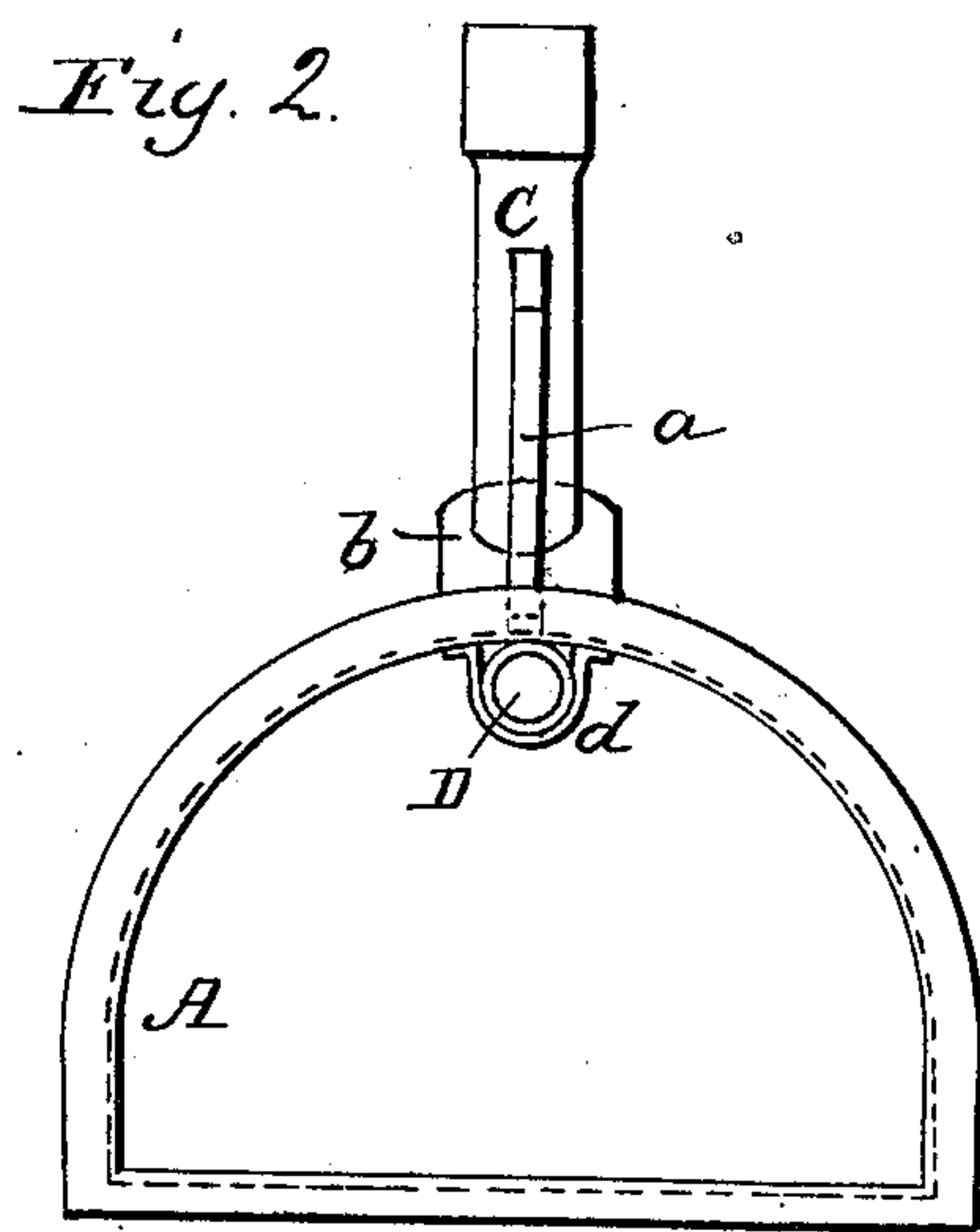
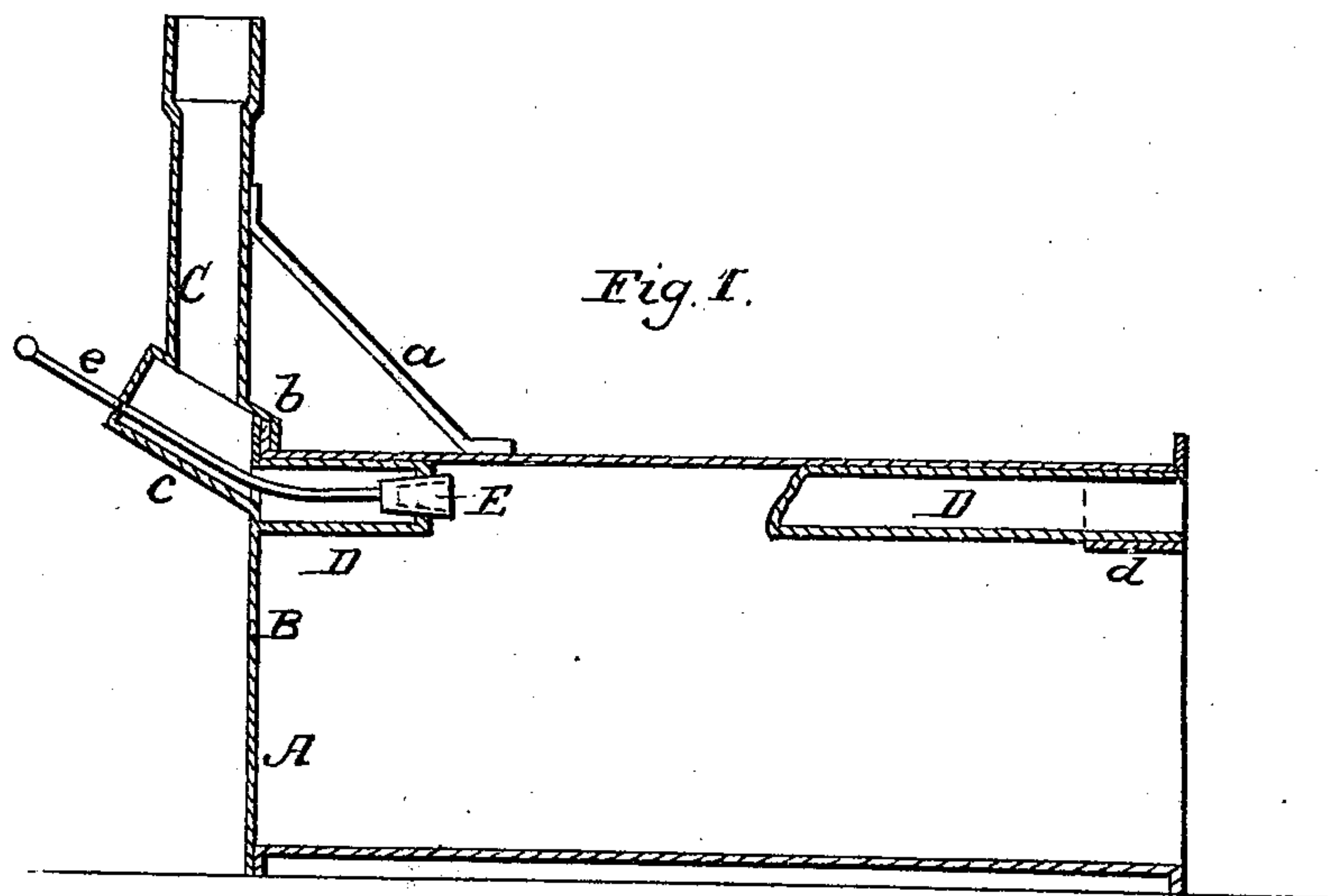


