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F. C. HEYLMAN

Re. 17,556

STOPCOCK

Original Filed Oct. 11, 1917

Fig. 1.

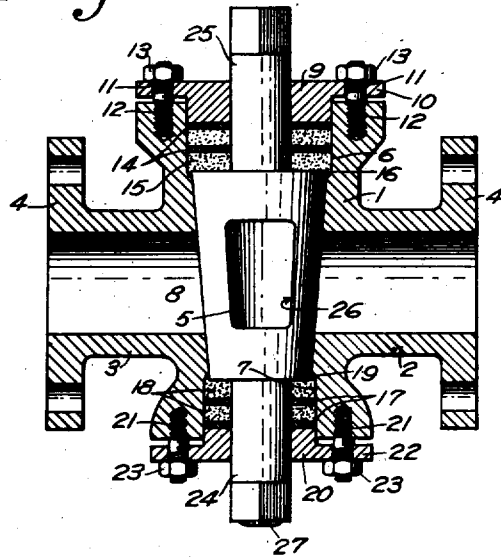


Fig. 2.

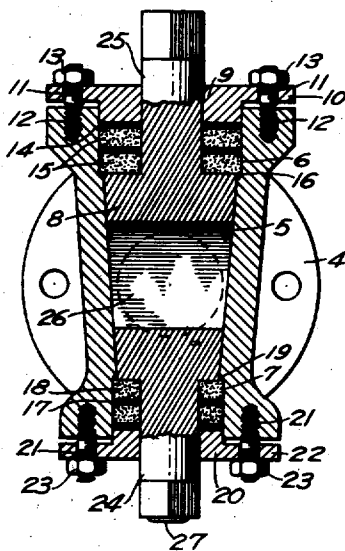
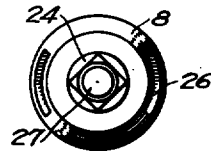


Fig. 3.



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STOPCOCK

Original No. 1,370,745, dated March 8, 1921, Serial No. 196,000, filed October 11, 1917. Application for reissue filed August 12, 1929. Serial No. 385,394.

This invention relates to stock-cocks or shut-off valves, and the primary object of the invention is to provide an improved construction for valves of this character whereby leakage will be prevented when the valve is used in connection with either steam or liquid.

One of the objects of the invention is to provide an improved valve of this character that may be easily disengaged from its valve seat when the tendency of the valve proper is to adhere to seat as when the valve is employed with liquid which tends to cause the valve to tightly cling to its seat as when acid or similar liquids are employed.

The invention has for a further object to provide a device having a longitudinally adjustable tapered valve carrying oppositely projecting valve stems whereby the valve may be properly adjusted from either end of the valve casing; which include packing boxes at both ends of the said valve whereby leakage from either end of the valve casing can be prevented without changing the relative position of the valve with respect to its seat; and which may be moved to various positions and made water-tight so that an effective seating of the valve will be maintained at all times.

A further object of the invention is to provide a valve of this character which will consist of comparatively few parts and is simple in construction, but durable and especially adapted to withstand the rough usage to which devices of this kind are ordinarily subjected.

For a full description of the invention and the advantages and merits thereof, reference is to be had to the following detailed description and the accompanying drawing wherein is illustrated the preferred form of the invention and, in which—

Figure 1 is a vertical section through the valve body showing the invention in assembled position.

Fig. 2 is a transverse section, and

Fig. 3 is a bottom plan view of the valve member.

Referring to the drawing, wherein is illustrated the preferred form of the invention

and in which like characters of reference indicate corresponding parts throughout the several views, the valve casing 1 is provided with the oppositely projecting portions 2 and 3 which form the inlet and outlet for the valve and each of these projections have flanges 4 whereby the valve may be attached to the ends of piping for arranging the valve in connection with a system of pipes having steam or liquid conducted through their interiors. As shown in Fig. 2, the main portion of the valve body is tapered and has an interior tapered bore 5 extending through the valve body. The upper end of the valve body has an enlarged recess 6 which forms a packing box while a comparatively smaller recess 7 is formed in the opposite end of the valve body. Communication between these two recesses 6 and 7 is established through the tapered bore 5 and a tapered plug valve 8 is rotatably mounted in this tapered bore 5. Each of the recesses 6 and 7 is slightly larger than the corresponding end of the tapered bore as shown to advantage in Figs. 1 and 2. The plug valve 8 is slightly longer than the bore 5 so that normally the ends of the plug are projected slightly into each of the recesses 6 and 7.

