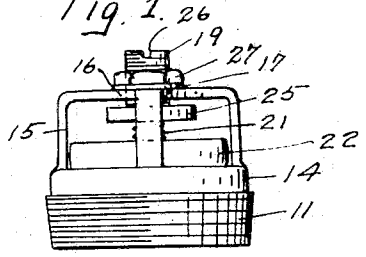
Dec. 5, 1933. D. B. EVANS 1,938,418

PUMP VALVE

Filed Dec. 24, 1932 2 Sheets-Sheet 1

Fig. 1.



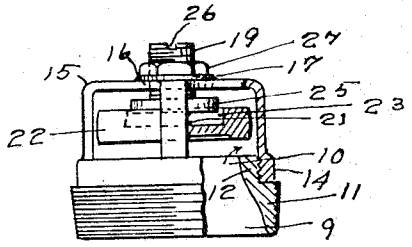
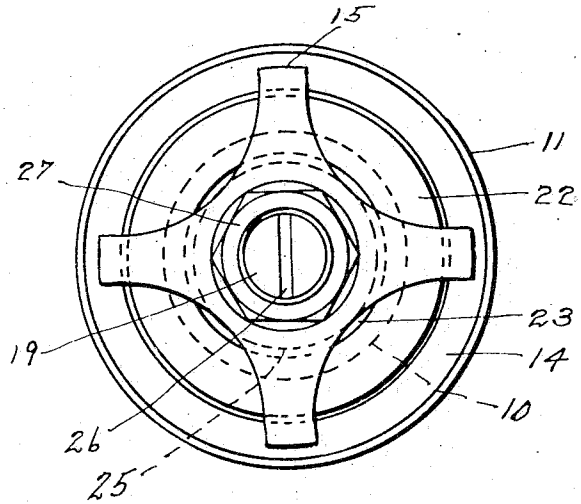


Fig. 4

Fig. 3.



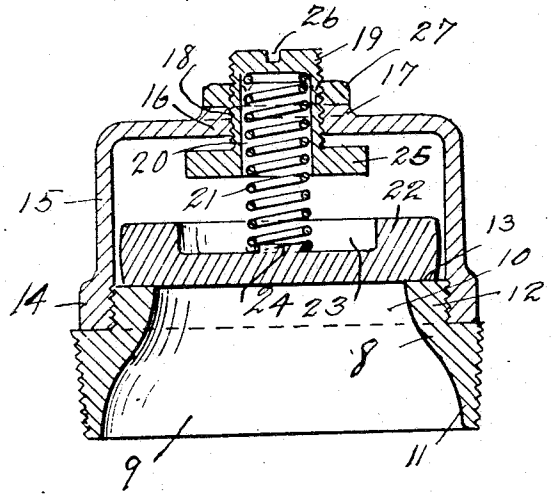


Fig. 2

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Dec. 5, 1933. D. B. EVANS 1,938,418

PUMP VALVE

Filed Dec. 24, 1932 2 Sheets-Sheet 2

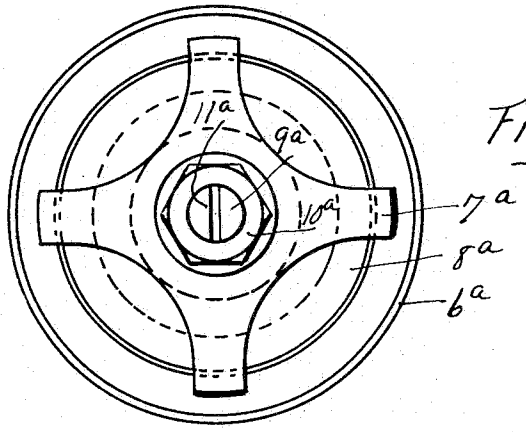


Fig. 5.

