

March 6, 1934.

R. M. STAFFORD ET AL

1,949,497

GREASE GUN

Filed Aug. 12, 1932

2 Sheets-Sheet 1

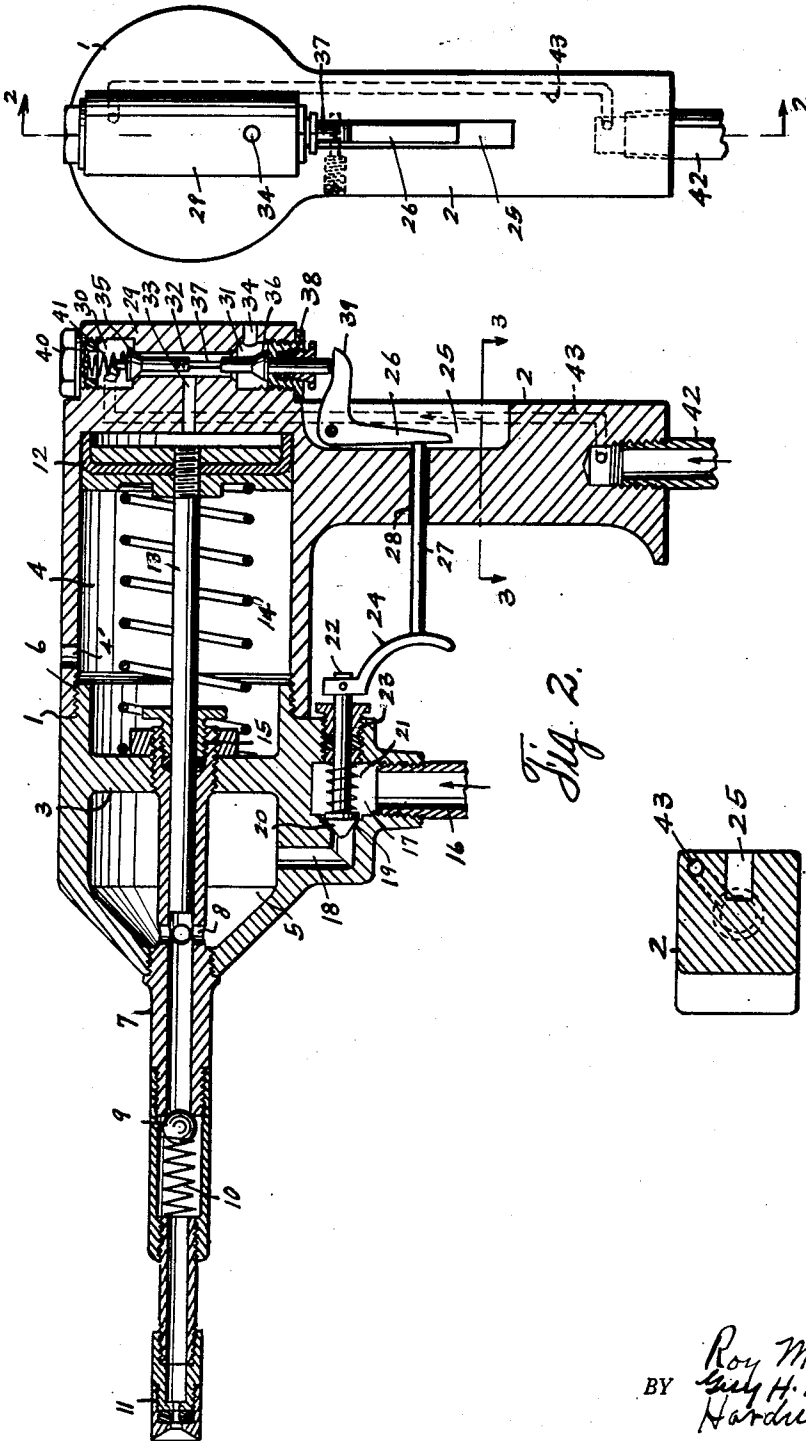


Fig. 1.

