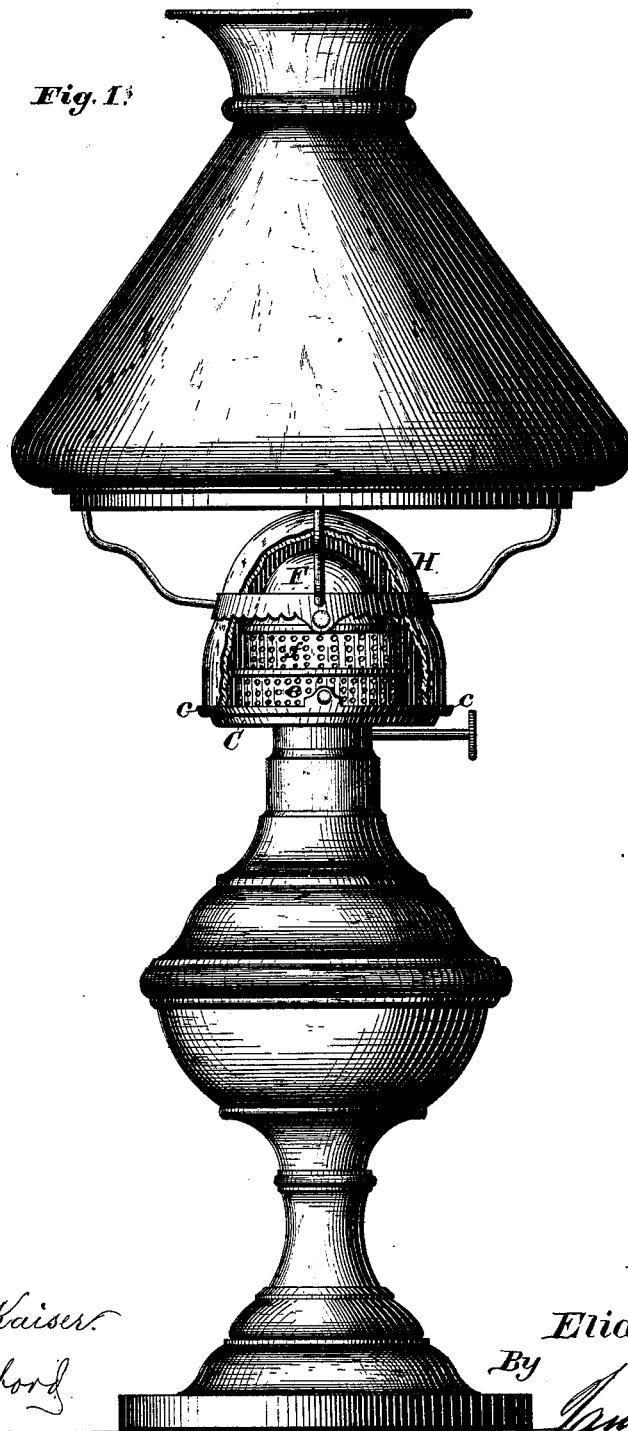


E. B. REQUA.  
Lamp-Burner.

No. 219,766.

Patented Sept. 16, 1879.

*Fig. 1.*



*Attest:*

*J. Henry Kaiser.*  
*J. A. Rutherford.*

*Inventor*

*Elias B. Requa.*

*By*

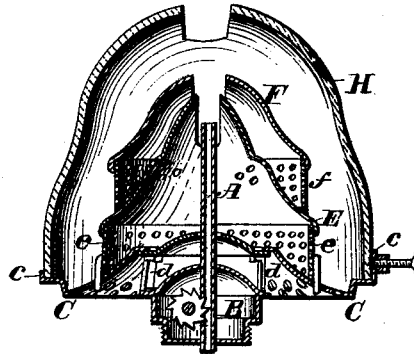
*James L. Norris*  
*Att'y.*

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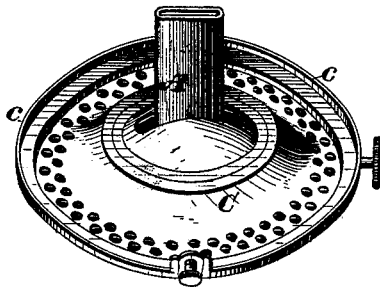
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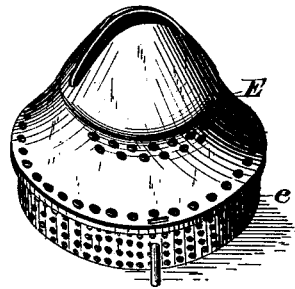
*Fig. 2.*



