June 5, 1951 W. W. BOLSER 2,555,727

MANUALLY OPERATED HYDRANT

Filed Feb. 1, 1946

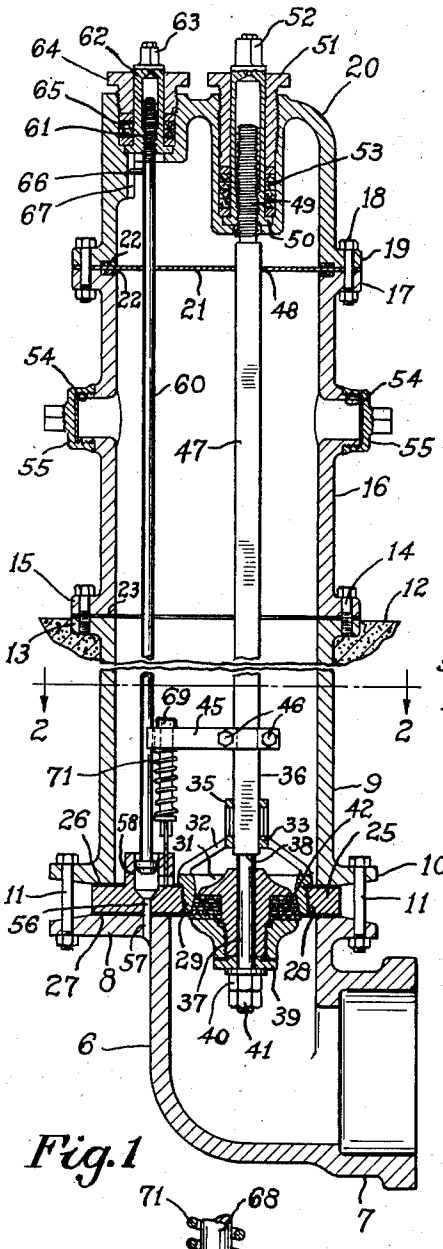


Fig. 1

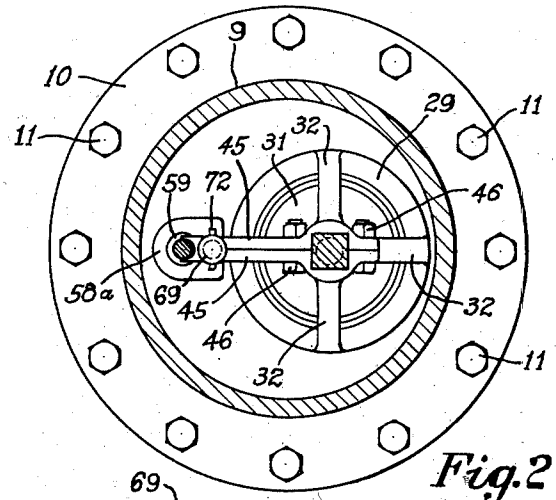


Fig. 2

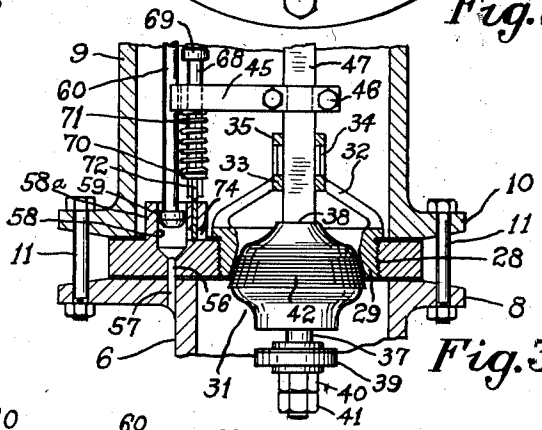


Fig. 3

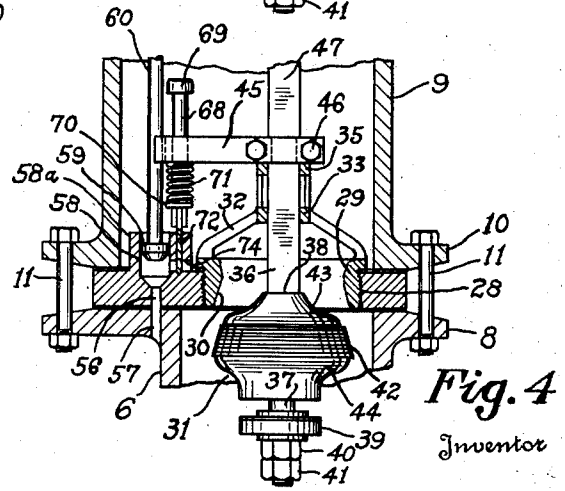


Fig. 4

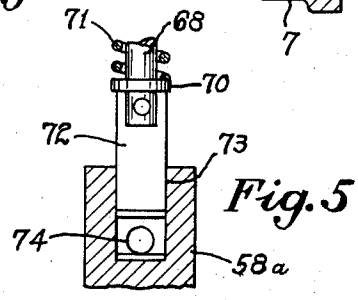


Fig. 5

Inventor

William W. Bolser

By Frease and Bishop

Attorneys

Patented June 5, 1951

2,555,727

UNITED STATES PATENT OFFICE

2,555,727

MANUALLY OPERATED HYDRANT

William W. Bolser, Akron, Ohio, assignor of one-half to Samuel E. Bolser, Canton, Ohio

Application February 1, 1946, Serial No. 644,889

4 Claims. (Cl. 137—13)

1

The invention relates generally to fire hydrants having an underground connection with a water main, and more particularly to hydrants in which the main valve communicating with the water main is manually operated from the exterior of the top of the hydrant casing.

Certain prior hydrant constructions have included a drain extending laterally through the wall of the casing just above the main valve for draining water from the casing after the main valve is shut. Such construction is objectionable because the drain frequently becomes clogged and it is usually necessary to shut off the water main at some remote point and dig up the whole hydrant in order to clean out the drain.

Moreover, such drains permit moisture in the ground to seep back into the hydrant through the drain and corrode or freeze the operating parts.

In my prior Patent No. 2,262,489, dated November 11, 1941, for Hydrant, I disclose a vertical drain which can be cleaned out from the top of the hydrant without shutting off the water main or digging up the hydrant, and said drain has a valve for preventing moisture in the ground from entering the hydrant when it is closed. However, the main valve in said patent is hydraulically operated by the pressure in the water main, and the means controlling the main valve functions to close the drain when the main valve is opened.

