

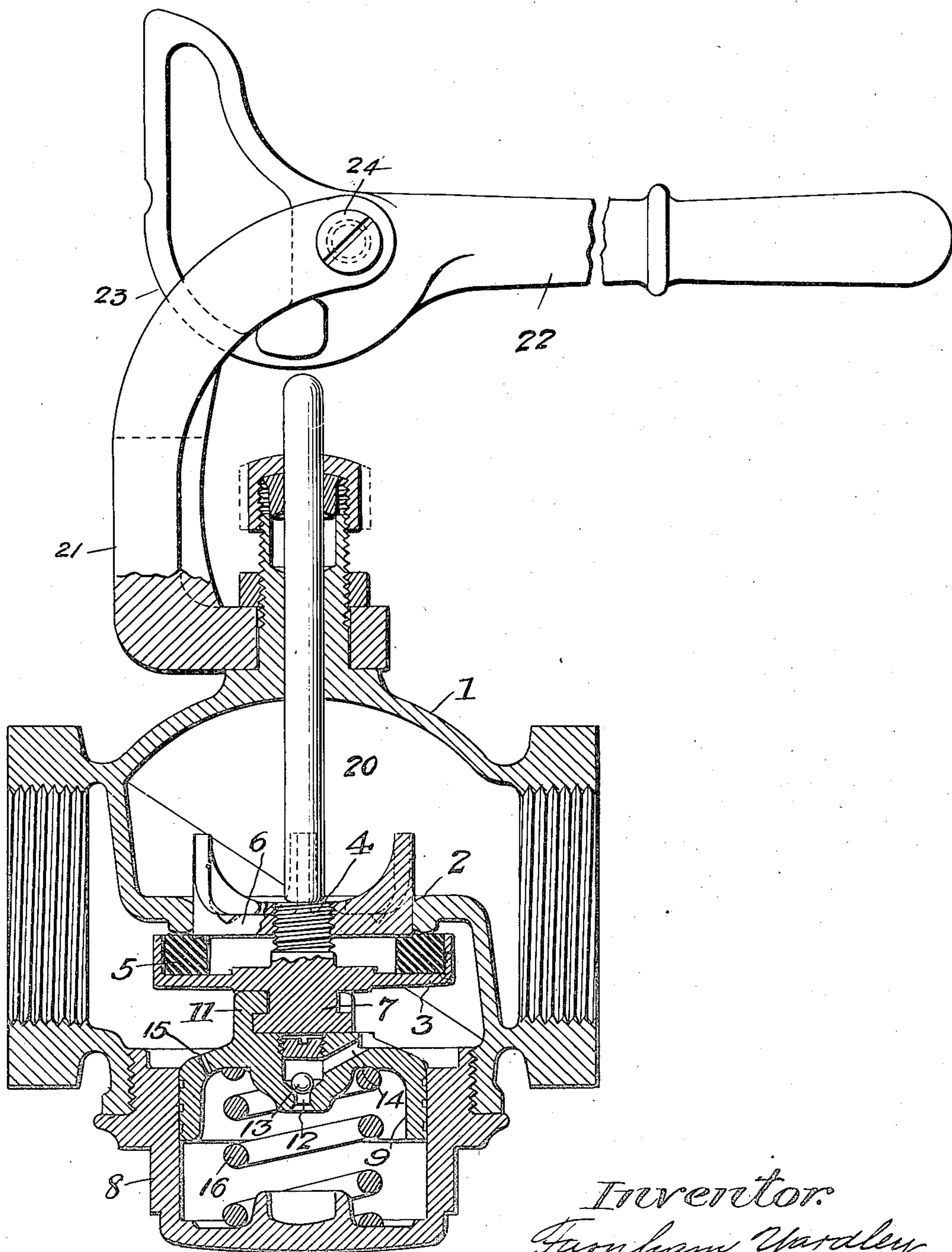
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F. YARDLEY

VALVE

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Inventor.  
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## UNITED STATES PATENT OFFICE.

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## VALVE.

Application filed May 4, 1922. Serial No. 558,437.

*To all whom it may concern:*

Be it known that I, FARNHAM YARDLEY, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a novel and useful construction of a valve provided with means for effecting a quick opening thereof, and with means for preventing the rapid closing of the valve, which would produce the objectionable effect known as water-hammer.

In my copending application, Serial Number 506,518, filed October 8th, 1921, I have described and claimed a valve involving a particular type of operating mechanism, and the object of the present invention is to supplement the operating means of the quick action type of valve illustrated, with a special construction of valve and associated dash-pot mechanism, that will be effective in producing a gradual closing of the valve without undue jar or shock, without, in any way, interfering with the rapid opening of the valve.

