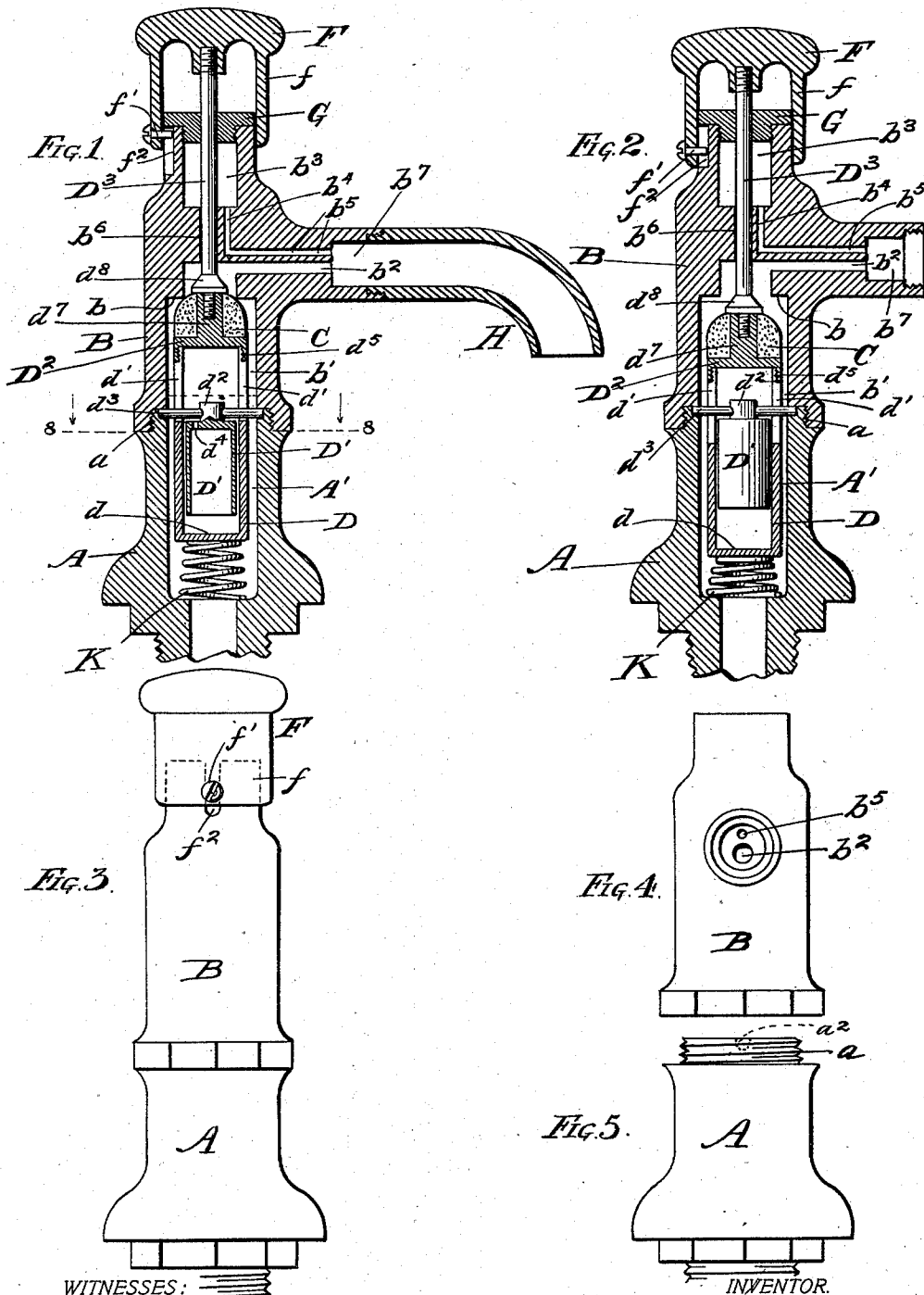


F. H. MASON.
AUTOMATIC VALVE.

(Application filed June 24, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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F. H. MASON.
AUTOMATIC VALVE.

(Application filed June 24, 1901.)

(No Model.)

2 Sheets—Sheet 2.

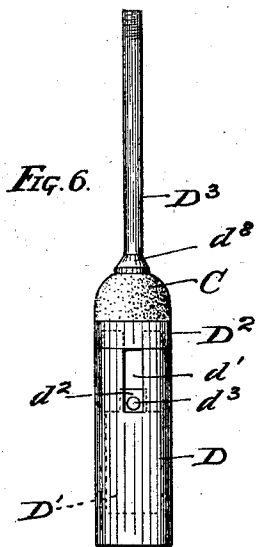


Fig. 7.

