

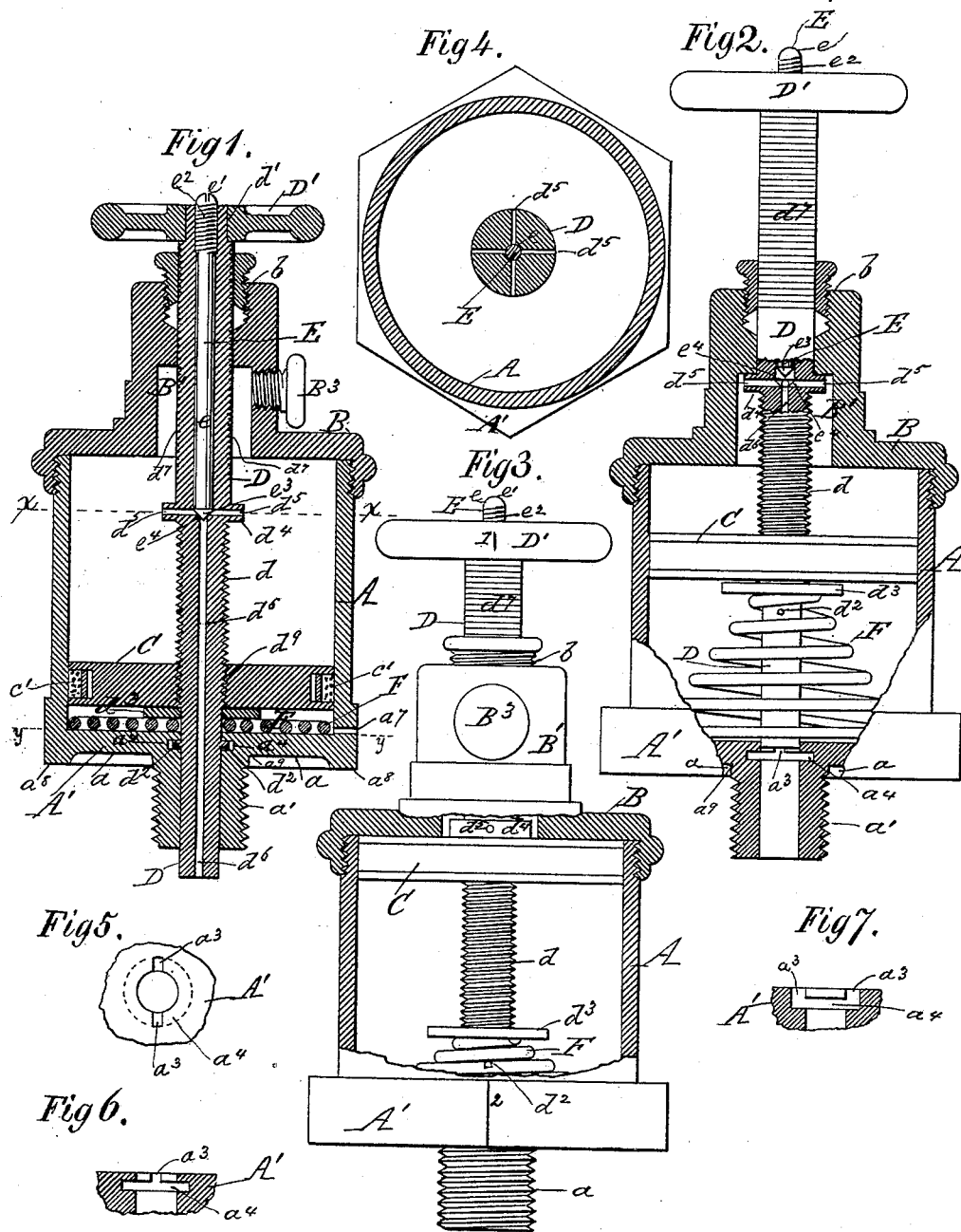
(No Model.)

2 Sheets—Sheet 1.

B. S. REYNOLDS & W. A. ORR.
LUBRICATOR CUP.

No. 422,038.

