June 10, 1941. E. J. HOLLIFIELD, JR 2,244,993

DOUBLE GATED SAFETY FIRE HYDRANT

Filed Oct. 25, 1939

Fig. 3.

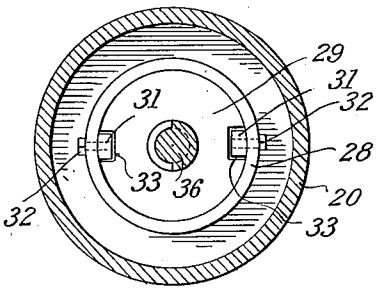


Fig. 2.

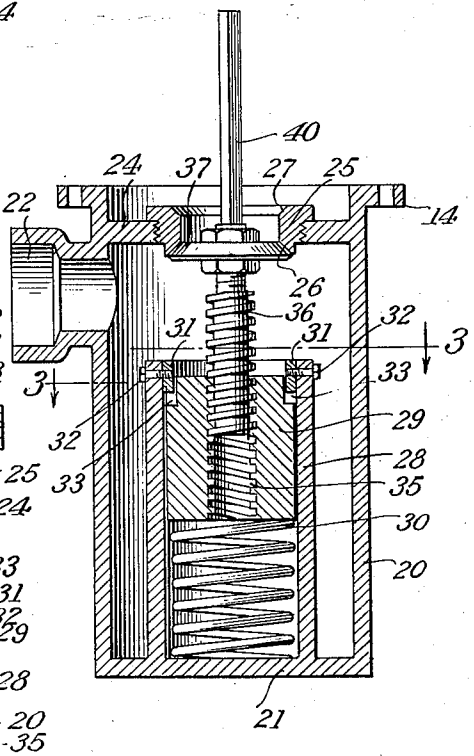
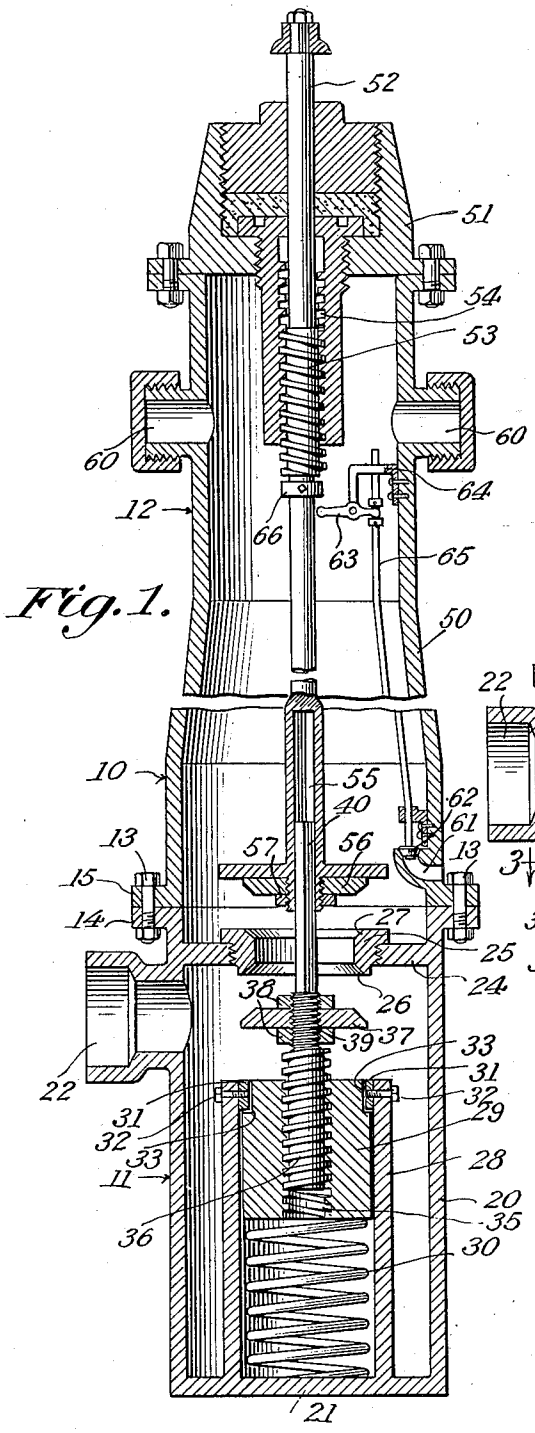


Fig. 1.



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DOUBLE GATED SAFETY FIRE HYDRANT

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2 Claims. (Cl. 137—13)

This invention relates to improvements in hydrants especially water fire hydrants of the types commonly in use on public thoroughfares.

