W. T. BIRCH.

PUMP VALVE.

APPLICATION FILED JAN. 30, 1913

1,090,775. **Patented Mar. 17, 1914.**

Fig. 1.

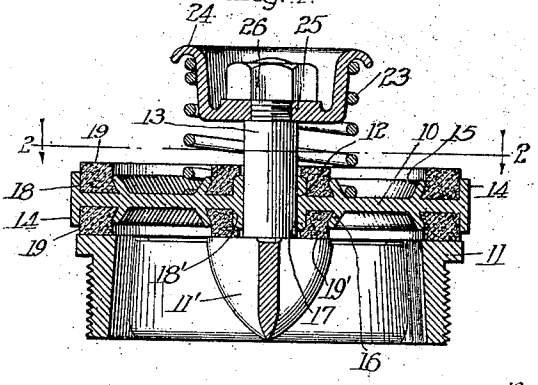


Fig. 2.

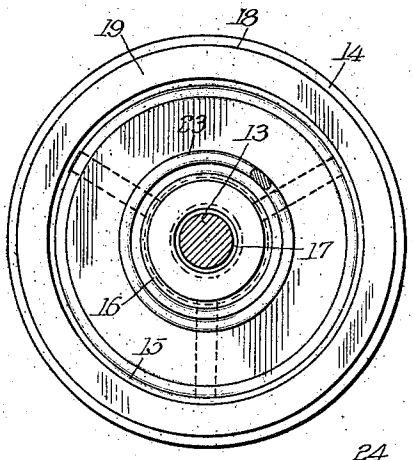


Fig. 4.

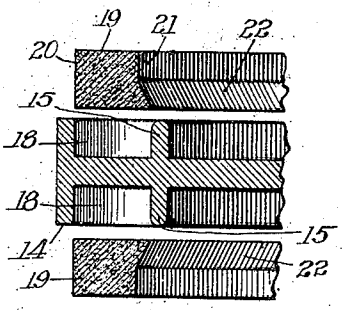


Fig. 5.

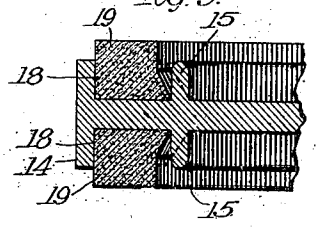
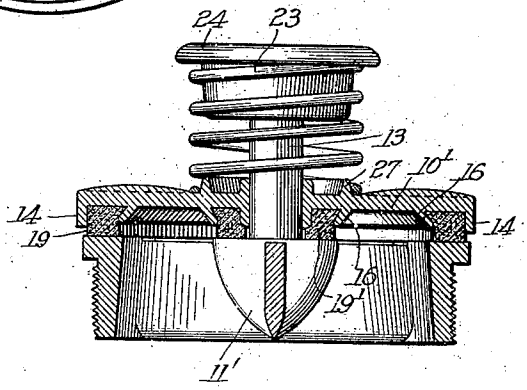


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM T. BIRCH, OF CHICAGO, ILLINOIS.

PUMP-VALVE.

1,090,775. Specification of Letters Patent. Patented Mar. 17, 1914.

Continuation of application Serial No. 706,253, filed June 27, 1912. This application filed January 30, 1913. Serial No. 745,083.

To all whom it may concern:

Be it known that I, WILLIAM T. BIRCH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pump-Valves, of which the following is a specification.

My invention relates to improvements in pump valves and has for its general object to provide a valve structure which shall have the combined advantages of few parts, simplicity, and cheapness of construction of said parts, advantageous coöperation between said suitably constructed parts, and other practical advantages hereafter to be made more clearly apparent.

Another object of my invention is to provide a double face valve so that when one face becomes inefficient by wear it can be turned over and the reversed face used.

In this application I have illustrated and described a particular form of double face reversible valve which is made the subject matter of the claims in a divisional application filed by me February 7th, 1914, and serially numbered 817,157, the application being entitled Pump valves.

Other and further objects of my invention will become readily apparent to those skilled in the art from a consideration of the following description of an embodiment thereof taken in conjunction with the accompanying drawing, wherein—

Figure 1 is a vertical central section through a valve constructed in accordance with my invention; Fig. 2 is a transverse section taken on line 2—2 of Fig. 1; Fig. 3 is a central vertical section of a modified form of my invention; Fig. 4 is an enlarged fragmentary section of parts of the structure shown in Fig. 1 and of the rings and body part before assembling; Fig. 5 is a similar section showing the rings in their final positions and showing, in dotted lines, the annular integral ribs after they have been deflected from their initial positions into their final positions by being rolled over into engagement with the vulcanized or semi-vulcanized rings that afford the packing face of the valve.

In all views, the same reference characters indicate similar parts.

Specifically, 10 indicates the body part of the valve, of suitable metal, such as a casting of brass, having integral ring-engaging means upon one or both of its sides to secure packing rings thereto for operative association with the face of the valve seat 11.

In Fig. 1, I have shown the valve constructed with packing rings on each of its side faces so that after one set of rings have become defective by wear the valve may be reversed and the rings on the opposite side may then be used, while in Fig. 3 the valve is constructed to carry rings only on one side or face. In either case the body part is centrally perforated, as at 12, to receive the stem 13 which is an integral part which extends from the hub 11′ of the valve seat 11 of the usual type. The body part 10 of the valve has extending laterally thereof, and concentric with the said central perforation, a series of concentric ribs 14, 15, 16, and 17, providing therebetween grooves 18—18′ somewhat wider than the width of the packing rings, to be carried by the body, at the seat-engaging portions of said rings.

