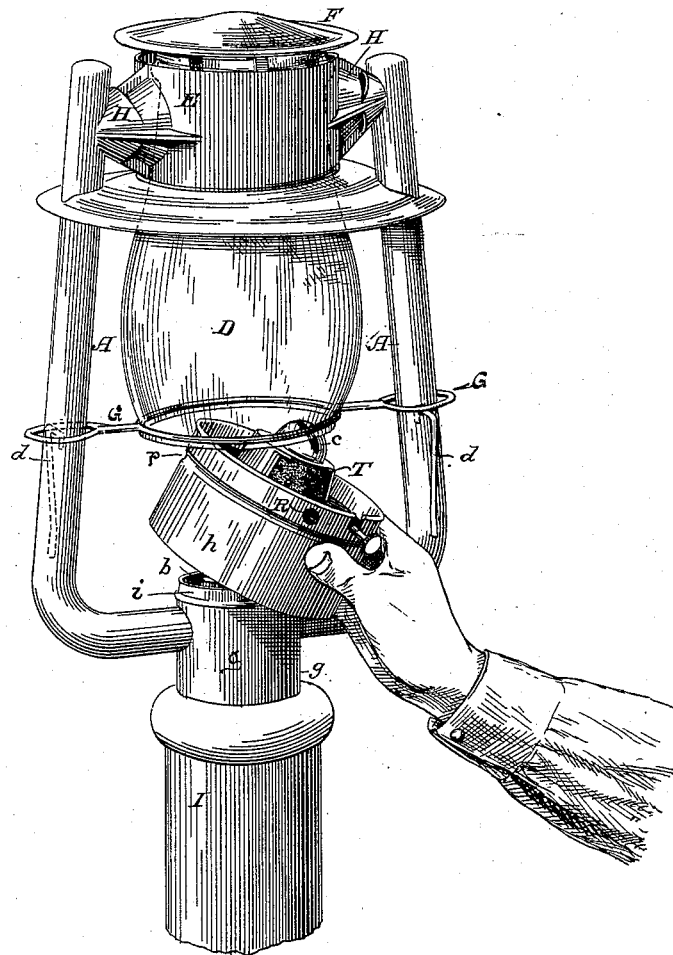


L. F. BETTS.
Tubular Lamp.

No. 218,917.

Patented Aug. 26, 1879.

Fig. 1.



Attest:

Clarence Pool
Aug²⁶ 1879

Inventor:

Lewis F. Betts
By his atty
R. O. Smith

L. F. BETTS.
Tubular Lamp.

No. 218,917.

Patented Aug. 26, 1879.

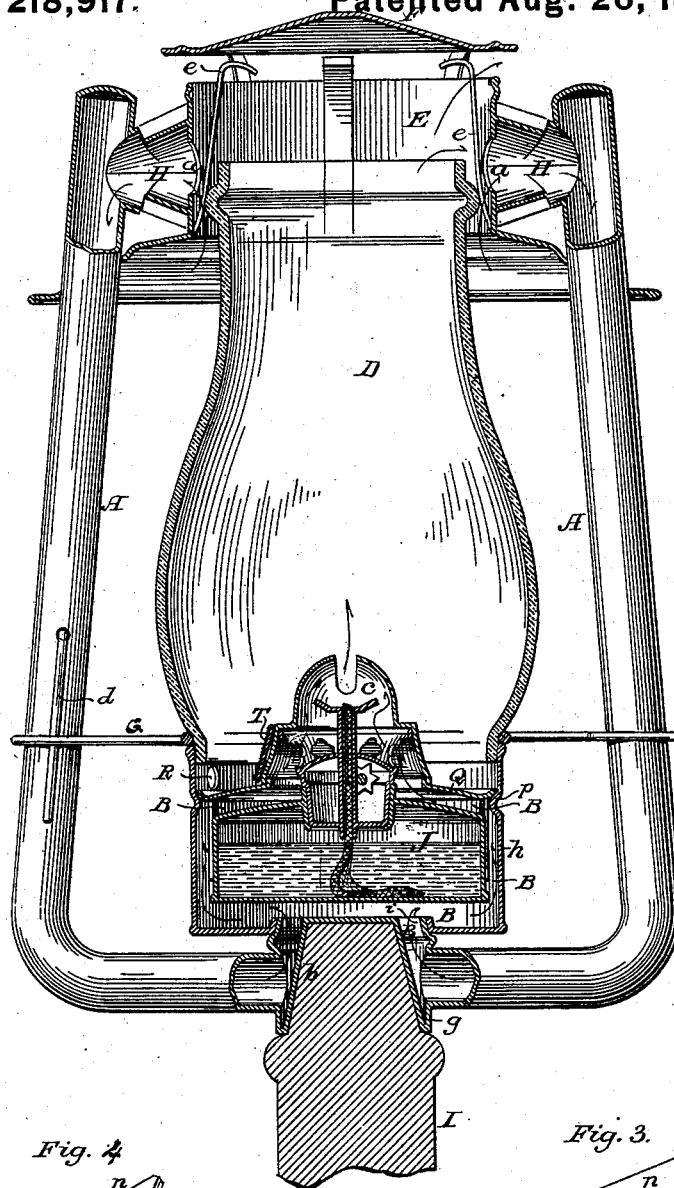


Fig. 2.

