

June 15, 1937.

F. S. BARKS

2,083,590

LUBRICATING APPARATUS

Filed Aug. 1, 1935

2 Sheets-Sheet 1

FIG. 1.

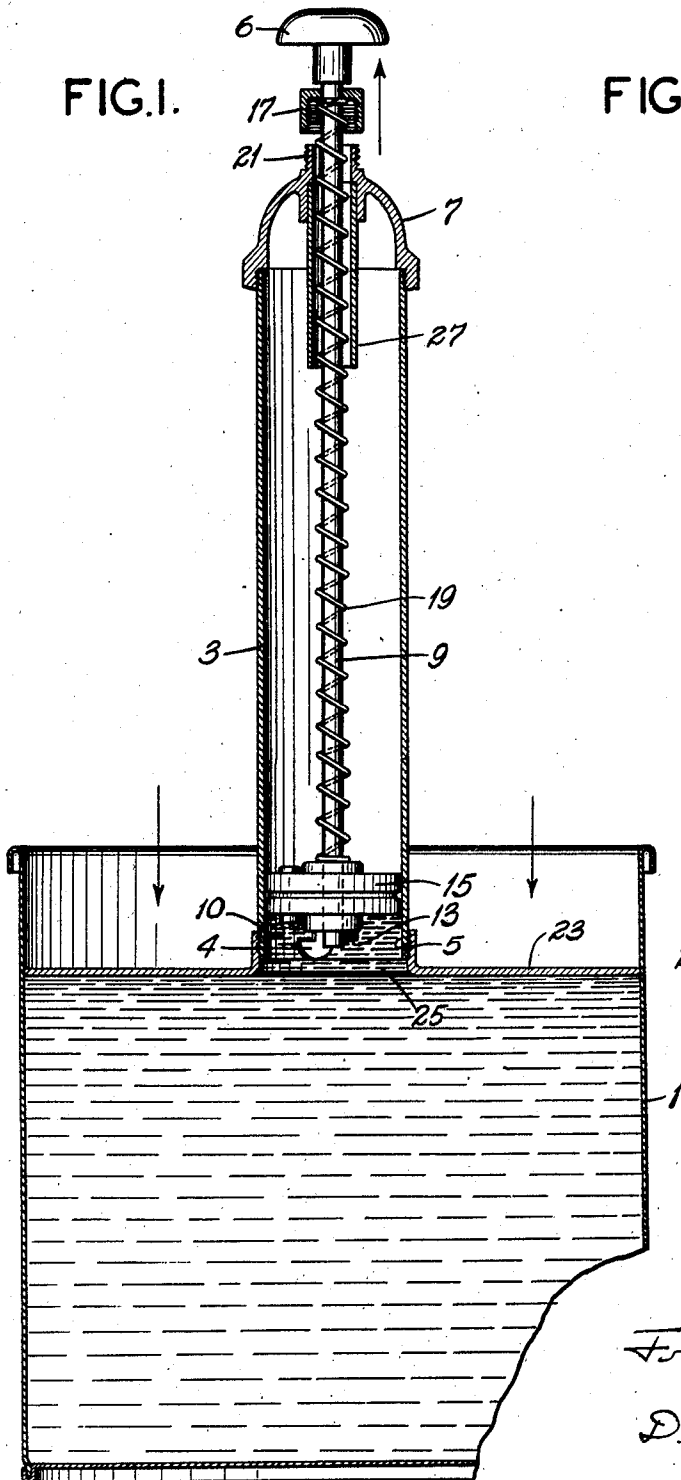
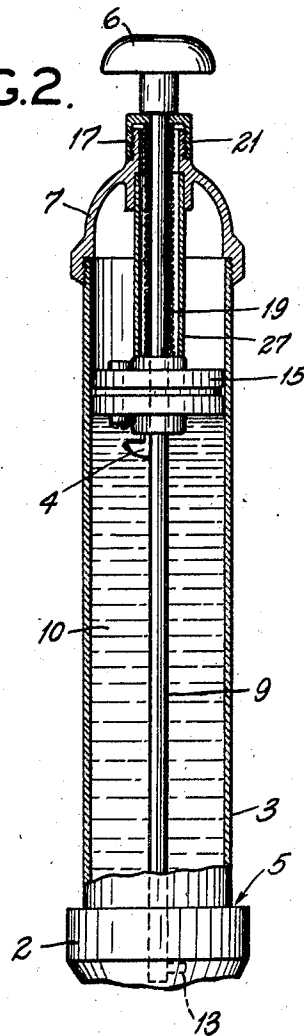


