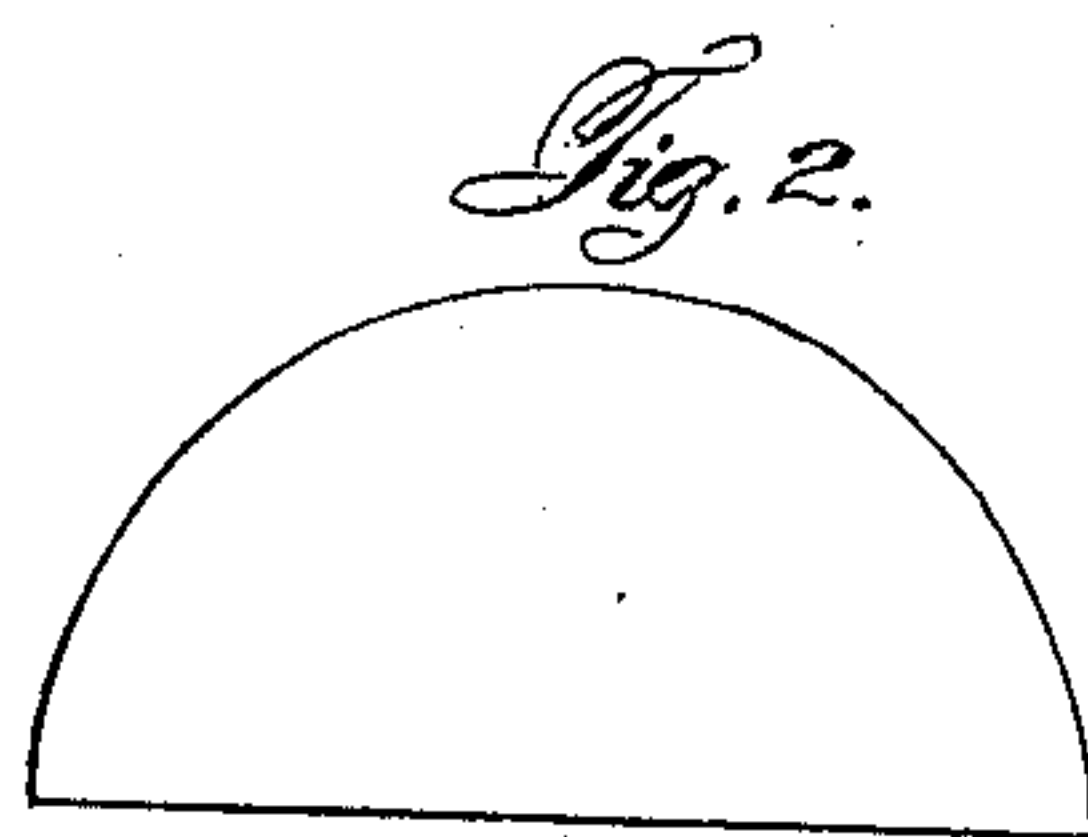
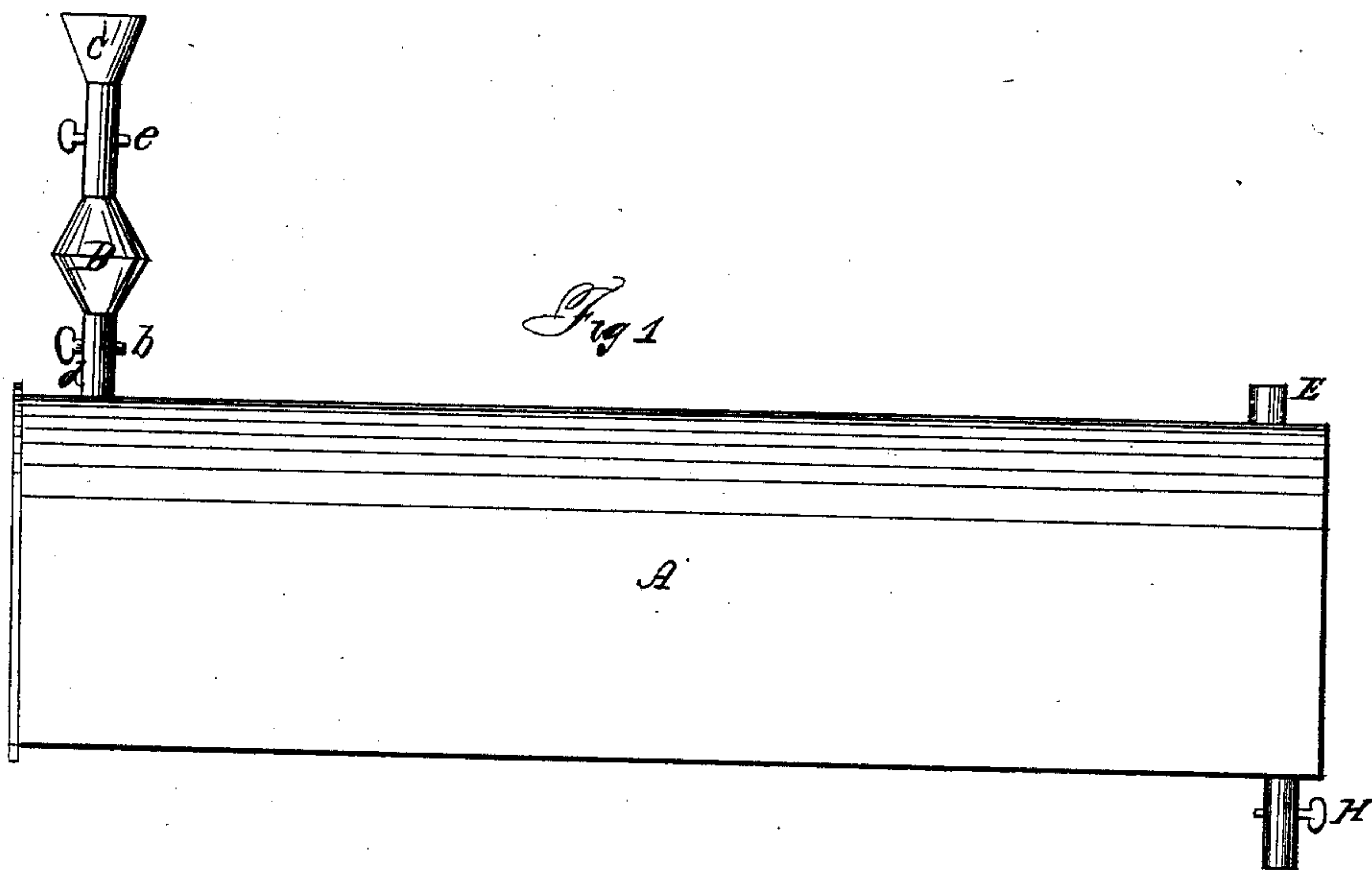


