

R. W. SARGENT.

Vapor Burner.

No. 9,334.

Patented Oct. 12, 1852.

Fig. 1.

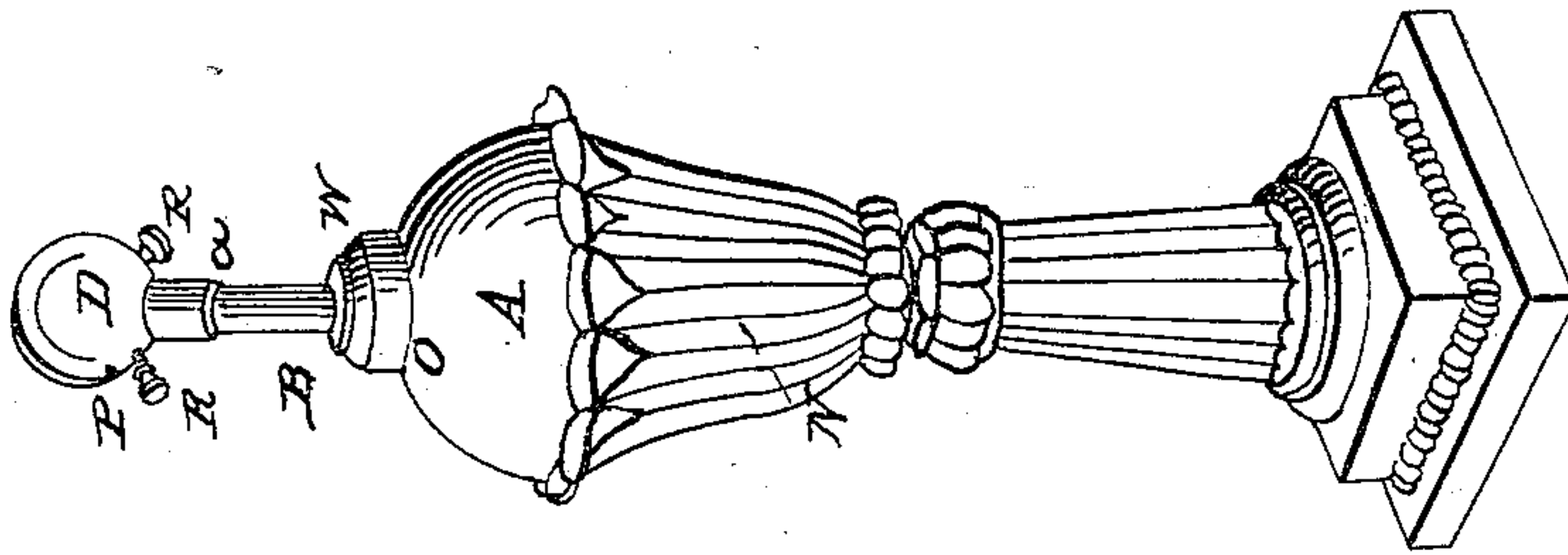


Fig. 2.

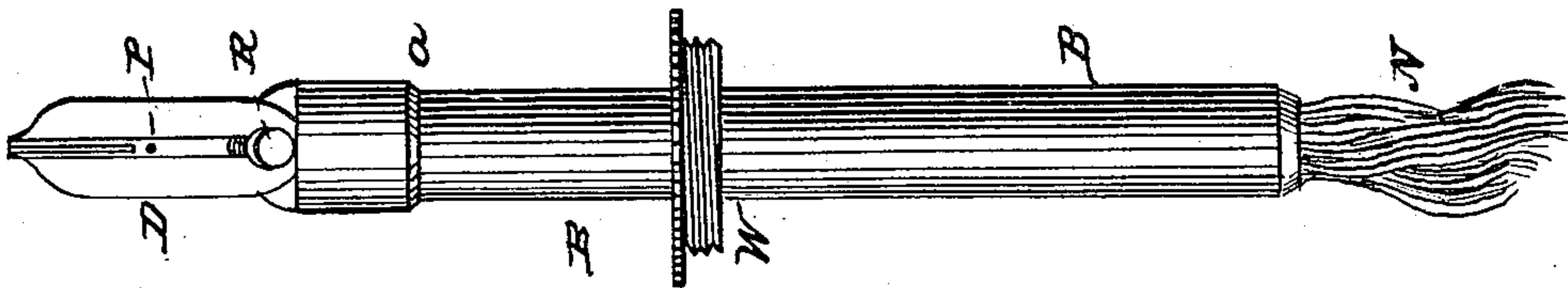


Fig. 4.

