June 11, 1929. E. W. DAVIS 1,716,487

LUBRICATING APPARATUS

Filed July 24, 1926

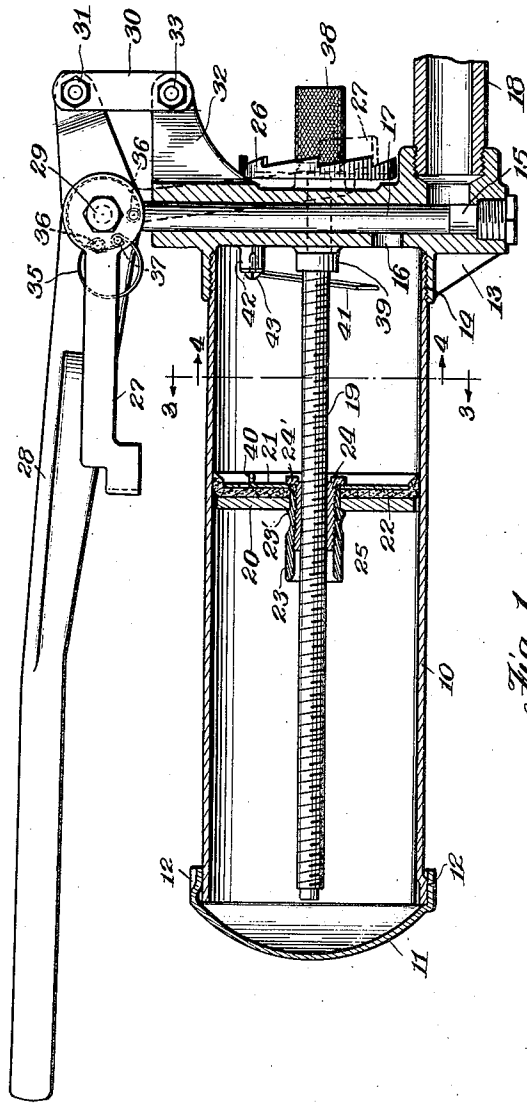


Fig. 1.

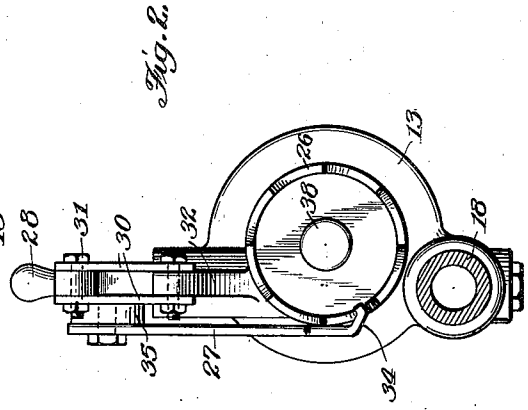


Fig. 2.

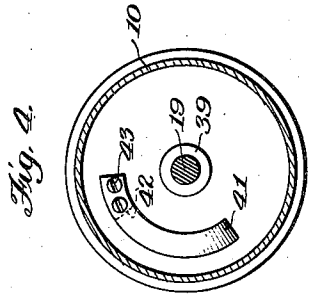


Fig. 4.

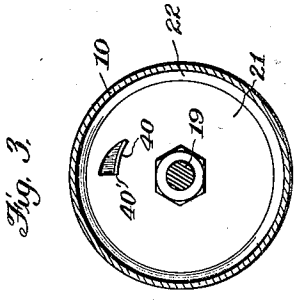


Fig. 3.

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UNITED STATES PATENT OFFICE.

ERNEST W. DAVIS, OF OAK PARK, ILLINOIS, ASSIGNOR TO ALEMITE MANUFACTURING CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

LUBRICATING APPARATUS.

Application filed July 24, 1926. Serial No. 124,744.

My invention relates to improvements in lubricating apparatus and is particularly concerned with the provision of a lubricant compressor comprising certain novel features.

The lubricant compressor with which my invention is concerned comprises a barrel having a cap at one end in which is formed a high pressure cylinder that communicates with and is primed with lubricant received from the barrel. A suitable plunger and an operating lever form the means for expelling the lubricant from the high pressure cylinder through a suitable conduit to the points of application of the lubricant.

In compressors of this type some difficulty has heretofore been experienced in insuring the necessary transfer of lubricant from the barrel to the high pressure cylinder and one of the objects of my present invention is to provide means for positively insuring and effecting such transfer of lubricant.

In the particular form of means that I employ for insuring the proper priming of the high pressure cylinder I make use of a piston that is actuated by a threaded piston rod and occasionally there is a tendency for this piston rod to stick when it reaches the inner end of its stroke. Another object of my invention is, therefore, to provide means for preventing this sticking of the piston so that it may easily be returned to the outer end of the barrel to permit its removal prior to filling the barrel of the compressor.