FIG. 2.



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FIG.3.

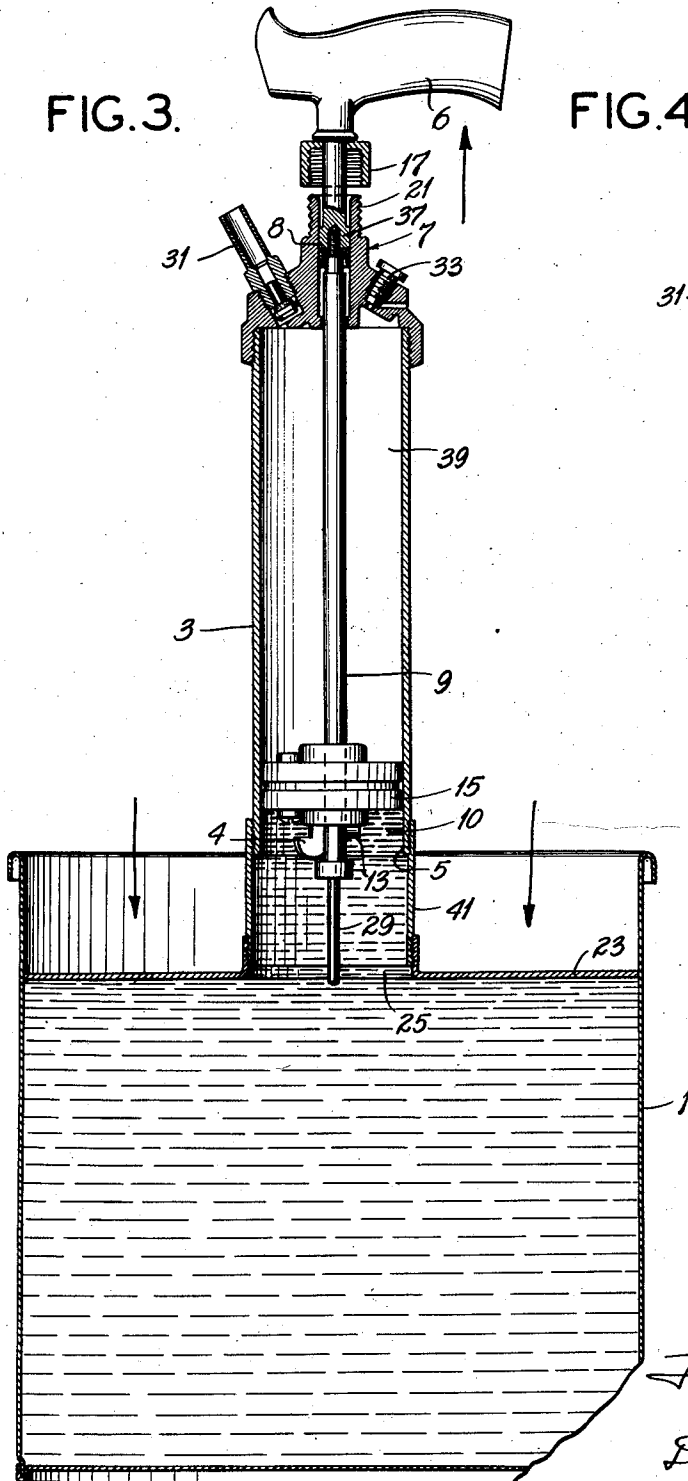
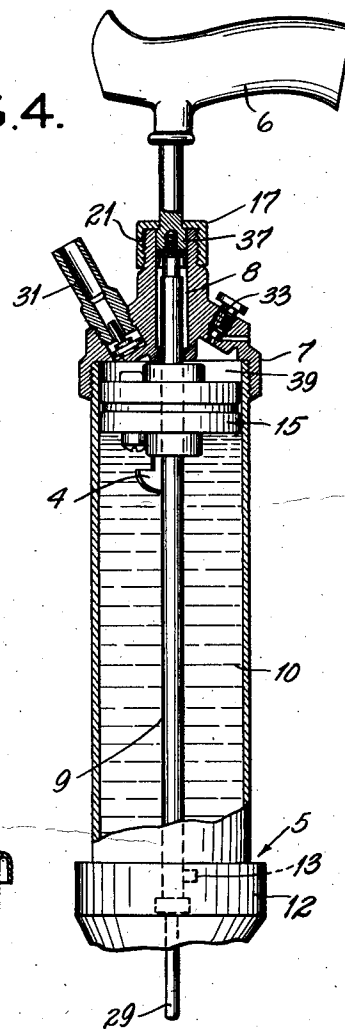


