

Jan. 29, 1929.

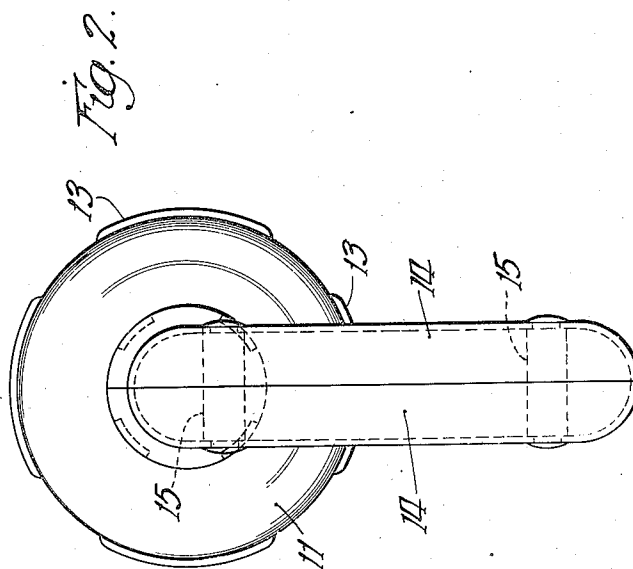
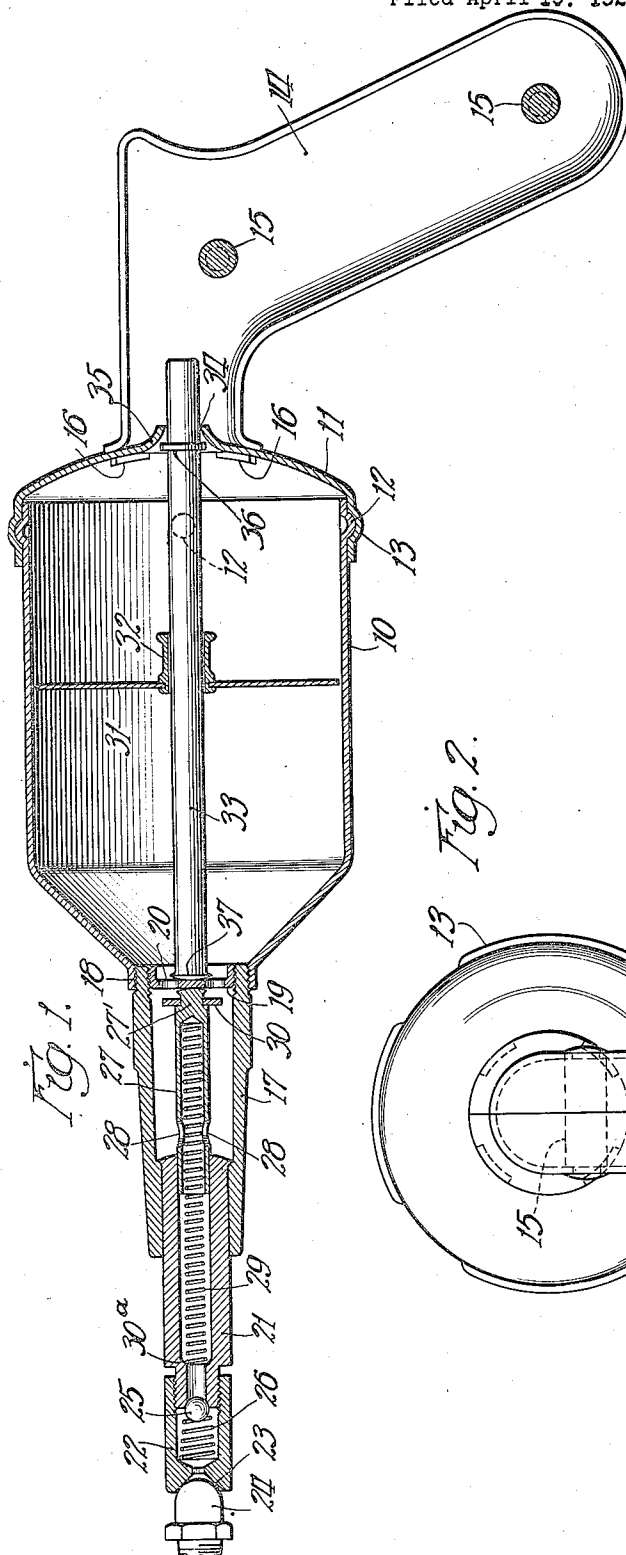
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LUBRICANT COMPRESSOR

