W. H. PUTNAM.

FORCE FEED LUBRICATOR.

APPLICATION FILED AUG. 2, 1917.

1,262,979.

Patented Apr. 16, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

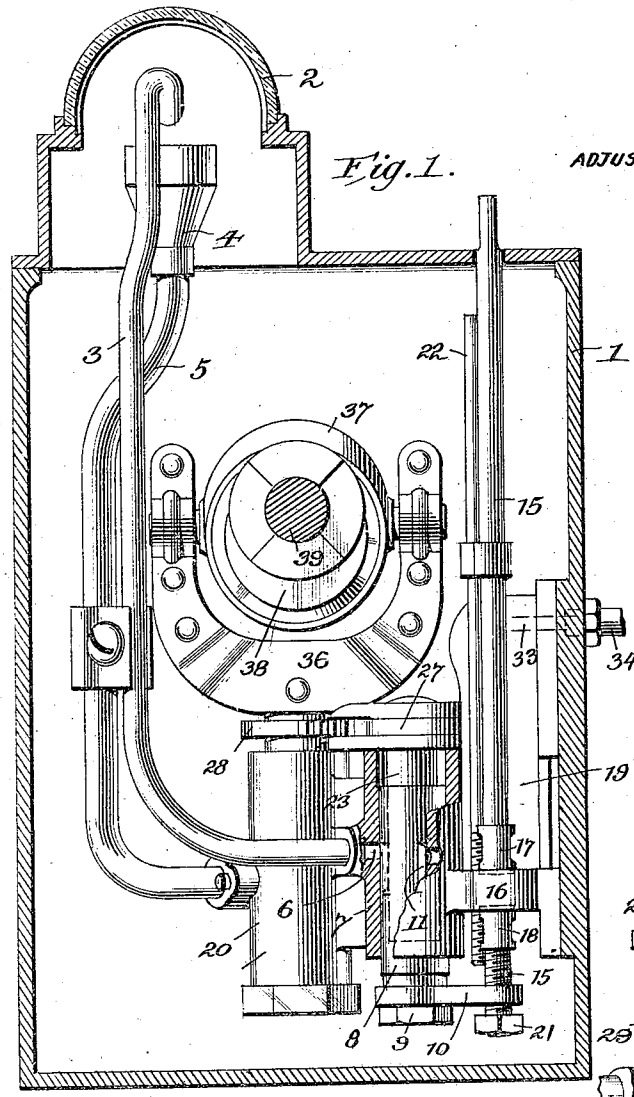


Fig. 2.

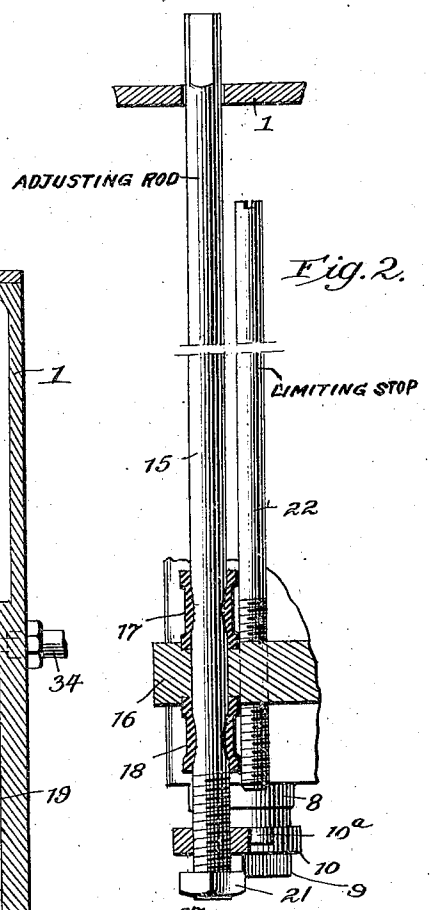


Fig. 3.

