No. 855,350. PATENTED MAY 28, 1907.

J. W. SINGMASTER.

HYDRANT.

APPLICATION FILED AUG. 18, 1905.

Fig. 3.

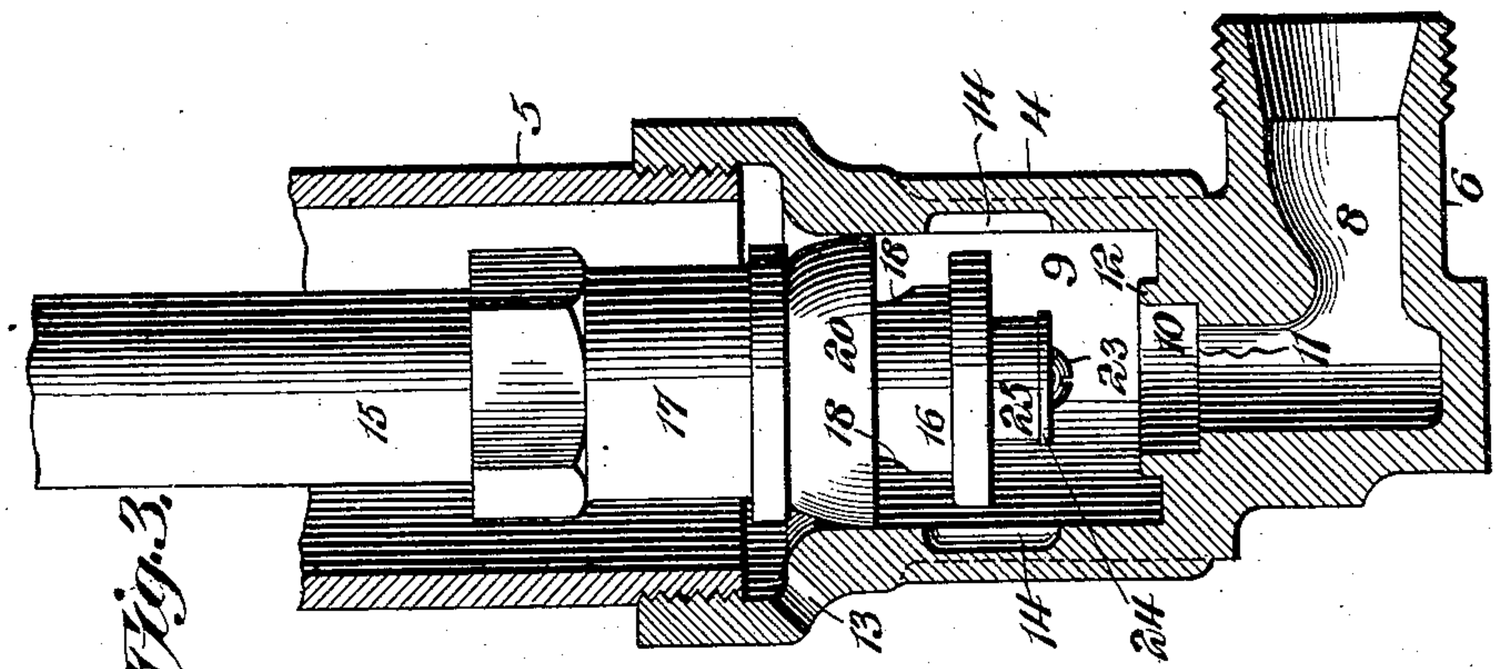


Fig. 2.