Fig. 2.

Fig. 3.

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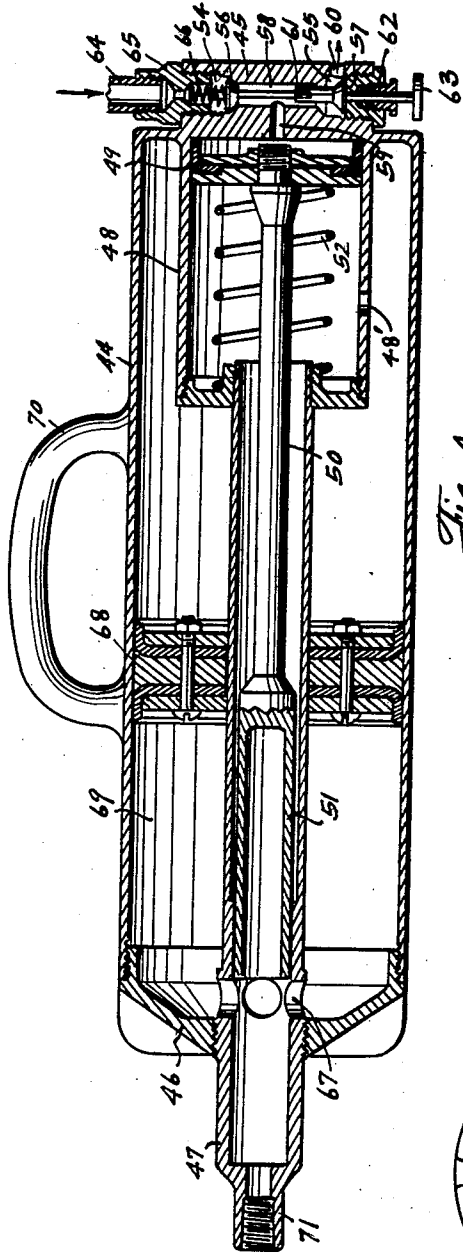


Fig. 4.

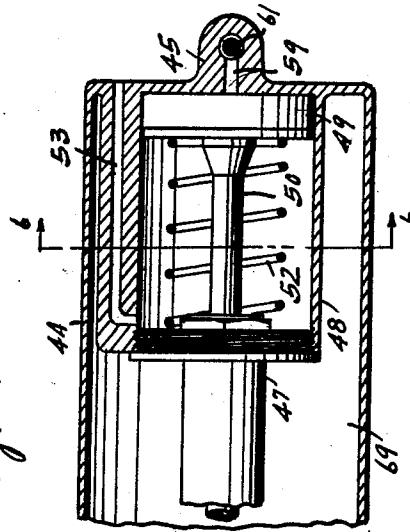


Fig. 5.

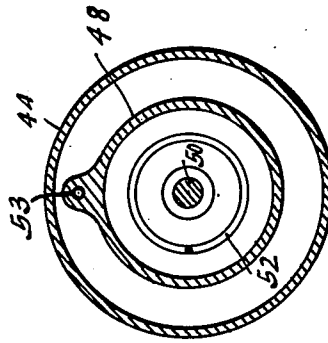


Fig. 6.

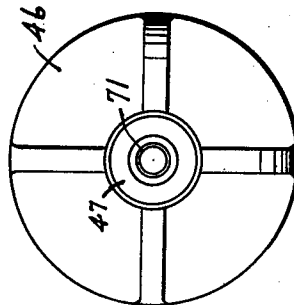


Fig. 7.

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UNITED STATES PATENT OFFICE

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GREASE GUN

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Application August 12, 1932, Serial No. 628,570

5 Claims. (Cl. 221—47.3)

This invention relates to a grease gun.

An object of the invention is to provide an apparatus for applying a lubricant to the parts to be lubricated.

5 A further object of the invention is to provide a lubricating apparatus whereby charges of lubricant may be forced into the parts, or bearings, to be lubricated by the use of a pressure fluid.

