

July 19, 1938.

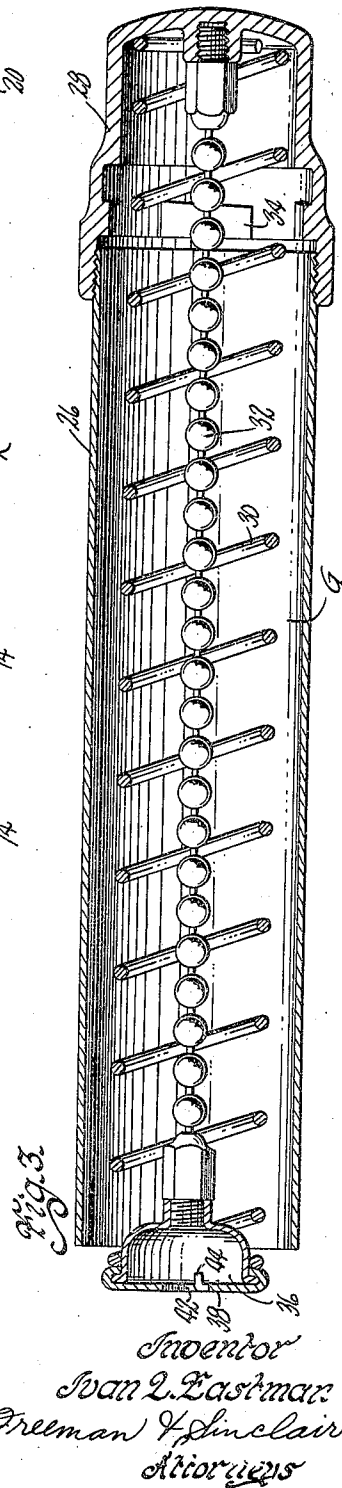
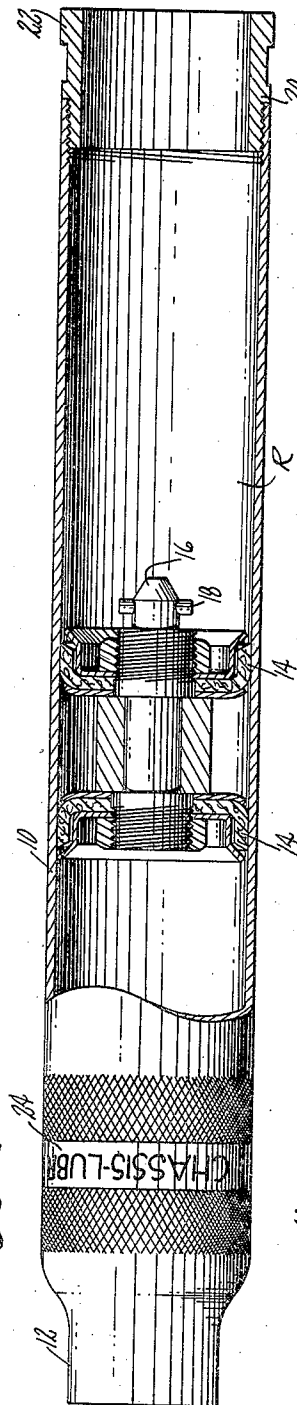
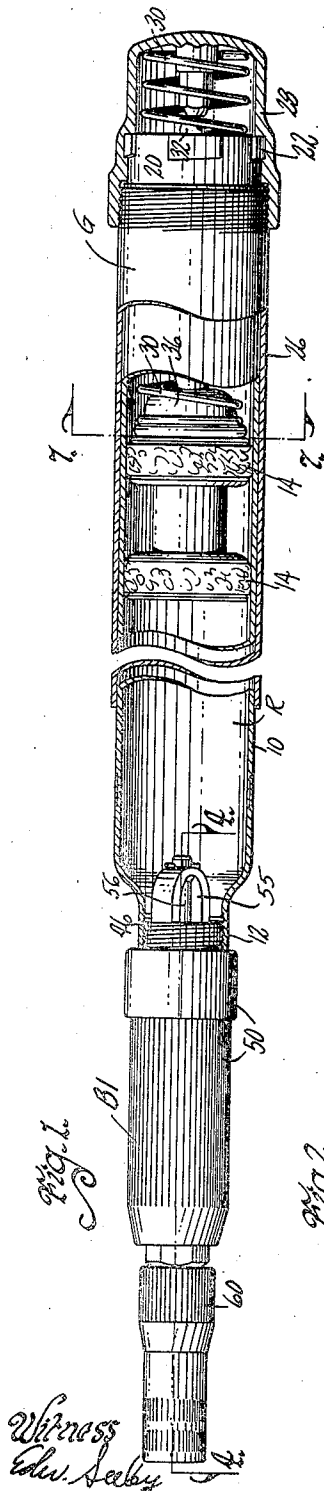
I. L. EASTMAN

