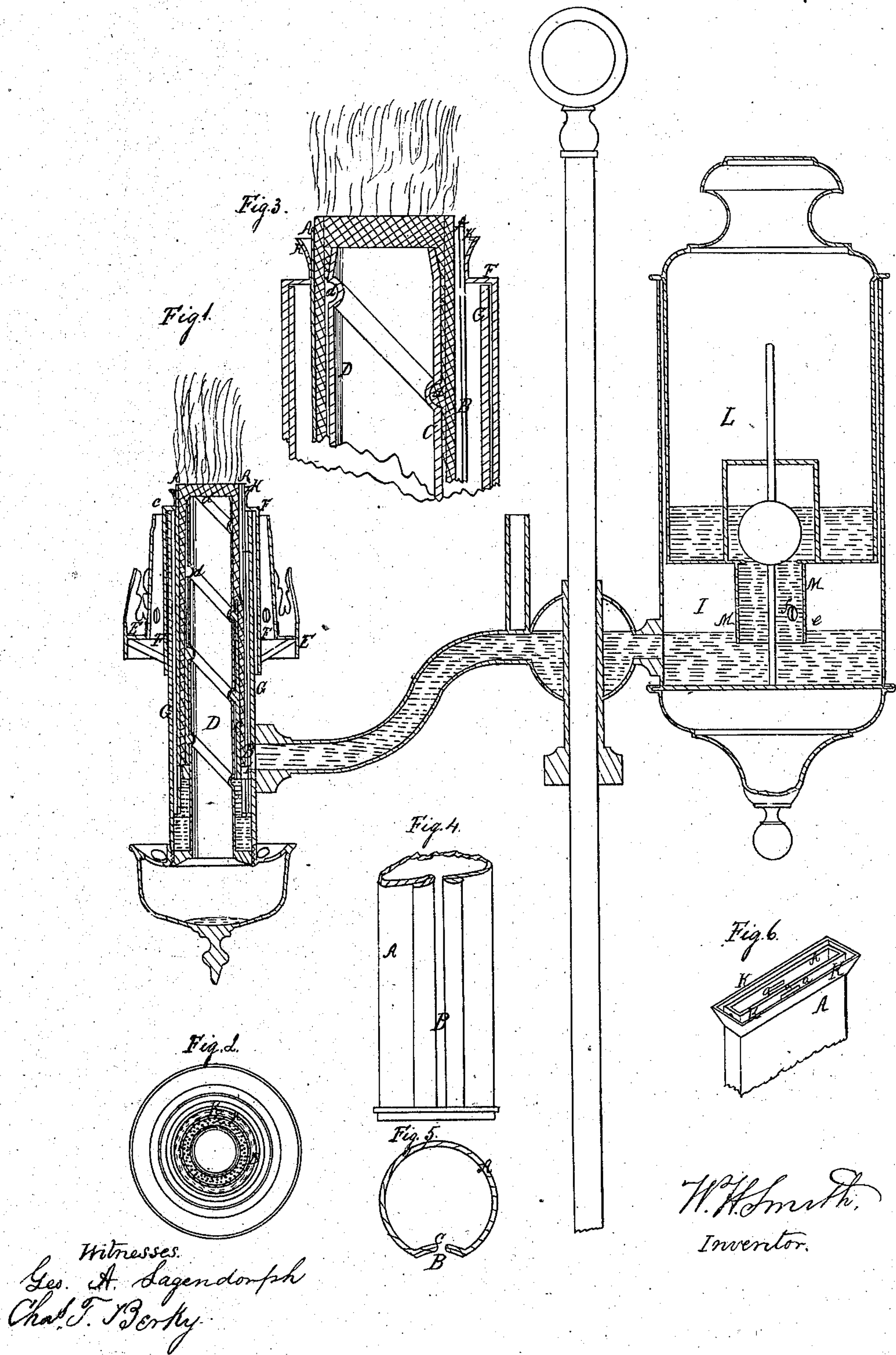


W. H. Smith.
Lamp.

Nº 75479

Patented Mar. 10, 1868



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Inventor.

United States Patent Office.

WILLARD H. SMITH, OF NEW YORK, N. Y.

Letters Patent No. 75,479, dated March 10, 1868.

IMPROVEMENT IN LAMPS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLARD H. SMITH, of the city, county, and State of New York, have made new and useful Improvements in Lamp-Burners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 represents a vertical central section of a lamp with my improvements.