It is an object of the present invention to provide a novel manually operated hydrant having a vertical drain which can be cleaned out from the top of the hydrant.

Another object is to provide a novel manually operated hydrant having a vertical drain with a drain valve operable from the top of the hydrant.

A further object is to provide a novel manually operated hydrant having a vertical drain and means for automatically closing the drain when the main valve opens.

A still further object is to provide a novel manually operated hydrant having a vertical drain in which the drain is automatically fully closed by the opening operation of the main valve operating mechanism before the main valve begins to open.

Finally, it is an object of the present invention to incorporate all of the foregoing objectives in an extremely simple and inexpensive construction which has a minimum number of parts, and is easy to construct, repair and maintain.

These and other objects are accomplished by the parts, improvements, combinations and arrangements comprising the present invention, a preferred embodiment of which is shown by way of example in the accompanying drawing and described in detail in the attached specification; the constructions, combinations and sub-combinations comprising the invention, and reasonable mechanical equivalents thereof obvious to those skilled in the art, being set forth in the appended claims.

2

In general terms, the invention may be stated as including a hydrant having an upright casing and a main valve connecting the bottom of the casing to a water main, with a vertical drain port to one side of said main valve, a vertical screw for operating the main valve and a drain valve operatively connected to the screw for closing the drain port before the main valve opens and keeping it closed during opening movement of said main valve.

