Jan. 22, 1963 D. L. PLETCHER ET AL 3,074,424

FROSTPROOF SILLCOCK

Filed April 18, 1960

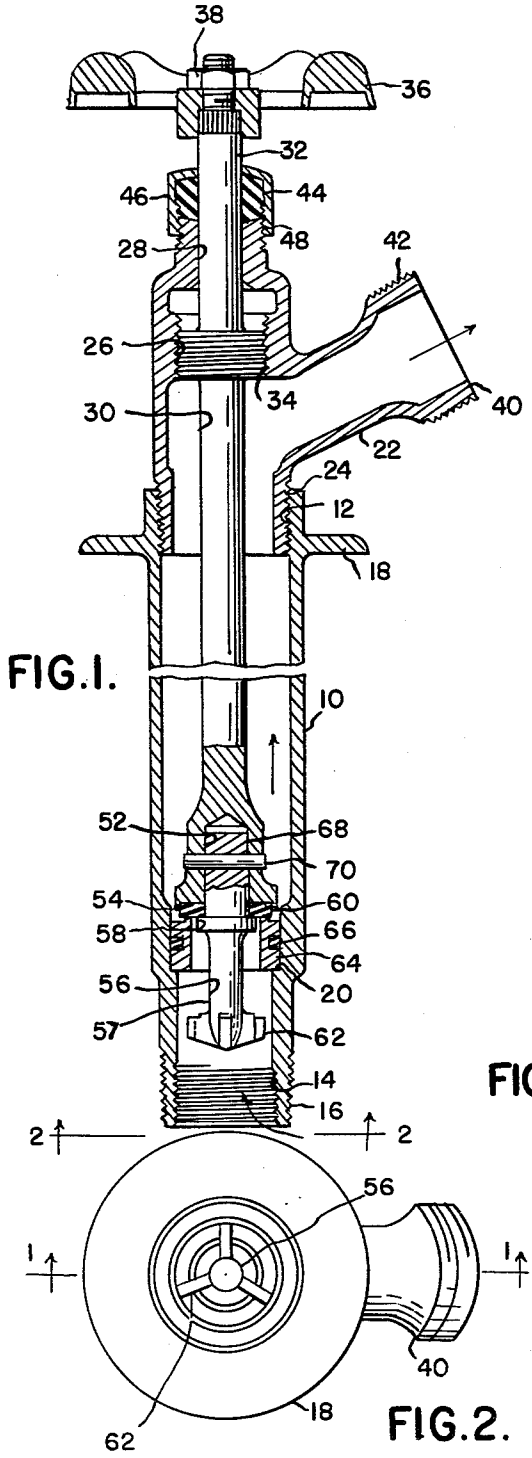


FIG. 1.

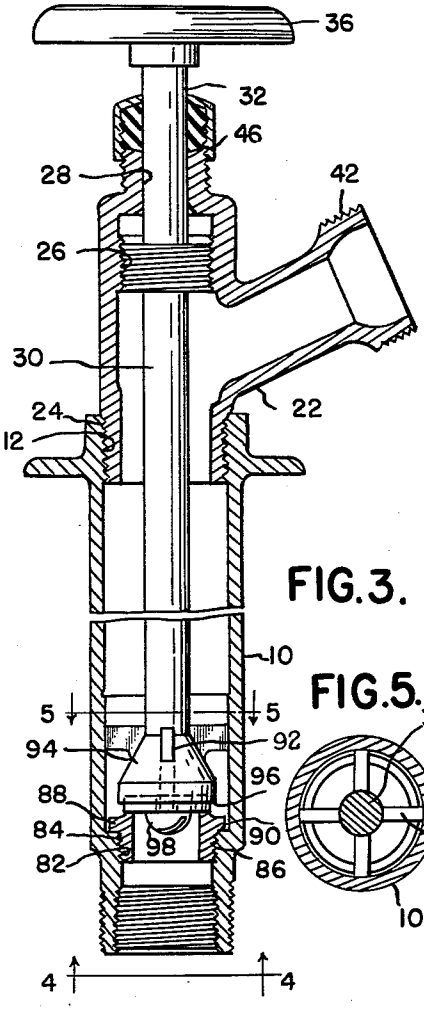


FIG. 3.

FIG. 5.

FIG. 4.

