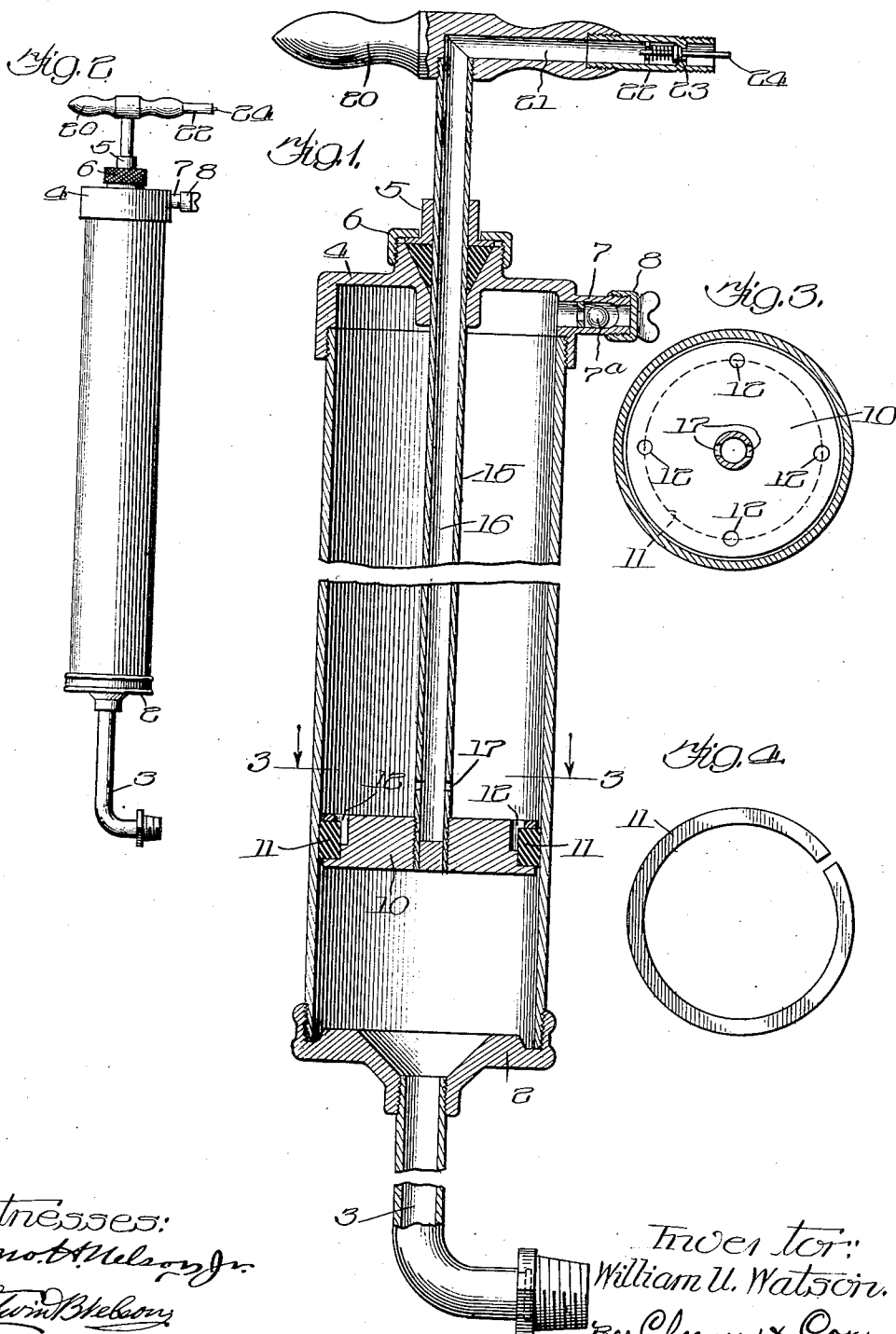


W. U. WATSON.
GREASE GUN.
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UNITED STATES PATENT OFFICE.

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GREASE-GUN.

1,042,627.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM U. WATSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Grease-Guns, of which the following is a specification.

My invention relates to pumps, more particularly of the type known as "grease guns."