10 Another object is to provide apparatus of the character described equipped with means whereby the application of the pressure fluid may be controlled by the operator.

15 With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, examples of which are described in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 shows an end view of the gun.

20 Figure 2 shows a longitudinal sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 2.

25 Figure 4 shows a longitudinal sectional view of another form of the gun.

Figure 5 shows a fragmentary longitudinal sectional view taken at right angles to that shown in Figure 4.

30 Figure 6 shows a cross sectional view taken on the line 6—6 of Figure 5, and

Figure 7 shows an end view.

35 In the drawings the numeral 1 designates the gun body having the grip 2. The body 1 is formed hollow and has a transverse partition 3 separating the same into a cylinder 4 and a lubricant container 5.

The body is formed of sections connected by the threads 6 for convenience in assembly.

40 There is a tubular barrel 7 which is anchored to the partition 3 and to the forward end of the body 1 and within the container 5 this barrel has one or more inlet openings 8. Within the barrel there is an outwardly opening back pressure valve 9 normally held in position to close the passageway through the barrel by the spring 10. The outer end of the barrel has a nozzle 11 shaped to fit the fitting of the bearing to be lubricated.

50 Within the cylinder 4 there is the piston 12 which is fixed on the plunger 13. This plunger works in the barrel 7. Surrounding the plunger 13 and interposed between said piston 12 and the partition 3 there is a coil spring 14 which normally holds the piston retracted in which posi-

tion the free end of the plunger will clear the openings 8.

The plunger 13 works through a stuffing box 15 in the inner end of the barrel 7.

There is a pressure line 16 connected to the 60 body 1, and connected into the valve chamber 17 in said body. Leading from this chamber 17 into the container 5 there is a duct 18 whose end adjacent the chamber 17 is formed into a valve seat 19. There is an outwardly opening valve 65 20 arranged to cooperate with said seat and to close said duct and this valve is normally held closed by the coil spring 21. The valve 20 is attached to the inner end of the valve stem 22 which works through the stuffing box 23 and 70 attached to the outer end of said stem there is the trigger 24.

In the outer side of the grip 2 there is an oblong recess 25 and pivotally mounted in said recess there is a lever 26. A push rod 27 is attached 75 to the trigger 24 and works through a bearing 28 in the grip 2 and against the free end of the lever 26.

The outer end of the body 1 is reduced forming a valve casing 29 and this casing is formed 80 with the valve chambers 30, 31. These chambers are connected by the passageway 32. A duct 33 connects said passageway with the outer end of the cylinder 4 and an exhaust port 34 connects the valve chamber 31 with the free atmosphere. 85

In the chambers 30, 31 are the valves 35, 36 which are connected by a common stem 37 through the passageway 32. This stem 37 is extended through the stuffing box 38 and its free end works against the free end of the arm 39 90 which extends outwardly from the pivoted end of the lever 26. The valve chamber 30 is closed by the screw cap 40 and between this cap and the valve 35 there is a pressure spring 41 which normally holds the valve 35 in position to close 95 the passageway 32 and the valve 36 in position to open said passageway.

A fluid pressure line 42 is attached to the free end of the grip and a duct 43 leads from this line and enters the valve chamber 30. 100

In use the gun may be held by the grip 2 and the nozzle 11 applied to the conventional fitting of the bearing or other part to be lubricated. The trigger 24 may then be pulled which will operate to open the valve 20 and permit the lubricant to enter and fill the chamber 5, if the same is not already filled with the lubricant. At the same time the rod 27 will actuate the lever 26 and the arm 39 will press against the outer end of the stem 37 to close the valve 110

36 and open the valve 35. Thereupon the pressure fluid will pass through the duct 43, the valve chamber 30, the passageway 32 and the duct 33 and will force the piston 12 forwardly driving the plunger 13 forwardly through the barrel 7, the air ahead of the piston escaping through the cylinder relief port 4' and the lubricant ahead of the plunger will be forced out past the valve 9 and through the nozzle and into the bearing to be lubricated. Upon release of the trigger 24 the valve 20 and the valve 35 will be closed and the valve 36 opened. The spring 14 will thereupon retract the piston and plunger, the air behind said piston escaping out through the outlet port 34, and air entering the cylinder in front of the piston through the port 4'.