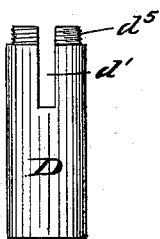


Fig. 8.

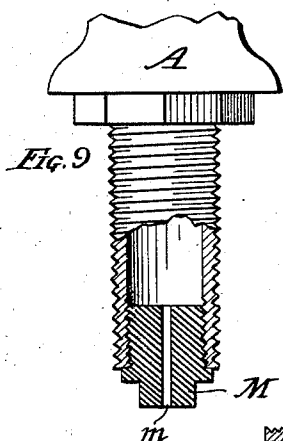
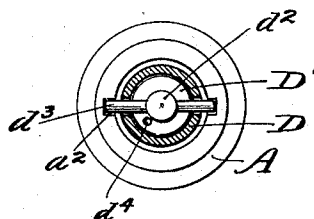


Fig. 10.

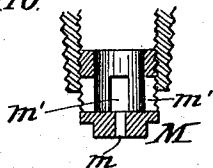


Fig. 11.

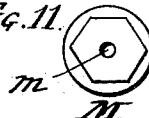


Fig. 12.

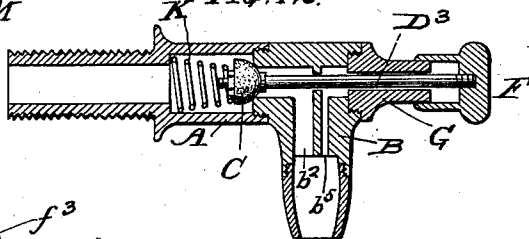


Fig. 13.

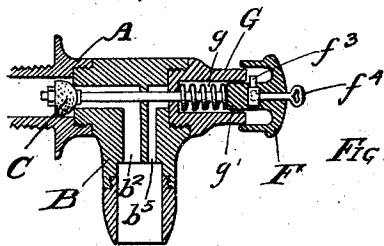
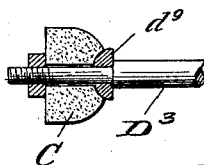


Fig. 14.



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UNITED STATES PATENT OFFICE.

FREDERIC H. MASON, OF SPOKANE, WASHINGTON.

AUTOMATIC VALVE.

SPECIFICATION forming part of Letters Patent No. 698,530, dated April 29, 1902.

Application filed June 24, 1901. Serial No. 65,791. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC HAMILTON MASON, a citizen of the United States, residing in Spokane, in the county of Spokane and State of Washington, have invented a new and useful Improvement in Automatic Valves, of which the following is a specification.

My invention relates to automatically-closing valves.

10 The object of my invention is to provide an automatically-closing valve which will at once be of simple and cheap construction and which will effectually prevent all tendency to water-hammer or chatter when used for drawing
15 fluids under pressure.

The nature of my invention will be readily understood by those skilled in the art from the accompanying drawings, forming a part of this specification, and in which like letters
20 of reference indicate like parts.

In said drawings, Figure 1 is a central vertical section through a valve or faucet embodying my invention, showing the valve closed. Fig. 2 is a similar view showing the
25 valve open. Fig. 3 is a rear elevation. Fig. 4 is a front elevation, the delivery-spout removed. Fig. 5 is a front elevation of the lower fitting. Fig. 6 is a front elevation of the double-acting fluid cushion. Fig. 7 is a
30 detail front elevation of the outside cylinder or member of the fluid cushion. Fig. 8 is a cross-section on the broken line 8 8 of Fig. 1. Fig. 9 is an elevation, partly in section, of the lower fitting. Fig. 10 shows the preferred construction of the reducing-plug in the lower
35 fitting. Fig. 11 is a bottom view of the reducing-plug. Fig. 12 is a central vertical sectional view illustrating my invention as applied to a horizontal faucet. Fig. 13 is a similar view showing the preferred construction of the horizontal faucet, and Fig. 14 is a detail
40 section of the valve and stem shown in Figs. 12 and 13.

