No. 60,416. PATENTED DEC. 11, 1866.

J. M. PERKINS & M. W. HOUSE.

LAMP.

Fig. 2.

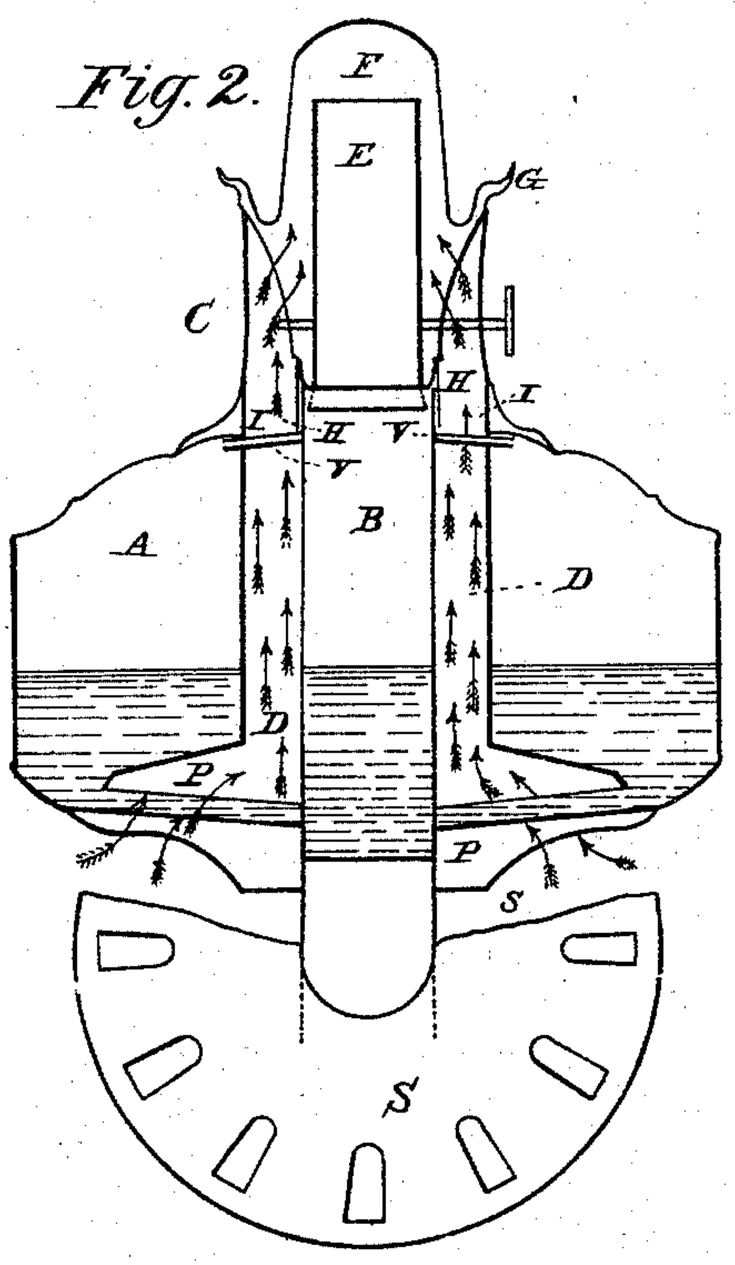


Fig. 3.

