W. J. SPRINGER.

PUMP.

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1,396,296.

Patented Nov. 8, 1921.

Fig 1

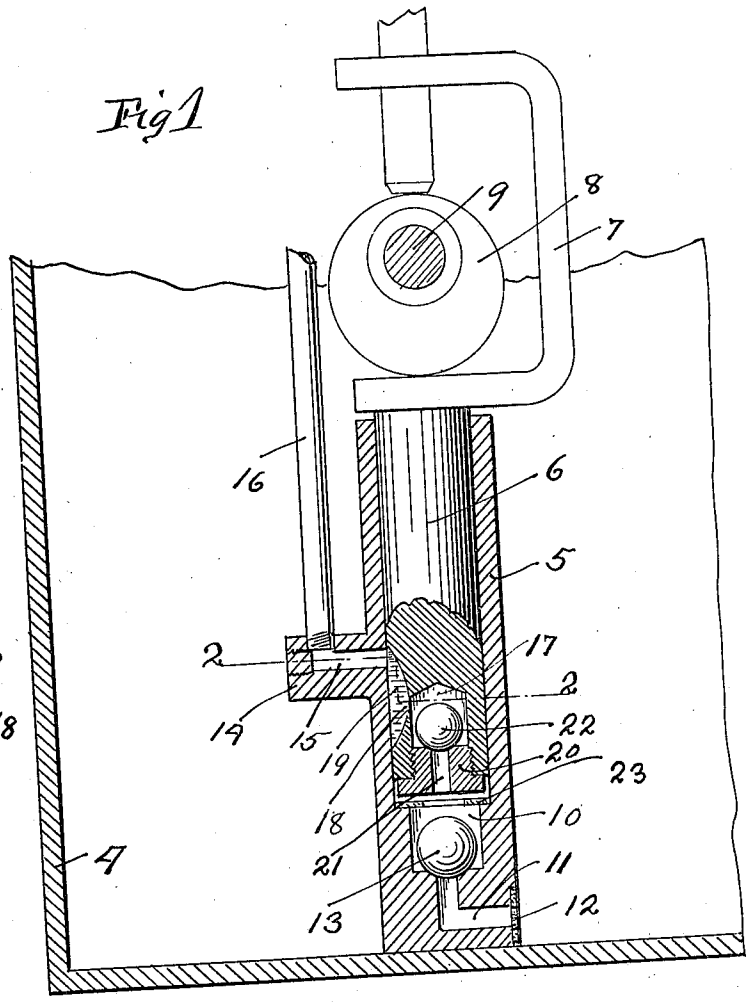


Fig 3

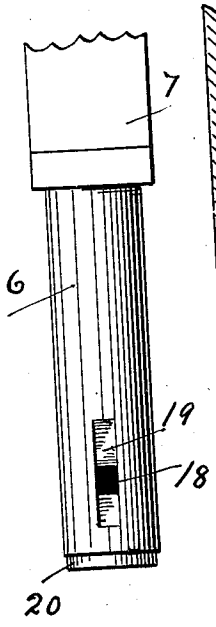
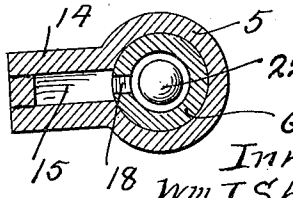


Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM J. SPRINGER, OF DETROIT, MICHIGAN.

PUMP.

1,396,296. Specification of Letters Patent. Patented Nov. 8, 1921.

Application filed March 21, 1919. Serial No. 284,171.

To all whom it may concern:

Be it known that I, WILLIAM J. SPRINGER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pumps and has for its principal object the provision of an extremely simple and highly efficient pump for use in connection with lubricators. Generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The salient feature of this invention consists in providing a pump plunger with an oil conduit, port and coöperating check valve which makes possible the use of but one check valve or ball outside of the plunger. This arrangement very greatly simplifies the pump structure.

The preferred form of the improved pump is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a view chiefly in vertical section with some parts shown in full and some parts broken away;

Fig. 2 is a horizontal section taken on the irregular line 2—2 of Fig. 1; and

Fig. 3 is a front elevation of the pump plunger, some parts thereof being broken away.

