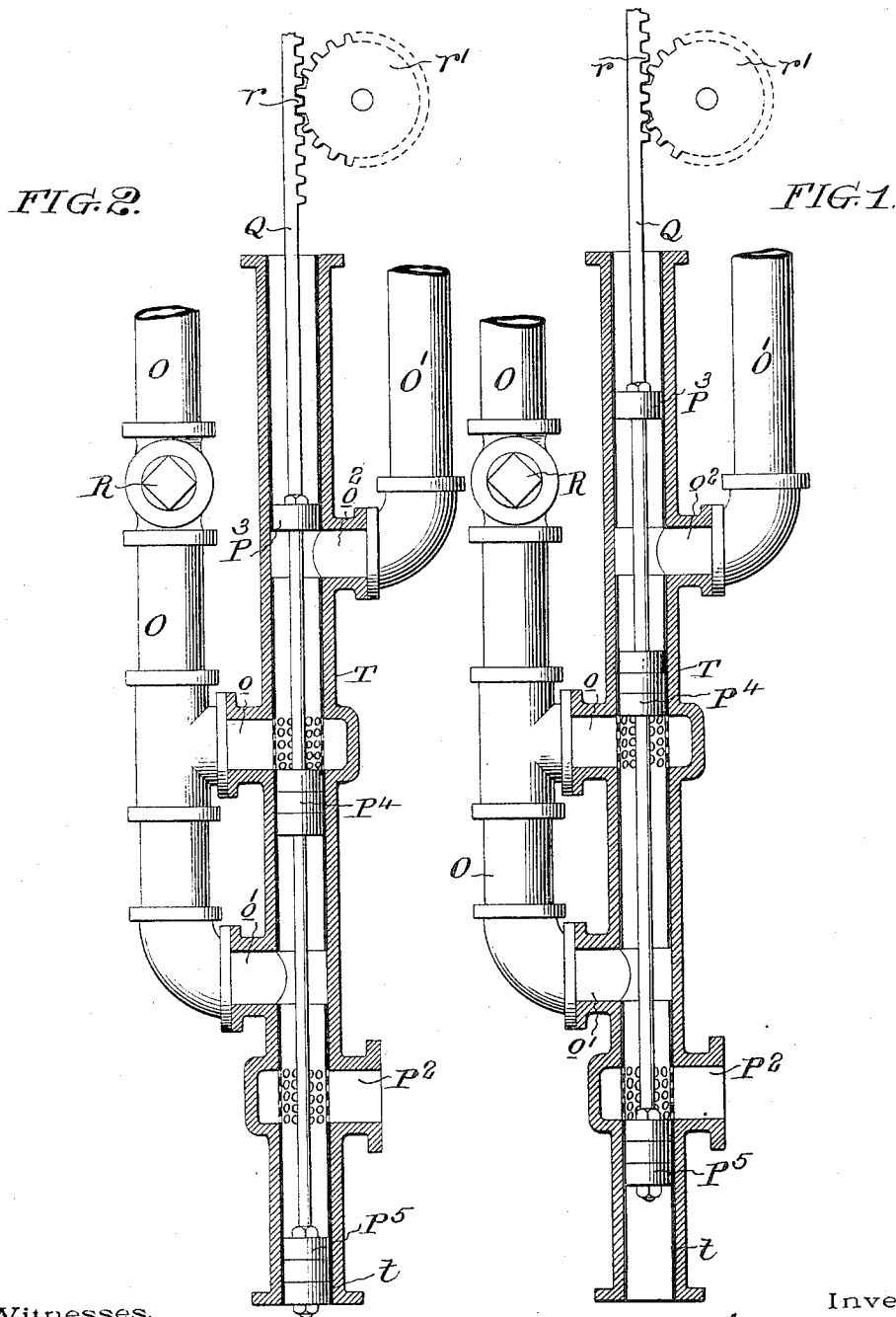


(No Model.)

F. A. BATES.
VALVE DEVICE.

No. 599,466.

Patented Feb. 22, 1898.



Witnesses.

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VALVE DEVICE.

SPECIFICATION forming part of Letters Patent No. 599,466, dated February 22, 1898.

