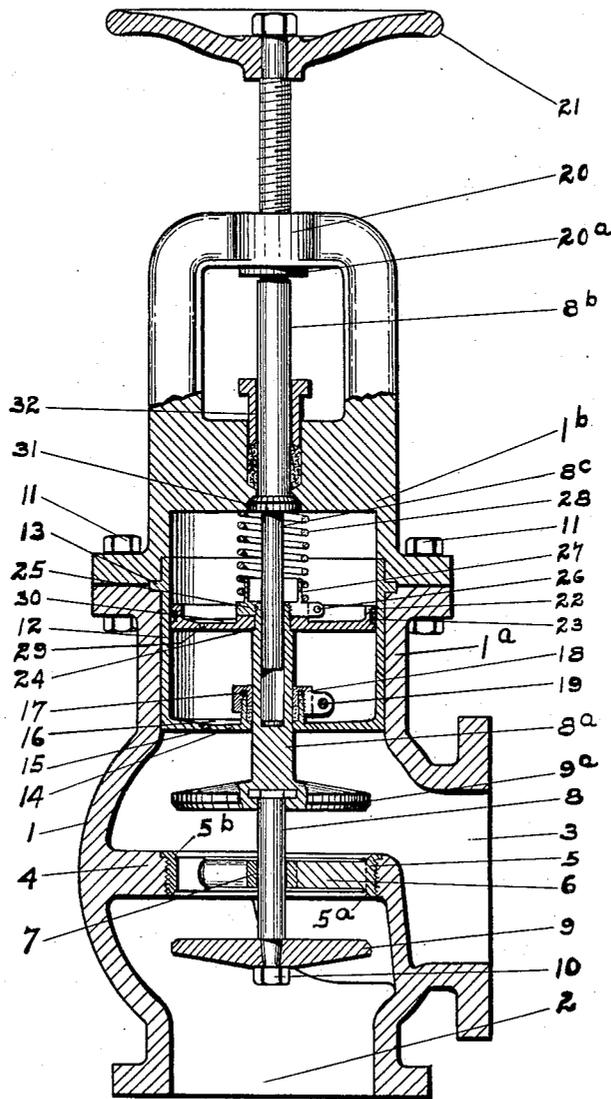


E. E. HAUER,
 AUTOMATIC VALVE.
 APPLICATION FILED OCT. 16, 1911.

1,171,610.

Patented Feb. 15, 1916.
 2 SHEETS—SHEET 1.

FIG. 1.



Inventor

Witnesses

L. Brownellgen
Virgil Baker

By

Elmer E. Hauer
Oscar Norton

Attorney

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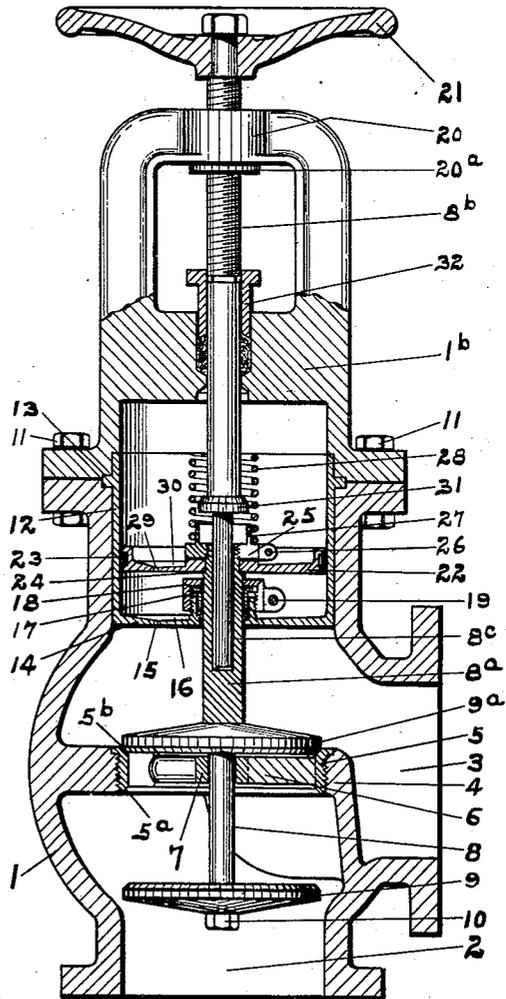
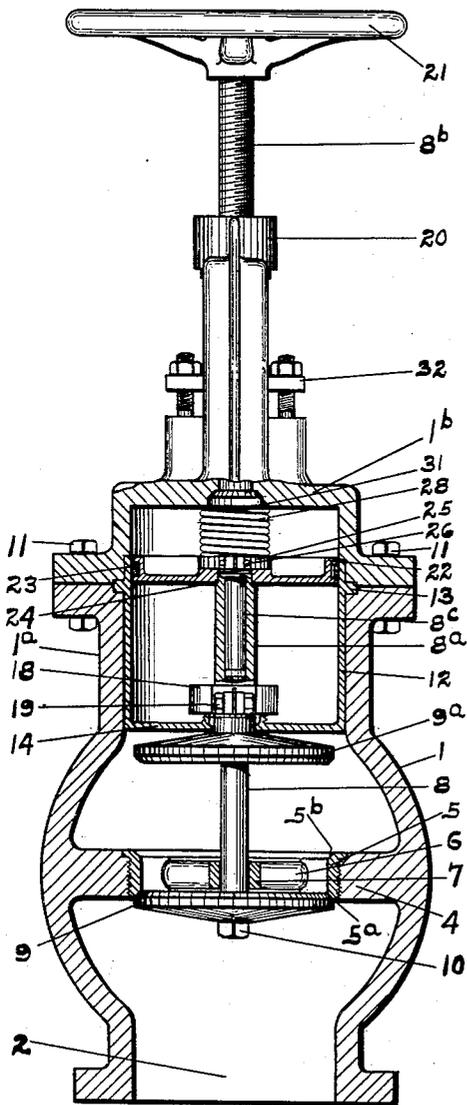
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2 SHEETS—SHEET 2.

