No. 654,771. Patented July 31, 1900.

E. F. VAN VECHTEN.

VALVE MECHANISM.

(Application filed Oct. 2, 1899.)

(No Model.)

Fig. 1.

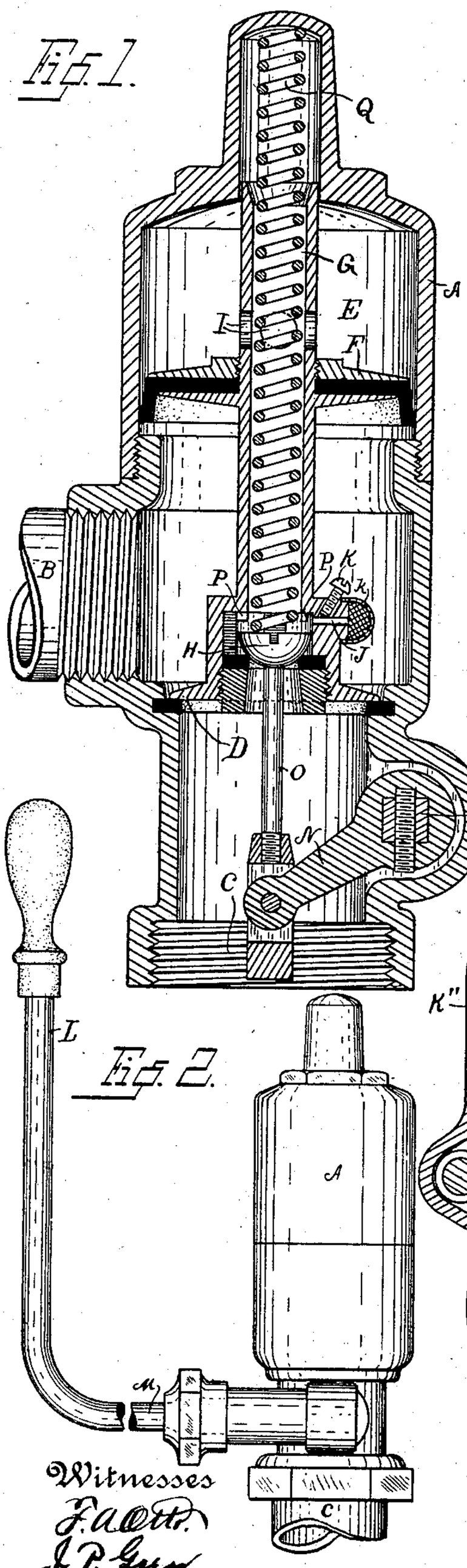


Fig. 3.

