R. H. SMITH & J. GOLDTHORP.

Apparatus for the Manufacture of Illuminating Gas.

No. 166,645. Patented Aug. 10, 1875.

Fig 1

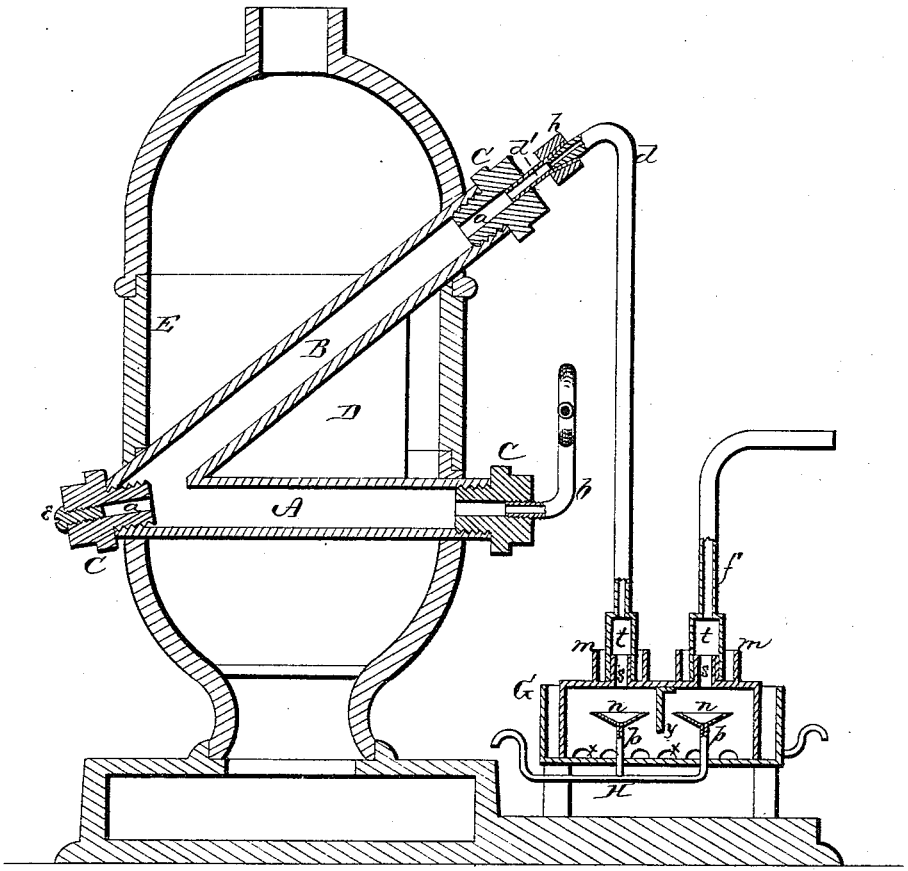
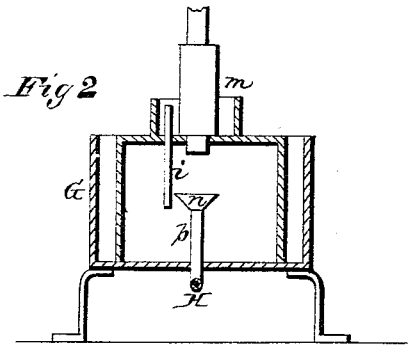


Fig 2



WITNESSES
Franck L. Durand
C. L. Emerson

By

INVENTOR
R. H. Smith & J. Goldthorp
Alexander Mason
Attorney

UNITED STATES PATENT OFFICE

ROLAND H. SMITH AND JOSHUA GOLDTHORP, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **166,645**, dated August 10, 1875; application filed July 19, 1875.

To all whom it may concern:

Be it known that we, R. H. SMITH and JOSHUA GOLDTHORP, of Pittsburg, in the county of Allegheny and in the State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for the Manufacture of Illuminating-Gas or other gases; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of our invention consists in the construction and arrangement of an improved apparatus for the manufacture of illuminating and other gases, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section of our entire gas apparatus. Fig. 2 is a transverse vertical section of the washer.

