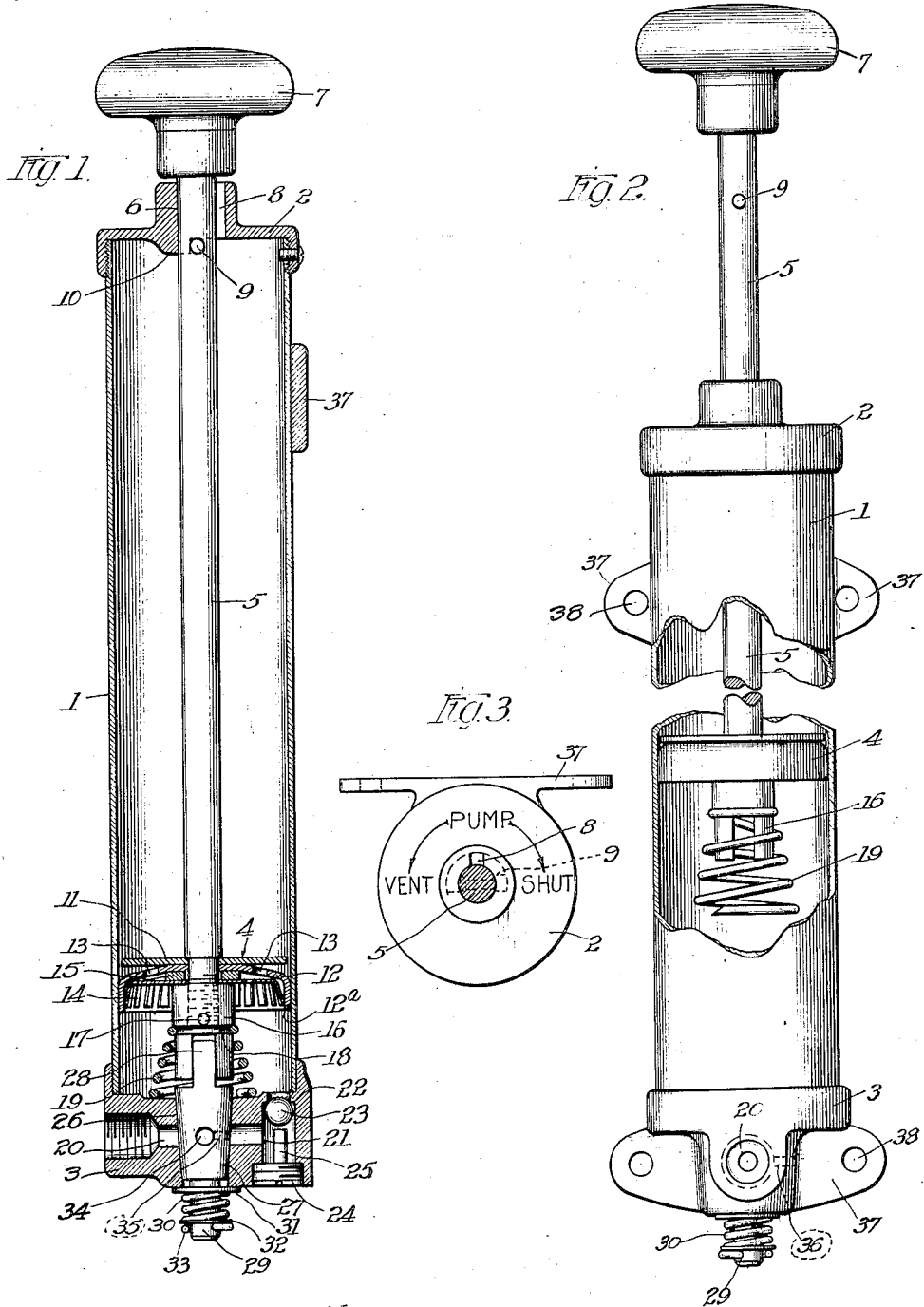


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PUMP.
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PUMP.

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To all whom it may concern:

Be it known that I, HARRY W. HANCOCK, a citizen of the United States, residing at Charlotte, in the county of Eaton and State of Michigan, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to improvements in pumps and contemplates more particularly an improved air pump for use on automobiles for the purpose of pumping air to any desired place as, for example, into the gasoline tank to force the gasoline therefrom.

