

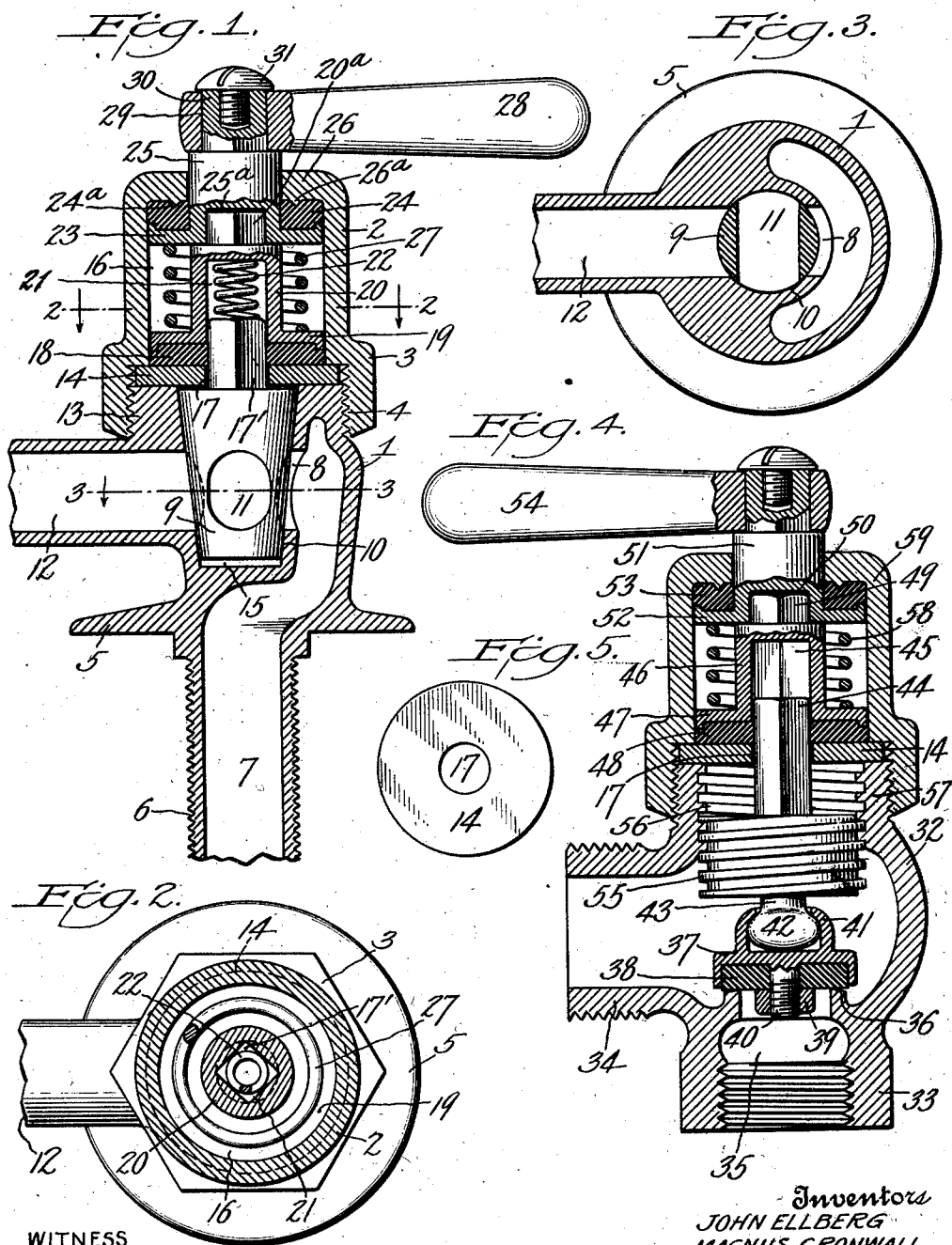
Dec. 31, 1929.

J. ELLBERG ET AL
VALVE, COCK, AND THE LIKE

1,741,983

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2 Sheets-Sheet 1



WITNESS

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Fig. 6.