One of the types of hydrants now in use to which this invention particularly relates is that wherein means are provided for draining water entrapped in the hydrant casing after the closing of the hydrant valve whereby freezing of the water and cracking of the casing during cold weather is precluded.

It is an object of the present invention to provide a novel valve system for use in the above-mentioned type of hydrant whereby an especially secure and leak-proof closure of the hydrant feed chamber is effectuated, whereby waste of water is eliminated and likelihood of entrapment of water in the hydrant casing with the possibility of freezing and damaging the same is minimized.

Another object of this invention is to provide in a hydrant of the aforementioned type a novel system of coacting valves functioning in a manner such that one of the valves supplements or complements the other, whereby, in the event of leakage of one of the valves, the other valves may be replaced or repaired without requiring shutdown of the main line feeding the hydrant.

An important advantage of the novel hydrant construction according to this invention is that in the event repair of the hydrant is necessary the entire hydrant super-structure may be removed from the hydrant base chamber connected to the feed line without necessitating discontinuance of service in the feed line.

Noteworthy among the features of the novel hydrant according to this invention are its simplicity and ruggedness of construction, the former assuring minimum cost of manufacture through reliance upon mass production and the latter serving to minimize likelihood of expense of repair.

Other objects, advantages and features of the new and improved hydrant construction according to the present invention will be apparent to those skilled in this art during the course of the following description.

Regarded in certain of its broader aspects the novel hydrant structure according to the present invention includes in a hydrant of the type comprising a bottom chamber communicating with the fluid supply and an upper hydrant casing; the improved means for controlling fluid flow from the chamber into the casing comprising simultaneously oppositely moving primary and secondary valves seating at opposite ends of an opening in the chamber.

In order to facilitate a fuller and more complete understanding of the present invention a specific embodiment thereof herein illustrated will be hereinafter described, it being clearly understood, however, that the illustrated embodiment, although presently preferred, is provided solely by way of example of the practice of this invention and not by way of limitation thereof except insofar as the invention is recited in the subjoined claims.

Referring then to the drawing,

Figure 1 is substantially a vertical sectional view of the presently preferred embodiment of this invention, parts of the same being broken away,

Fig. 2 is essentially a vertical sectional view of the bottom chamber of the hydrant illustrated in Fig. 1 showing the primary valve in closed position, and

Fig. 3 is substantially a horizontal sectional view of Fig. 2 taken on the line 3—3 thereof.

Referring now to the drawing, it will be noted that the hydrant generally designated by the numeral 10 comprises a bottom chamber generally designated by the numeral 11 and an upper hydrant casing generally designated by the numeral 12, the chamber and casing being connected by bolts 13 received in flanged edge portions 14 and 15 of the chamber and casing respectively.

The bottom chamber 11 comprises an essentially cylindrical hollow member 20 closed at one end 21 and connectable to a fluid feed line through the inlet 22 formed integral with the member 20 essentially as shown. A partition 24 having a centrally located threaded opening therein carries a valve seat member 25 having beveled valve seats 26 and 27 formed on opposite ends thereof. An upwardly extending centrally located cylindrical member 28 mounted on the bottom 21 of the member 20 slidingly holds a block 29 pressed upwardly by the spring 30 acting against the base of the block and the bottom 21 of the member 20 substantially as shown. Guides 31 diametrically positioned on the top portions of a cylindrical member 28 and held essentially fixedly in place by bolts 32 are received in guide-ways 33 formed in edge portions of the block 29 whereby rotation of the block relative to the cylindrical member 28 is essentially precluded. A block 29 is provided with an axially extending opening 35 threaded to receive the screw 36 carrying on one end thereof a valve member 37 adapted to seat against the valve seat 26 of the valve member 25 hereinabove described. The valve 37 preferably is held in position upon the end of the screw 36 by nuts 38 engaging with threaded portions 39 of the screw end. A stem 40 formed integral with the screw 36 extends axially therefrom essentially as shown in Figs. 1 and 2. It is to be noted that the stem 40 is of irregular or at least not circular cross-sectional outline, being in the illustrated embodiment of the invention substantially square.

