Dec. 25, 1962 T. C. JESTER 3,070,115

CURB HYDRANT

Filed Jan. 29, 1958

FIG. 2.

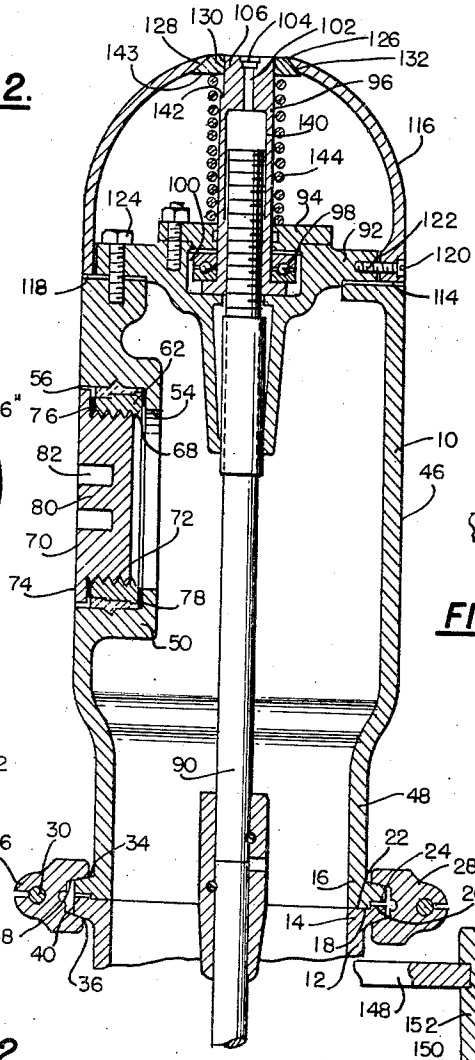


FIG. 4.

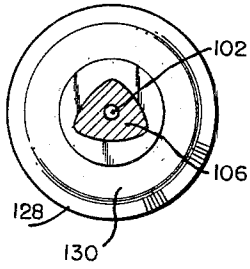


FIG. 8.

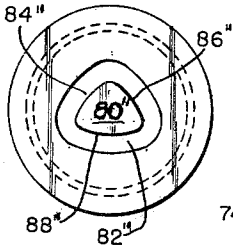


FIG. 5.

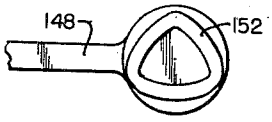


FIG. 7.

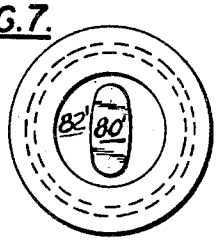


FIG. 6.

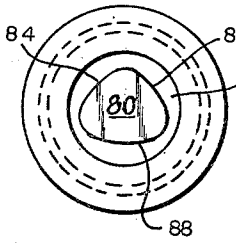


FIG. 3.

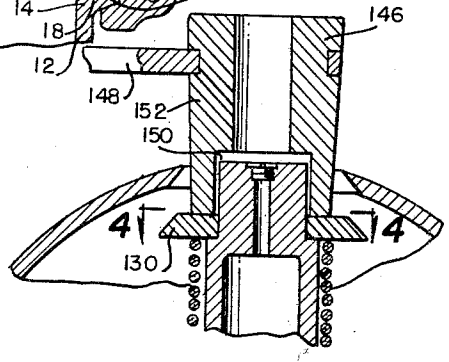
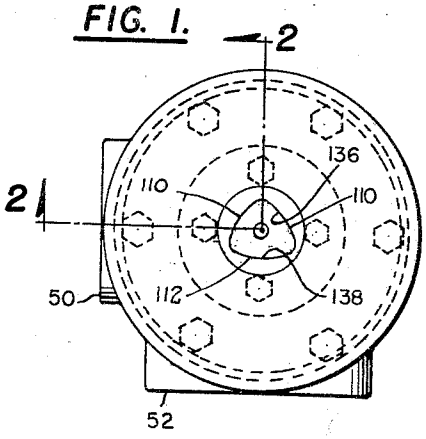


FIG. 1.



