

J. H. IRWIN.

Gas Retort.

No. 57,915.

Patented Sept. 11, 1866.

Fig: 1.

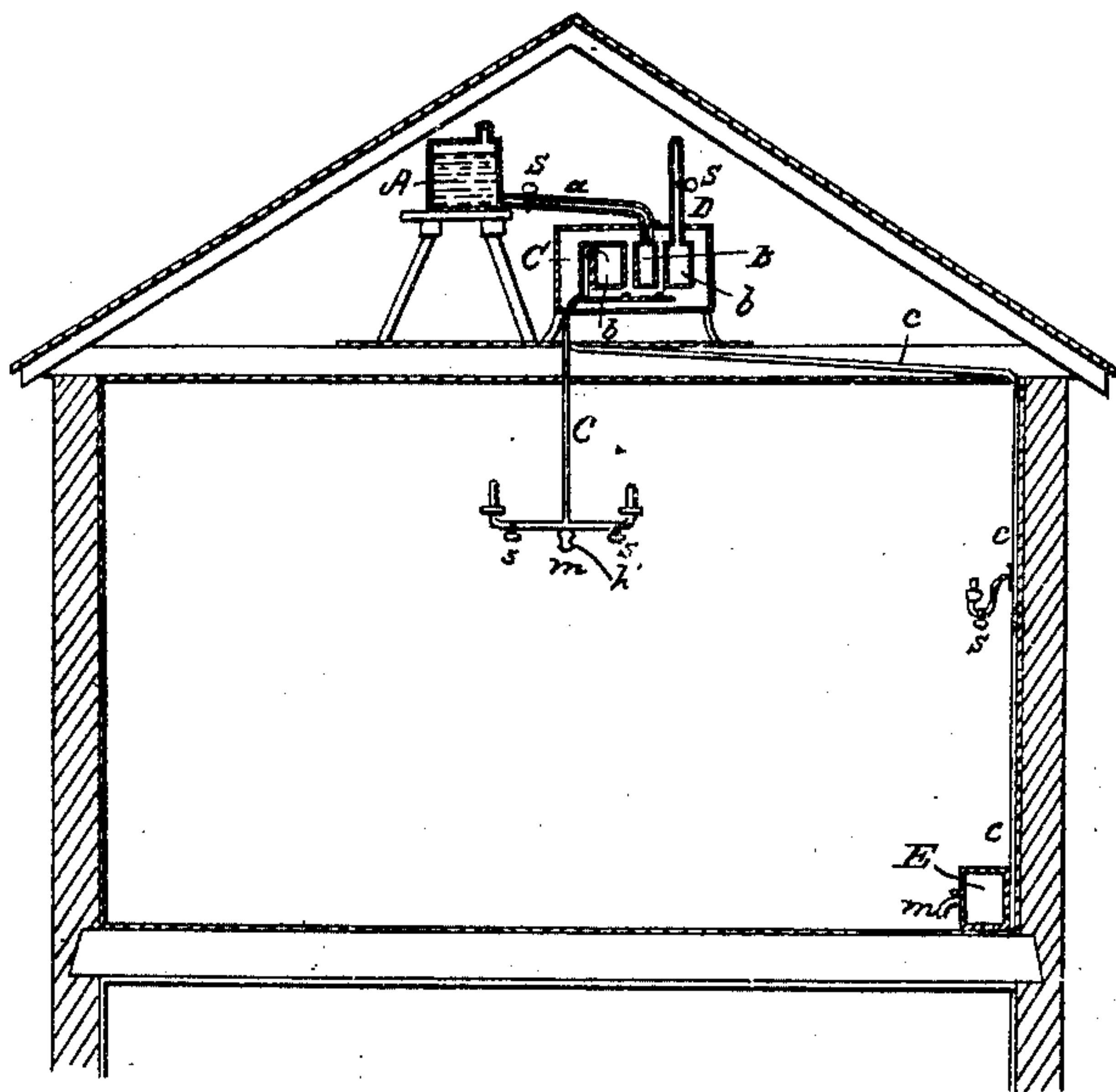


Fig: 2.

