Feb. 11, 1964 E. FISCHER ETAL 3,120,857

ADJUSTABLE BALL COCK

Filed March 8, 1961

FIG. 1

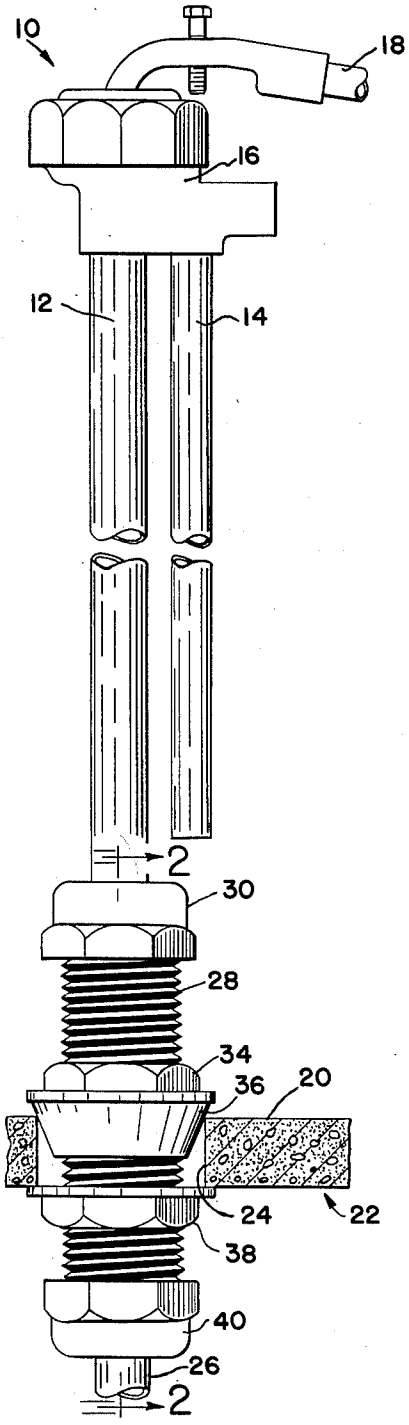


FIG. 2

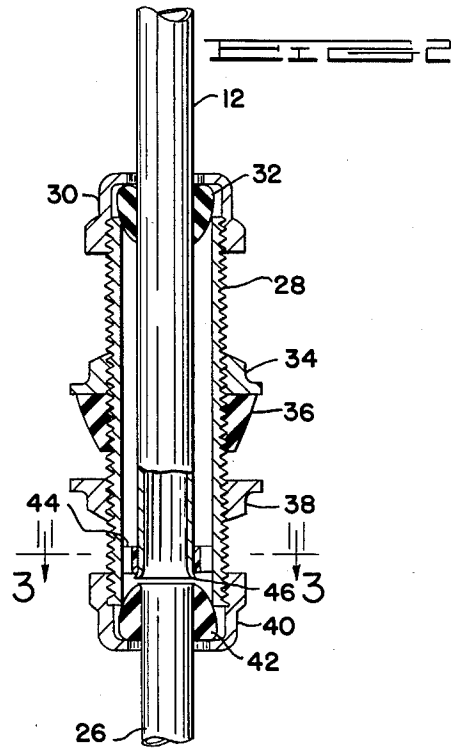
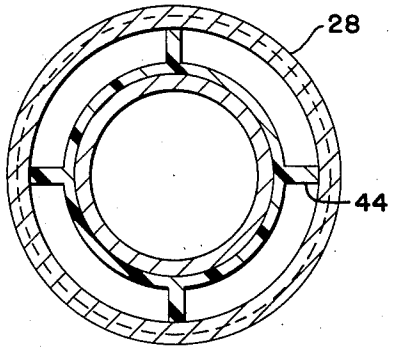


FIG. 3



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3,120,857
ADJUSTABLE BALL COCK

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The present invention relates to ball cocks and particularly to adjustable apparatus for connecting the standpipe of a ball cock to a water supply pipe and for supporting the standpipe in a water tank with the upper end of the standpipe a desired elevation above the bottom of the tank. The present invention is particularly adapted for use as a replacement ball cock, although it may be used equally well as an original installation.