As the plunger is retracted a vacuum will be created in the barrel and when the openings 8 are cleared by the plunger another charge of lubricant will enter said barrel in readiness to be discharged upon the next forward stroke of said plunger. Upon said next forward stroke of the plunger the valve 20 will be opened as above explained and additional lubricant will be forced into the container 5 so as to keep the same substantially filled with lubricant.

In the form shown in Figures 4 to 7 inclusive the tubular body is indicated by the numeral 44 and is provided with a valve casing 45 at one end and a removable end cap 46 at the other end. Threaded through the cap 46 is a tubular barrel 47 whose inner end is attached to the inner end of the cylinder 48 which in turn is attached to the opposite end of said body 44 and whose inner end is removable.

Within the cylinder 48 there is a piston 49 attached to which is a stem 50 which works in the barrel 47 and whose inner end is formed into a hollow plunger 51 whose forward end is open.

Within the cylinder 48 and surrounding the stem 50 there is a spring 52 which is interposed between the piston 49 and the opposite end of the cylinder 48. A duct 53 leads through the wall of the cylinder from the inner end of said cylinder to the free atmosphere.

In the valve casing 45 there are the oppositely arranged valve chambers 54, 55 in which are located the respective valves 56, 57 and connecting said chambers is a passageway 58. Leading from this passageway into the outer end of the cylinder 48 there is a duct 59 and an outlet port 60 leads out from the chamber 55. The valves 56, 57 are connected by a common stem 61 which is located in the passageway 58 and which is extended out through the stuffing box 62 and whose outer end has the enlarged head 63 thereon. A fluid pressure line 64 enters the valve chamber 54 and is connected to the valve casing 45 by the tubular connection 65. A coil spring 66 is interposed between the connection 65 and the valve 56 and normally holds said valve 56 in position to close the passageway 58 and the valve 57 in position to open said passageway to the port 60.

The barrel 47 has one or more openings 67 within the cap 46. Slidably mounted on the barrel 47 within the body 44 there is a floating piston 68.

In use the cap 46 may be unscrewed and removed and the body 44 filled with the lubricant, the piston 49 being forced back to the cylinder 48 so as to permit the lubricant containing chamber 69 to be filled to capacity and the cap 46

may then be replaced. As the piston 49 is moved backwardly the air behind it will escape through the port 48' in the cylinder 48 and out through the duct 53.

This type of the gun may be handled by the grip 70 and the nozzle 71 at the free end of the barrel may be attached in any suitable manner to the fitting of the bearing to be lubricated. The head 63 may then be depressed to open the valve 56 and close the valve 57. Thereupon the pressure fluid will enter through the passageway 58 and the duct 59 and will force the piston 49 forwardly forcing the plunger 51 forwardly discharging the lubricant. As the piston 49 moves forwardly the air in the cylinder will escape through the duct 53, and when the piston 49 clears the port 48' the pressure fluid will pass out through said port 48' and will operate to move the floating piston 68 forwardly to maintain the lubricant in the chamber 69 under pressure. Upon release of the head 63 the valve 56 will be closed by the spring 66 and the valve 57 will be open. Thereupon the spring 52 will retract the piston 49, sufficiently to clear the port 48' and the pressure fluid behind the piston 68 will enter the cylinder 48 behind the piston 49 and assist the spring 52 in fully retracting the piston 49 and the plunger, the air behind said piston 49 escaping out through the port 60. As the plunger 51 is retracted the valve of the conventional fitting to which the nozzle 71 is attached will close and a vacuum will be created in the outer end of the barrel 47 and when the plunger clears the openings 67 an additional charge of the lubricant will be forced through the openings 67 into the barrel, the piston 68 gradually moving forward by reason of the compressed air behind it and the operation may be repeated until the supply of lubricant has been exhausted.

