No. 686,335. Patented Nov. 12, 1901.

# W. H. RAWE.

## BALL COCK.

(Application filed Feb. 23, 1901.)

(No Model.)

FIG. 1.

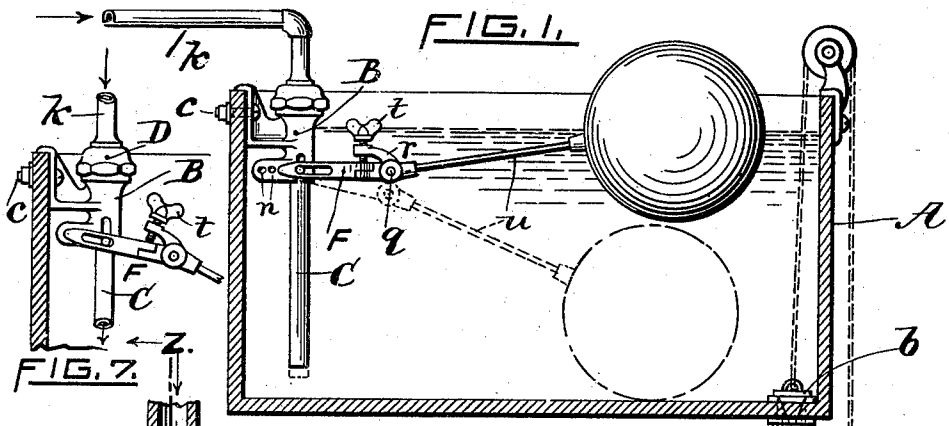



FIG. 7.



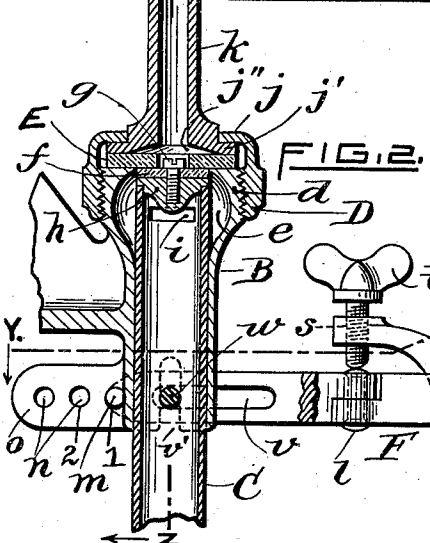




FIG. 2.

FIG. 4.

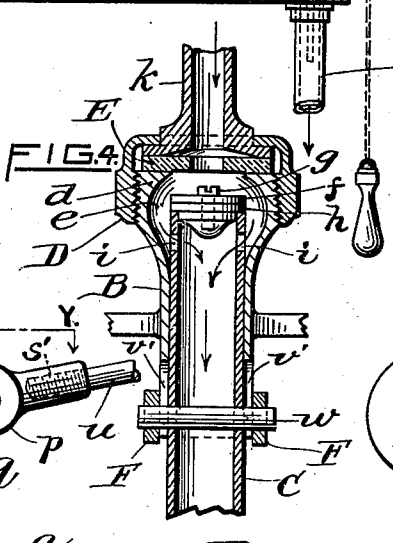
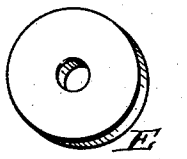



FIG. 6.



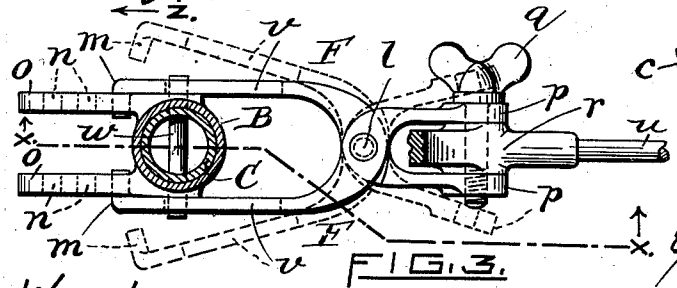
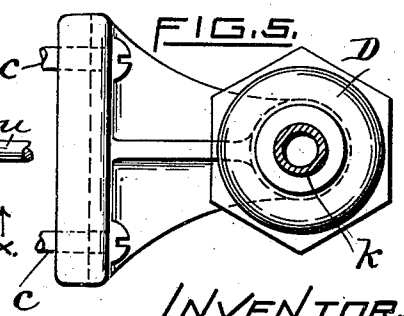




FIG. 3.

FIG. 5.




WITNESSES.

Isaac N. Lincoln.

Elmer Walker.

INVENTOR.

William H. Rawe.

By Charles J. Hamigan.

Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM H. RAWE, OF PAWTUCKET, RHODE ISLAND.

## BALL-COCK.

SPECIFICATION forming part of Letters Patent No. 686,335, dated November 12, 1901.

Application filed February 23, 1901. Serial No. 48,599. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. RAWE, a citizen of the United States of America, residing at No. 92 North Main street, in the city of Pawtucket, county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Ball-Cocks, of which the following is a specification.