FIG.4.



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UNITED STATES PATENT OFFICE

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LUBRICATING APPARATUS

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2 Claims. (Cl. 221—47.5)

This invention relates to lubricating apparatus, and with regard to certain more specific features, to apparatus for refilling grease guns and the like from an original lubricant container.

Among the several objects of the invention may be noted the provision of a simple means for effecting filling of grease guns from original containers, simply by making a quick-detachable but positive connection and effecting a uni-directional pull; the provision of apparatus of this class requiring less effort than heretofore on the part of the operator; the provision of apparatus of this class which increases the certainty and rate at which a refill may be accomplished; and the provision of apparatus of this class which is simple in operation and economical to manufacture and market. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are illustrated two of various possible embodiments of the invention,

Fig. 1 is a vertical section illustrating a filling event for one embodiment of the invention;

Fig. 2 is a section illustrating the gun of Fig. 1 filled and ready for use;

Fig. 3 is a view similar to Fig. 1 illustrating a filling event for another embodiment of the invention; and,

Fig. 4 is a section illustrating the gun of Fig. 3 filled and ready for use.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Lubricant guns are known which have a lubricant cylinder containing a pressure piston, operated to effect a suction for filling. In some of these the cylinder is divided by the follower piston into two compartments, one of which constitutes the lubricant supply compartment and the other a compartment in which other than manual pressure is applied to the follower. These guns ordinarily have a head carrying an outlet in communication with the lubricant supply compartment, and exteriorly controlled means for causing lubricant to be ejected from said outlet. The outlet head is ordinarily removable, the same having a quick-detachable connection with the cylinder, such as a threaded connection, a bayonet connection or the like. After a charge of

lubricant has been exhausted, the follower is usually in a position adjacent the outlet in the cylinder, and the problem arises of refilling the cylinder by drawing back the follower after the outlet head has been removed.

It has been suggested to place in the original container a follower having a hole therein, over which is positioned the gun cylinder. The gun cylinder is then to be pressed, and the pressure thus transmitted to the lubricant extrudes the lubricant from the opening, into the gun cylinder, at the same time pushing back the then-free pressure piston. The disadvantage of this construction is the inability to angle the gun cylinder on the follower without effecting leakage to the upper side of the follower and outside of the gun cylinder. This angling is difficult to prevent, and hence said leakage is common in this class of apparatus.

