W. W. EASTMAN.
Lamp-Burner.

No. 208,801. Patented Oct. 8, 1878.

Fig - 1.

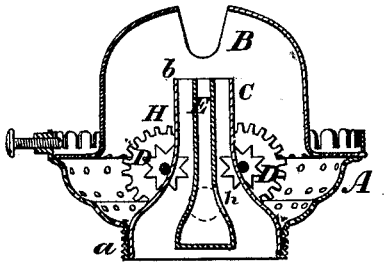


Fig - 2.

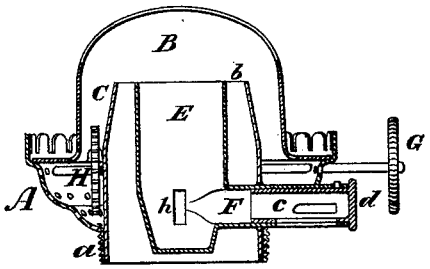


Fig - 3.

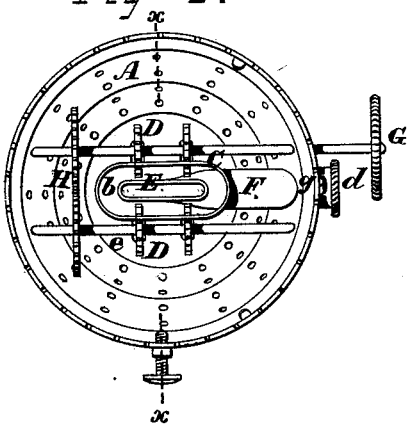
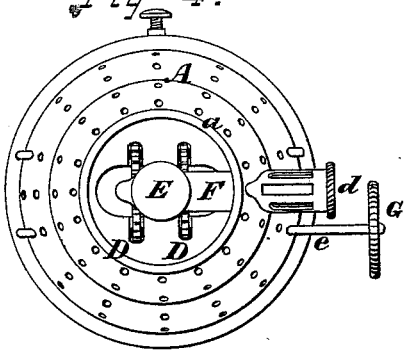


Fig - 4.



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UNITED STATES PATENT OFFICE.

WILLIAM W. EASTMAN, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY D. DUMONT, OF SAME PLACE.

IMPROVEMENT IN LAMP-BURNERS.

Specification forming part of Letters Patent No. **208,801**, dated October 8, 1878; application filed April 11, 1878.

To all whom it may concern:

Be it known that I, WILLIAM W. EASTMAN, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Burners for Lamps, of which the following is a specification:

This invention relates to a lamp-burner adapted to burn any of the petroleum products, from the ordinary light kerosene to the heavy hydrocarbon oils of 300° fire-test.

It is well known that in the ordinary kerosene-lamp the heavy oils cannot be burned successfully, partly from the fact that the oxygen supplied to the flame is not sufficient in quantity to produce perfect combustion, and partly from the fact that the wick-tubes in such lamps are not adapted to raise the heavy oils to the flame. Burners have been constructed which will burn the heavy oils; but to accomplish this result it has been found necessary to construct the burner so that the oil in the wick shall be heated by its metallic surroundings to a point somewhat below the vaporizing-point before it reaches the top of the wick-tube. This construction renders the burner useless for kerosene and the lighter oils, as the heat imparted would be apt to cause an explosion of the vapors produced.

My invention consists, partly, in a wick-tube conforming to the burner-shell at its base, flattened at the upper end, and provided with a centrally-arranged air-tube, so as to form an annular space to receive a single flat wick arranged to embrace and surround the air-tube.

It also consists in connecting the central air-tube with an air-inlet tube extending through the burner-shell, whereby cool air is admitted to the center of the wick just below the flame in sufficient amount to produce perfect combustion.

It also consists in providing the air-inlet tube with a register to regulate the admission of air from the outside of the burner-shell, and in various other features of construction and combinations, all of which will be more fully hereinafter set forth.

In the drawings, Figure 1 is a vertical mid-section of my improved burner, taken in the plane of the line *x x*, Fig. 3. Fig. 2 is also a vertical mid-section of the burner, taken in a plane at right angles to Fig. 1. Fig. 3 is a plan of the burner with the cone or deflector removed, and Fig. 4 is a bottom view of the burner.

Like letters of reference designate like parts in all of the figures.

A is the shell or cup of the burner, screw-threaded at *a* to fit the female screw in the lamp, and flanged at the margin or upper edge to retain the chimney and support the deflector B. The latter is readily removable, and when taken off exposes the whole interior of the burner, as in Fig. 3, permitting it to be cleaned. The wall of the burner-shell is perforated in the usual way to admit air inside of the deflector, and the horizontal flange of the deflector is also perforated to permit the escape of some of the air into the chimney outside of the cone.

