

(No Model.)

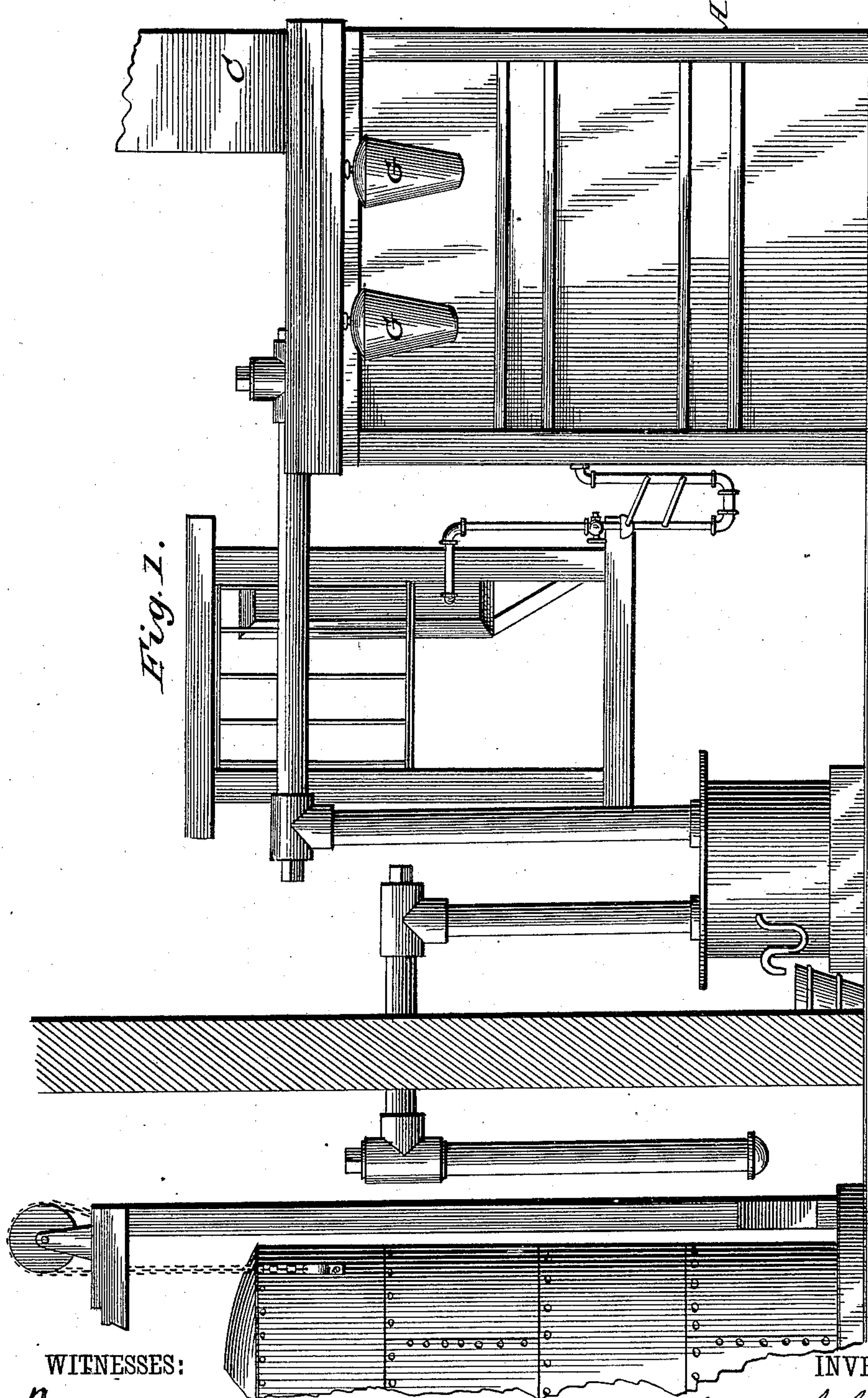
2 Sheets—Sheet 1.

J. J. JOHNSTON.

APPARATUS FOR MANUFACTURING GAS.

No. 312,729.

Patented Feb. 24, 1885.



