Jan. 12, 1960 E. S. BEARD 2,920,862

RENEWABLE RING AND HOLDER FOR GLOBE VALVE

Filed Sept. 18, 1956

Fig. 1

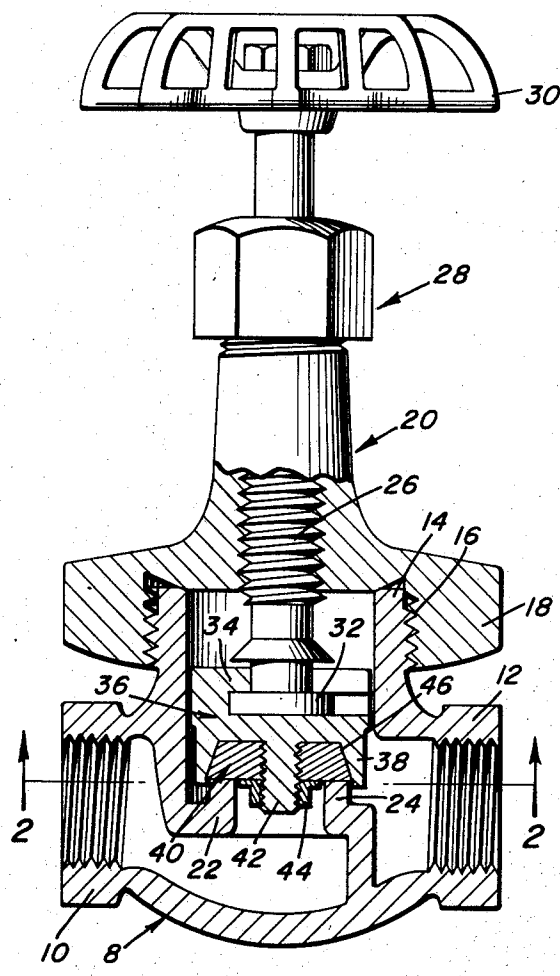


Fig. 2

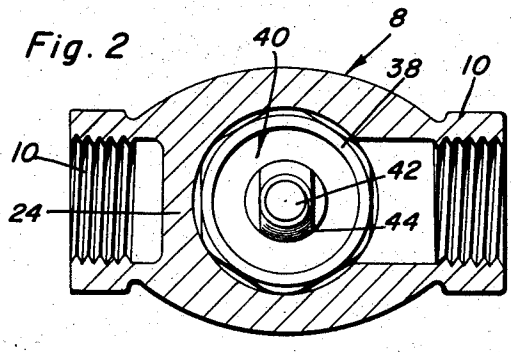


Fig. 3

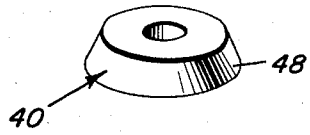


Fig. 4

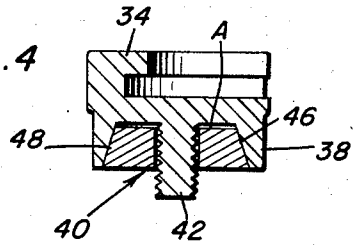
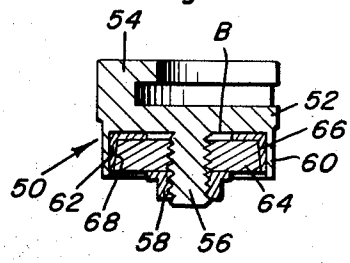


Fig. 5



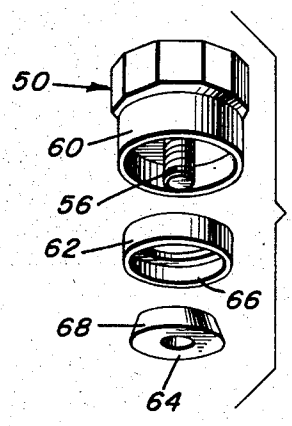


Fig. 6

Edward S. Beard
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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RENEWABLE RING AND HOLDER FOR GLOBE VALVE

Edward S. Beard, Spring City, Pa.