When replacing a worn or defective ball cock with a new one, a problem frequently arises when attempting to connect the lower end of the replacement standpipe to the originally installed water supply pipe. This problem occurs when installing a ball cock having a conventional mounting structure such as is shown, for example, in the United States Letters Patent to Price et al., Number 2,869,571, which mounting structure requires the standpipe initially to be secured in sealed relation to the bottom wall of a water tank and with the float arm extending in the proper direction. The location of the lower coupling, which is adapted to be connected to the upper end of the water supply pipe, is then fixed, and if this location is not suitable for making the proper connection with the end of the water supply pipe, modification or an addition to the latter is required. It can be appreciated that making such modification or addition can be troublesome and costly, particularly when the supply pipe is old or in a relatively inacessible location. Furthermore, this problem most frequently arises with old installations where the original ball cock structures have different dimensions from new ball cocks that may now be used by plumbers.

Accordingly, it is a principal object of the present invention to provide a ball cock structure having improved mounting means so that the standpipe can be connected to the bottom wall of the water tank and to the end of the water supply pipe, and such connections can be made easily, irrespective of rather large variations that may exist in the spacing between the end of the water supply pipe and the bottom wall of the water tank.

It is still another object of the present invention to provide a ball cock structure of the foregoing character which is constructed and arranged so that the mounting means thereof can initially be secured to the end of the water inlet pipe, and thereafter, this means can be adjusted as required to permit a proper connection to be made with the bottom wall of the water tank.

It is still another object of the present invention to provide a ball cock structure of the foregoing character which is constructed and arranged so that the standpipe may be turned on its longitudinal axis after the connection to the bottom wall of the water tank has been made, thereby facilitating aligning of the float arm in the proper direction.

Another problem that sometimes arises in connection with either original or replacement ball cock installations occurs when it is desired to change the normal elevation of water in the water tank or the effective elevation of the ball float. With respect to this problem, a practice sometimes followed to obtain the desired results is to bend the float arm, which practice is undesirable for obvious reasons.

Accordingly, it is still another object of the present invention to provide a ball cock structure which is constructed and arranged so that the standpipe is vertically adjustable relative to the mounting means therefor so that the level of water normally maintained in the water tank can be established between relatively wide limits, thereby assuming maximum economy in the use of the water.

It is still another object of the present invention to provide a ball cock structure adapted for use either in new water tank installations or as a replacement part and which is characterized by the adjustments that can be made in its mounting means thereby providing maximum applicability while realizing the most effective results of operation.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIGURE 1 is a fragmentary side elevation of a ball cock mounted on the bottom wall of a water tank and connected to a water supply pipe and illustrating one embodiment of the present invention;

FIGURE 2 is a fragmentary longitudinal section taken substantially on the line 2—2 of FIGURE 1; and

FIGURE 3 is an enlarged section taken on the line 3—3 of FIGURE 2.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawing, a more detailed description will be made of the present invention. The ball cock 10 includes a standpipe 12 and a fill pipe 14, on the upper ends of which is secured a valve casing 16. A float arm 18 is operatively mounted for actuating the valve mechanism (not shown) within valve casing 16. Any suitable valve mechanism may be used, and one such mechanism is shown in the aforesaid Letters Patent, Number 2,869,571.

In its normal operating position, the standpipe 12 is mounted on the bottom wall 20 of a water tank 22 (fragmentarily shown) with the lower end of standpipe 12 extending through the opening 24 in bottom wall 20. Adjacent the opening 24 and on the external side of the water tank 22 is a water supply pipe 26 through which water can be supplied to standpipe 12 and from there to the water tank 22 via the valve casing 16 and fill pipe 14. In mounting the ball cock 10 in its operating position it is necessary to provide communication between the upper end of water supply pipe 26 and the lower end of standpipe 12, and it is also necessary to seal the opening remaining in bottom wall 20 after standpipe 12 has been inserted therethrough.

