

PUBLISHED

MAY 25, 1943.

BY A. P. C.

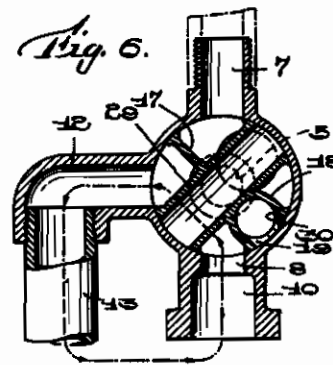
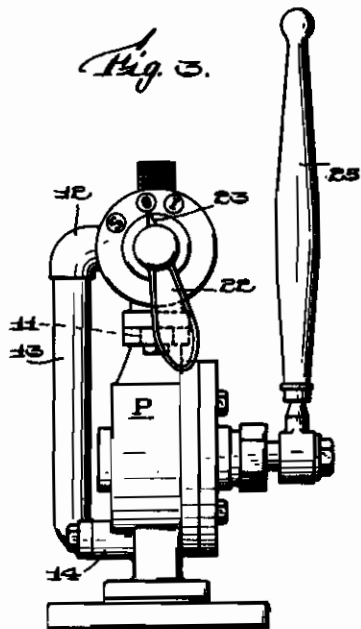
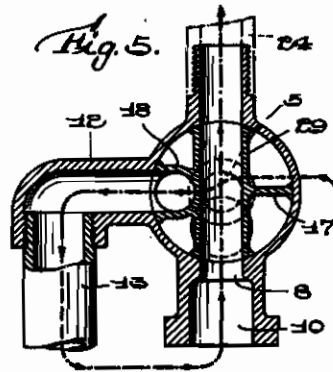
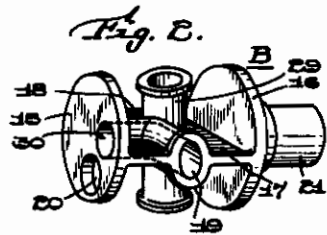
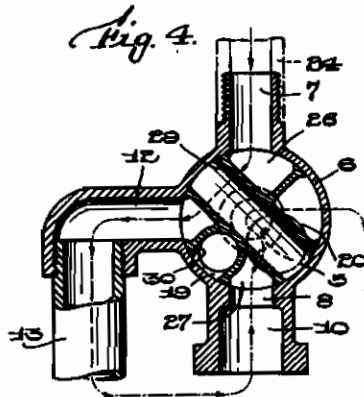
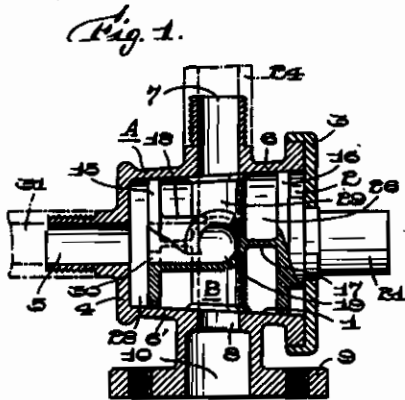
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REVERSIBLE VALVE FOR A PUMP.

Filed Dec. 4, 1940

Serial No.

368,491



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ALIEN PROPERTY CUSTODIAN

REVERSIBLE VALVE FOR A PUMP

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Application filed December 4, 1940

This invention relates to a reversible valve for a pump, which comprises fitting a valve body into a casing in such a manner as can be rotated freely by a handle, the said valve body being formed by connecting a pair of discs by a partition wall, providing a cylindrical tube which pierces the said partition wall in the midway between the discs, one of which has a perforation and also providing a bent pipe open in the said disc; and connecting the hollow part of a supporting leg and outlet of the valve casing to the discharge and suction ports of a pump respectively; causing the opening of the valve casing on the liquid receiving side to communicate with the discharge port of the pump by means of the above cylindrical tube of the valve body when liquid is to be fed and also making the said bent pipe of the valve body communicate with the suction port of the pump through the said outlet of the valve casing, while, when the liquid is to be discharged, the opening of the valve casing on the side where the liquid is discharged is caused to communicate with the suction port of the pump by one of the compartments separated by the partition wall of the valve body and the discharge port of the pump is connected with the discharge port of the valve casing by the other compartment. The object thereof is to obtain a reliable reversible valve for a pump which can discharge and supply liquid very simply by only shifting and adjusting a single valve body in the casing to the right and left by the handle.

Hitherto, to replace the liquid in a container by fresh one by connecting a pump and the container by a conduit, several valves have been used and opened and closed selectively in a certain order. But such selective opening and closing operations are so complicated that an error is often committed in the order, resulting in an unforeseen accident. Moreover, because of the use of several valves, the connection is complicated to the great inconvenience in handling. According to the present invention, the replacement of the liquid may be made very simply by using a single reversible valve and that without any apprehension of wrong operation.