The retort of our gas apparatus is composed of two pipes, A and B, meeting so as to form a sharp angle, and having the three ends closed with screw-plugs C or other caps, which may be bolted to flanges provided on the pipes, the two pipes being also connected at the angle by a strengthening-web, D. These retorts may be made of cast or wrought iron, clay, or any other suitable material; but cast-iron is thought to be the best, and the cross-section of the same may be either round, oval, square, or of any shape that may be found most desirable. They are set so that the lower limb of the angle shall be horizontal, and the other limb may be vertical, or to one side above it. Although it is possible to use the same retort when placed in any position obtainable, the position shown in the drawing is considered the best. This retort is most easily adjusted in an ordinary round stove, E, as shown, but may also be put in cooking-stoves, ranges, and fire-places, &c. The screw-plugs C, or their equivalents, which close the ends of the retort, or the caps which may be substituted therefor, are provided with smaller openings *a* through the center. In the plug in one end of the part A of the retort is inserted the inlet-pipe *b*, and in the plug in the upper end of the part B is inserted the outlet-pipe *d*. The center hole in the third plug is stopped by a screw, *e*, or its equivalent. Through the inlet-pipe *b* the petroleum or other substance intended to be converted into gas is introduced, the retort having been previously made red hot, and the gas produced passes by the outlet to the washer G, where it is purified, and from thence to the reservoir for use. Should the retort during use become clogged with carbon and refuse, all that is necessary to do is to remove the screw-plug *e* and the inlet and outlet pipes, thus allowing a free circulation of air inside the retort. The fire being kept up in the grate the carbon and refuse is gradually burnt away, leaving the retort clean and ready for further use. The retort is supported, as shown, by notches cut or cast in the body of the stove. On the outlet end of the retort is shown a new gas-tight joint intended to allow of the moving of the retort without the annoyance of taking with it the pipe, and also allowing the joint to be more easily made. It is constructed as follows: *d'* is a short piece of iron pipe inserted in the retort or plug C at that end, and having a slightly-angular head, which is finished outside and inside and ground to suit the other parts, which are also finished. The outlet-pipe *d*, communicating with the washer, is made of iron, with the joining end finished and ground to the interior of the pipe *d'*. *h* is a ring of gun or other non-expanding metals, fitted and ground to the exterior surface of the pipe *d'*, and clasping it tightly when it is in the position shown. The action of this joint is as follows: The outlet-pipe *d* being introduced and jammed into the pipe *d'*, the gun-metal ring *h* is drawn hard up to its position. As soon as the heat reaches the pipe *d'* the iron expands and tightens on the ring *h*, which does not expand, and thus forms a gas-tight joint. When it is desired to disconnect the pipe, all that is necessary to do is to knock the ring *h* back, thus relieving the binding, and the joint can be readily detached and as readily rejoined. The washer G is formed of two boxes, one inverted into the other, the inner or upper one having along its lower edge

notches or slots *x* cut out so as to allow the water that is placed in the outer one to have free circulation into the inner one, which inner one has also a flange or rib, *y*, across the inside, dividing it into two compartments. This flange or rib projects into the water a sufficient depth to form a seal, requiring the gas which comes from the retort to be brought into direct contact with the water. At the points where the pipes *d* and *f* are to be connected to the washer are two cups, *m m*, each having an interior central tube, *s*, and on the end of the pipe *d* or *f* is an enlarged tube, *t*, fitting over the central tube *s*, as shown, thus forming a loose sealed joint, allowing all parts of the washer to be readily taken apart. In each cup or seal *m* is a drip-tube, *i*, extending down into the washer for the purpose of relieving the surface of the water with which the seals are filled, and thus relieve the pipes of the noxious refuse which naturally collects on the water, conveying it down into the interior of the main body of the washer. In the body of the washer G are two vertical tubes, *p p*, with cup-heads *n n*, one to each compartment, which pipes also take the refuse floating on the water therein, and convey it away by the tube H. By this means all noxious effluvia from the washer is obviated.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A retort composed of two tubes, A B, connected at an angle, and provided with the strengthening-web D and hollow screw-plugs C, substantially as and for the purposes herein set forth.

2. The drip-tubes *i*, in combination with the seals *m* of the washer G, substantially for the purposes herein set forth.

3. The tubes *p*, provided with cupped heads *n* in the bottom of the washer G, substantially as and for the purposes herein set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 16th day of June, 1875.

ROLAND H. SMITH.
JOSHUA GOLDTHORP.

Witnesses:
RICHARD ALLEN,
JOHN D. MORELAND.