The drawings and description disclose what is now considered to be a preferred form of the invention by way of illustration only while the broad principle of the invention will be defined by the appended claims.

What we claim is:

1. A grease gun comprising a body having a cylinder and a lubricant container, said container having an inlet for a lubricant, a valve normally closing said inlet, a tubular barrel anchored to the body and terminating in a discharge nozzle, said barrel having an opening through which a lubricant in the container may enter the barrel, a plunger in the barrel, a piston in the cylinder, means normally holding the plunger retracted to position to clear said barrel opening, there being a channel for pressure fluid leading into the cylinder through which pressure fluid may be applied to the piston to force said plunger forwardly and a relief outlet through which a pressure fluid may be relieved from the cylinder, simultaneously movable control valves effective to normally close said channel and open said outlet and manually operable means for opening said inlet valve and simultaneously moving said control valves into position to open said channel and close said outlet.

2. In a grease gun having a lubricant container therein provided with an inlet and a valve normally closing said inlet, a tubular barrel extending through and projecting out beyond said container and terminating in a nozzle, a back pressure valve arranged to permit the flow of a lubricant outwardly through the barrel and to prevent the flow of lubricant inwardly through

the barrel, said barrel having an opening located within said container, a plunger in the barrel, means for controlling the application of pressure fluid to move the plunger forwardly to effect the expulsion of the lubricant in the barrel therefrom, said means also controlling said valve to admit lubricant into the container, means connected to said controlling means to release said pressure fluid to permit the retraction of the plunger and means to retract the plunger into position to clear said opening.

3. A grease gun comprising a body having a cylinder and a lubricant container in front of the cylinder, a partition separating said cylinder and container, a tubular barrel anchored to said partition and to the forward end of the body and extending axially through said container, said barrel having a discharge nozzle and an opening into the container, and also having a lubricant inlet, a plunger in the barrel, a piston in the cylinder, an inlet valve controlling said inlet, means having a relief outlet controlling the application of the pressure fluid to the piston to drive the piston and plunger forwardly and including valves movable simultaneously to permit application of said pressure to the piston and to close said outlet, when in one position, and to prevent such application and open the outlet when in another position, and manually operable means for simultaneously opening said valve and permitting the application of said pressure to the piston.

4. A grease gun comprising a hollow body having a cylinder and a lubricant container, a tubular barrel anchored to the body and to the cylinder wall and extending beyond said body and terminating in a nozzle, said barrel having an opening through which a lubricant may pass into the barrel and said container having an inlet for the lubricant, an inlet valve controlling said inlet, a plunger in the barrel, a piston in the cylinder connected to the plunger, there be-

ing a channel through which pressure fluid may be applied to the piston to force said piston forwardly and a relief outlet, a pair of manually operable valves to control said channel and outlet whereby pressure fluid may be admitted through said channel and relieved through said outlet alternatively, means for opening said inlet valve upon the admission of said pressure fluid whereby a lubricant is admitted to said container, and means acting against the piston and effective to retract said plunger upon release of the fluid.

5. A grease gun comprising a body having a cylinder and a lubricant container, said container having an inlet for a lubricant, a valve normally closing said inlet, a tubular barrel anchored to the body and terminating in a discharge nozzle, said barrel having an opening through which the lubricant in said container may enter the barrel, a plunger in the barrel, a piston in the cylinder, means normally holding the plunger retracted to position to clear the barrel opening, there being a channel for pressure fluid leading into the cylinder through which pressure may be applied to the piston to force the plunger forwardly and a relief outlet through which the pressure fluid may be relieved from the cylinder, said channel having spaced valve seats, valves controlling said seats, a common stem connecting said valves whereby when one of said connected valves is open the other will be closed, yieldable means normally acting to actuate the connected valves into position to close said channel and to open said outlet and means through which the inlet controlling valve may be opened and said connected valves simultaneously actuated to close said outlet and open said channel to admit the pressure fluid to the piston.

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