(No Model.)

H. P. MOHN.

VALVE.

No. 545,519. Patented Sept. 3, 1895.

Fig. 1.

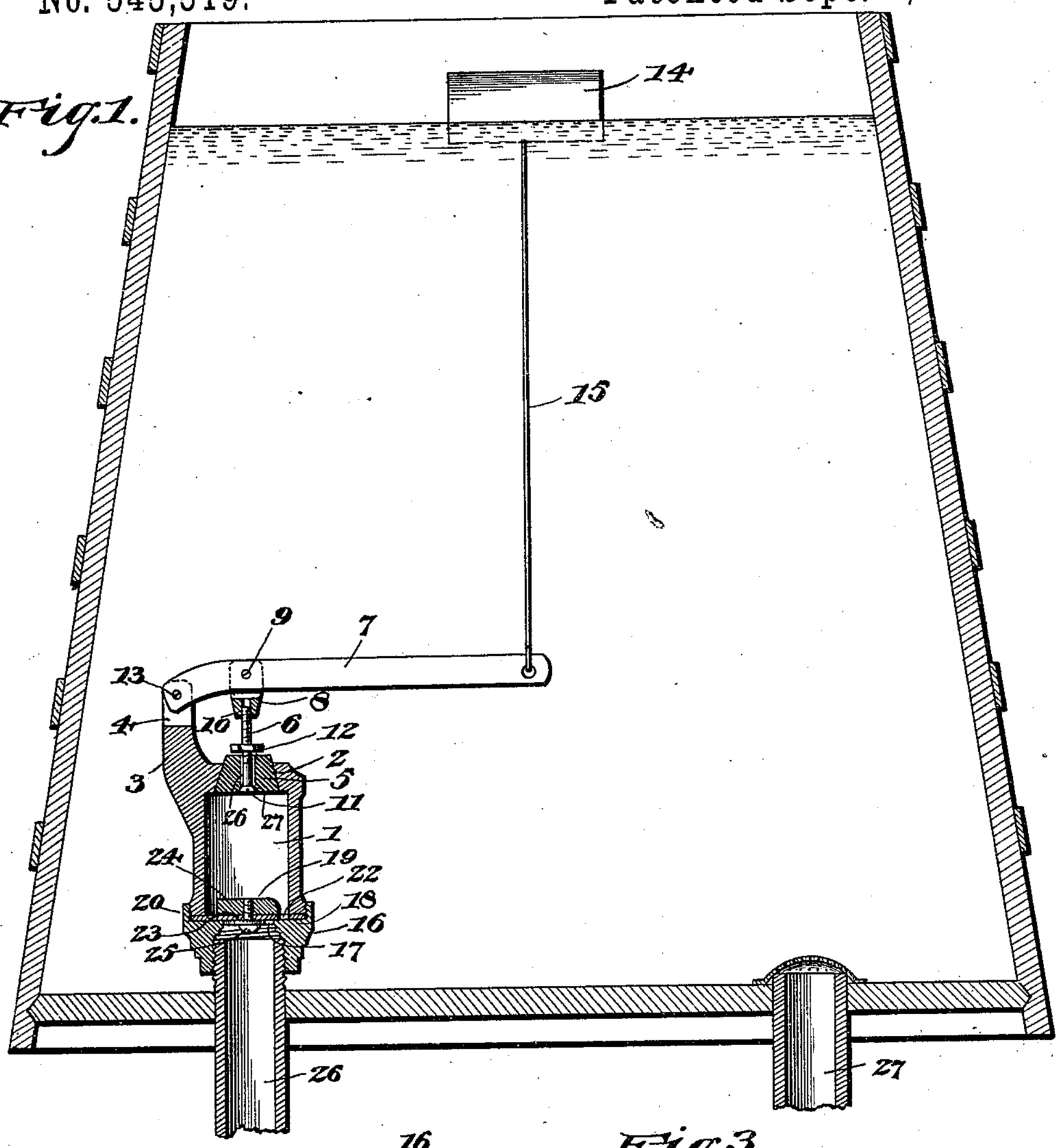


Fig. 2.