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1 Claim. (Cl. 251—357)

The present invention relates in a broad aspect to certain new and useful improvements in a globe valve and has reference, more particularly, to a renewable valve disk or ring of the usual composition type and an improved holder therefor.

It is a matter of common knowledge that a conventional globe valve is characterized by a substantially hollow body having an internal partition or divider provided with a passage for fluid and an annular seat for a valve. A wheel equipped spindle or valve stem is adjustably mounted in a bonnet, the latter being screwed on the valve body and being provided at its upper end with a suitable packing gland. On the lower end of the spindle a flanged head serves to accommodate a socket member on a detachable holder. The holder is characterized by a cup containing a renewable valving ring or disk as it is perhaps most often called. For quick reference a globe valve having these characteristics is seen in the Yardley Patent 1,988,258 of January 15, 1935.

Experience with globe valves constructed as generally stated above shows that thirty percent, more or less, of these valves may leak in little or no time due to the fact that the valve disk or ring under repeated opening and closing and stress and strain will crack and sometimes disintegrate. One object of the instant invention is to provide an adaptation in which wear and tear on the renewable valving ring or disk is minimized and the life of the valving ring is therefore greatly and economically extended.

Another difficulty which is encountered in the art is that which is indeed difficult to cope with; namely, the recurring situation which entails so much time and money in removing and replacing valving rings. As is well known these are so often distorted and jammed in their holding cups that one has to resort to drilling and chiseling and the use of special tools in dislodging the worn rings so that they may be expeditiously replaced. Therefore, it is another object of the invention to provide a renewable-type valving ring or disk which is not only easy to insert but is equally easy to dislodge and remove when a repair job has to be undertaken.

Features and advantages in addition to those specifically set forth will become more readily apparent from the following description and the accompanying sheet of illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a view in section and elevation of a globe valve embodying the herein improved holding cup and valving ring;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a perspective view of the improved bevelled-edge valving ring or disk by itself;

Fig. 4 is a section through the holder and valving ring before the latter is clamped securely in the bottom of the cup;

Fig. 5 is a view similar to Fig. 4 with the parts in section and wherein a modification (wherein an adaptor is provided) is disclosed; and,

Fig. 6 is an exploded perspective view of the modified form of the invention seen in Fig. 5.

Referring now to the drawings and particularly to Fig. 1 the conventional globe valve comprises a hollow body made with usual pipe connections **10** and **12** and an upstanding neck **14** screw threaded to accommodate the screw threads **16** on the nut like lower end **18** of the conventional type bonnet **20**. The interior of the body has the usual diaphragm or partition **22** with an upstanding annular valve seat **24**. The threaded portion of the valve stem or spindle **26** is adjustable mounted in the neck portion of the bonnet and the latter is provided on its upper end with an appropriate packing gland **28**. The valve stem or spindle has the usual hand wheel **30** on its upper end. On the interior of the neck of the body the lower end of the spindle or stem has a flanged head **32** removably supporting the socket member **34** atop the holder **36**. Actually all of these parts are old and well known as is evident. With reference to one form of the invention as seen in Figs. 1 to 4 it will be noticed that depending skirt or cup **38** provides a receptacle for the insertable and removable composition valving ring or washer **40** held in place as usual by a stud **42** passing through the center hole and serving to accommodate an assembling and clamping nut; for example, the nut **44** seen in Fig. 1. Here again it may be said that the construction described is common. The difference is that the inner periphery of the rim portion of the holder cup, that is the surface **46** is bevelled outwardly and downwardly. This means that the rim itself is decreased in cross section or thickness toward the open mouth of the cup. The valving ring or washer, which is of a suitable composition type, is fitted into the receptacle portion of the cup and is of a normal thickness less than the predetermined full depth of the cup. Also, the outer peripheral edge **48** has a bevel which is appropriately conformable with the bevelled periphery **46**. Actually the greatest outside diameter of the washer is about that of the greatest diameter of the mouth of the cup. When the nut **44** is tightened as shown in Fig. 1 the washer or ring pushes up into the cup and is seated in the bottom of the cup and it is squeezed radially, is compressed and the fibers are contracted and hence the washer is strengthened. The more the pressure applied to the valving surface against the seat **24**, the better the valving action becomes. These accomplishments result in rendering the valving washer less fragile and less likely to disintegrate, crack or become warped or otherwise damaged. By comparing Fig. 1 with Fig. 4 it will be noticed that in Fig. 4 the valving ring or washer is not under clamping pressure. Therefore, a slight space A exists between the bottom of the cup and the cooperating surface of the washer. When the latter is tightened and clamped "home" the result is as shown in Fig. 1 in which the then easy-to-remove ring or washer is in operating position.

