

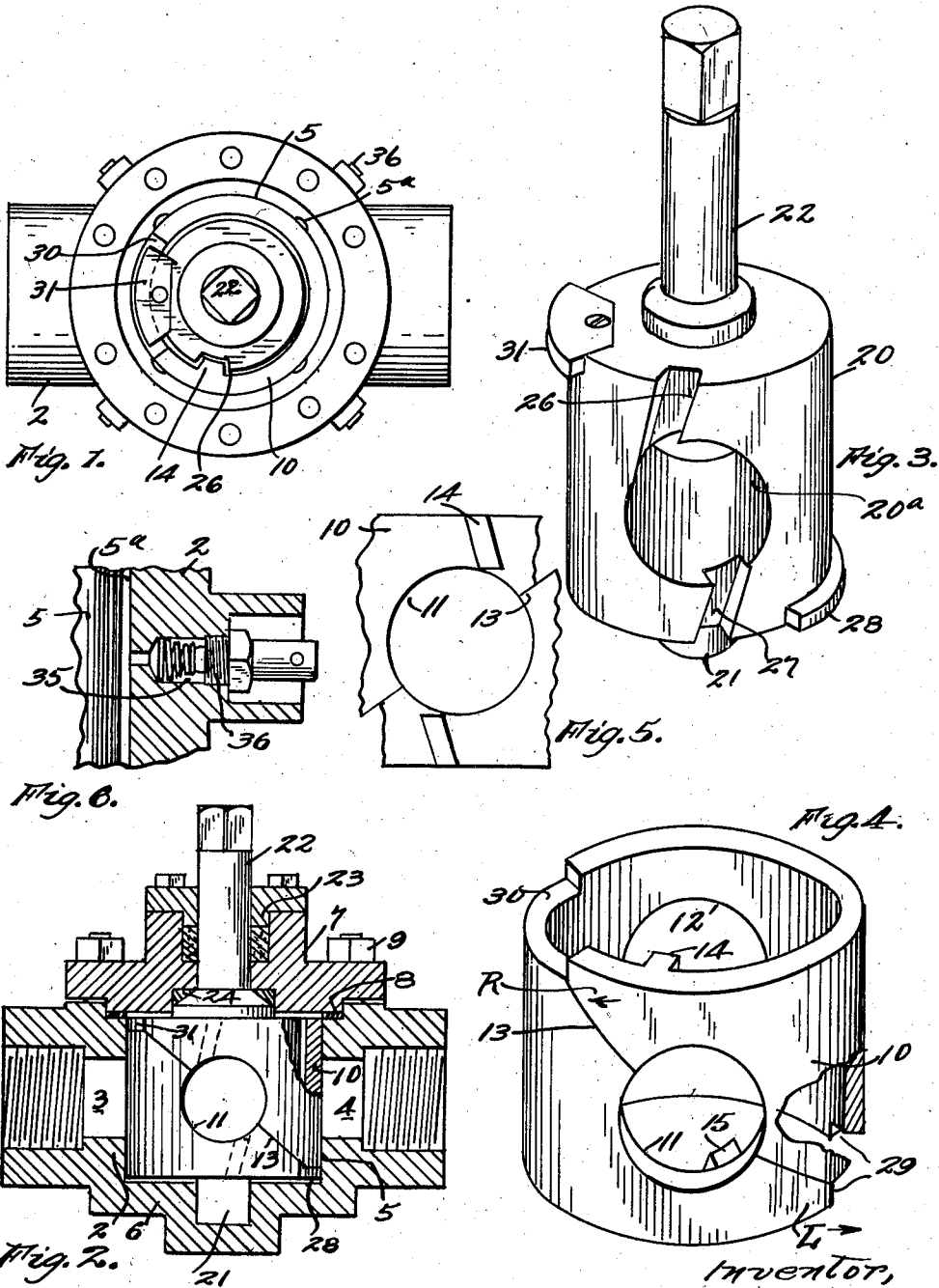
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LUBRICATED, SPLIT RING, STOPCOCK

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LUBRICATED, SPLIT RING, STOPCOCK

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This invention is a valve in the class of stop-cocks having a ring closure and a core operative in the body of the cock to shift the ring to open or to closed positions.

