Oct. 6, 1936. A. F. HOPPE 2,056,322

GLOBE VALVE

Filed May 20, 1933

Fig. 1.

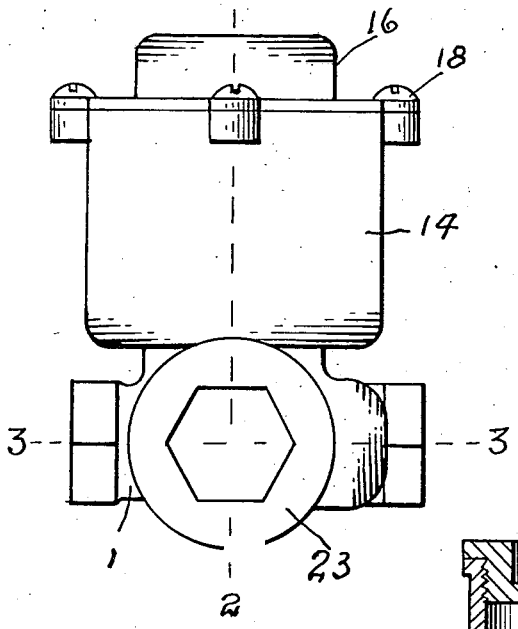


Fig. 4.

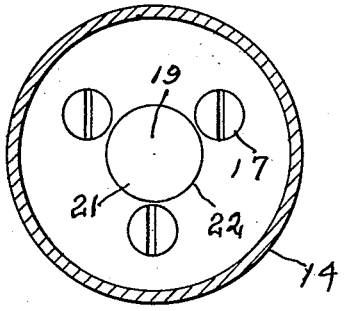


Fig. 2.

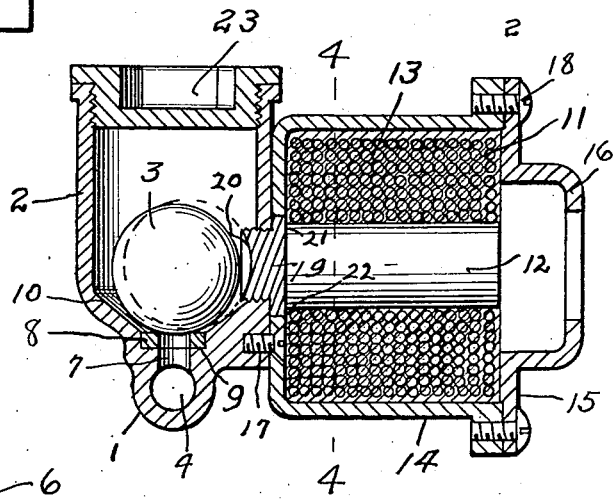
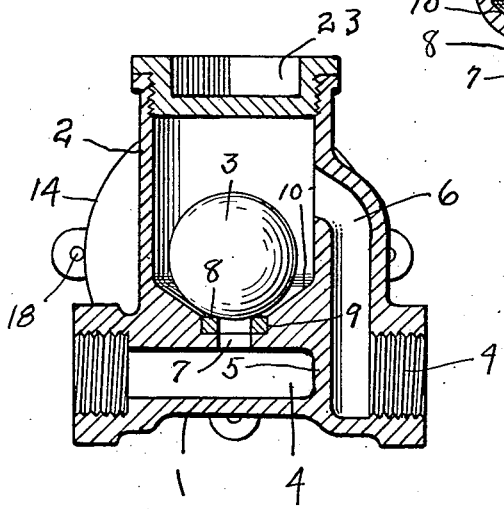


Fig. 3.



INVENTOR:

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UNITED STATES PATENT OFFICE

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GLOBE VALVE

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3 Claims. (Cl. 137—139)

This invention relates to globe valves of that class adapted to be operated by electricity and the prime feature of the invention is the provision of a ball valve and a magnet or solenoid for unseating the valve.

A further feature of the invention is in so constructing the valve casing that the same may rest in a horizontal plane with the magnet extending laterally therefrom and in the same horizontal plane with the valve casing proper.

A further feature of the invention is in so constructing the interior of the valve casing, adjacent the seat for the valve, that the valve will have a rolling action when seating or unseating, for lessening the resistance of the movement of the valve.

A further feature of the invention is the provision of a seat for the valve having a flat upper surface upon which the valve rests when in seated position.

A further feature of the invention is the provision of a stud, the inner end of which extends within the valve casing and is provided with a curved seat in which the ball valve seats when in open position, while the opposite end of the stud is adapted to contact with the core of the magnet.

A further feature of the invention is in so constructing the horizontally extending valve casing for conveying the liquid passing thereinto that the liquid will enter the casing at a point above the valve seat and discharge therefrom at a point below the valve seat.

Other objects and advantages will be hereinafter more fully set forth in the accompanying description.

In the accompanying drawing which is made a part of this application,

Figure 1 is a top plan view of the valve structure.

Figure 2 is a sectional view thereof as seen from line 2—2, Fig. 1.

Figure 3 is a similar view as seen from line 3—3, Fig. 1, and,

Figure 4 is a sectional view through the magnet housing, with the magnet removed, as seen from line 4—4, Fig. 2.

Referring to the drawing, the numeral 1 designates the body of the valve casing and 2 indicates the housing for the ball valve 3, the casing proper being constructed from any suitable non-magnetic metal or other substance, while the ball valve 3 is preferably constructed of steel or other substance subject to magnetic attraction.