Referring to the drawing in which a preferred embodiment of the invention is shown by way of example,

Figure 1 is a vertical longitudinal sectional view through a hydrant embodying the invention;

Fig. 2 is an enlarged plan sectional view thereof, as on line 2—2, Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view similar to Fig. 1, showing the drain valve closed and the main valve about to open;

Fig. 4 is a similar view showing the main valve fully opened; and

Fig. 5 is an enlarged fragmentary sectional view showing the drain valve in elevation and in open position.

Similar numerals refer to similar parts throughout the several views of the drawing.

The bottom casting 6 of the hydrant is provided at one side with a neck or bell 7 adapted for connection to a water main in a well-known manner. This casting 6 is provided at its upper end with an outturned eccentric flange 8, which is adapted for connection with a vertical casing or stand pipe section indicated generally at 9, which is of larger diameter than the upright portion of casting 6 and which is eccentrically located with respect to the upright portion of casting 6.

The upright casing section 9 is preferably provided at its bottom end with an annular flange 10 for registering with the annular flange 8, and the flanges 8 and 10 are provided with circumferential series of bolt holes adapted for receiving the bolts 11 for clamping the casing section 9 and the casting 6 together.

The casing section 9 is adapted to extend upwardly to the ground level 12 where it is provided

with a peripheral flange 13 adapted to be connected, as by cap screws 14, to a similar peripheral flange 15 on the bottom end of the upper casing section 16; and the upper end of the section 16 has a peripheral flange 17 adapted to be connected by bolts 18 to the peripheral flange 19 of a cap 20. Preferably, a metal plate 21 is clamped between the flanges 17 and 19 by the bolts 18, and suitable sealing gaskets 22 may be provided above and below the plate 21. Similarly a suitable gasket 23 may be provided between the flanges 13 and 15.

By providing the two casing sections 9 and 16 and locating the joint between said sections at the ground level 12, if the upper part of the hydrant is damaged or broken by impact, for example, as a result of being struck by a vehicle, the upper casing section 16 may be removed and replaced without requiring digging up the entire hydrant or removing the section 9 from the ground.

A bronze plate 25 is preferably clamped by the bolts 11 between the flanges 8 and 10, and suitable gaskets 26 and 27 are provided between the plate and the flanges 10 and 3 respectively. The bronze plate 25 is provided with an eccentric opening 28 which is substantially coaxial with the vertical axis of the upper portion of casting 6, so that the seat for the main valve may be located within the opening 28 concentric to the casting 6 and eccentric to the vertical casing of the hydrant.

A valve seat ring 29 is screwed into the opening 28, and the ring has an internal tapered seating surface 30 for fitting the main valve which is indicated generally at 31. The upper end of the ring 29 has arms 32 extending angularly inward from the ring to a collar portion 33 which may be connected by spaced vertical ribs 34 to another collar portion 35. The collars 33 and 35 are provided with square openings for slidably fitting around the squared portion 36 of the vertical rod which carries the main valve 31.

As best shown in Fig. 1, the lower end 37 of the main valve rod is cylindrical and the valve 31 is slidable thereon between the shoulder 38 and the abutment washer 39 which is supported on the lower end of the rod by an adjusting nut 40 and a lock nut 41.

The main valve 31 preferably includes a plurality of leather or fiber discs 42, the outer surfaces of which are tapered to fit on the seating surface 30 of ring 29, and the discs 42 are preferably clamped between the upper and lower valve members 43 and 44, which may be screwed together as shown in Fig. 1.