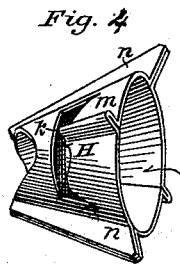


Fig. 4.

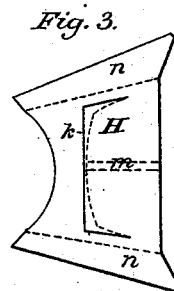


Fig. 3.

Attest:
Clarence Poole
Aug. 26, 1879

Inventor:
Lewis F. Betts
By his atty R. O. Smith

UNITED STATES PATENT OFFICE.

LEWIS F. BETTS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOSEPH S. DENNIS AND HENRY H. WHEELER, OF SAME PLACE.

IMPROVEMENT IN TUBULAR LAMPS.

Specification forming part of Letters Patent No. **218,917**, dated August 26, 1879; application filed July 8, 1879.

To all whom it may concern:

Be it known that I, LEWIS F. BETTS, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Tubular Lamps, specially adapted to use for street illumination; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of my lamp. Fig. 2 is a vertical central section of the same. Fig. 3 is a plan of one of the blanks from which the injector is made. Fig. 4 is a perspective of one of the injectors detached.

The particular objects attained by these improvements are as follows: First, the structure is very greatly simplified and cheapened by employing a smaller globe than heretofore and suspending the same from the top, with a freedom to move up and down in its attachment to the top, whereby the oil-pot and its case may be readily removed; second, the method of connecting the feeding-tubes at the top, with an annular space open at bottom to the atmosphere and at top to the space above and within the globe, insures a complete and perfect balance of pressure in the burner and a corresponding permanence of flame; third, the peculiar form of the injector renders it efficient and inexpensive to a greater degree than any similar device heretofore adapted to the same use; fourth, the oil-pot and case are separable from each and from the frame of the lamp, and may therefore be constructed more cheaply than heretofore, but they are more easily handled and cared for, and are less troublesome to replace; fifth, the base of the lamp is provided with an air-chamber, upon which the oil-pot and its case is supported, and it has a socket within said air-chamber to receive the head of its supporting-post; sixth, the oil-pot is suspended from a plate, the edges of which rest upon suitable stops within the oil-pot case, so that said oil-pot does not at any point touch said case, and air being admitted below said oil-pot bathes its whole surface; seventh, there is a match-lighter within the lamp, so that the match is less likely to be extinguished before igniting

the wick, and the globe is not smoked and soiled by the burning match.

That others may fully understand my invention, I will more particularly describe it.

A A are the tubes, through which air to support combustion in the burner descends from a point about as distant above the burner as is the top of the chimney. B is the air-chamber, into which the tubes A discharge, and from which air passes beneath the burner-cone *c* to support combustion. D is the globe, which, in this case, acts also as a chimney to carry away the products of combustion and cause a forced or chimney draft through the burner and feeding-tubes. The top of the globe or chimney D is within the chamber, inclosed by the band E, and it is surmounted by an ejecting-cap, F.

The top of the chimney D is smaller in diameter than the band E, so that there is an intervening space all around, open at the bottom to the air outside of the globe, and open at the top to the air above and inside the same.

The top of the chimney is maintained in position by guides or fastenings of some suitable kind which will hold it securely, and at the same time will permit the globe to be moved up or down. In the drawings the fastenings shown for this purpose are the springs *e e*.

The bottom of the globe D is held by a yoke, G, which surrounds it, and is connected at its ends with the tubes A, along which they slide. Latches *d* may be provided to arrest the return of said yoke when it has once been pushed up, and thereby hold the globe in an elevated position; but these latches are not essential, as the guides at the top of the globe may be arranged so as to dispense not only with the latches *d*, but with the yoke also.

I am aware, however, that globes have been heretofore made movable up and down, and therefore I do not propose to claim such movement or support, broadly.

The tubes A, at their upper ends, communicate with the chamber inclosed by the band E by means of holes *a a*, pierced through said band; and immediately external to said holes there are devices H for injecting air which blows against them from without, and ejecting

air from the space within the band E and from the top of the chimney.

It is now well understood that in a lamp so organized the ascending hot currents within the chimney are balanced by the descending currents within the tubes A, and their communication at top and bottom neutralizes any unequal disturbing effect of exterior air-currents.