A packing gland 9 is extended into one of the recesses at one end of the valve body and this gland has a flange 10 provided with openings 11 for the reception of the ends of studs 12 screw-threaded into screw-threaded recesses in the end of the valve body. Nuts 13 are adapted for reception on the ends of the studs whereby the gland may be forced into the recess 6. Interposed between the large end of the tapered plug valve 8 and the adjacent end of the gland is a series of layers of suitable packing, which, in the present instance, is shown as including alternate layers of hard and soft packing material and taken in combination with the gland, provides an elastic thrust bearing for the end of the plug 8. This packing material is preferably of asbestos and includes the two compressed disks 14 and the loose intermediate asbestos packing 15. One of the washers 14 is in direct contact with the gland 9 while one of the portions of packing material 15 is in

direct contact with the corresponding end of the plug 8. This construction permits a portion of the loose asbestos packing 15 to be pressed into the annular space 16 around the extreme end of the plug in the bottom of the recess 6 when a pressure is applied to the gland.

The opposite recess 7 is provided with a similar elastic thrust bearing for the opposite end of the plug 8 and comprises packing material which includes the relatively smaller packing disks 17 and the loose packing material 18, one layer of the latter being in engagement with the smaller end of the plug so that it may be pressed into the annular space 19 around the said end. This packing within the recess 7 is held in position by the gland 20 which is of a formation similar to the gland 9, being slightly smaller in size. Stud 21 is provided in this end of the valve body and the studs project through openings in the flange 22 of the gland and receive a nut 23 to press the gland into position within the recess 7 for tightly packing the packing material within the recess.

Each end of the plug 8 is provided with a stem indicated at 24 and 25 and each stem projects through the elastic thrust bearings whereby the terminal of each stem is extended beyond the valve casing and has a square portion for the reception of a wrench or the like, whereby the valve may be turned from either end. A passageway 26 in the plug 8 permits the plug to be moved to open or closed position.

The tapered bore 5 forms a valve seat with which the plug valve contacts to provide a water-tight joint. It will be apparent that continued use of the valve will have a tendency to reduce the effectiveness of tightly closing the bore and at such times it will be necessary to longitudinally adjust the plug valve for placing it in the proper position to tightly hold the bore. When this is desired it is simply necessary to turn either the nuts 13 or 23 to more compactly press the packing in the corresponding end of the body.

When one gland is pressed inwardly to tightly pack the packing material the opposite gland will be correspondingly loosened to permit the packing in this end of the valve body to release its pressure on the end of the plug valve thus accomplishing the longitudinal adjustment of the valve. When the valve, for any reason, sticks or becomes immovable and tightly adheres to its seat, it is merely necessary to tap the end 27 of the stem 24 with a hammer or other suitable instrument to loosen the valve away in its seat or should the valve become loose in its seat a tapping on the upper end of the stem will properly seat it. The loose packing about the ends of the valve plug will lend itself to expansion or compression upon adjustment of the valve plug to maintain a fluid-tight joint.

When the valve becomes worn after continued use, longitudinal adjustment may be accomplished as above stated and the alternate layers of compact and loose packing will tightly fill the packing boxes formed by the recesses 7 and 6 so that a water-tight valve is provided at all times.

From the foregoing it will be observed that a very simple and durable stop-cock has been provided, the details of which embody the preferred form. I desire to be understood, however, that slight changes may be made in the details of construction without departing from the spirit of the invention or the scope of the claims hereunto appended.

What is claimed is:—

1. A high pressure cock comprising: a body having openings therethrough in two directions, one of which forms a valve seat and recesses adjacent the ends of said valve seat; a revoluble plug fitting said seat, and having flat shoulders and stems at both ends; packing at both ends of said valve plug, said packing resting in said recesses and engaging said flat shoulders of said revoluble plug; flanged collars for engaging said packing and forcing same against the flat shoulders of said plug whereby said plug by the proper proportioning of the pressures of the packings thereagainst will be held in proper engagement with said valve seat; means for holding said flanged collars in position, the stems extending through both of said collars.

2. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; packing resting in both of said recesses and engaging said shoulders; and flanged collars for engaging said packings for forcing same against said shoulders of said plug whereby said plug by the proper proportioning of the pressures of the packings thereagainst will be held in proper engagement with said valve seat, said flanged collars having openings through which said stems extend.

3. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; packing resting in both of said recesses and engaging said shoulders, said packing being resilient so that the application of a sharp blow on

said stem extending from the smaller end of said plug causes said packing to yield sufficiently to free said plug from said valve seat should it become stuck; and flanged collars for engaging said packings for forcing same against said shoulders of said plug whereby said plug by the proper proportioning of the pressures of the packings thereagainst will be held in proper engagement with said valve seat, said flanged collars having openings through which said stems extend.

4. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; packing resting in both of said recesses and engaging said shoulders, said packing being resilient so that the application of a sharp blow on said stem extending from the smaller end of said plug causes said packing to yield sufficiently to free said plug from said valve seat should it become stuck; and flanged collars for engaging said packings for forcing same against said shoulders of said plug whereby said plug by the proper proportioning of the pressures of the packings thereagainst will be held in proper engagement with said valve seat, said flanged collars having openings through which said stems extend, said stem projecting from the larger end of said plug having means whereby said plug may be rotated, and said stem extending from the smaller end of said plug being adapted for receiving blows for axially moving said plug to free it from said valve seat should it become stuck.

5. A high pressure stop-cock comprising: a body having openings therethrough in two directions, one of which is ground to form a valve seat; a revoluble plug fitting said seat and having flat shoulders and stems at both ends; elastic packing forming thrust bearings at both ends of said revoluble plug; flanged collars at both ends of said revoluble plug for holding said elastic thrust bearings in place against the flat shoulders of said plug; and means for securing said flanged collars in position, the stems of the revoluble plug extending through both of said flanged collars.

6. A high pressure stop-cock comprising: a body having openings therethrough in two directions, one of which is ground to form a valve seat; a revoluble plug fitting said seat and having flat shoulders and stems at both ends; elastic packing forming thrust bearings at both ends of said revoluble plug; flanged collars at both ends of said revoluble

plug for holding said elastic thrust bearings in place against the flat shoulders of said plug; and means for securing the flanged collars to said body, said means being operable against said flanged collars so as to obtain the desired elastic pressure of said elastic thrust bearings against said flat shoulders of said plug, said stems of said revoluble plug extending through both of said flanged collars.

7. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; elastic packing forming thrust bearings resting in both of said recesses and engaging said shoulders; and flanged collars for engaging said elastic thrust bearings for compressing same against said shoulders of said plug whereby the elasticity of said elastic thrust bearings by the proper proportioning of the pressures thereagainst will hold said plug in proper engagement with said valve seat, said collars having openings through which said stems extend.

8. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; elastic packing forming thrust bearings resting in both of said recesses and engaging said shoulders, said elastic thrust bearings being sufficiently elastic that the application of a sharp blow on said stem extending from the smaller end of said plug causes the opposite elastic thrust bearing to yield sufficiently to permit said plug to be freed from said valve seat should it become stuck; and flanged collars for engaging said elastic thrust bearings for compressing same against said shoulders of said plug whereby the elasticity of said elastic thrust bearings by the proper proportioning of the pressures thereagainst will hold said plug in proper engagement with said valve seat, said collars having openings through which said stems extend.

9. A cock comprising: a body having two openings therethrough in two directions, one of which forms a conical valve seat, and having recesses formed at the opposite ends of said valve seat; a revoluble conical plug fitting said seat and having flat shoulders formed at the ends thereof; stems extending

from the opposite ends of said plug and through said recesses, said stems being concentric with the axis of said plug; elastic packing forming thrust bearings resting in both of said recesses and engaging said shoulders, said elastic thrust bearings being sufficiently elastic that the application of a sharp blow on said stem extending from the smaller end of said plug causes the opposite elastic thrust bearing to yield sufficiently to permit said plug to be freed from said valve seat should it become stuck; and flanged collars for engaging said elastic thrust bearings for compressing same against said shoulders of said plug whereby the elasticity of said elastic thrust bearings by the proper proportioning of the pressures thereagainst will hold said plug in proper engagement with said valve seat, said collars having openings through which said stems extend, said stem projecting from the larger end of said plug having means whereby said plug may be rotated, and said stem extending from the smaller end of said plug being adapted for receiving blows for axially moving said plug to free it from said valve seat should it become stuck.

In testimony whereof I have hereunto set my hand at Amsterdam, Netherlands, this 10th day of July, 1929.

FREDERICK C. HEYLMAN.