Application filed November 6, 1897. Serial No. 657,597. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. BATES, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Valve Devices, of which the following is a specification.

My invention relates to valve devices; and it consists of the improvements which are fully described in the following specification and are shown in the accompanying drawings.

It is the object of my invention to provide a suitable valve device for supplying water or other fluid or gas, as may be desired, from either of two reservoirs or sources of supply to a receiver, whereby water, fluid, or gas of different character or at different pressure may be supplied to the receiver.

It is also an object of my invention, while permitting the water, fluid, or gas to be supplied from either source of supply to the receiver, to enable the supply from both to be cut off and the supply or pressure in the receiver to be maintained or the water, fluid, or gas to be discharged therefrom.

My invention may be applied to a variety of uses. Among other uses it is adapted to control lifting devices for raising light and heavy loads, as in hoisting-machines and elevators, so that the pressure of the water, fluid, or gas actuating the hoisting cylinder or engine may be raised to suit the load, a heavy pressure being supplied when heavy loads are to be raised, and vice versa, and in my application, Serial No. 657,598, filed November 6, 1897, I have shown my improved valve devices so applied.

In this case the valve device is connected by independent inlet-ports with two independent storage-tanks, in each of which a different pressure is maintained—*e. g.*, of one hundred and ten and two hundred pounds to the square inch—and by means of the valve mechanism, which may be controlled from the moving elevator or lift in the usual manner, water from either storage-tank may be supplied to the lifting engine or cylinder, according to whether a light or heavy load is to be raised.

I shall now refer to the accompanying drawings for the purpose of more particularly describing my invention.

Figure 1 is a vertical sectional view of a valve device embodying my invention, and Fig. 2 is a similar view showing the valve-pistons moved into a different position.

T is a cylinder provided with a port o^2 , communicating with the pipe O', two ports $o o'$, communicating both with a pipe O, a port P^2 below the ports $o o'$, and an outlet t at the bottom below the port P^2 .

Q is a piston-rod extending through the cylinder T and provided with three pistons P^3 , P^4 , and P^5 , of which the piston P^3 is located above the port o^2 , the piston P^5 adjacent to and normally below the port P^2 , and the piston P^4 adjacent to the port o , so as to control the same. The piston-rod may be reciprocated in any convenient manner. For illustration I have shown it provided on its outer end with a rack r , operated by a pinion r' .

R is a check-valve in the pipe O, which opens to permit passage of water or other fluid or gas to the inlet-ports $o o'$, but closes in the opposite direction.

When the piston-rod Q is in the position shown in Fig. 1, with the piston P^4 above the port o and the piston P^3 below the port P^2 , the water, fluid, or gas may flow through the check-valve R and pipe O, through the port $o o'$, into the cylinder T, and thence through the port P^2 to the cylinder, tank, or vessel to be supplied. Supply from the pipe O' through the port o^2 is closed by the piston P^4 , and the pressure of the water, fluid, or gas from the pipe O' is counterbalanced between the pistons P^3 and P^4 .

When the piston-rod Q is lowered into the position shown in Fig. 2, the piston P^4 is lowered below the port o' , and the water, fluid, or gas may flow from the pipe O', through the port o^2 , into the cylinder T above the piston P^4 , and thence through the port o into the pipe O and through the port o' back into the cylinder T and out through the port P^2 . The check-valve R will prevent the backward flow of the water, fluid, or gas up into the pipe O and where the pressure in the pipe O' is greater than in the pipe O will keep the valve R closed and prevent the flow from the pipe O.

By raising the piston-rod Q until the piston P^5 closes the port P^2 the passage of water, fluid, or gas to or from the port o^2 may be closed and the supply in the cylinder, tank,

or reservoir connected with the port P^2 may be maintained. By raising the piston-rod until the piston P^3 passes above the port P^2 the water, fluid, or gas may be discharged through the port P^2 , through the outlet t , into a tank or reservoir. Thus by the reciprocation of the piston-rod Q water, fluid, or gas may be admitted through the port P^2 to the cylinder, tank, or receiver connected therewith from either the pipes O or O' and the respective storage or supply tanks connected therewith, so that fluid or gas under different pressures may be supplied or the fluid or gas in the cylinder, tank, or receiver may be maintained or discharged therefrom.