WITNESSES:

Fred. S. Dieterich
W. I. King

INVENTOR.

James J. Johnston

(No Model.)

2 Sheets—Sheet 2.

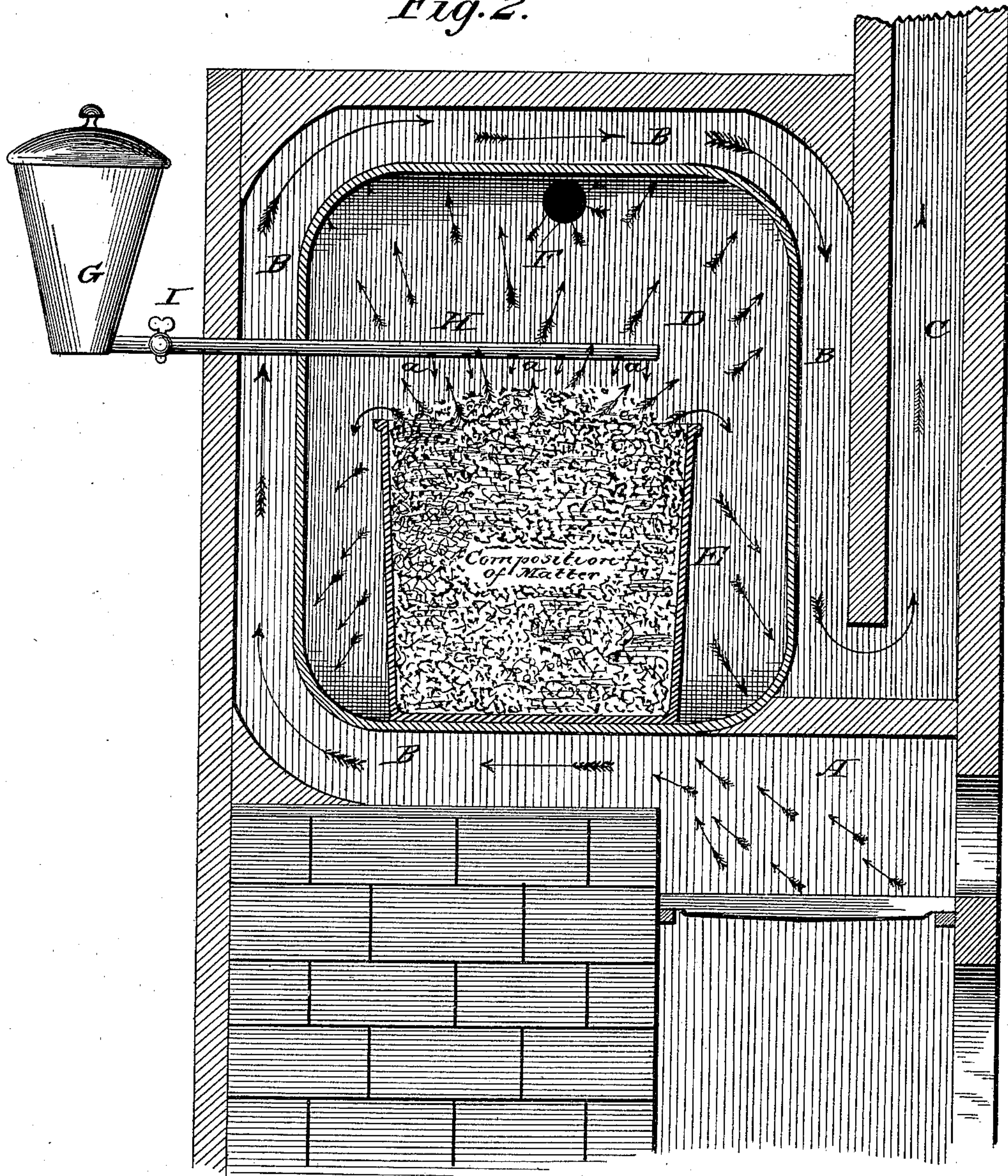
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Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES J. JOHNSTON, OF COLUMBIANA, OHIO, ASSIGNOR TO THE LIGHT AND FUEL COMPANY, OF SAME PLACE.