Patented Feb. 25, 1890.



Witnesses:
J. P. TheodLang.
E. J. Fenwick

Inventor:
Benjamin S. Reynolds.
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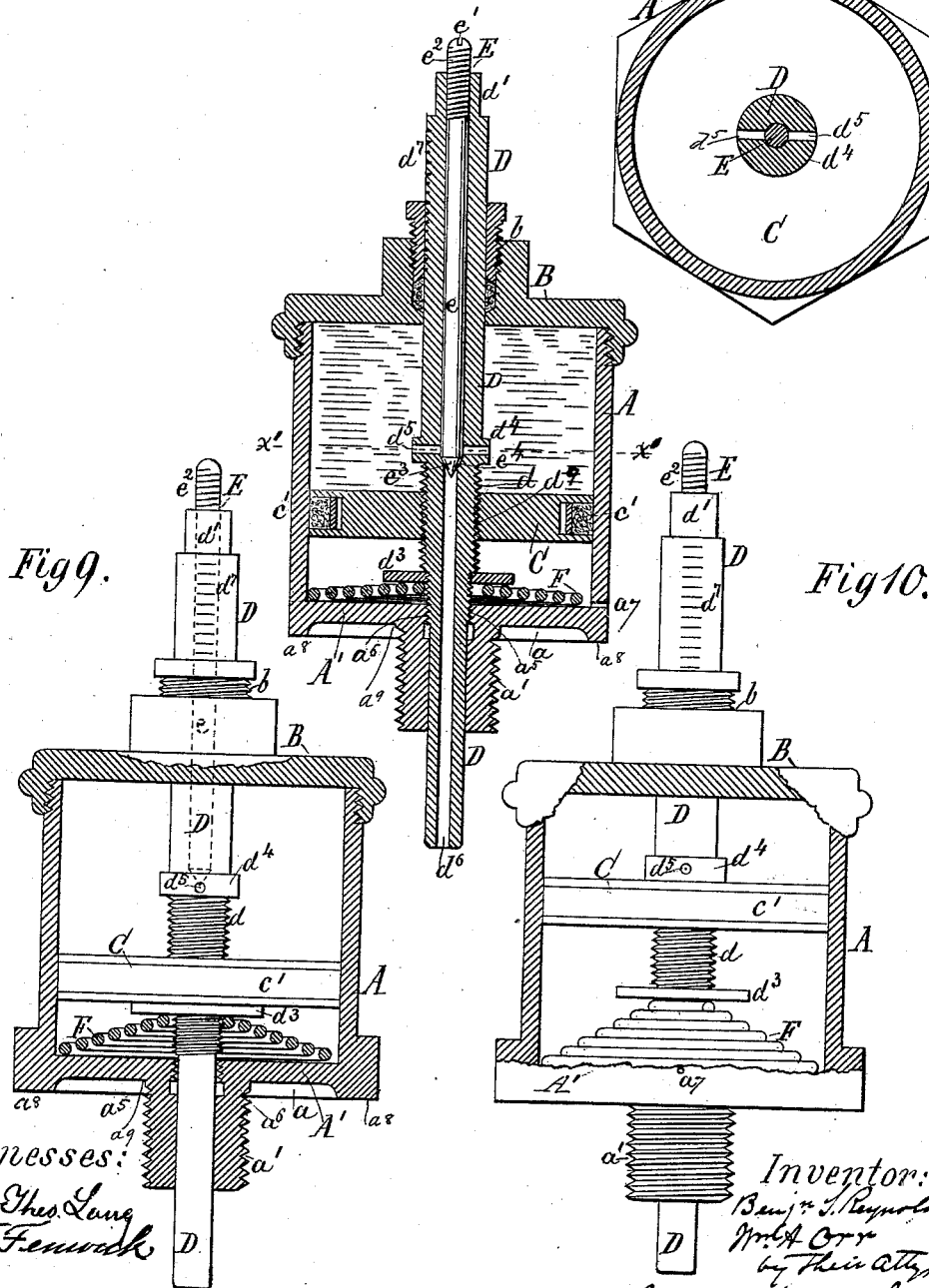
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Fig 8.