Filed April 19. 1924

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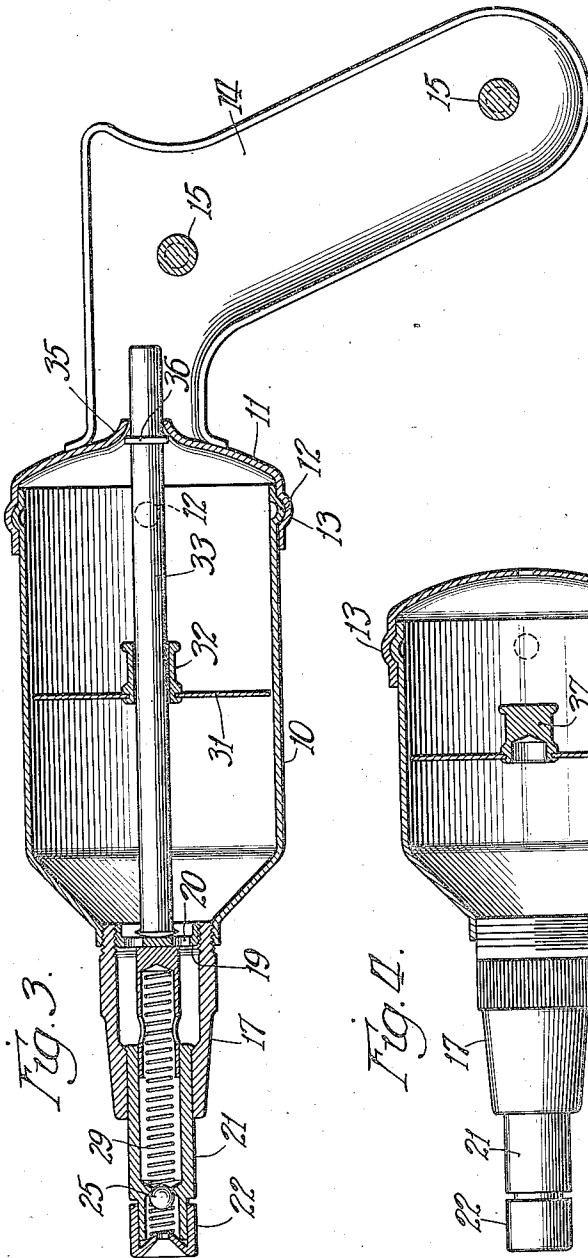


Fig. 3.

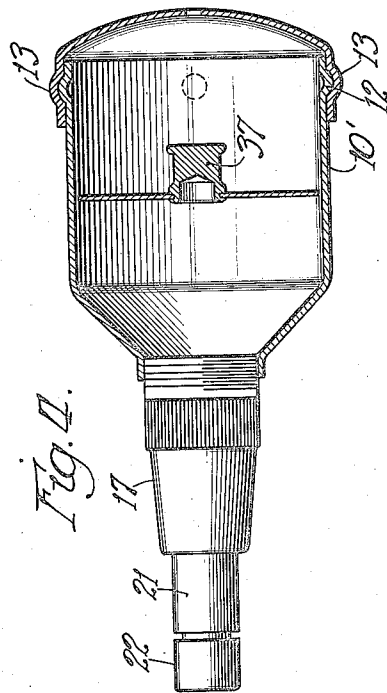


Fig. 4.