APPARATUS FOR MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 312,729, dated February 24, 1885.

Application filed July 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. JOHNSTON, of Columbiana, in the county of Columbiana and State of Ohio, have invented a new and useful Improvement in Apparatus for Manufacturing Gas; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in apparatus for manufacturing gas.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of this specification, Figure 1 is a side elevation of my improvement in apparatus for manufacturing gas, representing it connected to the ordinary appendages of a gas-works. Fig. 2 is a vertical section of my improvement in apparatus for manufacturing gas.

In the accompanying drawings, A represents the furnace, having a flue or flues, B B B B, which communicate with the stack C. Said flue or flues surround the chamber D, which should be so constructed as to be easily and readily sealed up, and should be of much greater capacity than the open retort E, and furnished with an opening, F, for the outflow of gas to the "hydraulic main."

G represents vessels having a pipe, H, provided with a valve, I. Said pipe passes through the furnace-wall, flue B, and the wall of the chamber D, and extends over the open retort E, and is furnished with a number of small openings. (Marked *a a*.)

The operation of the hereinbefore-described apparatus is as follows: The bituminous coal or other matter, or the composition of matter described in my applications for Letters Patent having serial numbers 138,881 and 138,883, and bearing even date with this application, and marked "Case A" and "Case C," from which the gas is to be evolved, is charged into the open retort E, which is then placed in the chamber D, which is then sealed up. Fire is then made in the furnace A, the heat of which, acting upon the chamber D, the retort E and its contents, evolves the gas from

said charge. The gas as it is evolved comes in contact with the heated walls of the chamber D, and is thereby converted into a fixed gas, which passes off through the opening F into the hydraulic main, and is then treated and manipulated in the usual manner and by the ordinary means, which are well known and well understood.

By constructing the chamber D much greater in capacity than the retort E a greater area of heating-surface is secured for acting upon the gas evolved from the charge in the open retort, and the evolved (but unfixed) gas is speedily converted into a fixed gas. The advantage of this feature of my invention will be apparent in view of the following facts: It is well known that the first action of heat upon coal in the retort in the manufacture of gas results in the disintegration of the coal, and that this condition must be attained before any considerable quantity of gas in the coal can be evolved from it, and that this disintegrating of the coal crowds it against the walls of the retort, so that the direct action of the heat of the walls of the retort by contact of the gas therewith is prevented, and the gas is retained in the coal longer than it should be, and this unnecessary retention of the gas among the coal results in waste and degeneration of it. It is also well known that perfect disintegration of the coal charged into the retort, in the ordinary operation of making gas, does not take place. This is evident by the presence of coke in the retort in an agglomerated condition, and that, when perfect disintegration does not take place, loss of time, loss of heat, and waste of and degeneration of the gas follows. The open retort E and chamber D, of greater capacity than said retort, and the great area of free surface of said chamber, against which the evolved gas comes in contact, effectually overcomes these stated disadvantages common to the ordinary process of making gas.

In the manufacture of gas it is frequently the case that the gas is too rich in carbon, and therefore does not burn with a clear flame. To remedy this the vessels G G are charged one with water and the other with oil, and valves I are opened, so as to allow the said

oil and water to flow slowly through pipes H and fall in drops through the openings *a* upon the charge in the retort E. From the said oil and water gases are evolved which, uniting
5 with the heavy gas too rich in carbon, will impart to it the proper quality for burning with a clear bright light.

Having thus described my improvement, what I claim is—

10 The hereinbefore-described apparatus for the manufacture of gas, consisting of the furnace A, the inclosed chamber D, above said furnace, the encircling flue B B, the stack C,

and the open retort E, resting upon the bottom of chamber D and having a lesser bottom
15 area and height than said chamber, the retort being so located as to leave an intermediate space between its outer surface and the inner walls of the chamber, substantially as shown and described. 20

In testimony whereof I have hereunto set my hand this 21st day of June, A. D. 1884.

JAMES J. JOHNSTON.

Witnesses:

A. C. JOHNSTON,

A. C. ELLIS.