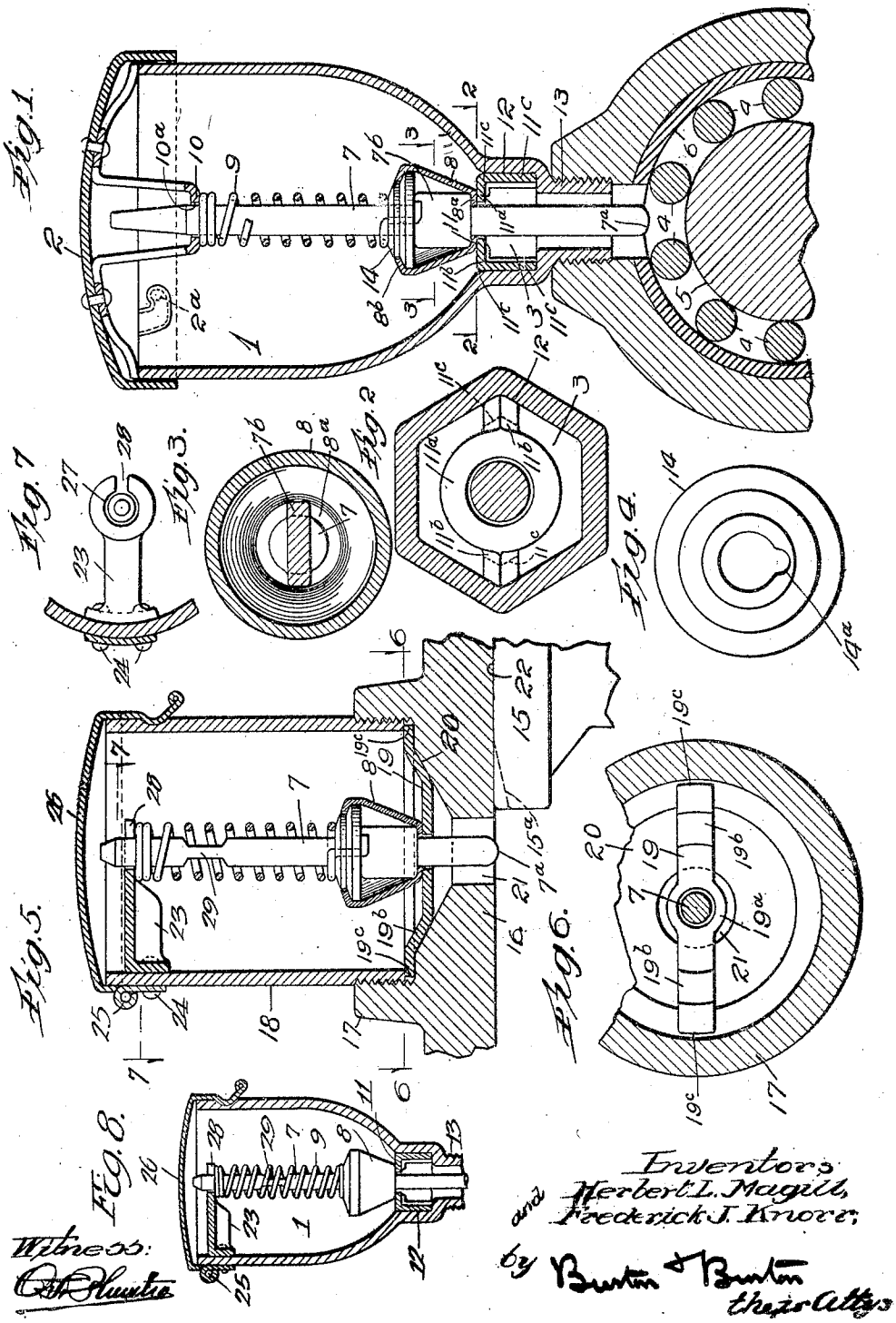
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LUBRICATOR

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Witness:

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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

Application filed May 23, 1917, Serial No. 170,548. Renewed May 17, 1923.

To all whom it may concern:

Be it known that we, HERBERT L. MAGILL and FREDERICK J. KNORR, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Lubricator, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to means for supplying a heavy lubricant such as grease to a bearing, and includes mechanically actuated means for facilitating and regulating the feed of such lubricant. It consists in the features and elements and their combination hereinafter described and shown in the drawings as indicated by the claims.

In the drawings:—

Figure 1 is an axial section of a lubricator embodying this invention, showing such lubricator applied to a roller bearing, said bearing being shown in section transverse to the axis of rotation.

Figure 2 is a detail section taken as indicated at line 2—2 on Figure 1.

Figure 3 is a detail section taken as indicated at line 3—3 on Figure 1.

