

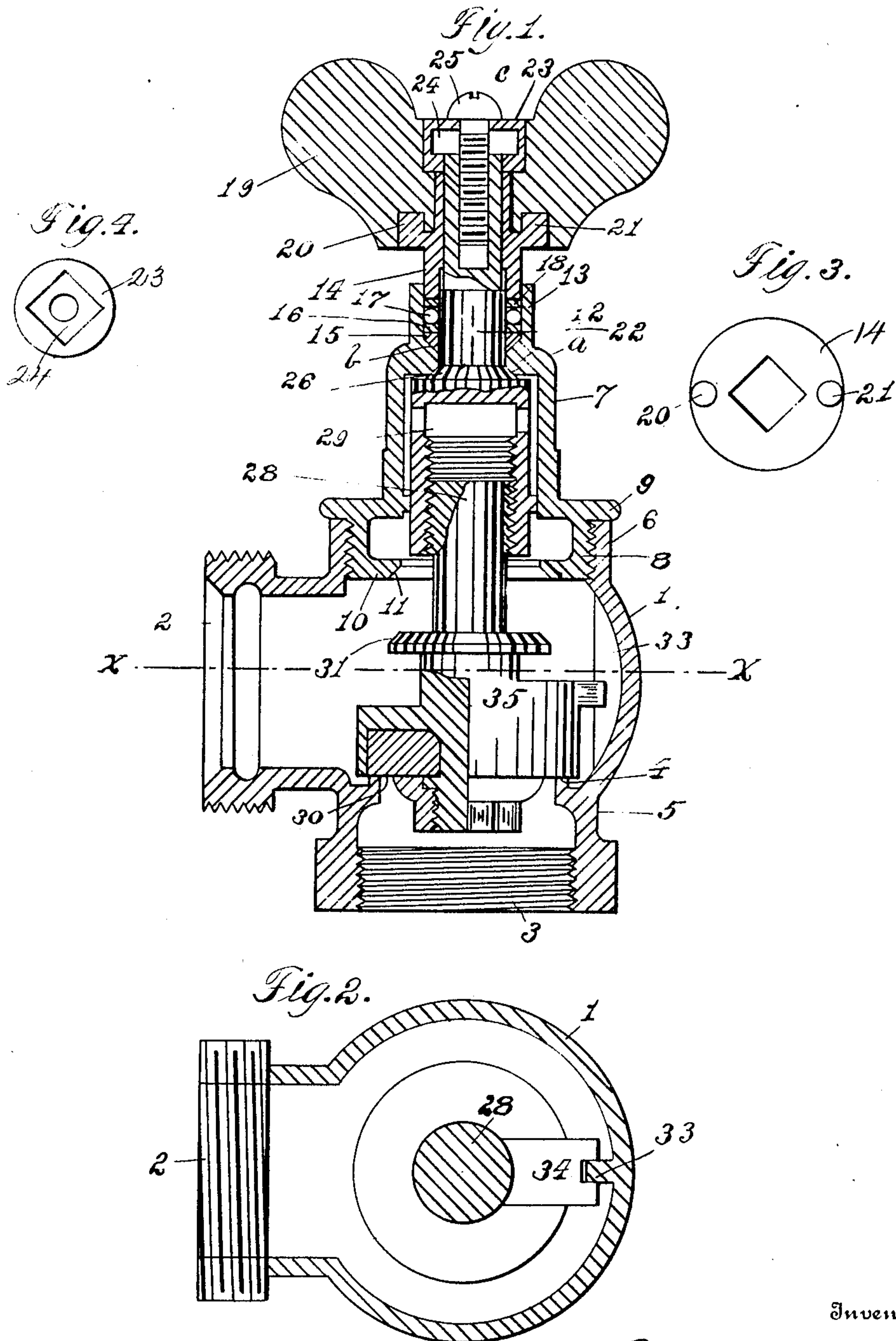
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VALVE.

APPLICATION FILED MAR. 25, 1908.

920,187.

Patented May 4, 1909.



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# UNITED STATES PATENT OFFICE.

FRANK SCHREIDT, OF MANSFIELD, OHIO.

## VALVE.

No. 920,187.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed March 25, 1908. Serial No. 423,116.