INVENTOR

Thomas C. Jester

BY Mann, Liddy, Daniels & Mark

ATTORNEYS

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CURB HYDRANT

Thomas C. Jester, Williamsport, Pa., assignor to Darling Valve & Manufacturing Company, Williamsport, Pa., a corporation of Pennsylvania

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This invention relates to hydrants and particularly to a hydrant having an exterior free from projections and which is also tamper proof.

The hydrants usually employed in city streets for providing a readily accessible water supply for fire fighting or other purposes embody one or more nozzles and caps associated with the nozzles which project outwardly from the hydrant body. In many instances the hydrants are very close to the curbing and these projections extend beyond the street curb lines. This often results in damage to vehicles. As a consequence municipalities having these hydrant conditions are plagued with claims for damages resulting from vehicles striking these projections.

Accordingly an object of this invention is to provide a hydrant construction in which there are no projecting nozzles or caps to afford opportunity for damage to vehicles or other objects even though the hydrant may be immediately adjacent the curbs.

The heretofore known hydrants also all embody an operating nut projecting above the top of the hydrant. These nuts can be turned with the average open end wrench of suitable size or with a monkey wrench. Further, the nozzle caps can be similarly removed with the same common wrench means. As a result the caps are very often stolen and the hydrants opened. Children are particularly apt to open the hydrants in the summer months.

Another common problem encountered with the previously known hydrants is that they are often packed with objects which render them useless or damage them or at least interfere with their use. Children will remove the nozzle caps and fill the hydrant barrel with sand, pebbles, etc., for example, and often even take the caps as souvenirs.

Accordingly still another object of the instant invention is to provide a hydrant structure with which the theft of caps, unauthorized operation of the hydrant, and stuffing of the hydrants with sand, etc. becomes a practical impossibility.

Another difficulty experienced with hydrants is due to the intrusion of foreign material through natural causes, such as rain, snow and dirt, particularly after the cap is stolen. In northern areas the rain or snow may turn into ice. This is often apt to occur around the operating nut. Accordingly another object of the invention is to provide a hydrant structure wherein the infiltration of these foreign elements through natural causes is impossible.

A further object of the invention is to provide a recessed operating nut structure for hydrants wherein the operating nut is enclosed by the hydrant yet is still accessible from the exterior.

It is also an object of the invention to provide recessed nut structure for the caps whereby the operation can be achieved by authorized personnel from the exterior in the usual fashion, but wherein unauthorized persons, such as children, will be frustrated in their attempts to remove the caps.

Further, an object of the invention is to provide an operating nut structure for hydrants accessible by authorized personnel from the exterior, but which is enclosed, together with means permanently attached to the hydrant

forming part of the enclosing means for the nut yet yieldable to permit accessibility to the operating nut structure.

Yet another object of the invention is to provide recessed operating structure for the nut and the caps, and a special wrench and nut type structure not readily available wherein the special wrench structure must be used to operate the hydrant or remove the caps.

A still further object of the invention is to provide a resiliently positioned movable nut enclosing member movable away from the nut to provide accessibility to the nut by a special wrench.

An additional object of the invention is to provide a hydrant having the usual thrust plate type construction cooperable with the operating nut but wherein the thrust plate structure operating nut and all means used for connecting the thrust plate, bearings, nut and barrel are fully enclosed within the hydrant and cannot be tampered with.

One other object of this invention is to provide a stuffing box cover which is independently removable for access to the nut and bearings.

These and other objects and advantages will become apparent from the following description and the accompanying drawings in which:

FIGURE 1 is a top plan view of a hydrant constructed in accordance with the invention showing the hydrant connected to a standpipe.

FIGURE 2 is a sectional elevational view taken along line 2—2 of FIGURE 1.

FIGURE 3 is a fragmentary sectional view illustrating the use of an operating wrench constructed in accordance with the invention in opening the hydrant.

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 3.

FIGURE 5 is a bottom view of a hydant wrench constructed in accordance with the invention.

FIGURE 6 is an elevational view of a cap.

FIGURE 7 is a view illustrating a modified form of cap.

FIGURE 8 is a plan view of a third form of cap.

