

Gas Retort.

Patented April 6, 1858.



UNITED STATES PATENT OFFICE.

DAVIS L. WEATHERHEAD AND JAMES T. HENRY, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNORS TO THEMSELVES, JOHN M. SMITH, AND WM. CAMPBELL, OF SAME PLACE.

PORTABLE GAS-RETORT.

Specification of Letters Patent No. 19,900, dated April 6, 1858.

To all whom it may concern:

Be it known that we, DAVIS L. WEATHERHEAD and JAMES T. HENRY, of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Portable Gas Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Our invention consists in generating gas in a cylinder containing a second perforated cylinder filled with broken pumice stone, the exterior cylinder being in constant communication with a supply of material to be generated into gas, so that the whole may form a continuous gas generating and gas purifying retort.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

In reference to the drawing which forms a part of this specification, Figure 1 is a sectional elevation of our improved portable gas apparatus. Fig. 2 a ground plan of the same.

A is the fire-chamber or stove furnished with the chimney *b*, and a hinged cover *c* for the admission of fuel. Through the stove A, as well as through the fuel contained therein, passes the cylinder B, both ends of which project beyond the ends of the stove. One end of this cylinder is closed, with the exception of an orifice for the admission of the pipe F, the opposite or front end of the cylinder being furnished with a detachable cover *a*. In the interior of the cylinder B is a second cylinder C somewhat shorter than the first. Each extreme end of the interior cylinder is enlarged so that a small space may be left between its body and the inside of the exterior cylinder. The cylinder C is perforated with small holes and is furnished with a rod for extracting it from the exterior cylinder.

D is a siphon-formed pipe, furnished at the top with a funnel mouth *d*, and communicating at the bottom with the front end of the cylinder B.

A vessel E for containing the oil or fatty matter is attached to the chimney, so that the heat from the same may maintain the contents of the vessel in a fluid condition.

F is a pipe passing from the end of the

cylinder B to the well G of the gasometer, through which it passes upward into the gas chamber H above the level of the water in which it is bent so that the bent end may terminate some distance below the level of the water. The extreme end of this pipe is enlarged as seen in Fig. 1 and the lower portion of this enlargement is perforated with small holes or narrow slits or the end of the pipe may be formed in any other manner by which the gas may be allowed to escape into the water in minute jets or thin films. The pipe F is bent downward, near the retort and gasometer and is furnished with two cocks *i* and *j* in order that any water which may be collected in the perpendicular portion of the pipe may be more readily disposed of.

A rod *k* is secured to the bottom of the well G and passes upward through the central tube *l* of the gas chamber H, thereby guiding the latter which may be weighted in any convenient manner.

I is the outlet or distributing pipe to the burners. The inner perforated cylinder C having been filled with pumice stone broken into pieces about the size of a walnut, and the fuel in the stove having been ignited, the apparatus is ready for the generation of gas. The oil or fatty matter is allowed to drop into the funnel mouth *d* of the pipe D from which it drops into the front projecting portion of the cylinder B. Here the gas is generated in an impure state and from thence it passes through the interstices formed by the broken pieces of pumice stone in the inner perforated cylinder and passes into the pipe F in a pure state. After repeated experiments with different materials we have found pumice stone to answer best for the desired purpose, for the following reasons: It is indestructible as regards the action of the fire, and is of such a porous nature as to absorb all the moisture of the gas and to assist in the extraction of the tar from the same. This tar passes between the interstices of the broken pieces through the perforations of the inner cylinder, and is brought in contact with the heated exterior cylinder, where all the useless refuse portions of the tar are consumed and all the gas it contained carried off through the perforations of the inner cylinder through the interstices formed by the pumice stone and thence to the pipe F. It will thus be seen

that the outer cylinder B and the inner perforated cylinder C with its broken pumice stone, form when combined a purifying gas retort, and that the usual detached cumbrous and expensive purifying apparatus is dispensed with. The gas in a purified but heated state passes along the pipe F and is discharged through the perforated end of the same at a point below the level of the water in the chamber H of the gasometer; then rises to the space above and makes its exit through the distributing pipe to the burners.

Although we have alluded to the use of oil and fatty matter as the substances from which to generate the gas we wish it to be understood that our purifying retort as well as the cooling and safety apparatus are equally applicable to the generation of pure and cool gas from other known gas producing substances.

What we claim as our invention and desire to secure by Letters Patent is—

The exterior horizontal cylinder B, in combination with the interior horizontal perforated cylinder C, charged with pumice stone when the cylinders are so constructed and arranged, that the material from which the gas is to be made shall flow into the annular space between the two cylinders, and the gas when generated shall pass through the body of porous material for the purpose of purification in the manner described.

In testimony whereof, we have signed our names to this specification before two subscribing witnesses.

DAVIS L. WEATHERHEAD.
JAMES T. HENRY.

Witnesses:

HENRY HOWSON,
WILLIAM E. WALTON.