The invention is illustrated in the accompanying drawing, in which the figure shows the valve in vertical sectional elevation.

Referring to the drawing, 1, indicates the valve casing, which is preferably of the globe type, having the valve seat 2, in the cross partition, the casing being provided with the usual threaded inlet and outlet connections.

Co-operating with seat 2, is the valve proper, which comprises a metallic cup-like section 3, having a central screw threaded boss 4, on one side, and a T-headed lug 7, on the opposite side. Within the cup-like member 3 is fitted a seating ring 5, which engages the annular rim of the valve seat 2, said ring 5, being held in position by means of a spider-like nut 6, adjustably mounted on the threaded boss 4, and snugly fitting the opening in the valve seat 2, thereby serving as a guide for the valve in its opening and closing movements, and also constituting an additional closure for the opening in

the valve seat, the passage through the latter being opened only when the valve proper has been completely unseated and moved to an extent sufficient to cause the peripheral rim of the spider member 6, to move below the edge of the valve seat.

The lower end of the valve casing is provided with a threaded opening in which is fitted a hollow cap 8, which constitutes the cylinder of a dash-pot or check device, the other elements of which comprise a piston member 9, working in the cylinder, and which is loosely connected to the boss 7, on the under side of the valve by a neck 11 having a keyhole slot slidably engaging the boss 7; the piston member having a central vent opening 12, closed by a ball check valve 13, and an exhaust passage 14, communicating with the passage 12, a small port 15, being provided in the piston to admit the pressure to the under side thereof, slowly. Preferably a helical spring 16 is interposed between the under surface of the piston 9, and the end of a cylinder cap 8, and normally assists the pressure in seating the valve.

The valve is normally unseated by means of a loose stem 20 passing through a suitable packing gland and engaging the upper end of the threaded boss 4, the outer end of stem 20, being operatively engaged by the cam end 23, of the lever 22, pivoted at 24, to a suitable bracket 21, adjustably connected to the neck of the valve casing.

In the normal operation of the valve, as described, when the valve stem 20 is depressed by the proper manipulation of the handle 22, the ring 5, of the valve member, is first disengaged from the valve seat, and the spider member 6 is moved downward sufficient to clear the rim of the valve seat, and thereby opening up the passage through the valve. The piston member 9, which is loosely connected to the under side of the valve moves downward against the tension of spring 16, the fluid pressure on the under side of the piston being released through the passage 12, past the ball check 13, and thence through the lateral passage 14. This passage is of sufficient size to permit the instant release of pressure below the piston, so that the latter does not interfere with the quick action in opening the valve. When it is desired to close the valve, the handle is swung to the position shown in the draw-



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ing, thereby permitting the spring 16, and the fluid pressure on the underside of the valve, to close the latter. If the valve were permitted to close quickly, under the influences of these two forces, it would be liable to quick deterioration because of the heavy impact between the valve and the seat, and would also produce the objectionable effect known as water-hammer.

10 In order to avoid these difficulties, the valve is caused to seat slowly and without undue shock, first, by the throttling action of the spider member 6, and second, by the retarding action of piston 9, which will rise only as fast as the pressure on the inlet side of the valve seeps into the cylinder of the dash-pot, through the small opening 15, in the piston, the check valve 13, serving to prevent the pressure passing to the under side of the piston, through passages 14 and 12.

It will be particularly noted that the connection between the valve proper and the piston is such as to permit a relatively free movement between these elements, and as both of said elements are loosely mounted in the valve casing, and are held therein principally by the cap 8, it will be apparent that the parts may be readily removed for inspection, adjustment or repair, after which

they may be quickly restored to their proper positions within the casing.

What I claim is:

1. The combination of a valve casing, a transverse valve seat therein, a valve closing against said seat, having a T-headed lug on the rear face, a hollow screw cap forming a cylinder engaging in an opening in the bottom of the casing, a piston working in said cylinder and having a slotted neck surrounding the lug on the valve, an exhaust passage in said piston having an inwardly seating ball check therein, and a relatively small inlet passage in said piston to slowly admit the pressure to the cylinder.

2. The combination of a valve casing having a transverse valve seat therein, a hollow screw cap forming a cylinder mounted in an opening in the casing opposite the valve seat, a disk valve closing against said seat, a piston working in said cylinder, means for detachably connecting the piston to the rear of the valve disk, an exhaust passage in the piston, an outwardly opening check valve in said passage, and a relatively small inlet passage in said piston to admit pressure gradually to the cylinder.

In testimony whereof I affix my signature.  
FARNHAM YARDLEY.