

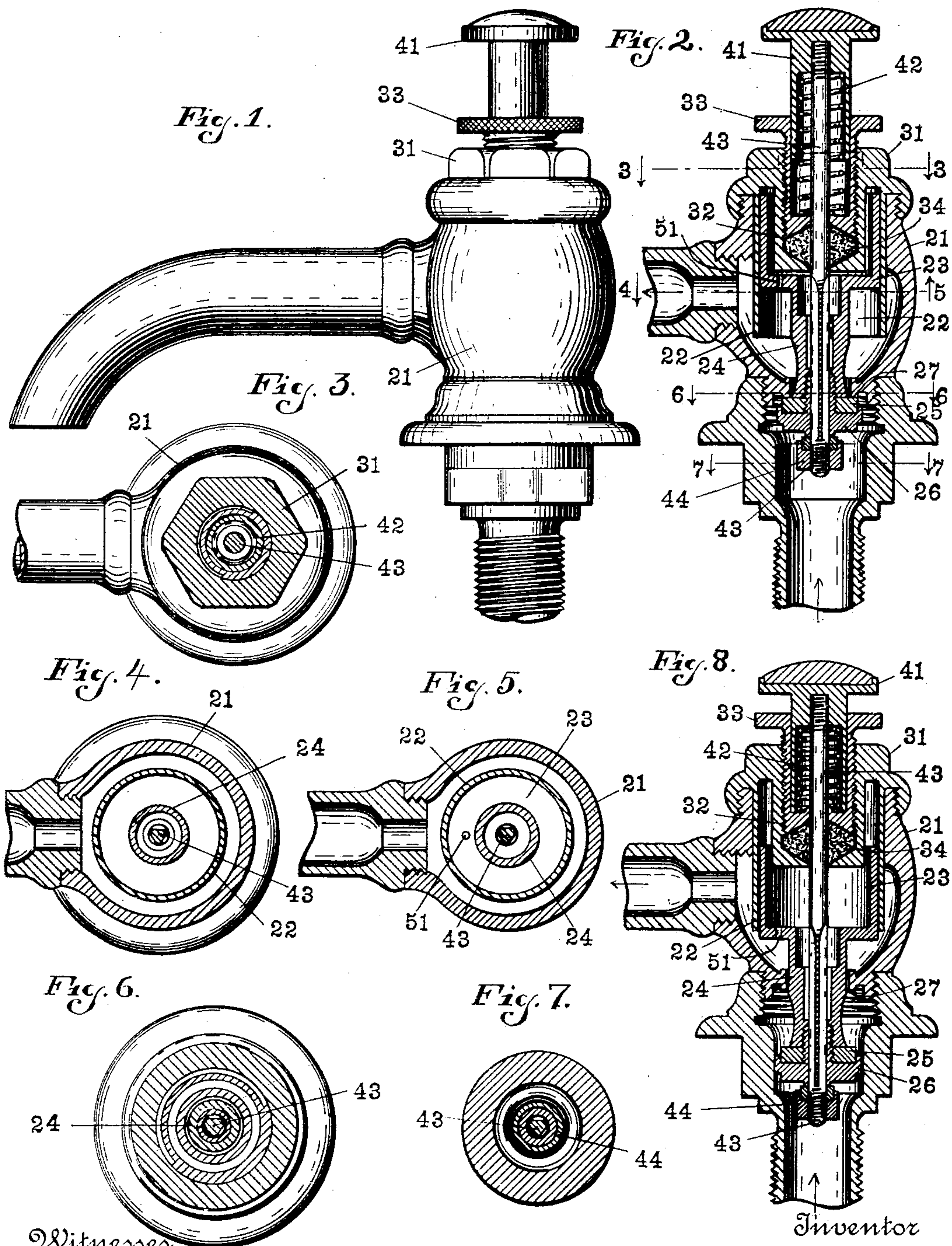
No. 751,677.

PATENTED FEB. 9, 1904.

J. W. NETHERY.  
VALVE.

APPLICATION FILED AUG. 10, 1903.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 751,677, dated February 9, 1904.

Application filed August 10, 1903. Serial No. 168,894. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. NETHERY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My present invention relates to automatically-operating valves or faucets; and its object is to produce a simple and reliable device of this character at a minimum of cost. A leading feature therefore consists in a construction by which most of the working parts are positioned within one another for a greater portion of their length, so that they are all contained within a small compass, with the result that a comparatively small amount or weight of material is required, and the expense of the valve compared with previous valves capable of corresponding operations is very much reduced. In achieving this principal object I have also overcome certain other defects and disadvantages and have produced a very superior valve thereby, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a valve or faucet and immediately adjacent parts embodying my present invention; Fig. 2, a central vertical sectional view of the same; Fig. 3, a horizontal sectional view looking downwardly from the position indicated by the dotted line 3 3 in Fig. 2; Fig. 4, a similar view looking downwardly from the position indicated by the dotted line 4 5; Fig. 5, a similar view when looking upwardly from the position indicated by the dotted line 4 5; Fig. 6, a similar view when looking downwardly from the dotted line 6 6; Fig. 7, a view when looking downwardly from the position indicated by the dotted line 7 7; and Fig. 8, a view similar to Fig. 2, but showing the valve parts differently positioned.

