F. SCHREIDT.

VALVE.

APPLICATION FILED MAY 3, 1907.

914,886. **Patented Mar. 9, 1909.**

Fig. 1.

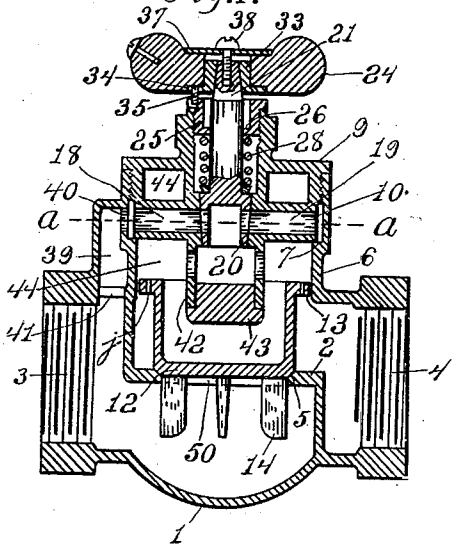


Fig. 9.

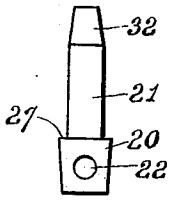


Fig. 2.

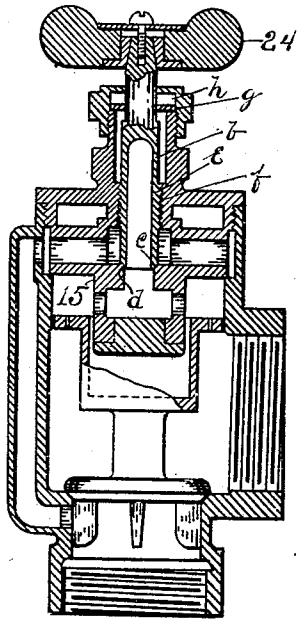


Fig. 3.

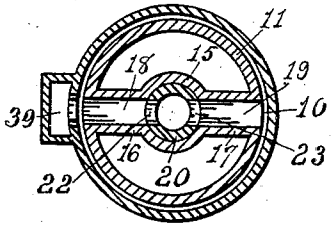


Fig. 5.

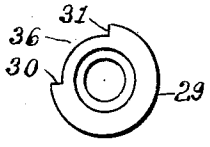


Fig. 7.

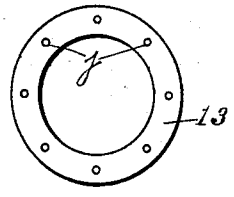


Fig. 4.

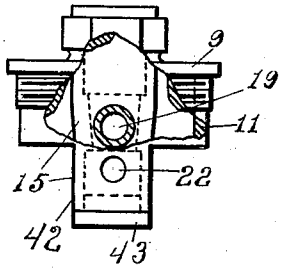


Fig. 6.

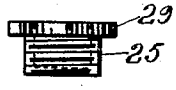
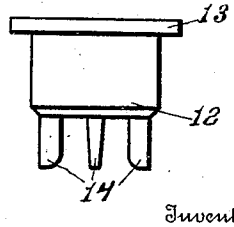


Fig. 8.



Witnesses

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VALVE.

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Application filed May 3, 1907. Serial No. 371,567.

To all whom it may concern:

Be it known that I, FRANK SCHREIDT, citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to rapid opening and closing fluid pressure valves and consists in providing a main piston valve adapted to open and close communication between the source of supply of the fluid and service pipe or other apparatus, the automatic operation of which is accomplished through the medium of an auxiliary valve physically disconnected therefrom.

The objects of my improvement are to construct a valve comprising a main valve that is normally closed by confining the fluid pressure within the valve casing in such a manner as to exert a pressure against the valve disk and to provide means whereby the fluid confined in the chamber, under pressure, will be released permitting the main valve to open.

My invention further consists in the construction and arrangement of the parts hereinafter described in the specification and claims.

In the drawings, Figure 1 represents a sectional elevation of an ordinary globe valve showing the application of my invention thereto with preferred form of auxiliary valve. Fig. 2 is an elevation of an ordinary angle valve embodying my invention showing a modified construction of the auxiliary valve. Fig. 3 is an inverted cross-sectional view of Fig. 1 taken on the line *a a*. Fig. 4 is a side view of the tubular cap upon which the auxiliary valve is mounted with a portion broken away to show means of communication from the auxiliary valve into the ports formed in the cap. Fig. 5 is a plan view of a cup-shaped plug having a washer made integral with a portion cut away to receive a pin and form stops to regulate the rotation of the operating handle of the auxiliary valve. Fig. 6 is a side view of Fig. 5. Fig. 7 is a plan view of the main piston valve showing apertures formed in the piston. Fig. 8 is a side view of Fig. 7 showing the construction of the main valve and piston. Fig. 9 is a detail view of the hollow tapered plug valve and stem showing apertures formed therein which register with the ports formed in the cap when the valve is open.

