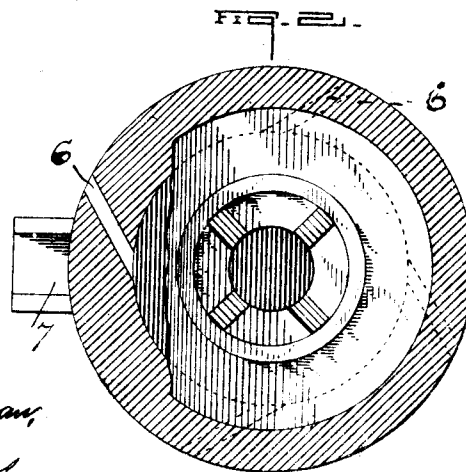
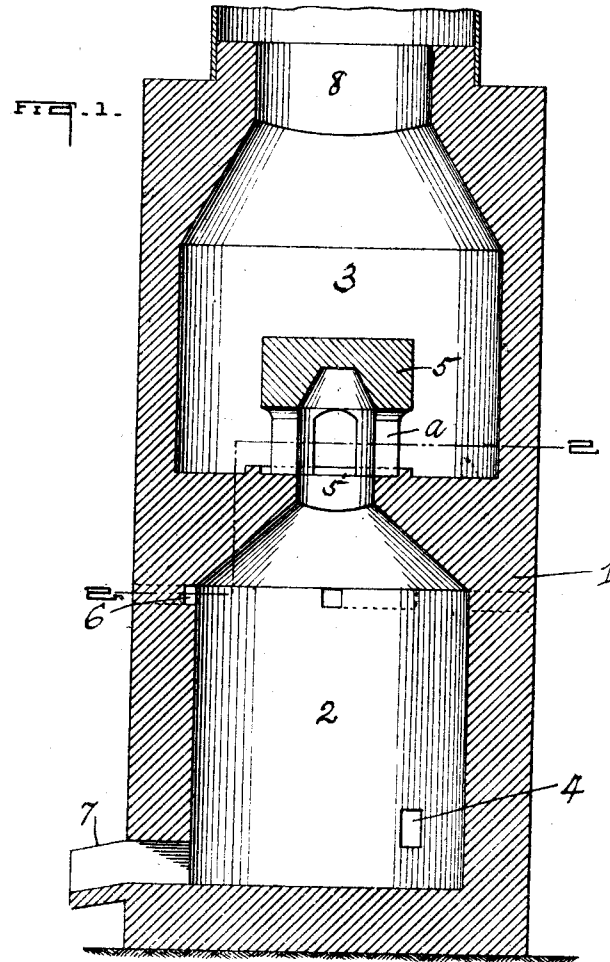


J. H. HIRT.
GAS PRODUCER.
APPLICATION FILED NOV. 30, 1908.

1,114,355

Patented Oct. 20, 1914.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JULES H. HIRT, OF SEWICKLEY, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO ALLIS-CHALMERS MANUFACTURING COMPANY, A CORPORATION OF DELA-
WARE.

GAS-PRODUCER.

1,114,355.

Specification of Letters Patent.

Patented Oct. 20, 1914.

Application filed November 30, 1908. Serial No. 465,424.

To all whom it may concern:

Be it known that I, JULES H. HIRT, a citizen of the United States, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Producers, of which improvement the following is a specification.

My invention relates to improvements in apparatuses for producing gas.

The object of my invention is to produce a simple and efficient apparatus capable of continuously producing gas high in carbon monoxid. I accomplish this object by means of the apparatus hereinafter more specifically described, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a vertical central section of my improved apparatus for making gas. Fig. 2 is a transverse section on line 2—2 of Fig. 1.