At the upper end of the end of the squared portion 36 of the valve rod, the rod is provided with a reduced portion around which is clamped a pair of arms 45 by bolts 46, and the arms 45 extend laterally of the valve rod for a purpose to be described. The upper portion 47 of the valve rod is preferably square and passes through a squared hole 48 in the plate 21. The upper end 49 of the rod is screwed into a nut member 50, the upper part of which projects through a packing nut 51 and has a squared end as shown at 52 for receiving a wrench. The packing nut 51 is threaded into the cap 20 for compressing a plurality of packing rings 53 for sealing the joint around the upper end 49 of the valve rod. Hose nipples 54 of well known design are provided on the casing section 16, and have the usual caps 55 for closing the same.

By turning the squared end 52 of the nut 50 with a suitable wrench, the rod 47 will be moved vertically, because the square rod is held from turning by the square hole 48 in plate 21 and by the square holes in the rings 33 and 35. Turning the nut 50 in one direction will lower the rod and the valve 31 mounted thereon to open the same, and turning the nut in the opposite direction will close the valve 31 against its seat 30, as shown in Fig. 1.

The wider portion of the bronze ring 25, as shown to the left of the main valve 31 in Fig. 1, is provided with a vertical drain port 56 which registers with the vertical drain port 57 in the flange 8 of the casting 6, the port 57 thus being located outside of the casting 6. The upper end of the port 56 in the ring 25 is enlarged as shown at 58 to provide a seat for a valve 59 adapted to close the port 56, and the enlarged hole is extended upwardly by the boss 58a. The valve 59 is mounted on a rod 60 which extends vertically upward through the hydrant casing, and which is screwed at its upper end 61 into a nut 62, the upper part of which projects out of the cap 20 and has a squared end 63 for receiving a wrench. The upper part of the nut 62 extends through a packing nut 64 threaded into the cap 20 for compressing a plurality of packing rings 65 to seal the joint around the nut 62. Preferably the rod is provided adjacent its upper end with a lateral pin 66 which is slidably engaged in a vertical slot 67 formed in the interior of the cap 20, so as to prevent the rod from turning when the nut 62 is turned, and thus raise and lower the rod 60.

The purpose of the drain port 56, 57 is to drain all the water from the hydrant casing after the main valve 31 has been closed, and the valve 59 and rod 60 is provided so that the drain port can be closed by turning the nut 62 from the top of the hydrant and thus prevent moisture from the ground from getting into the hydrant casing during the winter season and freezing or corroding the inner parts of the hydrant.

The novel means for automatically closing the drain port when the main valve 31 is opened, is independent of the valve 59 and preferably includes a vertical pin 68 slidable in a hole provided in the outer ends of the arms 45, and having a head 69 adapted to abut the top of said arms. A washer 70 is secured to the lower end of the pin 68, and a spring 71 is interposed between the washer 70 and the arms 45. Below the washer 70, the end of the pin 68 has secured thereto a gate valve member 72 which is vertically slidable in a slot 73 in boss 58a and intersecting a lateral port 74 which provides communication between the hydrant casing and the enlarged portion 58 of the drain port 56. As shown in Fig. 5 the gate 72 is in raised position to open the lateral port 74 and allow water to drain out of the hydrant casing while the main valve 31 is closed.

As the valve rod 47 is lowered to open the main valve 31, the arms 45 compress the spring 71 to close the gate 72 for shutting off the lateral port 74 leading to the drain port, and as shown in Fig. 3, this initial downward motion of the valve rod 47 first moves the shoulder 38 downwardly against the valve 31 before the valve 31 begins to open, because the pressure from the water main on the underside of the valve 31 will hold it shut until it is forced downwardly by abutment with the shoulder 38.

Accordingly, before the main valve is open, the drain port is positively closed by the gate

72, thus preventing water from entering the hydrant casing and discharging through the drain port to wash away the ground around the hydrant, and further downward movement of the rod 47 to open the valve 31 will merely compress spring 71. Moreover, the fact that the drain port is always closed when the main valve is open enables withdrawing a small volume of water from the hydrant whereas in the old style of hydrant the water pressure would force water out through the drain.