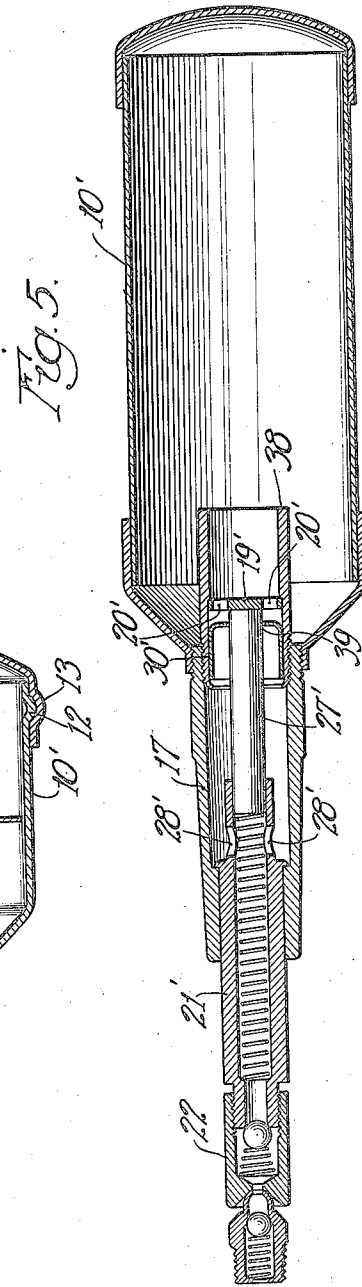


Fig. 5.

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LUBRICANT COMPRESSOR.

Application filed April 19, 1924. Serial No. 707,697.

My present invention relates to improvements in lubricant compressors and is particularly concerned with the provision of a novel lubricant compressor for supplying lubricant under high pressure to bearings to be lubricated.

The principal objects of my invention are to provide a compressor of the character described which is simple in construction, economical to manufacture and easy to operate.

Another object of my invention is to provide a compressor which is able to handle either fluid or semi-plastic lubricants. A still further object of my invention is to provide a compressor, such as described, by means of which lubricant can be supplied under pressure to a bearing, irrespective of the angle of approach to the bearing.

Other objects of my invention will appear as this description progresses, reference being had to the accompanying drawings in which Figure 1 is a central longitudinal section through one embodiment of my invention, Figure 2 is an end view thereof, Figure 3 is a view similar to Figure 1 showing a modified form of my invention, Figure 4 is a view partially in elevation and partially in section showing a further modification, and Figure 5 is a central longitudinal section of another embodiment of my invention.

The embodiment of my invention illustrated in Figures 1 and 2 comprises a barrel 10 having a removable closure 11, which is secured thereto by means of the projections 12, forced outwardly from the open end of the barrel, and the bayonet grooves 13 formed in the cap. The handle comprises the two hollow metal stampings 14 secured to the cap enclosure 11 by means of the tongues 16, which project from the forward ends of the two portions of the handle through suitable openings in the cap 11, and are then bent over as shown in Figure 1 so as securely to clamp the handle to the cap.

The opposite end of the barrel 10 is reduced in diameter and supports the guide tube 17 which is secured thereto by the thread connection 18. A flanged disk 19 is threaded into the inner end of the guide tube 17 and provided with a plurality of eccentric ports 20 for the passage of lubricant.

A cylinder 21 is reciprocally mounted in the outer end of the guide tube 17 and provided at its outer end with a cap or coupling

member 22. A conical depression 23 is formed in the outer end of the coupling member 22 for coacting with the spherical end of a fitting 24 such as described in my Patents Nos. 1,655,213 and 1,679,888.

A closure, or check valve 25, is yieldingly held against the outer end of the cylinder, by means of a compression spring 26, confined between the closure 25 and the end of the cap or coupling member 22.

A hollow plunger 27 is reciprocally mounted in the cylinder 21 and projects inwardly therefrom in such manner that the inner end of the plunger 27 bears against the central portion of the disk 19. Ports 28 formed through the wall of the plunger 27 provide means for establishing communication between the barrel 10 and the cylinder 21. A compression spring 29 confined between the annular shoulder 30^a of the cylinder 21 and the inner end of the bore of the hollow plunger 27 provides means for holding the cylinders 21 and the plunger 27 in separated relation as shown in Figure 1.

The inner end of the plunger 27 is reduced in diameter as shown at 27' and slidably supports a washer, or perforated disk 30, which, when in its innermost position, partially closes the ports 20 and thereby causes resistance to be offered to the passage of lubricant from the guide tube 17 to the barrel 10.