*To all whom it may concern:*

Be it known that I, FRANK SCHREIDT, citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to valves and its primary object is to construct a valve that in its use it will not require the ordinary packing.

One of the objects of my invention is to provide an auxiliary valve on the valve stem to effectually prevent the leakage of steam or water past or around the stem when the main valve is in full open position.

A further object is the application of double ground joints with means of keeping said joints in close contact with their seats and at the same time reduce the friction on the stem incident to opening and closing the main valve.

Another object is to provide an improved valve stem composed of two parts to permit the part carrying the main valve to operate wholly within the valve case or body so that the part of the valve stem that projects from the valve body will always remain in the same relative position when the valve is being opened or closed.

A further object of my invention is to provide a washer having an inner periphery formed to fit a part of the stem and means to secure it to the stem independent of the operating wheel which means also affords facilities for adjusting the ground joints to their seats.

A further object is to provide an efficient stop valve for the main valve when it is opened to full open position.

I attain these and other objects by the mechanism illustrated in the accompanying drawing in which;

Figure 1 is a vertical cross sectional side elevation of the valve showing the detail of the operating mechanism. Fig. 2 is a longitudinal section of the valve taken through the line X—X showing the means of holding the lower part of the valve stem which carries the main and stop valves and keep them from rotating when the main valve is opened or closed. Fig. 3 is a plan view of a tubular member provided with an aperture to correspond with and fit the outer periphery of the valve stem. Fig. 4 is a bottom plan view of a washer having a rectangular or similar

shaped inner periphery formed adjacent to an annular recess.

In the drawings, 1 represents a valve body having an inlet 2 and an outlet 3. A flat valve seat 4 is formed in the lower portion 5 of the valve body. A projecting portion 6 is formed on the body having its inner periphery screw-threaded. A cap 7 provided with a depending portion 8 exteriorly screw-threaded is adapted to fit the projecting portion 6 of the valve body and is connected to the valve body in the ordinary manner leaving the outwardly extending flange 9 in contact with the upper surface of the projecting portion 6 forming a steam and water tight joint.

An inwardly extending annular flange 10 is provided on the cap and a valve seat 11 formed thereon. The upper portion of the inner periphery of the cap is provided with an annular inwardly extending flange 12 beveled on both sides to form part of two joints or seats *a* and *b*. The bonnet 7 has an upwardly extending tubular portion 13 extending upward from the double joint seats into which one end of the tubular member 14 is fitted. A separable ring 15 is fitted in the tubular portion 13 and adapted to contact with the seat *b* to form a joint. The washer 16 rests upon and is supported by the ring 15 forming the lower portion of a race for the balls 17. A similar washer 18 rests upon the top of the balls completing the ball bearing race for the balls 17. To the upper portion of the tubular member 14, a hand-wheel 19 is secured through the medium of the lugs 20 and 21 which fit suitable apertures provided in the lower portion of the hand-wheel 19. The valve stem is made in two parts, the upper part 22 being fitted to a suitable aperture formed in the center of the tubular member 14. The stem projects above the upper surface of the depressed portion (*c*) of the hand wheel and the washer 23 is fitted to the projecting portion of the part 22 of the valve stem and rotates with the stem independent of the hand or operating wheel. The washer rests upon the upper surface of the tubular member 14 and is not affected by the strain on the hand wheel incident to the operation of opening and closing the valve.

An annular recess 24 is formed in the washer 23 to permit the valve stem 22 to be forced upward, for the purpose of adjusting the joint members. The washer 23 is se-



curely held in place upon the upper end 22 of the valve stem through the medium of the adjusting screw 25 which is threadably connected to the part 22 of the stem. When the  
 5 adjusting screw 25 is turned downward, it forces the ring 15 in contact with the upward seat (a) of the flange 12 and at the same time it forces the member 26 to contact with the  
 10 lower seat (b) formed on the flange 12 thereby forming twin joints to surround the part 22 of the stem making an air, steam and water tight joint without the use of the ordinary packing.

It will be observed that the twin joints a and b are interposed between the separable  
 15 ring 15 and the member 26 in such a manner that when the screw 25 is turned downward for the purpose of forcing the ring 15 and member 26 in close contact with their respective seats (a) and (b) both joints are adjusted at the same time.