When the rod 47 is raised to close the valve 31, the valve 31 will seat on the seating portion 30 before the gate 72 starts to raise, and further upward movement of the rod will cause the arms 45 to engage the head 69 of pin 68 and raise the gate 72 to open port 74.

In the improved hydrant, repairs or replacements of the working parts may be made without digging up or removing the hydrant casing, and in case the drain ports become clogged, it is only necessary to remove the valve 59 and its rod 60, whereupon a clean out rod can be inserted from the top of the hydrant and forced downwardly through the drain ports 56 and 57 without having to shut off the water pressure in the water main at some remote point.

The improved hydrant is extremely simple and inexpensive to make and assemble, and to repair and maintain, because it embodies a minimum number of operating parts which are accessible from the top of the hydrant.

Having now described the features of the invention, the construction, arrangement and use of a preferred embodiment thereof, and the advantageous, new and useful results obtained by the improved construction, the new and useful devices, constructions and combinations, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

I claim:

1. In a hydrant including a casing having a top cap, a main valve seat and a vertically movable main valve cooperating with said seat and having manual valve operating means, the lower part of the casing having a vertically disposed drain passage including a valve seat offset laterally and positioned down stream of said main valve seat, a vertical valve rod axially aligned with said drain passage having a valve member on its lower end closely fitting said passage, said valve rod being removable through and manually operable from said top cap to close and open said drain passage, said drain passage having a lateral port above the valve seat communicating with the interior of said hydrant only when the drain valve member is in open position above its seat, a vertically movable gate for closing said lateral port, and means within said hydrant casing operatively connecting said gate to said main valve operating means for positively closing the gate before the main valve begins to open.

2. In a hydrant including a casing having a top cap, a main valve seat and a vertically movable main valve cooperating with said seat and having manual valve operating means, the lower part of the casing having a vertically disposed drain passage including a valve seat offset laterally and positioned down stream of said main valve seat, a vertical valve rod axially aligned with said drain passage having a valve member on its lower end closely fitting said passage, said valve rod being removable through and manually operable from said top cap to close and open said drain passage, said drain passage having a lateral port above the valve seat communicating with the interior of said hydrant only when the drain valve member is in open position above its seat, an auxiliary valve for closing said lateral port, and means within said hydrant casing operatively connecting said auxiliary valve to said main valve operating means for positively closing the auxiliary valve before the main valve begins to open.

3. In a hydrant including a casing having a top cap, a main valve seat and a vertically movable main valve cooperating with said seat and having manual valve operating means, a vertically disposed drain offset laterally of the main valve seat and positioned down stream thereof, said drain having an upper bore, a drain valve vertically movable in said bore and removable through said top cap, said drain having a lateral port providing communication under said drain valve only in open position between the drain and the interior of said hydrant, an auxiliary valve for closing said lateral port, and means within said hydrant casing operatively connecting the auxiliary valve to the main valve operating means for positively closing the auxiliary valve before the main valve begins to open.

4. In a hydrant including a casing having a top cap, a main valve seat and a vertically movable main valve cooperating with said seat and having manual valve operating means, a vertically disposed drain offset laterally of the main valve seat and positioned down stream thereof, said drain having an upper bore, a drain valve vertically movable in said bore and removable through said top cap, said drain having a lateral port providing communication under said drain valve only in open position between the drain and the interior of said hydrant, an auxiliary valve for closing said lateral port, and yielding means within said hydrant casing operatively connecting said auxiliary valve to said main valve operating means for closing said auxiliary valve before the main valve begins to open and for opening the auxiliary valve after the main valve has been fully closed.

WILLIAM W. BOLSER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
3,185	Colvin	July 20, 1843
163,425	Vergenes	May 18, 1875
188,676	Richardson	Mar. 20, 1877
242,243	Adams	May 31, 1881
694,180	O'Brien	Feb. 25, 1902
2,262,489	Bolser	Nov. 11, 1941