For these purposes, there is provided the externally threaded sleeve member or sleeve 28 into which the standpipe 12 extends. On the upper end of the sleeve 28 is a nut 30, and operatively positioned around the standpipe 12 and between sleeve 28 and nut 30 is a rubber-like gasket ring 32. A liquid tight joint is provided by screwing nut 30 onto sleeve 28 until the gasket ring 32 is squeezed tightly between these parts and the standpipe 12.

The space between sleeve 28 and the edges of opening 24 are effectively sealed by the nut 34 which has a conical shaped annular gasket 36 on its lower face, and the nut 38, both threadedly connected to the sleeve 28 and

adapted to clamp the bottom wall 20 and gasket 36 therebetween so as to provide the desired liquid seal.

The sleeve 28 also has a nut 40 threadedly connected to its lower end, and operatively positioned around the water supply pipe 26 and between the sleeve 28 and nut 40 is a rubber-like gasket ring 42, which when the nut 40 is screwed onto sleeve 28 will squeeze the gasket ring 42 so as to provide a liquid tight joint between sleeve 28 and water supply pipe 26.

From the foregoing description, it can be seen that the extent of spacing of the upper end of water inlet pipe 26 relative to the bottom wall 20 can vary an amount equal nearly to the length of sleeve 28, and a proper connection can still be made between water supply pipe 26 and standpipe 12. Thus, when making this connection, the connection between water supply pipe 26 and sleeve 28 can first be made. The nuts 34 and 36 can then be turned to effect axial movements of the same until they are in position to effect a sealed engagement with the bottom wall 20, as previously described. Thereafter, the standpipe 12 can be turned on its axis until the float arm 18 extends in the proper direction in the water tank 22 and the connection between standpipe 12 and the sleeve 28 can then be tightened to effect a water tight joint between these parts. Thus, it can be understood that a means has been provided for effecting a water tight connection between the ball cock 10 and the water supply pipe 26, which means is adjustable so as to accommodate variations in spacing that may exist between the bottom wall of a water tank and its water supply pipe.

The ball cock 10 is also constructed and arranged so that its upper end can be positioned a desired elevation above the bottom wall 20. Referring to FIGURE 2, it can be seen that the standpipe 12 extends substantially to the bottom of sleeve 28 so that when the upper connection, formed by nut 30 and gasket ring 32, is loose, the standpipe 12 can be moved axially within sleeve 28 to any position wherein the lower end of standpipe remains between the gasket rings 32 and 42. Thereafter, the upper connection is tightened, the ball cock 10 will be retained in this position with the float control mechanism retained at a desired elevation. Thus, within limits, the normal elevation of the water in the water tank 22 can be determined so as to provide the most effective flushing action and to provide the most economical usage of the water.

In order to maintain the standpipe 12 in its proper coaxial alignment with the sleeve 28, the lower end of standpipe 12 is provided with a spider 44 which is slidable on the inner wall of the sleeve 28. The spider 44 can be retained on the lower end of standpipe 12 in any suitable manner, and in the present embodiment, this is accomplished by the lower end of standpipe 12 being outwardly flared as at 46, to restrict the spider 44 to movement on the standpipe 12. Also, in the present embodiment the spider 44 is made of a suitable material, such as nylon, to permit easy axial adjustment of the elevation of the ball cock 10.

Having thus described our invention, we claim:

1. A ball cock assembly adapted to be mounted in an opening in the bottom wall of a water tank and adapted to be connected to a water supply pipe positioned below the opening in said bottom wall, said ball cock assembly comprising a sleeve adapted to extend through said opening, a first coupling on the lower end of said sleeve adapted to connect said sleeve to said water supply pipe, said first coupling means including a first packing nut threadedly connected to said sleeve and a resilient annulus adapted to be positioned between said sleeve and said liquid supply pipe and to be urged into sealing relation therebetween by said first packing nut, sealing means axially adjustable to selected positions on said sleeve and adapted to engage said bottom wall in any of said selected positions so as to provide a liquid seal between said bottom wall and said sleeve, a standpipe with valve means on its upper end for controlling flow of water therethrough, the lower end of said standpipe extending into said sleeve and axially movable relative thereto, and a second coupling on the upper end of said sleeve operatively connected to said standpipe to secured said standpipe at a desired height relative to said bottom wall and to provide a liquid seal between said standpipe and said sleeve, said second coupling means including a second packing nut threadedly connected to said sleeve and a second resilient annulus positioned between said sleeve and said standpipe and urged into sealing relation therewith by said second packing nut.