5 An object of the invention is to provide a simple, substantial, practical and effective stop-cock of few and inexpensive constructional parts, and provide a stop-cock including a stemmed core rotative in the body of the device substantially without frictional resistance and operative upon

10 a split ring, closure member to readily turn it from one position to another while under high pressure. Further an object is to provide a practical and convenient means to effectually lubricate the

15 working parts of the stop-cock. The invention consists of certain advancements in this art as set forth in the ensuing disclosure and having, with the above, additional objects and advantages as hereinafter developed, and whose construction, combination and details of means, and the manner of operation will be made manifest in the description of the herewith illustrative embodiment; it being understood that modifications, variations and adaptations may be resorted to within the scope, principle and spirit

25 of the invention as it is more directly claimed hereinbelow. Figure 1 is a plan of the cock shell and its insides; its bonnet being removed.

30 Figure 2 is an axial section of the stop-cock. Figure 3 is a perspective of the stemmed core. Figure 4 is a perspective of the partly broken-away closure ring.

Figure 5 is an inside elevation of a portion of the ring showing its core-engaging lugs.

35 Figure 6 is a sectional detail showing a lubricating device. The valve or stop-cock comprises a body or shell 2 having diametrically opposite flow ports

40 3-4 leading from a cylindrical, transverse, body bore surface 5 closed by the shell bottom 6 and, at the top, by a bonnet 7 seating on a gasket 8 around the rim of the bore 5 and being fastened by studs and nuts 9.

45 Expansively and rotatively, snugly fitting in the bore 5 is a firm-walled, split ring 10 having a length somewhat less than the depth of the bore 5 so as not to drag at the ends of the ring on near surfaces of the shell parts. Between its ends the ring 10 has diametrically opposite flow ports 11-12 to be turned into port-opening register with relative ports 3-4 in the shell; flow through the shell being stopped unless the ports are thus turned into register.

55 A feature of this invention is in the means for

effecting the motion of the port ring 10. As here shown, the ring is helically split on the line 13 from end to end similarly to a bevel cut piston ring and the opposed edges of the split slidably bearing on each other, and the line of the split passing through the center of the port 11; the ring being of resilient metal. At its upper end the ring is provided with an internal, slightly helically inclined lug 14; this lug being disposed above the port 11 and inclining in the direction of the upper end of the slit 13; that is, inclining toward the intersection of the slit with the edge of the port 11. The lug 14 is slightly offside of a longitudinal line along the ring 10 passing through the center of the port 11 and an internal lug 15 is provided on the inside of the lower end of the ring 10 and is located on the opposite side of the said longitudinal line; the inclination of the lug 15 being toward the point of intersection of the lower end of the slit 13 with the port 11 in the ring 10, Fig. 5.

The slit 13 is of left-hand pitch of about 40° angle and the helical pitch of the lugs 14-15 is very much less (is about 8° angle) in a right-hand direction; these angles not being fixed or limited.

The ring turning device comprises a cylindrical core 20 slightly less than the bore of the slit ring 10 and of about the same length as the ring; the lower end of the core having a truncation 21 turnably stepped in the shell bottom 6; the core end being spaced therefrom to turn free. A stem 22 of the core extends upward through the bonnet 7 and a packing gland 23 thereof, for application of a hand wheel or operating tool, as desired. An end thrust washer 24 is interposed between the top of the core 20 and the bonnet 7.

The core 20 is provided with an upper recess 26 complementary to but wider than the ring lug 14, and with a lower recess 27 complementary to and wider than the ring lug 15. It is desirable to prevent the ring 10 from shifting bodily on the core, especially at the corners having faces opposed to the corners L and R having the lugs 14-15, and still provide for free endwise, contractive movement of these latter corners. This is obtained by provision of a fixed, lower, lateral shoulder 28 entering and having some lost motion in a relative indent 29 in the lower end edge of ring 10, Fig. 4. The upper end edge of ring 10 is likewise indented at 30 to receive a shoulder 31 of the upper end of core 20. The shoulders 28-31 are shorter than their respective ring indents so as to have no turning engagement and serve only to stop endwise movement of the indented corners

of the ring 10; leaving the corners R and L free to ride endwise and to contract when the core 20 engages either lug 14 or lug 15. To facilitate assembly of the ring on the core, one or both of the shoulders 28—31 may be removably attached to the core 20.

