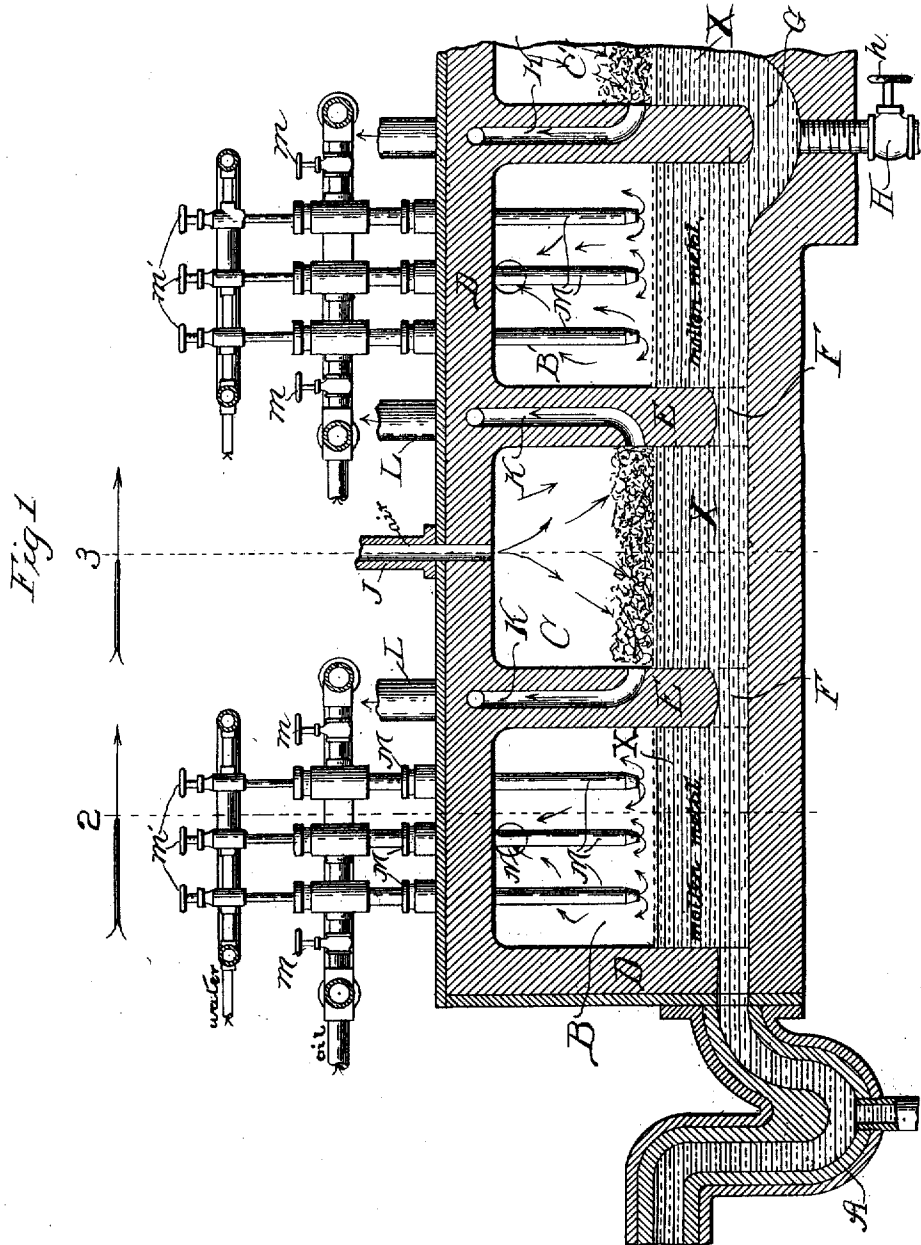


W. J. FAULKNER.
 APPARATUS FOR GENERATING GAS.
 (Application filed July 25, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
 Geo. C. Davison.
 Chas. A. Adams.