The nature of the invention will be more fully understood from the following description taken in connection with the accompanying drawings in which,

Figure 1 is a longitudinal central sectional view through a pump embodying the features of my invention. Fig. 2 is an elevation from the left side of Fig. 1 showing parts broken away. Fig. 3 is an end view of the cylinder taken from the upper end of Figs. 1 and 2.

In the exemplary embodiment of my invention which I have shown in the drawings, the pump cylinder comprises a cylinder proper 1, a cap 2 threaded on and closing one of its ends, and a head 3 closing the opposite end thereof. Within the cylinder is slidably mounted a plunger 4 having an operating stem or rod 5 which is slidably mounted in a bearing opening 6 in the cap 2. Said rod has a handle 7 fixed upon its outer or upper end.

In order to insure that a controlling valve, to be later described, which is operable by the plunger, will always be in its open position before the handle of the plunger can be drawn outwardly, I provide an interlocking engagement between the rod 5 and the cap 2 which prevents longitudinal movement of the plunger unless it is rotated into the position to open said controlling valve. This interlocking engagement may be provided for in different ways, the exemplary form which I have herein shown comprising a pin 9 fixed in the rod 5, said pin being movable by rotation of said rod into register with a groove 8 in the cap communicating with the bearing opening 6 for the plunger rod. This construction prevents withdrawal of the rod unless the pin 9 and groove 8 are in register, when the controlling valve above mentioned will always be in its open position. A lug

10, on the inner face of the cap 2, provides two opposite stops against which the pin 9 is arranged to abut when the rod 5 is rotated in opposite directions.

The head of the plunger 4 comprises in the present instance a disk 11 which is of less diameter than the internal diameter of the cylinder, said disk bearing against a shoulder formed on the rod 5 by the reduced inner end of said rod. A flexible member 12 of leather, rubber, or other suitable material is fitted over said reduced end and is arranged to lie against the disk 11. A plurality of ports 13 are provided in the member 12. The peripheral portion 12^a of the member 12 is turned at an angle to the body thereof and extends along and contacts the inner wall of the cylinder. A plurality of radial fingers 14 have at their ends bearing against the peripheral portion 12^a of the member 12, said fingers being of spring material such as sheet metal and tending to hold the portion 12^a in tight contact with the cylinder. Between the fingers 14 and the member 12 is a washer 15. The parts 11, 12, 14 and 15 are clamped together and against the shoulder on the rod 5 by means of a member 16 threaded on the reduced end of said rod and bearing against the fingers 14. A pin 17 serves to rigidly secure said member 16 to the rod 5. The member 16 is bifurcated to receive the stem of a valve member to be presently described, and said member 16 has an annular groove 18 in which fits one coil of a compression spring 19, said spring surrounding the bifurcated end of the member 16.

The head 3 has a passage-way 20 extending therethrough transversely of the cylinder 1, the outer end of said passage-way being enlarged and internally screw threaded to receive a conductor leading to the tank or other place to which the air is to be pumped. The inner end of the passage-way 20 communicates with a passage-way 21 extending from the inner face of the head to the outer face thereof. Within the passage-way 21 is a shoulder 22 forming a valve seat against which a ball valve 23 is arranged to seat. A screw plug 24 is threaded into and closes the outer end of the passage-way 21, said plunger having a stem 25 arranged to hold the ball 23 in proper position. A tapered opening 26 extends centrally through the head 3 from the inner to the outer face

thereof, and intersects the passage-way 20. In this opening 26 is rotatably fitted a valve plug 27 having a stem 28 which the bifurcated end of the member 16 is arranged to embrace at times. The valve member 27 also has a stem 29 at its opposite end, and surrounding this stem 29 at the outer side of the head 3 is a coiled spring 30, said spring bearing at one end against the washer 31 and at its opposite end against a washer 32 and pin 33 fixed in the stem 29. A port 34 extends transversely through the plug 27 and is arranged to communicate with the passage-way 20 to permit air to be forced from the cylinder through the passage-ways 21 and 20 and into the tank or other place. A vent port 35 extends approximately at right angles from the middle portion of the port 34 to the periphery of the plug. When the valve plug is in a certain position said vent port 35 is arranged to communicate with a vent port 36 extending from the valve opening 26 to the exterior of the head.

When the pump is to be used upon an automobile, it may be provided with lugs 37 having openings 38 therein to receive fastening devices for securing the pump to a suitable support.