SMITH & PHILLIPS.

Gas Retort.

No. 69,594.

Patented Oct. 8, 1867.



*Witnesses:*

*John S. Hollingshead*  
*Charles Anderson*

*Inventors:*

*John W. Smith*  
*Thomas H. Phillips*

# UNITED STATES PATENT OFFICE.

JOHN W. SMITH AND THOMAS H. PHILLIPS, OF WASHINGTON, D. C.

## IMPROVEMENT IN THE MANUFACTURE OF ILLUMINATING-GAS.

Specification forming part of Letters Patent No. 69,594, dated October 8, 1867.

*To all whom it may concern:*

Be it known that we, JOHN W. SMITH and THOMAS H. PHILLIPS, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in the Manufacture of Illuminating-Gas; and we do hereby declare that the following is a full and clear and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a side elevation of the retort, and Fig. 2 end view of same.

In the drawings, A represents a D-form retort for coal-gas. B is a reservoir for gas-tar for second feeding; C, funnel for supplying the reservoir; E, pipe for discharging gas from the retort; *b*, a stop-cock between the feed-reservoir and retort; *e*, a stop-cock for the controlling of the feed-funnel; *c d*, pipe for letting tar into retort; 4, pipe with stop-cock at bottom for the purpose of determining whether gas is generating and to what extent and quality.

The invention consists in a mode of arranging and conducting the feed of a coal-gas retort, so as to compensate for the diminution of the carbon in the gas generated toward or during the latter half of the time the charge of coal is under heat by means of feeding in the gas-tar generated during the first half of the heating time.

The average time of heating the coal is two hours for the charge, and my time for feeding the gas-tar is at the end of the first hour, or at the middle of the operation; nor is this point in the process taken at random, but it is selected as the time when the richest part of the illuminating-gas has come over and when the light carbureted hydrogen is beginning to predominate, and something is wanting at this stage of the process to supply a gas that contains more carbon than what is derived directly from the coal. I therefore select the middle of the process for beginning the liquid

feed and keep up this feed to the end of three days, or near it, when the retort is to be charged afresh with coal. Nor is it a matter of indifference as to what tar is used. The latter part of the process yields products that have an excess of carbon, it is true, but, again require too high a heat to vaporize them to render them available as feed for the retort. This class of compounds embraces the chrysen kysen naphthalin paranaphthalin; but what is needed to be fed as coal-tar is the products of the first part of the distillation—namely, the light oils and the naphtha liquid and such as come over up to the end of the first hour. These materials contain an abundance of hydrogen and readily yield it in the presence of the half-exhausted bituminous coal, and serve to improve the quality and quantity of the gas from a given weight of coal.

Operation: The retort *a*, being of the D-shaped retort such as are now generally used in making gas from coal, is charged with the usual amount of coal, and when the heat has been on two hours, *b*, having been previously charged with the amount of gas-tar made the previous two hours, is now discharged slowly through pipe *d*, controlled by stop-cock *b* and *e*. The stop-cock *h* is for the operator to tell how much gas is made and what quality.

Having now described the process of making gas by a mode of feeding from a reservoir of liquid products produced in the first half of process, what we claim as our invention and desire to secure by Letters Patent, is—

An improvement in making gas from coal-tar, with the method as above described of determining the quality and quantity of gas at any time of the operation by the use of stop-cock *h*, as represented and described.

JOHN W. SMITH.

THOMAS H. PHILLIPS.

Witnesses:

JOHN S. HOLLINGSHEAD,  
CHAS. H. ANDERSON.