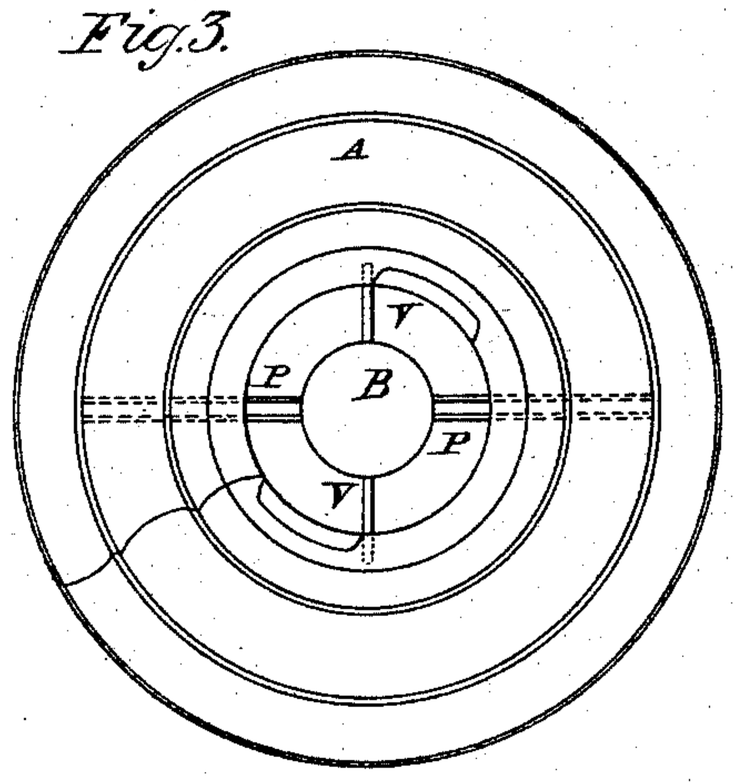
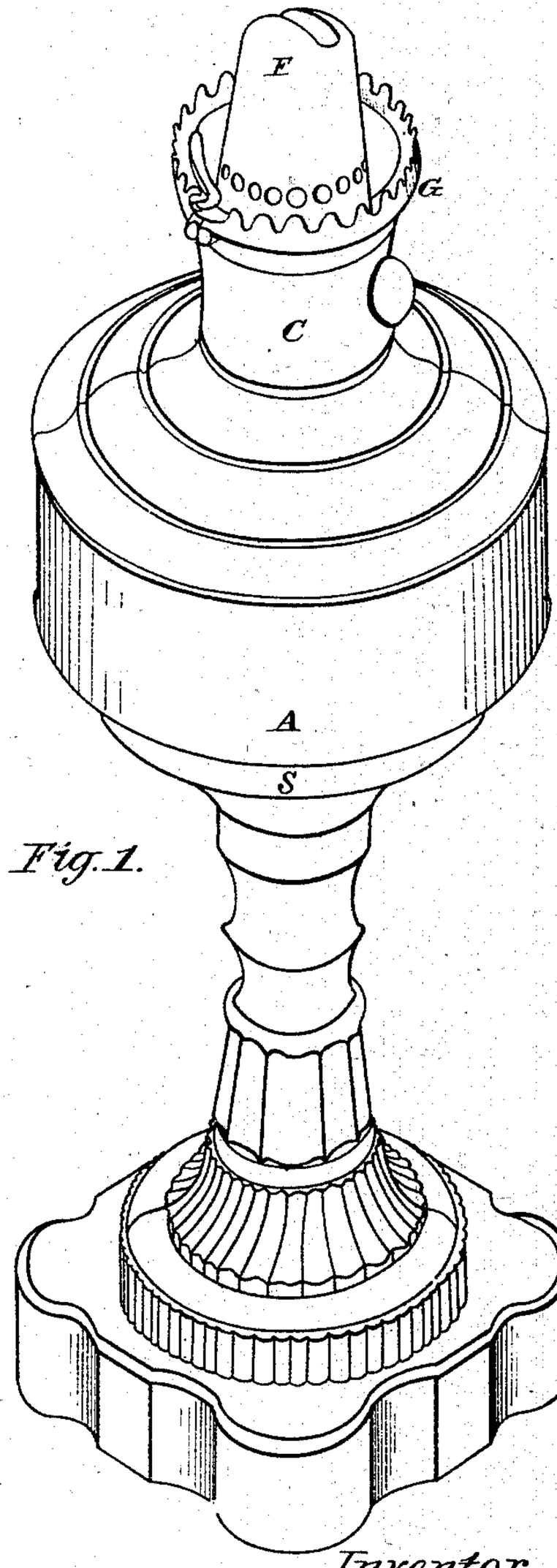


Fig. 1.



Witnesses.
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IMPROVEMENT IN LAMPS.

JOHN M. PERKINS AND MARK W. HOUSE, OF CLEVELAND, OHIO.

Letters Patent No. 60,416, *dated December* 11, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, JOHN M. PERKINS and MARK W. HOUSE, of Cleveland, Cuyahoga county, and State of Ohio, have invented new and useful Improvements in Lamps; and we do hereby declare the following to be a full and exact description of the same.

The nature of our invention consists in making a non-explosive lamp.

The same letters refer to the same parts in all the figures.

Figure 1 is a perspective view of the lamp when complete.

Figure 2 is a transeverse elevation of the lamp, showing all the essential parts of the improvement.

Figure 3 shows the top view, when the burner is removed.

In the drawings, A represents the reservoir for holding the oil or fluid; B, the burning chamber; C, the collar around the base of the burner; D, the air passage around the burning chamber; E, the wick-tube of the burner; F, the cone of the burner; G, the burner; H, the slip-joint; I, the fastening that secures the burner to the lamp; V, the vent tubes of the reservoir; P, the supply pipes leading from the reservoir to the burning chamber; S, the perforated screen at the base of the reservoir through which the cold air passes to feed the flame.

