W. H. ROBERTS.

FORCED FEED OIL CUP.

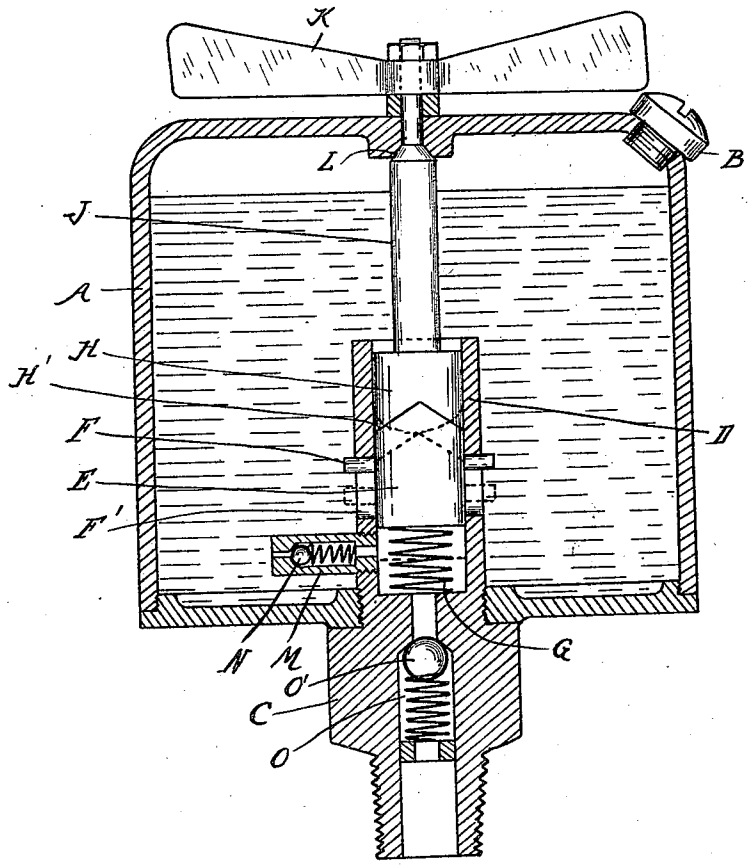
APPLICATION FILED AUG. 30, 1919.

1,407,086.

Patented Feb. 21, 1922.

2 SHEETS—SHEET 1.

Fig. 1.



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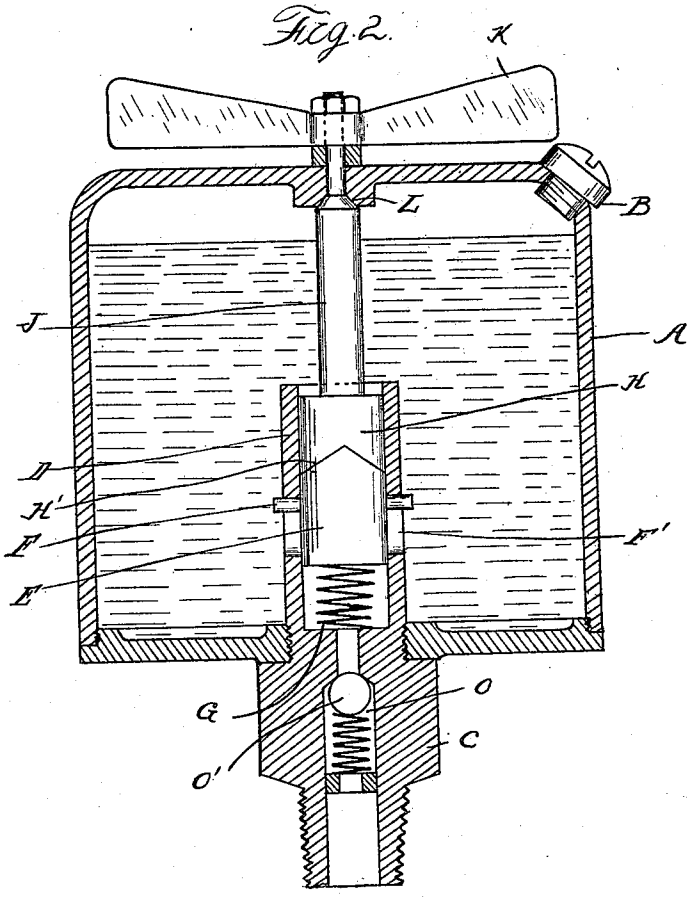
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. ROBERTS, OF DETROIT, MICHIGAN, ASSIGNOR TO ROBERTS BRASS MANUFACTURING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

FORCED-FEED OIL CUP.