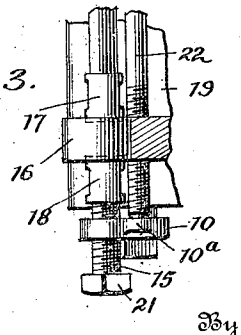
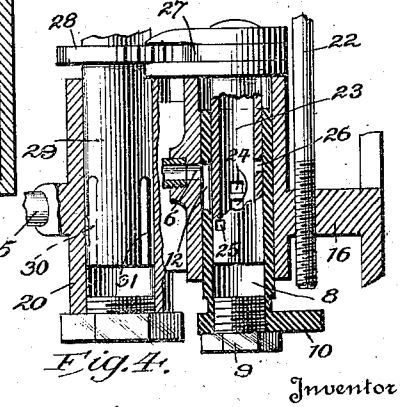


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

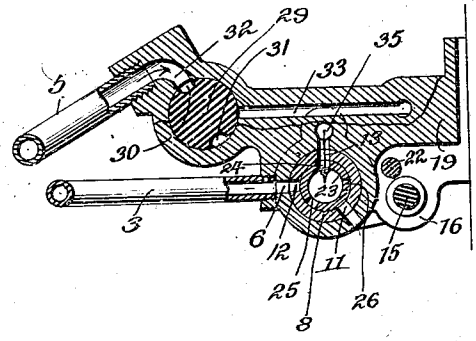


Fig. 6.

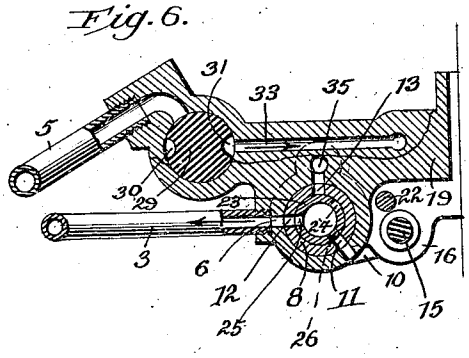


Fig. 8.

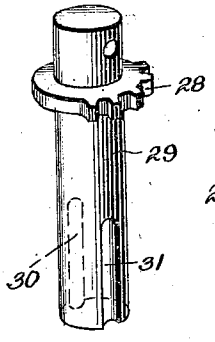


Fig. 9.

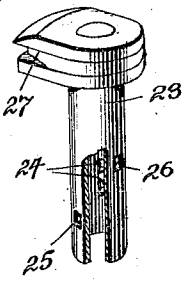


Fig. 7.

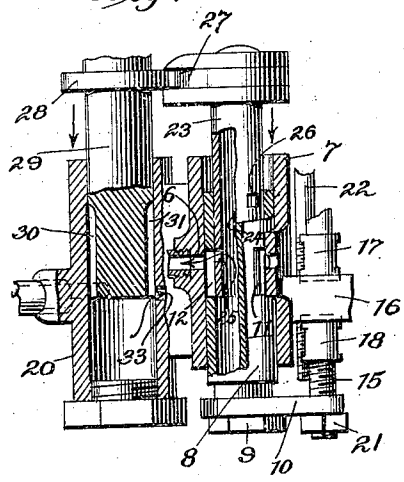
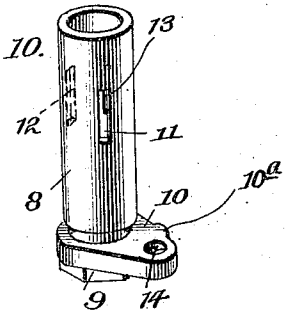


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM H. PUTNAM, OF MADISON, WISCONSIN, ASSIGNOR TO MADISON-KIPP LUBRICATOR COMPANY, OF MADISON, WISCONSIN, A CORPORATION OF WISCONSIN.

FORCE-FEED LUBRICATOR.

1,262,979. Specification of Letters Patent. Patented Apr. 16, 1918.

Application filed August 2, 1917. Serial No. 184,105.

To all whom it may concern:

Be it known that I, WILLIAM H. PUTNAM, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented a certain new and useful Improvement in Force-Feed Lubricators, of which the following is a specification.

My present invention pertains to force feed lubricators, and has reference more particularly to the provision of means for adjusting and controlling the flow of oil, the means being such as to prevent the parts from being brought into such position as will cut down the amount of oil fed below a predetermined minimum, while at the same time allowing free adjustment for a greater flow or feed.

In the use of force feed lubricators upon machines, and more especially upon automobiles and tractors, where adjustment of the parts frequently falls into inexperienced hands, there is a possibility of the user adjusting the lubricator so as to cut off the oil-supply, or reduce it to a point below which it will not effectively lubricate the parts to which the oil passes.

It is the object of this invention to provide an adjustable lock or stop for the feed-controlling means of the lubricator, preferably inaccessible, which lock may be initially set by one skilled in the art of lubrication and which, while permitting adjustment for greater feed, will prevent such adjustment as would cut the feed down below the established minimum.

My invention is illustrated in conjunction with a lubricator of the type set forth in Letters Patent No. 1,066,238, granted under date of July 1, 1913, to the Madison-Kipp Lubricator Company, as the assignee of Frank D. Winkley.