My present compressor is particularly designed for supplying very heavy oils and semi-plastic lubricants or greases to bearings, and, to insure the passage of lubricant from the barrel 10 into the cylinder 21, I provide the sheet metal piston 31 which is slidably mounted in the cylinder 10 and provided at its center with a sleeve 32 which rides upon the rod 33. The outer end of this rod extends through the opening 34 in the cap 11. The portions of the cap 11 immediately adjacent the opening 34 are pressed outwardly to form a conical depression 35 which assists in centering the outer end of the rod 33 when the cap 11 is applied to the barrel 10. A collar 36 carried by the rod prevents the latter from being displaced outwardly into the handle.

In the operation of my improved compressor the cap 11 is first removed; then the rod 33 is removed and carries with it the piston 31. In this connection it should be noted that the inner end of the rod 33 is provided with a head 37, which engages the end of the

sleeve 32, when the rod is withdrawn from the barrel and thus permits the easy removal of the piston 31. After the rod 33 and piston 31 have been removed, the barrel is substantially filled with lubricant, the rod 33 and piston 31 are then replaced, as is also the cap 11. The operator then brings the cap or coupling member 22 into contact with the spherical end of the fitting 24 and applies pressure to the handle in the direction of the fitting. This causes the plunger 27 to move into the cylinder 21 and the sleeve 17 to move downwardly over the cylinder, at the same time compressing the spring 29. The initial movement of the cylinder 21 into the guide tube 17 creates a pressure which moves the washer, or restraining device, 30, into position where it partially closes the ports 20 and thus causes a certain amount of resistance to be offered to the escape of lubricant from the space between the tubular guide 17 and the plunger 27. Consequently lubricant is displaced by the inner end of the cylinder 21 and passes through the ports 28 into the cylinder 21, before the ports 28 are completely closed by the inner end of the cylinder. In this manner substantially complete filling of the cylinder 21 is insured. Continued pressure upon the handle causes the plunger 27 to move still further into the cylinder 21 thereby displacing lubricant from the latter past the check valve 25 and into the fitting. When the operator then releases the pressure upon the handle the spring 29 expands and returns the parts to the positions shown in Figure 1. In moving out of the cylinder 21 the plunger causes a substantial vacuum to be produced in the cylinder, and, as soon as the ports 28 are uncovered, atmospheric pressure exerted upon the outer face of the piston 31 will cause the latter to move toward the cylinder 21 and force lubricant through the ports 20, the space between the tubular guide 17 and the closure 27, and through the ports 28 into the cylinder 21. It will, of course, be understood that the connections between the two portions of the handle and between the handle and the cap 11 are of such character as to permit sufficient air to pass into the outer end of the cylinder 10 to permit atmospheric pressure always to be exerted upon the outer face of the piston 31.

That form of my invention illustrated in Figure 3 is similar to the one just described except that the washer or disk 30 is omitted and the cap or coupling member 22 is pressed onto the outer end of the cylinder 21 in place of being threaded thereupon. The collar 30 can be omitted and a satisfactory operating construction will remain, particularly if the ports 20 are made small enough to offer a slight resistance to the reverse flow of lubricant.

The construction shown in Figure 4 is sim-

ilar to that of Figure 3 except that in the construction shown in Figure 4 the rod 33 of the previous construction is omitted and a knob or handle 37 substituted for the sleeve 32. In this construction the barrel 10' is made of comparatively large diameter, and comparatively shallow, so that the operator will have no difficulty in grasping the knob or handle 37 for the purpose of removing it from the barrel.

The construction shown in Figure 5 is designed particularly for supplying the more fluid lubricants to bearings, and differs somewhat from the disclosures in the preceding figures, in that a solid plunger 27' is employed and in that the ports 28' are formed in the inner end of the cylinder 21'. A sleeve 38 has one end threaded into the inner end of the guide tube 17 and extends inwardly therefrom. This sleeve supports a disk 19' which is provided with eccentric ports 20', and, as in the constructions previously described, acts as an abutment, or stop, for the inner end of the plunger 27'. A valve or restraining member in the form of a cap 30' is slidably mounted upon the inner end of the plunger 27' and adapted partially to close the ports 20'. The opening 39 in the bottom of the restraining member 30' is somewhat larger than the plunger 27' so as to permit the passage of lubricant through those portions of the ports 20' and the opening 39 which overlap. It will, of course, be seen that when the restraining member 30' is in its innermost position the openings through which the grease can flow, from the space between the plunger 27' and the guide tube 17 into the barrel, are comparatively small. It will also be understood that in this embodiment of my invention the restraining member 30' performs the same function as the disk 30 of Figure 1.