In United States Butler Patent 1,981,495, dated November 20, 1934, there is suggested the use of a follower on the lubricant in an original container, wherein a resilient outlet is provided through said follower, adapted to be contacted by the cylinder of the grease gun. The difficulty with a construction of this class is that although it permits angling, the cylinder of the gun to be filled must be pressed against the follower at the same time that the follower in the gun is withdrawn to draw in a charge. While in the Butler patent a seal is effected and a direct pull will cause filling, nevertheless, at least an initial diverse push and pull combination is necessary to effect an initial seal. The necessary push is on the cylinder and the necessary pull on the piston. Even after the seal is effected, there is the danger that an imperfect contact will again break it, thereby again requiring, or continuously requiring, a downward push on the gun cylinder while the control handle thereof is pulled in the opposite direction.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a commercial container for lubricant from which grease guns of the class described are to be filled or re-filled. The lubricant carried by the container 1 is ordinarily of a viscous nature which flows only sluggishly except when forced under pressure.

At numeral 3 is shown the cylinder of one type of gun, the head 2 having been removed from the threaded outlet 5 thereof (see also Fig. 2). The cylinder also carries a rearward head 7, slidably supporting a retractor 9. The retractor 9 has a pin 13 for contacting a follower piston 15 in said cylinder 3.

As shown in Fig. 2, the follower piston 15 is

normally pushed by a spring 19 against the lubricant in chamber 10. Under such conditions the spring 19 reacts against a removable nut 17. Suitable pumping mechanism (not shown) in the head 2 effects ejection of lubricant under its pressure prime and the retractor is at this time pushed into the cylinder 3 where it is out of the way. At this time the pin 13 is out of engagement with a bayonet notch piece 4 associated with the follower piston 15. The pin 13 may be placed in the notch piece 4 for manually driving the follower piston 15 toward the open end of cylinder 3, if and when this operation becomes necessary, as in ejecting residual lubricant. As the retractor 9 is pushed into cylinder 3, the power spring 19 is compressed against the follower piston 15 and so held by screwing bearing nut 17 to the threads 21 (Fig. 2). During retraction nut 17 is loose (Fig. 1).

At numeral 23 is shown a relatively loose follower which is placed upon the lubricant in the container 1, after opening the latter. It has a central opening 25 threaded as shown to cooperate with threads 5 at the lower end of the cylinder 3 to provide a quick-detachable connection.

To load a grease gun such as shown in Fig. 1, the cylinder 3 is threaded into the threaded opening 25. The threads are only class examples of any quick-detachable connection which may be used such as bayonet connections and the like. The criterion of the connection is that it be positive and not one requiring a manual push (against a pull) to fasten it, as in the case of said Butler Patent 1,981,495. Under these conditions, the follower piston 15 is at the lower end of the cylinder 3 and against the stop 13 (Fig. 1). By unscrewing the nut 17, the retractor 9 may be withdrawn by means of the handle 6, the spring 19 being drawn outwardly through the opening left by unscrewing the nut 17. After screwing the cylinder 3 to the follower 23, only a pull is needed on the handle 6, and no push is required on the cylinder 3. The reaction of the weight of the container 1 with its charge causes a vacuum in the cylinder 3 below its piston 15. The atmospheric pressure applied to the lubricant by way of the follower 23 and container 1 forces lubricant into the cylinder 3 after the piston 15. At the same time the follower 23 sinks relatively to the container 1 as the level of the lubricant in the container 1 is depressed. If, in order to produce an indrawing vacuum, the pull necessary is greater than the weight of the loaded depending apparatus, then the container 1 will be lifted, but this will not interfere with continued filling action. The container 1 under such conditions will merely advance upward relatively to the follower 23 to continue to force the charge into the cylinder 3. Thus the one-way pull is effective under all commercial conditions.

After the follower piston 15 has been drawn up against a stop 27, the cylinder 3 may be unscrewed from the follower 23. The head 2 is then applied at the threads 5 and the nut 17 is fastened. The spring 19 is at this time compressed to apply pressure to the piston 15 and hence to the lubricant in the chamber 10.