C is a wick-tube, cylindrical, or nearly so, at the bottom, where it is attached to the burner-shell, and flattened at the top *b*, so as to form an oblong opening, as seen in Fig. 3. It will be seen that the tube is gradually contracted or flattened, and reaches its narrowest limit above the feed-wheels D D, near the top, (see Fig. 1,) while the contraction in the other direction, (see Fig. 2,) produced by coning the upper part of the tube C, is greatest at the very top. This construction avoids all pressure on the oil-charged wick below the burning-point, and allows full play to the capillary force.

A burner-tube having a flattened annular apex or tip may be advantageously employed in what are known as "gas or vapor burners," as well as in those adapted for burning oils.

E is an air-tube, arranged concentrically in the wick-tube and flattened correspondingly, so that an annular space for the wick may be formed between them. This tube is connected at the bottom with an air-inlet tube, F, opening outside of the burner-shell. The tube F supports the tube E, and supplies the wick with a central current of oxygen. The supply of air to the interior of the wick is regulated by means of a suitable register. The one shown in the drawings is constructed as follows: That portion of the tube F which projects beyond the burner-shell has one or more slots or

ports cut in it, and an inner tube, *c*, which fits the other snugly, has also one or more slots or ports, and these may be brought to coincide with those in the outer tube by turning the former therein, which may be done by means of the milled cap *d*, or some other equivalent device. It is evident that the tube *c* may be on the outside of the tube F without materially affecting the operation of the device. By means of this regulator or register the operator is enabled to cut off entirely the supply of air to the interior of the wick, or to admit any required amount consistent with the capacity of the air-tube E. The rotative movement of the tube *c* may be limited by a projection on its surface playing in a slot in the tube F, as shown at *g* in Fig. 3.

The gases arising from the lamp are led off through an aperture, *h*, (see Fig. 2,) in the air-tube E, and are consumed in the flame. This arrangement prevents the accumulation of the gases.

G is the milled head, by which the feed-wheels D D are rotated, the shafts *e e* on which they are mounted being geared together at H. This burner requires a flat wick wide enough to fill the annular wick-space at *b*. The wick is doubled or folded in the direction of its width and inserted from below, the adjacent edges of the same passing on each side of the tube F, and meeting above it. It is pushed up until it engages the feed-wheels, when they will take hold of it on opposite sides and draw it up.

If it is desired to reduce the light (and consequent consumption of oil) at any time, the wick need not be turned down, as a reduction at the register of the supply of air will accomplish the desired result to perfection.

By the construction and arrangement of the wick and air tubes here shown, I combine all the advantages of the Argand burner with those having flat wicks; besides, I am enabled to arrange my wick-feed to better advantage than it can be arranged in the cylindrical-tube burner.

It will be observed also, by inspection of Figs. 1 and 2, that the wick has a little more space and freedom at the circular ends of the wick-space than at the flattened sides. This enables the feed-wheels to bring up the wick evenly all around.

I claim—

1. In a burner for lamps, a burner-tube, C, conforming and attached to the burner-shell at its base, and drawn in laterally to a point just above the feed-wheels D D, and drawn in slightly in the other direction at the part of the tube above the feed, in combination with an inner air-tube, E, flattened laterally, and having parallel sides from the feed to the top, and enlarged gradually below, substantially as set forth.

2. In a burner for lamps, a burner-tube conforming to the burner-shell at its base, and joined thereto, and flattened at the top, in combination with a concentric internal air-tube and a side air-inlet tube opening outside of the burner-shell, the latter connected together and arranged to operate substantially as set forth.

3. In a burner for lamps, an annular burner-tube, having an inner air-tube arranged to receive air through an adjustable register projecting through the burner-shell, and arranged to be operated from the outside, substantially as set forth.

4. The air-inlet tube F, provided with a register, whereby the amount of air required may be admitted and the admission regulated at will from outside of the burner-shell, substantially as set forth.

5. The air-tube E and air-inlet tube F, the latter provided with one or more slots or ports, in combination with the tube *c*, also provided with one or more ports, to rotate in or on the tube F, and the milled head or cap *d*, or its equivalent, the whole so constructed and arranged as to be capable of regulating the admission of air into the tube E, substantially as and for the purposes specified.

6. The combination, in a burner for lamps, of an annular burner-tube, C, an inner air-tube, E, slotted inlet-tube F, and slotted tube *c*, to rotate in or on the tube F, all constructed and arranged to operate substantially as set forth.

7. In a burner, the combination of the flattened burner-tube C with the inner air-tube E, provided with a gas-aperture, *h*, opening into the enlarged part of the tube C below the feed-wheels D D, where it is not liable to be closed by the wick, substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM W. EASTMAN.

Witnesses:
SAM. TRO. SMITH,
HENRY CONNETT.