Fig 11.



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UNITED STATES PATENT OFFICE.

BENJAMIN S. REYNOLDS AND WILLIAM A. ORR, OF SCRANTON, PENNSYLVANIA.

LUBRICATOR-CUP.

SPECIFICATION forming part of Letters Patent No. 422,038, dated February 25, 1890.

Application filed June 27, 1889. Serial No. 315,713. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN S. REYNOLDS and WILLIAM A. ORR, citizens of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Lubricator-Cups; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to lubricators; and it consists in certain novel constructions, combinations, and arrangements of parts hereinafter described and specifically claimed, whereby a novel forcing-lubricator for grease or nearly-fixed lubricants is produced, which is very simple in construction and easy of operation.

In the accompanying drawings, Figure 1 is a vertical central section of our lubricator disconnected from its bearing-support, showing the interior parts as they would appear had the lubricator been screwed to its support and filled and ready for having its piston unlocked and being set in operation. Fig. 2 is a vertical section of the lubricator and a forcing-spring, taken at a right angle to Fig. 1, and representing the same after the piston-rod has been turned or unlocked and as it appears after having been some time in operation. Fig. 3 is an elevation and sectional view of the lubricator, exhibiting the piston of the lubricator at its highest elevation upon the piston-rod, and illustrating how the force of the spring is augmented by lowering the piston-rod and collar after the piston has been moved to about the position shown in Fig. 2. Fig. 4 is a horizontal section of the lubricator in the line xx of Fig. 1. Fig. 5 is a broken detail plan view of a portion of a bottom of the lubricator as seen from above the line yy in Fig. 1. Fig. 6 is a broken detail vertical section of the bottom portion of the lubricator. Fig. 7 is a similar view to Fig. 6, except that the section is taken at a right angle to said figure. Fig. 8 represents in vertical section a modification of the invention, the parts being in substantially the same condition as in Fig. 1. Fig. 9 is a

vertical section of the said modification taken at a right angle to Fig. 8, and representing the same after the piston has been unlocked and is ready for operation. Fig. 10 is an elevation and a sectional view of said modification, exhibiting the piston of the lubricator at a greater elevation on the piston-rod, and illustrating how the force of the spring is augmented by lowering the piston-rod and collar after the piston has been moved to about the position shown in Fig. 2; and Fig. 11 is a horizontal section of the said modification in the line $x'x'$ of Fig. 8.

The letter A in the drawings represents the vertical body portion of the lubricator; A', the bottom, and B its screw-cap.

C is a piston, D a hollow piston-rod, E a feed-regulation valve, and F a force-spring.

The body A of the lubricator may be of cylindrical or of other suitable shape, while its bottom A' is flat on its upper side and provided with a depression a on its under side, outside of which is an annular base-flange a^s and a central screw-threaded foot portion a' , by which latter it is fastened to the bearing to be lubricated. The lubricator by being formed with the depression a will, when fastened to its support or bearing and its annular flange a^s is in contact with said support, withstand accidental blows without breaking off, from the fact that the fulcrum of strain is not, as commonly, at the angle a^9 formed by the junction of the body A' with portion a' , but at the periphery of the body portion A of the lubricator, and consequently bending or breaking off of the lubricator at said angle a^9 is prevented.

The body portion A is closed by a screw-cap B, which is provided with stuffing-box b for the piston-rod D, and may have a chamber B' with a filling-passage closed by a screw-plug B^s, as shown in Figs. 1, 2, and 3; or it may be closed by an ordinary screw-cap B, as shown in Figs. 8, 9, and 10.

The piston C is suitably packed at c' and held upon the piston-rod D by a screw fitting $d d^9$, the piston-rod being provided with the screw-thread d , which is of greater longitudinal extension than the thickness of the piston and the piston provided with the shorter screw-thread d^9 . By this construction the

piston C can be vertically adjusted on the rod D by turning the latter, which can be effected by a hand-wheel D', fastened upon the square end d' of the piston-rod. The piston-rod below the screw-thread d may be provided with two coupling and locking pins d^2 , as in Figs. 1, 2, and 3; or with a coupling and locking screw a^5 , of reduced diameter, as in Figs. 8 and 9.