2,124,138

LUBRICANT GUN SET

Filed May 13, 1935

3 Sheets-Sheet 1



July 19, 1938.

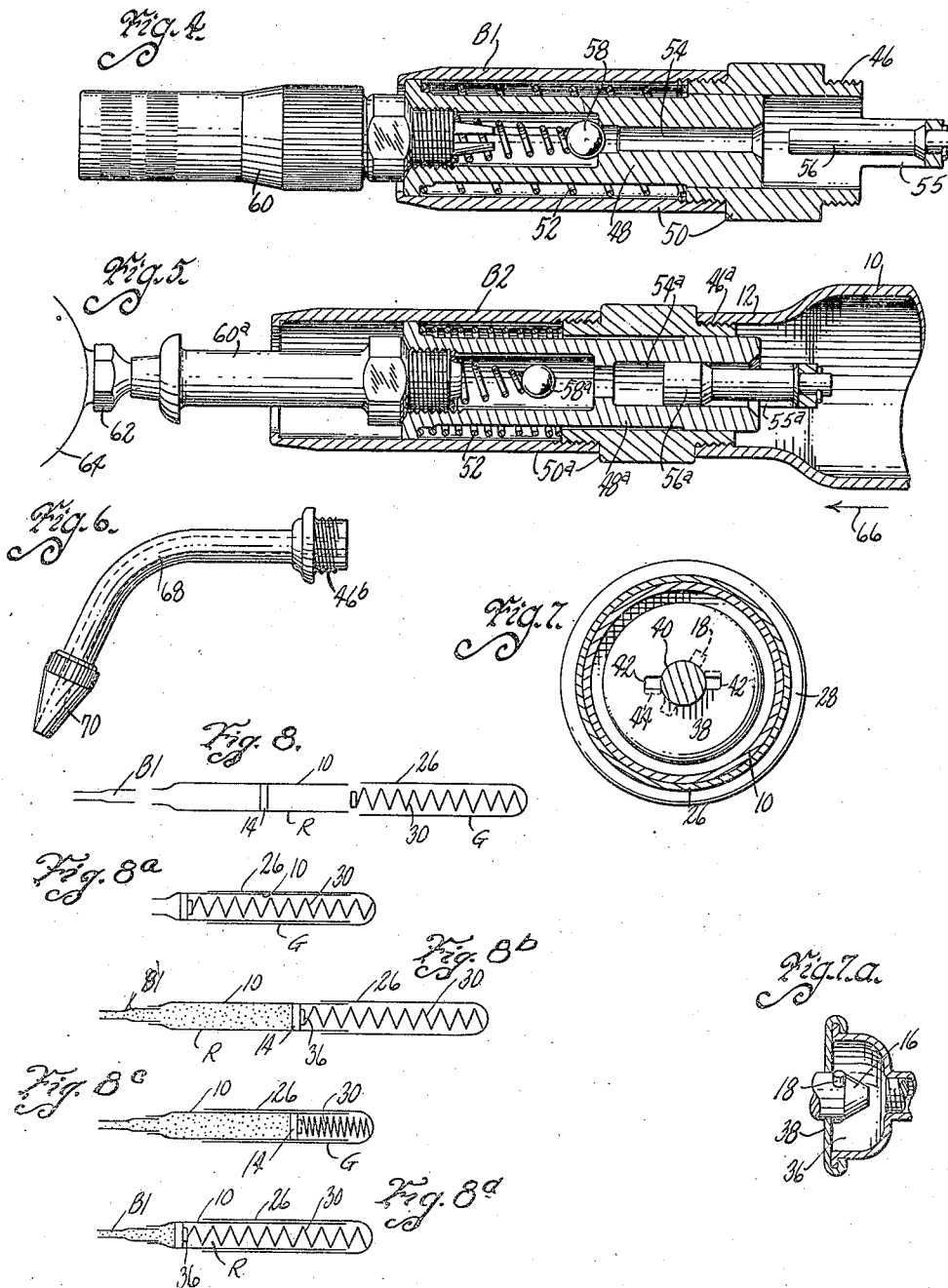
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Witness  
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LUBRICANT GUN SET

