

April 9, 1929.

W. F. SCHULTHEISS

1,708,241

VALVE SEAT STRUCTURE FOR BIBBS AND THE LIKE

Filed Aug. 17, 1927

Fig. 1.

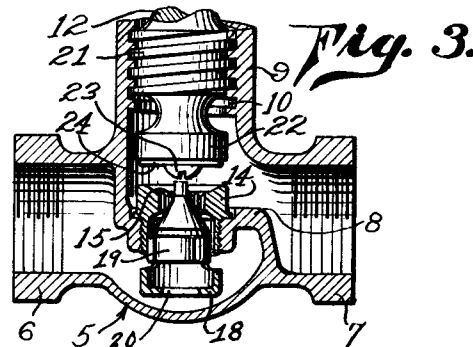
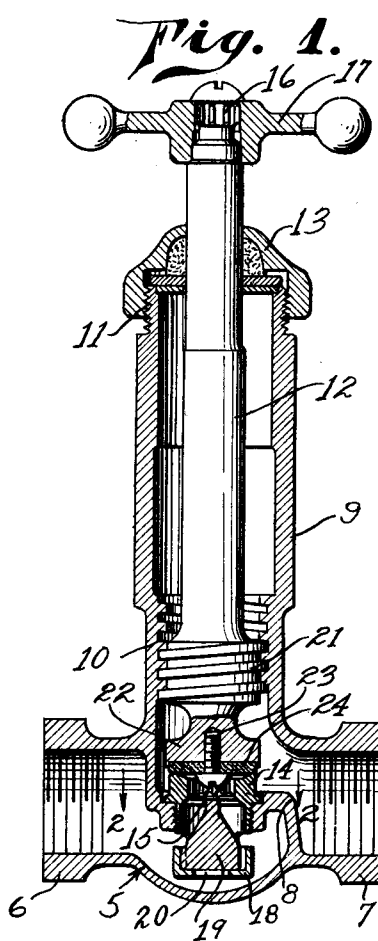


Fig. 4.

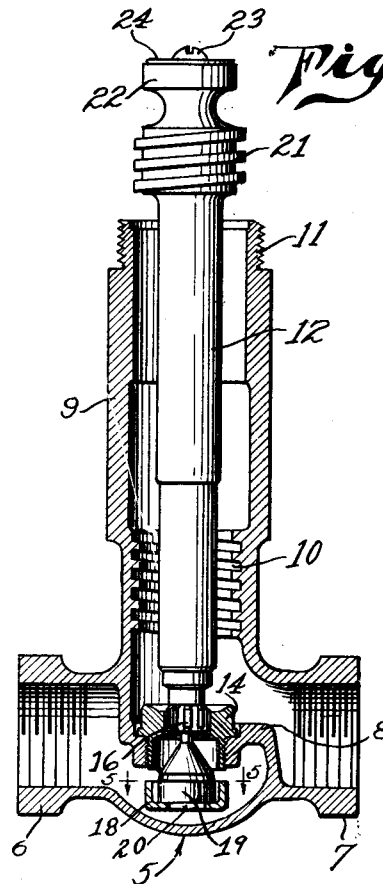


Fig. 2.

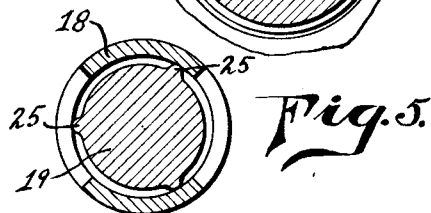
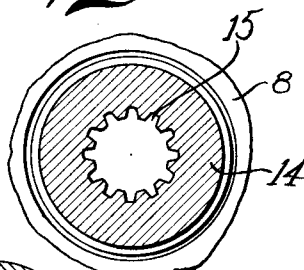


Fig. 5.

INVENTOR
William F. Schultheiss
BY Nestall and Wallace
ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM F. SCHULTHEISS, OF LOS ANGELES, CALIFORNIA.

