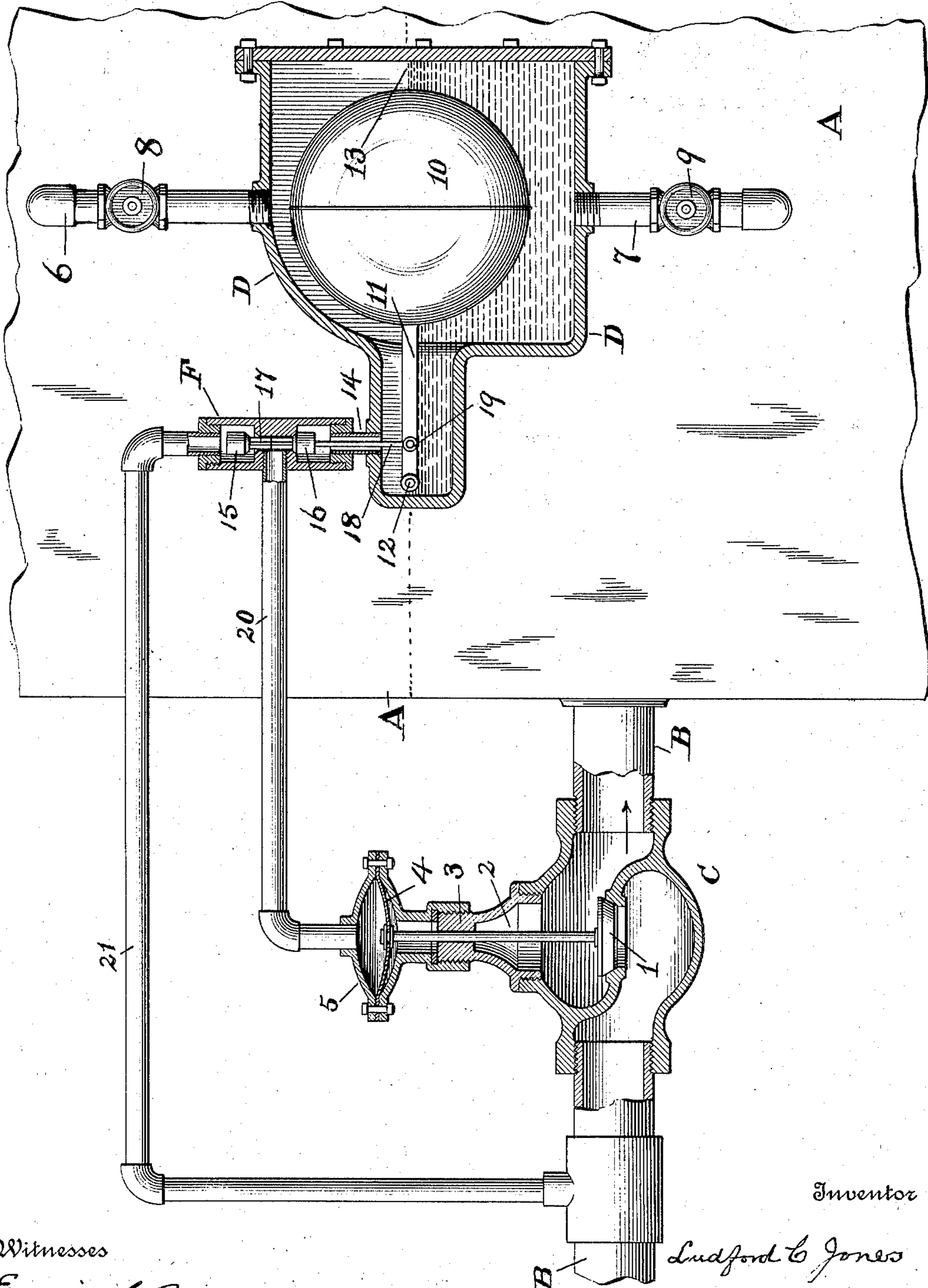


VALVE MECHANISM FOR LIQUIDS.

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Patented Aug. 9, 1910.



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UNITED STATES PATENT OFFICE.

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VALVE MECHANISM FOR LIQUIDS.

966,921.

Specification of Letters Patent.

Patented Aug. 9, 1910.

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To all whom it may concern:

Be it known that I, LUDFORD C. JONES, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Valve Mechanism for Liquids, of which the following is a specification.

This invention relates to an automatic valve-mechanism for maintaining a predetermined height or quantity of water in a storage tank or reservoir,—the stored water being continually consumed or used.

The invention is illustrated in the accompanying drawing, but it is not to be understood that the claims appended hereto are limited to the precise construction or arrangement of parts shown in said drawing.

Referring to the drawing the letter, A, designates the tank or reservoir that is to contain a storage of water; B, designates the main pipe that supplies water to the said tank; C, designates the case of a valve that governs the flow of water through said main-pipe; D, is a case containing a float-ball; and, F, is a case containing auxiliary valves that are operated by the up-and-down movement of the said float-ball.

The tank, A, may be of any size and any material, and is designed to contain a storage of water that is continually being used or consumed, and the object of the valve-mechanism which is the subject of this invention is to so regulate the supply of water to this tank as to maintain therein a predetermined height or quantity of the water. The pipe, B, leads from a source of supply to the said tank and the valve-case, C, in this pipe has a main-valve, 1, which is of the puppet form, that closes against the pressure of the water coming through the said pipe. The stem, 2, of this valve is movable through and neatly fits in a neck, 3, of the valve-case and said stem is attached to a flexible diaphragm, 4, whose rim is tightly clamped between the two convex plates of the metal chamber, 5. The diameter and area of the diaphragm, 4, is greater than the diameter and area of the face of the valve, 1.