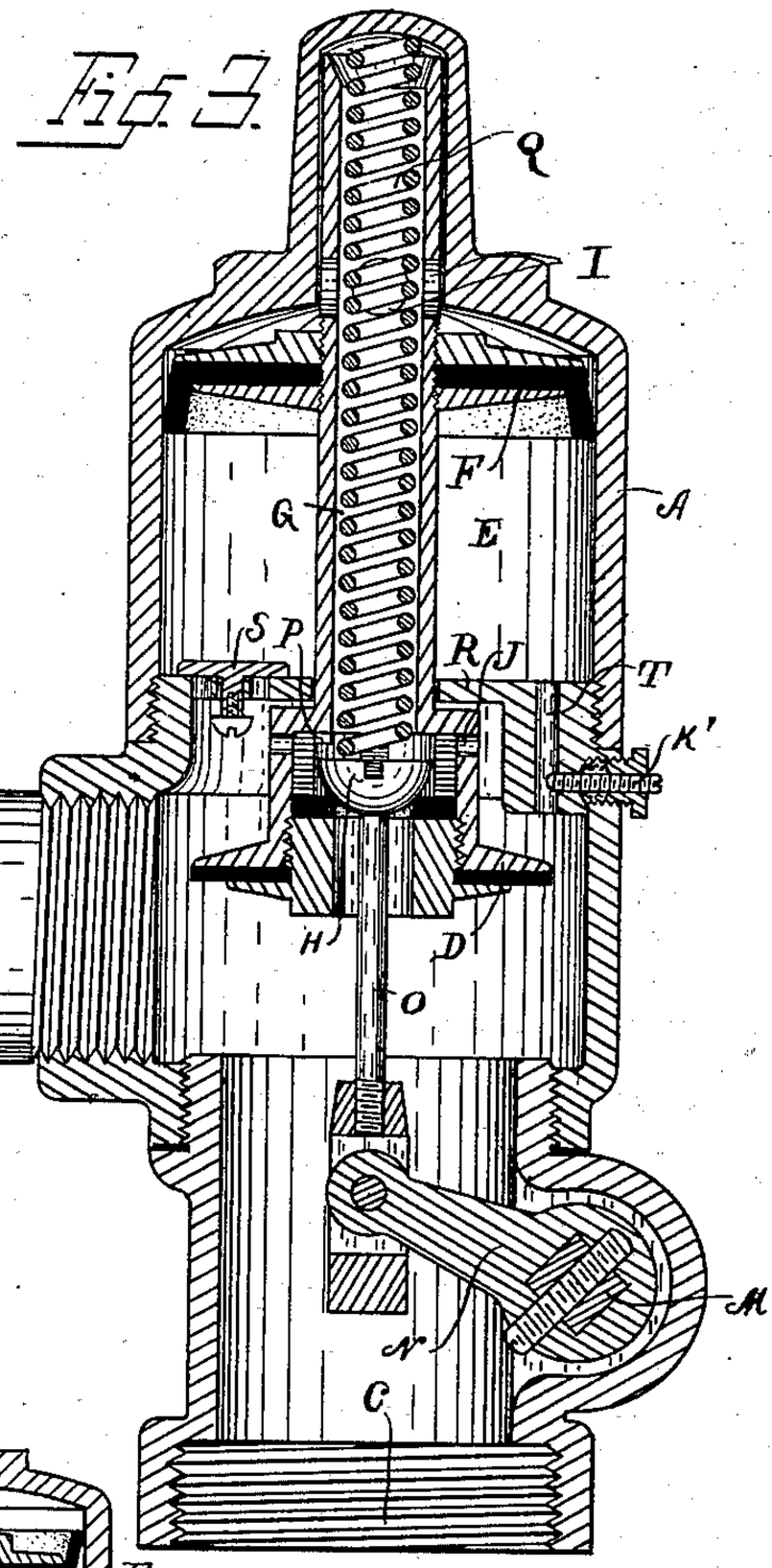
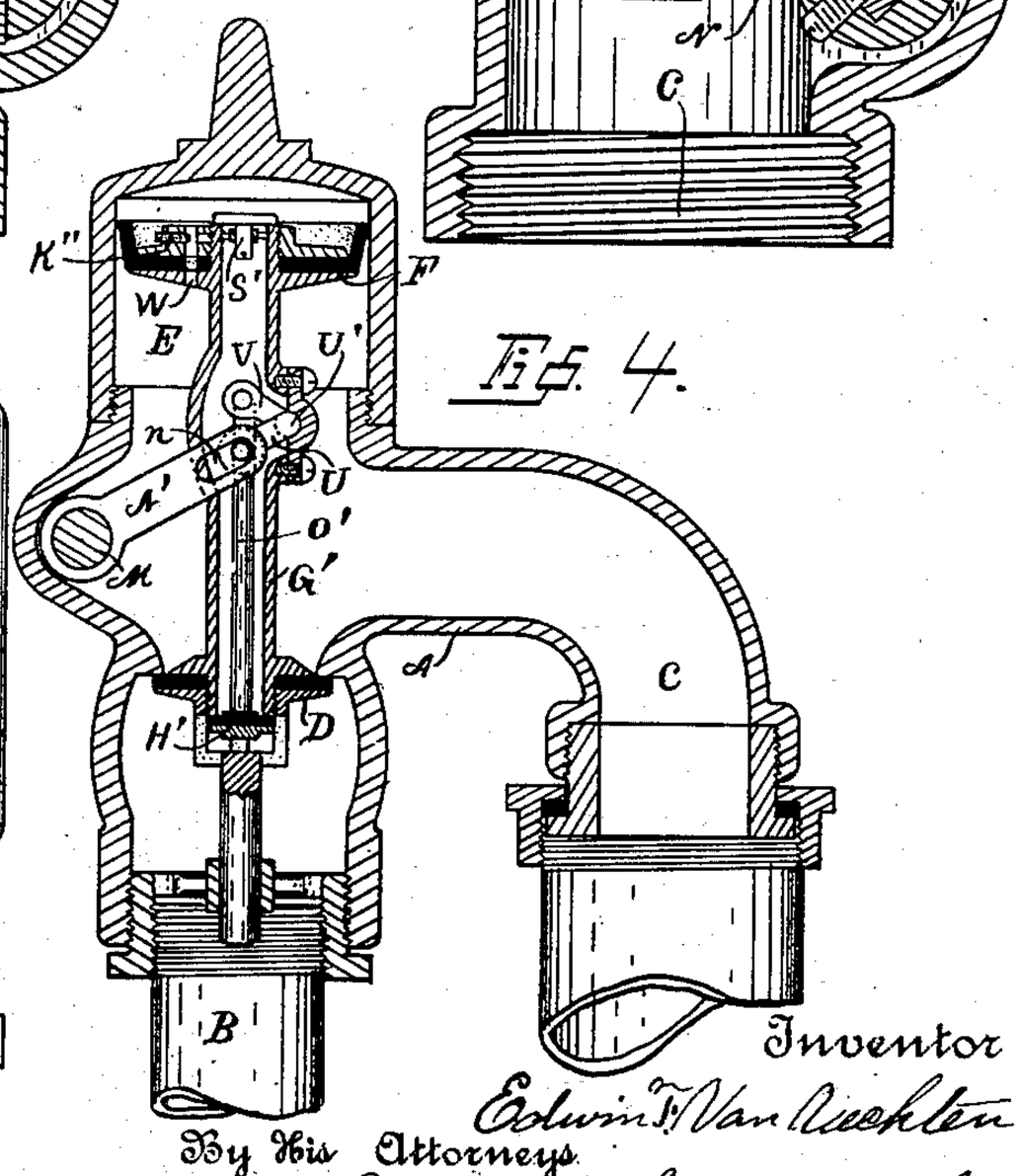