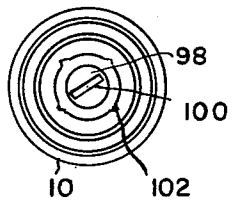


FIG. 2.

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3,074,424

Patented Jan. 22, 1963

3,074,424

FROSTPROOF SILLCOCK

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Filed Apr. 18, 1960, Ser. No. 22,951
5 Claims. (Cl. 137—316)

This invention relates to a frostproof sillcock. More particularly, this invention relates to a water faucet normally placed at about sill height on the outside of a building. This invention is characterized by its structural arrangements contributing to improved maintenance, reliability and long life.

The sillcock consists of a tubular member having at its outer end a threaded portion in which is threadedly received a removable spout or body portion. The tubular member is normally mounted in the building. The body portion extends beyond the plane of the building and is readily removable from the tubular member by unthreading the connection therebetween. The valve seat which is subject to wear, due to long and continued operation, is normally positioned in one of two ways in the tubular member against an internal shoulder. The body adjustably supports the stem which carries the valve in such a manner as to move the valve toward and away from the valve seat to close and open the sillcock.

A tool may be utilized to place the valve seat on the shoulder of the tubular member prior to the body being threadedly engaged with the tubular member. After the valve and/or valve seat has been subjected to wear it is necessary to replace the wearing part(s). This may be easily accomplished by removing the body, which carries the stem and valve therewith, and inserting a tool into the tubular member to remove the valve seat. In another embodiment, the same essential parts are generally utilized except that means are provided so that the valve stem may carry and insert the valve seat against the internal shoulder, wherein the valve still functions in the normal manner so as to move toward and away from the valve seat. The same means are utilized in removing the valve seat without the necessity of a separate tool. In effect, a sub-assembly, including the body portion, valve stem, valve and valve seat is provided for insertion as a unit into the tubular member without the necessity of utilizing an independent tool for inserting or removing the valve seat. This is accomplished by loosely locating the valve seat inbetween the anti-rattle fingers, carried by a rod connected to the stem and the valve.

It is an object of the present invention to provide an improved sillcock having a removably mounted valve seat therein.

Another object of the invention is to provide an improved sillcock comprising a tubular member and a valve sub-assembly adapted to be inserted as a unit into said member, said sub-assembly providing means for carrying a valve seat and locating the seat in the tubular member.

Still another object of the invention is to provide an improved sillcock comprising a tubular member and a valve sub-assembly adapted to be inserted as a unit into said member, said sub-assembly providing means for carrying a valve seat and locating the seat in the tubular member, said means further providing means for removing the valve seat with the removal of the valve sub-assembly from the tubular member.

A feature of the present invention is to provide an improved sillcock having a tubular member which is held in the foundation of a building, a body threadedly secured to the outside part of the tubular member, a valve stem mounted in said body and extending into said member, said stem providing means for locating a valve seat in the

tubular member and carrying a valve therewith which is registerable with the valve seat, said valve seat and valve being removable with the stem as a unit by initially removing the body from the tubular member and exerting an axial force to lift the stem, valve and seat from the tubular member.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawing, illustrating preferred embodiments of the invention, wherein:

FIGURE 1 is an elevational sectional view of the present invention, taken on line 1—1 of FIGURE 2.

FIGURE 2 is an end view taken on line 2—2 in FIGURE 1.

FIGURE 3 is an elevational view showing another embodiment of the present invention.

FIGURE 4 is an end view looking in the direction of arrow 4—4 of FIGURE 3.

FIGURE 5 is a sectional view taken on line 5—5 of FIGURE 3.

FIGURE 1 shows a tubular member 10 having an internally threaded end 12 at the flange end of the member and having an internally and externally threaded end at the other end represented by numerals 14 and 16 respectively. The flange end consists of a flange 18 which is generally annular. The tubular member 10 is generally mounted in the foundation of a building or similar structure.

The threaded end 12 normally projects outwardly from the foundation of the building. The other end of the tubular member 10 may have an internally or externally threaded member connected thereto so as to engage either of the threaded portions 14 or 16. The tubular member 10 has an internal shoulder 20. The member 10 is usually inserted in the foundation before the sub-assembly, comprising the remaining parts of the valve structure, is inserted therein.