The operation of the compressor just described is quite similar to that of the compressors shown in Figures 1 to 4, inclusive. When the compressor is held with the coupling member 22 at a level lower than that of the barrel 10' lubricant will flow through the ports 20', the opening 39, and through the ports 28' into the cylinder. If the coupling end of the compressor is then elevated above the level of the barrel 10' the lubricant will tend to return to the barrel 10' but its weight will cause restraining member 30' to move to a position to partially close the ports 20', and the return of lubricant to the barrel 10' will be so slow that the operator is given ample opportunity to make use of the compressor for forcing lubricant into a fitting, long before the lubricant drains from the cylinder 21'.

While I have described the details of construction of the preferred embodiments of my invention, it is to be clearly understood that my invention is not limited to these de-

tails of construction 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 having a removable cap at one end, a guide tube communicating with said barrel, a disk carried by the inner end of said tube and provided with a port, a cylinder reciprocally mounted in the outer end of said tube, a plunger carried by said tube and reciprocable in said cylinder, the outer end of said plunger being hollow and having a lateral port communicating with said tube, a spring enclosed by said cylinder and plunger for holding said cylinder and plunger in separated relation and a movable means carried by the inner end of said plunger for restricting return flow of lubricant through the port in said disk.

2. A lubricant compressor comprising a barrel, a guide tube communicating with said barrel, a disk carried by the inner end of said tube and provided with a port, a cylinder reciprocally mounted in the outer end of said tube and communicating with said tube, a plunger carried by said tube and reciprocable in said cylinder, a spring for holding said cylinder and plunger in separated relation and means carried by the inner end of said plunger for restricting return flow of lubricant through the port in said disk.

3. A lubricant compressor comprising a barrel, a guide tube communicating with said barrel, a cylinder reciprocally mounted in the outer end of said tube and communicating with said barrel, a plunger for cooperating with said cylinder, a spring for holding said cylinder and plunger in separated relation and means permitting substantially unrestricted flow of lubricant from said barrel to said cylinder but restricting the flow of lubricant in the reverse direction.

4. A lubricant compressor comprising a barrel, a cylinder communicating with said barrel, means for discharging lubricant from said cylinder and means for causing lubricant from said barrel to pass into said cyl-

inder comprising a rod removably mounted in said barrel, a piston slidably mounted upon said rod, and a cap removably secured to one end of said barrel, said cap having an opening surrounded by a conical depression for receiving the outer end of said rod.

5. A lubricant compressor comprising a barrel, a cylinder communicating with said barrel, means for discharging lubricant from said cylinder and means for causing lubricant from said barrel to pass into said cylinder comprising a rod removably mounted in said barrel, a piston slidably mounted upon said rod and a cap removably secured to one end of said barrel, said cap having an opening for receiving the outer end of said rod.

6. A lubricant compressor of the class described comprising, in combination, a container, expelling means carried thereby, said means operated by thrusting said container toward a part to be lubricated, means for making a sealed connection with a lubricant receiving fitting, and an operating handle for said compressor, said handle comprising hollow stamped metal members secured together, said members having parts contacting with said container for receiving the thrust exerted on said handle to operate said expelling means, and angularly related parts on the inside of said container for holding said container and members in assembled relationship.

7. A lubricant compressor of the class described comprising, in combination, a barrel, means for expelling lubricant at high pressure and supplied from said barrel, said means operated by thrusting said barrel toward a part to be lubricated, means for making a sealed connection with a lubricant receiving fitting, a cap for said barrel, and a stamped metal handle having parts engaging said cap to receive the thrust exerted on said handle to operate said expelling means and laterally disposed parts inside said cap for holding said cap and handle in assembled relationship.

In testimony whereof I have hereunto signed my name this 1st day of April, 1924.

OSCAR U. ZERK.