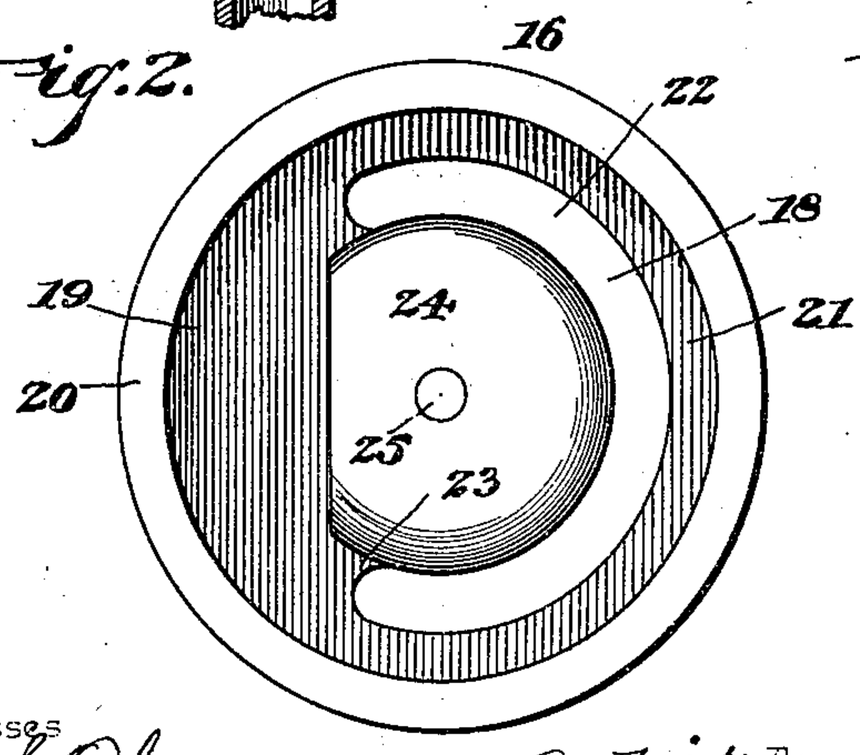
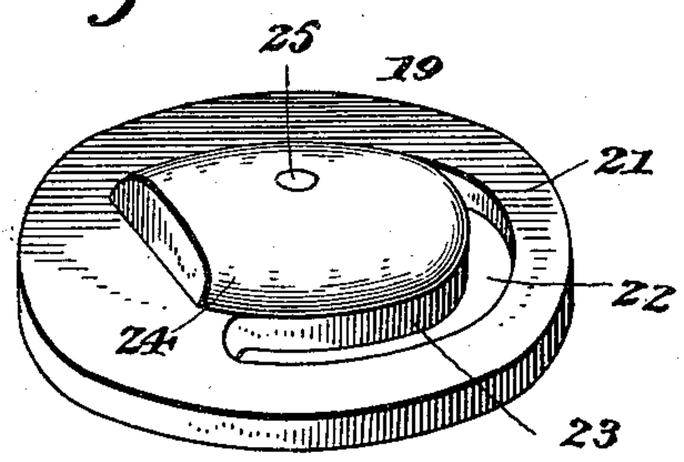


Fig. 3.



Inventor

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Witnesses

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UNITED STATES PATENT OFFICE.

HENRY P. MOHN, OF ASHLAND, OHIO.

VALVE.

SPECIFICATION forming part of Letters Patent No. 545,519, dated September 3, 1895.

Application filed March 9, 1894. Serial No. 503,042. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. MOHN, a citizen of the United States, residing at Ashland, in the county of Ashland and State of Ohio, have invented a new and useful Valve, of which the following is a specification.

My invention relates to improvements in valves, and particularly to that class of valves employed in connection with tanks, reservoirs, &c., and operated by means of floats to close the inlets in the tanks when the water reaches a certain predetermined height.

My improved valve is especially adapted for use in connection with tanks which are arranged in a battery and are supplied by a common pipe and when each of the tanks is provided with an individual service or outlet pipe whereby the level of the water may be different in different tanks. With this arrangement of tanks, unless the water is drawn uniformly from the tanks, there is a flow of water through the supply-pipe from the tank or tanks containing more water to those containing less, and this passage of the water from one tank to another is, under certain circumstances, objectionable, and it is to cure this disadvantage that I employ the valve forming the subject-matter of this invention.

Further objects and advantages of my invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a vertical section of a valve embodying my invention arranged in operative position in a tank. Fig. 2 is a plan view of the removable cap detached from the body of the valve-casing. Fig. 3 is a detail view of the check-valve.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates the casing, which is substantially cylindrical in form and is provided at its top with an upwardly-tapered seat 2, and 3 represents an arm formed integral with the casing at one side of the seat 2 and bifurcated at its upper end, as shown at 4.

5 represents a conical or upwardly-tapered float-operated valve, which is adapted to fit in the conical seat 2, and is provided with a stem 6, connected pivotally at its upper end to the lever 7. The upper end of the stem is bifurcated, as shown at 8, to pass upon opposite sides of the lever, and is connected thereto by means of the transverse pin 9. This bifurcated portion of the stem is preferably formed separate from the shank portion, and is provided with an axial bore 10, into which the upper end of the threaded shank is screwed. The shank of the stem is provided at its lower end with a head 11, and a nut 12 is threaded upon the stem above the plane of the upper end of the valve to hold the latter in place. It will be seen that the distance of the valve from the lever may be adjusted by screwing the shank portion more or less into the socket of the bifurcated portion of the stem. The lever is fitted between the arms of the bifurcation of the arm 3, and is pivotally connected thereto by means of the transverse split pin 13. A float 14 is connected by means of a wire or cord 15 to the free end of the lever, the said float being adapted to rest upon the surface of the water and be elevated thereby, and by means of the extended wire or cord communicate its upward motion to the free end of the lever, whereby when the water in the tank reaches a certain height the inlet through the valve-casing is closed by the rising of the float-operated valve to its conical seat.