Generally, after the tubular member 10 is fixed in position, the outer body 22, which forms part of the sub-assembly, is threadedly engaged with the threaded end 12 of the body 10 through the externally threaded portion 24. The body 22 generally has a somewhat smaller diameter than the tubular member 10. The body 22 has an internally threaded portion 26 and an opening 28 in the top portion thereof. A valve stem 30 is threadedly inserted into the body 22 with the outer portion 32 thereof extending outwardly from the opening 28 with the threaded part 34 of the shaft 30 engaging the threaded portion 26 of the body 22. A handle 36 is connected to the outer end 32 of the stem 30 by appropriate fastening means, such as the nut and bolt arrangement 38 as shown.

The body 22 includes a portion which is axially in line with the tubular member 10 and, in addition thereto, has a spout portion 40 with an externally threaded end 42. Appropriate packing 44 is retained by a packing nut 46, which is secured to the threaded end 48 of the body 22. Obviously, the packing 44 helps to prevent leakage across the valve stem 30 at the point where the stem 30 emerges from the threaded end 48.

The other end of the valve stem 30 is somewhat enlarged and has a drilled hole 52 therein. A rim 54 is provided at the outer end of the valve stem 30 for positioning the valve disc 60, as will be subsequently described in more detail.

The valve rod 56 has a shoulder 58 thereon which carries the valve 60. The lower end 57 of rod 56, on the other side of the shoulder 58, has a plurality of fingers 62 secured thereto. Prior to the valve 60 being placed on the rod 56 and the rod 56 being connected to

the stem 30, the annular valve seat 64 which has an O-ring 66 at the mid-point thereof, is loosely placed around the rod 56. The fingers 62 prevent the valve seat 64 from slipping off from the lower end 57 of rod 56.

The valve unit consists of the rod 56, the fingers 62 located on the end 57 of rod 56, the valve seat 64 inserted over the shoulder 58 and the valve 60 placed on the shoulder 58. The other end of the rod 56, as identified by numeral 68, is inserted into the opening 52 of the valve stem 30. A pin 70, or similar means, is used to secure the rod 56 to the lower end of the stem 30. It should be observed that the valve seat 64 is loosely located inbetween the valve 60 and fingers 62 prior to assembling.

After the valve unit has been connected to the valve stem 30 and is, in turn, threadly connected to the body 22, the body 22 is threaded into engagement with the threaded end 12 of the tubular member 10. As a result thereof, the valve stem 30 and the associated valve components extend axially into the tubular member 10. The body 22, stem 30 and the valve components form a sub-assembly which is readily adaptable for insertion as a unit into the tubular member 10.

As the valve stem 30 and the valve components carried thereby move axially into the tubular member 10, the valve seat 64 is loosely carried by the rod 56. Finally, the valve seat 64 comes to rest on the shoulder 20 of the tubular member 10. A sufficient force must be applied to the valve stem 30 so as to place the valve seat 64 in the proper position against the shoulder 20. It should be observed that the fingers 62 are smaller in length than the internal diameter of the lower part of member 10, and, hence do not interfere with the assembling of the seat 64.

The valve 60 is shown in a closed position in FIGURE 1. The water generally flows in the direction of the solid arrows; namely, into the threaded end 14, across the valve seat 64 and out through the spout portion 40. Obviously, the spout portion 40 may be opened or may have suitable conduit means connected therewith, such as a garden hose.

In operation, all that is required is that the handle 36 be rotated in a direction so as to move the valve stem 30, which carries the valve 60, upwardly. This, in turn, opens the valve 60 and permits the water to flow across the valve seat 64. It should be observed that the fingers 62 are smaller in area as compared to the valve opening and, therefore, do not create a restriction of substantial size. When it is desirable to close the valve, all that is required is that the handle 36 is rotated so as to move the valve stem 30 downwardly into the tubular portion 10 thereby moving the valve 60 into contact with the valve seat 64.

One of the problems in the industry has been the replacement of the valve seat 64 and the valve 60 after considerable wear has taken place. This wear may be caused by continued operation over a long period of time, or may be caused by the mineral effects of the water on the valve seat 64 and valve 60. In addition, frost and generally cold weather will have an adverse effect on the valve. In any event, for whatever reason, it is sometimes required to replace the valve seat 64 and valve 60. Previously, it was required to remove the entire sillcock assembly from the supporting structure. This method required a considerable amount of time and labor, and complicated the maintenance problem. It was particularly difficult to perform in inclement weather.