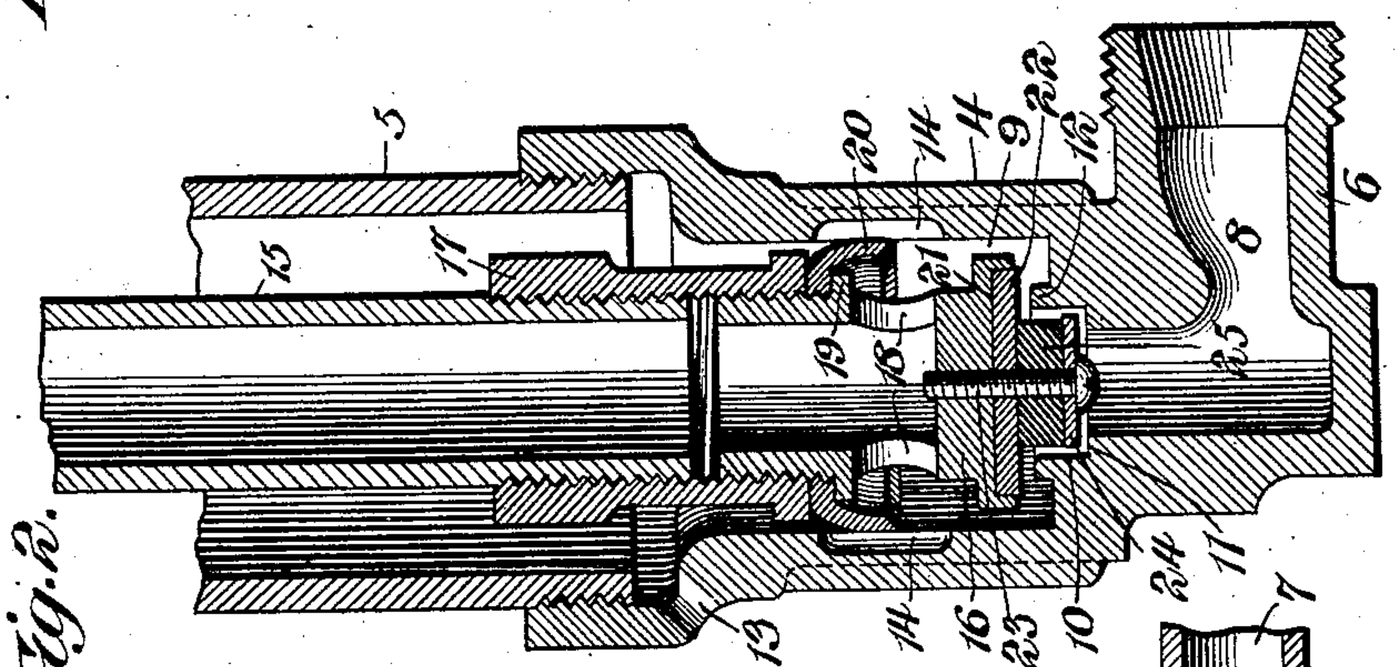
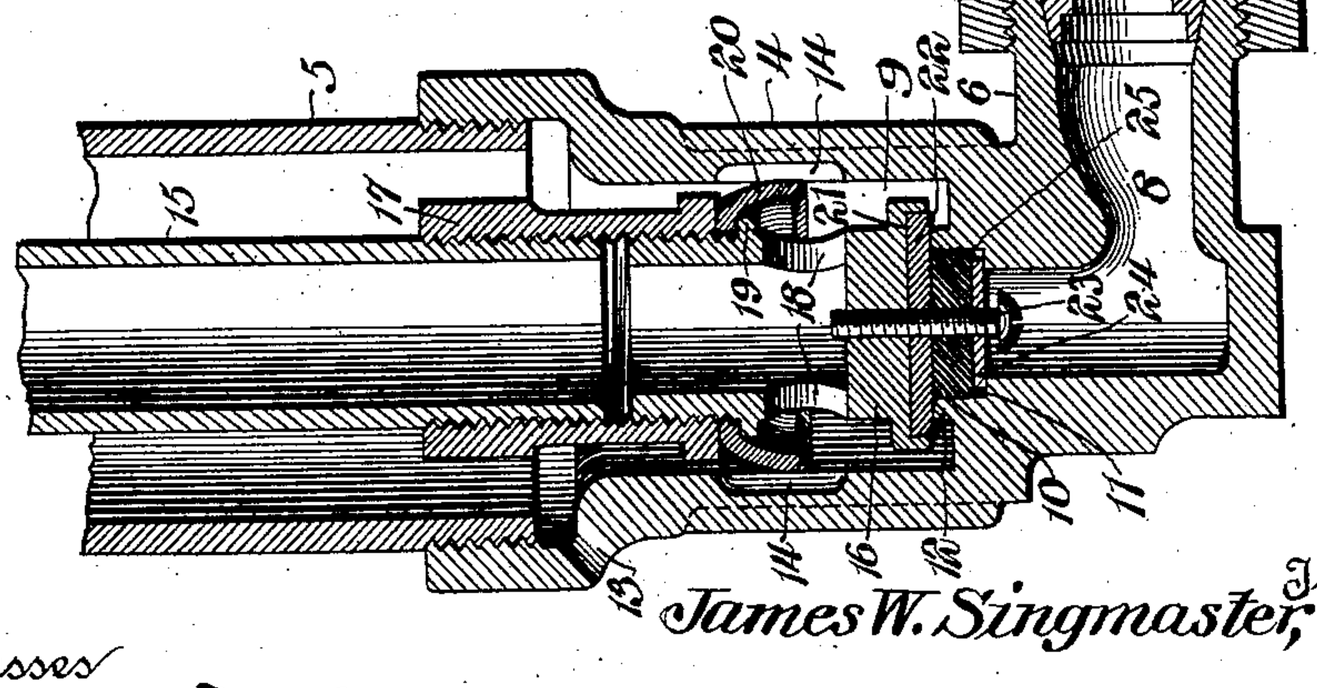


