C. F. BURNAP & T. COPE.

Lamp.

No. 216,652. Patented June 17, 1879.

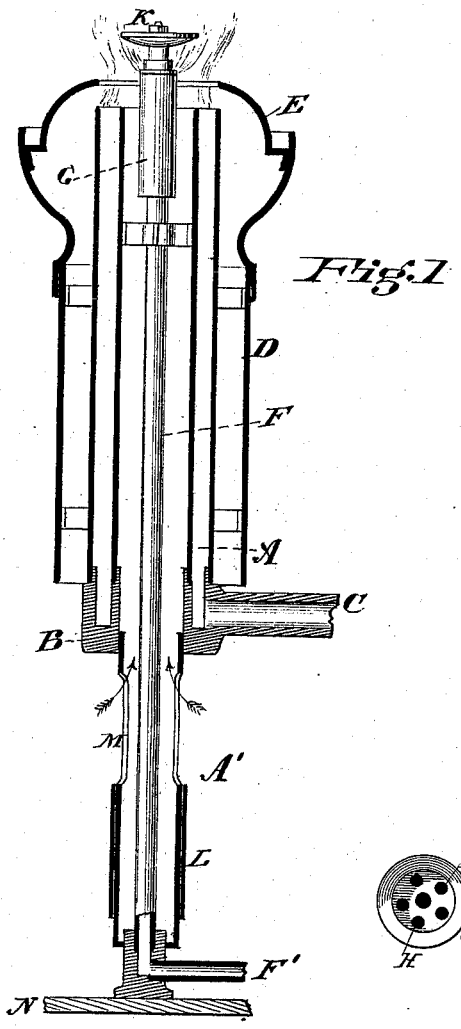

Fig. 1

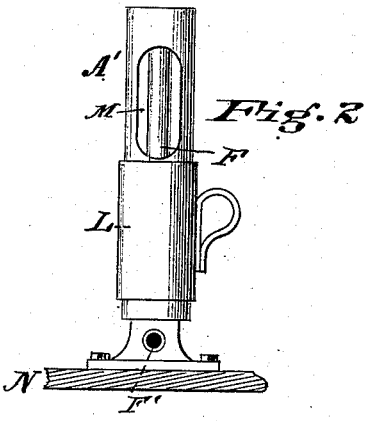

Fig. 2

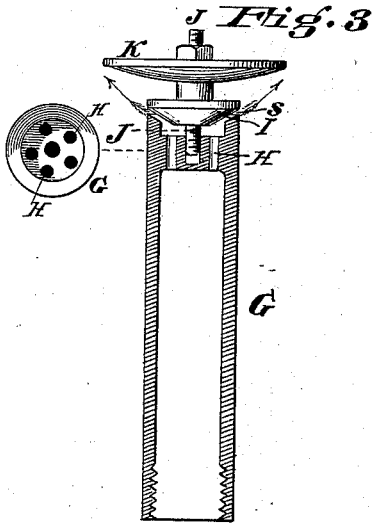

Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES F. BURNAP, OF CINCINNATI, OHIO, AND THOMAS COPE, OF COVINGTON, KENTUCKY.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. **216,652**, dated June 17, 1879; application filed January 31, 1879.

To all whom it may concern:

Be it known that we, CHARLES F. BURNAP, of Cincinnati, Hamilton county, Ohio, and THOMAS COPE, of Covington, Kenton county, Kentucky, have jointly invented a new and useful Improvement in Oil-Burning Lamps, of which the following is a specification, reference being had to the drawings annexed to and forming part thereof.

Our invention, though not confined to lamps of any particular description, is more especially applicable to locomotive head lights, light-house lamps, and others where a light of great intensity and power is desirable; and its object is to increase the intensity and power of the light without interfering permanently with or adding materially to the cost of the ordinary use of the lamp.

To this end our invention consists in the application of a jet of oxygen gas, or its equivalent promoter of combustion, at a point above the wick, as a means of increasing the intensity and power of the flame, and in the means and devices by which said jet is applied.

In the drawings herewith, Figure 1 is a sectional elevation of the burner and its immediate connections of an ordinary locomotive head-light, showing our improvement. Fig. 2 is an elevation of the lower end of the central air-tube, showing the adjustable gate; and Fig. 3 is a sectional elevation of upper section or cap-piece of the gas-feeding tube with its immediate attachments, with a plan of the recessed head.

We have selected for illustration of our invention the burner and attachments of an ordinary locomotive head-light, which consists, essentially, of concentric tubes carrying the wick between, and having an air-space formed by the inner tube, through which air is fed to the inner wall of the flame, and an outer casing, which conducts air to a deflector or cone, by which it is directed against the flame from without.