In said drawings, A represents the lower
45 fitting or part of the valve-shell, which connects with the source of fluid-supply, and B is the upper or main fitting of the valve-shell, united by screw-threads a with the fitting A. The valve-shell A B is furnished with an interior fluid-cushion chamber A', in which fits
50 the fluid cushion, composed of two telescopic

parts D and D'. The valve-shell is also provided with a valve-seat b , against which fits the valve C. The main fitting B also has a valve-chamber b' , a contracted outlet-channel b^2 , a drainage-chamber b^3 , and a drainage-channel b^4 b^5 , and a valve-rod channel b^6 , and a delivering-chamber b^7 , into which the contracted outlet-channel and drainage-channel lead parallel and closely adjacent to each other, the same terminating in the delivering-chamber very near each other, so that the fluid flow under pressure through the contracted outlet-channel into the enlarged delivery-chamber will suck or draw any liquid that
55 may collect in the drainage-chamber out of the same and prevent liquid accumulating in the drainage-chamber under pressure and overflowing or leaking around the valve stem or rod.

The outer cylinder D of the fluid cushion has an integral solid closed bottom d and is provided with slots d' d' , extending from about its middle portion to its upper end. The inner piston portion or member D' of the fluid cushion is preferably of an inverted-cup shape in form and is provided with a stem d^2 , through which extends a pin d^3 , rigidly secured thereto, and the ends of which fit in suitable notches or recesses a^2 in the lower fitting A at its
75 junction with the upper fitting B of the valve-shell. The inner or piston member D' of the fluid cushion is thus held stationary in the valve-shell, while the outer or cylinder member D reciprocates with the valve to which it is connected. The inner piston member D' is provided with a minute opening or vent d^4 , which prevents all tendency to chatter that might be caused by confined air in situations where the water or fluid pressure is very high. The upper end of the outer cylinder D is provided with screw-threads d^5 , by which it is united to the cap D², that closes its upper end, said cap having a lower screw-threaded flange d^6 for this purpose. The cap
85 d^2 also forms a support or holder for the valve C and is provided with a central screw-threaded projection d^7 to receive the valve C and for connection with the valve stem or rod D³, which is furnished with a screw-threaded lower end and with an integral button or
90 shoulder d^8 to hold the valve in place and

prevent its slipping up on the valve-rod under excessive pressure. The upper end of the valve-rod D^3 is screw-threaded to a knob or handle F for operating the valve. The drainage-chamber b^3 is closed at its upper end by a screw-plug G, having a hole through which the valve-rod extends. The knob F has a depending flange f , which surrounds and telescopes upon the upper end of the valve shell or fitting B and is connected thereto by a screw or pin f' , which fits in a vertical slot f^2 in the upper end of the fitting B, so as to permit the necessary up-and-down movement of the knob and valve, while preventing any rotary movement of either.

H is the delivery-spout, screw-threaded to the end of the delivery-chamber b^7 .

To aid in seating the valve and holding the same seated at all times, I provide a loose supplemental spring K. As illustrated in Figs. 1 and 2, this spring bears against the fluid cushion which is connected to the valve and valve-rod. In Fig. 12 I have illustrated this spring as bearing directly against the valve, and in Fig. 13 I have shown the plug G as provided with a separate chamber g to receive the spring and the valve-rod as provided with a button or collar g' for the spring to bear against. This construction is specially applicable for use with liquids other than water, which might corrode or weaken the spring. In Fig. 13 the knob F is shown as provided with a lock-bolt f^3 and key f^4 for turning the lock-bolt to prevent the operation of the valve when the bolt is in its locked position, as shown in Fig. 13. For use with hot liquids the knob F should be made of non-heat-conducting material. In Figs. 12, 13, and 14, in which I prefer to solder the knob fast to the valve-rod, I use a loose or removable collar or button d^9 instead of the integral collar d^8 to hold the valve in place on the valve-rod.

The lower end of the fitting A, I provide with a screw-threaded reducing-plug M for use in locations where the water-pressure is exceedingly high. In the preferred construction of this reducing-plug (shown in Fig. 10) it is provided with a small central opening m and four lateral slot-shaped openings m' , which may be closed off to a greater or less extent by screwing the plug in as desired. In Fig. 9 only the small central opening is shown.

As in my construction, the valve as a whole is composed of few parts, and as the chambers and channels in the same are all straight and circular in form the same can be rapidly and cheaply bored with automatic machines, and the valve may thus be very cheaply manufactured and put together, and at the same time it is efficient and effective in operation in every situation.

By locating the extremity of the drainage-channel immediately alongside of the outlet-channel and where the fluid being delivered under pressure or by gravity reaches an en-

larged space and expands leakage around the valve-rod is effectually and entirely prevented. If the drainage-channel were simply connected with the valve-rod channel without the drainage-chamber, the leakage around the head of the valve-rod would not be entirely overcome; but by providing the drainage-chamber the fluid which escapes from the valve-chamber when the valve is operated reaches the drainage-chamber and expands and is entirely siphoned out by the current created by the flow of fluid through the outlet-channel. This stoppage of overflow would not be overcome entirely if the drainage-channel reached to the end of the delivery-spout or any other place than exactly alongside of the outlet-channel, as shown.