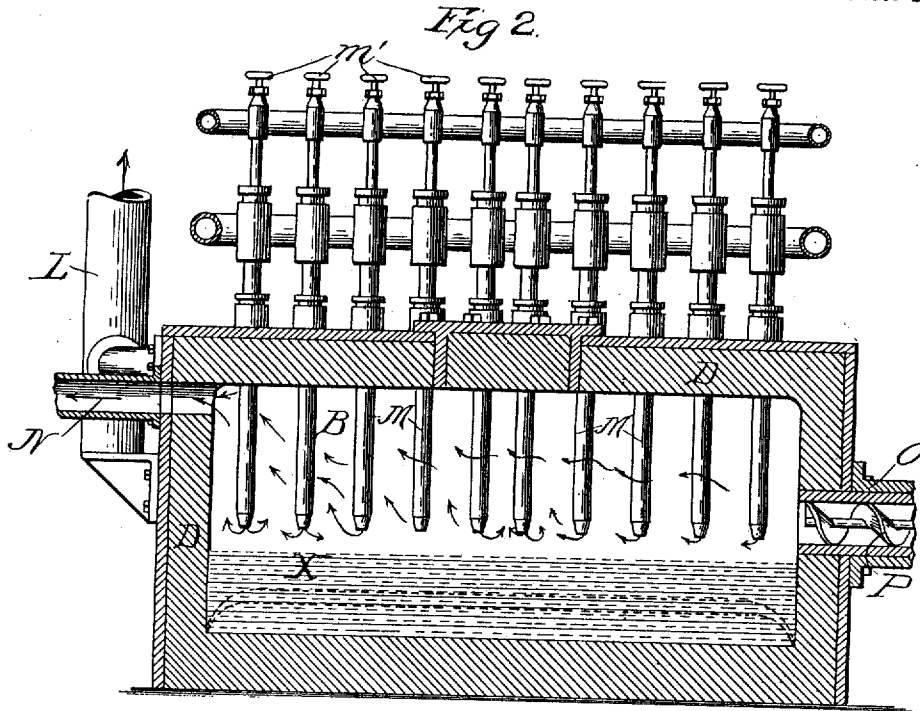
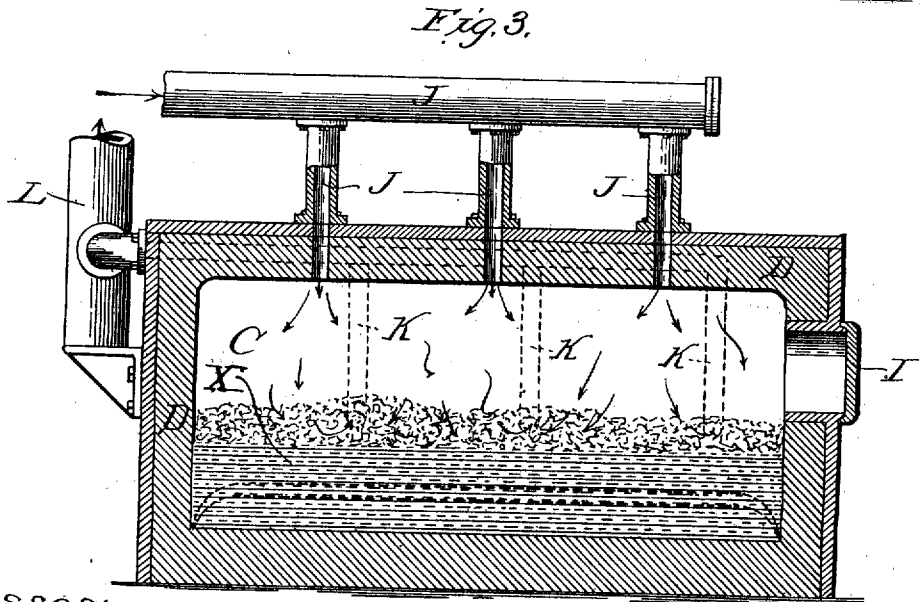
Inventor:
 William J. Faulkner.
 By Charles Turner Brown,
 Att'y.

W. J. FAULKNER.
APPARATUS FOR GENERATING GAS.

(Application filed July 25, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

Geo. A. Davison.
Chas. A. Adams.

Inventor:

William J. Faulkner,
By Charles Turner Brown,
Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM J. FAULKNER, OF CHICAGO, ILLINOIS.

APPARATUS FOR GENERATING GAS.

SPECIFICATION forming part of Letters Patent No. 701,186, dated May 27, 1902.