It will be understood by those familiar with the use of automobiles and the accessories thereof that for lubricating the gear box and other parts of the machine it is common to employ heavy grease. This grease is usually non-fluid or at most semi-fluid and therefore cannot be ejected from the gun as water or oil would be ejected from a syringe or oil can. Great pressure is necessary, the amount being greater than can be readily exerted by a person pressing upon the handle of the gun.

Various expedients have been tried and one of the objects of my invention is to provide means whereby the necessary pressure may be obtained from compressed air or other gas.

Another object of my invention is to provide means for maintaining a close fit between the piston and the sides of the cylinder both when the gun is being filled and grease is being ejected.

Another object of my invention is to provide means whereby the user may have the choice of introducing the compressed air directly into the cylinder, or into a duct formed in the hollow piston and handle.

I obtain my objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a central longitudinal section of the complete device. Fig. 2 is a side elevation thereof. Fig. 3 is a cross-section taken on line 3—3, Fig. 1, and Fig. 4 is a top view of the packing ring for the piston.

Similar reference characters denote like parts in the different views.

The cylinder 1 is provided at its lower end with a cap 2, which will be removed when the gun is being filled. Said cap is provided with a nozzle 3 whereby the grease may be introduced directly to the point required. At the upper end, the cylinder is closed by a cap 4 preferably provided with packing 5 and nut 6. In the preferred form, cap 4 is also provided with a nipple

7, whereby compressed air or other actuating fluid may be introduced into the cylinder. This is normally closed by a cap 8 and may be provided with a ball check valve 7^a.

Within the cylinder is fitted a piston consisting of a piston body 10, having an annular channel in its periphery adapted to contain the packing ring 11 shown separately in Fig. 4. This ring consists preferably of leather and in order that it may be expansible, is discontinuous at one or more points. In the body of the piston, a number of ducts 12 lead from the base of the peripheral channel to the top of the piston. This admits the actuating fluid to the back of the packing ring, thus forcing the ring outward and perfecting the contact between the ring and the inside of the cylinder. This prevents leakage past the piston in either direction.

A piston rod 15 is fastened to the piston in any suitable manner. This rod is hollow, being provided with a longitudinal duct 16 which communicates through a port 17 with the inside of the cylinder at a point just above the piston. At the outer end, the rod is provided with a handle 20 and this also has an internal duct 21 which communicates with duct 16 inside of the piston rod. By preference the duct 21 extends horizontally to the end of the handle where it communicates with a nipple 22 which is screw threaded at its outer end to enable it to be coupled with an air pump, gas tank or other source of actuating fluid under pressure. Nipple 22 is provided with a spring closed valve 23, having a stem 24 which projects slightly beyond the end of the nipple as shown at the upper right corner of Fig. 1. The parts are so arranged that when the nipple is disconnected from the air hose, the thumb of the operator will naturally occupy a position adjacent to valve stem 24, thus enabling him to control valve 23 while his hand is in position upon handle 20.

In operation let it be assumed that the device is empty and that the operator wishes to fill it with the heavy grease herein above mentioned. He first removes the cap 2 and forces the piston down to the lower end of the cylinder. Then, keeping his thumb off valve stem 24, puts the open end of the cylinder down into the grease and pulls upward on the handle. The upward movement of

the piston draws in the grease behind it and fills the cylinder. The operator is able to thus draw in the grease by hand since the entire end of the cylinder is open and no impedance is offered to the grease except the viscosity thereof. The cylinder end is not contracted by the cap 2 and nozzle 3 as it is when the grease is to be ejected into the place of final use.

It will be noted that as the operator is thus filling the cylinder with the valve 23 closed, there will be no outlet for the air confined in the cylinder on top of the piston. The result is that the air becomes compressed here and, entering the ducts 12 acts upon the back of the packing ring 11 and forces the latter outward. As the piston rises, the pressure behind the piston tends to increase, but the operator by pressing his thumb upon the valve stem 24 relieves the pressure and maintains it at the intensity which he thinks sufficient for maintaining the contact between the packing ring and the inside of the cylinder.