When the stop pin 9 lies at the inner side of the cap 2, the member 16 and the valve stem 28 will necessarily be interlocked. The normal position of the parts is clearly shown in Fig. 1 and in such position of the parts the port 34 in the valve plug will extend transversely of the passage-way 20, so that said passage-way will be closed. In this position of the valve plug the stop pin 9 will abut against the right-hand shoulder of the lug 10 or next to the word "Shut" in Fig. 3. When it is desired to operate the pump, the operator turns the handle 7 ninety degrees to the left which will bring the stop pin 9 into register with the groove 8. The handle may now be drawn away from the cylinder and the spring 19, which is under compression when the pin 9 is at the inner side of the cap 2, will tend to force the plunger outwardly to carry the pin out through the groove 8. In moving the handle 7 to bring the pin 9 into register with the groove 8, the valve plug 27 will have been simultaneously rotated to bring the port 34 into register with the passage-way 20. When the stop pin 9 is at the outer side of the cap 2, the bifurcated member 16 will have been moved out of engagement with the stem 19 of the valve plug, so that the handle 7 can be rotated freely without affecting the position of said plug. During the pumping operation the spring 19 acts as a cushion to prevent shock to the parts at the inner end of the plunger stroke. Said spring also serves to prevent rattling of the parts when in their normal position.

As the plunger 4 is drawn outwardly, air

passes around the edge of the disk 11 and through the ports 13 in the member 12 into the space between the plunger 4 and the head 3. In such outward movement of the plunger the member 12 moves away from the disk 11, so that the air can pass freely through the ports 13. When the opposite or compressing movement of the plunger is commenced, the member 12 will be forced tightly against the disk 11 so that the ports 13 are closed by said disk. As the plunger is now moved toward the head 3, the air will be forced past the check valve 23, through the ports 21, 20 and 34 and through the conduit to the tank or other place desired. In the outward movement of the plunger the pressure of the air in the tank holds the ball 23 tightly seated against the valve seat 22. It will be noted that the stem 25 holds the ball at one side of the port 20 so that the ball will always be in position to be closed by the pressure of the air in the tank. When sufficient air has been pumped, the operator may return the parts to their normal position, as shown in Fig. 1 and above described. In case it is desired to withdraw all or a portion of the air in the tank, this may be done by rotating the rod 5 to the left a half revolution from the position shown in Fig. 1 when the stop pin 9 will abut against the left-hand shoulder of the lug 10 and point toward the word "Vent" in Fig. 3. This movement of the rod 5 will rotate the valve plug 27 through one hundred eighty degrees and bring the vent port 35 into registry with the outer portion of the passage-way 20 and in communication with the interior of the tank. At the same time, one end of the port 34 will be moved into registry with the vent port 36 leading to the exterior of the head and the atmosphere. The air in the tank may now escape through the passage-way 20 and ports 35, 34 and 36.

I have herein described the present embodiment of my invention in considerable particularity for the sake of clearness, but I would have it understood that I do not thereby intend to limit the invention to the precise construction disclosed. I aim to cover in the appended claims all modifications falling within the scope of the invention.

I claim as my invention

1. In a hand pump, in combination, a cylinder having a head at one end provided with an outlet passage extending transversely of the axis of the cylinder, a rotary valve plug extending across said passage and having a port arranged to register with said passage, a plunger in said cylinder having a disengageable connection with said plug for rotating the latter, and means for preventing reciprocation of said plunger until said port has been moved into register with said passage.

2. In a hand pump, in combination, a cylinder having a head at one end provided with an outlet passage extending transversely of the axis of the cylinder, a rotary valve plug mounted in the head axially of the cylinder and crossing said passage, said plug having a transverse port arranged to register with said passage, a plunger slidable in said cylinder and having a disengageable connection with said valve plug, a coiled compression spring mounted on the inner end of said plunger and arranged to engage said head, said spring tending to force said plunger outwardly, a cooperating pin and groove on the plunger stem and the opposite end of the cylinder, the port in said valve plug registering with said passage when said pin registers with said groove, the pin preventing outward movement of the plunger until the pin registers with the groove.

3. In a pump, in combination, a cylinder having an outlet passage, a valve plug crossing said passage and having a transverse port therethrough adapted to register with said passage, said plug also having a vent port leading substantially at right angles from the first mentioned port to the surface of the plug, the cylinder having a vent passage adapted to register with said vent port in the plug, and a hand-operable plunger slidable in said cylinder and adapted to rotate said valve plug.