10 In the bottom A' of the body A, Figs. 1 and 2, the passage for the lower stem of the piston-rod is enlarged by cutting an annular groove a^4 below the surface of the said bottom A', and the locking-pins d^2 enter this 15 groove by means of two diametrically-opposite vertical passages a^3 , and when said groove is thus entered by said pins and the pins are turned out of coincidence with the passages, as illustrated in Fig. 1, by turning the piston-rod slightly the piston will be locked down 20 so that the lubricator may be filled with lubricant without inconvenience from the upward pressure of the spring against the piston.

Instead of the locking device just described, 25 the said piston-rod passage may be provided with an inner screw-thread a^6 and the piston-rod locked by means of the screw-thread a^5 entering the screw-thread a^6 , as shown in Fig. 8.

30 At the shoulder formed by the screw thread d a collar d^3 is provided upon the piston-rod and fastened by frictional contact or in any other suitable manner, and another shoulder d^4 is provided on the piston-rod at the upper 35 termination of the screw-thread d , and between the shoulder b^4 and collar d^3 the piston is movable up and down on the piston-rod by means of the male screw d and female screw-thread d^9 . The conical spring F is interposed between the bottom A' of the body 40 portion A and the collar d^3 , and by means of said spring the piston is forced upward against the lubricant in the said body portion above the piston. The piston-rod D extends upward through and beyond the stuffing-box b 45 of the screw-cap B, and also down through and beyond the screw portion a' at the bottom of the said body portion A. The shoulder d^4 is provided with a number of diametrically-opposite passages d^5 , which connect with an 50 axial passage d^6 extending downward into the bearing to be lubricated, said passages serving for conducting nearly solid lubricant from the chamber above the piston down to 55 the bearing to be lubricated. The passage of the lubricant from the lubricator is regulated or shut off by means of a valve E, fitted in the upper portion of the piston-rod, and consisting of a rod e , with a nicked top e' , screw-thread e^2 , and a conical lower valve-face e^8 , which 60 latter is fitted to a corresponding valve-seat e^4 at the upper termination of the passage d^6 , while the adjusting-screw thread e^3 is fitted into the corresponding female screw-thread 65 in the upper end of piston-rod D.

When the lubricator is to be put into use, the piston C is screwed down upon the piston-

rod D until it comes in contact with the collar d^3 , whereupon the piston, its rod, and the collar d^3 are pushed down against the spring 70 F until the pins d^2 pass through the passages a^3 and come horizontally in range with the annular groove a^4 , when the piston-rod is turned so as to move the pins into the groove and lock the piston down near the bottom of 75 the bottom portion A; or the said parts are pushed down until the screw-thread a^5 touches the screw-threaded portion a^6 of the body portion, whereupon the piston-rod is turned into said screw-threaded portion a^6 until it is 80 locked so as to be capable of withstanding the tension of the spring. If the locking is effected by the pins d^2 , the collar and piston do not change their relation to one another; but if it is effected by the screw-threads a^5 a^6 85 the collar d^3 is moved downward away from the piston a short distance, the piston, owing to its frictional resistance against the inner surface of the body portion A', being kept from revolving. The screw-plug B³ of the 90 cap is now removed and the body portion filled with lubricant; but, if desired, the filling operation may be effected by removing the cap. The screw-plug B³ or cap B being replaced, the piston-rod D is un- 95 locked by turning the pins d^2 in line with the passages a^3 or by unscrewing it from the threaded portion a^6 of the bottom of the body portion, and when thus adjusted the collar and piston occupy either the position rela- 100 tive to one another shown in Fig. 1 or Fig. 9. The valve E is now raised by means of the screw e^2 , so as to open passages d^5 d^6 , and the piston and piston-rod, under the adjustment of the parts as described being free to be 105 forced up by the spring D, said spring by exerting its power upon the collar d^3 , piston-rod D, and piston C gradually forces out the lubricant from within the body portion A through the passages d^5 into the passage d^6 110 of the piston-rod, from whence it goes into the bearing to be lubricated, the quantity discharged in a given time being governed by the size of the opening between the valve-surface e^8 and valve-seat e^4 . Whenever the 115 lubricant becomes consumed to such an extent as to render the force of the spring too weak for effectively raising the piston farther and thereby forcibly discharging the lubricant, the collar d^3 is screwed down upon the 120 spring away from the piston, as illustrated in Figs. 3 and 10, and thereby the upward force of the spring upon the piston augmented and a more forcible discharge effected during the latter portion of the stroke of the piston. In 125 order to avoid resistance from air in the chamber containing the spring F a vent-hole a^7 is provided in the body portion A below the piston, and in order to indicate the upward progress of the piston under the force 130 of the spring a scale d^7 is provided upon the piston-rod, and thus the effect of adjusting the valve E for increasing or decreasing the feed of the lubricant can be immediately ob-