VALVE-SEAT STRUCTURE FOR BIBBS AND THE LIKE.

Application filed August 17, 1927. Serial No. 213,609.

This invention relates to a valve especially adapted for house water service systems. In such systems, it becomes necessary or advisable to replace valve parts such as valve seats, washers and the like. Compression valves are commonly used and the removal and replacement of the valve stems and washers is easily accomplished. In some instances, replaceable valve seats have been provided. These are commonly of ring form and serve for engagement with corresponding threads in the partition wall of the valve body. Ordinarily, while a valve is being worked upon, the valve stem and washer being removed, it is necessary to shut off the water so that the work may be performed.

The present invention has for its primary object the provision of a valve having a replaceable valve seat arranged so that it may be conveniently removed by the aid of the valve stem. Another object of this invention is to provide a valve seat having automatic means to shut off the ports in the valve upon removal of the valve stem and washer. In addition to the broader objects of this invention, there are certain details of design, whereby a simple, economical and efficient structure is obtained, one which does not depart from the usual valve structure. These objects together with other objects and corresponding accomplishments are obtained by means of the embodiment of my invention illustrated in the accompanying drawing, in which:

Fig. 1 is a section through a complete valve structure showing a portion of the stem in elevation, the valve being in closed position; Fig. 2 is a section as seen on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary sectional view part with the valve stem in elevation showing the position of the valve parts with the valve open; Fig. 4 is a sectional view showing the bonnet removed and the valve stem inserted in the seat for removal of the latter; and Fig. 5 is a section as seen on the line 5—5 of Fig. 4.

Referring with more particularity to the drawing, the valve body 5 is provided with an inlet 6 and an outlet 7 separated by a partition wall 8. The partition wall is provided with a port for the passage of water from the inlet to the outlet. In alignment with the port is a tubular extension 9 having an internal thread 10 for the valve stem and an external thread 11 for the bonnet. Extending into the valve through the tubular por-

tion is a stem 12 which is suitably packed by means of bonnet structure 13. The construction just described is well known.

Referring to the partition 8, the inner wall of the port thereof is internally threaded so as to receive a ring seat member 14. The seat member is suitably threaded and provided with a limiting shoulder so that it may be threaded into position within the port. At the center of the seat member there is an opening having a female broach 15 as shown in Fig. 2. This broach corresponds to the male broach 16 upon the other end of the valve stem. Broach 16 is designed to receive a handle 17. The valve stem with its broach and handle are of the usual construction. However, the valve seat is novel in that the female broach corresponding to the broach on the stem is provided. The valve seat is provided with a cage 18 having suitable lateral openings and housing a reciprocable valve member 19. The valve member 19 is in the form of a plunger arranged so that it cannot be rocked in the cage. It co-operates with a valve seat in the valve seat member so that when in its upper position the port through the valve seat will be closed. Ribs 25 act as guides for the valve and provide clearance between it and the cage for the flow of water around it. The arrangement is such that if there is a pressure on the inlet side and the valve 19 is unrestrained, pressure acting through opening 20 in the cage causes the valve to be moved upwardly and seated so as to close the port through the valve seat.

The valve stem has an enlargement adjacent its lower end provided with a thread 21 for meshing with the thread 10 in the tubular portion of the valve body. A valve head 22 is also provided and has a bore tapped to receive a screw 23. The valve head is arranged to be engaged with the head of screw 23. The screw also serves to hold a washer 24 in position. The washer is of the usual construction.

