

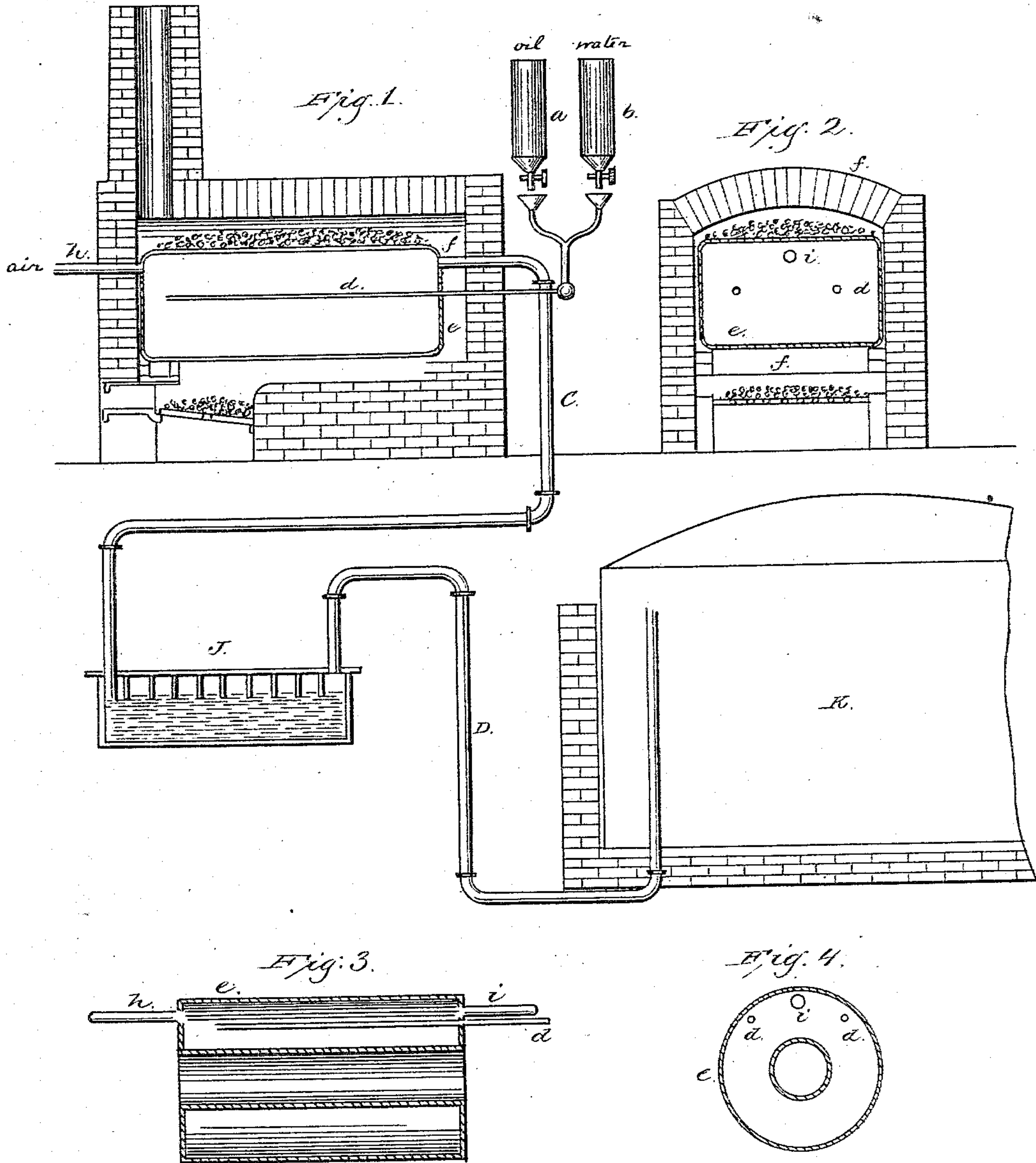
(No Model.)

2 Sheets—Sheet 1.

A. P. CHAMBERLAIN.
METHOD OF MANUFACTURING GAS.

No. 286,589.

Patented Oct. 16, 1883.



Witnesses;
W. A. Clark.
Jno. H. Judge.

Inventor
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By
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Attorney.

(No Model.)

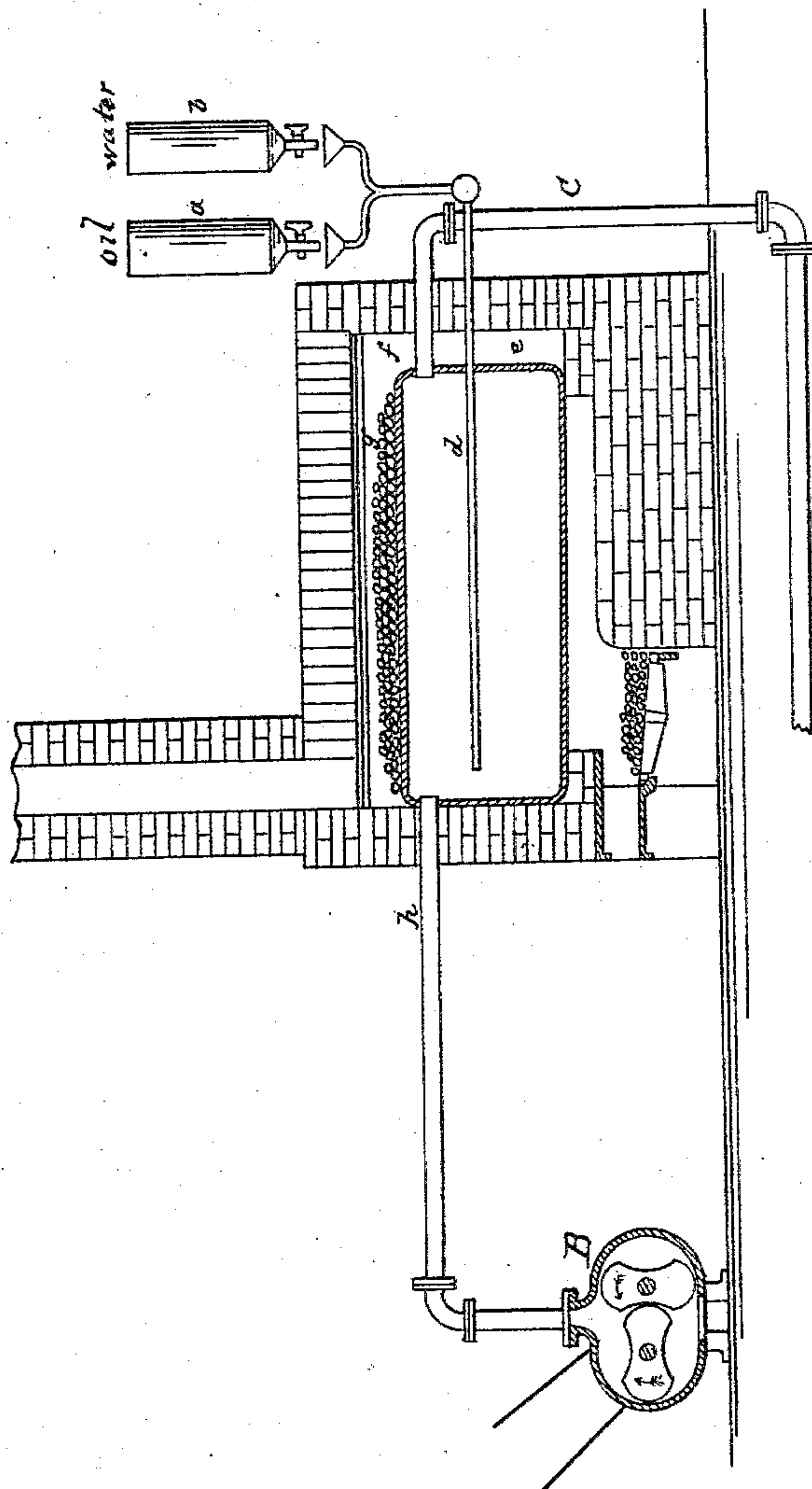
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Fig. 5



Witnesses.

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UNITED STATES PATENT OFFICE.

AMOS P. CHAMBERLAIN, OF LONDON, ENGLAND.

METHOD OF MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 286,589, dated October 16, 1883.

Application filed October 13, 1882. (No model.) Patented in England February 23, 1880, No. 791, and December 10, 1880, No. 5,156; in Germany August 21, 1880, No. 14,183; in France August 23, 1880, No. 133,324, and June 10, 1881, No. 143,326; in Belgium August 27, 1880, No. 52,423, and in Spain September 15, 1881, No. 1,637.

To all whom it may concern:

Be it known that I, AMOS PEIRCE CHAMBERLAIN, a citizen of the United States, at present residing in London, England, have
5 invented a certain new and useful Method of Manufacturing Gas suitable for Illuminating and Heating Purposes, of which the following is a description in such full, clear, concise, and exact terms as to enable any one skilled in the
10 arts to which it appertains or with which it is most nearly connected to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the figures and letters of reference
15 marked thereon, and in which—

Figure 1 is a longitudinal sectional elevation of a suitable form of retort to be used in the practice of my invention, together with a water-reservoir and gas-receiver. Fig. 2 is a
20 transverse section of Fig. 1, showing only the parts that appear by cutting the section. Fig. 3 is a longitudinal section of a retort of circular form having a return-flue through its center for the passage of the heat, instead of over
25 the top, as in Fig. 1. Fig. 4 is a transverse section of the retort shown by Fig. 3. Fig. 5 is a longitudinal vertical section through the retort and an air-forcing apparatus, B.

My invention relates to the manufacture of
30 a rich fixed gas for illuminating and heating purposes; and it consists of making such gas of hydrocarbon oil, water, and atmospheric air by intermingling them in a retort heated high enough to decompose them, and of then
35 passing the resultant gas directly from the retort, in its highly-heated condition, through a water bath.