Figure 4 is a detail section at line 4—4 on Figure 1.

Figure 5 is a partial axial section of a modified form of lubricator shown applied to another form of bearing.

Figure 6 is a transverse section taken as indicated at line 6—6 on Figure 5.

Figure 7 is a detail section taken as indicated at line 7—7 on Figure 5.

Figure 8 is an axial section of a lubricator showing certain detail features of Figure 1 combined with other detail features of the form shown in Figure 5.

This invention relates to that class of lubricators known as grease cups, which in their simplest form are merely receptacles for a quantity of grease, each receptacle being arranged with a removable cover for filling it, and with an outlet leading to the bearing to be lubricated. Referring first to Figure 1, it will be noticed that the lubricator embodying this invention comprises a shell or chamber, 1, adapted to contain a quantity of grease and provided with a removable cover, 2. The side walls of the chamber, 1, converge toward an outlet opening, 3, leading directly to the portion to be lubricated, which, as shown in Figure 1, consists of the rollers, 4, and runways, 5 and 6, of a roller bearing. To facilitate the passage of grease through the chamber, 1, to the outlet, 3, a feed pin, 7, is mounted in the chamber, with its end portion extending through the outlet, 3, the extreme end of the pin being rounded at 7^a, to act as a cam in contact with the rollers, 4, of the bearing, as they pass successively across the opening into which the outlet, 3, of the lubricator discharges.

The feed pin, 7, is provided with an enlargement consisting of a shell, 8, secured to the pin at a portion adjacent the converging walls of the chamber, 1, said shell being tapered with its smaller end toward the outlet, 3, so that reciprocation of the pin, 7, along its own axis, causes the shell, 8, to force the grease downwardly through the converging walls of the chamber, 1, toward the outlet, 3, and such reciprocation of the pin, 7, will be caused by contact of its rounded end, 7^a, with the successive rollers, 4, whenever they are caused to travel upon the runway, 5, by rotation of the journal, 6, of the bearing. To render this movement of the pin, 7, more positive and certain, a spring, 9, may be provided, arranged to yieldingly resist movement of the pin away from the outlet, 3, thus insuring the return of its cam portion, 7^a into the path of the rollers, 4, after each contact with one of said rollers in their travel. This spring, 9, as shown, is coiled around the portion of the pin, 7, within the larger part of the chamber, 1, said spring reacting against the upper side of the enlargement, 8, and a guide, 10, provided for the end of the pin remote from the outlet, 3, said guide being supported upon the removable cap, 2.

The protrusion of the cam portion, 7^a, of the pin, 7, into the path of the rollers, 3, is limited by providing a stop member, 11, which serves also as a guide extending across the constricted throatway of the chamber 12, between the position of enlargement, 8, on the pin, 7, and the outlet, 3, of the chamber. As shown, the outlet, 3, is formed in a threaded neck, 13, by which the lubricator is secured to the bearing, and for convenience in attaching or detaching it, the throatway, 12, is of a non-circular

form shown in Figure 2 as hexagonal. The stop member, 11, may therefore be formed as indicated in Figure 2, comprising a middle apertured portion, 11^a, serving as a guide for the pin, 7, and provided with outwardly extending arms, 11^b, whose terminal portions are bent transversely of the plane of the guide portion, 11^a, at 11^c, for frictional contact with the walls of the throatway, 12. Preferably the arms, 11^b, are inverted V-shape in cross section, so that they may not seriously interfere with the feed of the grease through the throatway, 12, and the terminal portions, 11^c, may also be V-shape, so as to fit in the angles of the hexagonal throatway, 12.

The details of construction of the enlargement of the feed pin, 7, may be noticed by comparison of Figures 1, 3 and 4. As indicated in Figure 3, the pin, 7, at this point is flattened and thereby widened, to form shoulders facing toward its opposite ends respectively, said flattened portion being indicated at 7^b. A flange, or collar, 14, is applied to the pin, 7, against one of these shoulders, while the frusto-conical shell, 8, is slipped on over the other end of the pin for engagement of its lower flange, 8^a, with the other shoulder of the flattened portion, 7^b. The upper end of the shell, 8, at its larger diameter, is then crimped or pressed down around the collar, 14, as shown at 8^b, whereby the flange 14, is permanently secured in position. If desired, to prevent the spring, 9, from being lost when the chamber, 1, is opened and in case the parts are removed, the lower end of said spring may be inserted through a notch, 14^a, in the collar, 14, and bent against the under side of said collar, 14, before the shell, 8, is applied. The upper guide member, 10, against which the spring, 9, reacts, may be simply a strip of metal riveted as shown to the cover, 2, at two points and bent to depend from said cover, and having an aperture, 10^a, in such depending portion to receive the upper end of the pin, 7. The cover, as indicated, at 2^a, is secured to the chamber wall by means of a "bayonet lock."