In the drawings, A denotes the annular wick-tube, rising from a base-piece or annular trough, B, to which oil is fed by a feed-pipe, C, leading laterally to the reservoir. D is the outer casing, terminating above in a cone-reflector, E. In the ordinary constructions of this class the inner air-tube is extended downward below the wick-tube, and is usually provided with a perforated screen or other means of equalizing the flow of air in respect to the vibratory movements of the structure on which the lamp is used. The extension of this tube is shown at A′; but instead of a screen or other devices of that nature, we use a plain tube having a lateral opening, M, governed by a sliding gate, L, for regulating the admission of air.

The main feature of the apparatus by which in the present instance our invention is carried out is the central tube, F, terminating above in the extension or head-piece G. (Shown in enlarged section in Fig. 3.) Near the top of the extension G is a recessed head, H, perforated as shown in the plan view accompanying the figure, and sustaining a conical cap, I, between which and the beveled edges of the tube G is left a narrow slit or opening, S, as shown. The cap-piece is mounted upon a screw-threaded standard, J, by which it is sustained from the head H and the size of the lateral aperture regulated. Above the cap I the standard carries also a button, K, which is a disk of lime, talc, or other refractory material, preferably convex on the under side.

The tube F extends downward through the bottom of the extension A′, which is otherwise closed, and is secured upon a base-piece—as, for example, the bottom of the drip-cup N, with a lateral branch, F′, communicating with a gas-reservoir.

The tube F should be so adjusted as to length that the slit or opening S, formed between the upper beveled edges of the head-piece G and the conical cap I, may stand a little above the edge of the deflecting-cone E. The angle of said opening S will, of course, determine the direction of the jet of gas, and experiment has shown that the best results are attained when the jet is discharged about in line with the edge of the button K.

In operation, a jet of oxygen gas is delivered from a receiver under a slight pressure to and through the pipes F′ F G, and is delivered against the flame just above the inward deflection caused by the cone E, causing intense

combustion of the minute particles of carbon passing upward with the body of flame. Ordinarily the effect desired may be produced by allowing the air to enter the inner air-tube through the opening M beneath by adjusting the slide L for that purpose, in which case a very small quantity of oxygen only is necessary; but when the most intense effects are desired, the gate L may be closed and an increased supply of oxygen used. Should the supply of oxygen fail from any cause, the aperture M is opened, and the lamp continues to burn in the ordinary manner, being supplied with air through the inner tube, as in ordinary cases.

It will be apparent that any gas possessing the property of aiding the combustion of carbon may be used instead of oxygen—as, for example, hydrogen, carbureted hydrogen, and carbonic oxide; but the best results are attained with pure oxygen.

We are aware that a jet of oxygen gas has been used in connection with an Argand burner; but in such cases as in the "Bude light" the gas is introduced into the interior air-tube below the combustion end of the wick. This mode of using oxygen is objectionable, for the reason that, even when largely diluted with air, the combustion at the wick is rendered so intense as to char the wick and destroy its capillarity, and heat the wick-tube to a degree interfering with its proper action, unless great precautions are used. Continuous action is therefore impossible, except in special constructions unfitted for portable lamps.

Having fully described our invention, we claim—

1. An annular jet of oxygen introduced independently of the air-supply, as a means of intensifying the flame of a lamp, and projected in the manner set forth laterally against the flame at a point above the wick, all substantially as specified.

2. In combination with an Argand burner and an independent oxygen-reservoir, a gas-supply tube extending from the reservoir into and through the central opening of the burner, and provided with means, as shown and set forth, for discharging against the flame at a point above the wick, substantially as described.

3. In combination, in an Argand burner, a cone, E, exterior to the flame, and means for conducting and projecting a jet of oxygen gas against the flame from within at a point above the cone, substantially as and for the purpose specified.

4. In combination with a gas-supply tube, G, located within the central opening of an Argand wick-tube, the head I, or its equivalent, forming with the tube G an annular adjustable opening for directing a current of gas radially against the flame, substantially as and for the purpose specified.

5. In combination, the gas-supply tube G, perforated head H, and standard J, carrying the head I and button K, substantially as and for the purpose specified.

6. In combination, in an Argand burner, a button or disk, K, of refractory material, having a spherical or conical lower surface, and means for projecting an annular jet of oxygen gas independently of the air-supply against the flame at the outer edge of said button, substantially as and for the purpose specified.

7. In combination with an Argand burner provided with means for supplying an internal jet of oxygen gas, the air-tube A′, provided with means for regulating the supply of air, substantially as and for the purpose specified.

In testimony whereof we have hereunto set our hands this 23d day of January, 1879.

CHAS. F. BURNAP.
THOS. COPE.

Witnesses:
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