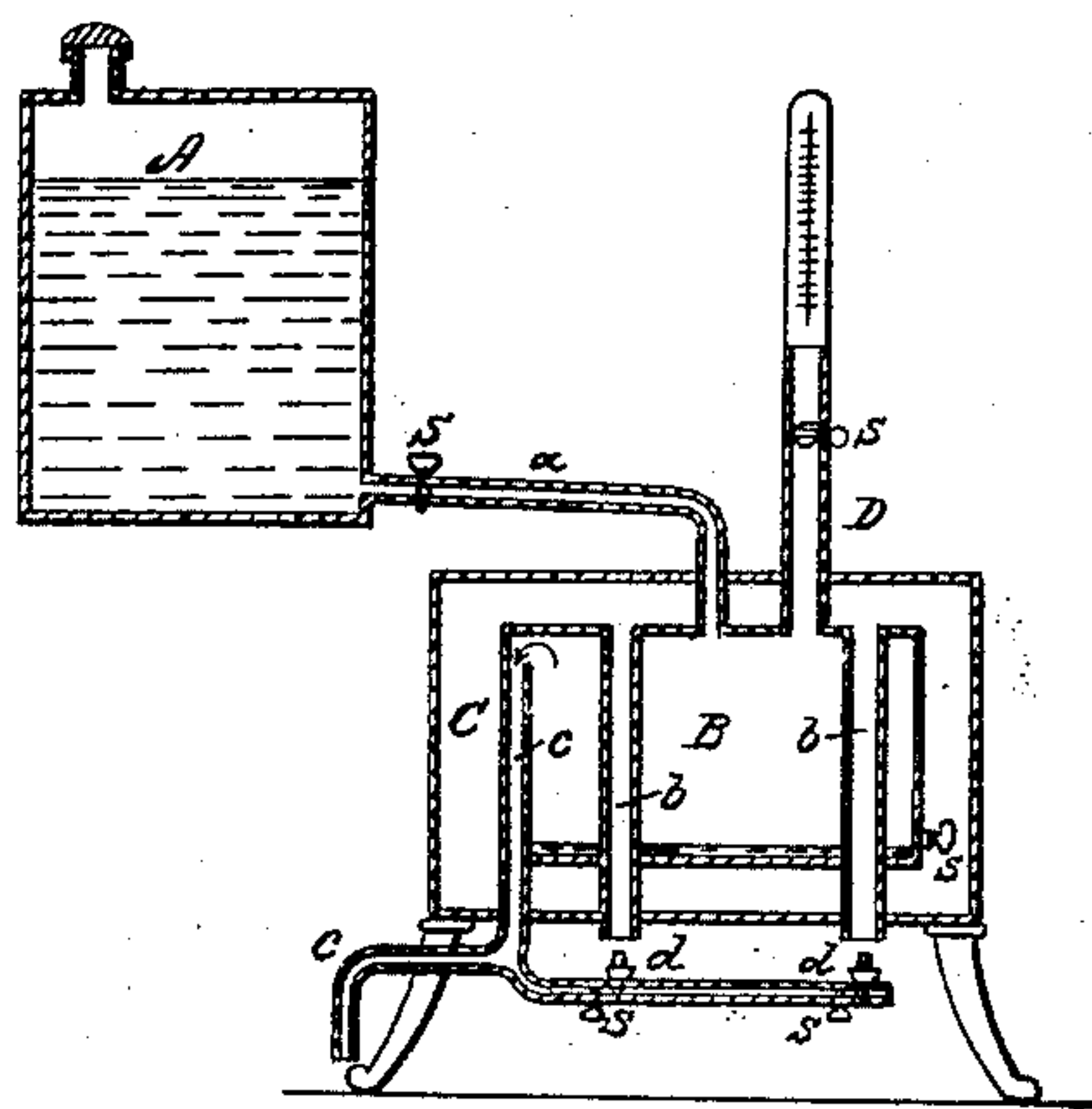