Figure 5 illustrates the application of the mechanically actuated feed pin, 7, to a cross-head slide bearing, a fragment of the cross-head being indicated at 15, and the bearing member, 16, being shown as formed with an annular boss, 17, interiorly threaded to receive a plane cylindrical shell, 18, which forms the chamber of the lubricator. With this construction, a simplified form of guide and stop is provided at 19, being merely a strip of metal having a central apertured disk portion, 19^a, embracing the pin, 7, and positioned to engage the enlargement, or shell, 8, as a stop, and having outwardly extending arms, 19^b, which may lie as shown on the sloping walls, 20, which connect the interior of the shell, 18, with the outlet opening, 21, leading to the bearing surface, 22. The extreme terminal portions of the arms, 19^b, may be clamped in position by the screwing down of the tubular shell, 18, in the threaded boss, 17, these portions being shown at 19^c. The rounded end of the feed pin, 7, extends just sufficiently in the path of the cross-head, 15, to be actuated thereby, and, if desired, the end portion of said cross-head may be formed with a gradually sloping surface, 15^a, for contact with the rounded portion, 7^a, of the pin, 7. Figure 5 and Figure 7 also show a modified form of guide for the arm of the feed pin, 7, remote from the throatway; this consists in a bracket, 23, secured to the side wall, 18, by the same rivets, 24, which serve to hold the hinge, 25, for the cover, 26. Adjacent the guide opening, 27, the arm is formed with a slot, 28, communicating with said opening and through which a thin portion, 29, of the pin, 7, may be entered in assembling the parts.

It will be understood that the differences in detail construction shown in Figure 5 are not essential to the adaptation of the lubricator to a cross-head bearing as distinguished from a roller bearing; but said figure is merely used for convenience in showing these modifications of detail. Since in both forms of grease cup illustrated, the guide for the lower portion of the feed pin is readily removable, and since in both forms of guides, 10 and 19 respectively, the central apertured portion is a disk, it will be evident that these guides may be made with central disks of various sizes so that by replacing one guide with another having a central disk portion of different size, the unobstructed area of throatway may be varied and the rate of feed of the grease cup thus varied for different installations.

It may be further understood that the two forms of covers, as well as the two forms of guides for the upper end of the feed pin, 7, as shown in Figures 1 and 5 respectively, may be interchangeably used, regardless of which form of guide is employed for the lower end of the pin and regardless of the particular design of the grease cup adjacent the bearing. One such re-combination is illustrated in Figure 8, in which the hinged cover, 26, and guide arm, 23, are shown associated with a cup whose nipple and lower guide member, 11, are of the form shown in Figure 1.

I claim:

1. In combination with a bearing and a movable member bearing thereon and having a surface which diverges acutely from a part of the bearing surface adjacent the bearing area thereof, said bearing surface being apertured for admission of lubricant, a lubricator comprising a chamber formed

with walls convering toward said aperture and a feed pin in the chamber with an enlargement adjacent said converging walls, and having its end portion projected through the aperture for operative contact with said oblique surface of the moving member.

2. In the combination defined in claim 1, the feed pin having its end portion rounded and projecting through the aperture for its contact with the moving member.

3. In the combination defined in claim 1, a spring yieldingly holding the pin in position for its contact with the moving member.

4. In the combination defined in claim 1, a stop device in the chamber arranged for limiting the movement of the pin toward said moving member.

5. In the combination defined in claim 1, a stop arranged for limiting the movement of the pin toward said moving member, and a spring positioned to resist movement of the pin away from said member.

6. In the combination defined in claim 1, a guide in the chamber engaging said feed pin for positively centering it with respect to the outlet.

7. In the combination defined in claim 1, guiding means in the chamber engaging said pin adapted to permit longitudinal movement thereof, but arranged to resist lateral displacement of said pin in the chamber.

8. In combination with a roller bearing, a chamber for lubricant provided with an outlet leading to the bearing rollers, and a movable feed pin in said chamber extending through the outlet for contact with said rollers in their travel.

9. In the combination defined in claim 8, a stop arranged for limiting the movement of the pin toward said rollers.

10. In the combination defined in claim 8, said feed pin being yieldingly held in position for contact of its end portion with the rollers in their travel.

11. In the combination defined in claim 8, a spring resisting movement of said pin away from the rollers.

12. In the combination defined in claim 8, a stop arranged for limiting the movement of the pin toward the rollers and a spring resisting the movement of the pin away from the rollers.

13. In the combination defined in claim 8, said feed pin having its end rounded to act as a cam for contact with the rollers of the bearing.