Application filed July 25, 1901. Serial No. 69,653. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FAULKNER, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Apparatus for Generating Gas, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

This invention relates to an apparatus used in generating gas from carbonaceous material and fluids containing inflammable gaseous elements, or from one thereof, by disintegration and decomposition, such result being effected when a compound of carbonaceous material and fluid containing inflammable gaseous elements, or either one thereof, is quickly brought from a low temperature to a sufficiently high temperature.

In the casting of iron, steel, and other metals and in the molding of glass it often occurs that the temperature of the molten material is greater than is required to insure its running freely into the molds, and by this invention I am able to utilize some of the superfluous heat contained therein for generating gas, although this apparatus is not limited to use in connection with the casting in molds from molten material.

The object of this invention is to obtain an apparatus wherein the process of generating gas by the disintegration of carbonaceous material and the decomposition of a fluid containing combustible gaseous elements, and particularly the decomposition of oil and water, may be rapidly and economically practiced and in a manner to obtain a uniform quality of product.

The object sought by me is well secured when fluid, preferably a mixture of oil and water, at a low temperature, or when coal in a comminuted condition (as coal-dust) and water (or steam) are continuously discharged against, upon, or immediately adjacent to a mass of highly-heated material—as, say, molten iron, steel, glass, and the like—and thereby by rapid and complete decomposition or disintegration thereof is obtained.

In the drawings accompanying and form-

ing a part of this specification, Figure 1 is a vertical sectional view, in a plane extending longitudinally thereof, of an apparatus in which gas may be generated by the process hereinbefore referred to, Fig. 2 a vertical sectional view thereof in a plane extending laterally through one of the gas-generating chambers of the apparatus, and Fig. 3 a like view as Fig. 2 through one of the combustion-chambers of the apparatus.

A reference-letter applied to designate a given part is used to indicate such part throughout the several figures of the drawings.

In the construction preferred by me of an apparatus by means of which this process may be practiced I arrange gas-generating chambers to alternate with combustion-chambers, as is illustrated in Fig. 1, where A is the inlet to the apparatus for the molten material, B B' gas-generating chambers, and C C' combustion-chambers.

D D are walls, and E E are laterally-extending partitions constructed, at least adjacent to the molten material flowing through the apparatus, of fire-brick or other like heat-resisting material. The several chambers communicate as by means of the arches F F or inverted arch G, as preferred.

H is an outlet provided with valve or gate h, through which outlet molten material flowing through the apparatus, or a part of such molten material, may be withdrawn as desired.

I is a door through which fuel may be introduced in the combustion-chambers of the apparatus to raise the temperature of the molten material.

J J J are inlets to the combustion-chamber, through which, as by forced draft, air to support combustion is introduced into the combustion-chamber, and K K K are outlets for the products of combustion or partial combustion in the combustion-chamber, such outlets communicating with chimney L.

M M are feeders in the gas-generating chambers, through which feeders the oil and water from the decomposition whereof gas is generated is introduced into the generating-chamber of the apparatus, and N is the outlet through which gas is conveyed from the chamber.

The feeders M M may be constructed in the ordinary way of constructing feeders designed to introduce a mixture of oil and water in liquid form into a gas-generating chamber and are provided with the ordinary valves *m m'*, respectively, controlling the flow of liquid through the feeders and by means of which any one of such feeders may be turned out of operation when desired.

I prefer to construct the outer shell of so much of the several feeders as is contained within the gas-generating chamber of the apparatus of fire-clay or other like material.

O is a duct or conduit discharging into the gas-generating chambers, and P is a conveyer in duct or conduit O. By means of duct O and conveyer P coal or other solid gas-producing material may be introduced into the generating-chamber in addition to the oil and water introduced therein through feeders M M or as a substitute for such oil.

When carbonaceous material is introduced into the gas-generating chamber, as last above described, I prefer to have the same consist of coal in a finely ground or comminuted condition.

It will be observed that the surface or level of the molten material X in the several chambers of the apparatus is above the arches F, F', and G, so that no air will pass through such arches from the combustion-chamber (or from the atmosphere) to the gas-generating chamber—that is, such gas-generating chamber is sealed by the molten material contained in the apparatus, and the heat of such molten material generates the gas from the carbonaceous and other material supplied as described.

