C. A. HOWARD.

Gas Retort.

No. 15,973. Patented Oct. 28, 1856.

Fig 1.

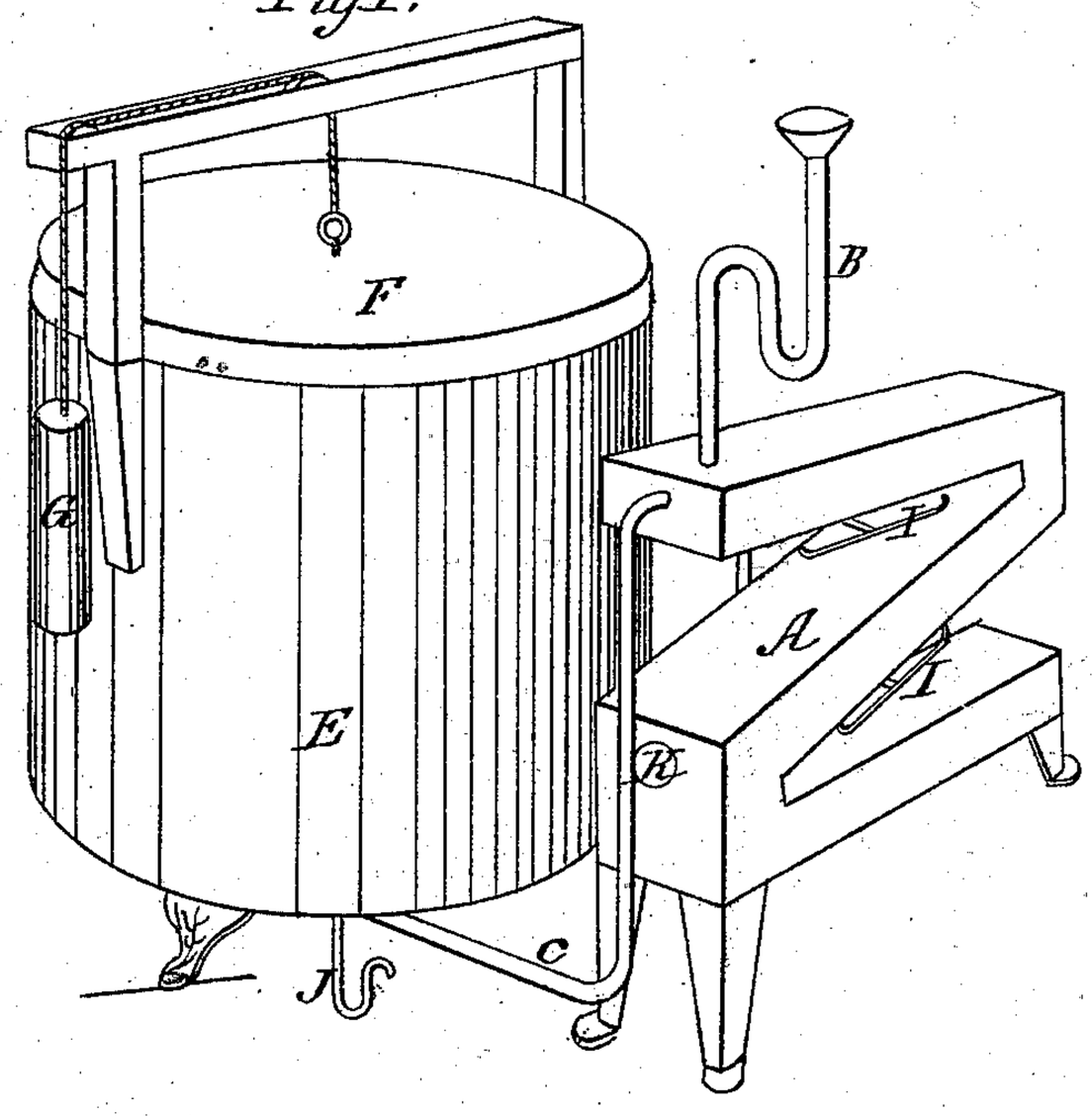


Fig. 2.