Figure 2 is a top view of the burner of the lamp.

Figure 3 is a central vertical section of the top part of the burner on an enlarged scale.

Figure 4 is a detached side view of a portion of the wick-tube.

Figure 5 is a cross-section of the same.

Figure 6 is a perspective view of the top part of a burner with a flat wick, showing my improvements applied to it.

Similar letters of reference indicate corresponding parts in the several figures.

In the ordinary lamps it is generally the case that the oil raised to the top edge of the wick-tube is not completely consumed, and in consequence flows down over the outside of the wick-tube, producing a bad odor, and wasting, or filling the waste-cup very rapidly, so that the person using the lamp is compelled to keep a watch upon the waste-cup. As soon as the oil flows over the top edge of the wick-tube, a siphon-like action takes place, which encourages the overflow and increases its amount constantly, so that the absence of a sufficient supply of heat and oxygen causes the lamp to smoke.

Now, the object of my improvement is to provide means for returning the overflow of oil immediately back into the wick-tube, thereby retarding the capillary action of the wick and wick-tube, and at the same time to provide means by which the air when it comes in contact with the vapors of the oil at the bottom of the flame will be sufficiently heated to cause complete combustion, and thereby increase the brilliancy of the flame.

First. The nature of my invention consists in providing the wick-tube with a flange, surrounding it near its top edge, and projecting upwards and outwards, so as to form a receptacle for the overflow of the oil, and in providing an aperture, opening from the interior of the receptacle so formed to the interior of the wick-tube, through which such overflow of the oil returns immediately into the wick-tube, and thereby retards and counteracts the capillary action of the wick, and balances the supply of oil with the consumption of the same. In consequence of the flange projecting outwards from the wick-tube, the current of cold air passing upwards towards the flame is prevented from coming in direct contact with the base of the flame and the vapors of the oil, so that when such current of air comes in contact it is already considerably heated, and so causes a more rapid and perfect combustion, and produces a better light than is obtained from the lamps now in use.

Secondly. It consists in constructing the wick-tube, in lamps in which this tube is provided with a longitudinal slot for producing the feed-motion of the wick, more stiff, and stronger than those now made, by means of turning the edges of the slot with a lap, whereby the said edges become of double thickness of metal, and become smooth and round-edged.

Thirdly. It consists in providing distinct openings through the side of the entrance-tube of the upper oil-cistern, which openings are of corresponding size with the required size of flame, and serve to furnish only sufficient air in the upper cistern for discharging to and feeding the lower cistern with oil for the desired flame, whereby the heavy vibration of the flame caused by the admission of large bubbles of air, and by the admission of the air under the edge of the said entrance are prevented.

Fourthly. By contracting the upper end of the worm-pipe, for the purpose of making a space between the inside of the wick and the said pipe, thereby preventing an overflow of oil over the edge of said pipe.

To enable others skilled in the art to make and use my improvements, I will proceed to describe their construction and operation.

A represents the outside wick-tube of a so-called "study-lamp," which is made with a circular wick. B is the slot in the tube A, by means of which the inside wick-tube C, to which the wick is secured, is turned by means of a projection, b, entering the said slot B, and being part of the tube C. D is the ordinary worm-pipe, which is made with a spiral groove, d, in which and over which the tube C works, for the purpose of raising and lowering the wick of the lamp. Instead of forming the edges of this slot B of single thickness of the tube, I turn

a lap on each edge, as shown in figs. 4 and 5, so that the said edges become rounded and smooth, and become of double thickness, whereby the projection *b* will slide in the slot with less friction, and whereby the wick-tube A is made stronger and more stiff than with those of the ordinary construction. E represents the ordinary chimney-holder and air-conductor, which is secured upon the tube F, and the tube F is secured to the wick-tube A, it having an inward-projecting flange, *c*, fitting around the wick-tube A, which flange *c* rests upon the ordinary oil-tube G, upon and over which the tube F is loosely fitted, so that by turning the chimney-holder F the wick is raised or lowered. By means of the tube F and inward-projecting flange the wick-tube A is made stronger and stiffer.

