

J. POWELL.

Lubricator for Steam-Engines.

No. 159,962.

Patented Feb. 16, 1875.

FIG. 1.

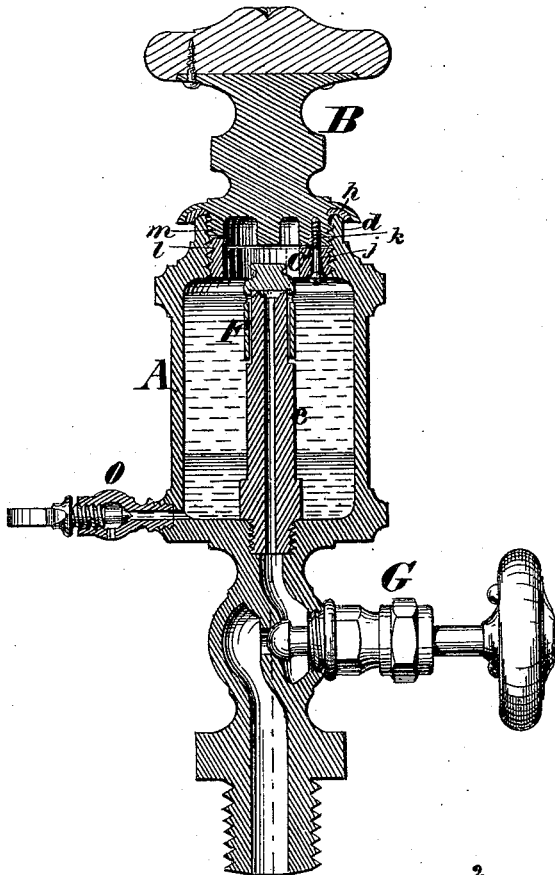


FIG. 2.

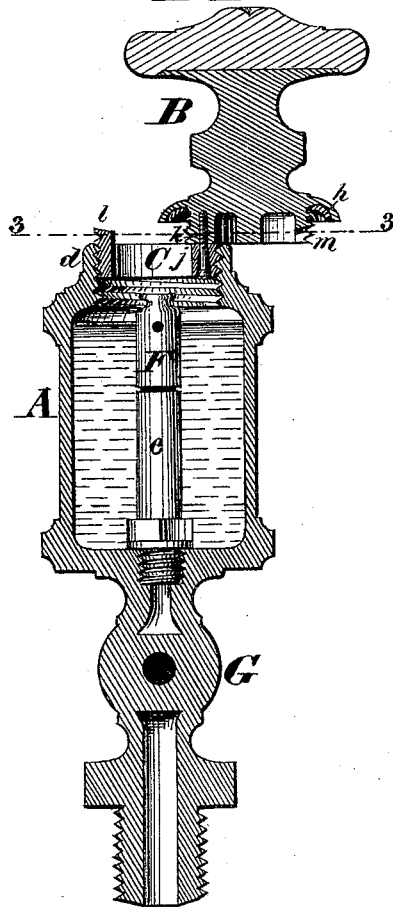
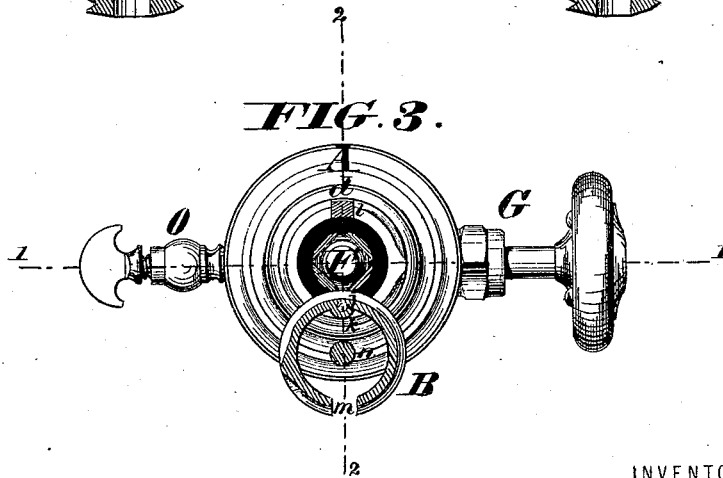


FIG. 3.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO.

## IMPROVEMENT IN LUBRICATORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **159,962**, dated February 16, 1875; application filed October 21, 1874.

*To all whom it may concern:*

Be it known that I, JAMES POWELL, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Lubricator for Steam-Engines, of which the following is a specification:

This is an improvement in the class of engine-lubricators known as being automatic in action, in which a delivery-tube is placed within the cup or cistern, so as to receive the oil or other lubricant at the top of the cistern, the oil being supported at the proper level by the waters of condensation formed from the steam within the cistern. In oil-cups of this class a serious difficulty has been to render the automatic regulating-valve positive and reliable in its action, and the principal cause of this difficulty has been the liability of ordinary valves to stick to their seats, or the passages to become obstructed from various causes, so as to render the steam-pressure on the exposed surface of the valve inadequate to lift the latter. It has also been customary to construct such lubricators with a cap screwing into the neck of the cup to prevent any escape of steam while in use without any means for supporting such caps while unscrewed for the purpose of refilling the cistern. This is productive of considerable inconvenience, rendering the cap liable to be lost or misplaced, as, for instance, on a locomotive in motion while the engineer is engaged in refilling the cups.