H. K. SYMMES.

Gas Retort.

No. 25,225.

Patented Aug. 23, 1859.



Witnesses:
E. Woodward.
J. M. Stail-

Inventor.
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UNITED STATES PATENT OFFICE.

H. K. SYMMES, OF NEWTON, MASSACHUSETTS.

GAS-RETORT.

Specification of Letters Patent No. 25,225, dated August 23, 1859.

To all whom it may concern:

Be it known that I, H. K. SYMMES, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Gas-Retorts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a longitudinal vertical central section of a gas retort constructed according to my invention. Fig. 2 is an end view of ditto.

Similar letters of reference in both views indicate corresponding parts.

Retorts for the manufacture of illuminating gas from coal and other bituminous substances are placed in ovens of masonry for the purpose of being heated, and as often as necessary they are removed and new ones put in their places. If the retorts are of single length, the rear end will always reach a higher degree of heat than the front, as the fire in the furnace below receives the cold air at the front of the bench, the heat increasing toward the back. Besides this the mouth of the retort through which the coal or other material used for the manufacture of gas is introduced, being also in front, is always more or less cooled by the removal of the lid for the purpose of charging the retort, and consequently the material left in and near the mouth is not so thoroughly distilled as that near the rear end, where there is a greater degree of heat. The quantity of gas obtained from the material in the front part of the retort is considerably smaller in proportion, and it is of inferior quality than the gas emanating from the material in the back part of the retort, owing to the lower temperature at which the material in the front part is distilled. The same difficulty exists with retorts of double length charged at both ends, as the fires in the furnaces draw toward the center of the bench, leaving the outer ends of the retorts at a lower temperature than the middle and thus causing a portion of the material used for the manufacture of the gas to be imperfectly distilled.