It will now be seen that with the ring and core in place in the valve shell 2, the split ring 10 will expand into snug, concentric bearing on the bore 5, and the ring lugs 14—15 will lie in interlocking relation in their core recesses 26—27. If, with the parts in position as shown in Fig. 2, the stem and core 20 be turned, as usual to the left to open the valve or cock, the left side wall of the lower recess 27 will move into engagement with the near side face of the lower lug 15 of the ring 10 and the contiguous lower corner L, Fig. 4, will be jammed against and ride down on the opposed near reacting face of the inclined slit 13, all with a tendency to contract the end L of the ring from the wall of the shell. The ring 10 will therefore be readily turned until its ports 11—12 register with the coordinate ports 3—4 in the shell 2. Conversely, when the valve is to be closed the core 20 is turned in a righthand direction and one wall of the top recess 26 will move against the near face of the upper lug 14 of the closure ring 10. This coaction will force the upper corner R of the split ring 10 to ride up on the opposing surface of the relative portion of the slit 13 at the corner R of the ring. The reaction on the corner R will cause it to slightly contract and effect an easy rotation of the ring 10 until the several ports 3—4 are again covered and closed by the blind or imperforate wall portion of the ring.

In some uses of the stop-cocks it may be desirable to introduce a lubricant between the shell and the closure ring 10, and for this purpose the bore surface 5 is provided with a series of oil channels 5^a from which lead tapped ducts 35 having inlet check valves 36 adapted for the attachment of suitable grease gun means (not shown) whereby to force the lubricant into the bore channels 5^a and contract the split ring sufficiently to permit a thin film of lubricant to be forced between the ring and the bore of the body or shell of the valve.

The core 20 has a cross-port 20^a aligned with the opposite ring ports 11—12.

What is claimed is:

1. A stop-cock having a shell with a bore and ports leading therefrom, an expansive, helically split closure ring seated in the bore and having ports registerable with the shell ports, and operative means engageable with the split ring whereby to move either of diagonally opposite corners of the split side into engagement with, and slide it on, the opposite split surface to effect a contractive release of the ring from its seat in the bore.
2. A stop-cock having a ported shell with a bore, a ported closure in the bore comprising a helically split ring expansively seating in the bore and having flow ports, and rotary means in the ring cooperating with ring corners at the oppo-

site ends of the split to relatively move either corner on the opposite split surface to contractively draw the ring from its seat.

3. A stop-cock having a ported, bored shell, a closure ring expansively seating in the bore and being diagonally split on one side from end to end and the edges of the split being mutually engageable, a rotative element mounted in the cock and selectively engageable with corners of the ring at ends of the slit whereby to longitudinally shift a selected corner on opposing split surface to radially contract the ring from fully seated relation in the bore.

4. A stop-cock having a ported bore, a diagonally split closure ring expansively seated in the bore and the surfaces of the ring being interengageable, and rotary means selectively engageable with either of diagonally opposite corners of the ring at ends of the split to ride the selected corner on the opposed surface of the split to effect radial contraction of the selected part of the ring from its seat in the bore.

5. A stop-cock having a ported bore, a diagonally split, ported, expansive ring seated in the bore and the surfaces of the split being interengageable, and rotational means engageable with upper and lower corners, at the ends of the split, of the ring; whereby to relatively move either corner on its opposed surface of the split to effect a contraction of the ring from its seat in the bore.

6. A stop-cock as set forth in claim 5, and said means including a device to limit endwise shift of the ring.

7. In a stop-cock, a ported ring part and a rotative core part therein, the ring being diagonally split and having the surfaces of the split mutually engageable, said parts having means at upper and lower corners at the end of the split for rotationally connecting the parts and to effect a contractive, riding action of the selected corner, subjected to rotating pressure, on the opposed, split surface.

8. A stop-cock as set forth in claim 7, and in which said means includes a set of lugs on one of said parts interengaging in respective recesses in the other part; the lugs being located contiguous to upper and lower corners of the ring.

9. In a stop-cock, an expansively seating, diagonally split, ported, closure ring having internal lugs on the upper and lower corners of the ring at the ends of the split, and a rotary core in the ring having recesses in which the lugs have slight, angular shift; the core acting selectively on the lugs to effect a contractive, riding engagement of the said corners on the opposed split surface.

10. A stop-cock as set forth in claim 9, and in which the said lugs and recess walls have a lifting angle of pitch for their respective corners of the ring.

11. A stop-cock as set forth in claim 9, and in which there is means to limit relative, axial shift of the ring and the core.

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