In the modification seen in Fig. 5 the numeral **50** designates a valve member or head which is conventional throughout in that it has a body portion **52** with a recessed boss or socket member **54** on its top corresponding with that already described as at **34**. There is the usual simple stud **56** carrying a clamping nut **58**. The relatively thin skirt or annular rim is denoted at **60** and here the diameter of the receptacle portion of the cup is uniform throughout. In this arrangement an adaptor band of rigid metal **62** is provided. The external or peripheral surface is truly circular and is therefore fitted telescopically into the correspondingly shaped cup. The composition ring or washer **64** is fitted here into the internally tapered portion **66** of the band; that is, the adaptor band and hence the adaptor and washer serve as a unit. Here

again the outer peripheral surface of the valving ring or washer is tapered at 68 to correspond with the internal taper of the adaptor band and also the thickness is less than the cross-section of the adaptor band to provide the compensating space seen at B in Fig. 6. Therefore, the takeup and squeeze-in action is the same here as already set forth. This construction makes it possible to employ the invention at hand in conjunction with existing type holders in more or less standard globe valves. In other words the "adaptor" makes this changeover possible. The fact remains, however, that in both forms of the invention herein seen the marginally tapered valving element and the tapered cup or holder provides not only the non-cracking feature but also assists in enabling one to readily remove and replace a worn washer.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A repair assembly for the holder of a valve wherein the holder has a cup provided with an essentially annular side wall and a bottom, and a stud centrally axially secured in said cup and at approximately right angles to said cup bottom, said repair assembly comprising an annular adapter band having a side wall provided with an inner annular edge and an outer annular edge, the distance between said edges being approximately the same as the depth of said cup, said band removably fitting in said cup and disposed against the inner surface of the side of the cup thereby occupying a portion of the space defined by said cup and reducing the effective diameter of said cup, the outer diameter of said band being substantially equal to the inner diameter of the cup, the inner surface of said band being bevelled and said band

gradually increasing in thickness from the outer annular edge to said inner annular edge to form the bevel so that the thinner edge of the band is located at the mouth of the cup, a compressible washer fitting removably and conformingly within said band, the side of said washer being bevelled with the greater diameter part of the washer located at the wider diameter part of the band so that the respective bevels conform with each other, said stud having a cylindrical outer surface, said washer having a cylindrical opening conforming to the cylindrical surface of said stud, said stud extending through said washer opening, said washer having an outer surface, means connected with said stud and engaging a portion of said washer outer surface for removably clamping said washer and consequently said adapter band in said cup, said washer being of a thickness less than the depth of the cup so that when said washer is moved inwardly against the bottom of the cup said washer is compressed radially inwardly by engaging said band and tends to become contracted while said washer is also squeezed radially outwardly by the action of said clamping means, and the radial outward force of said washer and the radial inward reaction from said band cooperating to radially compress said washer.

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