To obviate this difficulty and to cause the gas to pass toward the rear of the retort over the hot coke or other material, before making its exit, is the object of this invention, which consists in arranging the lid of

the retort with a horizontal tube or flue, in such a manner that it (the flue) can easily be removed and cleaned independently of the retort; and it further consists in arranging the lid with a socket to fit to a flange which is cast or otherwise rigidly attached to the lower end of the stand pipe so that the lid can be attached to the body of a retort, dispensing with the mouth piece altogether, and that the gas emanating from the material in the front part of the retort has to pass back over the hotter portion of the coke in order to reach the opening in the flue through which it passes to the stand pipe; and the stand pipe is secured to the body of the retort so that its lower end is open when the door is taken off, said lower end being provided with a flange to fit into the socket which is secured to the upper portion of the lid, and if this arrangement is applied to retorts of double length, I close the openings of the flues by valves, which can be operated from the outside and in this case I charge the two ends of the retort at different times so that one end is hot while the other one is charged, and that by closing the flue on this end, the gas arising from the fresh charge can be forced to pass through the whole length of the retort to the flue on the opposite end.

To enable those skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A represents a portion of the body of a common D-shaped retort, to which the lid, B, is secured, no mouth piece being used. The stand pipe, C, is secured to the outer end of the retort by means of a brace, *a*, and by a flange, *b*, which latter fits into a socket, *c*, which is rigidly attached to the outside of the lid B. The stand pipe, C, is open below and the socket, *c*, which is closed at the bottom communicates with the interior of the retort by means of a flue, D, which may be shorter or longer according to the length of the retort, and as experience may dictate. This flue is attached to the inside of the lid, and when it should be found necessary to make it of considerable length, its inner end is supported by a ring, *d*. Said flue is attached to the lid in such a manner that it can easily be removed for the purpose of cleaning or replacing it, whenever it should be found necessary.

When retorts of double length, and open at both ends, are used the lids on both ends

are provided with flues, D, which, in this case, may be made very short, and both are provided with valves, E, working by means of a rod, e, through the lid, or through the socket, c. These valves may be made of hollow cones, working in the ends of the tubes, or a plate closing their ends by means of luting. In this case, when the charge in one end of the retort is half burned off, the other end may be charged, and the door applied with the valve closed. The valve may then be opened at the end where the charge has become thoroughly heated, and the gas thus made to pass over the hottest portion of the retort, before making its exit. By charging the ends alternately the gas may always be made to pass the hottest portion of the retort before reaching the stand pipe.

In retorts of single length the tube, D, may be secured by running it through a ring, cast for that purpose, on the bottom of the stand pipe, and so arranged as to be easily removed for the purpose of cleaning. Where clay retorts are used the flange on the lower joint or elbow of the stand pipe may extend quite round the mouth, thus forming a more secure fastening for the lugs, if desired; and that part which is designated as the socket, c, in the drawing may be rigidly attached to the lower end of the stand pipe, if desired, instead of the lid.

By means of a flue entirely detached from the retort the durability of the latter will be greatly increased, and, at the same time, the flues can be cleaned by the firemen while

they are out, thereby saving time and the waste of heat which necessarily occurs, if stationary flues are used, in cleaning them. And besides this the retorts without the stationary flues can be cast in ordinary flasks so that they can be furnished much cheaper, and, at the same time, they are more durable and less liable to crack as they can be made of uniform thickness throughout, which is not the case when the flues are cast with the body of the retort. And if the flues should become too small at the outer end by means of deposits from the gas, no time need be lost in charging, as the same may be slipped out in a short time and replaced by other ones, and the deposit can be burned out in the furnace below or otherwise removed, at the convenience of the firemen. And where clay retorts are used, my arrangement is of particular advantage, as every retort can thus be furnished with cast iron flues attached to the lids or to the elbows of the stand pipes, whereby the same are rendered much more valuable, the iron mouth pieces being entirely dispensed with.

What I claim as new and desire to secure by Letters Patent is:—

The arrangement of the removable flues, D, with valves, E, in combination with retorts of double length, substantially as and for the purpose described.

H. K. SYMMES.

Witnesses:

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J. M. START.