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3 Sheets-Sheet 3

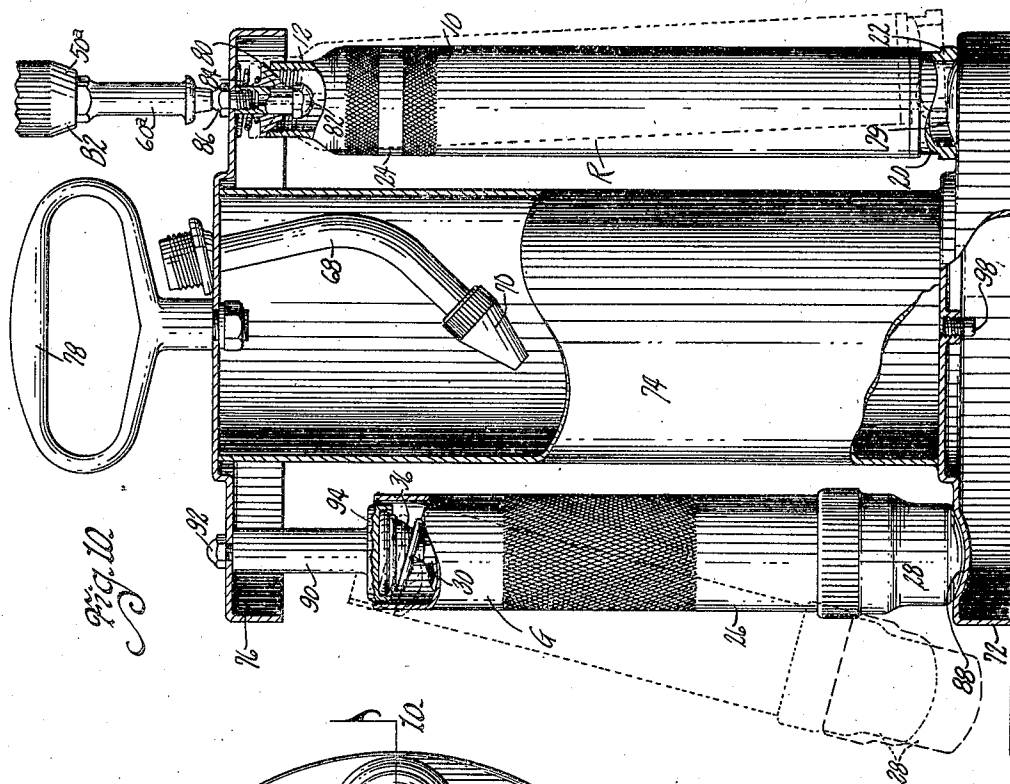


Fig. 10

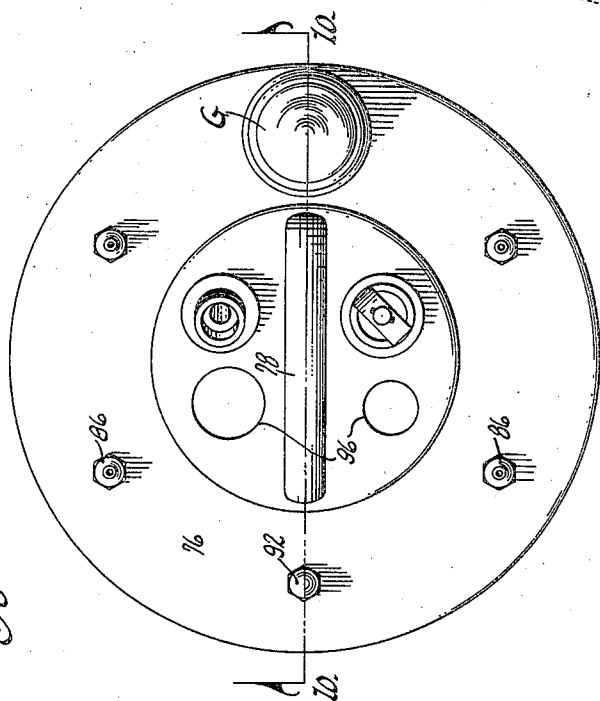


Fig. 9

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## UNITED STATES PATENT OFFICE

2,124,138

## LUBRICANT GUN SET

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8 Claims. (Cl. 221-47.4)

The object of my invention is to provide a lubricant gun set of simple, durable and inexpensive construction.

A further object is to provide a grease gun set including a plurality of reservoirs, each for a different grade of lubricant, and each being provided with a follower, a single actuator being provided for coaction with any reservoir and operable to actuate the lubricant follower to discharge the lubricant from a nozzle at the discharge end of the gun, the contents of the reservoirs when not in use being free of any tendency to discharge.

A still further object is to provide an actuator for the lubricant follower normally operable to discharge lubricant from the reservoir by spring pressure, a tension member being associated with the spring for the purpose of retracting the follower member when desired.

A still further object is to provide a gun set having a plurality of reservoirs, a plurality of interchangeable nozzles for selective coaction with the reservoirs, and a follower actuator for connection with the follower of any desired reservoir.

Another object is to provide a rack for the reservoirs, nozzles and follower actuator which is especially adapted for supporting the particular gun structures disclosed.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation partly in section of a reservoir, booster nozzle and follower actuator embodying my invention, and showing the parts assembled together in position with the contents of the reservoir under pressure.

Figure 2 is an enlarged sectional view of one of the reservoirs per se.

Figure 3 is an enlarged sectional view of the follower actuator per se.

Figure 4 is an enlarged sectional view on the line 4-4 of Figure 1 illustrating one of the booster nozzles associable with the plurality of reservoirs.

Figure 5 is a similar view showing another type of booster.

