July 14, 1953 J. H. LUCAS ET AL 2,645,452

CURB STOP AND DRAIN

Filed Oct. 23, 1947

Fig. 1.

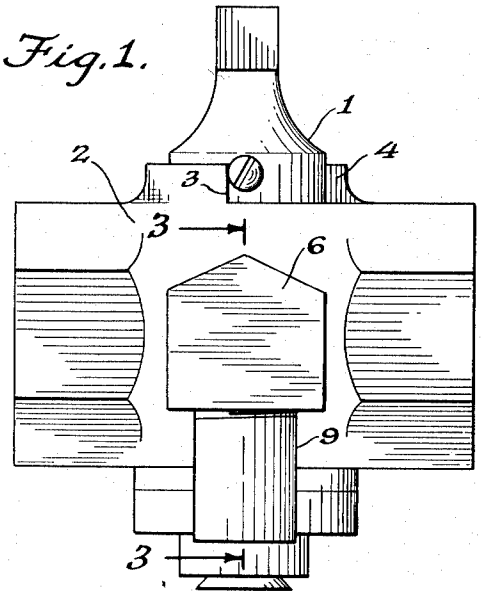


Fig. 2.

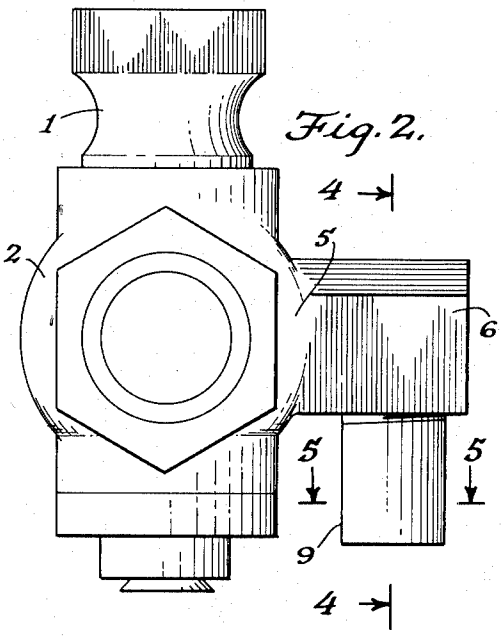


Fig. 5

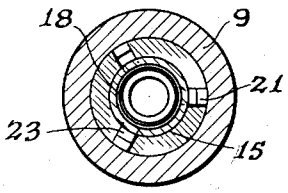


Fig. 6.

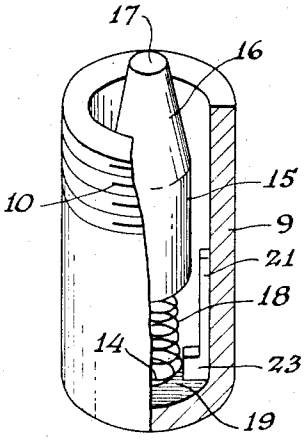


Fig. 4.

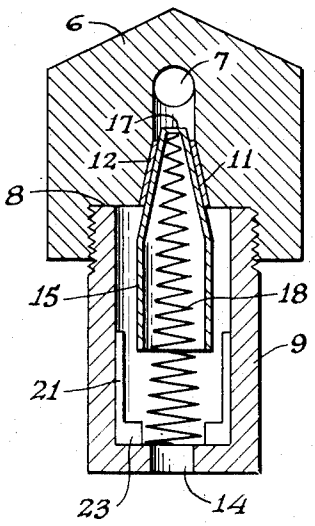
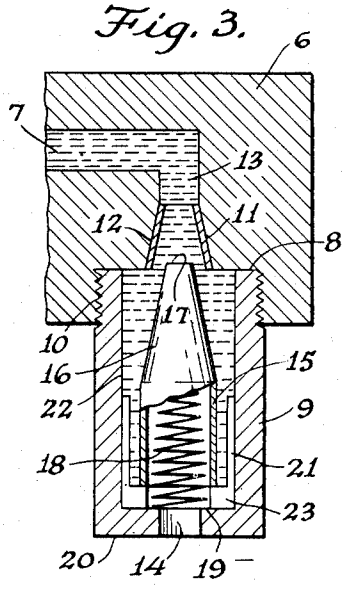


Fig. 3.