In the drawings, which exemplify one form or embodiment of the invention;

Figure 1 is a sectional elevation of so much of a lubricator as is necessary to an understanding of the invention;

Fig. 2 a sectional elevation of the adjusting rod and stop bar or rod;

Fig. 3 a similar view showing the parts in a different position;

Fig. 4 a sectional view of the measuring pump, the forcing pump, and the capacity-varying element of the measuring pump;

Fig. 5 a transverse, horizontal sectional view, taken through the two pumps and their allied members;

Fig. 6 a similar view showing the parts in a different operative relation;

Fig. 7 a view similar to Fig. 4, but showing the parts in a different operative position;

Fig. 8 a perspective view of the piston of the force pump;

Fig. 9 a like view of the measuring-pump piston; and

Fig. 10 a similar view of the capacity-regulating quill or sleeve employed in the measuring pump.

A suitable casing 1 is provided in which the working parts are mounted and inclosed, a sight window or cover 2 being placed over the upper end of a tube or pipe 3 leading from the measuring pump, the upper end of which pipe is downwardly curved and discharges into a cup 4 mounted upon the upper end of a pipe 5, leading to the force pump. Pipe 3 at its lower end is in communication with a port 6 formed in the side wall of the cylinder 7 of the measuring pump. Said cylinder is open at its upper and lower ends, and slidably mounted in the lower end thereof is a sleeve 8, the lower end of the sleeve being closed by a screw plug 9, while an arm 10 extends laterally from the lower end of the sleeve. Said sleeve is provided with three elongated ports, 11, 12 and 13, and said sleeve is designed to be adjusted lengthwise in the cylinder 7 to vary the capacity of the pump. To this end the arm 10 is provided with a threaded opening 14, into which is screwed the lower threaded end of a rod 15. Said rod passes freely through an opening formed in a web 16, and is held against longitudinal movement by stop collars 17, 18, shown as pinched inwardly against flattened portions of the rod and bearing, respectively, on the upper and lower faces of the web. Said web 16 is formed integrally with a frame or casting denoted generally by 19, in which the cylinder 7 and also the cylinder 20 of the force pump are formed. As will be seen upon reference to Fig. 1, the member 19 is secured to the side wall of the casing 1 and supports the pump structure within the casing when submerged in the oil.

A nut 21 is fastened to the lower end of the rod 15, said nut preventing the rod from being turned entirely out of the arm 10 when the rod is rotated in that direction to lower the sleeve 8. The lowering of the sleeve increases the capacity of the measuring pump, and to prevent the sleeve from being raised to such point as would not afford a sufficient feed to properly lubricate the parts for which the apparatus is designed, I provide a stop rod 22. Said rod is mounted in a threaded opening in the web 16, and the lower end thereof stands in line with the arm 10, or a projection 10^a extending laterally therefrom. As will be seen upon reference to Fig. 1, the rod 15 may be manipulated by the user of the machine. The rod 22, preferably, though not necessarily, terminates within the casing, where it is normally inaccessible, and is provided with a cross slot in its upper end, whereby it may be raised or lowered to bring it to that position which will regulate the minimum amount of lubricant. In other words, the lower end of the rod 22, standing in line with the arm 10, will prevent the operator from raising the sleeve 8 beyond a predetermined limit and thus prevent the flow of the oil passing through the lubricator from being cut down below a predetermined amount. The rod 22 will be initially set by a person expert in the art of lubrication, so that at no time can the sleeve be elevated to cut off what would be the ordinary minimum amount necessary for the lubrication of the part which the lubricator is designed to feed.

Working within the sleeve 8 is a hollow piston 23, having the following ports formed therein, to wit, an intake port 24, a feed port 25, and an overflow port 26. The upper end of the piston has secured to it a shrouded sector gear 27, adapted to mesh with a sector gear 28, secured upon the upper portion of the piston 29 which works in the cylinder 20. Said piston 29 is provided with a longitudinally-extending feed port 30, and a similarly extending exhaust port 31 upon its side wall at the lower end. Port 30 is arranged adjacent to a port 32 (see Fig. 5) which is in communication with the lower end of pipe 5. The port 31, when the parts are brought to the positions shown in Fig. 6, registers with a port or passageway 33 which extends through the casting 19 and terminates at its upper end in a delivery pipe 34, leading to the part to be lubricated.

The intake port for the oil is shown in Figs. 5 and 6, and is designated by 35, being an opening extending upwardly through the lower part of the casting 19, thence laterally into the cylinder 7.