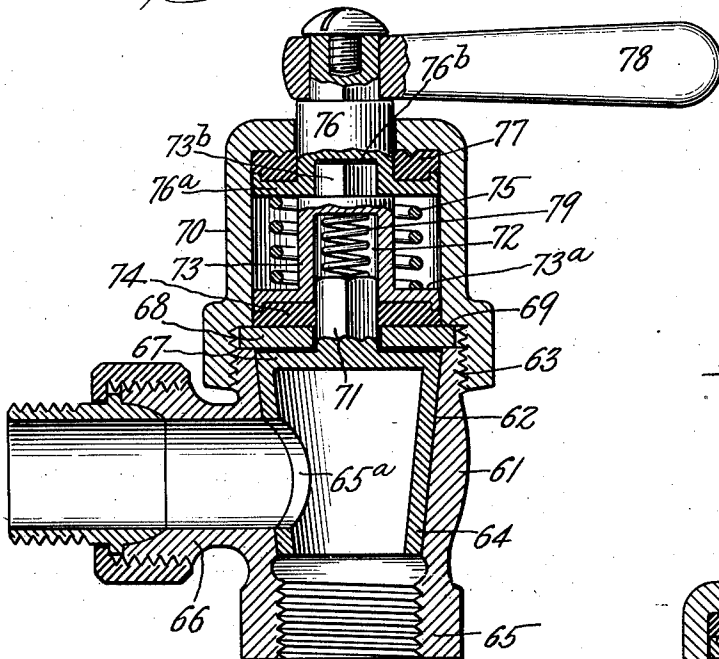


Fig. 7.

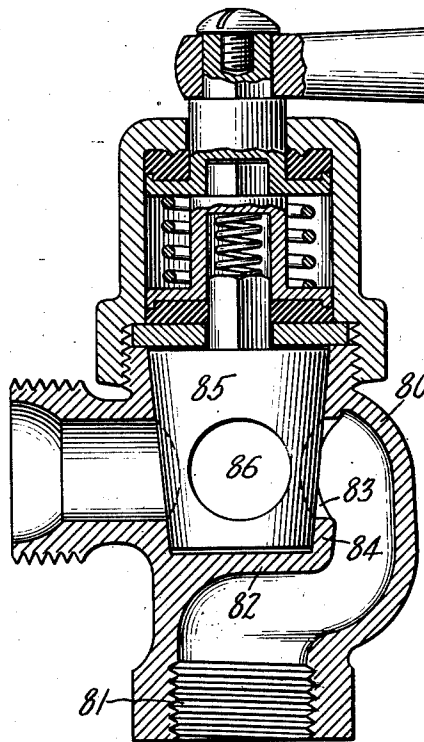
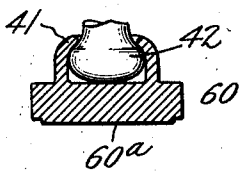


Fig. 8.



WITNESS

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UNITED STATES PATENT OFFICE

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VALVE, COCK, AND THE LIKE

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The present invention resides in an improved construction and arrangement of parts in valves, cocks, and the like, by means of which devices of this character may be simply and economically manufactured; rendered effective in service; and made to respond uniformly to the light pressure of a manipulator's hand.

One purpose of our invention is to provide means of improved construction whereby valves, cocks, and the like may be opened and closed while at the same time an effective fluid-tight connection between the valve housing and the valve operating parts may be maintained without the use of packing in and around the valve stem.

Another purpose contemplated by our invention is to provide valve-operating parts of improved sectional construction to avoid binding effects on the valve stem, to permit freer movements of the valve and operating parts, to produce a more perfect seating of the valve, and to improve the wearing qualities of said valve.

Other and more specific purposes of our invention will be understood from the specification, the constructional features relating thereto being recited in the appended claim and shown on the accompanying drawings.

In the drawings which show several embodiments of our invention,

Figure 1 is an axial section of a valve cock constructed in accordance with the principles of this invention, parts being broken away and parts shown in elevation.

Figure 2 is a transverse section on the line 2-2 of Figure 1.

Figure 3 is a transverse section on the line 3-3 of Figure 1.

Figure 4 is an axial section of an angular globe valve constructed in accordance with the principles of this invention, parts being broken away and parts shown in elevation.