Fig. 2.

Fig. 4.



Witnesses
F. A. Otto.
J. P. Guyf.

Inventor
Edwin F. Van Vechten
By his Attorneys
Erwin Wheeler & Wheeler.

UNITED STATES PATENT OFFICE.

EDWIN F. VAN VECHTEN, OF MILWAUKEE, WISCONSIN.

VALVE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 654,771, dated July 31, 1900.

Application filed October 2, 1899. Serial No. 732,291. (No model.)

To all whom it may concern:

Be it known that I, EDWIN F. VAN VECHTEN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Valves and Valve Mechanisms, of which the following is a specification.

My invention relates to improvements in valves and valve mechanisms, and pertains especially to that class of improvements shown and described in an application for Letters Patent on valves filed by me on June 12, 1899, Serial No. 720,199, and to which reference is hereby made.

The objects of my invention are, first, to provide means whereby in a valve closing with the pressure such pressure may be utilized to assist in opening the main valve, and, second, to provide means for automatically closing the valve after a predetermined interval, whereby a given quantity of liquid will be discharged whenever the valve is opened.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of my invention drawn on the axes of the valve-ports and showing the valve closed. Fig. 2 is an elevation of the same on a reduced scale, showing the actuating-lever from the side. Fig. 3 is a similar view to that shown in Fig. 1, but with the valve open, and also illustrating a modified form of construction. Fig. 4 is a sectional view, reduced scale, illustrating a further modification, this view being also drawn on the axes of the valve-ports.

Like parts are identified by the same reference-letters throughout the several views.

Referring to Fig. 1, A is the valve-casing, B and C the inlet and outlet ports, respectively, and D the main-valve. The upper portion of the casing is formed into a cylinder E, in which a partition F is located, the partition F being connected with the valve by a tubular connection G, communicating with the discharge and in which a small relief-valve H is located. It will of course be understood that while the partition F is illustrated as a piston a diaphragm or any other movable part adapted to perform the same function may be used as an equivalent therefor. The tube G is provided with apertures I, communicating between the interior of the tube and the cylinder E, above the piston F; also, an aperture or duct J, communicating with the space below the piston F, a regulating device, such as the set-screw K, being provided to control the passage of water through this aperture. A screen K covers the exterior end of the duct J. L is a valve-actuating lever. This is connected with a rock-shaft M, which is provided with an interior arm N, the latter being connected with a valve-stem O, secured to the auxiliary or relief valve H. When the lever L is actuated to open the valve, the valve H is first lifted into contact with the shoulders P in the tube G, when the fluid above the piston F is permitted to escape freely into the discharge through the tube G and around the relief-valve H. As soon as the pressure above the piston is relieved the pressure of the supply fluid below the piston tends to force the latter upwardly, and thus open the main valve D. Where the piston is of larger area than the main valve, the latter will obviously be thus opened by the pressure of the supply fluid independently of any pressure exerted upon the lever L other than that required for opening the auxiliary valve H. In use, however, the lever L is continuously actuated until the piston F reaches the upper end of the cylinder, as shown in Fig. 3. When the valve has been opened, as above described, the same may be again closed by a spring or weight or by the pressure of the hand upon the lever L. In the drawings I have shown a spring Q, located in the tube G and adapted to bear upon the auxiliary valve H. The effect of the spring or of any reactionary pressure exerted upon the auxiliary valve or its actuating connections is first to close the valve H and then to move the main valve toward its seat. The latter movement is retarded by the tendency to form a vacuum behind the piston F, and as the inflow of water to this portion of the cylinder is controlled by the regulating device K it is obvious that the movement of the main valve toward its seat can be regulated to correspond with the time during which it is desired that the valve shall remain open.