To the upper end of the piston 29 there is secured by a gimbal joint a yoke 36 (Fig. 1). A strap 37 is swiveled in the yoke, said strap being in engagement with an eccentric 38, through which a driving shaft 39 passes, this construction being similar to that disclosed in Letters Patent No. 796,659, dated August 8, 1905.

Through the rotation of the shaft 39 the eccentric causes the strap and yoke to be raised and lowered, and likewise imparts an oscillating movement to the yoke, which motion is transmitted to the pistons 23 and 29 through the intermeshing sector gears 27 and 28. As a consequence, such pistons are raised and lowered and also oscillated, and through the intake and delivery ports, as above set forth, the oil will be drawn in by the measuring piston 23 and forced to the sight feed cup 4 and thence to the part to be lubricated by the piston 29. In Fig. 5 the parts are shown in a position where the oil is being drawn inwardly by the measuring pump, and the oil which was previously discharged into the measuring cup passes into the cylinder 20 through the port 32 and piston port 30.

When the parts are brought to the positions shown in Fig. 6, the inlet of the measuring pump is cut off and the feed port 25 is open; consequently, as the pistons descend the oil which was previously fed into the cylinder 20 will pass outwardly therefrom through the port 31, port or passage 33, and to the pipe 34. At the same time, the piston 23 will force the oil from the cylinder 7, or more specifically from the interior of the sleeve 8, outwardly through the port 6 and pipe 3 and into the measuring cup. This cycle of operations will continue so long as the shaft 39 is rotated.

As above noted, in adjusting the device the expert will turn the rod 22 up or down as the case may be, and as a consequence the sleeve 8 cannot be raised within the cylinder 7 beyond a predetermined height and, therefore, the flow of oil is never completely shut off.

The operator can, of course, increase the amount of oil above the minimum set, by turning the rod 15 and lowering the sleeve. Thus, in Fig. 2 the member 10, and consequently the sleeve 8, are shown as adjusted between the maximum and minimum, whereas in Fig. 3 the parts are brought to the position where the minimum feed would be effected. Beyond that, however, the operator cannot go, unless the rod 22 is manipulated, and the inexperienced operator is, under ordinary conditions, precluded from varying the minimum amount of oil to be pumped to the part to be lubricated.

Having thus described my invention, what I claim is:

1. In a force feed lubricator, the combination of means for forcing the lubricant to the part to be lubricated; adjustable means for varying the effective action of said forc-

ing means; and an adjustable stop device to preclude the adjusting of said last-named means beyond a predetermined limit.

2. In a force feed lubricator, the combination of a pump; means for varying the effective volume of said pump; means for adjusting said means; and an adjustable stop device to preclude the adjusting of said volume-varying means below a predetermined point.

3. In a force feed lubricator, the combination of a pump; means for varying the effective volume of said pump; a casing inclosing said parts; a device for adjusting said volume-varying means, said device extending therefrom to a point outside the casing; and an adjustable limiting stop for said device inclosed within the casing and normally inaccessible.

4. In a force feed lubricator, the combination of an inclosing casing; a pump located therein; a sleeve movable into and out of said pump to effect a variation in the effective volume of the pump; a rod having a threaded connection with the sleeve, said rod being accessible from without the casing; and an adjustable, normally inaccessible limiting stop for the sleeve located within the casing.

5. In a force feed lubricator, the combination of an inclosing casing; a pump located therein; a sleeve movable into and out of said pump to cause a variation in the effective volume of the pump; a rod having a threaded connection with the sleeve, said rod being accessible from without the casing; and a second rod located wholly within the casing and adapted, through its adjustment, to limit the movement of the sleeve.

6. In a force feed lubricator, the combination of a pump; means for varying the effective volume of said pump; a casing inclosing said parts; a device for adjusting said volume-varying means; and an adjustable limiting stop for said device.

7. In a force feed lubricator, the combination of a casing; a pump located therein; a sleeve movable into and out of said pump to effect a variation in the effective volume of the pump; a rod having a threaded connection with the sleeve; and an adjustable limiting stop for the sleeve.

8. In a force feed lubricator, the combination of a casing; a pump located therein; a sleeve movable into and out of said pump to cause a variation in the effective volume of the pump; a rod having a threaded connection with the sleeve and adapted by such connection to vary the adjustment thereof; and a second rod coöperating with the sleeve and adapted, through its adjustment, to limit the movement of the sleeve beyond a predetermined point.

In testimony whereof I have signed my name to this specification.

WILLIAM H. PUTNAM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."