In my invention the valve is of a very strong and durable construction and very cheap to manufacture as a whole, and the valve itself is prevented from slipping up on the valve-rod under high pressure by the integral collar or button on the valve-rod. As the slots in the outside cylinder of the fluid cushion extend to the open end thereof, the same can be very cheaply formed by a simple sawing operation, and the transverse pin being rigidly secured to the inner member of the fluid cushion it can be simply driven or forced in and held by a wedging or swaging fit before the two cylinders are assembled, as the open-ended slots in the outer cylinder permit this.

I do not herein claim the subject-matter of my copending application, Serial No. 40,240, filed December 18, 1900. In the present application the pin d^3 is rigidly secured to the inner or piston member D' , while in said copending application the pin d^3 is removably secured by screw-threads to the inner or piston member D' , such construction being required, as in said copending application the slots d' do not extend to the extremity of the outer cylinder D, as in the improved construction of the present application.

I claim—

1. The combination with a valve, of a valve-shell having two screw-threaded fittings, a two-part fluid cushion, one part connected to the valve and movable therewith, and a transverse pin fitting between said sections of the valve-shell and rigidly secured to the inner member of the fluid cushion, substantially as specified.

2. The combination with a valve, of a valve-shell having two screw-threaded fittings, a two-part fluid cushion having an inner or piston member connected to the valve-shell and having an outer or cylinder member provided with a screw-threaded cap at its upper end, said cap also forming a support or holder for the valve, substantially as specified.

3. The combination with a valve-shell and valve, of a two-part, double-acting fluid cushion immersed in and its interior connecting with the fluid under pressure within said shell, said fluid cushion having an outer slotted cylinder member and an inner inverted-

cup-shaped piston member provided with a minute opening or vent in its upper end, substantially as specified.

4. The combination with a valve-shell and valve, of a fluid-cushion cylinder member D, having opposite slots d' extending from its middle portion to its upper end, and an inner piston member provided with a transverse pin secured to the valve-shell, substantially as specified.

5. The combination with a valve-shell and valve, of a fluid-cushion cylinder member D, having opposite slots d' extending from its middle portion to its upper end, and an inner piston member provided with a transverse pin secured to the valve-shell, said outer cylinder D having a removable screw-threaded cap forming also a holder for the valve, substantially as specified.

6. The combination with a valve-shell and valve, of a fluid-cushion cylinder member D, having opposite slots d' extending from its middle portion to its upper end, an inner piston member provided with a transverse pin secured to the valve-shell, said outer cylinder D having a removable screw-threaded cap forming also a holder for the valve, and provided with screw-threads for connection with the valve-rod, substantially as specified.

7. The combination with a valve and valve-shell, of a valve-rod, a knob for reciprocating the valve-rod furnished with a flange telescoping on the valve-shell, and a lock-bolt and key, substantially as specified.

8. The combination with a valve, of a valve-shell having two screw-threaded fittings, a double-acting two-part fluid cushion, connected one part to the valve-shell and one part to the valve, and a reducing-plug in the

lower fitting of the valve-shell, substantially as specified.

9. The combination with a valve, of a valve-shell having two screw-threaded fittings, a double-acting two-part fluid cushion, connected one part to the valve-shell and one part to the valve, and a screw-threaded reducing-plug provided with lateral openings in the lower fitting of the valve-shell, substantially as specified.

10. The combination with a valve and valve-stem, of a valve-shell having two screw-threaded sections, a transverse pin between the meeting ends of the sections, a fluid-cushion piston secured to said pin, a reciprocating fluid-cushion cylinder having longitudinal slots to receive said pin, a removable screw-threaded cap closing its upper end to receive said valve and to receive the threaded end of the valve-stem, said valve-stem being provided with an integral collar or shoulder to hold the valve in place on said cap, substantially as specified.

11. The combination with a valve and valve-shell, having two screw-threaded fittings, and provided with a valve-chamber, a contracted outlet-channel, a delivery-chamber, a drainage-chamber and a drainage-channel terminating in said delivery-chamber adjacent to and at the mouth of said contracted outlet-channel, and a screw-plug closing said drainage-chamber, and provided with a spring-chamber and spring to act against the valve-rod, substantially as specified.

FREDERIC H. MASON.

Witnesses:

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EDW. S. EVARTS.