The present invention consists in means for remedying or obviating the difficulties above stated, as hereinafter set forth.

In the accompanying drawing, Figure 1 is an axial section of an improved lubricator for steam-engines illustrating this invention, the same being represented in closed condition. Fig. 2 is an axial section in a plane at right angles to that of Fig. 1, and represents the improved lubricator in open condition as having been just refilled. Fig. 3 is a plan view, partly in horizontal section, through the cap and its retaining-ring, with the former turned to one side, as for refilling.

The planes of the respective sections are represented by dotted lines correspondingly numbered in the other figures.

Referring to the drawing, A represents the

body or shell of an engine-lubricator. B is a screw-cap; C, a retaining-ring applied to the cap B; *d*, the neck of the cup A; *e*, a central discharge-tube within the cup; F, a regulating-valve; G, a stop-valve for opening or closing communication between the engine and cup; *h*, packing of soft metal or other suitable material applied to the rim of the cap B, to insure a tight joint between the same and the top of the neck *d*. *j* represents a pivot-screw passing freely through the ring C and tapped into a boss, *k*, on the inside of the cap-shank. *l* represents a pin or projection on the upper face of the ring C; and *m*, a notch in the lower surface of the cap-shank to receive said pin. *n* represents a central stem projecting downward from the cap *d* sufficiently far to prevent the valve F from being raised too high when the lubricator is in operation. O represents a pet-cock for drawing off the waters of condensation preliminary to refilling the cup with oil.

In lubricators made after my plan the automatic valve F, for regulating the flow of oil, is placed wholly outside of the discharge-tube *e*, constituting what is known as a "sleeve-valve," and is constructed so as to move freely upon the discharge-tube while its bearing is upon the top and outer edge thereof. The upper end of the discharge-tube *e* is also countersunk or made flaring, so as to form a narrow or sharp valve-seat at the outer edge, and to expose as nearly as possible the entire area of the head or face of the valve. There are openings around the circumference of the valve, just below the bearing, to permit the oil to pass through and down the tube when the valve is raised. These openings also constitute passages for steam and the waters of condensation into the cistern as the oil is discharged.

This construction of valve and the discharge-tube insures two results, namely: first, the automatic movement of the valve at each stroke of the piston, because of the large area prevented by the head of the valve and the consequent greater amount of pressure exerted thereon; second, freedom from liability of the regulating-valve to stick or set fast upon the discharge-tube.

The cap B, made with an ordinary screw-

shank, is provided with an extension in the ring C, which is attached thereto by the pivot-screw *j*, projection *l*, and notch *m*. This ring acts as a safety-piece to retain or hold the cap B, when the cap is unscrewed from its place in the neck *d*. The projection and notch *l m* unite the cap and ring, so that they may be screwed in and unscrewed together; and the pivot-screw *j* working loosely in the ring provides for disengaging the notched shank from the projection, and for turning the released cap to one side, so as to expose the neck-orifice for refilling, as illustrated in Figs. 2 and 3.

The operation is as follows: When it is desired to obtain access to the cistern or cup-chamber the cap B is unscrewed until the dividing-line between the cap B and ring C appears above the top of the neck *d*, when the cap is slightly tilted back on the pivot-screw *j* until the projection *l* is disengaged from the notch *m*. The cap is then turned round on the pivot and swung out of the way without further unscrewing. The neck-opening is thus left free to admit oil to the chamber or cistern. When it is desired to close the cup the cap B is turned back until the projection *l* is opposite the notch *m*. The cap is then dropped onto the ring, and both are screwed into place. As soon as the steam is turned on by means of the stop-valve G the regulating-valve F is raised until its openings are on a level with the top of the discharge-tube *e*, when a small amount of oil passes through and down the tube. The equilibrium of pressure being restored the valve F drops and cuts off the supply of oil until the next stroke of the piston and a sufficient quantity of steam is condensed to reduce the pressure in the chamber A. The lubricant being of less specific gravity than the water of condensation it floats on the latter, and is thus kept up to the proper level until exhausted.

It is obvious that slight modifications can be made in the construction of the safety-ring attachment without deviating from the general principle which it embodies; for instance, the pivot-screw *j* may be displaced by a hinge, which may be so arranged as to close within the periphery of the screw-shank, and, with or without the notch and matching projection, may serve to carry the safety-ring in screwing and unscrewing. The sleeve-valve can also be operated from the cap, and have its principal bearing above the top of the discharge-tube, and in the cap itself, having only a sufficient prolongation below the top of the tube to cut off the oil in the manner described.

I am aware that a perforated sleeve-valve operated by a piston and spring within the conducting-tube of an automatic lubricator has been patented. In the present improvement the discharge-passage is left entirely clear.

I claim as new and of my invention—

1. The retaining-ring C, in combination with a screw-cap, for oil-cups or other purposes, substantially as herein described.

2. The combination of the discharge-tube *e*, constructed with a countersunk or flaring upper end, forming the valve-seat at its outer edge, and the regulating-valve F, forming a sleeve, and constructed with lateral perforations at its upper end for the admission of steam to the cistern, and for the escape of the lubricant as floated up by the water of condensation, substantially as herein shown and described, for the purposes set forth.

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Witnesses:

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