Referring to the drawing, 1 represents an ordinary globe valve body having a partition wall 2 formed within the body with an opening therein communicating with the outlet aperture 3 and inlet aperture 4. The longitudinal section of the partition wall 2 is provided with a valve seat 5 formed thereon surrounding the opening (50) communicating with the inlet and outlet apertures. The valve body is provided with an upwardly extending portion (6) having an inwardly extending annular shoulder 7 formed within the valve casing. The inner periphery of the upper portion 6 is interiorly screw-threaded to engage with the threaded exterior of the cap 9. An annular recess 10 is formed in the portion 6 of the valve body with the wall or ring 11 of the cap resting upon the shoulder 7 and forming a closure for the recess 10 forming an annular port, the purpose of which will be described hereinafter. A main valve 12 carrying a piston 13 and wings 14 is adapted to seat upon the seat 5 to normally close the opening between the inlet and outlet apertures. The piston 13 fits the inner periphery of the valve body loosely and guides the upper portion of the valve structure while the wings 14 guide the lower portion thereof keeping the main valve in alinement with its seat when it is opened or closed by the fluid. The cap 9 is preferably constructed to conform to the shape shown in Fig. 4 with a central depending tubular portion 15 having tubular arms 16 and 17 extending therefrom forming ports 18 and 19. The ports 18 and 19 communicate with the annular recess 10. A tapered aperture is formed in the depending tubular portion 15 into which a hollow tapered plug or auxiliary valve 20 is fitted leaving the stem 21 projecting out through the top of the cap. The hollow valve 20 is provided with alined apertures 22 and 23 which register with the ports 18 and 19 when the operating handle 24 is rotated to open the main valve. In order to keep the plug valve 20 in close contact with the tapered aperture and prevent leakage of the fluid past the stem, I provide a cup-shaped screw-threaded plug 25 which is provided with an inwardly extending annular flange 26 to loosely fit the stem 21 of the valve 20 and form a shoulder. The stem 21 of the valve 20 is made smaller in diameter than the valve, forming a shoulder 27. A coil spring 28 is interposed between the annular flange 26 and the shoulder 27 exerting a pressure

downward against said valve keeping it in close contact with the tapered aperture and automatically taking up the wear of the parts. A washer 29 is made integral with the plug 25 and a portion in the form of a segment of a circle cut away to provide the stops 30 and 31 to stop the rotation of the operating handle when the auxiliary valve 20 is in full open or closed position or in other words, when the apertures in the valve do or do not register with the ports 18 and 19 of the cap. The free end 32 of the valve stem is preferably formed rectangular in shape to fit a corresponding aperture formed in a bushing 33 inserted in the operating handle 24. A flange 34 is made integral with the bushing and carries a pin 35 which depends into the opening or slot 36 formed in the washer 29 and is adapted to contact with the stops 30 and 31 stopping and regulating the rotation of the operating handle. The bushing is secured to the operating handle by the plate 37 and screw 38. A by-pass 39 communicates with the annular recess 10 and ports 18 and 19 through the opening 40 and with the outlet 3 through the apertures 41. A tubular boss 42 is formed on the cap depending into the hollow portion of the piston and a buffer 43 is inserted in the open or free end to receive the impact of the main valve when it is forced to ascend by the fluid pressure when the auxiliary valve is opened and the fluid is released from the valve chamber 44.

In Fig. 2 I have shown a modification of my valve structure with my improvements applied to what is known as an angle valve. Instead of using a plug tapered valve I employ a hollow valve stem (*b*) having a valve (*c*) formed upon its lower extremity. A seat (*d*) is formed upon the tubular portion 15 of the cap. The outer periphery of the valve stem is provided with an enlarged threaded portion (*e*) which is adapted to engage with the threaded inner periphery *f* of the cap which provides a means of opening or closing the auxiliary valve to release or confine the fluid pressure within the valve casing as described in Fig. 1. In order to prevent leakage past the stem *f*, I employ an ordinary stuffing box *g* to receive the packing *h* which is held in frictional contact with the stem. The parts shown in Fig. 2, and not herein described are substantially the same as shown in Fig. 1.