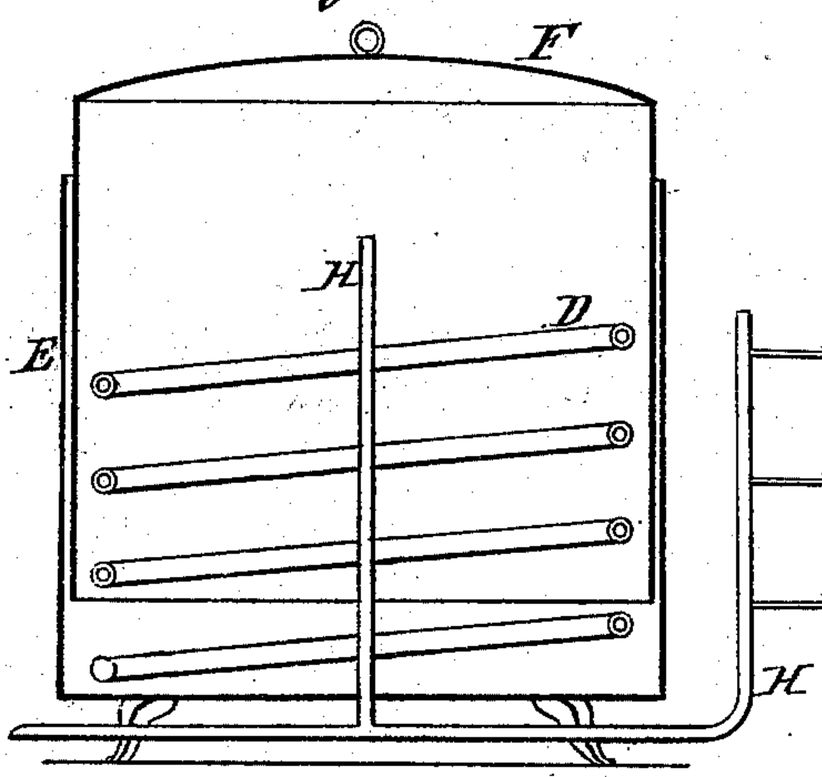
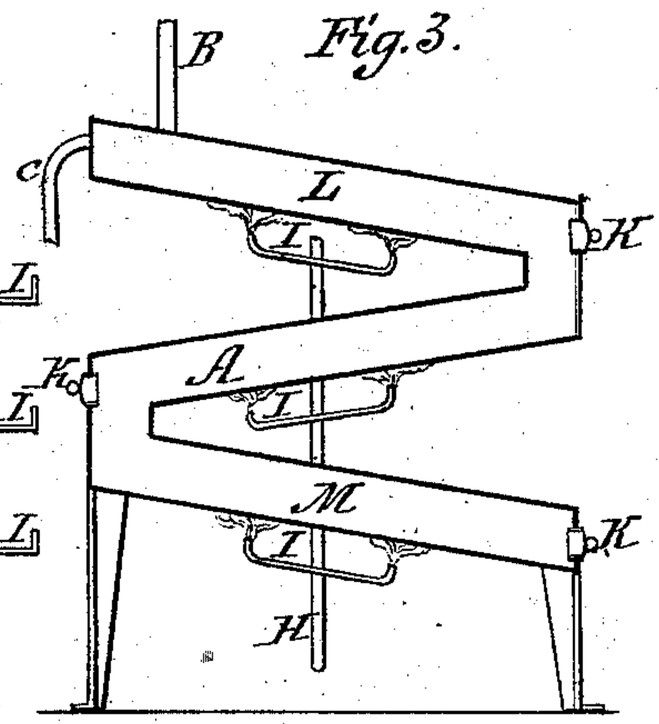


Fig. 3.