1,407,086. Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed August 30, 1919. Serial No. 320,754.

To all whom it may concern:

Be it known that I, WILLIAM H. ROBERTS, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Forced-Feed Oil Cups, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to forced feed oil cups, and has reference particularly to a plunger actuating mechanism for a forced feed oil cup.

It is an object of the invention to provide an oil cup having a plunger reciprocatory therein to discharge the oil and to provide a rotative member for actuating said plunger, the rotative member being extended through a wall of the cup.

A further object of the invention is to provide a plunger mechanism for a forced feed oil cup in which the discharge stroke of the plunger is actuable by a rotative cam member provided with a stem passing through a wall of the cup and having a thrust bearing on said wall, the suction stroke of the plunger being effected by a spring which also normally subjects said cam member to a pressure tending to firmly seat the said stem at said thrust bearing so as to avoid a possible leakage of oil.

Still another object of the invention is to provide a forced feed mechanism for a lubricator cup comprising a plunger for ejecting from the cup a definite quantity of oil at each stroke and a rotative actuating member for said plunger tending to snap into its position corresponding to the raised position of the plunger so that both the plunger and its actuating member automatically assume the initial position for another stroke after any stroke has been completed.

The invention further consists in the various structural features and arrangements of parts hereinafter fully described.

Figure 1 is a view of the invention in sectional elevation.

Figure 2 is a similar view of an alternative construction.

Referring first to Figure 1, the reference character A designates an oil cup provided in its upper portion with a fill opening closed normally by the plug B. C is a nipple screw threaded in the bottom of said cup for attaching the latter to the machine or part to be lubricated.

D is a cylinder within the cup A formed as an upward extension of the nipple C, the top of said cylinder being open. A plunger E is mounted within said cylinder and is restrained from rotation therein by oppositely projecting pins F engaging in vertical slots F′ formed in the cylinder. The upper and lower limiting positions, between which said plunger travels, are indicated in the drawings respectively in full lines and dash lines. The upstroke or suction stroke of the plunger is actuable by a spring G compressed between said plunger and the nipple C. The down stroke or discharge stroke of the plunger is actuable by a rotative cam member H engaging in the upper portion of the cylinder B, the opposing end faces of said cam member and the plunger being correspondingly V-shaped as indicated at H′. The member H is provided with an upwardly extending stem J passing through the top of the oil cup and carrying above the oil cup the actuating handle K. The stem J is formed with a beveled shoulder L which has a thrust bearing upon a correspondingly shaped seat, interiorly provided upon the top of the oil cup. M is an intake fitting for the cylinder D communicating with the latter just below the plunger E when the latter is raised, said fitting housing the spring pressed check valve N. Said valve yields upon the rising of the plunger and admits a charge of oil beneath the plunger. This oil is discharged upon the down stroke of the plunger through the passage O formed in the nipple C. A spring pressed check valve O′ in said passage closes the same on the up stroke of the plunger but yields to permit of a discharge of oil upon the down stroke.

In the operation of the described mechanism when the cam member H is rotated through a half circle by means of handle K the engagement of the two V-shaped cam faces H′ forces the plunger E downwardly to the position disclosed in dash lines, the charge of oil beneath the plunger being thereby ejected through the passage O. Either a continued rotation of the handle K to complete its circle or a return thereof to its initial position will permit the spring G to again elevate the plunger

E and thus draw another charge of oil into the cylinder through the fitting M. Thus, a return movement of the cam member H to its normal position, shown in full lines in the drawings, is effected after each down stroke of the plunger. Such return movement will be effected by the spring G acting through the cam faces H′, since in the lower positions of the plunger said cam faces have their apices engaging each other and providing insufficient bearing faces to hold the plunger down.

