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BALL VALVE.

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953,414.

Patented Mar. 29, 1910.

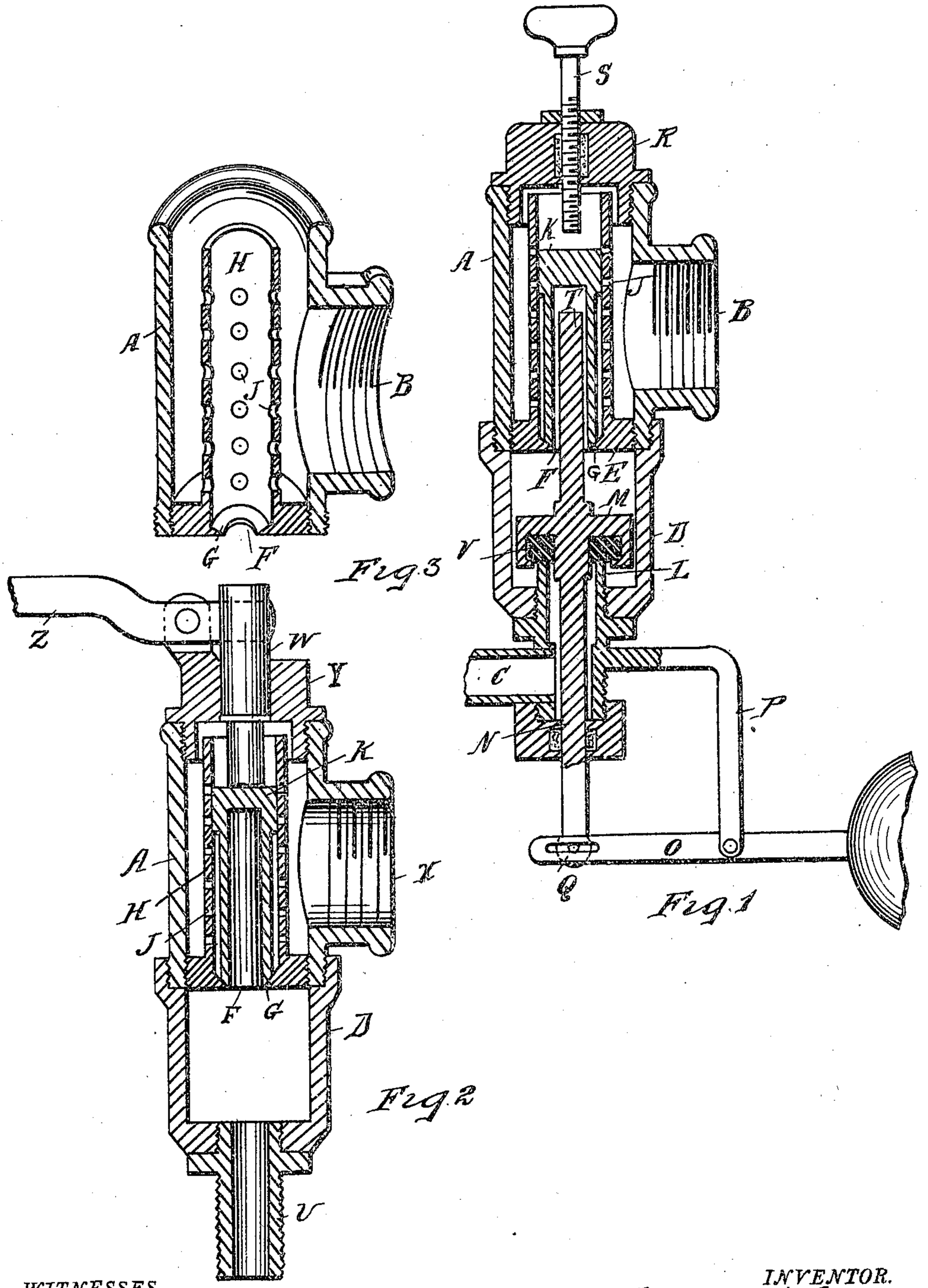

Fig. 3

Fig. 1

Fig. 2

WITNESSES.

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BALL-VALVE.

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To all whom it may concern:

Be it known that I, NORMAN ENGLISH, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Ball-Valves, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to ball valves, and has for its object an improved device of this type, adapted to permit the quick and noiseless closing of the valve without the objectionable and familiar "pounding", whether the closure movement be with or against the pressure.

In the drawings:—Figure 1, is a sectional elevation of the type of valve adapted to close with, that is, in the direction of the flow of, the pressure. Fig. 2, is a sectional elevation of a valve adapted to close against the pressure. Fig. 3, is a perspective of that portion of the casing adjacent the side opening shown in Figs. 1 and 2, and which in one instance is the inlet, and the other the outlet port.

Referring to Fig. 1, A represents the casing having an inlet opening B and an outlet opening C. The lower portion D of the casing, may, if desired, be made separately from the main portion A and subsequently attached thereto by screw threading as shown. At about this height in the interior of the casing is fixed a partition member E, whose centered portion is apertured as at F, the walls of the portion about this aperture being beveled as at G. About this apertured center and preferably concentric therewith, rises a perforated shell H through the holes J in which the fluid entering through the inlet opening B may pass, and after the plunger K is raised from the seat G, may escape into and through the lower chamber of the casing.