Referring now particularly to the drawings: A hydrant constructed in accordance with the instant invention comprises a barrel 10. The barrel seats on a base 12 at a point above ground level. The base 12 and barrel are provided with cooperating connecting rings 14 and 16. The ring 14 is seen to have a stepped horizontal surface providing two flanges 18 and 20 with the inner flange being a step below the outer flange. The barrel on the other hand has a pair of flanges 22 and 24 with the inner flange 22 projecting outwardly of the flange 24. These flanges are made so that they will properly mate when assembled. Clamping ring structure consisting of clamp rings 26, 28 are used to secure the base and barrel. A four section clamp ring assembled with nuts and bolts 30 is used. It is seen that the rings 14 and 16 are provided with tapering outer surfaces 34 and 36. The clamp ring 26 has inner tapering surfaces 38 and 40 adapted to cooperate with the surfaces 34 and 36. It is obvious that as the nuts and bolts are tightened the clamp ring is urged inwardly toward the base and in so doing the tapering surfaces result in a clamping of the barrel onto the base. Pressure tightness is insured by a gasket between rings 14 and 16. Other known nuts may obviously be used instead of the clamp ring joint described.

The barrel comprises an upper generally cylindrical section 46 and a lower section 48 also cylindrical but reduced in cross section as compared with the section 46. A pair of enlarged boss like portions 50 and 52 (see FIG. 1) are formed integral with the barrel 10. Each of the bosses provides a nozzle opening. The nozzle structure

cooperating with each boss like portion is identical and accordingly only boss 50 and its associated nozzle structure will be described.

The boss 50 has a port opening 54 which is cored to provide a recess 56 to receive the nozzle 62 and cap 70. The nozzle may either be screwed into place or leaded and caulked in place. The drawing shows the leaded and caulked construction. The nozzle has interior threads 68 instead of the heretofore used exterior threads. Nozzle cap 70 is received within the boss 50. The cap has threads 72 which cooperate with the threads 68 on the nozzle. The cap has a flange 74 which projects over the nozzle into close relationship with the cylindrical cored recess 56. Gaskets 76 and 78 insure water tightness.

The cap and nozzle is also readily distinguishable from the heretofore known constructions in that the cap does not have an exterior nut shaped projection for cooperation with a wrench. Instead the cap is seen to have a boss 80 recessed within the cap and forming therewith a channel 82. In the form illustrated in the drawing the boss is made in the shape of a triangle with curvilinear sides. The triangle, generally speaking, is of an isosceles shape, but this is not essential. Further the boss may take other shapes; it may for example be square or pentagonal. It should be noted that the boss in the illustrated form has sides of curvilinear shape such as 84, 86, 88 joined by fillets. Preferably curvilinear sides will be used with bosses having from two to four sides. With a pentagonal boss however straight sides would be provided. The channel in the form shown thus has a curvilinear inner wall and a circular outer wall. In all instances the outer wall of the channel is curvilinear although not necessarily circular. FIGURE 7 illustrates a form in which a two sided boss is used. Obviously other shapes may be used. The channel 82 is adapted to receive a wrench shaped construction formed complementarily to the boss 80. The special wrench construction used with the cap will be described hereinafter.

The hydrant further comprises an operating rod 90. The rod extends through a thrust plate 92 and a bearing plate 94. An operating nut 96 cooperates with the operating rod to open and close the valve through rotation of the nut. The nut is received within a bearing 98 and the latter is in turn mounted within the recess 100 provided in the thrust plate and below the bearing plate. At its upper end the operating nut has a grease opening 102 closed by a grease fitting 104.

The nut proper comprises a generally cylindrical member, but at its upper end it is provided with a nut like extension 106. The latter is formed similarly to the nut like boss 80 of the cap 70 in that it has a configuration in the general shape of an isosceles triangle but with the sides of the triangle being curvilinear instead of straight and being joined by fillet type portions. This is clearly illustrated in FIGURE 1 with the sides of the curvilinear triangle indicated at 110 and 112. By forming the projection or extension 106 identical in size and shape with the boss 80 a single wrench can be used for operating the cap as well as the nut.

