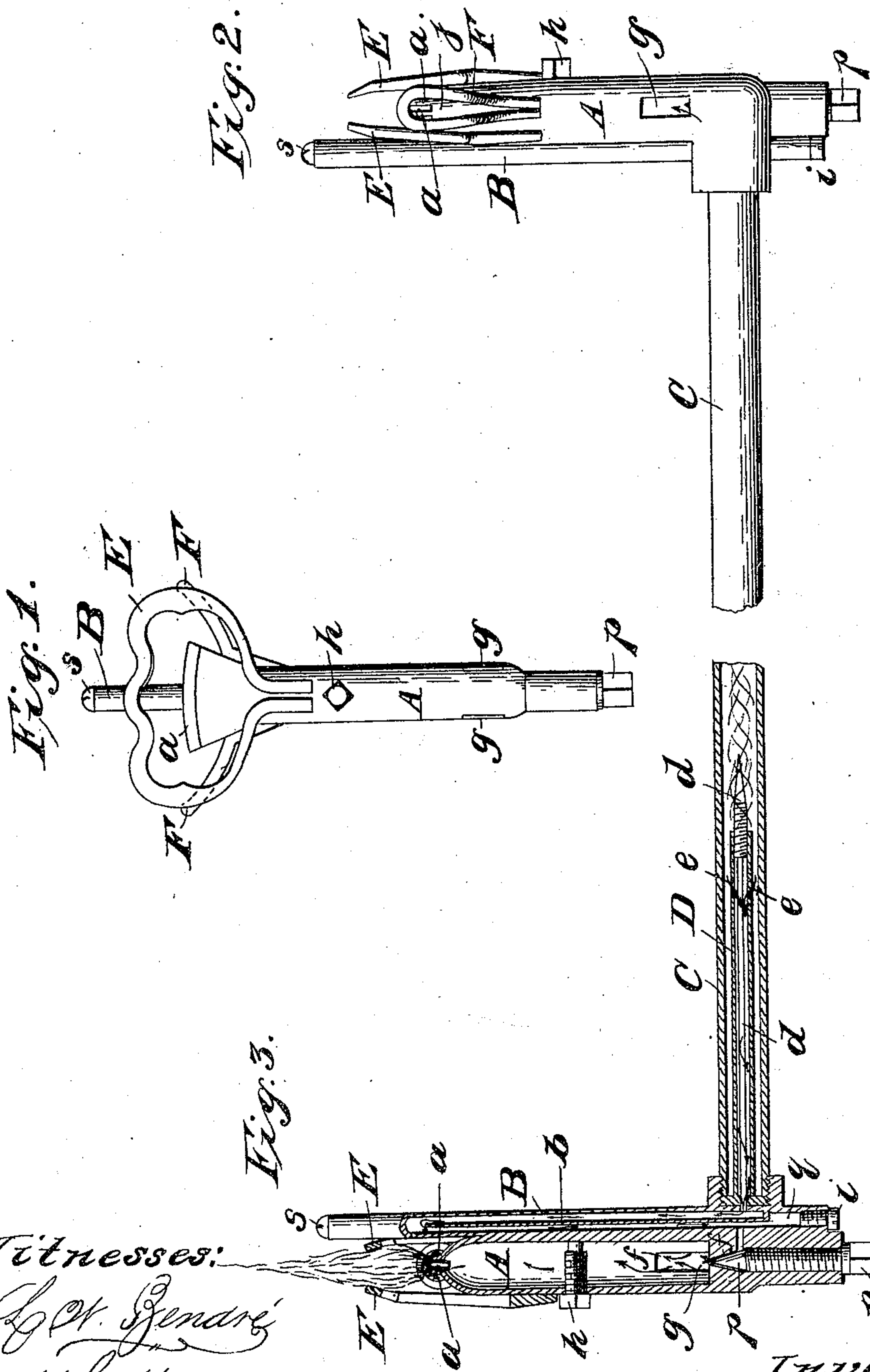


M. L. CALLENDER.
VAPOR BURNER.

No. 36,452.

Patented Sept. 16, 1862.



Witnesses:
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MILLS L. CALLENDER, OF NEW YORK, N. Y.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. 36,452, dated September 16, 1862.

To all whom it may concern:

Be it known that I, MILLS L. CALLENDER, of the city, county, and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Vapor Burners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are side views at right angles to each other of a burner with my improvements. Fig. 3 is a central vertical section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

My invention relates more particularly to burners for the vaporization and combustion of the vapors of the heavier volatile hydrocarbon liquids, such as naphtha or camphene; and its object is to provide more effectually than is done in the burners heretofore used for the vaporization of the liquid by heat, for the heating of the vapors before their arrival at the mouth of the burner, and for the more perfect combustion of the vapor; also, for the regulation of the supply of vapor to the burner and for the stoppage of the supply of vapor to the burner when the light is extinguished, and for the cleaning of the pipes or chambers.

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

A represents the body of the burner, having a mouth of the form common to vapor-burners—that is to say, made with two flat and parallel lips, *a a*.