This invention relates to ball-cocks; and the invention has for its object to provide an interchangeable fulcrum for the ball-cock having an adjusting device whereby the float may be raised or lowered to obtain the proper height of water in the tank.

A further object of the invention is to improve the valve-seat and simplify the structure for holding the same in position and make the seat more ready of renewal in case of necessity.

Reference is had to the accompanying sheet of drawings, forming a part of this application, in which like characters indicate like parts wherever they occur.

Figure 1 represents a view of a closet-tank provided with my improved ball-cock, the tank being shown in section and the other parts in side elevation. Fig. 2 is an enlarged partial vertical sectional view of the ball-cock, taken in line *x x* of Fig. 3 and showing the relative position of parts embodying my invention as when the valve is closed. Fig. 3 is a top plan sectional view of the ball-cock, taken in line *y y* of Fig. 2, showing the adjusting device for the float connection to actuate in closing the valve. Fig. 4 is a vertical sectional view of the ball-cock, taken in line *z z* of Fig. 2, as when the valve is open. Fig. 5 is a top plan view of the ball-cock casing and its bracket-support. Fig. 6 is a perspective view of the renewable packing-disk. Fig. 7 is a side elevation of the principal parts shown in Fig. 1, and illustrating the float-connecting device adjusted to the extreme position of the fulcrum, as for a low pressure in the inlet-pipe.

Referring to the drawings, A is the tank for holding the supply of water and provided with suitable discharge-pipe *a* and lifting-valve *b*.

B represents the ball-cock casing, which is secured to the wall of the tank by screws *c c*, which pass through the flange of a bracket integral with the casing. (See Fig. 5.) This casing has an enlarged head *d* at one end thereof inclosing a spherical chamber *e*, extending from a straight bore through the casing, and said head is circumferentially screw-threaded to engage the coupling-nut of the inlet-pipe, as hereinafter described.

C represents the delivery-pipe, provided at its upper end with a valve-disk *f*, which is secured by a screw *g* to a plug *n*, driven in or otherwise secured to the pipe. This valve-disk is made of leather or other suitable yielding material and of a diameter of the outside diameter of the pipe. This delivery-pipe is further provided with two rectangular-shaped ports *i i* beneath the said valve and disposed opposite of each other, and these ports communicate with the chamber of the casing.

D is the coupling-nut, provided with an interior screw-threaded surface to engage the threaded head of the casing, and this nut has an inner annular flange *j* to close over an outer annular flange *j'* of the supply or inlet pipe *k*.

E represents a packing-disk, made of non-corrodible yielding material, which forms a renewable seat for the valve to rest against, and this packing is interposed between the head of the casing and inlet-pipe, respectively, and is secured firmly in place by the coupling-nut. The bottom end face of the inlet-pipe is beveled slightly, as at *j''*, to give an upward diaphragm movement of the packing when the valve is closing.

F F represent two crossover levers, made exactly alike and connected together at their point of crossover by a pin *l*. Two arms of these levers close upon each side of the ball-cock casing at the lower end thereof, each arm having an inwardly-projecting lug *m* at its rear extremity adapted to enter circular openings *n n*, formed in rearward extensions *o o*, integral with the casing, as shown in Fig. 3. The opposite arms of the levers F F have ears *p p*, each provided with a circular opening opposite of each other, one of which openings is screw-threaded to receive the threaded end of a thumb-screw *q*, and loosely mounted upon this screw between the ears of the said levers is a short lever *r*, having its forward portion screw-threaded to engage the threaded end of the float-rod, as at *s'*, and this lever has a curved arm rearwardly of its pivotal

center $q$ and provided with a screw-threaded opening $s$ to receive the shank of an adjusting-screw $t$, the bottom end of which is over the pivotal center $l$ of the levers F F. To get the proper height of water in the tank, by adjusting the screw $t$ a limited upward swing is given to the float to close the valve upon its seat. Each arm of the levers F F, which close upon the side of the casing, is provided with a slotted opening longitudinally disposed, as at $v$ $v$, to receive the projecting ends of a pin $w$, driven transversely through the delivery-pipe, and said levers being actuated by the float gives a reciprocating movement to the delivery-pipe in the opening and closing of the valve.

The delivery-pipe is prevented from rotation by the pin $w$, which moves in vertical slots $v'$ $v'$, formed in the bottom end portion of the casing. (See Fig. 4.) The offsets between each set of openings $n$ $n$ and the axial center of the delivery-pipe are so proportioned apart as to counterbalance the pressure of water from the inflow $k$.

Assuming that a high pressure of, say, one hundred pounds is given by the inflow, the levers F F would be attached to that position of fulcrum 1, as seen in Fig. 2. If a lower pressure is given by the inlet-pipe, by disconnecting the thumb-screw $q$ and compressing the ears of the levers to the position as indicated in dotted lines of Fig. 3 the said levers may be moved rearwardly with their lugs attached in fulcrum 2, so that when the pressure of the inflow is known the change of fulcrum for the float can be readily obtained to move the valve either slowly or rapidly, according to the different water-pressures.