INVENTORS.

JAMES H. LUCAS

NORRIS A. TALPEY

BY

Albert M. Parker

ATTORNEY.

Patented July 14, 1953

2,645,452

UNITED STATES PATENT OFFICE

2,645,452

CURB STOP AND DRAIN

James H. Lucas and Norris A. Talpey,
York, Maine

Application October 23, 1947, Serial No. 781,608

4 Claims. (Cl. 251—144)

1

This invention relates to curb stops and drains, otherwise known as curb stops and wastes, for water lines going to buildings, and in particular curb stops and drains including preventatives against extraneous liquids and pollution getting into service pipes.

The common practice in installing water service for residences, or other buildings, is to employ a valve known as a curb stop at the curb line, or street line. This valve is, of course, well beneath the ground and is covered by a housing known as a service box, which is nothing more or less than a tube through which an implement to operate the valve can be inserted. The service box has a lid, or cover, at the ground level. It has heretofore been the practice to provide these curb stops with drains which are nothing more than a small hole in the side of the valve housing. Such drains are closed by the stop, or valve, when it is in open position, but are opened when the water is shut off and remain open so that water from the building can drain out through the service pipe, and flow into the ground through the drain hole. There is nothing, however, to prevent possibly polluted water, or other fluids in the ground, from flowing into the service pipe through such drain holes, after the water from the house has drained out, and while the drain holes still remain open.

There have been some recent incidents where the water systems of buildings have been polluted by material in the ground which has flown into service pipes through the drain holes in the curb stops while the water was shut off. Once the water is turned on at the curb stop, such pollution is, of course, carried throughout the whole water line of the building. This condition has caused concern, not only among occupants of premises, but among the utilities supplying the service, since the curb stops and drains are the property of the utilities, and are controlled by them. Thus the consensus is that the utility companies would be liable for any damages resulting from pollution entering into the water system of a building.

The drain of our invention eliminates the above hazards and does so in a simple, economical and fool-proof manner. It provides for full drainage of the returning water from the service line, when the supply is cut off at the curb stop, but closes the drain opening when the draining action has been completed. Furthermore, that closing effect is increased by the action of any water, or other liquid in the ground, which attempts to flow into the service pipe through the drain. Our drain device adopts the recognized, effective elements of known curb stops and combines therewith an improved drain construction in place of the drain hole previously employed. The modification of existing constructions is brought about in a simple and economical manner and the additional cost in relation to the safeguard provided is inconsequential.

2

It is, accordingly, a principal object of our invention to prevent the pollution of the water systems of buildings when the water supply is shut off.

Another object of the invention is to prevent such pollution while at the same time providing for full draining of such systems.

A further object of the invention is to provide for increase in the resistance to the possibility of such pollution in response to increase in liquid acting to cause the same.

A further object of the invention is to accomplish the foregoing objects in a simple and economical manner.

Further objects of the invention will, in part, become obvious, and in part be pointed out as the description of the invention proceeds with reference to the accompanying drawing in which:

Figure 1 is a side elevation of a curb stop and drain in accordance with the invention.

Figure 2 is an end elevation thereof, looking at Figure 1 from the left hand end.

Figure 3 is a section taken on line 3—3 of Figure 1, looking in the direction of the arrows, with a fragment of one port in elevation and showing the drain device in open position.

Figure 4 is a section taken on line 4—4 of Figure 2, and looking in the direction of the arrows.

Figure 5 is a sectional plan view taken on line 5—5 of Figure 2, and looking in the direction of the arrows, and

Figure 6 is a perspective view of the drain valve and valve chamber, in accordance with our invention, with a portion of the chamber broken away to show the interior thereof.

The curb stop which we employ, as shown in Figure 1, is in the form of a rotary valve having a barrel 1, which is received and is turned within a seat in the body 2, as is well known in the art. The valve barrel is operable through substantially a quarter of a turn, as indicated by the stop shoulders 3 and 4. In one extreme position, the valve opens the passage between the service line and the main, or pipe coming therefrom. In its other extreme position the rotary valve shuts off the service line from the main and opens it to a small drain port on one side of the valve body, such as the side shown at 5 in Figure 2.

