S. F. HAWLEY.
Burner for Lamps.

No. 214,774. Patented April 29, 1879.

Fig 1.

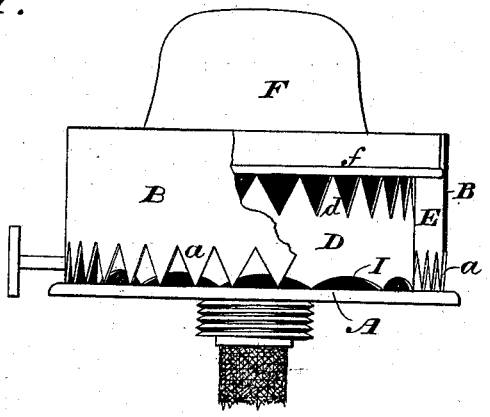


Fig 2.

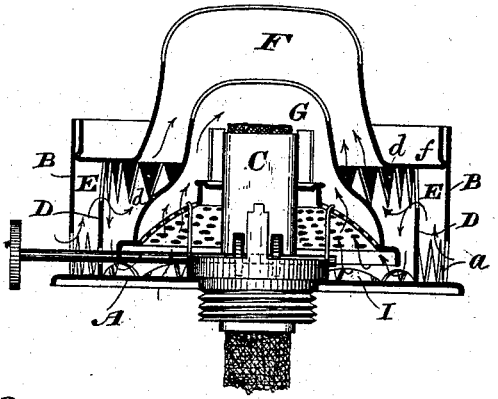
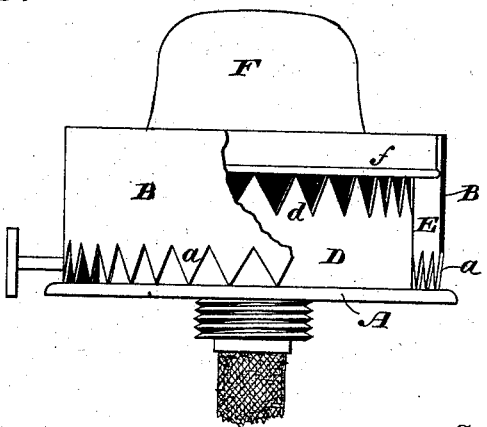


Fig 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL F. HAWLEY, OF WHEELING, WEST VIRGINIA, ASSIGNOR TO W. K. ELSON, WM. H. ROBINSON, AND THOMAS WALTON, OF SAME PLACE, ONE-FOURTH TO EACH.

IMPROVEMENT IN BURNERS FOR LAMPS.

Specification forming part of Letters Patent No. **214,774**, dated April 29, 1879; application filed March 7, 1879.

To all whom it may concern:

Be it known that I, SAMUEL F. HAWLEY, of Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Burners for Lamps, &c., of which the following is a specification.

My invention relates to improvements in burners of the class in which provision is made for a regular supply of air to the flame in such a manner as to promote combustion and insure a steady flame.

I employ the usual two-part or double cone around the burner, the inner cone or section of the double cone being perforated at the base, to admit air to pass up to the burner-tip or base of the flame at the same time that air is supplied to the flame above between the two cones or sections of the double cone.

My improvements consist in a novel organization of parts, whereby the incoming air is caused first to ascend, and then is divided and deflected or directed in part to the burner-tip or base of the flame by way of the inner cone, and in part is directed between the sections or two parts of the double cone to the flame above the burner-tip, as will hereinafter first more fully be set forth, and then specifically designated by the claims.

My improvements also consist in a peculiar combination of devices, whereby the incoming air is in part directed directly to the cone-base, and in part caused to first pass upward and then divide into two currents, one continuing upward between the cone-sections, and the other passing downward, as will hereinafter be described, and then specifically designated in the claims.

In the accompanying drawings, Figure 1 is a view, in elevation, of a burner embodying my improvements, with a portion of the outer wall or shell broken away; Fig. 2, a vertical central section of the same, with some parts in elevation; and Fig. 3, a view similar to Fig. 1, showing a somewhat different burner from that represented in the preceding figures, the air-inlets in the lower part of the partition or air-deflecting ring being omitted.

The base or disk A rests upon or may form the cover of any suitable oil-reservoir or lamp-body, and near the edge or periphery of this base is provided the vertical outer shell, wall, or ring, B. This ring forms the wall or outside of the combustion-chamber, or chamber into which the air enters from without, and by which it is then directed to the burner-tip or burner proper, C, and also to the flame above its base. The air enters the chamber by openings or notches in the lower cap of the shell or ring B.

A partition or inner ring, D, concentric with the ring or outer shell, B, extends from the base A upward for, say, two-thirds (more or less) the height of the shell B.