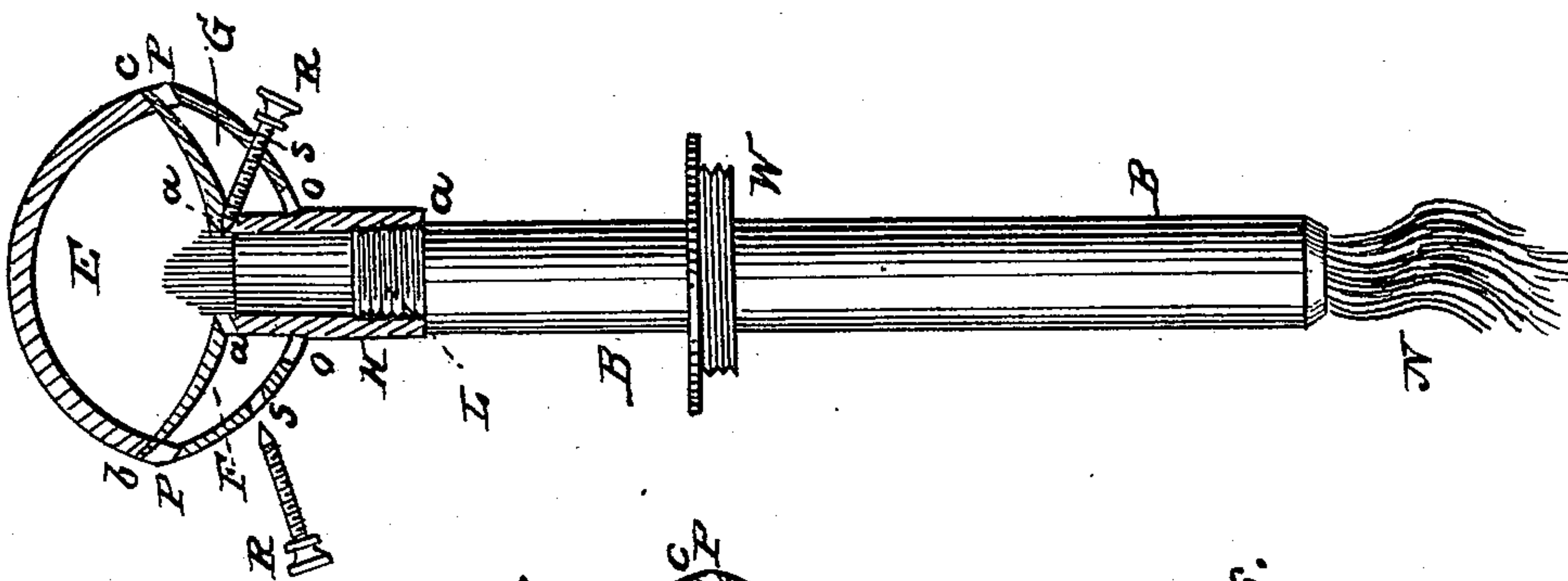


Fig. 5.