The ports o' and o^2 are independent supply inlet-ports from the two sources of supply connected with the corresponding supply-pipes O and O' , and the port o is an auxiliary inlet-port communicating with the port o' exterior to the interior of the cylinder. The piston P^4 constitutes a movable valve which controls the auxiliary inlet-port o , so as to open or close the communication thereof with the inlet-port o^2 .

When the valve is applied to an elevator or hoist, the pipes O or O' communicate, respectively, with two independent storage-tanks, in each of which a different pressure is maintained, that in the tank communicating with the pipe O being, for example, one hundred and ten pounds to the square inch, while that in the tank communicating with the pipe O' is, for example, two hundred pounds. The outlet P^2 communicates with the hoisting-cylinder, and the valve-rod Q is operated in the usual manner from the moving car or platform. When the valve is moved into the position shown in Fig. 1, the liquid will be supplied to the lifting-cylinder from the storage-tank connected with the pipe O at one hundred and ten pounds, and when the valve is in the position shown in Fig. 2 the liquid will be supplied from the other tank at a pressure of two hundred pounds.

The details of construction shown may be varied without departing from the invention.

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

1. A valve device, consisting of a cylindrical body open at top and bottom and provided with an outlet-port on its side, two independent inlet supply-ports also opening from the side, and an auxiliary inlet supply-port communicating with one of said inlet supply-ports exterior to the cylindrical body, in combination with a movable balanced valve in the cylindrical body for controlling the supply from one of said inlet-ports directly to the outlet-port or from the other inlet-port to said outlet-port through the other inlet-port and the auxiliary inlet-port communicating therewith exterior to the valve-body.

2. A valve device composed of the cylindrical body having the inlet-ports o' , o^2 , the auxiliary port o communicating with one of

said ports o' , o^2 , exterior to the cylindrical body, and the outlet-port P^2 , the movable piston-rod Q provided with the pistons P^3 , P^4 , P^5 , and the check-valve R for preventing backward flow from the ports o , o' , substantially as and for the purposes described.

3. In a valve device, the combination of a main body provided with an outlet-port, two independent supply-pipes communicating therewith through independent inlet-ports, an auxiliary inlet-port communicating with one of said supply-pipes, and a movable valve for controlling the supply from one of said inlet-ports directly to the outlet-port, or from the other inlet-port to the outlet-port, through the auxiliary inlet-port to the other supply-pipe.

4. In a valve device, the combination of a main body provided with an outlet-port, two independent supply-pipes communicating therewith through independent inlet-ports, an auxiliary inlet-port communicating with one of said supply-pipes, a movable valve for controlling the supply from one of said inlet-ports directly to the outlet-port, or from the other inlet-port to the outlet-port through the auxiliary inlet-port to the other supply-pipe, and a check-valve located in the supply-pipe with which the auxiliary inlet-port communicates.

5. In a valve device, the combination of a main body provided with an outlet-port, two independent supply-pipes communicating therewith through independent inlet-ports, an auxiliary inlet-port communicating with one of said supply-pipes, and a movable valve for controlling the supply from one of said inlet-ports directly to the outlet-port, or from the other inlet-port to the outlet-port, through the auxiliary inlet-port to the other supply-pipe, consisting of the reciprocating piston P^4 .

6. In a valve device, the combination of a main body provided with an outlet-port, two independent supply-pipes communicating therewith through independent inlet-ports, an auxiliary inlet-port communicating with one of said supply-pipes, a reciprocating piston-rod movable in the main body, and the pistons P^3 , P^4 and P^5 carried by the movable piston-rod, substantially as and for the purpose described.

7. A valve device composed of a cylindrical body provided with an outlet-port, two independent inlet-ports, and an auxiliary inlet-port communicating with one of the inlet-ports at a place outside of the interior of the cylindrical body, and a movable valve located within the body adjacent to the auxiliary inlet-port and arranged to open or close the communication thereof with the inlet-port with which said auxiliary port is not connected.

In testimony of which invention I hereunto set my hand.

F. A. BATES.

Witnesses:

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D. C. GIBBONEY.