The purpose of the ball bearing is to reduce the friction to a minimum so that the movable members of both joints can be maintained in close contact with their seats (a) and (b) and the part 22 of the valve stem rotated freely. The lower part 28 of the valve stem is exteriorly threaded and adapted to fit within the inner periphery 29 of the upper  
 30 part 22 of the valve stem which is interiorly screw-threaded to receive the threaded exterior of the valve stem 28. The threads are preferably double left-handed thread. To the lower part 28 of the valve stem, the main  
 35 flat disk valve 30 is secured and adapted to contact with the valve seat 4 formed in the lower portion of the valve body. Between the valve 30 and the threaded portion of the valve stem 28, an auxiliary stop valve 31 is  
 40 interposed and adapted to seat against the valve seat 11 when the valve 30 is in full open position, thereby closing off all communication with the upper portion of the valve cap and preventing the steam or air from passing  
 45 out or around the valve stem in conjunction with the ring 15 and member 26 and providing a stop for the main valve when it is in full open position.

It will be apparent that when the valve 31  
 50 contacts against the seat 11 that it will effectually cut off any leakage of steam past or around the stem even though the upper part 22 of the stem is subjected to any unusual strain that would prevent the joint members  
 55 15 and 26 from seating properly. Attention is further called to the fact that there is one valve and two joints working in unison to prevent any leakage of steam around the stem when the main valve is in full open position. In order to keep the main valve and lower part 28 of the stem from turning when the main valve is being opened or closed, a rib 33 is made integral with the body of the valve and projects into an outwardly projecting bifurcated portion 34 formed or se-

cured to the valve holder 35 of the main valve.

It will be observed that in rotating the hand wheel 19 that the upper portion of the stem always remains in the same plane and the upward and downward movement of the lower part 28 of the valve stem in the operation of opening and closing the main valve is made wholly within the valve case or body.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:

1. A packless valve comprising a body portion with a valve seat formed in the lower portion thereof, a bonnet secured to said valve body having a valve seat formed within the inner periphery, a valve adapted to contact therewith, a two-part valve-stem, one of said parts secured to said bonnet by twin joints both of which are adapted to prevent leakage past the stem.

2. A valve comprising a body portion with an inlet and outlet aperture, a valve seat formed in the lower portion of the body, a bonnet secured to said valve and provided with a valve seat, a stem composed of two parts, one of said parts mounted in the bonnet and movably secured thereto by two ground joints and the other part threadably connected to the part mounted in the bonnet and also carrying a valve which is adapted to contact with the seat formed on the lower extremity of the bonnet.

3. A valve comprising a body portion with an inlet and outlet aperture, a valve bonnet provided with twin ground joint members, a stem composed of two parts, one of said parts having a valve formed thereon adapted to contact with a valve seat formed in the bonnet, a loose joint member fitted to the bonnet and adapted to contact with a joint member formed in the bonnet, a ground joint member provided on one part of the stem and adapted to contact with one of the twin ground members, said valve and joint members being all adapted to prevent leakage past the stem when the main valve is in full open position.

4. A valve comprising a body portion with an inlet and outlet aperture, a tubular bonnet secured thereto, a valve stem composed of two parts and threadably connected together mounted in said cap, twin ground joint seats formed in the upper portion of the cap, a removable joint member mounted in the bonnet and adapted to contact with one of the seats of the twin ground joint members, a joint member carried by one part of the stem and adapted to contact with the other seat of the joint formed in the bonnet.

5. A valve comprising a body portion with an inlet and outlet aperture, a bonnet secured thereto, a valve stem composed of two parts and threadably connected together and mounted in said bonnet, twin joint seats



formed in the bonnet, a joint member formed upon one part of the stem, a loose joint member mounted on said stem, means to keep said joint members in close contact with said seats during the operation of opening and closing the valve, a washer provided with a rectangular inner periphery and an annular recess and secured to the projecting portion of the upper part of the valve stem, means to retain said washer upon the stem and take up the wear of the joints in the upper portion of the bonnet.

