

UNITED STATES PATENT OFFICE.

ROBERT HITCHCOCK, OF WATERTOWN, NEW YORK.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. **145,176**, dated December 2, 1873; application filed November 11, 1873.

To all whom it may concern:

Be it known that I, ROBERT HITCHCOCK, of Watertown, Jefferson county, New York, have invented certain new and useful Improvements in Lamps, of which the following is a specification:

These improvements relate to lamps for burning heavy oil without a chimney. I have heretofore obtained several Letters Patent for such lamps, the same being numbered as follows: No. 125,954, of April 23, 1872; No. 134,547, of January 7, 1873; and No. 142,103, of August 26, 1873.

The lamp in which my present improvements are contained possesses the main characteristics of said patented lamps, to which I refer for explanation of the general plan or principle upon which my present lamp operates. The improvements hereinafter described embrace details designed to render the lamp more effective and better adapted for use. I employ the combination of interior and exterior air-passages and mechanism for impelling a forced blast of air through said passages, as described in my several patents above referred to. I also combine, with the air-impelling mechanism, a pump apparatus for supplying oil to the wick at or near the point of combustion, as described in my patent, No. 142,103, of August 26, 1873. But I materially modify the position and arrangement of the air-impelling mechanism, the oil-reservoir, and the wick-tubes; and these modifications require changes in the structure and arrangement of the accessory parts connected to and operating in conjunction with them.

It has been my object to shield and protect the "movement" or air-impelling mechanism, as far as possible, from dust and dirt—a matter of much importance when the lamp is used in railroad-cars. To this end I inclose the movement in and surround it by the oil tank or reservoir, and separate the air-fan from the gearing or driving mechanism by a diaphragm or plate, the air for the fan being taken in outside of and without passing through the said gearing or movement proper. The movement thus takes the place heretofore occupied by the wick-tube, and I now arrange the wick-tube entirely above and outside of the oil-reservoir, combining it with air-passages which

communicate properly with the air-impelling mechanism. To this elevated wick-tube I connect a supply-pipe, communicating with a pump in the oil-reservoir, actuated by the movement, as described in my former patent last above cited; and I provide around the upper end of the tube an overflow-trough of small dimensions, so as to expose as little oil-surface as possible to dust that may enter the lamp, said trough communicating with a return pipe or duct for leading the oil back to the reservoir.

Having thus given a general statement of the main characteristics of my present lamp, I shall proceed to describe more particularly my improvements by reference to the accompanying drawings, in which—

Figure 1 is a vertical central section of the lamp in a plane passing through the axis of the mainspring of the movement. Fig. 2 is a like section of the lamp in a plane at right angles with the plane of the section in Fig. 1. Fig. 3 is a plan of the lamp with the wick-tube and its jacket removed, and the oil-strainer partly broken away. Fig. 4 is a view of a portion of the wick-tube, representing a peculiar wick-holding device for use in connection with the wick-raising mechanism.

A is the oil-reservoir, made of annular or other suitable form, so that it shall have formed in it a central chamber, B, of suitable size and shape to receive the movement C. The movement is of the usual structure, as fully described in my previous patents, and drives the fan C, by which air is impelled to the flame. Between the fan and the movement is a diaphragm or sealing-plate, *a*, which fits closely in the chamber B, thus shutting out, as far as possible, dust from the movement. To further assure the exclusion of dust, a packing piece or sheet, *b*, of felt or other suitable material may be fitted onto the diaphragm *a*. In this way not only dust and dirt, but oil, will be excluded from the movement. Air may be supplied to the fan through one or more side passages, *c*, as shown; or, which is preferable, when the lamp is in a position exposed to drafts, a false bottom, *d*, may be provided with perforations *e* for entrance of air, which will then pass up through one or more tubes, *f*, extending through the oil-reservoir into a passage or

passages leading to the fan, as seen on the left in Fig. 3. By this means the force of the draft or puffs of air will be expended to a great extent in the chamber *d*, and the subsequent changes of direction in the air-passages will cause the current to be fully equalized before it reaches the fan. The top of chamber B is closed by a cover, *g*, formed at its center with an air-opening, surrounded by a cylindrical sleeve, *g*¹, the lower end of which fits around the upper end of the cylinder *g*², in which the fan is located. Cover *g* supports a dish-like device, *h*, which is intended as a shield to prevent charred wick, oil, and foreign matter from dropping onto the fan; and also as a strainer to free the return oil from impurities before it flows back into the oil-reservoir. The top of the dished portion is, therefore, covered by a wire-gauze strainer, *h*¹, which may be made removable, if desired; and the outer portion of the shield extends out beyond the opening in cover *g*, and is formed with an overhanging deflecting-flange, *h*², which prevents any oil that may happen to escape over the sides of the shield from dropping down upon the fan. The oil thus deflected will drop on top of the reservoir, and will eventually find its way back into the reservoir through openings in the top. The air from the fan passes up through the opening in cover *g*, and thence outwardly and upwardly around shield *h*. Above the ash-shield and strainer is located the wick-tube, consisting of an inner tube, *i*, open from end to end, and an encircling outer tube, *j*, of like conformation, but of greater size, so as to leave a space for the wick between the two tubes, which space is closed at the bottom, as shown at *i*² in Figs. 1 and 2. Around the outer tube is a cylindrical jacket, *k*, which is widened at its base *k*¹, so as to fit the top *k*² of the lamp-body. The outer tube is secured to the jacket by legs or lateral pins *l*, as shown in Fig. 2, so that when the jacket is removed from the body of the lamp the wick-tubes and parts attached to the same will be thereby removed also. The passage for internal air-current is marked *i*¹, and that for external air-current is marked *j*¹, and the course of the air from the fan is indicated by arrows in Fig. 2. Oil is fed to the wick by means of a supply-pipe, *o* *o'*, leading from two single-acting pump-cylinders, *m*, (indicated by dotted lines in Fig. 2,) arranged within the oil-reservoir, and actuated from the movement by means of a lifter-rod, *n*, operated by the movement in the manner described in my patent, No. 143,103, of August 26, 1873, and connected, by a link or lateral connection, *n*¹, with a rod, *n*², jointed to the cross-piece to which the piston-rods of the pumps are attached, as seen in Fig. 2. Any suitable pump device may be employed for the purpose other than the two-cylinder single-acting pump shown, as will be well understood without further explanation. The supply-pipe *o* *o'* is made in two parts—the upper section, *o'*, carried by the wick-tube, and opening into it, preferably, at a point, *p*, near to the point of