Referring to said drawings, 1 is a vertically disposed furnace, preferably circular in cross section. The interior of said furnace is divided into two chambers 2 and 3, the lower one, 2, of which is preferably circular in cross section, and is provided with an opening 4 which is disposed tangentially relatively to the axis of the chamber, whereby when finely divided carbonaceous material is charged into said chamber it is caused to travel in a circulatory path so that the highly heated gases thereof meet the incoming material and raise the temperature thereof very considerably and vortex like the gas ascends toward the contracted top of the chamber and passes through the opening 5' into chamber 3. The process herein is broadly claimed in application Serial No. 543,726, filed Feb. 14, 1910. The swirling of the gas and the discharge of the same through the central constricted opening 5', tends to prevent the escape of free carbon from within the combustion chamber, the particles being prevented from passing through the opening 5' by the action of centrifugal force thereon. A cap 5 in which passages *a* are formed is placed immediately over said opening 5', and additionally serves to prevent the escape of free carbon, if any might be in the carbon monoxid admitted to chamber 3. At a point in chamber 2 where the highest temperature is attained, *i. e.*, where it begins to

contract a series of steam jets enter ports 6, 6 for the purpose of regulating or controlling the temperature of said chamber, whereby the usual refractory materials may be employed in the construction of the furnace, otherwise without the introduction of the steam the temperature attained at this point in the furnace would quickly destroy the most highly refractory materials. The introduction of the steam at this point by disassociating its hydrogen serves to produce a better quality of gas than is usually obtained. The gas evolved is taken off through the opening 8 in the top of the producer and the slag from the impurities contained in the material is removed through the opening 7. The opening 4 for the admission of carbonaceous material is connected with any suitable means for pulverizing or reducing the material to a finely divided state and means for admitting thereto air under pressure.

The operation of my apparatus is as follows, viz: The material admixed with air sufficient to convert the same to carbon dioxide is charged into the furnace until the interior thereof becomes highly heated, preferably until the refractory lining becomes incandescent. The volume of air is then reduced to a volume sufficient only to convert the material into carbon monoxid, and steam or other form of moisture is admitted through ports 6, 6, for the purpose of controlling the very high temperature attained and incidentally to enrich the gas evolved by disassociating hydrogen. The highly heated material is given a circulatory motion due to the tangential disposition of the charging orifice and the pressure under which it is forced into the furnace and ascends in the form of a vortex toward the top of chamber 2, at the upper end of which, where the highest temperature is attained, steam or other form of moisture is admitted which serves to preserve the furnace lining as heretofore stated.

Having described my invention, what I claim and desire to secure by Letters Patent is—

1. In a gas producer, a furnace comprising two superposed chambers, a single diaphragm extending entirely across and between said chambers, said diaphragm having a constricted central means of communication between said chambers, a fuel inlet

to the lower chamber directed at an oblique angle to the wall of said chamber, and an opening from the upper chamber for the delivery of gas therefrom.

5 2. In a gas producer, a furnace comprising two superposed chambers, a wall between said chambers having a central means of communication between said chambers, an
10 inlet for gas forming material at the lower end of the lower chamber directed at an oblique angle to the wall of said chamber, an inlet for moisture at the upper end of the lower chamber and adjacent said intermediate wall, and an opening from the upper
15 chamber for delivering gas therefrom.

3. In a gas producer, a furnace comprising a chamber having an inlet thereto directed at an oblique angle to a wall of said chamber, and a single diaphragm extending
20 entirely across the upper end of said chamber and provided with a constricted central outlet for gases therefrom for all conditions of operation of said gas producer.

4. In a gas producer, a furnace consisting
25 of two superposed chambers separated by a

single diaphragm and having a central constricted means of communication, a fuel inlet leading to the lower end of the lower chamber and directed at an oblique angle to the wall of said chamber, and a gas offtake
30 leading from the upper end of the upper chamber.

5. In a gas producer, a furnace comprising two superposed chambers having a central constricted means of communication, a
35 fuel inlet leading to the lower end of the lower chamber, a moisture inlet leading to the upper end of said lower chamber, both said inlets being directed at an oblique angle to the wall of said chamber, and a gas
40 offtake leading from the upper end of the upper chamber.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JULES H. HIRT.

In the presence of—

CLARENCE A. WILLIAMS,
JOHN H. RONEY.