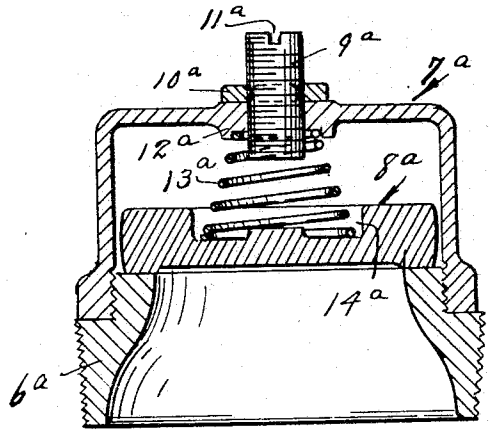


Fig. 6.

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Patented Dec. 5, 1933 1,938,418

UNITED STATES PATENT OFFICE

1,938,418

PUMP VALVE

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Application December 24, 1932
Serial No. 648,781

3 Claims. (Cl. 251—146)

My invention relates primarily to improvements in the construction of pump valves whereby the use of stems and the like is eliminated.

Another object is to provide means for assisting in absorbing the shock when the upward movement of the valve is checked on its opening movement and at the same time assist the valve to return to its seat and thus reduce the liability to distortion and injury to the valve member and cage to the minimum.

Another prime object is to provide means whereby the foregoing means may be adjusted to suit the particular fluid being pumped and to adjust or vary the upward movement of the valve to provide greater or less opening as desired or found necessary.

Other objects and advantages will appear hereinafter and, while I have shown and will describe the preferred form of my invention, it will be understood that I do not limit myself to such preferred form but that various changes and adaptations may be made therein without departing from the spirit of my invention.

In the drawings accompanying and forming a part hereof:

Fig. 1 is a side elevation of my valve detached from its place of use.

Fig. 2 is a central vertical section through Fig. 1, on an enlarged scale.

Fig. 3 is a top plan of Fig. 2.

Fig. 4 is a view similar to Fig. 1, but showing the valve in its open position and being partly broken away for clearness of illustration.

Figs. 5 and 6 are a top plan and central vertical section respectively of a modified form of my invention.

Referring to the drawings the body 8 of my valve is cylindrical in top plan having large and small communicating openings 9 and 10, respectively. The opening 9 is surrounded by an exteriorly screw threaded flange or rim 11, and the opening 10 is surrounded by an exteriorly screw threaded flange or rim 12 of smaller diameter than the flange 11. The upper edge of flange 12 forms a valve seat 13. Surrounding the screw threaded flange 12, in screw threaded engagement therewith is an annular ring 14 from the upper edge of which project upwardly a plurality of spaced arms 15, which arms extend upwardly for a suitable distance and then inwardly towards each other and are connected together by an enlarged central portion 16. Projecting upwardly from this portion 16 centrally thereof is a boss 17 and provided through this boss 17 and the portion 16 is an interiorly screw-threaded hole 18 and in this hole is screw threadedly mounted a downwardly opening spring housing 19 within which is provided a spring chamber 20, opening downwardly and mounted within this chamber 20 is the upper end of a spring 21. My valve comprises an annular disc 22 the outer periphery of which is curved on a true radius to prevent locking or jamming of the disc in case it should not travel upwardly parallel with the seat. Provided centrally in the upper face of the disc 22 is a concentric recess 23, and provided centrally of the bottom wall of this recess is an upwardly projecting boss 24 over which is positioned the lower end of the spring 21. Surrounding the lower end of the spring housing 19 is an annular flange 25 which is slightly smaller in diameter than the recess 23. A slot 26 is provided in the top wall of the housing 19 for the reception of the end of a screw driver or other suitable tool by means of which said housing may be rotated to increase or decrease the tension of the spring 21 or to raise or lower the flange 25 to limit the travel of the said disc, it being understood that the flange 25 is provided to act as a stop for the valve in its upward movement.