The hydrant housing generally designated by the numeral 12 comprises a barrel portion 50 terminating in a head 51 wherein is rotatingly mounted a valve stem 52 having a threaded portion 53 engaging with a tapped sleeve portion 54 of the casing head. The stem 52 extends downwardly within the barrel 50 of the casing and terminates in a socket 55 for receiving the irregularly shaped stem 40 of the screw 36 hereinabove described. The socket 55 also carries in the extreme end thereof the valve member 56 held in place on the socket end by the nut 57 and adapted to seat against the valve seat 27 of the valve member 25 hereinabove described. It is especially to be noted that the threadings of the portion 53 of the stem 52 and of the screw 36 are in opposite directions, that is to say, one is left hand and the other right hand, whereby rotation of the stem 52 causes the valve 56 to simultaneously move toward or away from the valve 37 depending upon the direction of rotation. Outlets 60 communicate with the interior of the hydrant barrel 50 and an auxiliary outlet 61 closed by the valve 62 is provided for draining the barrel when the hydrant is not in use. It will be noted that the valve 62 is operable by counter-clockwise rotative motion of the lever arm 63 carried in the bracket 64 mounted on parts of the barrel casing and acting upon the connector rod 65. It will be seen that the collar 66 during downward motion of the stem 52 will abut against and impart counter-clockwise rotative motion to the lever arm, thereby opening the valve and permitting water or other fluid within the barrel to drain through the outlet 62. As will be apparent to those skilled in this art, the valve 62 is open only upon such occasion as the valve 56 is closed and conversely. Hence fluid can not drain through the opening 61 except when the hydrant is not in normal use.

Having thus described the structural features of the novel hydrant according to this invention, its mode of operation and the advantages attendant thereon will now be described. Assuming that initially the valve 37 hereinafter called the primary valve is pressed against the valve seat 26 of the valve member 25 substantially as shown in Fig. 2, and the valve 56 hereinafter referred to as a secondary valve is in like manner pressed against the seat 27 of the valve member 25, the sequence of operations attendant upon rotation of the stem 52 will be noted. As the stem is rotated, the valves move away from each other and from the seats, thereby permitting fluid to pass from the bottom chamber into the barrel of the hydrant. The valve 62 closes upon upward movement of the collar 66 due both to the action of gravity upon the connector member 65 and also to the pressure of the fluid within the hydrant casing. When use of the hydrant is completed the stem 52 is rotated in the opposite direction causing the primary valve member to seat itself, being spring pressed firmly against the seat by the spring 30, as shown in Fig. 2, and thereafter causing the secondary valve to seat itself, substantially sealing communication between the bottom chamber and the hydrant casing. As the valve 56 is closed, the valve 62 is opened as hereinabove described.

While the primary valve may be worn slightly during use, it is unlikely that the wear will be such as to permit more than slight leakage and accordingly the leakage is prevented by the secondary valve. The wear on the secondary valve of course will be substantially less than the wear on the primary valve because the secondary valve is closed after the primary valve. The primary valve in short insures major closure of communication between the bottom chamber and the hydrant casing: the secondary valve completes the closure and prevents leakage of fluid into the casing with the possibility that the fluid may freeze in the casing cracking the same.

In the event that the secondary valve requires repair or replacement, the bolts 13 can be unscrewed after the valves have been closed and the entire hydrant super-structure lifted off, it being noted that the socket 55 slidingly receives the irregular stem 40 of the screw 36. At this juncture it should be observed that any system of slidingly coupling the upper stem 52 and the stem 50 can be employed, the invention not being limited to the use of socket and irregular stem as illustrated. When the hydrant super-structure has been removed as mentioned, of course repairs can be made and the device thereafter assembled as before.

From the foregoing it will be evident that the novel hydrant according to this invention possesses both structural advantages and also permits economies of operation and repair, not possible with existing types of hydrants.

It is to be understood of course that this invention is capable of extended application and is not confined to the precise illustrated forms nor described construction and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope of the appended claims.

Having thus described the present invention, what it is desired to secure by Letters Patent is:

1. A hydrant comprising a casing within which are two chambers communicating through an opening formed in a common wall, the edges of the opening presenting valve seats; means for controlling fluid flow between the chambers comprising simultaneously oppositely moving first and second valves seating at opposite ends of the opening; mounting means for one of said valves comprising a threaded spindle carrying the valve, a block having a tapped opening wherein the spindle is received; and supporting means for holding said block in a manner permitting limited yielding in the direction of valve motion, said supporting means comprising a sleeve wherein the block is freely slidably received, stops on the block engaging with slotted parts of the sleeve whereby sliding of the block with respect to the sleeve is limited between extreme positions, and means for pressing the block into one of its extreme positions.

2. A hydrant, comprising a casing within which are two chambers communicating through an opening formed in a common wall, the edges of the opening presenting valve seats, opposed valves simultaneously seating at opposite ends of the opening, means for moving the upper valve downwardly upon its seat, a housing below the wall, a block in said housing, means for limiting the upward movement of the block in the housing, a spring below the block, a rod having a sliding connection with the upper valve operating means and rotated therewith, a threaded connection between the lower end of the rod and the block, and a valve carried by the rod below the lower valve seat.

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