The threaded piston arrangement described above is actuated by a pawl and ratchet mechanism and another object of my invention is to provide certain novel means for holding the pawl either in its operative or in its inoperative position.

The above and other objects, such as the provision of a compressor that is of rugged and simple construction and easy to operate, will appear as this description progresses, reference being had to the accompanying drawings, in which

Figure 1 is a longitudinal section through my improved compressor;

Figure 2 is an end view;

Figure 3 is a transverse section taken on line 3—3 of Figure 1; and

Figure 4 is a transverse section taken on line 4—4 of Figure 1.

Throughout the several views similar reference characters are used for referring to the same parts, and the several sections are taken looking in the directions of the small arrows.

Referring to the drawings, my improved compressor comprises a barrel 10 that is preferably cylindrical, having sufficient capacity to hold a considerable quantity of lubricant. One end of this barrel is provided with a removable cap 11 that may be held in place by any suitable means, such, for instance, as the bayonet joints 12.

The opposite end of the barrel is provided with another cap 13 that may be more or less permanently attached to the barrel as it is not intended to be removed therefrom. A suitable screw-thread connection, such as indicated at 14, may be employed for this purpose. A high pressure cylinder 15 is formed integrally with the cap and extends transversely of the barrel but is positioned at one side of the axis of the barrel. This cylinder communicates with the barrel, as shown at 16. The cylindrical plunger 17 reciprocates in the cylinder 15 and acts as a valve to isolate the high pressure cylinder from the low pressure cylinder after the end of the plunger passes the port 16 on the pressure stroke. The lubricant expelled by the plunger 17 may be discharged through a suitable conduit 18 to the point where the lubricant is to be used.

In order to insure positive priming of the high pressure cylinder, I provide a screw-threaded piston rod 19, one end of which is suitably journaled in the cap 13. This piston rod is substantially coaxial with the barrel 10. A piston, comprising the follower plate 20, the face plate 21 and the cup leather 22, is mounted to slide in the barrel 10 and the three parts just referred to are secured together by means of the sleeve 23 and the elongated nut 24 that are threaded together, as shown at 25. The sleeve 23 and the nut 24 are provided with the shoulders 23′ and 24′, respectively, between which the elements 20, 21 and 22 are clamped and by means of which they are held together. The nut 24 is threaded to co-act with the threads on the piston rod 19 so that when the latter is turned in one direction the piston is moved toward the cap 13, and when rotated in the opposite direction the piston is moved toward the cap 11.

The means that I prefer to use for advancing the piston toward the cap 13, that is, in the direction in which it serves to discharge lubricant from the barrel 10 into the high

pressure cylinder 15, comprises a crown ratchet wheel 26 that is secured to the end of the piston rod 19 projecting beyond the cap 13. A pawl 27 is pivotally mounted upon the operating lever 28 by means of the pivot pin, or bolt, 29 that also connects the plunger 17 with the lever 28. This lever is carried by a pair of links 30, the upper ends of which are pivotally connected with one end of the lever, as shown at 31, and the lower ends of which are pivotally connected with a bracket 32, projecting from the cap 13, by means of the pivot pin 33.

The pawl 27 has an inturned end, as shown at 34, for engaging the teeth of the ratchet wheel 26 on the upward stroke of the lever 28.

Inasmuch as the compressor described herein is intended and adapted to be held in any position, it is necessary to provide some means for maintaining contact between the pawl 27 and the ratchet wheel, and for this purpose I provide the circular leaf spring 35, one end of which is connected with a pin 36 extending from the pawl inwardly toward the lever 28, and the other end of which is connected with a pin 37 projecting outwardly from the lever. When the pawl 27 is thrown down into position to engage with the ratchet wheel, this spring occupies the position shown in dotted outline in Figure 1. It is, however, sometimes desirable to hold the pawl 27 out of engagement with the ratchet, as, for instance, when the piston rod 19 is to be turned in the proper direction to move the piston to the outer end of the piston rod to permit refilling of the barrel. To accomplish this the pawl is thrown to the position shown in full line in Figure 1, whereupon the spring assumes the position shown in full line in this figure and holds the pawl in the position shown. It will, therefore, be understood that the single spring 35 performs two functions; first, that of holding the pawl in contact with the ratchet, and second, that of holding the pawl in inoperative position.

The extreme outer end of the piston rod is provided with a knurled handle 38, by means of which it can be rotated to move the piston to the open end of the barrel.

When, after being in operation for some time, the lubricant in the barrel is exhausted, or substantially exhausted, the inner end of the nut 24 will engage with the collar 39 that is formed integrally with the piston rod 19 and which tends to prevent the screw from moving outwardly through the cap 13. The friction between the cup leather 22 and the barrel is sufficient to cause these two elements to stick together more or less tightly, and due in the fact that at this time the piston is practically inaccessible, it is practically impossible to separate these two elements except by the insertion of a suitable tool into the barrel. In order to overcome this objection, I provide the face plate 21 of the piston with a down-turned lug 40, having one edge 40′ that extends almost at right angles to the face plate.