In constructing this lamp, the burning chamber, B, is very little or no greater in diameter than the wick tube, E; in depth it should extend a little below the bottom of the reservoir, A. The burner, G, is attached to the burning chamber by slip or telescope joint and secured by the fastening, I. This construction of the joint enables the burner to be detached from the burning chamber with greater ease and facility than it could be if the ordinary screw joint was used. The reservoir, A, for holding the oil is made independent of the burning chamber, B, and only connected by the supply oil pipes, P, and the vent tubes, V, for the escape of gases and supply of air to the reservoir. The air space, D, between the burning chamber, B, and the reservoir, A, may be made of any convenient capacity that will furnish a full supply of air for combustion; space of one fourth to three eighths of an inch around the burning chamber is found to be ample for that purpose. The supply pipes, P, leading from the bottom of the reservoir to the burning chamber, B, should be large enough to admit the ready flow of oil to the reservoir when it is replenished; size of one eighth ($\frac{1}{8}$) to three sixteenths ($\frac{3}{16}$) of an inch inner diameter is found to admit the oil readily, and also to resist the action of flame when of sufficient length. We prefer to make these pipes from one inch to one and a half inch long, and place them in connection with the reservoir, so that all the oil will be drawn to the burning chamber. The vent tubes, V, are about one sixteenth of an inch inner diameter, and from three eighths to one half inch long, connecting the reservoir at its highest point with the burning chamber; these tubes will resist the passage of flame to the reservoir when that receptacle is charged with the most explosive gases, and all gases that are generated in the reservoir are conveyed to the burning chamber, where they are at liberty to pass up to the flame and be consumed. The collar, C, is attached to the upper portion of the burner, G, and extends down to the top of the reservoir, and secures the burner, G, to the burning chamber, B, by the fastening, I. This collar, connecting the burner, chamber, and reservoir, completes the air-passage, D. All the air that is fed to the flame for combustion traverses the air-passage through the perforated plate, S, and air-passage, D, as shown by the arrows. The effect of this artificial draught of cold air is to keep the oil in the burning chamber and reservoir at a lower temperature than it could be if no draught was created, and the air to form combustion supplied through the base of the burner in the common way.

Another advantage in this construction of lamps consists in the uniformity of the light while the full contents of the lamp is being consumed. All kerosene or burning oils have a tendency to arrange themselves in strata of different specific gravity when left in a quiescent state and subjected to heat, the light and etherial portion at the top, and the low gravity oils at the bottom. When the reservoir is full, the oil standing on a level in the burning chamber, and that being supplied from the bottom of the reservoir; it follows that the heaviest oil is being consumed when the oil has the least distance to travel on the wick; when the reservoir is nearly exhausted and the oil has the greatest distance to traverse the wick, the lightest portion of the oil is being consumed; hence the uniformity of the light with the least amount of heat and adjustment. By taking the cold air to keep up combustion in the manner we do, the flame of the lamp is much less susceptible to motion or currents of air than in the ordinary lamp. In consequence of the low temperature of the oil, and body of the lamp, and small amount of conducting surface from the burning chamber to the body of the lamp, it is not so readily covered with oil on the outside by capillary attraction as the common lamp.

In a lamp constructed upon our plan we secure the following advantages: In consequence of the small amount of surface of oil exposed by any means to the action of flame, gases cannot be generated in sufficient quantity to become dangerous or do the least damage; the orifice of the opening to the burning chamber through which flame enters or gases escape is as large as the surface of oil acted upon.

We can burn in this lamp light oils and volatile fluids, and perfectly control the flame.

The burning chamber and reservoir holding the oil are kept at a low temperature by the current of cold air constantly passing, and the large amount of oil surface in the reservoir is so protected that flame cannot enter and explode it, as repeated tests have shown, by filling the reservoir with benzine and burning it in the burning chamber.

The combustion is more perfect than in lamps taking the supply of air above the body of the lamp, as in such lamps, the air entering the burner near the flame becomes heated before entering, while in our lamp the cold air is brought from a point so far below the flame as to be wholly unaffected by it.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the annular reservoir A, the annular air chamber D, the burning chamber B, the supply pipes P, and vent tubes V, constructed and arranged, substantially as and for the purposes described.

2. We also claim the collar C, in combination with the perforated burner G, when both are so constructed and arranged as to extend the cold air chamber, D, up around the perforated portion of the burner, substantially as shown and described.

JNO. M. PERKINS,
MARK W. HOUSE.

Witnesses:
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