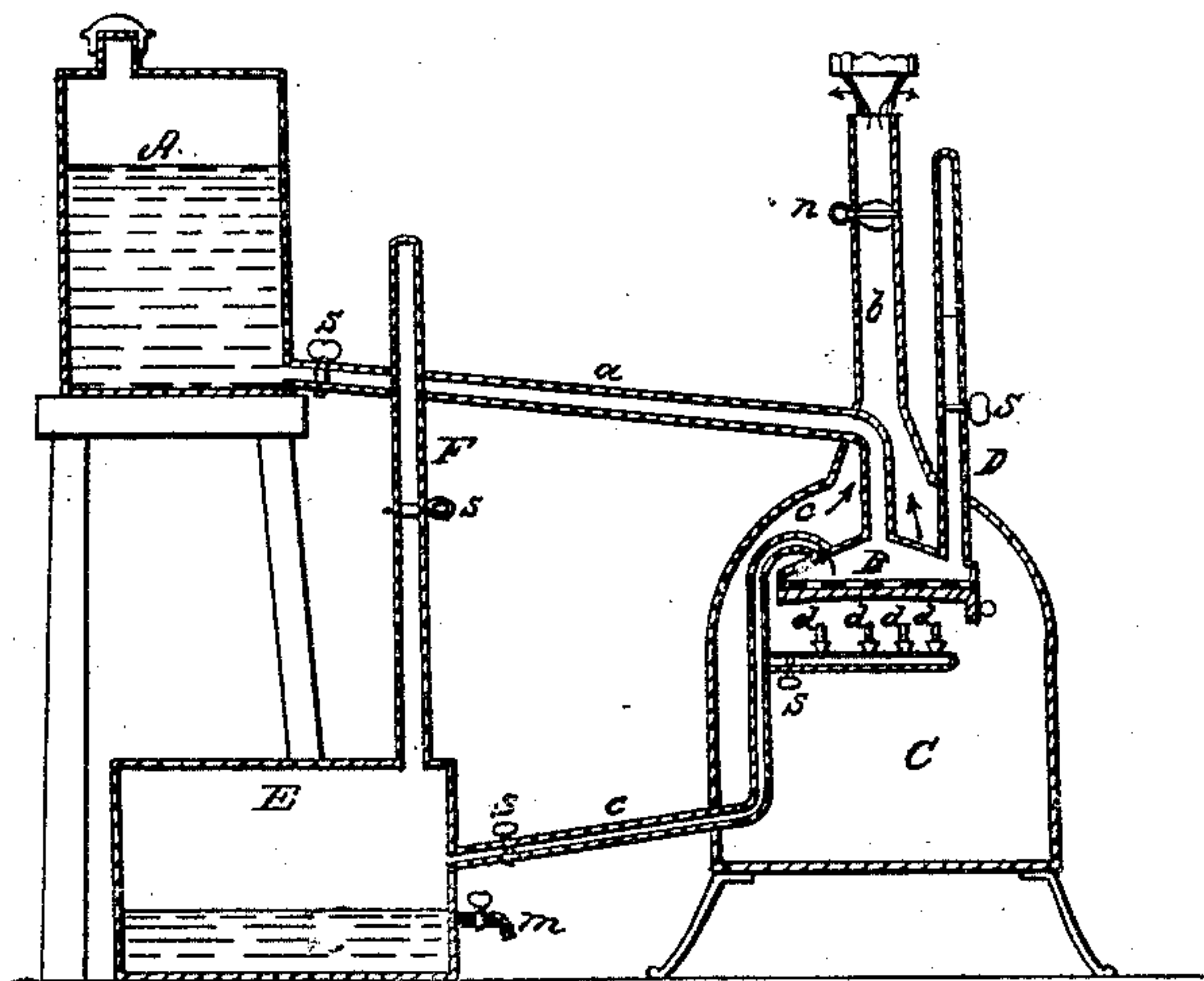