2. In combination: a tank having an opening in its bottom wall; a liquid supply pipe terminating below said tank generally in alignment with said opening; and a ball cock assembly mounted in said opening and connected to said liquid supply pipe, said ball cock assembly comprising a sleeve extending through said opening and receiving in its lower end the upper end of said supply pipe, first coupling means connecting said sleeve and said liquid supply pipe to provide a liquid tight joint, said first coupling means including a first packing nut threadedly connected to said sleeve and a resilient annulus adapted to be positioned between said sleeve and said liquid supply pipe and to be urged into sealing relation therebetween by said first packing nut, means on the external side of said sleeve secured to the upper and lower edges of said opening for effecting a liquid tight joint between the sleeve and the edges of said opening, said means being axially movable on said sleeve to selected positions to enable the sleeve to be connected to said liquid supply pipe and to said bottom wall irrespective of variations in spacing between these parts, a standpipe with valve means for controlling flow of liquid from said liquid supply pipe into said tank, the lower end of said standpipe extending into said sleeve and being axially movable relative thereto so as to enable the elevation of the upper end of the standpipe to be varied relative to said tank, and second coupling means connecting said sleeve and said liquid supply pipe to provide a liquid tight joint, said second coupling means including a second packing nut threadedly connected to said sleeve and a second resilient annulus positioned between said sleeve and said standpipe and urged into sealing relation therewith by said second packing nut.

3. A ball cock assembly comprising a sleeve adapted to be vertically disposed, first coupling means connected to the lower end of said sleeve and adapted to retain with said lower end the end of a liquid supply pipe, said first coupling means including a first packing nut threadedly connected to said sleeve and a resilient annulus adapted to be positioned between said sleeve and said liquid supply pipe and to be urged into sealing relation therebetween by said first packing nut, sealing means axially adjustable to selected positions on the external side of said sleeve adapted to engage retainingly and in sealing relationship the upper and lower edges of an opening in the bottom wall of a tank, a standpipe with valve means at its upper end for controlling flow of liquid therethrough, the lower end of said standpipe extending into said sleeve and being axially movable relative thereto, said standpipe having a smaller external dimension than the internal dimension of said sleeve so as to be spaced therefrom, spider means carried on the lower end of said standpipe and operably positioned to maintain the lower end of said pipe concentrically of said sleeve, and second coupling means connected to the upper end of said sleeve for securing the standpipe concentrically at a desired elevation in said sleeve and for effecting a liquid tight joint between said sleeve and said standpipe, said second coupling means including a second packing nut threadedly connected to said sleeve and a second resilient annulus positioned between said sleeve and said standpipe and urged into sealing relation therewith by said second packing not.

4. In a ball cock assembly, a sleeve member adapted to be disposed in a generally vertical position, a first coupling means on the lower end of said sleeve member for making connection with a water supply pipe, said first coupling means including a first packing nut threadedly connected to said sleeve and a resilient annulus adapted to be positioned between said sleeve and said liquid supply pipe and to be urged into sealing relation therebetween by said first packing nut, axially adjustable mounting means on the external side of said sleeve member, a standpipe with its lower end telescoped into said sleeve member, and second coupling means on the upper end of said sleeve member securing the standpipe in a selected axial position in said sleeve member, said second coupling means including a second packing nut threadedly connected to said sleeve and a second resilient annulus positioned between said sleeve and said standpipe and urged into sealing relation therewith by said second packing nut.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,120,857 February 11, 1964

Edward Fischer et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 5, for "assuming" read -- assuring --; column 4, line 6, for "secured" read -- secure --; line 75, for "not" read -- nut --.

Signed and sealed this 14th day of July 1964.

(SEAL)

Attest:

ESTON G. JOHNSON
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents