

(No Model.)

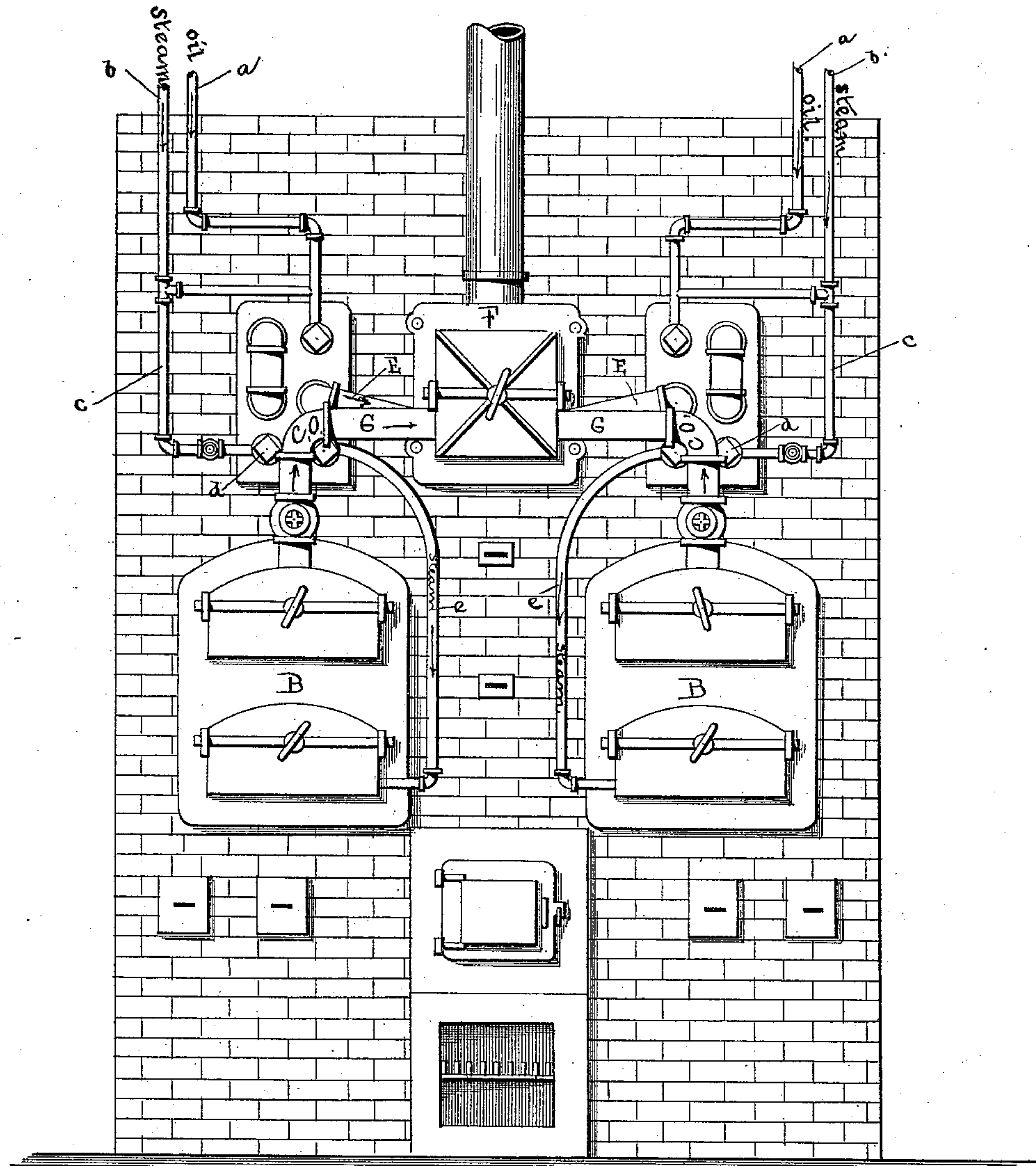
2 Sheets—Sheet 1.

A. M. SUTHERLAND.  
GAS MAKING APPARATUS.

No. 466,283.

Patented Dec. 29, 1891.

Fig. 1.



WITNESSES

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INVENTOR

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(No Model.)

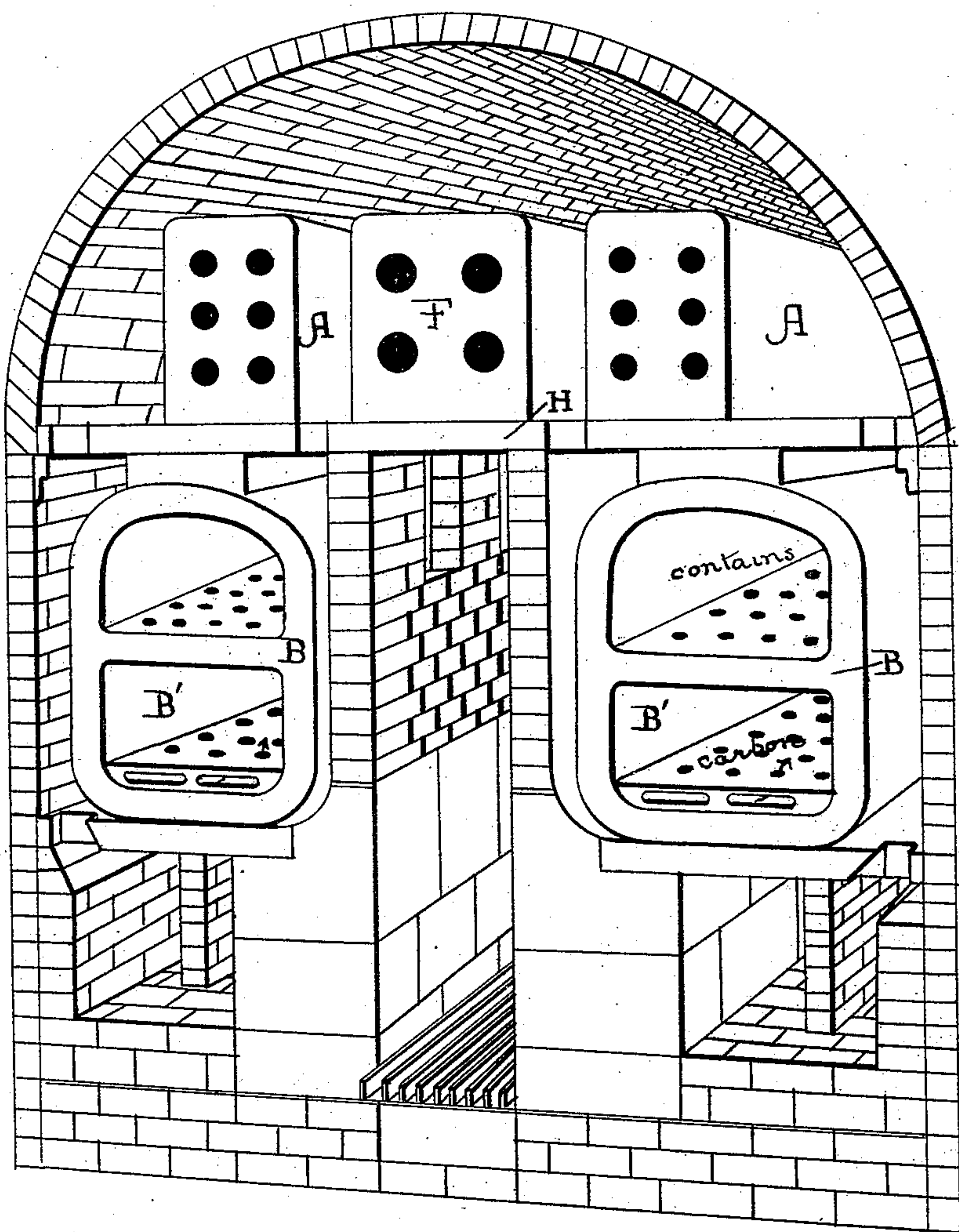
2 Sheets—Sheet 2.

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Fig. 2.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ALEXANDER M. SUTHERLAND, OF NEW YORK, N. Y.

## GAS-MAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 466,283, dated December 29, 1891.

Application filed August 9, 1889. Serial No. 320,291. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER M. SUTHERLAND, a subject of the Queen of Great Britain, and a resident of New York, county of New York, and State of New York, have invented new and useful Improvements in Gas-Making Apparatus, of which the following is a specification.

This invention relates to the manufacture of gas.

The object of the invention is to produce an apparatus applicable to existing coal-gas arches, by which what is commonly called "water-gas" can be made and enriched with gas made from crude petroleum of any grade or other low-priced hydrocarbons in one complete bench heated by one fire; and the invention consists in the combination and arrangements of the parts, substantially as hereinafter disclosed, and pointed out in the claims.

I have illustrated the invention in the accompanying drawings, in which—

Figure 1 is a front elevation of a bench constructed in accordance with my invention, and Fig. 2 is a view showing the bench with the front wall inlet and outlet pipes, &c., removed.

In the drawings, A A represent retorts designed for the reception in their upper portion of mixed oil and steam, which mixture is passed through the pipes of the retort in such manner as to cause it to come in contact with the greatest possible amount of fixing or heating surface, this fixing or heating surface being preferably after the design of the retort shown in the application for patent filed August 9, 1889, Serial No. 320,290, or of any other suitable form to be kept at a comparatively low temperature, and the mixture of oil and steam being thrown against the inner faces by means of spiral ribs or similar devices.

The oil is introduced through the pipes *a* and the steam through the pipes *b*, the steam-pipes *b* being each provided with branch pipes *c*, leading to tubes *d*, one passing from the front of each retort A to the rear thereof and thence back to the front, where they communicate with the pipes *e*, each leading to the bottom of one of the retorts B, arranged near the bottom of the bench.

The retorts B consist of the chambers B'

for containing incandescent carbon, the bottom of each chamber being perforated for the purpose of allowing the ready passage through the carbon of the steam superheated in the retorts A.

The combined steam and oil, after becoming thoroughly commingled and vaporized in the upper portion of the retorts A, is carried through the pipes E to a commingling and fixing retort F, and the superheated steam after becoming decomposed is also carried through suitable pipes G to this retort.

The construction of the commingling-retort is such that the contents of the pipes E and G are conducted through one or more pipes or conduits to the rear of the retorts into a mixing-chamber and from this chamber to the front of the retort, preferably through a larger number of pipes than are employed to convey the gas to the rear of the retorts, in order to effect the thorough fixing of the gas, and thence through a stand-pipe to a suitable place of storage.

It is well known that a much greater heat is required to maintain carbon in a state of incandescence than could be applied to hydrocarbons while converting them into a gas, the reason being that a degree of heat required for the first-mentioned purpose would, if applied to hydrocarbons, result in carbonizing or burning a large portion thereof.

In order to utilize the heat of one fire-chamber in my apparatus, I provide the dividing floor or diaphragm H, having therein a series of openings to be closed by dampers capable of being opened and closed at will. This floor is located just above the retorts B B, so that by manipulating the dampers in the dividing-floor the desired amount of heat may be admitted to the upper retorts, while that impinging upon the lower ones may be raised to any desired degree.

From the foregoing it will be clear that a continuous process of manufacturing a fixed combined oil and water gas may be carried on with very little manipulation of the apparatus.

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

1. In an apparatus for the manufacture of gas, the combination of a fixing-retort, retorts having in their upper portions flues for oil and



steam, and oil and steam supply pipes leading to said latter retorts and in their lower portions flues for steam, retorts B, having perforated bottoms and adapted to contain incandescent carbon, and steam-pipes leading from the lower portions of the first-named retorts and from the retorts B to the fixing-retort F, substantially as described.

2. In an apparatus for carrying on a continuous process of making a combined oil and water gas, the combination of a fixing-retort F, the retorts A, having in their upper and lower portions, respectively, flues for oil and steam and for steam, and oil and steam supply pipes leading to the retorts A, the retorts B, having perforated bottoms and adapted to

contain incandescent carbon, the superheating steam-pipes leading from the lower portions of the retorts A to the retorts B, and pipes leading from the retorts A and B to the fixing-retort F, and the perforated dividing-floor separating the retorts A and F from the retorts B, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day July, 1889.

ALEXANDER M. SUTHERLAND.

Witnesses:

R. G. DYRENFORTH,  
DAVID H. MEAD.