



# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN LUBRICATORS.

Specification forming part of Letters Patent No. 187,964, dated March 6, 1877; application filed October 24, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM A. CLARK, of Westville, in the county of New Haven and State of Connecticut, have invented certain Improvements in Lubricators, of which the following is a specification:

My invention relates to that class of lubricators or oil-cups which are used for supplying oil to the valve-chest and valves of a steam-engine; and the invention consists in certain details of construction, whereby it is rendered more efficient in its operation, as hereinafter more fully described.

Figure 1 is a central vertical section, and Fig. 2 a sectional view, of a portion enlarged.

To construct my improved apparatus, I provide a metallic cylindrical cup or vessel, A, to one side of which is attached a glass gage-tube, G, which is connected by a passage at both top and bottom with the interior of the cup A, as shown in Fig. 1, so that the water and oil will stand at uniform heights in both the cup or reservoir and the gage-tube, as represented in the drawing.

Upon the top of the cup A I secure a chamber or small vessel, C, into which the steam is conducted by a pipe, R, and in which chamber the steam condenses. This chamber is connected by a tube, V, which is provided with a stop-cock, O, to the top of the reservoir or cup A, as shown, it being connected to the tube V by a coupling, b, so that the condenser C can be turned in any desired direction to bring the tube R in position to be most conveniently connected with the supply steam-pipe or valve-chest, from either of which the steam may be taken, the tube T, which connects with the reservoir A below, being also connected with the same steam-supply, so that the pressure shall be uniform in all parts of the apparatus.

As shown in Fig. 1, a small passage, f, leads from the condenser C down into the top of the cup A, and from thence extends along laterally toward the gage-tube, where it terminates, by opening upward into a small chamber, r, in which is seated a small and very light check-valve, a, as shown in Fig. 1, these parts being shown enlarged in Fig. 2. From this chamber r a passage, v, extends downward into the glass tube G, this passage v terminating with

a small tube, P, which has one side, at its end, cut off slanting, as shown in Figs. 1 and 2, the object of this tube P being to deliver the drops of condensed water at or against the side of the glass tube G, so that they may be readily seen, the dark color of the oil used in these lubricators often preventing the operator from perceiving the drops of water when fed into the gage-tube or into the reservoir in the usual manner, and thus preventing him from telling whether the apparatus is working properly or not. By this construction each drop of water, as it emerges from the lower end of the small tube P, is delivered near to or against the side of the glass, where it can be readily seen, and its passage down through the oil easily followed by the eye.

It is obvious that this drip-pipe P may be arranged to deliver the water within and against the side of the reservoir A in those cases where the latter is made of glass, as in my former patent, the gage-tube G in that case being dispensed with, the function and operation of the drip-pipe being the same in either case.

A supply cup, D, is secured above the gage-tube G, with which it is connected by a channel, m, through which the oil is supplied to the reservoir A, there being a screw-plug, E, by which the upper end of the passage m may be closed, as shown in Fig. 1.

From the top of the reservoir A there projects a small tube, d, the passage in which connects with the oil-passage e, as shown in Fig. 1, this tube d being provided with a screw-cap, l, which has a hole, c, in its side, as shown in Fig. 1, so that when it is desired to admit air for any purpose—such, for instance, as drawing off the contents of the reservoir—it is only necessary to loosen this screw-cap l.

It will be observed that the passage e extends entirely across the top, from the gage-tube G on one side to the pipe T on the opposite side, and connecting at the center with the chamber of the reservoir A. At the point where the passage e terminates in the pipe T, a trap is formed by slanting the passage e downward, and having it enter a small chamber, t, which has an opening or outlet, h, near its upper side, as shown in Fig. 1, the pipe T being made in sections, as shown, for the pur-

pose of enabling the passages and chamber *t* to be formed therein with convenience. The trap thus located serves to prevent steam from entering the reservoir through the tube T, which, as before described, is connected by a small pipe with the valve-chest of the engine.

The stop-cock O, which regulates the supply or passage of water from the condensing-chamber C to the gage-tube and reservoir, is provided with an arm which rests against a set-screw, by which it can be adjusted with great exactness, thereby regulating the discharge of the oil with equal exactness, as, of course, no oil can escape except as its place is supplied by the inflowing water. This feature, however, being fully shown, described, and claimed in my Patent No. 125,022, dated March 26, 1872, need not be further described, reference hereby being made to said patent for a more full and minute description of the same.

A drip or draw-off pipe, I, provided with a stop-cock, O, is attached at the bottom of the reservoir A, for the purpose of drawing off the water whenever it shall be found necessary.

In use, the lubricator is to be secured at any convenient point on or near the steam or valve chest, and the pipe T, through which the oil is delivered, is then connected by a tube with the valve-chest in such a manner as to deliver the oil to the valve at any required point, there being, also, another pipe leading from the steam-chest or steam-supply pipe, and connecting with the tube R, which leads into the condenser or steam-chamber C, this arrangement or connection being well understood by steam engineers, or those having charge of steam-engines, and therefore not necessary to show.

As a result of this construction, it will be seen that the oil and water passages *e* and *f* are entirely distinct, and that, while the water enters through the passage *f*, the oil escapes through passage *e*, and that if, by accident or otherwise, the cock B in the top of the condenser C, or the plug E in the supply-cup D, should be removed, the oil is prevented from being forced up into the condensing-chamber by the pressure of the steam entering through

pipe T by the check-valve *a*, which would be pressed down over the mouth of the passage *f*, thereby cutting off all communication with the chamber C. This I find by experience to be highly important, for the reason that, if the oil is permitted to enter the condensing-chamber, it is apt to adhere to, and more or less obstruct, the passage from the condensing-chamber, more especially the passage through the cock O, which, when adjusted, forms a very minute opening. So, too, oil can be supplied at any time without entering the passage *f*, as the oil passes down through the channel *m* into the gage-tube G, and from thence through passage *e* into the reservoir A.

The check-valve *a* may be dispensed with, and the apparatus made to operate as well in all respects, except that of preventing the oil from being driven up into the cup by the accidental or careless opening of the cock B, or the removal of the plug E, and as these contingencies are liable to occur, I prefer to use the valve.

Having thus described my invention, what I claim is—

1. The combination, in a lubricator, of a separate condensing-chamber and a passage, *f*, for conducting the water direct to the glass tube or reservoir, said passage being so arranged that the water shall enter the reservoir without passing through the oil-passages, substantially as set forth.

2. A drip-tube, P, constructed and arranged to operate substantially as described, whereby the water from the condenser shall be delivered against, or close to, the side of the glass, in order that it may be seen as it enters the oil or passes through the same.

3. The check-valve *a*, arranged to close the water-passage *f* against back pressure, whereby the oil is prevented from entering said passage, or the condensing-chamber, substantially as described.

4. The trap *t*, arranged at the end of the oil-passage, as shown and described.

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Witnesses:

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