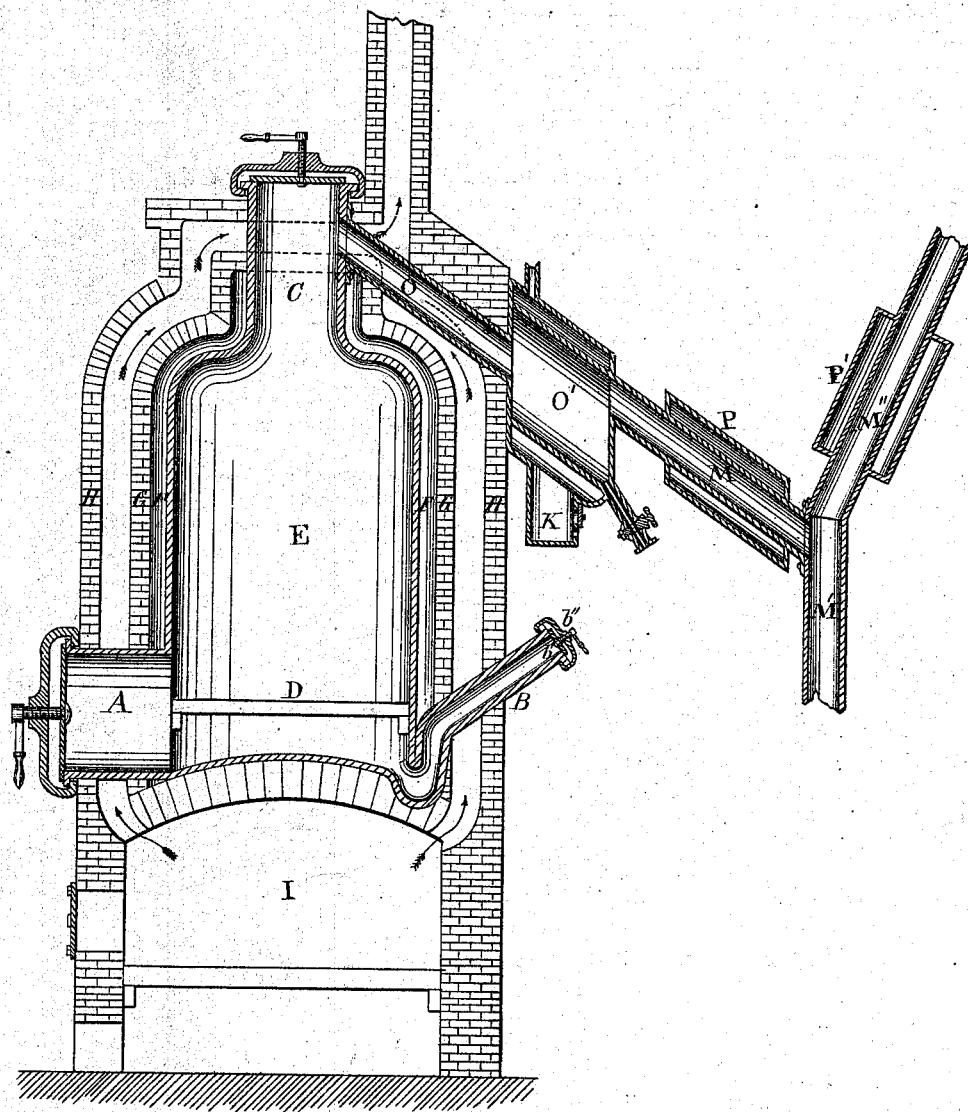


T. Sim,
Producing Bisulphide of Carbon.
No. 112,390. *Patented Mar. 7. 1871.*



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS SIM, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN RETORTS FOR PRODUCING BISULPHIDE OF CARBON.

Specification forming part of Letters Patent No. 112,390, dated March 7, 1871.

To all whom it may concern:

I, THOMAS SIM, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and Improved Retort for Producing Bisulphide of Carbon, &c., of which the following is a specification.

Nature and Objects of the Invention.

My invention is intended to obviate a difficulty heretofore experienced in cleaning retorts for the manufacture of bisulphide of carbon or other fluids produced by the combination of two solids, wherein the temperature of vaporization of said fluid and one of its component solids differs considerably.

It is particularly designed for the production of bisulphide of carbon, permitting the vaporized sulphur to ascend freely through the carbon and avoiding clogging the lower part of the retort, as well as allowing the refuse mass left after the operation is completed to be readily withdrawn from the retort.