The valve in its assembled position is shown in Figs. 1 and 3. The valve seat is positioned in the partition in the valve body and the valve stem is engaged by means of the threads 21 with the tubular extension of the valve body. The valve bonnet holds the packing about the stem and the handle is in position at the upper end. In the position shown in Fig. 1, the valve is closed, the washer being held upon its seat. To open

the valve, the handle is turned so as to raise the washer from its seat. The valve stem is raised only enough to uncover the upper portion of the valve seat, the head of the screw 23 engaging a post on the valve 19 and preventing the valve 19 from moving upwardly against its seat. The open positions of parts are shown in Fig. 3. If it is desired to remove the valve stem, the bonnet 13 is loosened and the valve stem unscrewed from the tubular extension. The valve 19 will then be forced to its seat by reason of the pressure of the water and there will be no leakage through the valve body. The cage and ribs hold the valve 19 from rocking thus preventing chattering during the normal operation of the valve. Suppose that it is desired to remove the seat. The valve handle 17 is detached from the stem. The stem is then inverted as shown in Fig. 4 and inserted within the tubular extension so that the broach enters the broached opening 15 in the valve seat structure. By turning the stem, the seat may be detached and removed. Thus, there is no separate tool required.

What I claim is:

1. A valve structure comprising a body, a detachable valve seat in said body, a stem detachably mounted in the said body and having a valve head for engagement with said seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

2. A valve structure comprising a body, having a ported partition wall with an internal thread in the port wall, a seat member threadedly mounted in the port opening of said wall so as to be detachable, a detachable valve stem in said body having a valve head for engagement with said seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

3. A valve structure comprising a body having a ported partition wall, a tubular extension in axial alignment with the port in said partition, the wall of said port being threaded, a seat member mounted in said port in threaded engagement with said wall, a stem detachably mounted in said body and tubular extension having a valve head for engagement with said seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

4. A valve structure comprising a body having a ported partition wall, a tubular extension in axial alignment with the port in said partition, the wall of said port being threaded, a seat member mounted in said port in threaded engagement with said wall,

a stem detachably secured in said tubular extension by threads for moving said stem axially, said stem having a valve head for engagement with said seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

5. A valve structure comprising a body having a ported partition wall with a thread in the wall of the port opening, a stem detachably mounted in said body having a valve head, a seat member threadedly mounted in the port opening of said wall so as to be detachable and having a seat for said head on one side and a cage on the other side, a check valve in said cage, said cage having a seat oppositely disposed to said first mentioned seat, means on said stem to engage and limit the closure distance of said check valve from it, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

6. A valve structure comprising a body having a ported partition wall with a thread in the wall of the port opening, a stem detachably mounted in said body having a valve head, a seat member threadedly mounted in the port opening of said wall so as to be detachable and having a seat for said head on one side and a cage on the opposite side, a check valve in said cage, said cage having a seat oppositely disposed to said first mentioned seat, a stop being arranged between said head and said check valve whereby to engage and limit the closure distance of said check valve from its seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

7. A valve structure comprising a body having a ported partition wall with a thread in the wall of the port opening, a tubular extension in axial alignment with the port in said partition, a stem detachably extending into said tubular extension and body having a valve head, a seat member threadedly mounted in the port opening of said partition wall so as to be detachable and having a seat for said head on one side and a cage on the opposite side, a check valve in said cage, said cage having a seat oppositely disposed to said first mentioned seat, a limiting post between said head and said check valve whereby to engage and limit the closure distance of said check valve from its seat, the outer end of said stem being provided with a male broach for attachment of a handle thereto, said seat having at its port a female broach corresponding to said male broach.

8. A valve structure comprising a body

having a ported partition wall with a thread in the wall of the port opening, a tubular extension in axial alignment with the port in said partition, a stem threadedly secured 5 in said extension so as to be moved axially by rotation of said stem and to be detachable from said extension, said stem having a valve head, a seat member mounted in said port in threaded engagement with said wall, 10 said member having a seat for said head on one side and a cage on the opposite side, a check valve in said cage, said cage having a seat oppositely disposed to the said first mentioned seat and a socket, a post to limit the closure distance of said check valve from 15 its seat, the outer end of said stem being provided with a male broach for attachment for a handle thereto, said seat having at its port a female broach corresponding to said male broach. 20

In witness that I claim the foregoing I have hereunto subscribed my name this 12th day of August, 1927.

WILLIAM F. SCHULTHEISS.