combustion, the lower section, *o*, attached to and communicating with the pumps, and the two contiguous ends of the sections formed so that the one will fit into the other when the jacket *k* is placed on the lamp-body. By this means, when the movement is in operation, a continuous supply of oil will be fed to the wick. To prevent any oil that may overflow the wick-tube from running down upon the lower part of the lamp, I provide around the mouth or upper end of the outer tube *j* an overflow-trough, *v*, which has but little superficial area, in order to expose as little oil-surface as possible to dust and dirt. This trough is provided with a return-pipe, *v*¹, that leads down alongside of the wick-tube, in such manner that the oil dropping from it will fall on the strainer *h*¹. The oil is thus strained and filtered, and collects in the lower dished part of the shield *h*, whence it is conducted back by return-pipe *v*² into the oil-reservoir. The top of the jacket *k* is surmounted by a slotted deflector, *s*. The movement is wound up by means of a key inserted through the passage *t*, formed in the side of the lamp, and through the oil-reservoir at a point opposite to the winding-arbor of the movement.

The pump mechanism is attached to a plate, *m'*, which fits over the opening in the top of the reservoir, through which the pumps are inserted. The pump mechanism is thus detachable and removable, as, indeed, are all the portions of the lamp which require to be removed at times.

The wick-raising devices are represented in Fig. 1, and are of the usual construction, involving in their general arrangement, nothing that is essentially novel. I, however, provide means for holding the wick, which will be found useful and very convenient. I provide the ordinary wick-raising sleeve, *v*, (over which the lower end of the wick is to be fitted in the usual way,) with spring catches or claws *x*, attached at their lower ends to the sleeve, and at their upper ends located in slots in said sleeve, as seen in Fig. 4, their position normally, or when raised above the inner wick-tube *i*, being such that the hooks on their ends will be about flush with the outer surface of the sleeve, in which position the backs of the claws will project inwardly beyond the inner face of the sleeve. When the sleeve is in this position, the wick can be easily slipped over it; but as soon as the sleeve, by the action of its operative mechanism, is lowered, the bulging or projecting backs of the claws will be pressed by the tube *i*, and the hook ends of said claws will, consequently, be forced outward, so as to pierce and penetrate the wick, which will thus be held with great firmness and security.

The filling-orifice for the reservoir is shown at *y*.

The lamp shown in the drawings is designed with special reference to its use as a ship lamp. It is, therefore, provided with trunnions *z*, located in such manner that the preponder-

ance of weight in the lamp shall be below the point of suspension.

Having described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a forced-blast lamp, the combination, with the oil-reservoir, of the movement contained in a chamber separate and distinct from, but surrounded on all sides by, said reservoir, substantially as shown and described.

2. The combination, in a forced-blast lamp, of the movement, the fan or air-impelling device, separated and partitioned off from, but driven by, said movement, and air-passages through which the air-supply for the fan is taken in outside of, and without passing through or in contact with, the movement, substantially as and for the purpose set forth.

3. The wick-tube and its surrounding jacket, arranged entirely outside of, and removable, bodily and together, from the oil-reservoir or main body of the lamp, and provided with air-passages for conducting the impelled air from the fan to the flame, substantially as shown and set forth.

4. The combination of the air-impelling apparatus, the surrounding oil-reservoir, and the wick-tube and jacket surmounting said reservoir, and formed with passages through which the impelled air-current will be directed upon the flame, substantially as set forth.

5. The combination of the air-impelling mechanism, the oil-reservoir, and the wick-tube surmounting the same, with the pump mechanism and supply-pipe for feeding the wick with oil, and the overflow-trough and return-pipe for conducting back to the reservoir the surplus of oil, substantially as shown and described.

6. In combination with the elevated wick-tube and return-pipe, the combined ash-shield and strainer, intermediate between the open bottom of the wick-tube and the air-impelling fan, and constructed, as described, with a cup or dish shaped receptacle and a gauze diaphragm to strain the return oil and catch the refuse from the wick-tube, and with an annular projecting flange to deflect from the opening above the fan the matter that might otherwise drop from the said shield and strainer onto the fan.

7. The wick-raising sleeve, slotted as described, and provided with spring-catches located in said slots, and normally projecting inward through the slots beyond the inner surface of the sleeve, as and for the purposes shown and set forth.

ROBERT HITCHCOCK.

Witnesses:

JNO. M. SIGOURNEY,
EWELL DICK.