In retorts of this class it has hitherto been necessary to withdraw the refuse from the aperture at top, that being the only one provided for both filling and emptying. This was a tedious and troublesome process.

Description of the Accompanying Drawings.

The figure is a central vertical section, showing the retort and its connections mounted on a furnace.

General Description.

E is the retort, supported in any proper manner over the furnace I, and surrounded with an inner wall, G, and outer wall, H, of fire-brick.

The space F between the retort and inner wall constitutes a hot-air chamber, and the interval between the two walls a fire-space, the inner wall preventing the flame from coming in direct contact with the retort, thereby insuring much greater durability.

C is the neck of the retort, through which charcoal is introduced, the aperture thereof being closed by a tightly-fitting cap.

B is the tube for the introduction of sulphur, and is furnished with a hinged cover, *b'*, which may be shut tightly over the aperture, or lifted, to insert the sulphur, by means of a lever, *b*, with a forked collar pivoted to the sides of the tube and suitably attached to said cover so as to raise it or allow it to fall, and be pressed firmly against it, as required.

The above-described arrangement may be replaced, as shown in the drawing, by a cap, having attached a circular plate operated by a screw, and fitted tightly to the orifice or other equivalent.

A is a pipe, provided with a suitable vapor-tight cover, of sufficient size to allow ready access to the interior of the retort, and passing through the interior and exterior walls of the furnace.

D is a grate near the bottom of the retort, serving to separate the sulphur in its solid form from contact with the superimposed charcoal, thus preventing clogging, and allowing the sublimed sulphur to thoroughly permeate the coal.

A pipe, O, is connected with the neck of the retort near its top. This pipe is enlarged throughout a portion of its length, or conducted into a chamber of greater sectional area than itself, forming a sulphur-trap, O'. This part is inclined downwardly from the retort, and is surrounded by a furnace, K.

The pipe M, issuing from O', is surrounded by a condenser, P.

After passing through this it is divided into two branches—one, M', leading downwardly to the tank or reservoir for receiving the condensed bisulphide, and the other, M'', passing upwardly through a second condenser, P', is led to a suitable place for the discharge of the incondensable vapors.

The above-described arrangement of the sulphur-trap and its connections may, however, be varied without affecting the general principles of construction and operation of the same.

Operation.

A charge of charcoal being introduced through the aperture C, this is closed and sulphur inserted into the pipe B, passing down to the bottom of the retort. All means of exit for the gases, except through the pipe O, being then closed, and fire started in the furnace I, when the retort becomes sufficiently heated to vaporize the sulphur, the vapor passes up through the carbon, combining therewith and forming bisulphide of carbon, (CS₂), which passes over in gaseous form through the pipe O, and is conducted off by M to the condenser P, where the greater portion of it is condensed, passing down through the pipe M'. The incondensable gases generated in the retort, and

any uncondensed CS₂ mingled therewith, are carried upward by the pipe M'' through the second condenser P', where the remaining bisulphide is condensed, the incondensable gases being finally discharged by the pipe M''. The vaporiform free sulphur which may have passed through the retort is condensed within the sulphur-trap O' and drawn off in a molten state through the opening *e* as often as requisite, say once a day, the furnace K being heated whenever necessary for this purpose. The sulphur is fed to the retort as often as required (at intervals of five to ten minutes, more or less) through the tube B, the door of which is opened by means of the lever *b*, and reclosed as soon as the proper charge is introduced. Fresh charges of charcoal may be supplied at intervals of two to three days. The refuse mass remaining in the retort is withdrawn, when necessary, through the cleaning-out pipe A.

I do not claim the sulphur-trap O', it being the invention of Elias S. Hutchinson, of Baltimore, Maryland.

Claims.

I claim as my invention—

1. The cleaning-out pipe, A, provided with a vapor-tight cap or cover, in combination with a retort, constructed and operated substantially as herein described.
2. In combination with a retort and its connections, as herein described, the gate D, substantially as and for the purposes specified.
3. In combination with a tube, B, for introducing materials into the body of a retort, the hinged cover *b'* and forked lever or collar *b'*, substantially as and for the purposes specified.
4. In combination with a retort and its appendages, constructed and operating substantially as herein described, the arrangement of an interior and exterior wall, forming fire and air spaces above the furnace I, substantially as and for the purposes described.

THOS. SIM.

Witnesses:

OCTAVIUS KNIGHT,
WM. H. BRERETON, Jr.