Figure 6 is a side elevation of a direct delivery nozzle selectively connectible with the reservoirs.

Figure 7 is a sectional view on the line 7-7 of Figure 1.

Figure 7A is a sectional view showing a con-

necting member in Figure 3 connected with a follower in Figure 2.

Figure 8 is a diagrammatic view showing a first step in the operation of the gun set.

Figs. 8a, 8b, 8c and 8d are similar diagrammatic views showing further steps in the operation thereof.

Figure 9 is a plan view of a rack in which the reservoirs, nozzles and follower actuator of the gun set are mounted; and

Figure 10 is a side elevation partly in section on the line 10-10 of Figure 9, showing the coaction of the reservoir, nozzles and follower actuator with the rack.

On the accompanying drawings I have used the reference character R to indicate a reservoir. The reservoir R comprises a cylinder 10 having a reduced discharge neck 12. Within the cylinder 10 I provide a lubricant follower F comprising a suitable support having cup leathers 14 for sealing purposes, and a connecting stud 16 provided with bayonet pins 18. At the rear end of the cylinder 10 I provide a connector sleeve 20. On the sleeve 20 are bayonet lugs 22. In my gun set I provide a plurality of reservoirs R each adapted to contain a different grade or kind of lubricant. For the convenience of the user, the lubricant in the reservoir is suitably indicated by a sheet metal band 24 soldered around the cylinder 10, having the proper indicia thereon. On the drawings, the reservoirs have been illustrated without lubricant therein.

For selective connection with the plurality of reservoirs R, my gun set includes a follower actuator G. It comprises a cylinder or sleeve 26 (adapted to telescope over the cylinder 10), a head 28, a spring 30 and a chain 32. The head 28 is secured to one end of the sleeve 26 and is provided internally with bayonet lugs 34 for coaction with the bayonet lugs 22 of the reservoir R, as shown for instance in Figure 1. The lugs 22 and 34 provide a quickly detachable connection which can be operated from connected to unconnected position, or vice versa, with less than a quarter turn of the actuator G relative to the reservoir R.

