J. D. PATTON.

Apparatus for Making Gas.

No. 146,610. Patented Jan. 20, 1874.

Fig. 1.

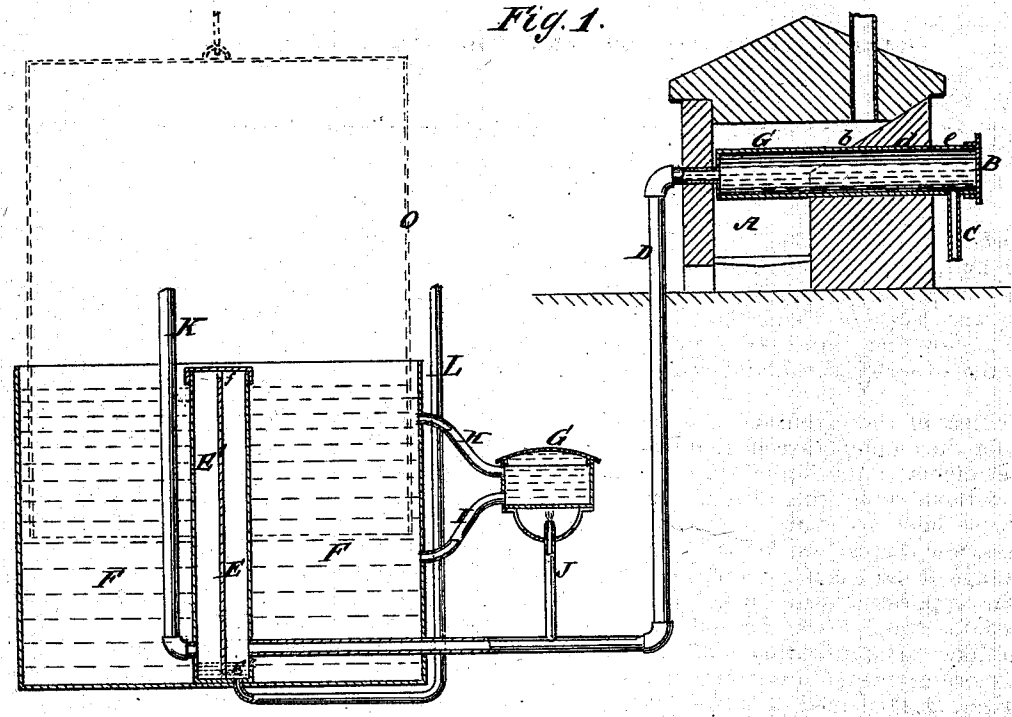


Fig. 2.

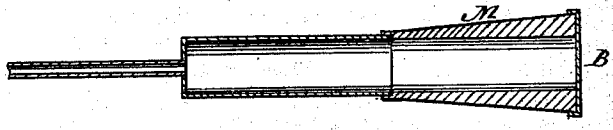
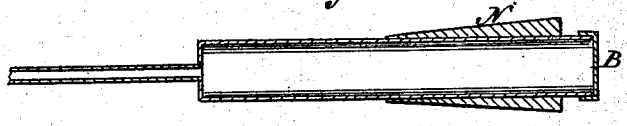


Fig. 3.



WITNESSES:

E. Wolff.

J. Seligmick

INVENTOR:

J. D. Patton

BY

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH D. PATTON, OF TREVORTON, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR MAK NG GAS.

Specification forming part of Letters Patent No. **146,610**, dated January 20, 1874; application filed November 15, 1873.

To all whom it may concern:

Be it known that I, JOSEPH DESHA PATTON, of Trevorton, in the county of Northumberland and State of Pennsylvania, have invented a new and Improved Petroleum-Gas Apparatus, of which the following is a specification:

The object of the invention is to provide a means for the manufacture of illuminating-gas from petroleum in any liquid form, in a single retort, without subjecting it from the first to the intense heat necessary to convert it into fixed gas, and to provide for the purification and storage of the gas in a simple and efficient way, the apparatus being more particularly intended for small works for individual use, and the like. The invention consists, first, of one or more retorts of any form, as angular, cylindrical, or D-shaped, so set or placed in a furnace as to secure temperatures varying from bright-red heat at one end to very dull red heat, or below any redness, at the other end of the same retort, with connections arranged to admit the oil at the coolest part, and cause it to pass along to the hottest part and out thereat when converted into gas. The graduated heat is secured by protecting a portion of the retort by embedding a portion partly, and another portion wholly, within the brick-work of the furnace, or by other equivalent protection by masonry or metal, or by varying the thickness of the retort itself. Second, the invention consists of a condenser located in the gas-holder, said condenser being a vessel of cylindrical or other form, divided longitudinally into two or more compartments, communicating with each other at top and bottom, the inlet-pipe from the retort communicating with one compartment near the bottom, an escape-pipe connecting with the bottom of the other, an exhaust-pipe for taking out the deposit, and both compartments being surrounded with water. Third, a small boiler or water-heater, communicating with the water-tank surrounding the condenser by two pipes, one lower than the other, the boiler being below the water-level, and having means for heating the water to prevent the water of the condenser from freezing in cold weather by the circulation which is maintained in it by means of the heater so connected.

Figure 1 is a sectional elevation of a furnace, retort-condenser, and water-heater constructed according to a plan by which my invention may be carried out. Figs. 2 and 3 are sectional elevations of retorts, showing different modes by which the heat can be graduated.

Similar letters of reference indicate corresponding parts.

A represents the furnace; B, the retort; C, the inlet-pipe for the oil; D, the gas-pipe, connecting the retort with the condenser-chamber E; F, the water-tank; G, the water-heater; H and I, pipes connecting it with the water-tank; J, gas-pipe for burning a jet under the heater; K, escape-pipe for the gas from the condenser; and L, a waste or drip pipe for taking out the drip or condensed gas from the bottom of the condenser by a pump attached to the pipe at the top. The part *a* of the retort is wholly exposed to the heat of the furnace. Part *b* is partly exposed, part *d* still less, and part *e* is exposed to the atmosphere.

The method of operation is as follows: Crude petroleum or benzine is let into the protected end of the retort, from which it gradually passes along in the direction in which the heat increases, while the gasifying process is going on, to the hottest part *a;* next to the escape-pipe, where it arrives in the form of fixed gas, and escapes to the condenser, which is to be within the gas-holder. Here the gas comes in contact with cold surfaces, by which it is purified and condensed, and it escapes into the holder, which may be arranged in the water-tank of the condenser, as indicated in dotted lines O, or in any other approved way. The drip caused by condensation falls into the bottom of the condensing-chambers, below the inlet-pipe, and is pumped out from time to time through the pipe L. From chamber E of the condenser the gas passes through passage *f* in the partition into chamber E^1, from which it escapes near the bottom into the gas-holder through pipe K. The drip escapes from chamber E^1 to E through a small passage, E^2. As the gas passes along the pipe D to the condenser, a small portion is diverted to the

burner J, under the water-heater, for heating it to keep the water of the condenser and tank from freezing when the furnace is not in operation, so that the heat cannot be obtained from it.

In Fig. 3 I have represented a retort with one portion made much thicker at the receiving end, and gradually lessening in thickness to the middle, or thereabout, for graduating the heat; and in Fig. 3 I have represented a cylindrical retort with a tapered jacket, N, of non-conducting material, as another means of graduating the heat.

Some of the advantages of this arrangement are, first, a graduated heat is secured to the retort in a simple manner; second, condensation is secured without the use of a pump or flow of water, and at the same time the remaining heat of the gas is utilized to prevent the condenser and water in the tank from freezing, in consequence of the arrangement of the condenser within the gas-holder; and, third, a convenient, reliable, and yet simple means of keeping the water of the condenser and tank from freezing while the furnace is not in operation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The retort B, having the rear end in combustion-chamber of furnace A, with a second portion partly, and a third portion wholly, embedded in masonry, the oil being admitted at front, as described, so that the oil will be gradually heated and finally evaporated before leaving the retort, in the manner set forth.

2. The combination, with tank F, of the condenser E, having a longitudinal partition, and provided with a gas-exit at the top and a liquid-exit at the bottom, as and for the purpose specified.

3. A water-heater, G, and a gas-burner, J, in combination with the water-tank of the condenser, in the manner described, to protect it from freezing, substantially as specified.

JOSEPH DESHA PATTON.

Witnesses:
J. B. NEWBAKER,
A. A. NEWBAKER.