In the normal raised position of the plunger the pressure of spring G is exerted therethrough on the cam H and stem J to seat the beveled shoulder L of said stem securely on its thrust bearing, thus avoiding any possibility of leakage. Aside from the provision of this bearing, however, the fact that the use of a reciprocatory actuating member is avoided, is a provision against leakage, since obviously a reciprocatory member would tend to discharge a certain amount of oil through its slide bearing. It is a feature of the invention that the actuating member has a snap movement to its position corresponding to the raised position of the plunger so that the mechanism is always positioned ready for ejecting a charge of oil, and the operator may be always aware of the lubricating effect secured through any rotation imparted to the handle K.

The construction shown in Figure 2 duplicates that which has been described with the exception that necessity for the intake fitting M and the check valve N is eliminated by so positioning and proportioning the slots R, corresponding to the slots F′ of Figure 1, that the lower ends of the same are uncovered by the plunger E when the latter is in its normal raised position, so that a charge of lubricant is admitted below the plunger through said slots.

What I claim as my invention is:

1. The combination with an oil cup, of a plunger operable therein for forcing a discharge of oil, and a rotative actuating member for said plunger coaxial therewith and extending exteriorly of the cup and journaled in a wall thereof.

2. The combination with an oil cup, of a plunger operable therein for forcing a discharge of oil, a rotative member for actuating the discharge stroke of the plunger, an actuating stem for said member extending through a wall of the cup and having an interior thrust bearing upon said wall, and a spring actuating the suction stroke of the plunger and acting through the plunger and said rotative member upon said stem to seat the latter and establish a seal at said thrust bearing.

3. The combination with an oil cup, of a plunger for actuating the discharge of oil therefrom, a rotative cam member within said cup engaging said plunger for actuating the discharge stroke thereof, a spring for actuating the suction stroke of the plunger, and a stem extending from said cam member through a wall of the oil cup.

4. The combination with an oil cup, of a cylinder therewithin, a plunger reciprocatory within said cylinder, a rotative actuating member for said plunger withing said cylinder, and a stem for said actuating member extending exteriorly of the oil cup and journaled in a wall thereof.

5. The combination with an oil cup, of a nipple engaging the bottom thereof having a discharge passage therethrough, a cylinder within the oil cup formed as an extention of said nipple and connecting with said passage through the nipple, said cylinder having an oil inlet, a plunger reciprocatory in said cylinder, a rotary actuating member for the plunger within said cylinder, and a stem for said plunger extending exteriorly of the oil cup.

6. The combination with an oil cup, of a cylinder therein having an oil inlet communicating with the oil cup, and an oil outlet extending exteriorly of the oil cup, said cylinder having its walls oppositely longitudinally slotted, a plunger reciprocatory within said cylinder, pins projecting from said plunger engaging said slotted cylinder to restrain the plunger against rotation, a rotary actuating member for the plunger within the cylinder, and a stem for said actuating member extending exteriorly of the oil cup.

7. The combination with an oil cup, of a reciprocatory plunger, and a rotary actuating member therefor within said oil cup, said plunger and actuating member having complementary V-shaped cam faces, and a stem for said actuating member extending exteriorly of the oil cup, rotation of said actuating member in either direction effecting reciprocation of said plunger.

8. The combination with an oil cup, of a plunger therein for actuating the discharge of oil, a rotary actuating member for said plunger, a stem for said actuating member extending through the cup, and means acting upon the plunger to return the same to its raised position and acting through the plunger upon an actuating member to rotatably shift the latter to a corresponding position.

9. The combination with an oil cup, of a cylinder carried by said cup formed with a longitudinal slot opening into the oil cup, a plunger reciprocatory within said cylinder uncovering the lower end of said slot when raised, means maintaining the plunger normally raised, a pin projecting from the plunger into said slot restraining the plunger from rotation, actuating means for the plunger, a discharge passage for the cylin-

der, and means normally closing said passage.

10. The combination with an oil cup, of a plunger operable therein for forcing a discharge of oil, a rotative member for actuating the discharge stroke of the plunger, an actuating stem for said member extending through and journaled in a wall of the cup and formed with a bevelled annular shoulder engaging a correspondingly bevelled thrust bearing interiorly of the cup and a spring actuating the suction stroke of the plunger and acting through the latter upon said stem to seat the latter firmly on said thrust bearing.

In testimony whereof I affix my signature.

WILLIAM H. ROBERTS.