The spring 30 is assembled under slight tension between the head 28 and a bell-like connector member 36. A connector disc 38 is assembled on the member 36 by its edge being spun over a flange of the member 36 as shown in Figure 3. The chain 32 is preferably of the swivel ball type shown, so as to provide a free swiveling movement, and to readily collapse into a very small space when necessary. The connector disc 38

(see Fig. 7) is provided with a round opening 40 large enough to permit the stud 16 to readily pass through it, the opening 40 being enlarged at 42 to permit the bayonet pin 18 to pass through the disc. Adjacent the parts 42 the metal is turned in to form ears 44 to limit the rotation of the disc 38 relative to the bayonet pin 18.

In Figures 1 and 4 I show a booster nozzle B<sup>1</sup> adapted to be associated with any of the reservoirs by a threaded connection at 46. This nozzle is a high pressure type. In Figure 5 I show a low pressure booster nozzle B<sup>2</sup>. The nozzles B<sup>1</sup> and B<sup>2</sup> are similar in construction and operation and I will now describe the high pressure nozzle B<sup>1</sup>.

The nozzle B<sup>1</sup> comprises a cylinder member 48 and a piston member 50 telescoping thereover, a spring 52 being provided to keep the parts extended. The cylinder member 48 has a cylinder bore 54 into which a high pressure expeller plunger 56 (carried by the plunger member 50) is adapted to project, for expelling lubricant through a check valve 58 and a nozzle member 60, which is designed for coaction with a lubricant reception fitting. The parts of the low pressure booster nozzle B<sup>2</sup> have been given similar reference numerals with the addition of the distinguishing characteristic "a". The nozzle member 60a in Figure 5 is shown coacting with a grease reception fitting 62 of a bearing 64, the parts being shown in this figure contracted by motion of the reservoir R in the direction of the arrow 66 for causing the plunger 56a to open the check valve 58a and expel lubricant into the bearing 64.

In Figure 6 I show a direct delivery nozzle consisting of a pipe 68 terminating in a nozzle member 70 at one end and having at its opposite end a connecting part 56b.

Referring to Figures 9 and 10, a rack is illustrated comprising a base 72, a catch receptacle 74 forming in effect a post thereon and a head 76. The head 76 is provided with a handle 78 for convenience in carrying the rack from one position to another about a service station.

The rack is provided for five reservoirs R. For each reservoir the base 72 has an abutment 78 adapted to position the rear end of a reservoir relative to the base. The other end is positioned by a cone member 80 slidably mounted on a hollow stud 82. The cone member 80 is urged toward the reservoir by a spring 84. A lubricant reception fitting 86 (minus the check valve commonly found in such fittings) retains the stud 82 in position.

For the follower actuator G I provide in the base 72 a depression 88. The top 76 is provided with a post 90 held in position by a cap screw 92 and terminating in a socketed head 94. The plate 76 above the catch receptacle 74 is provided with openings 96 for receiving the various nozzles of the gun set and supporting them when they are not in use. A drain plug 98 is provided for the catch receptacle 74 for draining it of any lubricant accumulated therein by dripping from the nozzles.

#### Practical operation

In the operation of my gun set, assuming the parts are disconnected as in Figure 8, the follower actuator G may be telescoped over any one of the reservoirs R, as at B for filling purposes. The connector disc 38 is operated to connect with the follower F by first causing the opening 40 of the disc to receive the pointed end of the stud 16 on the follower. The sleeve 26

accurately aligns the follower actuator with the reservoir during this operation. The actuator is pushed in far enough so that the spring 30 is under slight tension and the actuator is then rotated for rotating the disc 38 relative to the bayonet pins 18 until they register with the openings 42, whereupon the disc will snap past the pins and further rotation will cause the pins to assume the position illustrated in Figures 7 and 7A and the actuator G pushed inwardly to the position in Fig. 8a. Thereupon the neck 12 of the reservoir may be inserted in a supply of lubricant and the actuator G retracted for drawing the lubricant into the reservoir until the follower F strikes the connector sleeve 20. Thereafter either of the nozzles B<sup>1</sup> or B<sup>2</sup> can be attached to the reservoir and the parts will be in the position of Figure 8b. The spring is then compressed as in Figure 8c and the head rotated relative to the connector sleeve 20 for causing coaction of the bayonet lugs 22 and 34, thus positively connecting the actuator sleeve and head 26 and 28 with the reservoir. While the spring is being compressed, the telescoping connection prevents buckling thereof and misalignment of the actuator relative to the reservoir.