Witnesses.

J. R. Bowman.

Ac Thurber

Inventor.

Charles A. Howard.

UNITED STATES PATENT OFFICE.

CHARLES A. HOWARD, OF PONTIAC, MICHIGAN.

GAS-GENERATOR.

Specification of Letters Patent No. 15,973, dated October 28, 1856.

To all whom it may concern:

Be it known that I, CHARLES A. HOWARD, of Pontiac, in the county of Oakland and State of Michigan, have invented a new and Improved Portable Gas-Generator; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists of a series of inclined retorts that are heated by burners supplied with gas produced from the apparatus itself.

Figure 1 in the accompanying drawings is a perspective view of the apparatus complete. Fig. 2 is a vertical section of the gasometer and Fig. 3 is a vertical section of the inclined retorts.

A is a series of three rectangular retorts that are each inclined at a sufficient angle to allow the material from which the gas is to be produced to flow readily upon the inner side of their bottom plate. They may be made of thin cast iron in one piece or of sheet iron or other sheet metal secured tightly together. They may be used in a series of two or more in proportion to the amount of gas required to be produced. B pipe through which the material is fed to the retorts, made siphon shape to allow a quantity of the material to stand within it to prevent the escape of gas. C pipe attached to the highest end of the upper retort, to convey the gas from the retorts to the gasometer. It enters the gasometer at the bottom and connects with the coiled pipe D immersed in the water contained in the gasometer, for the purpose of cooling the gas in its passage through it, obviating the necessity of using a separate cooling box for that purpose. E outer cylinder of the gasometer, in which water is placed for the purpose of preventing the escape of gas from the inner movable cylinder F, and also for the purposes of cooling before mentioned. G weight to counterbalance such portion of the weight of the inner cylinder F as may be required to produce the requisite compression of the gas. H outlet pipe through which the gas is conveyed from the gasometer to the burners in the apartments where it is to be used and also to the burners I beneath the retorts. J trap pipe attached to the lowest part of the pipe B to permit the escape from it of the tarry and other residuous matters. K covers to hand-holes through which the retorts may be cleaned of any sediment or residuum that may burn upon and be attached to their surfaces. They are secured in place by being tightly fitted to the holes and are luted with fire clay or other proper material to make them perfectly tight to prevent the escape of gas.

In case the retorts require to be used while there is no gas contained in the gasometer—as in first starting them or when the supply of gas has been exhausted—a fire of shavings or light wood, or spirit or other lamps may be applied to heat them to a proper degree to vaporize the material in sufficient quantity to supply the burners I—when the fire or lamps are removed, and the gas from the burners I lighted to continue the operation.

The operation of my generator is as follows: The gas supplied to the burners I is lighted and when the retorts are properly heated by them, the material from which the gas is to be produced (either melted resin, resin oil, grease or similar substances used for that purpose that are in liquid form or that may be made so by heating) is fed from a reservoir in proper quantity to the upper retort through the feeding pipe B and is vaporized by coming in contact with the heated surfaces of the retort. The material flowing down the plane of the upper retort undistilled is received upon and heated and vaporized by, the heated surfaces of the next one below, and in case any portion of it flows past the second one it is received and similarly acted upon by the lower one. The gas as produced is taken off by the pipe C and conveyed to the gasometer, passing in its way through the coiled pipe D, within the gasometer, for the purpose of cooling it to a proper degree before it is used for illuminating or for heating as herein described.

By using the heat produced by the burning of the gas beneath the retort I avoid the use of the stove or other heating apparatus ordinarily used for that purpose, thereby making my arrangement less expensive in construction and operation, more compact and portable, and to be operated with less care and attention.

What I claim as my invention and desire to secure by Letters Patent is—

The series of inclined retorts constructed and arranged substantially as described.

CHARLES A. HOWARD.

Witnesses:

I. R. BOWMAN,

H. C. THURBER.