B is the vapor-heating pipe, arranged in an upright position close by the side of the body A in such manner as to be connected with the body from the bottom thereof nearly to the mouth thereof, extending upward above the mouth *a a*, and containing an upright partition, *b*, extending from the bottom to about on a level with the mouth *a a*. This pipe B communicates with the body A by an aperture, *f*, which enters the conical seat provided in the bottom of the said body A for a regulating-screw, *p*.

C is the supply-pipe, attached to the lower part of the heating-pipe B and extending therefrom in a horizontal position for some distance toward the reservoir. This supply-pipe is to

be filled or partly filled with wick, as shown in red color in Fig. 3. The said pipe C has no direct communication with the heating-pipe B, but is closed at its connection with that pipe and communicates with it only through a straight inner pipe, D, which constitutes part of the self-acting regulator. The said pipe D communicates with the heating-pipe by a small aperture, *c*, whose edges constitute a seat for a conical valve which is formed upon the inner end of a rod, *d*, which is screwed into the outer end of the brass or copper pipe D, and which projects in a pointed form some distance from the outer end of the pipe D. This projected pointed end of the rod *d* and a portion of the pipe D extends into the wick that is placed in the supply-pipe C. The pipe D communicates with the supply-pipe by means of one or more small apertures, *e e*, in the side or sides of the former. The rod *d*, which is made of iron or steel, is screwed so far into the pipe D, which is of copper or brass, that when both are at ordinary atmospheric temperature the valve at the end of the said rod closes the aperture *c*; but when the burner is heated the brass or copper, expanding more than the iron, causes the valve to open.

E E are open wings attached to the body A of the burner and arranged one on each of the two opposite sides of the mouth parallel, or nearly so, with the lips thereof. These wings differ from those of other vapor-burners in having their inner and outer edges corrugated, as shown in Fig. 1, instead of being regularly curved, and they have their upper edges inclined toward each other, as shown in Fig. 3, so that the upper edges of those parts of the faces of the wings E E which are presented to the flame will be ribbed, so as to facilitate the ingress of air to the flame, whereby the heat of the flame is increased without diminishing the light. The inner faces of the wings as ordinarily constructed are smooth, and the effect of presenting these smooth faces to the flame is to break the flame, diminish the light, and cause soot to be deposited upon the said faces, the flame being made to smoke for want of proper combustion; but by having the upper inner edges of the wings ribbed, as described, the above objections are overcome. The interstices between the ribs serve to admit air to the flame, thus increasing the combustion and consuming all soot.

F F are wings attached to the body of the burner and arranged opposite the ends of the mouth. These wings differ from those employed at the ends of the mouth of other vapor-burners in having openings J, as shown in Fig. 2, instead of being closed.

g g are openings in the bottom of the body A for the admission of air to mingle with the vapor.

h is a screw to contract or enlarge the passage in the body of the burner.

i is a screw in the bottom of the heating-pipe B, to be removed for the purpose of letting out tar or other impure matter from the lower part of the said pipe, which extends below the aperture c and pipe C, as shown at q in Fig. 3, forming a receptacle for such matters. At the top of the said pipe there is a screw-plug, s, for the insertion of a suitable contrivance for cleaning out the said pipe.

This burner to be set in operation requires, like other vapor-burners, to be first heated by flame applied to its exterior. When the vapor issues properly from the mouth a a and is ignited, the whole body A continues heated sufficiently. The whole of the pipe B is also heated partly by the exposure of its upper part to the flame and partly by the heat it absorbs from the body A by its continuous metallic connection therewith. Heat is also conducted by the pipe C and by the regulator D d to the wick, which is kept supplied with liquid from the lamp or reservoir, and the liquid being thus vaporized passes into the pipe D by the apertures e e and along the said pipe to the aperture c, by which it escapes into the heating-pipe B, passing first up the outer side of the partition b, then over the top thereof, and down the opposite side to the aperture f, by

which it is admitted to the body A, in which it mingles with the air admitted by the openings g g, and up which it passes to the mouth a a, where the mixture of vapor and air ignite and produce a brilliant flame. The corrugated forms of the wings E E and the inclination of the upper points of the corrugations toward each other cause numerous streams of air to be directed between the corrugations of said wings and the flame, and also cause a more perfect combustion, thereby preventing the deposit of carbon upon the wings, which often occurs in the use of burners with wings of the usual form. The openings in the end wings, F F, also provide for a more copious supply of air to the flame than when the said wings are of uniform surface and solid. When the light is extinguished, the cooling of the burner soon causes the contraction of the pipe D relatively to the rod d to such an extent as to make the valve at the end of the said rod close the aperture c.

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

1. Constructing the side wings, F, with open centers for the admission of air, as herein shown and described.

2. The combination, with the pipe D, of the self-acting valve-rod d, as herein shown and described.

3. The construction of the wings E E, with the upper edges of their inner faces bent or ribbed, so as to form spaces or interstices for the admission of air to the flame, substantially as herein shown and described.

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Witnesses:

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