When the parts are in this position, the chain 32 is collapsed within the spring and the follower is under the pressure of the spring for expelling the lubricant into the cylinder 54, but this pressure is insufficient to cause the lubricant to pass the check valve 58. Whenever the booster nozzle is reciprocated, however, the lubricant will be pumped from the nozzle and the spring 30 will cause the follower to keep lubricant supplied to the booster nozzle. This will continue until the parts assume the position of Figure 8d, whereupon the reservoir must be refilled.

My gun set can be used either as a booster type for grease or other heavy lubricant, or as a pump type for oil. Instead of using either of the nozzles B<sup>1</sup> or B<sup>2</sup>, the direct delivery nozzle 68 can be used, whereupon after the parts are in the position in B in Figure 8, this nozzle can be attached to the reservoir and then inserted in a container of oil for filling the gun by withdrawing the actuator G as in C. The parts of the gun are not then placed in the position of D, but the nozzle 68 is inserted in the crank case or wherever it is desired to discharge the oil, and the actuator G is pushed inwardly for discharging the charge of oil from the reservoir.

These operations are then repeated as often as required to supply the necessary oil to the part being oiled.

Whenever a reservoir is no longer to be used, it may be placed in the dotted position shown at the right side of Figure 10, and then pushed upwardly for sliding the cone member 80 upwardly against the tension of the spring 84 and swinging over the abutment 78. The reservoir is then allowed to settle over the abutment, in which position it is efficiently held by the cone 80 and the spring 84.

When the operator is through using the actuator G, he places it in the dash line position at the left of Figure 10, with the connector disc 38 engaging the socket 94 of the post 90. The actuator is then lifted to the dotted line position, which places the spring 30 therein under tension, and the lower end of the head 28 is swung into the seat 88. Thus the actuator is held in position by its own spring.

The nozzles when they are not in use are inserted into the openings 96 so as to be con-

veniently supported and readily accessible when needed. Any drippings therefrom collect in the catch receptacle 74 and can be removed from time to time by removing the plug 98 and draining out the receptacle.

By providing a plurality of reservoirs and a single actuator for the follower in each, whenever a reservoir is not in use, its contents are not under pressure, tending to cause leakage of lubricant out through the discharge end. This is one of the advantages of my arrangement.

Considering any one of the reservoirs, when it is supported in the rack, the cone member 80 serves to keep dirt out of the lubricant therein.

When a booster nozzle is changed from one reservoir to another, it is desirable to get rid of the last lubricant in the nozzle instead of expelling it with the lubricant from the second reservoir. I, therefore, provide the fittings 86 which are adapted to have the booster nozzles coact therewith so that, assuming the nozzle B<sup>2</sup> in Figure 10, having been removed from the reservoir R, shown in this figure, after the nozzle is placed on a second reservoir and the actuator G associated therewith, the nozzle B<sup>1</sup> can be operated to pump the former grease out of it back into the reservoir R from which it came. The operator, for instance, could be instructed to pump three full strokes of the booster nozzle to discharge the lubricant within the nozzle which came from the first used reservoir without discharging that which comes from the second used reservoir. Thereafter the gun may be used with the assurance that only the proper lubricant will be discharged from the booster nozzle.

By providing a plurality of reservoirs so that each can contain a different lubricant, and providing a quickly disconnectible follower actuator, I am able to dispense a plurality of lubricants from a compact gun set without each gun being complete in itself, and without taking any more time than required when each gun is complete in itself.

The nozzles being interchangeable can be so associated with the reservoir being used that the lubricant can be boosted out of the reservoir under either low or high pressure or pumped out when it is fluid enough and pressure is not required.