The structure is composed of the outer shell 21 and the inner shell or working barrel 22,

the latter being preferably formed of drawn tubing and rigidly secured within the former at the upper end, while its lower free end forms the inner wall of an annular chamber communicating with the ingress and egress passages. Within the working barrel 22 is a piston-valve 23, which reciprocates therein. The upper and larger portion of this piston-valve is chambered out to receive other parts, as will be presently explained. Its central portion or stem 24 extends downwardly and carries the valve proper, which is preferably composed of a packing-ring 25 and a screw-cap 26 whereby said packing-ring is held in place, so that the latter will come in contact when the valve is closed with the valve-seat 27, formed on the main shell 21. The piston-valve has its extension 24 reduced in size where it passes through the orifice in the main-valve seat, so that as the main valve moves in either direction the flow of fluid is increased as it approaches the center of its path of travel and is decreased as it approaches the end. Above this cut-away portion is a part of substantially the same diameter as the orifice through the main-valve seat, and this as the main valve reaches its lowermost position fills said orifice and cuts off the flow, thus in effect closing until the main valve starts on its return movement. In case, therefore, when the starting-valve is held down the flow is not thereby caused to be continuous, which, if permitted, would cause waste.

Secured to the upper end of the shell 21 is a combined cap and stuffing-box member 31, which is also chambered out and which is formed to extend down into the chamber of the piston-valve 23. This thin shell or chambered-out extension 32 of the cap 31 constitutes the outer member of the stuffing-box, through which the operating-stem of the starting-valve passes. The inner member 33 of this stuffing-box is also cut out until what remains is a thin shell, and it is screw-threaded to enter the part 31 32 and to compress between the lower end of the part 32 and the corresponding surface on the lower end of the part 33 the packing



34. The stem of the push-button 41 extends to within the chamber formed in this inner member 33 of the stuffing-box, and said stem in turn is formed with a chamber, which contains a spring 42. The push-button 41 is connected to a rod 43, which extends down through the stuffing-box, continuing through a perforation in the stem of the piston-valve 23, and carries the auxiliary or starting valve 44, the seat for which is formed on the under side of the main valve. The opening through the main or piston valve is sufficiently larger than the rod 43 so that when the starting-valve 44 is pushed away from its seat water will flow in through said opening (around said rod) to the chamber which is formed between the upper surface of the piston-valve and the adjacent surface of the structure above, with the result that the pressure thereof will force the said piston-valve downwardly off its seat, thus opening the main passage-way through the valve. This downward movement will continue until the valve-seat of the starting-valve 44 comes in contact with said starting-valve, so that the orifice is closed, whereupon the main valve will begin to reascend, this being permitted by the escape of the fluid from the chamber above the piston-valve through the fine perforation 51, leading through the piston-head out into the chamber of the valve which communicates with the discharge. This last-named perforation 51 is sufficiently smaller than the opening which surrounds the rod 43 so that the quantity of fluid which enters the chamber through the last-named opening is sufficiently greater than the quantity which can escape to cause the prompt operation which has just been described.

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

1. The combination, in a valve, of a valve-casing comprising a working barrel, a piston-valve within said working barrel having a chamber therein, a combined cap and stuffing-

box member secured to the valve-casing and extending to within the chamber in the piston-valve and also having a chamber therein, a second stuffing-box member entering the chamber in the first-named stuffing-box member and having a chamber, a push-button entering the chamber in said second stuffing-box member and also having a chamber, a starting-valve, a rod uniting said starting-valve and said push-button, and a spring contained within the chambers of the push-button and the interior stuffing-box member and surrounding said rod, said several parts being thus positioned within one another and contributing to reduce the valve structure as a whole in size and weight.

2. The combination, in a valve, of the valve-casing, a working barrel therein, a piston-valve in said working barrel having a stem or extension carrying the valve proper the sides whereof are cut away leaving a part above the cut-away portion of substantially the same diameter as the orifice through the valve-seat, a chamber above the piston-valve for the admission of fluid to operate said valve, an orifice through the stem of said main valve for the admission of fluid to said chamber, a starting-valve the rod whereof extends through said orifice (said starting-valve being seated upon the lower end of said main valve) the free travel of said starting-valve being equal to the travel of the main valve whereby when the starting-valve is pushed downwardly to the limit of its movement the main valve is adapted at the end of its movement to close the orifice through the main-valve seat and stop the flow.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 5th day of August, A. D. 1903.

JOSEPH W. NETHERY. [L. s.]

Witnesses:

CHESTER BRADFORD,  
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