The body 1 is designed to rest in a horizontal plane, when applied to use, the bore 4 therein being interrupted by a partition wall 5, so that liquid may not pass directly through the valve structure but is caused to pass upwardly into the housing 2 through a vertically disposed passageway 6, formed in the wall of the housing 2, the upper end thereof being projected inwardly into the housing 2 at a point above the ball 3, from whence the fluid passes downwardly through a port 7 into that portion of the bore 4 beyond the partition 5.

The ball valve 3 normally rests upon a seat 8, which is preferably located in a recess 9, surrounding the upper portion of the port 7, the seat 8 having a flat upper face upon which the ball rests when seated. The wall 10, at the lower end of the housing 2, is tapered or inclined, so that when the ball 3 is drawn upwardly and laterally, or again returns to its seat, will have a rolling action, thus greatly minimizing the pulling force required to release the ball from its seat and insuring the accurate return of the ball to its seat, when the pulling force is released therefrom.

The ball valve 3 is released from its seat 8 by means of a magnet 11, comprising a core 12 and a coil 13, as is common, the magnet being enclosed in a box 14, having a removable cap 15, the outer face of the cap having an offset central portion 16, in which are to be formed the usual splicing connections (not shown).

The box 14 is preferably made separate from the valve structure proper, but may be formed integral therewith if preferred and when made separate, is attached to the valve structure in any suitable manner, as by means of screws 17, while the cap 15 is attached to the box 14, preferably by means of screws 18.

Entered through the wall of the housing 2, a suitable distance above the valve seat 8 is a stud 19, the inner end projecting a distance beyond the inner face of the housing and having in its end a curved seat 20 into which the ball valve 3 seats when attracted to the stud, the curvature of the seat 20 being substantially coincident to the curvature of the ball 3. The outer end of the stud 19 is provided with a flanged head 21 which rests against the outer face of the wall of the housing 2 and limits the inward movement of the stud and the stud is preferably threaded through the opening in the wall of the housing 2.

The integral end of the box 14 has an opening 22, which fits around the head 21, so that one end of the core 12 may rest thereagainst and electrically energize the stud when the magnet is energized.

The upper end of the housing 2 is provided with a removable cap 23, so that the ball valve 3 may be readily introduced into the housing, the cap forming a perfect seal for the housing when properly applied thereto.

This form of valve may be used for various purposes for controlling the flow of liquids through a pipe line and may be used underground successfully, owing to the fact that all working parts are sealed from the surrounding elements, it being understood that any suitable sealing medium, such as bakelite, may be disposed around the magnet and hardened, thus completely sealing the same from dampness.

In operation, the ball valve 3 being normally in lowered or seated position, the magnet 11 may be energized by means of closing a manually or automatically operated switch for directing electricity through the magnet, thus magnetizing the ball valve and drawing the same to seated position against the end of the stud 19 and opening the port 7 and permitting liquid to pass upwardly through the passageway 6, downwardly through the port 7 again into the bore 4 and onwardly through the pipe line to which the valve may be attached.

As soon as the magnet is again demagnetized, the ball valve will again descend and positively seat over the port 7 and close passage therethrough and as the valve is still resting on the inclined wall 10 when engaged with the stud 19, the valve will descend onto its seat without undue metallic sound, by gravity.

What I claim is:

1. In a valve structure, a horizontally disposed body portion having a horizontally disposed bore therein, a vertically disposed housing connected with said body portion, the upper wall of said body portion forming a partition between said bore and housing, a port extending through said partition and connecting said housing with said bore, a valve seat surrounding the upper end of said port, a vertical partition in said bore at one side of said port closing communication through the bore, that portion of said bore with which said port communicates being of uniform diameter from the face of said partition to its point of connection with a pipe line, a ball valve for normally closing said port, a passageway connecting that portion of said bore on the opposite side of the vertical partition from said port with said housing, said passageway extending upwardly from said bore through the wall of said housing and communicating with said housing at a point above the axis of said valve when opened or closed and electrically operated means for moving and holding said valve off its seat.

2. In a valve structure, a body portion having a bore therein and extending in a straight line, a housing integral with the upper face of said body portion, the upper wall of said body portion forming a horizontal partition between said bore and housing, said horizontal partition having a port connecting the interior of the housing with said bore, a valve seat surrounding the upper end of said port and resting in a plane above said bore, a valve adapted to cooperate with said seat for closing said port, a passageway extending from said bore vertically through the wall of said housing with its upper end projecting inwardly and communicating with the interior of said housing a distance above said seat, a partition in the bore between said port and said passageway, that portion of said bore with which said port communicates being of uniform diameter from the face of said partition to its point of connection with a pipe line, and means for unseating said valve.

3. In a valve structure, a body portion having a horizontally disposed bore therein, a vertically disposed housing, said body and housing being formed in one piece and the upper wall of the body portion forming a closure for the lower end of said housing, a port centrally of said housing and connecting said housing with said bore, a valve seat at the upper end of said port and in a plane above the horizontal plane of said bore, a valve for closing communication through said port, a vertically extending passageway in the wall of said housing extending from said bore to a point above said seat, with its upper end projecting inwardly through which fluid passes from one end of said bore into said housing, a partition in said bore for causing the fluid to pass upwardly in said passageway, that portion of said bore with which said port communicates being of uniform diameter from the face of said partition to its point of connection with a pipe line, and means for unseating said valve.

ARNOLD F. HOPPE.