FIG. 2.

FIG. 3.



Inventor

Witnesses

Ernest Elgen
Virgil Baker

334

Elmer E. Hauer
C Percy Norton

Attorney

UNITED STATES PATENT OFFICE.

ELMER E. HAUER, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

AUTOMATIC VALVE.

1,171,610.

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Application filed October 16, 1911. Serial No. 655,057.

To all whom it may concern:

Be it known that I, ELMER E. HAUER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Automatic Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to automatic valves. The object of my invention is to provide an improved valve that will automatically close in the event of a break in the connections.

A further object is to provide improved means for balancing the valve to keep it from chattering under variations of pressure, said means being arranged to drain the waters of condensation.

With these and other objects in view, my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a sectional view of a valve embodying my invention, showing the valve in open position. Fig. 2 is a section at right-angles to Fig. 1, showing the valve in closed position against the direct flow, and Fig. 3 is a like section with Fig. 1, showing the valve closed against the return flow.

Like numerals represent the same parts in the several views.

In the drawings 1 represents a casing having an inlet 2 and outlet 3 and a partition 4 with an opening therethrough in which a detachable member 5 is screw-threaded, having a valve seat 5^a on its inlet side and a valve seat 5^b on its outlet side. Arms 6 project inwardly from said member and terminate in a hub 7 formed to act as a guide for a valve stem 8. A valve is provided comprising a disk 9 adapted to close on the seat 5^a and a disk 9^a adapted to close on the seat 5^b. The stem 8 is preferably of wrought material secured to the disk 9^a by casting said disk about it; and the stem 8^a is preferably formed of the same material as the disk 9^a and cast integral with it. The disk 9 is secured against a shoulder on the stem 8 by a nut 10, as shown.

The casing 1 is provided with an extension forming a cylinder 1^a, said cylinder having a cap 1^b secured thereto by bolts 11. The cylinder 1^a is preferably provided with a cylindrical lining 12 having an outwardly extending flange 13 secured between the cylinder 1^a and cap 1^b; and I preferably provide said lining 12 with a head 14 at its lower end forming a partition between the valve chamber and the piston chamber. This partition or head 14 has an opening 15 to admit and discharge the fluid pressure, and an annular channel 16 gradually inclined to the opening 15 is provided so that the waters of condensation will drain by gravity through said opening. A stuffing box having a gland 17 is secured in place by a split nut 18 provided with a tightening bolt 19.

The cap 1^b is provided with a yoke having a centrally disposed hub 20 in which there is fixed a bronze nut 20^a bored and screw-threaded in which a screw-threaded portion of the stem 8^b is operated by a hand-wheel 21. The lower end 8^c of said stem is reduced in diameter and extends into a recess in the stem 8^a.

A piston 22 having packing-ring 23 is secured against a shoulder 24 on the stem 8^a by a split nut 25 which is tightened in place by a bolt 26. Said nut is provided with a hub 27 which extends within the lower end of a helical spring 28 carried by said piston. Said piston is provided with a port or passage 29 so that the fluid pressure may pass through and equalize the pressure on opposite sides of the piston. The fluid pressure may be introduced to opposite sides of the piston in various ways, such as by piping, or through a conduit in the wall of the casing, or by making the piston slightly less in diameter than the cylinder; but I preferably make it through the piston and of restricted size for the sole purpose of equalizing the pressure on opposite sides of the piston to prevent chattering of the valve. Said piston is further provided on its upper side with an annular channel 30 which is gradually inclined to the port or passage 29 so that the waters of condensation will drain by gravity through said port or passage.