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

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HYDRANT.

No. 855,350. Specification of Letters Patent. Patented May 28, 1907.

Application filed August 18, 1905. Serial No. 274,755.

To all whom it may concern:

Be it known that I, JAMES WALTER SINGMASTER, a citizen of the United States, residing at Macungie, in the county of Lehigh and State of Pennsylvania, have invented a new and useful Hydrant, of which the following is a specification.

This invention relates to valve mechanism particularly useful in hydrants.

One of the principal objects is to provide mechanism of the above character which will permit a gradually increasing flow of water during the opening movement of the same, thereby avoiding the sudden and objectionable rush of water, said mechanism when in closed condition constituting an effective bar to the passage of water and being provided with a packing valve that is not subjected to material friction during the opening and closing movements.

The embodiment of the invention that is at present considered preferable is illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical sectional view through the improved structure, showing the valve mechanism closed. Fig. 2 is a similar view, but showing the valve mechanism partially opened. Fig. 3 is a sectional view through the casing showing the valve mechanism in elevation and entirely open.

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

In the embodiment illustrated, a valve casing 4 is employed, into the upper end of which is threaded the usual tubular body 5, the lower portion of said casing having an offset nipple 6, to which a supply pipe as 7 may be attached. An inlet passage 8 extends through this nipple and is upturned to communicate with an interior chamber 9 of the casing. The upper end of the passageway is counterbored, as shown at 10, thus forming an annular stop shoulder 11, constituting a valve seat. The upper end of the nozzle or counterbore is surrounded by an upstanding rib 12, forming an upper valve seat. A vent opening 13 in the upper portion of the casing 4 communicates with the upper portion of the chamber 9, while vent channels 14, are formed in the inner sides of the casing walls at any points desired.

Vertically slidable in the tubular body 5 is the usual valve stem 15, which, as shown, preferably constitutes the conduit through which the water flows to the discharge of the hydrant, and forming a part of this stem is a lower head 16, connected to the tubular portion 15 by means of a suitable coupling 17, and having lateral openings 18 therethrough, which openings afford communication between the chamber 9 and the bore of the stem. The upper end of the head 16 is threaded into the coupling 17 and just below said coupling the head is provided with an annular flange 19. Between said flange and the coupling is clamped a vent closure in the form of a leather cup 20, that snugly fits against the wall of the chamber 9, is movable upwardly above the vent channels 14 upon the corresponding movement of the stem, as shown in Fig. 3, and has its lower end movable to a point between the ends of said channels, as illustrated in Fig. 1, so that water may pass freely from the stem 15, through the channels to the vent opening 13.

The lower end of the head 16 is enlarged and has in its bottom a seat 21, receiving a washer 22, constituting a valve, adapted to bear upon the upper valve seat 12 when the vent closure is in its lowermost or inoperative position, as shown in Fig. 1. A screw shank 23 is threaded into the bottom of the head, and slidably mounted thereon is a metallic disk 24, that constitutes the valve that cooperates with the lower valve seat 11. Interposed between the valves 22 and 24 is a compressible and expansible device, preferably in the form of a rubber collar 25, which when in its normal condition is of less diameter than the counterbore 10, as will be apparent by reference to Fig. 2. When, however, this device is compressed between the valves, its diameter is increased, so that it will expand laterally against the walls of the counterbore and thus form a side-seating valve.