The injector and ejector H is constructed from two flat blanks, (shown in Fig. 3,) each having an internal double L-shaped cut, *k*. The metal at the inner corners of said cut is then bent downward, and an exterior longitudinal fold, M, is made, extending from the straight base up to the cut *k*, the effect of which is to shorten that part of the blank laterally, so that when the blank is rounded up the lower part will be apparently smaller than the upper part, and the slit *k* will be opened, as shown. Two of these blanks, united by soldering their edge flanges *n*, as shown, constitute a double-cone injector.

At the bottom the tubes A discharge into the air-chamber B, and the bottom of said chamber is made with a conical cup, *b*, which forms a socket to receive the end of the lamp-post I.

The chamber B is inclosed by the case *g*, which is permanently attached to the tubes, and the case *h*, which is movable, and may be taken away with the oil-pot J and burner-cone *c*. The top of the case *g* has a large circular opening, the edge whereof is turned outward or provided with a flange, *i*, which serves as a seat for the similar opening in the bottom of the case *h*. The case *h* is open at its upper end, but is provided on its inner side with a flange or bead, *p*, upon the upper side of which the plate Q is arrested. The plate Q is constructed with a central opening, through which the burner projects, but which is covered by the cone *c* of the same.

The oil-pot J may be suspended from the lower surface of the plate Q, and entirely clear of the case *h*, as shown in the drawings; or, if preferred, the oil-pot may be otherwise supported within said case, as upon legs, while the plate Q may be independent and constitute a lateral extension of the base of the cone *c*.

I am aware that a lamp has been constructed with the burner-cone extending laterally to the inner surface of the chimney; but it was not joined tightly thereto, nor was there any air-chamber except when said chimney was present.

The air to support combustion therefore enters the feeding-tubes at their upper ends, and is discharged from said tubes into the chamber B, whence it flows over all sides of the oil-pot, and issues through the slot in the cone *c*. It therefore has an effect of refrig-

eration upon the oil-pot, and prevents the generation of dangerous gases within it.

The lower edge of the globe D fits into the top of the case *h*, as shown, or otherwise, to produce a tight joint at that point and to secure the case and oil-pot from accidental displacement.

A hole, R, is made in the side of the case *h*, above the position of the plate Q, for the ready insertion of a match or other device for lighting the wick; and to obviate the difficulty of inserting a match already lighted without extinguishment, and also to obviate the soiling of the globe and parts adjacent to the hole R by smoke and flame from the burning lighter, I place a friction-tablet, T, of sand-paper, or other suitable material, within the globe and case, and, as I think, most conveniently against the side of the cone *c*.

Having described my invention, what I claim as new is—

1. In a tubular lamp, a loose globe suspended from the top of the lamp-frame and movable up and down therein, combined with a loose case containing the oil-pot at the bottom, whereby when said globe is raised up the said case may be removed laterally from the lamp.

2. In a tubular lamp, a loose globe suspended from the top and movable up and down therein, combined with a yoke, G, to confine the base of said globe and hold the same in position.

3. In a tubular lantern, a loose globe suspended from the top and movable up and down therein, combined with a yoke, G, and latches *d*, to lock and support the same when raised up.

4. In a tubular lamp, the case *g*, connected directly with the tubes A, and constituting part of the inclosure of an air-chamber, B, combined with a movable case, *h*, which is fitted upon the open upper side of the case *g*, and completes the inclosure of said air-chamber B, and the oil-pot J, placed within the case *h*, but detached from its walls, as and for the purpose set forth.

5. In a tubular lamp, the case *g*, connected directly with the tubes A, and receiving in its interior the air delivered by said tubes, combined with a socket, *b*, which is within said case *g*, and constitutes the bottom or inner wall of the same, and at the same time serves as a means of attachment to the supporting-post I.

6. In a tubular lamp, an air-chamber, B, inclosed by a case, *h*, combined with an oil-pot, J, suspended from a plate, Q, which fits and fills the top of said case, to support the oil-pot at a distance from the top, bottom, and side walls of said air-chamber, as set forth.

7. In a tubular lamp, an air-chamber, B, closed at its top by the extended edges of the

burner-cone *c*, combined with an oil-pot, *J*, within said chamber, and supported therein at a distance from the walls of said chamber, so that air may pass around the top, bottom, and sides of said oil-pot, as set forth.

8. In a tubular lamp, an injecting and ejecting device, *H*, constructed from two similar flat blanks, shown in Figs. 3 and 4, with slits *k* and folds *m*, combined with an air-

chamber, inclosed by band *E*, and a feeding-tube, *A*, substantially as set forth.

9. A burner-cone, *c*, provided with a friction tablet or surface, *T*, upon its exterior, for the purpose set forth.

LEWIS F. BETTS.

Witnesses:

EDMOND Q. BOWMAN,
GEORGE W. STEAD.