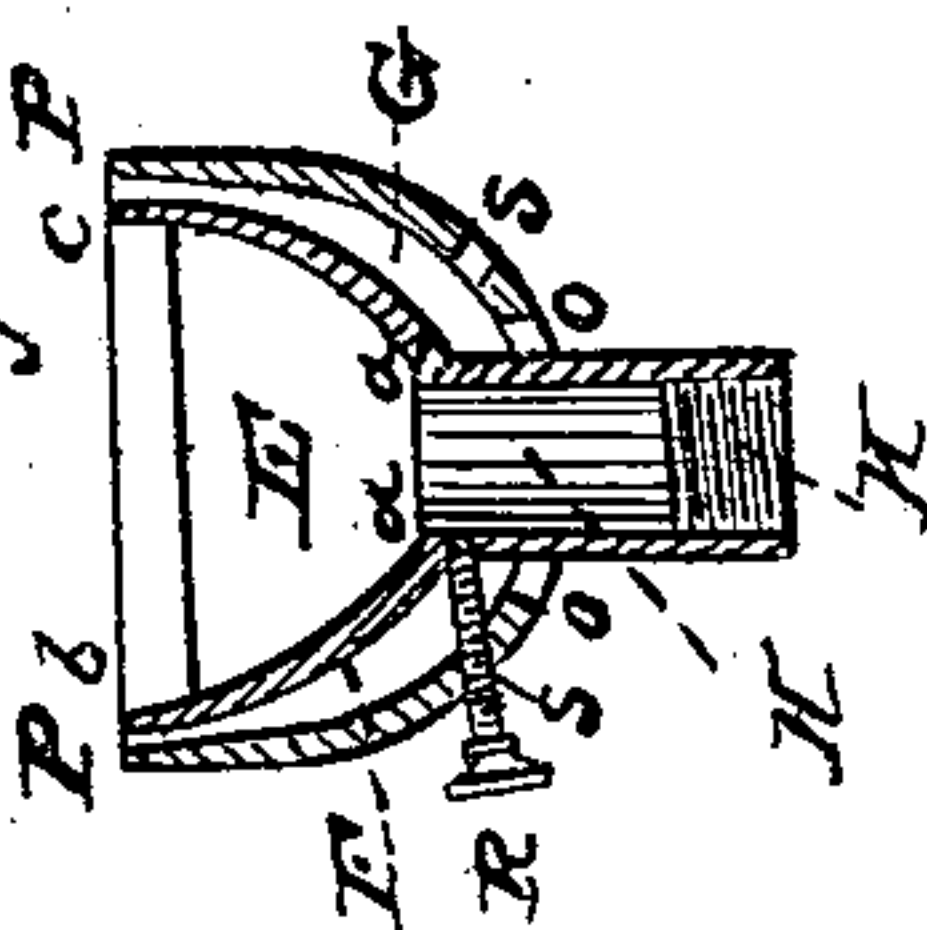


Fig. 3.

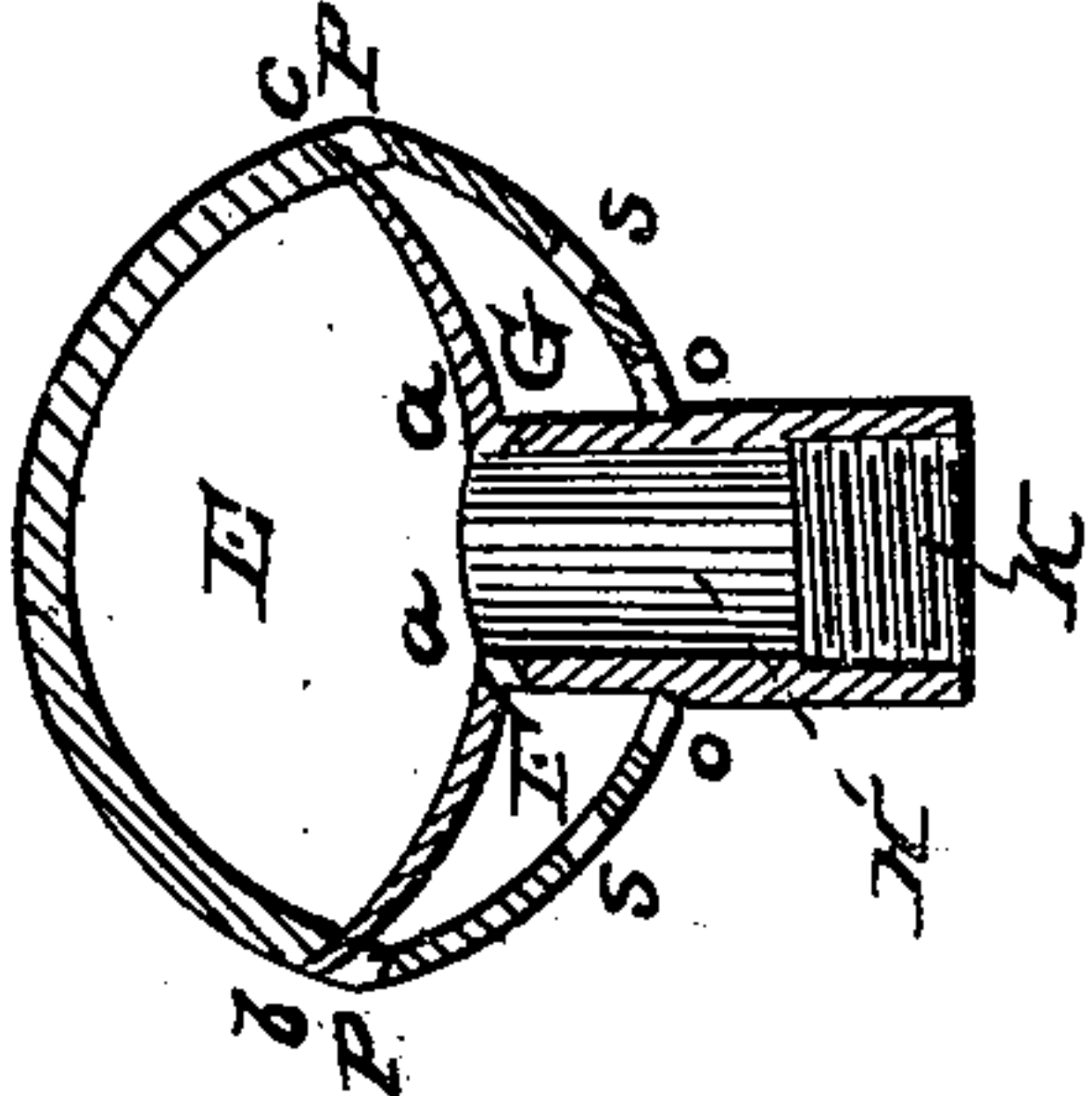
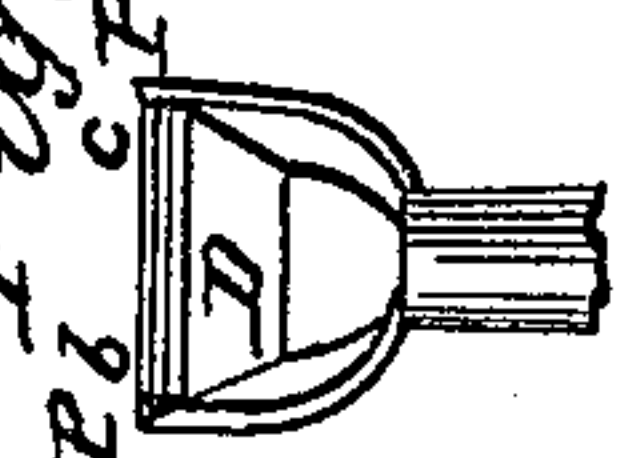