Our invention has overcome this basic problem by employing means for removing the sub-assembly including the valve seat 64, valve 60, and the valve stem 30 from the tubular member 10 as a unit. This is accomplished in part by means of the fingers 62 which are carried by the rod 56. After the water supply has been terminated so that there is no flow across the valve, the outer body 22 is rotated so as to remove its threaded end 24 from the threaded end 12 of the tubular member 10. Immediately after the threads 12 and 24 have been disengaged, an axial force is exerted or applied to the body 22 in the direction of the rod 30 so that the fingers 62 are brought into engagement with the bottom of the valve seat 64. An increased amount of force will lift the valve seat 64 from the annular shoulder 20 after which the entire valve sub-assembly is removed from the tubular member 10 as a unit.

In order to replace the valve and valve seat, it is necessary that the pin 70 be removed and the rod 56 removed from the recess 52 of the stem 30. The valve 60 and the valve seat 64 are then easily replaced on the rod 56. After the replacement parts have been positioned on the rod, the rod portion 68 is brought into engagement with the opening 52 and the pin 70 connected or inserted. The sub-assembly is inserted in the tubular member 10 in the manner previously described. From such a description, it is obvious that the valve seat and valve may be replaced in a short period of time and with a minimum amount of effort.

The other embodiment of the invention, as shown in FIGURES 3–5, is described utilizing many of the numeral designations as applied to FIGURE 1 where similar parts are utilized. In essence, the invention differs from the first embodiment in the valve structure. In this embodiment the valve seat 82 has a threaded portion 84 which is threadedly engaged with the internal threads 86 of the lower part of the tubular member 10. The valve seat 82 includes a flange portion 88 which engages the shoulder 90 of the tubular member 10. The valve seat 82 is inserted in and removed from the tubular member 10 by a tool, not shown.

The valve stem 30 carries on the lower end thereof, four thin locating members 92 which are appropriately secured to the shaft 30. In addition, the conical valve disc carrying member 94 carries therewith the valve disc 96 which is secured thereto by means of a screw 98. Screw 98 has a slot 100 therein which permits the screw to be readily removed so that the disc may be replaced. The bottom of the valve seat 82 has a plurality of tool-carrying notches 102 which are substantially square and are formed on the inner periphery of the valve seat 84. The tool has projections to match the notches 102. After the body 22, which carries the stem 30 and disc 96 is removed from the tubular member 10, the tool is inserted in the notches 98 from the threaded end 16 and rotated in a direction so as to unthread or to disengage the threaded portion 84 from the threads 86.

The drawings and the foregoing specification constitute a description of the frostproof sillcock in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What we claim as our invention is:

1. A sillcock comprising an elongated tubular member, an internal shoulder in said tubular member near one end thereof, and a removable sub-assembly for said tubular member comprising a body threaded to the other end of said tubular member, said body having a passage therein connected to the interior of said tubular member, an elongated valve stem movably carried by said body and having one end thereof extending into said tubular member, means for moving said valve stem lengthwise with respect to said tubular member, said one end of said valve stem being provided with an axially aligned cavity which opens toward said shoulder, an abutment on said one end of the stem surrounding said cavity, a rod having an end portion in said cavity, means for securing said rod to said stem, a flange on said rod axially spaced from said abutment, a resilient valve element interposed on said stem and held against said abutment by the flange on said rod, a plurality of fingers on the other end portion of said rod, an

annular valve seat member removably mounted with a force fit in said tubular member in abutting engagement with said shoulder, said rod extending freely through the passage in said seat member, said fingers being out of engagement with said seat member in the normal valving movement of said rod, said valve element and said stem being effective to urge said seat member into shoulder engaging position and said fingers being effective to engage said seat member to move said seat member away from said shoulder engaging position upon disassembly of said body from said tubular member.

2. A sillcock defined in claim 1 wherein the first-mentioned end portion of said rod is in surface-to-surface contact with the wall of said cavity.

3. A sillcock defined in claim 2 wherein the means for securing said rod to said stem includes a removable pin.

4. A sillcock defined in claim 2 wherein the means for securing said rod to said stem is in the form of a pin which has an axis substantially perpendicular to the axis of said stem.

5. A sillcock defined in claim 1 wherein said valve seat is provided with an annular groove on the outer periphery thereof which receives an O-ring seal.

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