The operation of the structure may be briefly described as follows: Referring first to Fig. 1, it will be noted that, when the water supply controlling valves are closed, the lower disk valve 24 is upon its seat. The upper valve has been forced down and is upon its seat and the cushion or expansible collar having been compressed between the valves is expanded laterally against the walls of the coun-

terbore. Thus practically three valves are provided which will efficiently prevent leakage through the passageway into the chamber 9. The vent closure cup 20 is, however, in inoperative position, and thus water in the stem 15 will pass freely through the channels 14 and out of the vent 13. If now, the hydrant is opened, the stem will be raised and the initial movement thereof will cause the closure cup 20 to be elevated. At the same time, the upper valve 21 will be unseated, the lower valve, however, being at first held upon the seat by the expansive pressure of the collar 25. This longitudinal expansion of the collar will cause a decrease in its diameter, and thus said collar will disengage from the walls of the counterbore prior to its upward movement. Thus frictional and wearing contact with said walls is avoided. It will be observed that the disk 24 is also of less diameter than the counterbore, consequently, as soon as the pressure upon said disk is relieved, the water will begin to leak slowly past the same, and, as the disk is raised, the flow will gradually increase, until the disk is moved completely out of the counterbore, as shown in Fig. 3, whereupon the full volume of the water can flow into the chamber 9. By this time, however, the cup 20 has passed the upper ends of the vent channels 14, and, as a result, the vent 13 will be cut off from the water supply. In closing the hydrant, the reverse of the above action takes place, that is to say, the volume of the water will be gradually decreased until it is cut off altogether, whereupon the vent is opened and the standing water in the stem is allowed to escape.

It will be apparent by reference to Fig. 1 that the valve mechanism when in closed condition is exceedingly effective to prevent leakage, and, while a rubber or other packing of compressible material is employed, broad bearings for the same are provided so that the wearing action thereupon is reduced to a minimum and there is no friction upon the edges of the packing during the opening and closing movements. This packing, moreover, serves to yieldingly maintain the lower valve upon its seat, and thus performs a double function. Moreover, in this structure the flow of water can be efficiently controlled, as already described.

From the foregoing it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a hydrant, the combination with a casing having a liquid passageway including a counterbored portion forming a valve seat, of a stem having a shank longitudinally movable in the passageway, a valve disk slidably mounted on the shank and movable into and out of engagement with the seat to close the liquid passageway, and a compressible and expansible collar mounted on the shank behind the disk, said collar being expanded and compressed against the walls of the counterbore when the disk is seated.

2. In a hydrant, the combination with a casing having a passageway and spaced valve seats surrounding the same, of relatively movable valves co-operating with the seats, and a yielding device interposed between the valves and maintaining them in separated condition, said device being expanded against the walls of the passageway when the valves are relatively moved toward each other and seated.

3. In a hydrant, the combination with a casing having a passageway and spaced valve seats surrounding the same, of a stem operating longitudinally of the portion of the passageway having the seat, valves carried by the stem and co-operating with the seat, one of the valves being slidable upon said stem, and a compressible and expansible device separating the valves and being longer than the distance between the seats, said device being compressed and expanded against the walls of the passageway when the valves are seated and the sliding valve is thereby moved toward the other valve.

4. In a hydrant, the combination with a casing having a water inlet passageway including an upwardly extending portion provided at its upper end with a counterbore, of a valve seat at the lower end of the counterbore and a valve seat at the upper end of the same, a stem slidably mounted in the casing and having a valve at its lower end that co-operates with the upper valve seat to close the passageway therethrough, a shank carried by the free end of the stem, a valve disk slidably mounted on said shank and co-operating with the lower valve seat to close the passageway therethrough, and a compressible and expansible collar interposed between the valves, said collar constituting a side-seating valve that is expanded against the side walls of the counterbore when the valves are seated.

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

JAMES WALTER SINGMASTER.

Witnesses:
HORACE F. NEUMEYER,
HOWARD M. SINGMASTER.