The improved pump is shown as designed for use in a force feed lubricator system, such as used on locomotives but may be generally used wherever a pump of its character may be found efficient. As illustrated in the drawings, the numeral 4 indicates an oil containing well and the numeral 5 indicates the pump cylinder casting or body which is rigidly secured to the bottom of the tank and in which works a suitable pump plunger 6. As illustrated, the pump plunger has a yoke 7 attached at its upper end and this yoke is subject to an eccentric 8 carried by a shaft 9 driven in the usual or any suitable way, not necessary for the purposes of this case to further consider, but simply to state that rotation of the first eccentric and shaft produces reciprocations of the plunger 6 within the pump cylinder 5.

In the lower portion of the pump cylinder 5 is a valve chamber 10 which is open at its top and at the bottom is connected to an oil intake conduit 11 which, as shown, draws the oil through a suitable filter 12. Normally, the upper extremity of the conduit 11 is closed by a gravity-seated check valve 13 preferably of the ball valve type.

At one side, the cylinder 5 is provided with an extension 14 formed with an oil discharge conduit 15 that leads from the side of the plunger seat and is connected to an oil discharge pipe 16.

The lower end of the plunger 6 is recessed to afford a valve chamber 17 which, at one side and preferably near its top, is in constant communication through an opening 18, with a vertically extended port 19 preferably formed by milling a groove in the side of the plunger 6. This port 19, under reciprocations of the pump plunger, always maintains communication with the oil discharge conduit 15.

A plug 20 is tightly screwed into the lower end of the valve chamber 17 and is provided with an axial oil conduit 21 that is normally closed by a gravity-seated check valve 22, preferably of the ball valve type, connected in the chamber 17 of the plunger 6. The numeral 23 indicates a washer seated in the lower extremity of the plunger seat of the cylinder 5 at the top of the valve chamber 10. The opening in this washer should be angular or of some other form that will not fit the ball 13, so that its passage therethrough cannot possibly be closed by the said valve even if the latter should be raised against the washer.

The operation of this improved pump is substantially as follows:

Under upward movement of the plunger 6, check ball 22 will tightly close oil conduit 21 so that the plunger will act under suction to draw oil from the well 4 in through conduit 11, raising check ball 13 and passing through ball chamber 10 into the lower end of the plunger seat.

Under downward movement of the pump plunger, check ball 13 will be tightly seated, thereby preventing the backward escape of oil through conduit 11, and check ball 22 within plunger 6 will be raised, thereby opening port 21 and permitting the escape of the oil from the lower end of the plunger

seat through conduit 21, valve chamber 17, port 18—19, conduit 15 and pipe 16.

The construction described has been found highly efficient for the purposes had in view, is strong, durable, compact and of comparatively small cost.

What I claim is:

1. A pump comprising a cylinder and cooperating pump plunger working therein, said cylinder having an intake conduit and a check valve controlling the same, and said plunger having an oil conduit extended through its lower end and a check valve controlling its said conduit, the oil conduit through said plunger terminating in a lateral port located in one side of said plunger, adjacent said conduit therein, and said cylinder having a discharge conduit intermediate its ends with which the lateral port of said plunger maintains constant communication.

2. A pump comprising a cylinder and a coöperating pump plunger working therein, said cylinder having an oil intake conduit leading to the lower end of the plunger seat of said cylinder and equipped with a check valve, said piston, in its inner end, having a ball chamber, and in one side having a lateral discharge port opening into said ball chamber, a plug screw threaded into the lower end of said ball chamber and having an axial oil conduit, and a check ball within the ball chamber of said plunger normally closing the conduit through said plug, the said cylinder having a lateral discharge conduit with which the lateral discharge port of said plunger maintains constant communication.

3. A pump comprising a cylinder, a cooperating pump plunger working therein, said plunger having a chamber therein near the lower end, the end of the plunger being closed, save for a small central opening communicating with said chamber, a ball check valve in said chamber coöperating with said small opening, a port extending along the side of said plunger and a port communicating with said port and the chamber in said plunger, said cylinder having a port in the side thereof with which the port in the side of the plunger coöperates.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM J. SPRINGER.

Witnesses:
WM. O. POSEY,
RAY WILLOUGHBY.