In referring to Fig. 1, which illustrates my device adjusted in position as for high pressure, and assuming the tank to be free of water, when the valve is forced from its seat by the pressure the water passes through the ports of the delivery-pipe and into the tank and the buoyancy of the water raises the float from its depressed position in the tank, as indicated by dotted lines, to the proper level, as shown, and by adjusting the screw $t$ the float will act in conjunction with the levers F F to close the valve after a certain quantity of water is delivered in the tank. The clearance formed by the beveled face $j''$ of the inlet-pipe and the overlap of the head of the casing gives a yielding diaphragm to the packing E in effecting a sudden opening or closing of the valve. Furthermore, by having the packing-disk located in the structure, as described, the packing can be readily replaced when worn by simply unscrewing the coupling-nut.

Having described my invention, what I claim is—

1. A ball-cock comprising a casing having an enlarged head at one end thereof, said head provided with a spherical chamber centrally with a bore through the casing, said casing having two rearwardly-extending arms at the other end thereof, each provided with a series of circular openings forming independent points of fulcrum for the float connection, two crossover levers divided by a pivotal center and having two of their arms to close upon each side of the said extensions of the casing and each provided with an inwardly-projecting lug to enter the fulcrum-point according to pressure of the inflow, a screw in the opposite arms of the said levers for holding the same in position upon the casing, a lever rigidly secured upon the float-rod and loosely mounted upon the said screw, an adjusting-screw in the rear portion of the said lever adapted to bear against the pivotal center of the crossover levers to give a limited movement of the float in closing the valve, a discharge-pipe in the casing provided with inflow-ports communicating with the chamber thereof, said pipe having reciprocating motion through the movement of the float, a valve mounted on the discharge-pipe, a packing-disk secured upon the head of the casing and provided with a centrally-circular opening of a size of the inflow, with means whereby the said packing-disk has a diaphragm movement in the closing of the valve, as set forth.

2. A ball-cock comprising a casing having an enlarged head at one end thereof inclosing a circular chamber, an inlet-pipe having an exterior annular flange of a diameter of the head of said casing and provided with an inwardly-circular face, as $j''$, a flexible packing-disk interposed between the face of the head of said casing and flange of said inlet-pipe, respectively, with means for securing said parts together, as described, a discharge-pipe in the casing, a valve mounted on the end of said pipe, a pin projecting transversely through the said pipe, two crossover levers connected together and provided with a slotted opening in two of their extensions to receive the projecting ends of the pin of said casing and each of said extensions having a projecting lug to enter one of the points of fulcrum of said casing, said levers actuated by the float to close the valve upon its seat, as set forth.

3. A ball-cock comprising a casing having two parallel extensions integral at one end thereof, each provided with a series of openings opposite of each other, a packing-disk mounted on the opposite end of said casing and held in position by the structure, as described, a discharge-pipe in the casing, a valve-disk secured upon the end of said pipe, two crossed levers connected together at their point of crossing, adapted to engage the openings of the said extensions of the casing, a screw to hold the said crossed levers in engagement with the extensions of said casing, a lever secured upon the end of the float-rod and pivoted upon the said screw, with an adjusting-screw in said lever adapted to bear against the said crossed levers in giving a

limited degree of rise of the float to close the valve, as set forth.

4. In a ball-cock, the combination, of the tubular-shaped casing B having an enlarged head at one end thereof, provided with a chamber centrally with the bore of said casing, a discharge-pipe provided with ports communicating with said chamber, a valve-disk secured upon the end of said pipe, above said ports, a packing-disk situated upon the end face of the head of said casing and held in position by the structure, as described, said casing having two transverse parallel extensions *o o*, each provided with a series of openings opposite of each other, two crossed levers F F connected together at their point of crossing, as at *l*, said levers having an inwardly-projecting lug at the extremity of two of their arms, adapted to engage in the openings of the said extensions of the casing and arranged to act in conjunction with the float to close the valve upon its seat, as set forth.

5. In a ball-cock, the combination, of a casing having two transverse extensions integral therewith, each provided with a series of openings forming independent points of fulcrum, a discharge-pipe having a valve-disk secured upon one end thereof, a pin projecting transversely through the said pipe and movable in the said casing, two crossed levers connected together at their point of crossing and having a trunnion formed at the extremity of two of their extensions, as *m m*, each of said extensions provided with a slotted opening to receive the projecting ends of the pin of said discharge-pipe, a screw in the opposite extensions of the said levers to hold the same in a fixed position upon the casing and discharge-pipe, respectively, a lever *r* secured upon the end of the float-rod, as shown, and pivoted upon the said screw, between the last aforesaid extensions of the crossed levers, with an adjusting-screw *t* carried by the lever *r* and adapted to bear against the crossed levers in giving a limited degree of rise of the float to close the valve, as shown and described.

Signed by me at Providence, Rhode Island, this 21st day of February, 1901.

WILLIAM H. RAWE.

Witnesses:
ELMER WALKER,
ISAAC N. LINCOLN.