served, and if further adjustment is necessary it can by means of the scale be made with certainty, and in order to facilitate the register of the pins d^2 with the passages a^3 index-marks 1 and 2 may be provided, as shown in Fig. 3.

In operating our lubricating-cup it does not require that the cap and the piston shall be removed together. On the contrary, when the cap is removed the piston is locked down in the cup and the cup filled with the piston within it; or if the cap should not be removed the piston is locked down in the cup and the cup filled through the opening at B^3 while the piston is within it. The means for adjusting the force of the spring, as well as the spring, can also remain in the cup while the cap is being removed independently of the piston. Thus it will be seen that our invention differs materially from those structures wherein the piston is connected with the cap of the lubricator-cup, and both piston and cap must be removed together for the purpose of filling the cup; also, that it differs from those constructions wherein the spring-regulating collar is arranged in an extension of the cap of the cup, and the cap, piston, and regulating device are removed together when it is desired to fill the cup.

It will be seen from the foregoing description and accompanying drawings that the construction of a lubricator in accordance with our invention requires very little labor and very little skill, while by reason of its easy operation and efficiency it may be entrusted to workmen of less than average capabilities and cautiousness.

What we claim is—

1. The combination, with a lubricator-cup having a cap removable independently of the piston, of the described piston-locking mechanism below the piston, a forcing-spring below the piston, a screw-threaded piston, and screw-threaded piston-rod carrying collar d^3 below the piston for increasing the force of said spring, substantially as described.

2. A lubricator having cap B, having cham-

ber B' , and plug B^3 , hollow piston-rod D, having a shoulder d^4 , adjustable piston C, and a spring F, said shoulder being provided with passages for conducting the lubricant into a passage in said piston-rod above the piston and therefrom to a point below the piston, substantially as described.

3. The combination, with a lubricator-cup having a cap removable independently of the piston, of the piston-locking mechanism described, whereby the piston is held down while the lubricator is being filled with lubricant with the piston C, hollow piston-rod D, having an oil-passage and forcing-spring F, substantially as described.

4. The combination of the piston-rod D, carrying piston C and having pins d^2 , and the cup having bottom A' , provided with the passages a^3 and annular groove a^4 , substantially as and for the purpose described.

5. The combination of the body A of the lubricator, spring F, piston C, and piston-rod D, having a passage d^5 above the piston, and a connecting-passage d^6 , leading out below the same, substantially as and for the purpose described.

6. The combination, with the hollow piston-rod D, carrying piston C and having passages d^5 d^6 and screw-threaded and provided with a valve-seat e^4 above the piston, of the valve E, having valve-face e^3 and screw-thread e^2 , substantially as described.

7. The combination, with the body A of the lubricator having a cap B, of the spring F, piston C, and hollow piston-rod D, having a scale d^7 provided with down and lateral passages, and a lubricant-discharge-regulating valve, substantially as and for the purpose described.

In testimony whereof we hereto affix our signatures in presence of two witnesses.

BENJAMIN S. REYNOLDS.
WILLIAM A. ORR.

Witnesses:

RICHARD NICHOLLS,
JOHN L. JENKINS.