14. In the combination defined in claim 8, a guide in the chamber for the end of the feed pin remote from the outlet.

15. In the combination defined in claim 8, a guide in the chamber engaging said pin near said outlet.

16. In the combination defined in claim 8, a guide in the chamber engaging said pin near the outlet and a second guide in the chamber engaging a portion of the pin remote from said outlet.

17. In the combination defined in claim 8, said feed pin being provided with an enlargement adjacent the converging walls of the chamber, and a stop member secured between said walls in position to engage the enlargement for limiting the movement of the pin toward the rollers.

18. In the combination defined in claim 8, said pin being provided with an enlargement adjacent the converging walls of the chamber and a guide member secured between said walls, apertured to receive and position a portion of said pin between its enlargement and said rollers, said guide also engaging the enlargement for stopping the pin against excessive movement toward the rollers.

19. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a guide in said chamber between the enlargement of the pin and said outlet apertured to embrace said pin and positioned to engage said enlargement.

20. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a stop in the chamber positioned to engage said enlargement for limiting the movement of said pin in the direction of the outlet.

21. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a guide extending transversely in the chamber engaging the pin between its enlargement and the outlet, the surface of said guide facing the cavity of the chamber being inclined in the direction of the outlet to minimize the obstruction of said outlet by the guide.

22. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a guide in said chamber between the enlargement of the pin and said outlet apertured to embrace said pin and extending transversely therefrom to the walls of the chamber, but having its surface which faces the cavity of said chamber of V-shaped cross-section to prevent obstructing the feed of lubricant from the chamber through the outlet.

23. A lubricator comprising a chamber

having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a guide in said chamber secured between the walls thereof and engaging the pin between its enlargement and said outlet.

24. In a lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending toward the outlet and provided with an enlargement adjacent said converging walls, and a guide removably secured in the chamber between said enlargement to receive the pin and provided with arms extending for engagement with the walls of the chamber for positioning the guide therein.

25. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, a stop in the chamber positioned to engage said enlargement for limiting the movement of the pin in the direction of the outlet, and a spring resisting movement of said pin away from said stop.

26. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, a stop in the chamber positioned to limit the movement of the pin in the direction of the outlet, a guide in the chamber engaging a portion of said pin remote from the outlet and a spring disposed to react between said guide and the enlargement of the pin for yieldingly holding the latter against said stop.

27. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, a guide in the chamber engaging said pin near the outlet, and a second guide in the chamber engaging a portion of the pin remote from said outlet.

28. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, a cover for the chamber adapted to be opened to give access thereto and guiding means for said feed pin fixed in the chamber independent of said cover.

29. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, a cover for said chamber adapted to be opened to give access thereto, and a guide for the feed pin in the chamber secured to a wall thereof and independent of the cover.

30. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a cover for the chamber at the end opposite said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, said pin being completely enclosed in the chamber when the cover is applied thereto, and guiding means for the pin in the chamber independent of said cover.

31. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls, and a guide for the pin having a guide aperture with a laterally extending slot leading thereto and narrower than the diameter of said aperture, a portion of the pin normally out of contact with said guide being reduced in thickness to permit its insertion through said slot.

32. A lubricator comprising a chamber having an outlet and walls converging toward said outlet, a movable feed pin in the chamber extending into the outlet and provided with an enlargement adjacent said converging walls. a guide for the portion of said pin remote from the outlet comprising a bracket extending transversely from a wall of the chamber, a hinged cover for said chamber disposed with one member of its hinge against the wall of the chamber, and a securing member engaging said hinge and bracket for retaining said parts.

33. In a device of the character indicated a feed pin formed with oppositely facing abutments, a collar on the pin engaging one of said abutments, and a frusto-conical shell having a flange at one end engaging the other abutment, the other end of said shell encompassing said collar with the edge of the shell bent over the collar to retain said part on the pin.

34. In a device of the character indicated a feed pin having a deformed portion providing oppositely facing abutments, a collar on the pin in contact with one of said abutments and a shell enclosing said deformed portion, comprising a flange at one end engaging the other abutment, and a flange at the other end bent over the edge of said collar to retain the shell in position.

35. In a device of the character indicated, a feed pin having a deformed portion providing opposite facing abutments, a collar on the pin in contact with one of said abutments, said collar having a notch adjacent

the pin, a spring coiled upon the pin with one end extending through the notch of the collar and bent over on the opposite side of said collar, together with a shell enclosing the deformed portion of the pin and the bent end of the spring, and comprising a flange at one end engaging the other abutment of said pin, and a flange at the other end bent over the edge of said collar to retain the part in position.

In testimony whereof, we have hereunto set our hand at Chicago, Illinois, this 19th day of May, 1917.

HERBERT L. MAGILL,
FREDERICK J. KNORR.