Fig. 6.





# UNITED STATES PATENT OFFICE.

RUFUS W. SARGENT, OF PHILADELPHIA, PENNSYLVANIA.

## BURNER FOR SPIRIT-GAS LAMPS.

Specification of Letters Patent No. 9,334, dated October 12, 1852.

*To all whom it may concern:*

Be it known that I, RUFUS W. SARGENT, of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Burner for Spirit-Gas or Any Highly Volatile Fluid; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view of a lamp with the burner attached, Fig. 2, an elevation of the burner and burner-tube, Fig. 3, a longitudinal section of the burner, Fig. 4, a longitudinal section of the burner upon the burner-tube, Fig. 5 is a longitudinal section of a burner of a different shape, and Fig. 6, an elevation of the last named burner.

The reservoir for the fluid (A, Fig. 1) is of any convenient shape and material. The burner-tube (B, Figs. 1, 2, and 4,) is of brass or other metal—cylindrical in form—about half an inch in diameter, and descends into the reservoir through a collar or cap (C, Fig. 1) of the usual form and construction. It extends from one to three inches, at least below the cap, and rises above it from one to three inches. A wick of the ordinary cotton wicking rises above the top of the burner-tube, as at M (Fig. 4) and passes down through it of sufficient length to lie loosely on the bottom of the reservoir.

The parts as described thus far are in ordinary use in the common fluid lamps.

At *a* (Figs. 1, 2, and 4) a shoulder is formed upon the burner-tube; that part of the tube above the shoulder being smaller externally than the part below. The burner is made of brass or other suitable metal and externally presents an appearance as represented at D (Figs. 1, 2 and 6). Internally the burner has an upper chamber (E, Figs. 3, 4 and 5) and a lower chamber divided into two parts (F and G, Figs. 3, 4 and 5).