In the present construction, however, the use

of a drain port exhausting directly out from the curb stop into the ground is eliminated. Instead, the side of the curb stop body is furnished with an outwardly extending housing 6, which is internally bored at 7 with a port communicating with and extending outwardly from the valve seat in the body 2.

The housing 6 is preferably cast as a part of the body 2 of the curb stop, but of course may be joined thereto in other manners if desired. The outside of the housing 6 may be of any desired configuration, that here shown being believed to be a desirable one from the point of view of a construction which is embedded in the ground.

The housing 6 is recessed on its underside at 8 to receive the tubular shell 9 of the drain valve. This tubular shell made of a non-corrosive material, is secured in the recess 8, preferably in a removable manner, as through the screw thread engagement shown at 10. A tapered opening 11 extends upwardly from the top of the recess 8, and is centered with respect thereto. A sleeve 12 of non-corrosive material, preferably stainless steel, is received and secured within the opening 11, and overlies the same to form a valve seat as will hereinafter be described. A short bore 13 of the same diameter as the bore 7, extends downward from the outer end thereof, and communicates with the upper end of the opening 11. Thus a passageway is formed for the water draining from the curb stop to reach the interior of the shell 9.

The bottom of the shell 9 is substantially closed but is provided with a center drain hole 14, of the same diameter as the bores 7 and 13, so as not to impede the flow of water draining off. A hollow piston valve 15, having a conically tapered upper end 16, corresponding with the taper of the seat 12 is received within the shell 9. This piston valve should be capable of withstanding substantial pressure and should preferably be made of the same non-corrosive material as the valve seat 12. The upper end of the piston valve is closed, as shown at 17, but its hollow interior is open at the bottom in order that an actuating spring 18 may be received therein. Again, the spring 18 is formed of suitable non-corrosive material. The upper end of the spring 18 engages the underside of the closed end 17 of the piston valve, while its lower end is seated at 19 on the inside of the bottom 20 of the chamber 9, around the opening 14.

The spring 18 should be flexible enough to permit retraction of the piston valve 15 in response to water draining back from the service pipe through the curb stop when the latter is in closed position with respect to water from the main. When the curb stop is open, however, allowing water to flow through into the service pipe, the spring 18 should keep the piston valve 15 closed. This will prevent pollution getting into the drain line, and possibly being carried into the service pipe, on later openings and closings of the curb stop. The mated tapers of portion 16 of the piston valve 15 and the valve seat 12 provides a tight closing of the drainage passage since the entire area of the seat 12 is engaged by the tapered portion 16. The tapered surfaces make for easy disengagement when desired and the spring 18 should offer only reasonable resistance against unseating.

Free, but guided, actuation of the piston valve 15 is accomplished by a plurality of guides, here shown as three (3) in number, which surround the cylindrical lower skirt of the valve. These guides, 21, are in the nature of ribs secured to the inner side wall 22 of the shell 9. The guides 21, as shown in Figure 4, extend up high enough to overlie the lower end of the piston valve 15, even when the same is in closed position. At the bottom of each guide there is an inwardly projecting step 23. These steps serve as a seat for the bottom end of the piston valve 15 when it is in full open position. Furthermore, their inner ends define the seat 19 receiving the bottom end of the spring 18.

Referring now to Figure 6, it will be believed to be readily apparent that so long as the cylindrical skirt of the piston 15 is sufficiently spaced from the inner surface of the shell 9 and the size of the guides 21 with their steps 23 is properly chosen, water can waste downwardly past the piston valve 15, under its end and out through the waste hole 14. When that waste action has come to an end, however, the piston valve 15 will be urged by the spring 18 to the closed position shown in Figure 4. Though liquids in the ground may find their way into the interior of the shell 9, their effect on the interior of the piston 15 to maintain the same in closed position will be far greater than any effect the liquid could possibly exert to urge the piston to open.

From the foregoing it will be apparent that the construction of our invention meets all the requirements of a pollution proof curb stop and drain. It satisfies all the conditions for such a device and will continue to do so in a dependable manner over a long period of time.

It is to be understood that the form of our invention herewith shown and described is what we presently consider to be the preferred embodiment thereof. Various changes relative to material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention, or the scope of the following claims.