The case, D, is outside of the storage tank and may be supported in position by any suitable means. An upper pipe, 6, connects this case with the tank, A, and serves as a vent, and a pipe, 7, connects the same below and serves to supply water; both pipes are provided with cut-off cocks designated respectively, 8, 9. This case, D, contains a

ball-float, 10, which is attached to a lever, 11, pivoted at, 12, in the case. The water line, or water-level in the float-case is designated, 13; this water-level in the float case is shown in the drawing at such a height as to cause the ball-float, 10, to effect a closure of the main valve, 1, and cut-off the flow of water through the pipe, B. The water in the tank, A, of course stands normally, as indicated by a horizontal broken line at the same height as the water in the float-case, D, indicated by, 13.

Auxiliary valves are in a case, F, which is in communication through a tube, 14, with the case, D, containing the float; this auxiliary valve-case has a passage at the opposite ends of which are valve-seats, and two small valves, 15, and, 16, which are separate from each other, are employed, one valve being at each seat, and the said two valves are so arranged that when one is open or unseated, the other will be closed or seated. This action of the valves is brought about by having the ends of the wing-stems, 17, of the two small valves abutted against each other, and as the length of these two wing-stems, 17, together is greater than the measurement or space between the said two valve-seats, it is impossible for both valves to be seated at the same time. The small valve, 16, that is nearest to the tube, 14, which communicates with the float-case, D, has a rod or stem, 18, which extends through said tube and is attached by a joint, 19, to the float-lever, 11, whereby any up or down movement of the ball-float, 10, will seat or unseat said small valve, 16.

A pipe, 20, has one end tapped into the side of the auxiliary valve-case and opens into the passage between the said two small valves, 15, 16, and the other end of this pipe, 20, taps through the outer convex plate of the metal chamber, 5. Another pipe, 21, forms a communication between the outer end of the said auxiliary valve-case, F, and the main supply-pipe, B, at the inlet side of the main valve, C.

It will be seen that when the ball-float has its "up" or raised position the small valve, 16, that governs communication between the float-case, D, and the passage in the auxiliary valve-case, F, will be closed, and the other small valve, 15, will be opened. When the valve, 15, is open or unseated a water communication is established from the main supply-pipe, B, through pipes, 21, and, 20,

to the outer side of the flexible diaphragm, 4, as seen in the drawing and of course there will be the same pressure in the convex chamber, 5, on said diaphragm as there is in said main pipe, and the effect of this pressure will be to keep the main valve, 1, on its seat in closed position because the diaphragm, 4, has a greater area for water-pressure than the main valve itself.

10 When the ball-float, 10, is lowered, the positions of the two small auxiliary valves will be changed or reversed from that last described—the valve, 16, will then be unseated or open, and the other valve, 15, will be seated or closed. The closing of the valve, 15, at the outer side of the open end of pipe, 20, cuts off the pressure that comes from the main pipe, B, through pipe, 21, and the opening of the valve, 16, between said open-end of pipe, 20, and the tube, 14, allows some of the water in the pipe, 20, to escape into the auxiliary valve-case and pass therefrom through tube, 14, into the float-case, and the effect will be to remove practically all pressure from the diaphragm, 4, and thereby allow the main valve, 1, to open.

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

30 1. In automatic mechanism for controlling the flow of liquid, the combination of a storage tank; a main supply-pipe provided with a main-valve that governs the flow of liquid; a chamber provided with a movable diaphragm which is connected with said main-valve; a float attached to a pivoted lever; an auxiliary valve-case having a passage provided at its two opposite ends with valve seats; two separate auxiliary valves—one being at each of said seats and provided with stems that loosely abut so that only one of said valves can be seated at the same time; a rod jointed to the lever of said float and serving to seat and unseat one of said two auxiliary valves; a pipe one end of which

taps into the auxiliary valve-case between said two auxiliary valves and the other end of said pipe opening into the said diaphragm chamber; and a pipe communicating between the auxiliary valve-case and the main supply-pipe.

2. The combination of a storage tank; a main supply-pipe provided with a main-valve; a float attached to a pivoted lever; an auxiliary valve-case having a passage at the two opposite ends of which are valve-seats; two auxiliary valves—one being at each of said seats and provided with means whereby only one of said valves can be seated at the same time; a rod jointed to the lever of said float and operating one of said two auxiliary valves; and two pipes—one connecting between the auxiliary valve-case and the main-valve case, and the other between the auxiliary valve-case and the main supply-pipe.

3. The combination of a main supply pipe; a valve in the line of said pipe to govern the flow of liquid; a chamber having a movable diaphragm which is connected with said main-valve; an auxiliary valve-case having a passage at the two opposite ends of which are valve-seats; two auxiliary valves—one being at each of said seats and provided with means whereby only one of said valves can be seated at the same time; a pipe one end of which taps into the auxiliary valve-case between said two auxiliary valves and the other end of said pipe opening into the said diaphragm chamber; a pipe communicating between the auxiliary valve-case and the main supply-pipe; and means to operate one of said auxiliary valves.

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

LUDFORD C. JONES.

Witnesses:

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