When the piston has risen to the top of the cylinder, and the latter is filled with grease, the operator replaces the cap 2 and nozzle 3 whereupon the device is charged and ready for use. If only a small amount of grease is to be ejected, the operator may attach the compressed air hose to the nipple 22 and the compressed air on entering will automatically open valve 23 and pass through the handle and piston rod and port 17 into the cylinder behind the piston. This will force the piston downward and eject the amount of grease required. The air hose may then be detached and the gun will maintain the grease which it has left. If it is desired to fill a gear box, which ordinarily has a capacity several times that of the grease gun, the operator, instead of fastening the air hose to the nipple 22, may remove cap 8, and attach the air hose to the nipple 7. He can then fill and empty the gun any number of times without detaching the hose. This feature of the device, however, is not essential for when the device is in the hands of private users, it will not be called upon frequently for filling the gear box, and no time would otherwise be saved by using the nipple 7 instead of the nipple 22.

Attention is called to the fact that the packing ring is forced outward as well upon the downward movement of the piston as upon the upward movement thereof for in both cases is there compressed air on top of the piston and this has access to the back of the packing ring. Thus the device is double acting with respect to the packing ring so that leakage is avoided no matter which direction the piston is moved.

Another characteristic of my device may be noted, to-wit; if the compressed air hose

is connected to the nipple 7, and air is entering through it, the speed of the downward moving piston may be regulated by manipulating the valve 23. To illustrate, if the piston is traveling too fast, the movement may be retarded by opening the valve 23 and thus reducing the pressure above the piston without touching the air hose or its connection.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the class described, in combination, a cylinder having an opening at the lower end, a piston in the cylinder, a piston rod having a duct therein communicating at one end with the inside of the cylinder above the piston and at the other end with the atmosphere, and a valve for controlling the outer end of said duct.

2. In a device of the class described, in combination, a cylinder having an opening at the lower end, a piston having a peripheral groove the bottom of which is in communication with the space above the piston, an expansible packing ring in said groove, a hollow piston rod having a port communicating with the inside of the cylinder at a point above the piston, said rod projecting through the end of the cylinder, the cylinder being otherwise closed above the piston, and a valve for controllably releasing the air from said piston rod.

3. In a grease gun, in combination, a cylinder, a piston therein, a hollow piston rod projecting through the end of the cylinder and having a port communicating with the inside of the cylinder at a point above the piston, and means for controllably introducing compressed air and other gases into the cylinder through the piston rod.

4. In a grease gun, in combination, a cylinder closed at the top, a piston therein, a hollow piston rod projecting through the end of the cylinder and having a port communicating with the inside of the cylinder at a point above the piston, a handle for operating the piston rod, and a valve in convenient position for manipulation by the hand of the operator when his hand is in position upon the handle, said valve being adapted to control the escape of air from the inside of the piston rod.

5. In a grease gun, in combination, a cylinder closed at the top, a piston therein, a hollow piston rod projecting through the upper end of the cylinder and having a port communicating with the inside of the cylinder at a point above the piston, a handle for operating the piston, said handle containing a duct which communicates with the inside of the rod, and a valve in the handle for permitting and preventing, controllably, the escape of air from the upper end of the cylinder.

6. In a grease gun, in combination, a cylinder closed at the top and open at the bottom, a hollow piston rod, a piston having a peripheral groove communicating at the back
5 with the space above the piston, an expansible packing ring in said groove, a port for admitting compressed air into the top of the cylinder, and a valved duct leading through
10 the piston rod from a point above the piston, inside of the cylinder for controllably relieving the air pressure above the piston.

7. In combination, a cylinder closed at the top, a removable cap at the bottom of the cylinder provided with a delivery duct, a
15 piston having a groove in its periphery, ducts in the piston leading from the bottom of the groove to the top of the piston, a hol-

low piston rod having a port communicating with the inside of the cylinder at a point above the piston, a handle having a duct
20 communicating with the inside of the piston rod, and a valve in the handle duct for normally preventing the escape of air therefrom, said valve being spring closed and
25 being adapted to be opened by the finger of the user.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM U. WATSON.

Witnesses:

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GEO. J. UNDERLAND.