In practicing this process of generating gas in the apparatus described and illustrated in this specification the operation is: Molten material flows through inlet A into the adjacent gas-generating chamber and from thence under arches F, F', and G into and through the several combustion and gas-generating chambers of the apparatus and from the apparatus, as through outlet H. When necessary, such molten material is reheated in the combustion-chambers of the apparatus by fuel which may be introduced through door I, combustion being supported by air entering through inlets J J and the products of such combustion or partial combustion being continuously discharged through outlets K K K. Water is introduced to the gas-generating chambers, and to obtain an illuminating-gas carbonaceous material is also introduced into such generating-chamber in the form of oil mixed with the water or in the form of coal or other carbonaceous material through conduit or duct O.

Whatever material, as coal, oil, water, and steam, is introduced into the gas-generating chambers of the apparatus to be converted into gas such material is stored and conveyed to the gas-generating chamber in a manner to avoid the introduction of air therewith into

the gas-generating chamber, and the gas-generating chamber is of course made substantially air-tight in its construction.

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

1. In a gas-generating apparatus, a gas-generating chamber, a combustion-chamber, such apparatus provided with an inlet and an outlet for molten material and such chambers provided with a communicating passage-way through which molten material may flow, the gas-generating chamber provided with an outlet for gas and the combustion-chamber provided with an outlet for the products of combustion, molten material in the chambers, means to introduce gas-producing material into the gas-generating chamber, means to introduce fuel and means to introduce air to support combustion of the fuel into the combustion-chamber; whereby means are provided to supply gas-producing material to the gas-generating chamber and to exclude air therefrom, means are provided to supply fuel and air to support combustion thereof to the combustion-chamber, means are provided to supply molten material to the apparatus and to deliver molten material from the combustion-chamber into the gas-generating chamber and to thus maintain material in the gas-generating chamber at an operative gas-generating temperature: substantially as described.

2. In a gas-generating apparatus, a series of gas-generating chambers, a series of combustion-chambers, the gas-generating chambers respectively provided with outlets for gas and the combustion-chambers respectively provided with outlets for the products of combustion, and adjacent ones of such chambers provided with communicating passage-ways, molten material in the chambers, such chambers and communicating passage-ways arranged so that molten material may flow successively therethrough and the passage-ways opening into the respective gas-generating chambers will be sealed by such molten material to exclude air from such gas-generating chambers, means to introduce gas-producing material into the gas-generating chambers, means to introduce fuel and means to introduce air to support combustion of the fuel, into the combustion-chambers; whereby, as gas is generated in the gas-generating chambers of the apparatus and thereby the heat of the molten material flowing through such chambers is reduced, such molten material is replaced by molten material of a higher temperature flowing therein from the combustion-chambers of the apparatus; substantially as described.

3. In an apparatus for generating gas, the combination of a gas-generating chamber provided with an inlet and with an outlet for molten material and provided with an inlet for gas-producing material means to regulate the supply of gas-producing material deliv-

ered into the gas-generating chamber through the inlet therefor, and with an outlet for gas, with molten material to flow through the chamber: substantially as described.

4. In a gas-generating apparatus, the combination of a plurality of gas-generating chambers respectively sealed to exclude air therefrom and a combustion-chamber, such chambers provided with communicating passage-ways through which molten material may flow, such passage-way arranged so that the molten material shall seal the gas-generating chambers against the admission of air thereto, the gas-generating chambers respectively provided with inlets for gas-producing material and with outlets for gas, and the combustion-chamber provided with means to introduce fuel and means to introduce a supporter of combustion thereinto and with outlets for the products of the combustion therein: substantially as described.

5. In a gas-generating apparatus, the com-

bination of a series of gas-generating chambers and a series of combustion-chambers alternating therewith, the division-walls thereof being common thereto, such chambers provided with communicating passage-ways and such gas-generating chambers respectively provided with an inlet and with an outlet for molten material, with an inlet for gas-producing material and with an outlet for gas, and the combustion-chambers respectively provided with means to supply air to support combustion therein and with outlets for the products of combustion, such outlets arranged in the division-walls with openings thereof adjacent to the surface of the molten material in such combustion-chamber: substantially as described.

WILLIAM J. FAULKNER.

In presence of—

CHARLES TURNER BROWN,

CHAS. E. GORTON.