Figure 5 is a plan view of the seating washer or partition employed for maintaining a fluid-tight connection between the valve-operating parts and valve-housing.

Figure 6 is an axial section of another type of valve cock constructed in accordance with

the principles of our invention, parts being broken away and parts shown in elevation.

Figure 7 is a view similar to Figure 1 and showing a modified form of the valve cock shown therein.

Figure 8 shows a modified form of the valve proper shown in Figure 4.

Referring to the embodiment of our invention shown in Figures 1, 2 and 3, the valve housing 1 is provided with a cap or bonnet 2, a flange 3 of said cap or bonnet being threaded at 4 to the upper neck portion 13 of the housing 1. Said housing 1 is provided with a base flange or bib 5 below which extends a threaded neck 6 provided with an inlet passage 7 leading to a port opening 8 which is controlled by a conical valve 9 seated on a frusto-conical seat 10. Valve 9 is provided with a port 11 which is adapted to be moved into and out of registry with the port opening 8 and thus to control the discharge of water from the passage 7 through a discharge outlet 12. Interposed between the threaded neck 13 of housing 1 and the lower edge of bonnet 2 is a seating washer or partition 14 which separates the valve chamber 15 from a disk-seating chamber 16. The washer or partition 14 is provided with a central opening 17 through which projects a square stem-section 17' carried by the valve 9. Bearing on the upper surface of partition 14 is a seating disk 18 which is mounted in the enlarged recessed end 19 of a hollow stem section 20 which is closed at the top and is provided with an axial socket or chamber 21 of rectangular cross-section for movably but non-rotatably engaging the square stem-section 17' on the valve cock 9. A helical compression spring 22 is interposed between the top wall of chamber 21 and the upper end of the squared extremity 17' for yieldably pressing the valve cock 9 into contact with its seat 10. Mounted in a recessed disk 23 is a seating disk 24 of suitable composition, said recessed disk being carried by a stem section 25 which is oscillatably mounted in the top wall 26 of the cap or bonnet 2. The fluid-tight joint between seating disk 24 and the inner surface of top wall 26 may be enhanced by the provision of a circular spur 26^a on the latter which

works in a corresponding annular groove 24^a in the upper surface of the former. Interposed between the axially spaced flanges or disks 19 and 23 is a helical compression spring 27 which exerts a yieldable pressure for pressing the seating disks 18 and 24 into close contact with the finished surfaces of washer 14 and top wall 26. Surmounting the stem 25 is a handle 28 provided with a square socket 29 to fit the reduced square section 30 of stem 25. It will be understood from this description that whenever the handle 28 is shifted in one direction or the other, the uppermost stem-section 25, intermediate stem-section 20, and the bottommost stem-section 17' will be moved together on their common axis to open or close the valve cock 9. A screw 31 retains the handle in position on the reduced portion 30 of the uppermost stem-section 25.

Referring now to the embodiment of our invention shown in Figure 4, an angular housing 32 is provided with an interiorly threaded neck 33 to receive an inlet pipe (not shown) and an exteriorly threaded neck 34, which may be connected to a service pipe (not shown). An inlet chamber 35 opens upwardly through an annular valve seat 36 through which the flow is controlled by means of a valve comprising a recessed cap 37 and a seating disk or washer 38 secured thereto by a nut 39 carried by a threaded stem 40. An inwardly deflected flange 41 on the cap member 37 articulately engages the rounded lower extremity 42 of a reduced neck 43 which is rigid with a valve-stem section 44 of rectangular cross-section. The valve-stem section 44 projects into a rectangular recess or socket 45 in a hollow stem section 46 which carries a recessed disk 47 for the reception of a composition seating disk 48. The disk 48 bears on the finished upper surface of the partition or washer 14, the valve stem section 44 being presented through the opening 17 in the washer 14. The valve stem section 46 is provided with a square end 49 which fits a recess or socket 50 of rectangular cross-section which is formed within the valve stem section 51. This valve stem section 46 is provided with a flange or recessed disk 52 for the reception of a seating disk 53. The valve stem section 51 carries a handle 54 which, when shifted, causes the valve 38 to be lifted from its seat 36 by means of a threaded enlargement 55 which screws into a threaded socket 56 formed in the inner wall of a neck portion 57 of the valve housing 32. A compression spring 58, which is interposed between the flanges or recessed disks 47 and 52, maintains the seating disks 48 and 51 in contact with the finished surfaces with which disk 14 and the inner top wall of a cap 59 are provided. Said cap 59 screws onto the exteriorly threaded wall of the neck portion 57. The seating disk 53 is preferably formed with an annular groove 53^a into which fits