In changing from one gun to another, the actuator G is always first uncoupled so as to relieve the pressure on the lubricant, and then the nozzle is disconnected if it is desired to use it on the next reservoir. Before using the gun, the nozzle is always placed on first before the follower actuator is manipulated for placing the contents of the reservoir under pressure by the spring 30. The entire set is manually operable so that it is not necessary to have compressed air or electricity for operating the guns. A maximum of flexibility for the set is secured by the interchangeable features and the quickly attachable and detachable connection between the reservoirs and the follower actuator.

Some changes may be made in the construction and arrangement of the parts of the device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a lubricant gun, the combination of a reservoir, a follower in said reservoir and a nozzle for coaction with the discharge end of said reservoir,

with a follower actuator comprising a head for coaction with the other end of said reservoir, means for connecting said head to said reservoir, a spring carried by said head for urging the follower within the reservoir in a lubricant discharging direction, limiting means for the inner end of said spring, said inner end, in conjunction with said limiting means, being positively connectible with said follower for retraction purposes and disconnectible therefrom whereby to transfer said head, spring and limiting means only to another reservoir.

2. In a lubricant gun, the combination of a reservoir, a follower in said reservoir and nozzles for coaction with the discharge end of said reservoir, with a follower actuator comprising a sleeve for telescopic coaction with said reservoir, means for connecting said sleeve to said reservoir, and a spring carried by said sleeve for urging the follower within the reservoir in a lubricant discharging direction, said spring, at its inner end, having a bayonet slot and pin connection with said follower.

3. In a lubricant gun, the combination of a reservoir, a follower in said reservoir, means to retain said follower against removal therefrom and booster nozzles for coaction with the discharge end of said reservoir, with a follower actuator comprising a head for coaction with said reservoir, means for connecting said head to said reservoir, a spring carried by said head for urging the follower within the reservoir in a lubricant discharging direction and a connector element carried by the inner end of said spring and selectively connectible with and disconnectible from said follower for retracting and removal of said head from said reservoir without removing said follower therefrom respectively.

4. In a lubricant gun, the combination of a reservoir having therein follower means, with a follower actuator comprising a head for selective connection at the other end of said reservoir, a connector element selectively connectible with said follower, a flexible, collapsible, non-extensible member connecting said connector element with said head, and a spring interposed between said connector element and said head for engaging said connector element with the follower within the reservoir.

5. In a lubricant gun, the combination of a reservoir having therein follower means, with a follower actuator comprising a head for connection at one end of said reservoir, a spring carried thereby for engagement with the follower within the reservoir and terminating in a connector element selectively connectible with said follower, a collapsible, non-extensible connection between said connector element and said head, and a sleeve extending from said head and encircling said reservoir to prevent displacement of said head from axial alinement with respect to said reservoir while compressing said spring.

6. In a lubricant gun, the combination of a reservoir having permanently retained follower means therein, with a follower actuator comprising a head for selective connection at one end of said reservoir, a spring carried thereby for engagement with the follower within the reservoir to which said head is connected, a flexible limiting connection between said head and the engaging end of said spring and a connectible and disconnectible connection between said end of said spring and said follower for follower retracting purposes or for removal of the head without removal of the follower.

7. In a lubricant gun, a reservoir, a follower therein, and a follower actuator for connection with said reservoir, said actuator comprising a head for connection with said reservoir, a chain having one end connected with said head, a connector element for selective connection with said follower, said connector element being connected with and carried by the other end of said chain, and a spring under tension and interposed between said head and said connector element for urging said connector element and thereby said follower in a lubricant discharging direction.

8. In a lubricant gun, a reservoir, a follower therein, said reservoir having a restriction to per-

manently retain said follower therein and a follower actuator for connection with said reservoir, said actuator comprising a head for connection with said reservoir, a spring carried by said head and a connector member carried by said spring for connection with said follower, and a tension member between said head and said connector member, said connector member being connectible with said follower for retracting it and disconnectible therefrom to permit removal of said follower actuator from said reservoir without removing said follower therefrom.

IVAN L. EASTMAN.