For co-acting with the lug 40 I provide the leaf spring 41 that is secured to a lug 42 extending inwardly from the cap 13 by means of a screw 43. When the piston has approached the cap 13 to such an extent that the end of the nut 24 engages the collar 39, any further rotation of the piston rod 19 will simply result in the piston being rotated in the same direction. As long as this continues the lug 40 will ratchet over the end of the spring 41, but when it is desired to fill the compressor, rotation of the piston rod 19 in the opposite direction, by making use of the knurled handle 38, will cause the vertical edge of the lug 40 to engage the end of the spring 41. This will hold the piston stationary and continued rotation of the piston rod 19 will cause the piston to move toward the open end of the barrel until the lug 40 clears the end of the spring 41. At this time the friction between the cup leather and the inner wall of the barrel is sufficient to hold the piston against rotation, and further rotation of the piston rod 19 will move the piston to the open end of the barrel where the sleeve 23 can be grasped by the fingers and the piston removed so that the barrel may be refilled.

While I have described the details of construction of the preferred embodiment of my invention, it is to be clearly understood that my invention is not limited to these details, but is capable of other adaptations and modifications within the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A lubricant compressor comprising a barrel, a cap secured to one end of said barrel and comprising a cylinder extending transversely of said barrel and communicating with said barrel, a plunger reciprocable in said cylinder, a lever having one end connected to said cap, and a part intermediate its ends pivotally connected with the outer end of said plunger, a threaded piston rod in said barrel having one end journaled in said cap, a piston surrounding said piston rod and comprising a nut for co-acting therewith, a ratchet wheel mounted on the outer end of said piston rod, a pawl pivotally mounted on said lever, and a single spring secured between said pawl and lever and protected thereby for holding said pawl in position to co-act with said ratchet wheel and for holding said pawl out of operative relation with said ratchet wheel, said spring in one contracted position encircling the axis of said pawl, and in another contracted position encircling an area eccentric of said axis.

2. A lubricant compressor comprising a

barrel, a cap secured to one end of said barrel and comprising a cylinder extending transversely of said barrel and communicating with said barrel, a plunger reciprocable in said cylinder, a lever having one end connected to said cap, and a part intermediate its ends pivotally connected with the outer end of said plunger, a threaded piston rod in said barrel having one end journaled in said cap, a piston surrounding said piston rod and comprising a nut for co-acting therewith, a ratchet wheel mounted on the outer end of said piston rod, a pawl pivotally mounted on said lever, and a single spring positioned between said lever and said pawl and protected thereby for holding said pawl in position to co-act with said ratchet wheel and for holding said pawl out of operative relation with said ratchet wheel.

3. A lubricant compressor comprising a barrel, a cap for one end of said barrel, a threaded piston rod mounted to rotate in said cap, said rod having a collar fixed thereto adjacent said cap, a piston slidable in said barrel and threaded on said rod, means to rotate said rod in one direction to force lubricant from said barrel, and means operative when said piston is adjacent said collar for preventing rotation of said piston relative to said cap when said rod is rotated in the opposite direction, said means comprising a spring detent for contacting with said piston before the latter contacts with said collar, and a lug carried by said piston for engaging said detent when said rod is turned in the direction to move said piston away from said cap.

4. A lubricant compressor comprising a barrel, a bearing at one end of said barrel, a threaded piston rod journaled in said bearing and having an integral collar adjacent said bearing, a piston threaded upon said piston rod and slidable in said barrel to force lubricant therefrom upon rotation of said rod in one direction, and means operable only at the end of the discharge stroke of the piston positively to prevent rotation of said piston upon rotation of said rod in the opposite direction.

5. A lubricant compressor comprising a barrel, a bearing near one end of said barrel, a piston rod journaled in said bearing, a collar fixed to said rod adjacent said bearing, a piston threaded on said rod and slidable in said barrel, and means stationary relative to said bearing for permitting rotation of said piston in one direction and preventing rotation thereof in the opposite direction when said piston is adjacent said collar.

6. A lubricant compressor comprising a barrel, a bearing near one end of said barrel, a threaded piston rod journaled in said bearing and having a collar adjacent the bearing, a piston threaded upon said piston rod and slidable in said barrel, and co-acting means carried by said barrel and piston for holding said piston against rotation only when the piston lies adjacent said collar and the piston rod is rotated in a direction in which it tends to move said piston away from said collar.

In witness whereof, I hereunto subscribe my name this 15th day of July, 1926.

ERNEST W. DAVIS.