We claim:

1. In valve construction, an elongated cylindrical chamber, said chamber being open at its top end and formed with a closing bottom at its opposite end, said bottom being formed with a restricted opening therethrough, an elongated hollow imperforate cylindrical valve member mounted within said chamber, the upper end of said valve member adjacent the top end of said chamber being symmetrically reduced into a closed end to serve as a valve head, radially extending ribs between the inner side wall of said chamber and the cylindrical portion of said valve member, said ribs terminating in spaced relation with respect to said cylindrical portion of said valve member when said valve member is axially aligned within said chamber, to guide said valve member against too great sidewise movement and mount the same in spaced relation with respect to said inner side wall of said chamber, and inwardly extending separated spacer elements between the bottom end of said valve member and the inner surface of the bottom of said chamber for maintaining said valve member in spaced relation with respect thereto.

2. In a drain valve construction of the character described, a body member formed with a conduit therethrough, said conduit being provided with a conical valve seat at one end thereof, an elongated cylindrical valve chamber and means to removably secure said valve chamber to said body member in axial relation with respect to said valve seat, an inwardly extending

annular ledge around the opposite end of said valve chamber, said ledge terminating in spaced relation with respect to the center of said end, to provide a restricted opening therethrough, said ledge being formed with upwardly extending spaced radial ribs on the inner surface thereof, a hollow elongated imperforate valve member having a cylindrical body portion and a closed conical upper end received within said chamber, said conical end being formed to mate with said conical valve seat, and a resilient member engaging the inner surface of said ledge around said opening and extending within said valve member to urge the same into closed position against said valve seat.

3. In a curb stop and drain construction for controlling the water supply to a building and draining the water supply from said building when said curb stop is shut off, a one way valve for controlling such drain, said valve comprising a cylindrical body portion open at its top end and formed with a restricted opening in the bottom end thereof, a housing formed with an entrant opening therein and means on said housing and on the top end of said body portion for removably interengaging said housing and said body portion, said housing and said body portion being interengaged, a conical valve seat formed in said housing within said entrant opening and inwardly of the interengagement of said housing and said cylindrical body portion, an elongated hollow imperforate valve member in said cylindrical body, said valve member being formed with a conical head mating with said conical valve seat to close the opening therethrough, and with an elongated cylindrical skirt extending downwardly from the larger end of said conical head, a spring member received within said valve member and extending outwardly from the bottom thereof into engagement with the bottom of said cylindrical body portion, said spring member serving as the sole supporting means for said valve member, and inwardly extending ribs on the side walls of said body portion, said ribs terminating short of the outer surface of said valve member when said valve member is centrally aligned within said body portion, said ribs serving to prevent undue side movement of said valve member within said body portion.

4. In valve construction, an elongated cylindrical chamber, said chamber being open at its top end and formed with a closing bottom at its opposite end, said bottom being formed with a restricted opening therethrough, an elongated hollow imperforate cylindrical valve member mounted within said chamber, the upper end of said valve member adjacent the top end of said chamber being symmetrically reduced into a closed end to serve as a valve head, radially extending ribs between the inner side wall of said chamber and the cylindrical portion of said valve member, said ribs terminating in spaced relation with respect to said cylindrical portion of said valve member when said valve member is axially aligned within said chamber, to guide said valve member against too great sidewise movement and mount the same in spaced relation with respect to said inner side wall of said chamber, spacer elements extending inwardly from the side wall of said chamber along the bottom thereof and terminating short of the border of said restricted opening to provide a spring engaging seat around said opening and a spring mounted on said seat, said spring extending up into said valve member through the open bottom thereof and serving to mount said valve member in operating position within said chamber.

JAMES H. LUCAS.
NORRIS A. TALPEY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
440,263	Harvey	Nov. 11, 1890
970,192	Divekey	Sept. 13, 1910
980,624	Gale	Jan. 3, 1911
1,173,554	Cahill	Feb. 29, 1916
1,317,789	Hoar	Oct. 7, 1919
1,599,716	Replogle	Sept. 14, 1926
2,136,898	Thomas	Nov. 15, 1938
2,192,670	Adkins	Mar. 5, 1940
2,206,356	Hutchings	July 2, 1940

FOREIGN PATENTS

Number	Country	Date
577,142	Great Britain	of 1946