The invention may be carried into effect by any suitable apparatus. The one I have represented by the drawings is well adapted for
40 the purpose; but others may be devised that will accomplish the same result without departing from the principle of the invention.

The apparatus illustrated by the drawings
45 consists of one or more retorts, *e*, inclosed in a brick chamber, and having a flue under, behind, and above it, as shown by Fig. 1. The furnace for heating the retort is made in the bottom flue, as indicated, and the top flue is

charged with coal or coke placed upon the top 50 of the retort, leaving room enough, nevertheless, for the passage of the air necessary for the draft of the furnace. The fire is kindled in the furnace under the retort and passes back around its rear end, returning through 55 the top flue upon the coal or coke, igniting it, and making a hot, live fire on the top as well as under the bottom of the retort. In combination with said retort are arranged two reservoirs, *a* and *b*, one to contain oil and the 60 other to contain water, and each of them to be fitted with suitable cocks or valves to regulate the flow of oil and water. In combination with each of these reservoirs is a branch pipe, each of which is provided with a funnel- 65 shaped top, into which the oil and water are delivered from the reservoirs. These branch pipes unite in a pipe, *d*, which is common to them both, and into which the oil and water flow and intermix on their way to the retort. 70

In the front end of the retort an air-pipe, *h*, is fitted, which pipe is connected to any suitable air-forcing apparatus, B, and should be fitted with a suitable cock or valve to regulate the supply of air. 75

In the rear end of the retort a gas-delivering pipe, C, is fitted, by which the hot gas, as fast as it is generated by the decomposition of the oil, water, and air, is carried from the retort to the water-reservoir J, and from thence 80 it passes through the water into the gas-holder K.

The operation of the apparatus is as follows: The oil and water are led from the separate reservoirs, in certain fixed proportions, 85 through the branch pipes to the pipe *d*, common to both reservoirs, the oil mingling with the water as it enters from the branch pipe into the pipe *d*. From this pipe the water and oil together are delivered into the retort in 90 the form of a spray, caused by the heat of the pipe *d*, which is carried well into the retort, as illustrated by the drawings. As the oil and water are delivered into the retort, there is also delivered into it a stream or blast of 95 air from the air-forcing apparatus B through the pipe *h*, the air mixing with the gas of the oil and water as fast as it is generated, the

whole then passing in its highly-heated state through the water in the reservoir J, and from thence to the gas-holder.

5 The air-forcing apparatus may be of any suitable construction; but I prefer what is commonly known as a "Root blower," an outline of which is shown by B.

Without departing from the spirit of the invention, the air may be heated in a separate
10 retort and mixed with the oil and water gas after it leaves the retort *e* and before it enters the water-reservoir; or the air may be heated in a separated retort and passed separately through the water-reservoir and mixed with
15 the oil and water gas in the gas-holder; or it may be heated and delivered directly into the gas-holder without passing it through the water; but I prefer to deliver the air into the retort simultaneously with the oil and water, and
20 pass the whole product through the water-reservoir, as first above described. The gas thus produced yields a bright white light when used for illumination, and can be stored for any length of time without deterioration.

25 In practice I use about the following proportions of oil, water, and air, assuming the ordinary standard white petroleum to be the oil used in the operation, viz: eighty per cent. of oil and twenty per cent. of water, and
30 air in the proportion of about three feet of air to one foot of gas made from the above proportions of oil and water; but these proportions may vary greatly, depending upon what the gas is to be used for, the richness of the
35 oil, and various other conditions entering into the manufacture and use of the gas. The best proportions of the several constituents under the various conditions will be quickly ascertained by a little experience on the part of

the person in charge of the manufacture of 40 the gas. The gas produced by this method may be used alone or in combination with the ordinary coal-gas, which is greatly improved by the combination.

In concluding this specification I observe 45 that in manufacturing gas upon the plan of my invention the oil and water are to be introduced into the retort in the fluid state, and not in the form of steam or hydrocarbon vapor. The introduction of a blast of steam into 50 the retort with the hydrocarbon oil or vapor I have found to be very objectionable. The gas produced is inferior, either because the force of the steam carries the gas-producing elements out of the retort before complete con- 55 version or because of some chemical action or reaction unknown to me; and, moreover, the use of a blast of steam for carrying the oil or hydrocarbon vapor into the retort is old, and is not included in my method or claim of in- 60 vention; but

What I claim is—

The method substantially herein described of manufacturing gas for illuminating and heat- 65 ing purposes, which method consists of introducing air, water, and hydrocarbon oil into a retort heated high enough to decompose them, and of then passing the resultant gas through water, substantially as described, for the purpose specified. 70

In witness whereof I have hereunto signed my name in presence of two subscribing witnesses.

AMOS PEIRCE CHAMBERLAIN.

Witnesses:

JNO. H. JUDGE,
AMOS BROADNAX.