The packing ring 19 is preferably composed of vulcanized, or semi-vulcanized, rubber and is to be contained in the groove 18 between the ribs 14 and 15. The seating surface of the ring, that portion contained between the vertical edges 20 and 21, is somewhat narrower than the base portion 22, this base portion of the ring being tapered to the vertical edge 21, it being substantially as wide as the groove 18.

Fig. 4 shows the relative location of the parts of the double-face valve before the rings are placed in the grooves 18—18′ and Fig. 5 shows the location of the parts after the rings have been placed in the grooves and before the ribs 15 and 16 have been radially deflected into contact with the inclined portions 22 of the rings. For packing the stem 13, I provide a similar but smaller packing ring 19′ adapted to be contained in the groove 18′ provided by the ribs 16 and 17. For the purpose of convenient construction the wider base portion of this ring extends radially and outwardly from its vertical edges. Both of these packing rings are made in the form substantially shown and vulcanized previous to placing them in the ring carrying portion of the valve body.

After the rings have been placed in their proper grooves, as shown in Fig. 5, the laterally extending annular ribs 15 and 16 are radially deflected, as shown in dotted lines in Fig. 5, by a process of rolling or spinning,

causing the ribs to tightly engage the enlarged tapered surfaces of the respective rings and to securely hold them in their proper positions in the body part of the valve without imposing any strain upon the body part of the valve tending to cause distortion thereof and causing the seating faces of the rings to be displaced from their normal horizontal plane. It will thus be seen that each of the packing rings is independently held in place by an integral part of the valve body. This construction has considerable advantage over prior structures wherein extraneous parts requiring screws, or the like, are employed to hold the rings in place as such arrangements are liable to disintegration and to become loosened and displaced by use. The flanges 15 and 16 may be readily rolled in place for holding the rings in their proper positions much more quickly than a single screw could be inserted in the body part, and when these flanges have been deflected into their proper positions, for purposes described, they are there for all time and intimately secure and hold the rings in their places without possibility of disengagement.

When the double-face valve is employed, as shown in Fig. 1, the deflected rib 16, that may, at the time, be on the top surfaces of the valve, provides a convenient tapering guide for the valve-closing spring 23. The upper end of the spring 23 engages under the curled-over edge 24 of the cup 25 which is secured by screw-threaded engagement to the upper end of the stem and by means of the nut 26. The spring 23 acts in the usual fashion to return the valve to its seat and yieldingly to permit the opening of the valve. The idle packing ring 19′ will cushion the blow against the head 25 when the valve body is moved to its extreme extent.

In the structure shown in Fig. 3, I preferably provide, on the upper surface, a rib or flange 27 to guide the lower end of the spring in a similar manner.

Some of the advantages of my device over prior structures will become readily apparent to persons skilled in the art from the foregoing description. The integral means of intimately securing the packing ring at every point along and adjacent to its circumferential surface, after the ring has been inserted is of great structural and operative value. It is further clearly advantageous for the reason there is no strain imposed upon the body part of the packing-ring-carrying body to cause it to become warped or distorted; therefore, the contacting faces of the outer and inner packing rings will remain always in the same horizontal plane.

What I claim is:

1. In a device of the character described, a ring-carrying valve-body part having a plurality of laterally projecting, integral, concentric ribs on its face to provide therebetween a seat for a packing ring; a packing ring seated between said ribs, a portion of one of said ribs being rolled over after the insertion of said ring to retain said ring in place.

2. In a device of the character described, a ring-carrying valve-body part having a plurality of laterally projecting, integral, concentric ribs on its face to provide therebetween a seat for a packing ring; a packing ring having its base wider than its face, seated between said ribs; a portion of the rib nearest the extended portion of said ring being rolled over, after the insertion of said ring, to overlie said extended portion thereof to retain the ring in place.

3. In a device of the character described, a ring-carrying body having extending from its side face two concentric parallel ribs integral with said body, and a packing ring having a vertical edge for coaction with one of said ribs and an outwardly inclined edge, the other rib being rolled down over said inclined edge, of the ring after the insertion of said packing ring.

4. In a device of the character described, the combination with a vulcanized packing ring having an inclined edge, of a valve body having concentric ribs spaced apart a distance substantially equal to the greatest width of said ring, a portion of one of said ribs being rolled over said inclined edge of the ring after the insertion of said ring, whereby, in the rolling process, said ring is secured between said deflected and undeflected rib.

5. In a device of the character described, a valve body having a central stem-receiving aperture, and having integral, laterally extending, concentric pairs of ribs adjacent said perforation in the body and adjacent the periphery of the body, respectively; the ribs of each said pair being spaced to provide a ring-receiving groove therebetween; and tapering valve rings, each having a base of substantially the width of the groove, seated between each pair of vertically extending ribs, one edge of each ring being inclined away from the adjacent rib, and a portion of said rib being rolled or otherwise deflected over said inclined edge, to hold the ring in place after the rings have been inserted in said grooves.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM T. BIRCH.

In the presence of—
JOHN M. LEE,
FLOSSIE SNOWDON.