Referring again to FIGURE 2: It is there illustrated that the barrel is provided with a seat 114 which extends inwardly from the exterior of the barrel and not outwardly as in the heretofore known constructions. Further, the thrust plate 92 seats on the seat 114 in spaced relation inwardly from the exterior of the barrel. The bonnet 116 is formed as a dome shaped member having a base 118 providing a horizontal seal parallel to the seat 114 and the outer extremities of the box are formed to be coextensive with the outer extremities of the barrel at the seat 114. Accordingly the bonnet fits on the seat 114 in alignment with the barrel. The bonnet is provided with screw means 120 cooperating with suitable threaded openings 122 in the thrust plate 92 to retain the bonnet in position. This construction results in a neat uniform exterior which will not catch dirt and in which the connections between the thrust plate and the hydrant body obtained by means of the bolts 124 are not subject to damage or removal by unwarranted persons. The bonnet 116 and barrel 10 form the exterior hydrant body or casing.

At its upper end the bonnet 116 is provided with a central opening 126. This opening is unique in that it tapers in a direction from its interior to its exterior such that the tapered opening is smaller at its exterior. This taper is indicated at 128. A mating tapered cover plate 130 which can be referred to as a cover ring has a tapered exterior surface 132 which is adapted to seat on the surface 128. The cover ring further is formed with an isosceles shaped curvilinear sided triangular opening having the sides 134, 136 and 138 formed complementarily to the sides of the triangular nut. The perimeter of the ring opening is closely adjacent the nut to prevent the passage of dirt, etc. In practice the ring opening periphery slidably contacts the nut. The ring 130 is thus capable of sliding movement along the nut. Due to the fact that the nut is formed with the triangular shaped extension projecting outwardly from the cylindrical barrel 140 of the nut itself there is formed three flanges 142 at the bottom of the triangular shaped projection. The base 143 of the ring 130 overlaps these flanges and thus the sliding movement of the ring 130 on the nut is limited in one direction by these flanges 142 and in the opposite direction by the tapered surface 132.

A resilient compression type spring 144 seats on the bearing plate 94 and bears against the ring 130 with the spring being loosely received on the nut. This spring urges the ring 130 to remain in the position illustrated in FIGURE 2. This is the closed or inoperative position. However, it is apparent that the ring can be pressed downwardly to the position illustrated in FIGURE 3 for access to the sides of the triangular shaped nut extension or projection 106.

A special wrench construction comprising the boss 146 and handle 148 is necessary for operating the caps or nut of the instant hydrant. This wrench construction includes a central bore 150 formed complementarily to the "isosceles" curvilinear sided triangular projection 106 and stud 80. The exterior of the wrench boss 152 is of a size to be received within the opening 126. Accordingly it is seen that the special wrench can be pressed against the ring 130 and the spring forced downwardly for operation of the nut in the usual fashion. Further, the walls of the wrench boss 146 are formed so as to be received within the channel 82 for operation of the caps.

The resulting construction of the hydrant is such that the operating parts are completely enclosed, there are a minimum of projections, and further a special wrench construction of a unique nature must be used to either remove the caps or operate the nut. Such special wrench construction is not available on the open market. The usual open ended or monkey type of machinist type wrenches would be of no avail in attempting to effect the operation of the hydrant. Thus a hydrant less likely to cause actionable damage to vehicles, etc., and less subject to damage or misuse is provided through my invention.

The fact that the wrench must have a socket formed complementarily to the triangular shaped nut and the boss of the cap yet it must also have a wall dimension comformable to that of the channel 82, and further it must be capable of extending through the opening 126 is another means of preventing improper use. According to the invention the opening 126 is made complementarily to the outer periphery of the channel 82. Thus, a wrench having a greater maximum thickness than a wrench receivable in channel 82 will not be satisfactory for operating the nut.

FIGURE 8 illustrates a form of the invention in which the outer channel wall has the same configuration as the nut like boss. The operating nut and cooperating cover ring for this form of the invention are similarly formed

so that a single wrench can be used. Likewise the operating nut and cover ring preferably used with the cap of FIGURE 7 are formed so that a single wrench can be used to operate the caps and operating nut.

While I have shown and described a preferred form of my invention it will be apparent that many changes in deails and form can be made, and therefore I claim an exclusive right to all modifications and changes in form coming within the scope of the appended claims.