a circular spur 59^a which is presented inwardly from the inner top wall of cap 59. As shown in Figure 8, the valve with its seating disk may be constructed in a single piece 60 with a raised pad 60^a provided with a finished machined surface adapted to seat against the annular valve seat 36 shown in Figure 4.

Referring now to the embodiment of our invention shown in Figure 6, an angular valve housing 61 is provided with an inverted frusto-conical seat 62 which opens upwardly through a threaded neck 63. An inverted frusto-conical valve-cock 64, which is made hollow, is open at its lower contracted end to admit fluid entering through a threaded inlet neck 65. A port opening 65^a in the lateral wall of the hollow valve-cock, is adapted to permit the discharge of fluid through a threaded outlet neck 66 whenever said valve-cock is open. Said valve-cock is preferably provided with a closed flat top wall 67 which is exposed on its inner surface to the pressure of the entering fluid and on its outer surface is slidably engaged by a washer or partition 68 which is clamped in position on the upper extremity of threaded neck 63 by means of an annular shoulder 69 formed in the inner wall of a cap 70, said cap being screwed onto the threaded neck 63. A central opening in the washer or partition 68 permits the oscillation of a square stem-section 71 which is integral with the valve-cock and fits into the square socket 72 of a hollow stem section 73 which is closed at the top. Said stem section 73 carries a seating disk 74 forming a close seal with the finished upper surface of washer or partition 68 under the pressure of a compression spring 75 which is interposed between the flanged lower ends 73^a and 76^a of stem section 73 and an uppermost stem section 76 respectively. The recessed flange 76^a carries a seating disk 77 which is pressed against the finished inner surface of the top wall of cap 70. A rectangular reduced end portion 73^b of the hollow stem-section 73 fits into a square socket 76^b in the uppermost stem section 76 which carries a wrench or handle 78. A compression spring 79 interposed between the square stem section 71 and closed top wall of the hollow stem-section 73 is employed to counteract the fluid pressure against the inner top wall of valve cock 64 to any desired degree.

In the embodiment of our invention shown in Figure 7, a form of valve-cock of somewhat similar construction to that shown in Figure 1 but arranged in an angular globe housing such as that shown in Figure 4 may be adapted for the control of fluids in pipes or conduits of relatively large cross-section. For this purpose, an angular globe valve housing 80 which is provided with an interiorly threaded inlet neck 81 of relatively large internal cross-section, is provided with

a baffle 82 extending across the direct line of flow of the entering fluid and deflecting said fluid into a laterally widened channel leading to a port opening 83 in a partition wall 84 which extends part way around an inverted frusto-conical valve head 85. Extending through the valve head 85 is a circular opening 86 which may be moved into and out of coaxial alinement with port opening 83 and the discharge outlet 87 of the valve housing. It will be understood from this description that a large volume of water may be thus controlled by a valve cock by the sectional stem connections described above under balanced fluid pressure and under a comparatively light axial pressure impressed upon the valve cock.

According to our improved valve and valve-cock operating device, it is readily seen that an effective fluid-tight seal may be maintained between the oppositely-presented seating disks and the finished bearing surfaces against which they press. All packing is thus avoided together with the undesirable binding and warping effects produced by the packings so commonly employed.

We claim:—

The combination with a valve housing provided with a cap threaded thereto, of a partition wall clamped to said valve housing by said cap, said partition wall being provided with a central opening, a valve in said valve housing, a valve-operating stem section extending through the opening in said partition wall, a seating disk provided with a hand-operated stem section rotatably mounted in the outer wall of said cap and rotatably abutting against the inner wall thereof, and a second seating disk rotatably abutting against said partition and having a stem section interengaging with the first-mentioned seating disk, said hand-operated stem section being non-rotatably connected to the second-mentioned seating disk.

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