In the operation of my valve as the valve is raised from its seat by the suction or fluid pressure spring 21 will be compressed lengthwise, thus gradually increasing the resistance of said valve to upward movement as the spring compresses. As the suction or fluid pressure ceases the spring will act to return the valve downwardly to its seat. A lock nut 27 is provided upon the upper end of the spring housing 19 and provides means for locking said housing against accidental rotation and disturbing the setting of said housing. When it is desired to adjust the tension of spring 21 or the position of the flange 25 the lock nut 27 will first be loosened and the necessary tool then used to rotate the housing 19 to the right or left according to whether it is desired to raise or lower the same.

In Figs. 5 and 6, I have shown a modified form of my valve. In this form the body 6*a*, cage 7*a* and the valve 8*a* are similar to the preferred form with the exception that instead of the spring housing 19 a screw 9*a* is provided which projects through the top wall of the cage in screw threaded engagement therewith and its lower end acts as a stop for the valve in its upward movement. a lock nut 10*a* and slot 11*a* being provided as before explained. Projecting downwardly from the under side of the top wall

of the cage 7*a* is a boss 12*a* and bearing against this boss is the upper smaller end of a conical spring 13*a* and the lower end of this spring rests within the recess 14*a* of the valve 8*a*. The operation of this form of my device will be obvious from the description of the preferred form.

Having described my invention what I claim is:

1. In a valve the combination of a seat member having two exterior surfaces of different diameters exteriorly screw threaded and concentric with each other, the outer end of the smaller portion forming a valve seat, a valve mounted on said seat provided in its upper face with an annular recess, a valve retaining spider in screw threaded engagement with the smaller screw threaded portion of the seat member and having a top wall disposed in spaced parallel relation with said valve seat, a spring housing mounted in the top wall of said spider in screw threaded engagement therewith and movable relative thereto, a downwardly opening spring chamber in said housing, an upwardly projecting concentric abutment in the bottom wall of said valve recess, a coil spring having its upper end mounted in said spring chamber and its other end surrounding said abutment, an annular outstanding flange surrounding the lower end of said spring housing concentric therewith adapted to project loosely into said valve recess and form a fluid check therefor upon upward movement thereof, and means to lock said spring housing against rotation.

2. In a valve, the combination of a seat member having concentric large and small communicating openings in opposite ends, the large opening being the inlet opening and small opening being the outlet opening, the portion of the member surrounding the outlet being of less diameter than the portion surrounding the inlet, both of said portions being exteriorly screw threaded, a valve retaining cage in screw threaded engagement with the outlet portion of said member having a top wall disposed in spaced parallel relation with the upper end of said outlet portion, a concentric screw threaded opening in said top wall, a spring housing mounted in said last opening in screw threaded engagement therewith, a downwardly opening spring chamber in said housing, an annulus surrounding the lower end of said spring housing, a valve mounted in said cage adapted to close the upper end of said outlet opening and having an annular concentric recess in its upper face, said recess being adapted for co-operation with said annulus upon the upward movement of said valve to form a fluid check, a coil spring having its upper end positioned within said spring chamber and its lower end positioned upon the bottom wall of said recess, and means to lock said spring housing against movement.

3. In a valve assembly the combination of a seat member having large and small communicating openings in opposite ends thereof, the large opening being the inlet and the small opening being the outlet, the portion of said member surrounding the outlet being of less diameter than the portion surrounding the inlet, both of said portions being exteriorly screw threaded and the upper end of said outlet terminating in a valve seat, a valve retaining cage in screw-threaded engagement with the smaller screw threaded portion of the seat member and having its top wall disposed in spaced parallel relation with said valve seat, and having a concentric screw threaded opening therethrough, an exteriorly screw-threaded downwardly opening spring housing mounted in said opening to project above and below said top wall, a radially extending flange surrounding the lower end of said housing concentric therewith, a valve in said cage adapted to close the opening through said outlet and being provided in its upper face with a concentric recess adapted for coaction with said flange to form a fluid check for said valve upon its upward movement, a coil spring having its upper end mounted in said spring housing and its lower end upon the bottom wall of said valve recess, and means to lock said spring housing against rotation.

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