I claim:

1. In a hydrant, an exterior hydrant body, an operating nut, said exterior hydrant body having an opening therein, said nut being aligned with said opening, a sealing ring, said nut and said sealing ring being flush with the exterior of said body, said sealing ring being adapted to seat in said opening and cooperating with said nut to substantially close said opening, said sealing ring being movably mounted in said hydrant and being movable inwardly of said hydrant to provide access to said nut.

2. The apparatus of claim 1 including means resiliently retaining said sealing ring in normal seated position in said hydrant opening.

3. The apparatus of claim 2 wherein said ring closely fits said operating nut and is slideable along said operating nut upon displacement inwardly of said body.

4. In a hydrant comprising a barrel, a bonnet mounted on one end of said barrel, said bonnet having an opening therein, a thrust plate supported on the end of said barrel within said bonnet, an operating rod mounted in said plate and extending into said barrel and bonnet, a nut supported on said plate and operatively engaging said rod, said nut extending upwardly from said plate and terminating within the opening in said bonnet, a sealing ring member, said member being adapted to seat on said bonnet and cooperating with said nut to close said opening, means resiliently retaining said member in seated position in said opening in the bonnet and said ring engaging said nut for sliding movement therealong against the action of said resilient means.

5. In a hydrant comprising a barrel, a bonnet mounted on one end of said barrel, said bonnet having an opening therein, a thrust plate supported on the end of said barrel within said bonnet, an operating rod mounted in said plate and extending into said barrel and bonnet, a nut supported on said plate and operatively engaging said rod, said nut extending upwardly from said plate and terminating within the opening in said bonnet, a sealing ring slidably engageable with said nut and adapted to seat in the opening in said bonnet, said sealing ring and nut being positioned in said opening in substantially flush relationship with the exterior of said bonnet upon said sealing ring being seated in the opening, means resiliently retaining said ring in seated position in said bonnet, said ring being displaceable inwardly of said bonnet for accessibility to said nut to operate same, said resilient means being operable to urge said ring to its seated position.

6. In a hydrant comprising a barrel having an inwardly extending annular seat at its upper end, a thrust plate supported on said seat, a dome shaped bonnet mounted on said seat and secured to said plate, an operating rod mounted in said plate and extending into said barrel and bonnet, a nut supported in said plate and operatively engaging said rod, an inwardly extending boss provided in said barrel, a nozzle positioned in said boss within said barrel, a closure cap removably connected to said nozzle and completely positioned therein, said cap having a recess formed therein and a projection provided in said cap and extending upwardly from the bottom of said recess to facilitate the removal of the cap from said nozzle, said projection being formed with curvilinear sides, said nut having a configuration complementary to said projection, a wrench for cooperation with said projection and said nut, said wrench having an opening formed therein with the portions of the wrench defining said opening being complementary to the configuration of said boss and said nut.

7. In a hydrant comprising a barrel having an inwardly extending annular seat at its upper end, a thrust plate supported on said seat, a dome shaped bonnet mounted on said seat and secured to said plate, an operating rod mounted in said plate and extending into said barrel and bonnet, a nut supported in said plate and operatively engaging said rod, an inwardly extending boss provided in said barrel, a closure cap positioned within said inwardly extending boss, said cap having a recess formed therein, a projection provided in said recess with said projection and the portion of said cap defining said recess defining walls extending upwardly from said recess, with the sides of said projection being curvilinear and said recess circular.

8. In a hydrant comprising a barrel having an inwardly extending annular seat at its upper end, a thrust plate supported on said seat, a dome shaped bonnet mounted on said seat and secured to said plate, an operating rod mounted in said plate and extending into said barrel and bonnet, a nut supported in said plate and operatively engaging said rod, an inwardly extending boss provided in said barrel, a nozzle positioned in said boss within said barrel, a closure cap removably connected to said nozzle and completely positioned therein, said cap having a recess formed therein and a projection provided in said cap and extending upwardly from the bottom of said recess to facilitate the removal of the cap from said nozzle, said projection being formed with curvilinear sides.

9. In a hydrant construction embodying a barrel, a bonnet mounted on one end of said barrel, said barrel having a valve operating stem therein, said bonnet having a valve stem operating nut completely positioned therein, said barrel having a removable cap completely positioned therein, said cap having a boss provided therein, said nut and boss each having a plurality of wrench engaging sides at least two of said sides being curvilinear throughout.

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