory material in each of said four chambers, a flue and an air-blast selectively connected with the bottom of each lower chamber, a gas-outlet pipe connected with the interior of the casing at a point adjacent to the top of each lower chamber, a steam-pipe connected thereto at a point below each upper chamber, and an oil-pipe discharging into the combustion and generating chamber above each upper chamber, 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.