Now, in order to prevent the oil when furnished in surplus to the flame from wasting over the wick-tube A and over the tubes F and G down into the usual waste-cup, I provide a flange, K, around the top edge of the wick-tube, as shown in fig. 3, and extend the slot B to the extremity of the said top edge. The wasting of the oil, if in surplus furnished, is thereby stopped and consumed. Openings may be made to turn the oil back on the wick again, but I prefer having the ring fitted tight, as it prevents the lamp from getting on fire, also preventing the flame from coming in contact with the wick-tube and heating the burner.

To prevent an overflow on the inside of the top edge of the wick, I contract the pipe D on its upper edge, so as to form a space between the wick and the tube or pipe D. The groove *d* extending thereto renders passage to run the surplus oil downwards to the wick, and in that manner stops its overflow down into the waste-cup. By these means the oil is prevented from filling the waste-cup too rapidly, and the usual constant attention upon the waste-cup is dispensed with.

It will be perceived that the tube F is united with the wick-tube by means of an inward flange meeting the periphery of the said wick-tube with tight joint, whereby the vapors rising from the oil in the oil-tube G are prevented from escaping between the said tubes to catch fire from the flame of the lamp, thereby enabling the user of the lamp to apply light-gravity oils.

In lamps in which a flat wick is employed, as shown in fig. 6, the flange K on the outside of the wick answers all purpose, and instead of having the slot B to serve as a passage from the flange to the wick, other-shaped openings may be used, such as shown at *a* in fig. 6.

L represents the ordinary movable oil-cistern used in the so-called study-lamp, which is inverted in order to fill it, and I is the cistern which supplies the oil-tube G of the lamp. The cistern L is provided with a valve, for the purpose of closing the aperture through which it is filled when it is to be replaced in the cistern I. The said valves, having a stem which strikes upon the bottom of the cistern I, provides for the raising of the valve when the cistern L is restored to its proper position when in use, so as to allow the oil from said cistern L to flow into the cistern I until the oil in the last-named cistern rises above the aperture of the cistern L, whereby the supply of air required in the cistern L, to allow the oil to flow from it, is stopped. The oil in the cistern I being under ordinary atmospheric pressure, as well as that in the tube G, as soon as the flame of the lamp consumes the oil from the wick, the same is replaced from the cistern I, and the level of the oil in that cistern is lowered until the air in the cistern I has an opportunity to flow through the aperture in the cistern L, into the cistern I, whereupon a fresh supply of oil flows from the cistern L into the cistern I.

In the ordinary lamp the air enters under the edge of the pipe M, and the level of the oil in the cistern I is lowered considerably below said edge before an entrance is made for the air, on account of the end of the pipe acting with a capillary attraction on the oil, and therefore when the air enters, it rushes in the pipe in large bubbles, when the column of oil held by capillary attraction between the level of the cistern and the end of the pipe breaks, thus causing heavy vibrations in both cisterns and in the flame.

Now, for the purpose of preventing the heavy vibrations of the flame above stated, I provide openings *e* *f*, shown in fig. 1, in the side of the entrance-pipe M of the upper cistern L, of which I make the opening *e* of a diameter only sufficient to furnish air in the cistern L, to give oil to the lower cistern I of the quantity continuously required by the consumption of a proper flame to give good light when used for working with it, and locate this opening immediately above the lower edge of the pipe M, and of which I make the opening *f* on a level immediately above the opening *e*, and of diameter only sufficient for furnishing a continuous flame sufficient for a night-light. By these means the air passes into the cistern L in small bubbles, and does not cause heavy vibrations of the flame of the lamp.

Having fully described my improvements, what I claim, and desire to secure by Letters Patent, is—

1. The round wick-tube A, provided with a flange, K, on its outside, and a passage, B, in combination with the worm-pipe D, constructed with an inward flange at its top, substantially as herein shown, and for the purposes described.
2. Constructing the wick-tube A with a slot, B, made in the manner and for the purpose substantially as herein shown.
3. Providing the two openings *e* and *f* on the tube M, arranged in relation to each other, substantially as and for the purpose herein set forth.
4. The construction and arrangement of the top edge of the spiral tube D, being below the edge of the tube A, for the purpose of preventing the flame reaching the tube D and heating the burner, substantially as herein shown.
5. The tube F, tightly jointed, and uniting with the wick-tube A, substantially as and for the purpose herein described.

W. H. SMITH.

Witnesses:

GEO. A. SAGENDORPH,
CHAS. T. BEEKY.