The operation of both valves is the same in principle, therefore it will suffice to describe the operation of the structure shown in Fig. 1, which is as follows: The fluid enters the inlet opening 4 and when the main valve is in its closed position as shown the fluid passes around the piston 13 and through the apertures (*j*) into the chamber 44 where it is confined and normally exerting a pressure downward against the main valve keeping the main valve closed when the auxiliary valve is closed which cuts off communication with the by-pass 39. When it is desired to open the main valve, the operating handle 24 is rotated opening the auxiliary valve and permitting the confined fluid to enter the ports 18 and 19 and pass into the annular recess 10 and thence through the by-pass 39 into the outlet aperture 3 relieving the pressure of the fluid upon the top of the main valve and the fluid from the inlet then exerts a pressure against the piston 13 forcing it to ascend and open the main valve. It will be noted that the instant the auxiliary valve is opened or closed the main valve will be forced from or upon its seat alternately cutting off the flow of the fluid or permitting it to pass through the valve. Attention is called to the fact that the main valve is not connected to the auxiliary valve and is operated automatically by the fluid pressure upon the principle of confining and releasing the fluid pressure within the valve body.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:

1. A valve comprising a body with inlet and outlet openings, a partition wall formed within the valve casing having a valve seat formed thereon, a main valve carrying a piston fitted within the valve body and adapted to contact with said seat, a tubular cap fitted to said valve body, an auxiliary valve mounted upon said cap, arms having ports formed therein carried by said cap, said auxiliary valve providing means whereby a portion of the fluid can be confined within and released from the valve casing.

2. In a fluid pressure valve comprising a valve body with an inlet and outlet aperture and a projecting portion made integral therewith to form a chamber, a tubular cap threadably connected to said projecting portion, an auxiliary valve mounted on said cap, arms made integral with said cap with ports formed therein communicating with an annular recess formed in the inner periphery of the valve body, a by-pass connecting said annular recess and outlet.

3. A fluid pressure valve comprising a valve body having an inlet and outlet aperture and a projecting portion forming a valve chamber, a tubular cap threadably connected to said projecting portion, a central portion depending from said cap having arms extending outwardly therefrom with ports formed therein communicating with an annular recess formed in the valve body, a ring secured to said arms and adapted to close said annular recess, a by-pass communicating with the chamber formed in the valve body and the outlet opening, and means to confine or release the fluid from the main valve chamber.

4. In a fluid pressure valve comprising a valve body with an inlet and outlet aperture, a main valve carrying a piston mounted within the valve body, a cap secured to said body, an auxiliary valve mounted in said cap, means to keep said valve firmly seated, arms having ports formed therein projecting from said cap, a ring made integral with said arms, an annular recess formed in the inner periphery of the valve body with its open side closed by said ring.

5. A valve comprising a body with inlet and outlet openings, a main valve mounted within the casing with a piston formed upon the upper extremity, a cap having ports extending outwardly from the center thereof and communicating with an annular recess formed in the inner periphery of the valve body, a tapered plug valve having a hollow central portion seated in said cap and adapted to permit or prevent the flow of the fluid through said valve as described and set forth.

6. In a fluid pressure valve a body having an inlet and outlet opening, a cap secured thereto having a portion depending into the body of the valve; said cap having outwardly extending ports formed thereon, and communicating with an annular recess formed in the body of the valve, a main valve carrying a piston fitted within the body of the valve and adapted to permit and cut off the flow of fluid therethrough, a by-pass formed on one end of the valve and communicating with the outlet opening, a manually operated valve fitted to the cap and adapted to permit or prevent communication from the inlet to the outlet opening.

7. In a fluid pressure valve comprising a valve body with inlet and outlet openings, a main valve carrying a piston mounted within the valve body, a cap secured to said body, an auxiliary valve mounted in said cap, means to keep said valve firmly seated, arms having ports formed therein projecting from said cap, a ring made integral with said arms, an annular recess formed in the inner periphery of the valve body with its open side closed by said ring.

8. In a fluid pressure valve, having inlet and outlet opening, a main valve carrying a piston mounted within the valve casing, a cap secured to the upper portion of the valve having a portion depending into the valve casing with ports extending therefrom and connecting with an annular recess formed in the valve body casing, a tapered plug valve fitted to a seat in said cap, means to normally hold said valve in contact with its seat, a by-pass formed in the valve body casing communicating with an annular recess formed therein and also with the outlet opening, said tapered plug being provided with apertures adapted to aline with the ports formed in said cap, the annular recess and the by-pass.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK SCHREIDT.

Witnesses:

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