Facing a passage-way through the partition member E is a valve seat L, upon which the piston member M is adapted to seat with (in the direction of) the pressure as it enters through the aperture F. The piston M does not fit tightly within the portion D in the casing which surrounds it, sufficient space being left around its peripheral edges, so that, in order to avoid pressure in this portion of the casing, it becomes in fact a balance valve member, which seats with a very slight actuating pressure. The piston M is moved with the stem N, which is adapted to reciprocate lengthwise of the casing, by a movement of the float lever O which is pivotally supported upon a bracket P, and has a sliding or slot connection Q with the stem N, such that while all of its up and down movements due to the action of the lever O are communicated to the stem N, it is not diverted from true concentricity with respect to the casing, and therefore does not cause binding of the piston M within the casing. The stem N extends beyond the piston M, so that its upper end T reaches into the recessed interior of the plunger K, so that when the stem is raised and the piston is thereby raised from its seat L, the plunger K is raised from its seat G, and the fluid entering through the inlet B is permitted to pass through the casing, past the valve seat L and out through the port C. When, however, the stem N is dropped, due to the movement of the float lever O, the plunger K, protected as it is from the direct flow of fluid by the cylinder H, falls of its own weight on to its seat G, thus contributing to the quick and sharp seating of the piston M upon its seat L, and yet preventing "hammering" because of the fact that shutting off of pressure does not occur at the valve seat L, but is caused by the drop of the plunger K.

The possible degree of lifting of the plunger K by the stem N is regulatable by the screw S, which passes through the cap R so that its regulating lower point is held at the desired distance above the top of the plunger K, and if it is desired to remove the packing V on the under face of the piston portion M, or to repair the valve seat L, the screw S may be moved so far downward into the casing that, by engagement against the top of the plunger K when it is in its lowermost position, with its lower end resting upon its beveled seat G, thus closing the aperture F from the access of fluid entering from the inlet B, it prevents the plunger from possible rise therefrom, and this makes it possible to detach the lower portion D of the casing from the upper portion A, without leakage of the fluid.

In the device shown in Fig. 2, the fluid enters the valve casing from the port U, and, passing through the lower casing D, impinges against the under side of, and

tends to raise, the plunger K from its beveled seat G. This, however, is held in place, thus closing the valve, by the pressure upon its top of the vertically slidable stem W, which is actuated up and down by the movement of the pivoted float lever Z. When the ball float on its end is raised high by a corresponding level of water, this is depressed so firmly against the top of the plunger K as to close the valve. When, however, the outer end of the lever drops, the stem W is raised, thus permitting the plunger K to slidably yield to the pressure upon its under face and rise within the shell H, and the water to flow through the holes J therein and through the port X.

What I claim is:—

1. In a valve, the combination of a casing having inlet and outlet ports angularly located with respect to one another, an apertured partition within said casing, a plunger member capable of limited longitudinal movement with respect to the shell adapted to seat thereon and to thereby control the flow therethrough, a perforated shell member interposed between said plunger and one of said ports, a stem member for actuating the plunger in one direction, its movement in the opposite direction being in the direction of the flow of fluid through the casing, and a ball float member for actuating the stem, substantially as described.

2. In a valve, in combination with a casing provided with inlet and outlet apertures, an apertured partition dividing the interior thereof into two chambers, a plunger adapted to close the passageway through said partition, apertured means for guiding the travel of the plunger, interposed between said plunger and the adjacent aperture in the casing, and a ball-float actuated stem adapted to regulate the opening and closure of the valve by its engagement against said plunger, substantially as described.

3. A valve, having in combination a casing, an apertured partition therewithin, said partition having a perforated extension portion on one side thereof, a plunger member adapted to move lengthwise thereof and of said casing to effect the opening and closure of the valve, a longitudinally movable stem adapted, by engagement against the plunger, to actuate it in one direction, its movement in the opposite direction being in the direction of the flow of fluid through the casing, and a ball-float by whose movement said stem is actuated, substantially as described.

4. In a valve, in combination with an apertured casing. an apertured partition member therein, a plunger adapted to seat thereover and to thereby control the flow therethrough, an apertured member interposed between said plunger and the adjacent aperture in the casing, a stem movable lengthwise of the casing, adapted to actuate said plunger in the opposite direction to that of the flow of fluid through the casing, and a ball float member, whereby the stem is actuated, substantially as described.

5. A valve, having in combination a casing having inlet and outlet apertures, an apertured partition located therewithin intermediate said apertures, a plunger adapted to close the passageway through said partition, a perforated shell member located between said plunger and one of the apertures in the casing, a longitudinally movable stem adapted to actuate the plunger in one direction, its movement in the other direction being in the direction of the flow of fluid through the casing, the perforated shell member being adapted to guide the longitudinal movement of the plunger, and an actuating member for the stem, substantially as described.

6. In a valve, the combination of a casing, an apertured partition member therewithin, a perforated shell rising concentrically about the apertured portion thereof, a plunger member slidably engaging therein and adapted to seat over and close the apertured part of the partition, and a float-actuated stem adapted to engage and actuate said plunger member in the opposite direction to that of the flow of fluid through the valve, substantially as described.

7. A valve, having in combination a casing provided with inlet and outlet apertures, an apertured partition dividing the interior thereof into two chambers intermediate said apertures, a plunger adapted to close the passageway through said partition, a valve seat intermediate said partition and the outlet opening, a piston adapted to reciprocate in that portion of the casing between said partition and said valve seat and to seat on said last named part, a stem whereon said piston is mounted, adapted to be actuated lengthwise of the casing and upon its engagement against said plunger to displace the same from its seat, a pivoted lever carrying a float at its free end adapted to actuate said stem, and a regulating screw whereby the degree of possible displacement of said plunger may be controlled, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

NORMAN ENGLISH.

Witnesses:
WILLIAM M. SWAN,
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