Referring to the construction shown in Fig. 3, it will be observed that it is substantially the same as that shown in Fig. 1, except that I have provided a partition R between the

piston-cylinder and the valve-chamber, with a check-valve S to freely admit the supply fluid to the space underneath the piston F. During the downward movement of the piston this fluid is forced through a duct T, which is also provided with a regulating device, such as a set-screw K′, by means of which the escape of the fluid through the duct T is controlled. With this construction it is not necessary to provide a regulator for the duct J at the lower end of the tube G, for the fluid underneath the piston acts as a cushion to retard the downward movement of the piston.

In Fig. 4 I have illustrated a form of construction in which the valve-actuating connections are located between the valve and the valve-controlling piston. The valve-stem O′ is located in the tube G′, and motion is communicated to open the auxiliary valve H′ from the rock-shaft M, through the arms N′ and U, shaft U′, and the arm V within the tube G′, the arm N′ being provided with a slot *n*, in which the coupling-pin of the arm U engages, so as to permit the two arms to rock freely upon their centers without cramping. In this construction when the auxiliary valve is opened the supply fluid passes through the tube G′ and enters the piston-cylinder above the piston through a check-valve S′ at the upper end of the tube. During the return movement of the piston this fluid escapes to the discharge-port through a duct W, provided with a regulating device K″. It will be understood that where it is not desired to prevent the valve from closing immediately the regulating devices may be omitted, and where it is not desired that the valve shall close automatically the springs or weights supplied for that purpose may also be omitted. In such case the valves may be closed when desired by actuating the valve-lever L.

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

1. The combination, of a valve-casing provided with inlet and exhaust ports; a movable partition; a main valve; a tubular connection communicating through said main valve and partition; a duct leading through said tubular connection between the main valve and partition; an auxiliary valve controlling the passage of fluid through said tubular connection below said duct; and connections for actuating both valves.

2. The combination, of a valve-casing provided with inlet and exhaust ports; a movable partition; a main valve; a tubular connection communicating through said main valve and partition; a duct leading through said tubular connection between the main valve and partition; an auxiliary valve controlling the passage of fluid through said tubular connection below said duct; and connections for actuating both valves, together with a spring engaging the upper portion of the casing and extending downwardly through said tubular connection to the auxiliary valve, said spring being adapted to automatically close the valves.

3. The combination of a valve-casing provided with inlet and exhaust ports; a piston-cylinder formed in said casing; a piston located therein; a main valve; a tubular connection extending through the main valve and piston, and secured to both; a passage communicating between the source of supply and said piston; cylinder beyond the piston; an auxiliary valve controlling the passage of fluid through the tubular connection to the exhaust-port; a partition located between the piston-cylinder and the main valve; a check-valve located therein and adapted to permit the fluid to pass into said cylinder; a duct leading from said cylinder to a suitable point of discharge; and a regulating device controlling the passage of fluid therethrough.

4. The combination of a valve-casing provided with inlet and exhaust ports; a movable partition; a main valve connected therewith by a tubular connection; an auxiliary valve located in said tubular connection; a duct communicating between the source of supply and the interior of said tube above the auxiliary valve; a stationary partition interposed between the source of supply and the movable partition; a valved aperture adapted to permit the passage of fluid through the stationary partition; a relief-duct also leading through said partition to a suitable point of discharge; and valve-actuating connection for said valves.

5. The combination of a valve-casing provided with inlet and exhaust ports; a movable partition; a main valve connected therewith by a tubular connection; an auxiliary valve located in said tubular connection; a spring interposed between the auxiliary valve and the upper portion of the valve-casing, and supported laterally by said tubular connection; a duct communicating between the source of supply and the interior of said tube above the auxiliary valve; a stationary partition interposed between the source of supply and the movable partition; a valved aperture adapted to permit the passage of fluid through the stationary partition; a relief-duct also leading through said partition to a suitable point of discharge; and valve-actuating connections for said valves.

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

EDWIN F. VAN VECHTEN.

Witnesses:
JAS. B. ERWIN,
LEVERETT C. WHEELER.