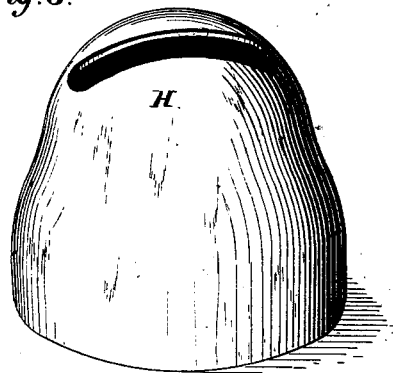
*Fig. 3.*



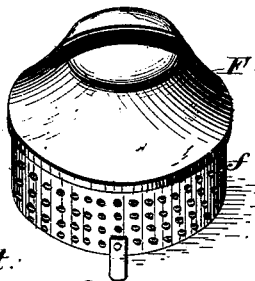
*Fig. 4.*



*Fig. 6.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

ELIAS B. REQUA, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN LAMP-BURNERS.

Specification forming part of Letters Patent No. **219,766**, dated September 16, 1879; application filed June 25, 1879.

*To all whom it may concern:*

Be it known that I, ELIAS B. REQUA, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Lamp-Burners, of which the following is a specification.

This invention relates to that class of hydrocarbon-lamp burners which do not require chimneys.

Its object is to supply a strong current of air upward along the wick-tube and to the base of the flame, creating an active combustion, carrying off all vapors from the interior of the deflectors, and preventing condensation of vapors upon the fount and deposit of carbon upon the surfaces of the deflectors, wick-tube, and wick, to cause a rapid passage of the heated products of combustion from the vicinity of the flame, and thus to produce from a flat wick-burner a light of the same quality as that obtained from the well-known student-lamp using a tubular wick.

It has the further object to protect the flame from outside currents of air.

The invention consists, first, in the combination, with the wick-tube of a lamp-burner, of an approximately conical air-heating chamber surrounding and extending above said tube, and having a base-plate concave on its under surface, and provided with a single central air-passage surrounding said wick-tube, said chamber having its upper wall perforated and provided with a flame-slot at its apex, and a concave deflector arranged above said chamber, and having a similar flame-slot, the lower edge of said deflector being connected to a perforated band standing intermediately and concentrically upon the conical upper wall of the air-heating chamber. The base-plate being concave on its under surface, and having but a single air-passage, which surrounds the wick-tube, when a draft is created by lighting the wick, the current of air is directed by the base-plate to its central opening, and thus a very strong current is created up along the walls of the wick-tube, striking the base of the flame vertically. At the same time a copious supply of air enters the heating-chamber through the perforations in its side wall; and this air is caused by the vertical current to flow forcibly upon

the opposite sides of the flame, so that there is always a strong current tending to keep the flame erect, and a lateral supply of heated air assisting in the combustion of the smoke, and, by its flow through the flame-slot, keeping the flame from flickering at its tip. A supply of air flowing through the perforations of the band upon which the concave deflector surrounding the air-heating chamber rests is guided by the deflector upon the upper portion of the flame, and assists in carrying off all products of combustion, while at the same time the band and deflector inclose a chamber in which is always a supply of air sufficient to temporarily support combustion, and prevent the extinguishment of the flame when the lamp is suddenly elevated, the band retarding the outflow of air in the chamber, and causing a portion thereof to enter the heating-chamber through its upper perforations.

The invention also consists in the combination, with the burner above described, of a novel flame-protector, which will be hereinafter fully described.

In the accompanying drawings, Figure 1 is a view, in elevation, of a lamp provided with my improved burner and flame-protector. Fig. 2 is a vertical central section of the burner and the flame-protector, taken on a plane at right angles to the slots for the passage of the flame. Fig. 3 is a detached perspective view of the burner-base. Fig. 4 is a similar view of the lower deflector. Fig. 5 is a similar view of the upper deflector, and Fig. 6 is a view of the flame-protector.

Fig. 1 being intended mainly to show the exterior appearance of the lamp when the parts are all in proper position, I will refer more particularly at first to Figs. 2, 3, 4, and 5 in describing the construction of my burner.