A socket-tube (H, Figs. 3, 4 and 5) about an inch in length, and forming part of the burner runs up through the lower chamber (dividing it into the two parts above mentioned) and ends upon a level with the bottom of the upper chamber. The upper chamber may be from half an inch to an inch high and broad in proportion according to the size of the lamp. The upper part of the burner tapers off slightly toward the top as shown at I, (Fig. 2). Along this up-

per edge from *b*, to *c* (Figs. 3, 4, 5 and 6) runs a very fine slit communicating with the upper chamber only and through which the gas for illumination escapes and where it is lighted. This slit may be seen in Figs. 1, 2 and 6. The socket-tube fits over the burner tube and is secured by the female screw (K, Figs. 3 and 5) fitting the male screw (L, Fig. 4) it extends down about to the shoulder at *a* and the top of the burner tube is then nearly on a level with the top of the lower chamber the wick rising a short distance into the upper chamber as seen at M (Fig. 4). The two parts of the lower chamber are precisely similar. Each slopes upward in its general form from the socket-tube as represented in the drawings (Figs. 3, 4 and 5). Each is about from one eighth to one quarter of an inch in height, varying directly as the height of the upper chamber. Each has two apertures communicating with the external air—one at the bottom where it joins the socket-tube (O, O, Figs. 3, 4 and 5) the other at its upper and outer side (P, P, Figs. 1, 2, 3, 4, 5 and 6.) The object of these apertures is to admit air into the lower chamber to support the combustion of the fluid or gas therein the air entering at the apertures O, O, and finding exit at the apertures P, P, which are smaller than O, O. Two small apertures (*d*, *d*, Figs. 3, 4 and 5) are made in the socket-tube one on each side which lead into the respective parts of the lower chamber. These apertures may be entirely closed or regulated by screws (R, R, Figs. 1, 2, 4 and 5) which pass through the lower chamber at the openings S, S, (Figs. 3, 4 and 5) fitting these openings closely by means of female screws. The top of the burner-tube should never come above the apertures *d*, *d*, so as entirely to close them.

I do not mean to limit myself to the precise shape or shapes of the burner above described as the shape is not material; nor to the sizes above mentioned viz: those with an upper chamber from half an inch to an inch high as for larger lamps the height of the upper chamber may be two inches or more and its breadth and the other parts of the lamp must in this case be proportionately enlarged. The gas for illumination may issue from a slit as above mentioned which will make an even flat flame or from small holes in the burner making jets of flame arranged in any form that may be desired. Instead of screws pins slides or any equiva-



lent method may be used to close or regulate the apertures *d, d*.

The reservoir being filled with ordinary burning fluid, spirit-gas or other highly volatile fluid of a similar nature through the cap C, which is fitted with a screw upon the burner-tube as shown at W (Figs. 2 and 4) external heat is applied to the burner or to the burner tube a short distance below the burner. This may be done in any of the ways now in use—by means of a spirit lamp—by applying a small sponge filled with alcohol and igniting it or by lighting a small quantity of alcohol in a dish or cup fitted around the burner-tube as used in Lüdersdorff's lamp &c. The fluid rising in the wick by capillary attraction is driven by the heat through the apertures *d, d*, into each part of the lower chamber where it is immediately ignited and fills the lower chamber with flame. At the same time the fluid runs from the wick into the upper chamber on each side is rapidly converted into gas by the heat generated in the lower chamber and escapes through the slit in the top where it is lighted and furnishes the illuminating flame. In a few moments the flame which fills the lower chamber suffices of itself to render the burner so hot that the fluid flows readily and continuously and the external heat being withdrawn the lamp continues to burn with a steady, clear and beautiful flame.

The intensity of the flame is regulated by the screws R R which control the supply of fluid through the apertures *d d* to the lower chamber and as this supply is greater or less the heat is increased or diminished the fluid flows more or less rapidly a greater or less amount of gas is evolved in the upper chamber and a larger or smaller flame is

produced. In the smaller-sized burners the flow of the fluid through the apertures *d d* may be regulated without the use of the screws R R by slightly elevating or depressing the burner upon the burner-tube so as to partially close the apertures with the burner-tube. This plan does not operate so well in the larger burners owing to the difficulty of regulating each aperture equally. The flow of the fluid into the lower chamber must never be so great as that the flame will issue from the openings O O though a small blue flame will be visible at them. The draft of air will of course cause the flame to issue more or less from the openings P P. The flow of the fluid may be regulated also by elevating and depressing the burner upon the burner-tube thus producing the same effect as regards the relative position of the wick in the burner as if the wick itself were raised and lowered.

I do not claim the reservoir burner-tube or arrangement of the wick.

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

The combination of the lower chamber or chambers F and G with the upper chamber E for the purpose specified viz: the lower chamber or chambers answering the purpose of a heater to volatilize or turn into gas the fluid in the chamber E the flame being regulated as above described and the whole arrangement being substantially as above set forth without restricting myself by this claim to the precise form of the burner described.

RUFUS W. SARGENT.

Witnesses:

SAML. C. PERKINS,  
CHARLES D. FREEMAN.