Fig: 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF CHICAGO, ILLINOIS.

## IMPROVED RETORT FOR GENERATING GAS.

Specification forming part of Letters Patent No. 57,915, dated September 11, 1866.

*To all whom it may concern:*

Be it known that I, JOHN H. IRWIN, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improved Retort for Generating Gas and other purposes; and I do hereby declare and make known that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

My said invention consists in a novel automatic portable apparatus for generating gas for illuminating and heating purposes, and which may also, by slight adaptations, be used advantageously for refining purposes; and said invention relates to that class of apparatus in which naphtha or some other form of hydrocarbon fluid or petroleum is used as the material from which the gas is produced or generated.

To enable those skilled in the art to understand how to construct and use my invention, I will proceed to describe the same with particularity, making reference in so doing to the aforesaid drawings, in which—

Figure 1 represents a vertical section of my invention as applied to illuminating purposes; Fig. 2, an enlarged similar view of the same; and Fig. 3 represents a view in section of the apparatus as applied for refining purposes.

The same letters of reference in the different figures denote like parts of the invention.

A represents a reservoir containing the hydrocarbon fluid used as the material for generating the gas, connected by the pipe *a* to a retort, B, in which the gas is generated, as hereinafter described. C represents a case inclosing the said retort B, as shown.

The retort may be constructed of cast-iron or other suitable material, and the case inclosing the same may be of any suitable sheet metal.

D represents a tube, opening into the top of the said retort B, extending up a suitable distance above said retort, as shown, and forming an inlet or air-vent into the same, for the purposes hereinafter described. From near the top of said retort B a pipe, *c*, extends, as shown, down to the burners, as shown in

Fig. 1, and down to the receiver E, as shown in Fig. 3, when used for refining purposes.

In each case a branch pipe leads under the retort where suitable burners *d* are provided, the tubes *b b* through the retort, as shown in Figs. 1 and 2, serving as chimneys, the heated air escaping from the case C through any suitable perforations. When used for refining purposes the chimneys used may be of cast-iron, if desired, and the furnace-chamber C may be provided with a chimney, *b*.

In Fig. 1, F' represents a small receiver to catch any condensed vapor or gas which may form in the pipes, *m* being a stop-cock, through which it may be drawn when necessary.

The operation of my invention is as follows: A small quantity of the hydrocarbon fluid in the reservoir A is allowed to flow down into the retort, the amount being regulated by means of the stop-cock *s* in the connecting-pipe *a*. The retort is then heated slightly in any suitable manner, and the fluid in the same is converted into vapor, which descends of its own weight to the burners *d* beneath, which are then ignited and serve to heat the retort, and cause it to generate the gas or vapor automatically as required.

By the arrangement of the tube D, which communicates with said retort, the pressure of the atmosphere acts upon the vapor and causes it to flow over and down to the burners or receiver F without any perceptible pressure, thus requiring only enough heat to vaporize the fluid without producing any internal pressure.

The vapor will rise in the tube D according to the pressure created by the heat, and, by arranging a glass tube with a scale marked upon the same, the same may serve as a gage, whereby to regulate the heat, as the height of the vapor can be clearly seen in the tube.

If the retort were closed, as is the usual manner of constructing them, no flow could be produced from the same without a considerable degree of internal pressure, which, in refining, forces over a large amount of impure matters; whereas, by the employment of the air-tube, as shown in my invention, the requisite amount of pressure is produced by the at-



mosphere, so as to require only sufficient heat to vaporize the fluid.

In refining, the residuum or tar is left in the retort, and may be drawn off through the cocks, as shown.

The retort must be arranged above the burners, when used for illuminating or heating purposes, and above the receiver, when used for refining purposes, in order to operate successfully.

Having described my invention, I will now specify what I claim and desire to secure by Letters Patent—

1. Providing a retort for generating gas and refining petroleum, arranged as described, with an air vent or tube, substantially as and for the purposes specified.

2. In combination with a retort of the de-

scribed arrangement and construction, the employment of a reservoir, A, and connecting-pipe *a*, arranged and operating as and for the purposes described.

3. The combination and arrangement of the reservoir A, connecting-pipe *a*, retort B, provided with an air-vent, as described, pipe *c*, and receiver F, substantially as and for the purposes set forth.

4. In combination with a retort, B, the employment of the auxiliary vapor-pipe and burners *d*, arranged and operating substantially as shown and described.

JOHN H. IRWIN.

Witnesses:

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