In Fig. 3 is shown a modified form of grease gun in which like numerals designate like parts. In this modification, the gun 3 has a plunger extension 29 on the rod 9 and the rearward head 7 is airtight. The head 7 is provided with an air inlet check valve 31 and a relief valve 33. On the rearward portion of the rod 9, where it passes

through the head 7, is provided a piston 37 which is subjected to air pressure carried in the chamber 39 and slides in a cylinder 8. Superatmospheric air pressure is carried in the chamber 39 behind the follower piston 15, the pressure being introduced through said check valve inlet 31. The lubricant supply chamber 10 is again ahead of the follower piston 15. Manual pressure on the handle 6 effects a pumping stroke of plunger 29 in head 12 and the return stroke is effected by air pressure on piston 37 when the push on handle 6 is reduced.

For this form of grease gun, the threaded outlet 25 in the follower 23 is provided with an adapter extension 41 which is threaded to receive the threaded end 5 of the cylinder 3, the adapter being long enough to accommodate the plunger extension 29 on the rod 9. It will be seen that without the adapter 41 and in the presence of the extension 29, it would be impossible to empty the drum 1 completely, inasmuch as the follower 23 could not come within a distance equal to the length of the extension 29 from the bottom of the container 1. The adapter positions the plunger extension 29 above the lower surface of the follower 23.

The operation of the modified form is similar to that of the form first described. The nut 17 is unscrewed, thereby permitting withdrawal of the rod 9 through the head 7, the pin 13 contacting the follower piston 15 and causing its retraction and the suction of a charge into the cylinder 3.

It will be appreciated that there should be no pressure behind the follower 15 under conditions of removal of the head from the threads 5, the same being released through valve 33.

From the above, the advantages of the invention will be clear. The quick detachable connection assures a rigid seal, requiring only a pull for filling and preventing the undesirable angling between the gun and follower 23. Instead of offsetting the undesirable features of said angling I prevent the angling.

It should be understood that the adapter 41 shown in Fig. 3 need not be used between the gun and the follower until the bottom of the container 1 is approached. To this end, the threads at the upper end of the follower 41 and those in the outlet 25 are of the same size so that the cylinder 3 is interchangeably threadable on the adapter 41 and in the outlet 25.

It is also to be understood in both forms of the invention that the trapping of a charge of air in the outlet 25 may be readily avoided by slightly pressing down the follower when it is initially placed and that the guns have a residual charge between their followers 15 and the ends of the cylinders 3 after entering. Thus the end surface of the residual charge and the end surface of the lubricant in the outlet 25 (or adapter 41) meet, upon connection of cylinder and follower or adapter, to form a solid lubricant mass with the supply in the container 1. This avoids trapping any deleterious mass of air.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In combination, a container having lubricant therein, a follower slidably fitting within the container and adapted to rest upon the lubricant, said follower having an opening therethrough, a lubricant gun comprising a cylinder having a head end adapted to be opened, a piston therein, said piston being adapted to assume a position adjacent the head end when said end is opened, means associated with the piston and extending from the cylinder when open and an adapter having a quick-detachable connection with said follower at said opening and with the end of said cylinder, said adapter being of a length to permit the follower ultimately to be positioned adjacent the bottom of the container whereby substantially all lubricant may ultimately be exhausted from the container, said follower also accommodating at said quick-detachable connection, lubricant guns of the class described without extensions.

2. In combination, a container having lubricant therein, a follower slidably fitting within the container and adapted to rest upon the lubricant, said follower having an opening therethrough, a lubricant gun comprising a cylinder having a head end adapted to be opened, an extension in the gun extending from the cylinder when said head end is opened, and an adapter having a quick-detachable connection with said follower at the opening therein and with the end of said cylinder when opened, said adapter being of a length to permit the follower ultimately to be positioned adjacent the bottom of the container whereby substantially all lubricant may ultimately be exhausted from the container, said follower also accommodating at said quick-detachable connection lubricant guns of the class described but without extensions.

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