Referring to the accompanying drawing which shows the manner of performing this invention,

Figure 1, is a front view partly cut off of the reversible valve according to the present invention;

Figure 2, a perspective view of the valve body;

Figure 3, a side view of a pump fitted with this reversible valve;

Figure 4, a section showing the relative position

of the valve casing and valve body and the course of the liquid to be discharged;

Figure 5, a section illustrating the relative position of the valve casing and valve body and the course of the liquid to be supplied and

Figure 6, a section illustrating the relative position of the valve casing and valve body and the course of the liquid to be circulated only in the pump.

As shown in Figure 1, the reversible valve of this invention consists of a special casing A and valve body B. The inner hollow wall 1 of the casing B has a truncated cone shape and a flanged cover 3 is fitted to an open end 2 of large caliber. An end wall 4 of a reduced diameter and the periphery 5 of the valve casing are provided with openings 5 and 7 respectively to allow liquid to go in and out. A periphery 6' opposite the opening 7 has a perforation 8 communicate with the inner hollow part 10 of a supporting leg 9. If this reversible valve is disposed on a pump P by said supporting leg as shown in Figure 3, communicates through its perforation 8 and hollow part 10 of the leg 9 with the discharge port 11 of the pump. A flow-out port 12 formed between the opening 7 and perforation 8 is connected with the suction port 14 of the pump P by a connecting pipe 13 as shown in Figure 3.

The valve body B fitted in the casing A as in Figure 1 is formed in the following manner as is clear from Figure 2. A pair of discs 15 and 16 of different diameters are connected by a partition wall 17 and a cylindrical tube 20 which pierces the said partition wall is provided between the discs 15 and 16. A bent tube 18 which opens at 30 on the disc 15 opens at 19 in the direction of a right angle to the axial line of the cylindrical tube 20. The disc 15 has a perforation 20, while the disc 16 is provided with an operating shaft 21 to which a handle 22 is fixed to rotate the valve body B, the said handle 22 being equipped with a pointer 23 to indicate whether the valve body B is in an oil discharging, feeding or stopping condition.

To explain the operation of this invention, the conduit 24 connected with the opening 7 of the valve casing A is inserted into any desired liquid container, for example, an oil tank of a transformer on a pole (not shown) and a conduit 31 is connected to an empty container. Next, the handle 22 is adjusted to the oil discharging position O shown in Figure 3, and the valve body B is set at the position indicated in Figure 4 with regard to the casing A. Operate the pump P

means of the handle 25, and then the pump will suck in the oil in the tank through its port 14, so that the oil in the transformer casing reaches the empty container through the conduit 24 from the entrance 7 of the casing A, and passing a compartment 26 around the other periphery of the cylindrical tube 29 and then through the flow-out port 12, the connecting pipe 13, the suction port 14 of the pump, the pump P, the inner hollow part 10 of the supporting leg, the perforation 8, a valve casing compartment 27, the perforation 20, a valve casing chamber 28 and discharge port 5, it is discharged from a conduit 31. Thus, it is possible to draw out the whole transformer oil from the tank.

To feed fresh oil to the tank thus made empty, a conduit 31 is dipped into an oil source. Next, after shifting the handle 22 to the oil feeding position I and adjusting the valve body B to the position shown in Figure 5, operate the pump P as before, and it will display sucking action at the suction port 14, so that the fresh oil is drawn thereinto through the conduit 31, valve casing chamber 28, opening 30, bent tube 18, flow-out port 12, connecting pipe 13 and suction port 14 from the oil source. Then, passing through the hollow part 10 of the supporting leg of the casing A, perforation 8, cylindrical tube 29, port 7

and connecting pipe 24, it will be fed to the tank. Further, if the handle 22 is operated to set its pointer 23 at the position indicated by S in Figure 3, the relative position of the valve casing A and valve body B will have the condition as shown in Figure 6, so that even if the handle 25 of the pump P is operated, the fluid will only flow circulatory through the flow out port 12, connecting pipe 13, suction port 14, pump P, inner hollow part 10, perforation 8 and compartment 26 of the valve casing. Consequently, the valve will display a stopping function without the transformer oil being discharged or charged.

As explained above, according to the present invention only one reversible valve is used, and by simply rocking its operating handle to the right and left it is possible with the same conduit to replace the oil and other kinds of liquids in a tank. The invention has the further advantage of being very reliable in operation.

The above is an explanation of the case where the oil of the pole transformer is changed or discharged, but it is needless to say that this invention is also applicable broadly to fire pumps, gasoline pumps, etc. when a fluid is to be supplied to a tank or drawn out from it.

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