The letter A, Figs. 2 and 3, indicates a flat wick-tube, which extends upward and downward through the feed-wheel chamber B, in the usual manner, except that the tube extends to a greater height than in ordinary burners.

C designates the base-plate, having a concave under surface and a central slot, through which the wick-tube passes, said slot being of such size as to leave a considerable space

or the passage of air between its edges and the surface of the wick-tube.

The base-plate is supported by pillars *d*, standing on the edge of the feed-wheel chamber. It has formed at its edge a lip, *e*, to hold the flame-protector in place, and just within this lip it has a double row of perforations, the portion between these perforations and the central slot being solid.

The letter E designates the lower deflector, supported by a perforated band, *e*, the lower edge of which joins the base-plate just within its double row of perforations. The upper portion of the deflector E approaches nearly to a wedge shape in cross-section, in order that its walls may oppose very little obstruction to the passage of air toward the slot. This wedge-shaped portion has a single annular row of perforations near its base, and about midway between this row and the slot, on each side of said slot, is a group of perforations. These perforations serve to permit the escape of hot air from the heating-chamber inclosed by its deflector E, and direct said hot air under an upper deflector, by which it is guided to the upper part of the flame.

The letter F indicates an upper deflector supported by a perforated band, *f*, the lower edge of which joins the base of the lower deflector just without the single annular row of perforations in the latter.

The entire shell of the upper deflector above the perforated band *f* is solid, with the exception, of course, that it has a slot for the flame, and it is to the upper portion of the flame passing through this slot that the deflector F guides the heated air escaping from the lower deflector.

I have now described the essential features of the burner, and its operation is as follows: The air is drawn through the slot around the wick-tube in the base-plate and up along the sides of the wick-tube to the base of the flame. As the slot is the only passage through the base-plate to the interior of the deflectors, the entire draft caused by the heat of the flame is compelled to pass through this small passage, and the result is, that a very strong current is produced, which carries along with it all vapors generated in and escaping from the feed-wheel chamber, and furnishes a copious supply of oxygen to the base of the flame, so that a very active combustion takes place. This active combustion might result in an overcharging of the lower deflector with unignited vapor and products of combustion, causing condensation upon its surface, a deposit of carbon upon the deflectors and wick-tube, and a hovering of the products of combustion close to the flame, producing a light of low illuminating quality and hurtful to the eyes; but I provide against this by the peculiar construction of the upper burner with relation to the lower, as it will be seen that fresh air is permitted to enter through the perforated band *f*, and mingle with a portion of

the said products of combustion as they rise through the perforations and slot of the lower deflector, and carry them off through the slot in the upper deflector.

The forcible draft produces a combustion, which results in a large flame, and the upper deflector relieves the lower of those products of combustion which would otherwise clog the flame and impair its illuminating power, as before stated.

When the glass flame-protector H rests upon the base-plate, a sufficient quantity of fresh air is permitted to enter through the double row of perforations to supply the upper deflector.

The flame-protector H does not affect the illuminating effect of the flame, but is simply for the purpose of protecting the large-sized flame produced by my lamp from outside drafts. This flame-protector is made of glass, or other transparent material which will not intercept the light of the flame. It should be of such height as to avoid contact with the flame, and is of approximately the same shape as the burner, and provided with a large slot for the escape of the products of combustion. The collar of the shade-ring frame fits around this flame-protector.

It has been common to protect the flame of lamp-burners by means of glass chimneys, and there has been used a glass chimney with a flaring base inclosing the burner except at the junction of the chimney; and I do not claim such devices.

What I claim is—

1. The combination, with the wick-tube, of the approximately conical air-heating chamber surrounding and extending above said tube, and having a base-plate concave on its under surface, and provided with a single central air-passage surrounding said wick-tube, said chamber having its upper wall perforated and provided with a flame-slot at its apex, and a concave deflector arranged above said chamber and having a similar flame-slot, the lower edge of said deflector being connected to a perforated band standing intermediately and concentrically upon the conical upper wall of the air-heating chamber, substantially as described, and for the purpose set forth.

2. In combination with the upper deflector and perforated band *f*, and the air-heating chamber E, having perforations *e*, the flame-protector H, and base-piece C, provided with perforations at its edge, leading into the interior of the flame protector, whereby a large volume of air may be supplied to the flame, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

ELIAS B. REQUA.

Witnesses:

EDWARD A. RANSOM,  
ROBERT D. WYNKOOP.