When the hand-wheel is operated to draw the stem 8^c to its highest position there is

sufficient space between the lower end of said stem and the lower end of the recess in the stem 8^a to permit the valve disk 9 to close upon the seat 5^a.

5 When the fluid pressure is admitted to the valve chamber the valve will be lifted until it reaches open position as shown in Fig. 1; then it will encounter resistance of the spring 28 interposed between the piston 10 22 and cap 1^b, said spring being of sufficient strength to hold it in open position under normal conditions of flow; but if a break occurs in the steam connection to the outlet side of the casing, the spring is not of sufficient strength to resist the pressure and 15 the valve disk 9 will close against its seat. Upon the other hand, if there is a break in the connection to the inlet side of the casing the valve disk 9^a will close to its seat.

20 In practice I have found that when the valve is opening it has a tendency to chatter and I have overcome this by providing a piston and a chamber therefor, with means to introduce the fluid pressure on opposite 25 sides of the piston as hereinbefore described.

The valve can be manually closed by operating the hand-wheel as will be readily understood. A valve 31 arranged on the valve stem 8^b is provided so that when said 30 stem is in its highest position, said valve will close upon a seat in the cap 1^b as shown to permit the re-packing of the stuffing box 32 while the valve is under pressure.

Having thus described my invention I 35 claim:—

1. A casing forming a valve chamber and a piston chamber with a partition between said chambers, there being a constantly open restricted passage through said partition 40 connecting said chambers, a valve in said valve chamber movable to open position by the flow of the fluid being transmitted and adapted to close when the fluid pressure is released in either direction, a piston in 45 said piston chamber connected by a stem to said valve, a spring within the piston chamber operative when said valve comes to open position to hold it in open position against the normal flow of the fluid, said piston 50 chamber having an access opening through which said spring is removable and said piston having a constantly open passage therethrough to equalize the pressure on opposite sides of said piston.

55 2. A casing forming a valve chamber having inlet and outlet seats, a piston chamber having an access opening with a closure for same and a partition between said chambers having a constantly open restricted 60 passage therethrough, a valve in said valve chamber adapted to close on said seats and movable to open position by the flow of the fluid being transmitted, a piston in said piston chamber having a restricted opening

therethrough and a connection to said valve, 65 a spring in said piston chamber removable through said access opening operative when said valve reaches open position to hold it in open position against the normal flow of 70 the fluid and means to manually operate said valve.

3. A casing forming a valve chamber having inlet and outlet seats, a piston chamber having an access opening with a closure 75 for same and a partition between said chambers having a constantly open restricted passage therethrough, a valve in said valve chamber adapted to close on said seats and movable to open position by the flow of the fluid being transmitted, said valve having 80 a stem with a recess and a piston secured to said stem, said piston having a restricted constantly open passage therethrough, a manually operated stem projecting through an opening in said closure and extending 85 into said recess, a valve seat in said opening and a valve on said manually operated stem to close on said seat, a helical spring surrounding said manually operated stem and carried by said piston within said piston chamber, said spring being operative 90 when said first named valve reaches open position to hold it in open position against the normal flow of the fluid.

4. A casing forming a valve chamber and 95 a piston chamber with a partition between said chambers, a valve in said valve chamber movable to open position by the flow of the fluid being transmitted, said valve comprising two disks connected by a stem, one 100 of said disks being cast about said stem and the other removably attached thereto, a piston in said piston chamber connected to said valve, a spring in said piston chamber operative when said valve reaches open position 105 to hold it in open position against the normal flow of the fluid, said partition and piston each having a constantly open restricted passage therethrough with a gradually inclined annular channel thereto. 110

5. A casing forming a valve chamber and a piston chamber having a removable cap, a lining for said piston chamber with a head forming a partition between said chambers 115 having a constantly open restricted passage therethrough, said lining further having an outwardly extending flange intermediate of its ends fitted between said casing and cap and secured thereby, a valve in said valve chamber movable to open position by the 120 flow of the fluid being transmitted, said valve having a stem with a recess extending through an opening in said partition, a helical spring operative when said valve comes to open position to hold it in open 125 position against the normal flow of the fluid, a piston having a restricted passage therethrough with means to secure the same to

said stem, said means being adapted to hold said spring in place between said piston and cap and a manually operated stem projecting through an opening in said cap and through said helical spring into said recess of the valve stem, substantially as described.

5 In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ELMER E. HAUER.

Witnesses:

VIRGIL BAKER,
GROVA ILGAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."