Threaded exteriorly upon the lower end of the casing is a cap 16, having a central opening 17, surrounded by a seat 18, upon which is arranged a check-valve 19. The lower edge of the body portion of the casing, when the latter is fitted within the flange 20 of the removable cap, bears upon the outer portion of the said seat surrounding the opening in the cap, and the check-valve, which is preferably struck from flexible material, such as leather, is provided with an integral ring 21, which is engaged between the lower edge of the body portion of the casing and the surface of the said seat. The check-valve is preferably struck from a disk of leather, and a segmental slit extends partly around the disk adjacent to its periphery to form a slot 22, whereby the ring, which is arranged at the outer edge of the disk is separated, except at one point, from the inclosed tongue 23, which forms the check-valve proper. The weight 24, which is preferably of metal, is secured to the upper side of the tongue by means of a

screw 25, threaded into a central perforation of the weight.

This being the construction of the improved valve, the operation thereof is as follows: When the level of the water in the tank is sufficiently low to allow the float to release the operating-lever and drop the float-operated valve upon its seat, water from the supply-pipe, which is indicated at 26, may pass through the casing by raising the check-valve in opposition to the effect of the weight which is secured thereto, and when the water reaches a height which is governed entirely by the length of the flexible connection between the float and the lever the float-operated valve is lifted to its seat, thus stopping the influx. When a portion of the water in the tank is drawn off through the service-pipe, such as I have indicated at 27, thus lowering the plane of the surface of the water and allowing the float-operated valve to drop from its seat, a pressure of water in the supply-pipe provided such pressure were greater than the weight of water in the tank, would enter the tank, as above described; but if there is no pressure in the supply-pipe or if the weight of water in the tank is greater than the pressure in the supply-pipe the water will flow from the tank through the supply-pipe and thence either back to the source of the supply or to another tank arranged in the same battery in which the level of the water is lower than that in the said tank. By the use of the check-valve above described, however, such backflow is prevented irrespective of the relative pressure and weight of water in the supply-pipe and the tank, and only when the pressure in the supply-tank is greater than the weight of the water in the tank can there be any flow from one to the other of these parts, and then only in the direction indicated above—namely, from the supply-pipe to the tank.

I have found in practice that the pressure of water in the valve casing or cylinder has a tendency to interfere with the unseating of the valve 5 after the upward strain upon the lever 7 has been relieved by the depression of the float, and in order to correct this matter and provide for the immediate release of the valve 5 I have enlarged the bore 26, through which the threaded rod 6 passes, and have provided said bore at its lower end with a conical seat 27 for the reception of the conical head 11 at the lower end of said rod, and in addition thereto I have arranged the nut 12, which holds the valve 5 in place, slightly above the plane of the upper side of this valve, whereby the rod 6 has a slight longitudinal movement in the bore of the valve 5 sufficient to unseat the conical head 11. This construction, including the head 11, rod 6, and stop-nut 12, constitutes a relief-valve mechanism, and the operation thereof is that when the float descends by the depression of the surface of the water in the tank and the upward strain upon the lever 7 is relieved the relief-valve drops from its seat 27, thereby equalizing the pressure upon opposite sides of the valve 5 and enabling the latter to unseat in the manner above described. The reason that the relief-valve will unseat while the main valve 5 is prevented by the pressure thereon is that the surface of the relief-valve is so small that the pressure thereon is insufficient to support the weight of the float, lever, and connections. Thus the inflow of the water from the supply-pipe is controlled positively by the float-operated valve to check such inflow when the water reaches a certain height, and backflow from the tank to the supply-pipe is prevented by the check-valve when the float-operated valve is unseated by the fall of the level of the water.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing and of the advantages of this invention.

Having described my invention, what I claim is—

In a valve, the combination with an upright cylindrical valve casing provided at its lower end with a check valve, and in its closed top with an upwardly tapered valve seat; of an inwardly opening solid movable conical valve plug arranged to work within the casing and into said tapered valve seat, said movable valve plug being provided with an enlarged central vertically disposed water passage having at its lower end a conical valve seat, a vertically arranged valve rod or stem of a smaller diameter than and mounted to loosely work within the vertical water passage of the movable valve plug, said rod or stem being provided with an upper threaded portion and at its lower end with an integral conical valve head registering in the conical valve seat at the lower end of the conical water passage through the valve plug and adapted to open downwardly in advance of the said valve plug, a stop-nut adjustably mounted on the threaded portion of the rod or stem above the plane of the valve plug and adapted to work against the top of the latter to open the same, a float actuated lever, and an adjustable connection between the lever and said rod or stem, substantially as set forth.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HENRY P. MOHN.

Witnesses:
T. R. SHINN,
H. D. TINSLEY.