The space E between the partition and shell forms the air-receiving chamber, by way of which the air, when first admitted to the shell by its air-inlets *a*, passes upward to the top of the partition.

The vertical partition or inner ring, D, is continuous around the base at a short distance from the shell or wall B, and has at its top a series of notches, *d;* or it may be perforated near its top. In this instance both the partition and the shell are formed of sheet metal, and are, respectively, provided with saw-like teeth, the spaces between which constitute the inlets *a* and the notches *d*. Both the inner ring or partition and the outer ring or shell are soldered in place upon the base or disk A.

The outer cone or section, F, of the double cone is provided with the lateral flange or annular horizontal rim *f*, which rests upon the top of the teeth *d* of the partition.

The teeth, it should be observed, are above the level or horizontal plane of the base of the inner cone, G. The base of this inner cone is perforated, and there is an annular space between this inner section of the cone and the partition or air-deflecting ring D.

The burner-tip or burner proper, C, and flame openings or slits of the cones are of the usual and well-known construction, and the cone-sections are concentric, the inner and outer cones being arranged at the proper distance apart to admit air between them.

In operation, cold air passes into the air-

receiving chamber E of the combustion-chamber by the inlets *a* at the base of the shell or wall of the combustion-chamber, thence upward outside of the partition D to its top or notches *d*, at and below the base of the outer cone or section, F, of the double cone. When the air reaches the top of the partition it comes in contact with the heated air or heat from the flame and inner cone or section, G, of the two-part cone, and the current is divided, part of the air continuing upward, and part being deflected and drawn downward to the base of the cone G, through which it ascends to the flame-base. In this way a regular steady supply of air is insured, flickering of the flame is prevented, and thorough combustion takes place of the oil and gases.

To prevent the inner cone or section, G, of the two-part cone from being heated to too great a degree, and to increase the efficiency of the burner, openings or notches I are made in the lower edge or base of the partition or air-deflecting ring D, through which cold air passes directly to the base of the cone-section G. The relative sizes of the openings I and *a* are such as to prevent so large a proportion of the external air passing to the base directly as to interfere with the proper supply of air to the chamber E, and thence upward to the top of the partition, where it is divided, and in part deflected in its course, as already fully explained.

The relative areas of the air-receiving chamber E, the air-inlets *a*, and bottom openings, I, and top openings, *d*, of the partition should be such, or thereabout, as to admit a much greater quantity of air to the notches or top openings, *d*, of the partition than to the inside of this partition by the bottom openings, I. In this way a too violent draft or forcible current of air to the flame is prevented. The interruption to the movement of the currents of air caused by the deflection downward of a portion of the air at the top of the partition, and by the commingling of this downward current and the direct ingoing current entering by the openings I, sufficiently checks or retards the currents to guard against violent and injurious drafts, such as would cause a flickering or unsteady flame. At the same time an abundance of air to insure complete combustion passes to the flame at and above the burner or flame-base.

I am well aware that numerous ways have heretofore been devised for supplying burners with air directed both to the base of the flame and above or to the body of the flame between the burner-cones, and I do not broadly claim devices for this purpose; nor do I broadly claim admitting air to the flame at different points by devices which allow it to enter the outer wall or shell of a combustion-chamber, and then cause a separation of the current, so as to cause a portion of the air to pass upward between the cones and the rest to enter the base of the inner cone. My peculiar improvements, however, differ from all others of which I have knowledge in essential respects, now to be pointed out; and

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the base or disk, the outer ring or shell, provided with the low-down air-inlets, the partition or inner ring, having the air-openings or notches at its top, and the two cones or inner and outer cone-sections, between which air admitted over the partition passes to the flame above its base, while a portion of the air is deflected downward to the perforated base of the inner cone, and is admitted to the flame-base, as described.

2. The combination of the outer ring or shell of the combustion-chamber, having the air-inlets at its lower edge, the partition or inner ring, having the air-inlets or notches at its top, and forming, with the outer ring, the air-receiving chamber, the outer cone or cone-section resting on the top of the partition, and the inner cone or cone-section having a perforated base below the air-inlets of the partition, these members being and operating substantially as hereinbefore set forth.

3. The combination, substantially as hereinbefore set forth, of the outer ring or shell of the combustion-chamber, perforated at its lower edge above the base or disk, the partition having the top and bottom air-inlets, and the two-part cone, to the base of the inner section of which air passes both over the partition and by way of the inlets at its bottom at the same time that air passes to the flame between the cone-sections.

4. The partition in the combustion-chamber having the top and bottom air-inlets, to both of which the air is admitted by way of the air-inlets in the outer ring or shell of the combustion-chamber, substantially as and for the purpose hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name.

SAMUEL F. HAWLEY.

Witnesses:

E. B. HOWARD,

W. D. CUSHING.