4. In a pump, in combination, a cylinder having an outlet passage and having a vent opening communicating with said passage, a valve member arranged to control said passage and said vent opening, an outwardly opening check valve controlling said passage between said valve member and the inner end of said passage, and a hand-operable plunger slidable in said cylinder and arranged to operate said valve.

5. In a pump, in combination, a cylinder having a head provided with a transverse outlet passage and having a vent opening communicating with said passage, a rotary valve plug crossing said passage, said valve plug having ports arranged to register with said passage and said vent opening, an outwardly opening check valve controlling said passage between said valve plug and the inner end of the passage, and a hand-operable plunger slidable in said cylinder and arranged to rotate said valve plug.

6. A pump comprising a cylinder having a head at one end, said head having an outlet passage extending transversely of the axis of the cylinder, a plunger arranged to reciprocate in said cylinder, a rotary valve member positioned concentrically with said cylinder and controlling said passage, a disengageable connection between said valve member and said plunger, and a handle for reciprocating said plunger and for rotating

said valve member through the medium of said disengageable connection.

7. In a pump, in combination, a cylinder having a head closing one end, and a cap closing the opposite end, said head having an outlet passage therein, a rotary valve member mounted in said head coaxial with said cylinder, and a plunger having a disengageable connection with said valve member for rotating the latter, said plunger having a rod slidably extending through said cap, said rod having a projection arranged to be moved into register with a groove through said cap by rotation of said rod to permit said projection to be moved to the outer side of said cap by endwise movement of said rod, said valve member being in its open position when said projection is in register with said groove.

8. In an air pump, in combination, a cylinder having an end-closing cap, and a plunger reciprocably mounted in said cylinder and comprising a rod slidable through said cap, a rigid disk fixed on said rod, a flexible member mounted on said rod and having its peripheral portion in tight contact with the interior of the cylinder, said disk being of less diameter than the cylinder, and said member having a port therethrough to permit the passage of air.

9. In an air compressing pump, in combination, a cylinder, a head closing one end of said cylinder and having an outlet therein, a cap closing the other end of said cylinder, and a plunger reciprocably mounted in said cylinder and comprising a rod slidable through said cap, a rigid disk fixed on said rod, a flexible member mounted on said rod alongside said disk and having its peripheral portion turned to lie along the inner surface of the cylinder, and yielding means tending to hold said peripheral portion against the cylinder, said disk being of less diameter than the cylinder, and said flexible member having a port therethrough where- by air may pass around said disk and through said port when the plunger is moved away from said outlet, said flexible member being arranged to be forced against said disk to close said port when the plunger is moved toward said outlet.

10. In a pump, in combination, a cylinder having a head closing one end thereof, said head having a passage extending from its inner to its outer surface and having another passage communicating therewith and extending transversely of the axis of the cylinder, a check valve controlling the first-mentioned passage, a plug closing the outer end of the first-mentioned passage, a rotary valve plug mounted in the head coaxial with the cylinder and having a transverse port therethrough arranged to register with the second-mentioned passage, and a piston reciprocably mounted in said cylinder and

having a disengageable connection with said valve plug whereby rotation of said piston will rotate said plug.

11. In a pump, in combination, a cylinder 5 having an outlet passage and a vent opening, a valve member arranged to close said passage and to connect the outer end of the passage either with said vent opening or with 10 the inner end of the passage, a check valve controlling the passage between said valve member and the inner end of the passage, and a hand-operable plunger in said cylinder 15 arranged to operate the first mentioned valve member.

12. In an air pump, in combination, a 20 cylinder having a discharge passage in one end thereof, a rotary valve controlling said passage, a plunger slidable in said cylinder and arranged to rotate said valve, and an interlocking engagement between the stem 25 of said plunger and the opposite end of said

cylinder whereby said stem cannot be withdrawn until said valve has been opened.

13. In an air pump, in combination, a 25 cylinder having a discharge passage in one end thereof, a rotary valve controlling said passage, a plunger slidable in said cylinder, a disengageable interlocking connection between said plunger and said valve when the 30 plunger is near said end of the cylinder, and an interlocking connection between the stem of said plunger and the opposite end of said cylinder, whereby said plunger must be rotated into position to open said valve before 35 said stem can be drawn outwardly.

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

HARRY W. HANCOCK.

Witnesses:

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