6. In a valve comprising a body portion with an inlet and outlet aperture, a bonnet threadably secured to said valve body having a valve seat formed thereon, a two part stem mounted in said cap the parts being threadably connected together, one of said parts carrying a main and a stop valve, the upper part of the stem having a joint member provided thereon and adapted to contact with a seat formed in the bonnet, a tubular member adapted to contact with the upper half of a ball-bearing race, means to hold the tubular member in place and tighten the joint members.

7. A valve comprising a body portion having inlet and outlet apertures, a bonnet mounted thereon, two joint seats formed in said bonnet, a two-part stem mounted in said valve-body, a joint member formed on one part of the stem, a loose joint member mounted in the bonnet, means to keep said joint members in close contact with their seats during the rotation of the upper part of the valve-stem, a valve provided on the lower part of the stem and adapted to contact with a seat formed in the bonnet when the main valve is in full open position, whereby three separate closures are formed to prevent leakage past the stem when the valve is open.

8. A valve comprising a body portion with an inlet and outlet aperture, a bonnet secured thereto provided with two seats for joints in its upper extremity, a two-part stem mounted within said valve-body, one of said parts being provided with a joint member adapted to contact with one of the seats in the bonnet, a loose joint member mounted in the bonnet and adapted to contact with the other seat in the bonnet, means to adjustably retain said joint members in contact with their seats.

9. A valve comprising a body portion with an inlet and outlet aperture, a bonnet secured thereto provided with a valve-seat on its lower extremity and two seats for joints in its upper extremity, a two-part stem mounted within said valve-body, one of said parts being provided with a joint member which is adapted to contact with one of the seats in the upper portion of the valve-body and the other part carrying a stop and a main-valve, a loose joint member

adapted to contact with one of the seats formed in the upper part of the bonnet and means to keep the joint members in close contact with their seats.

10. A valve comprising a body portion with an inlet and outlet aperture, a bonnet secured thereto provided with a valve-seat on its lower extremity and two seats for joints in its upper extremity, a two-part stem mounted within said valve-body and bonnet, one of said parts being provided with a joint member adapted to contact with one of the seats in the upper portion of the bonnet, and the other part carrying a stop valve which is adapted to contact with a valve-seat on the bonnet, a loose joint member adapted to contact with the other seat formed in the upper part of the bonnet, a tubular member mounted in the upper extremity of the bonnet and means to retain said tubular member in place and take up the wear of the joints.

11. The combination of a valve-body and a bonnet having a valve-seat formed on the lower extremity and two seats formed on the inner periphery of the upper extremity and a two-part stem mounted in said valve-body, said parts being threadably connected together, one of said parts also carrying a joint member adapted to contact with one of the seats formed in the bonnet, a main and stop valve carried by the other part, a loose joint member mounted in the bonnet, and means to retain the joint members in close contact with their seats.

12. A valve-body having inlet and outlet apertures, a bonnet threadably connected to said valve-body having joint-seats formed in the upper portion thereof, a two-part valve-stem carrying a main and stop valve, a movable joint member mounted in said bonnet, ball-bearing races resting upon said movable joint member, a tubular member secured to the upper portion of the bonnet, and means secured to the valve-stem to keep the movable joint members in close contact with their seats and at the same time maintain a proper adjustment of the ball-bearing races.

13. A valve comprising a body portion with an inlet and outlet aperture, a bonnet secured to said valve-body having a seat formed on its lower extremity and two seats for joints formed in the upper portion thereof, a two-part valve-stem mounted within said valve-body and bonnet, one of said parts provided with a joint member adapted to contact with one of the seats formed in said bonnet and the other part carrying a main and a stop valve which stop valve is adapted to contact with the seat formed in the lower extremity of the bonnet when the main-valve is in full open position.

14. The combination of a valve-body and bonnet provided with a valve seat thread-



ably connected together, of a two-part valve-stem mounted in said bonnet and valve-body, means provided on said valve-stem and bonnet to form twin joints to prevent  
5 leakage past the upper portion of the stem, said stem being also provided with a valve adapted to contact with the valve-seat formed in the bonnet, and limit the movement of the stem and also prevent leakage

past the stem when the valve is in full open 10 position.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK SCHREIDT.

Witnesses:

JOHN H. COSS,

PEARL ACKERMAN.