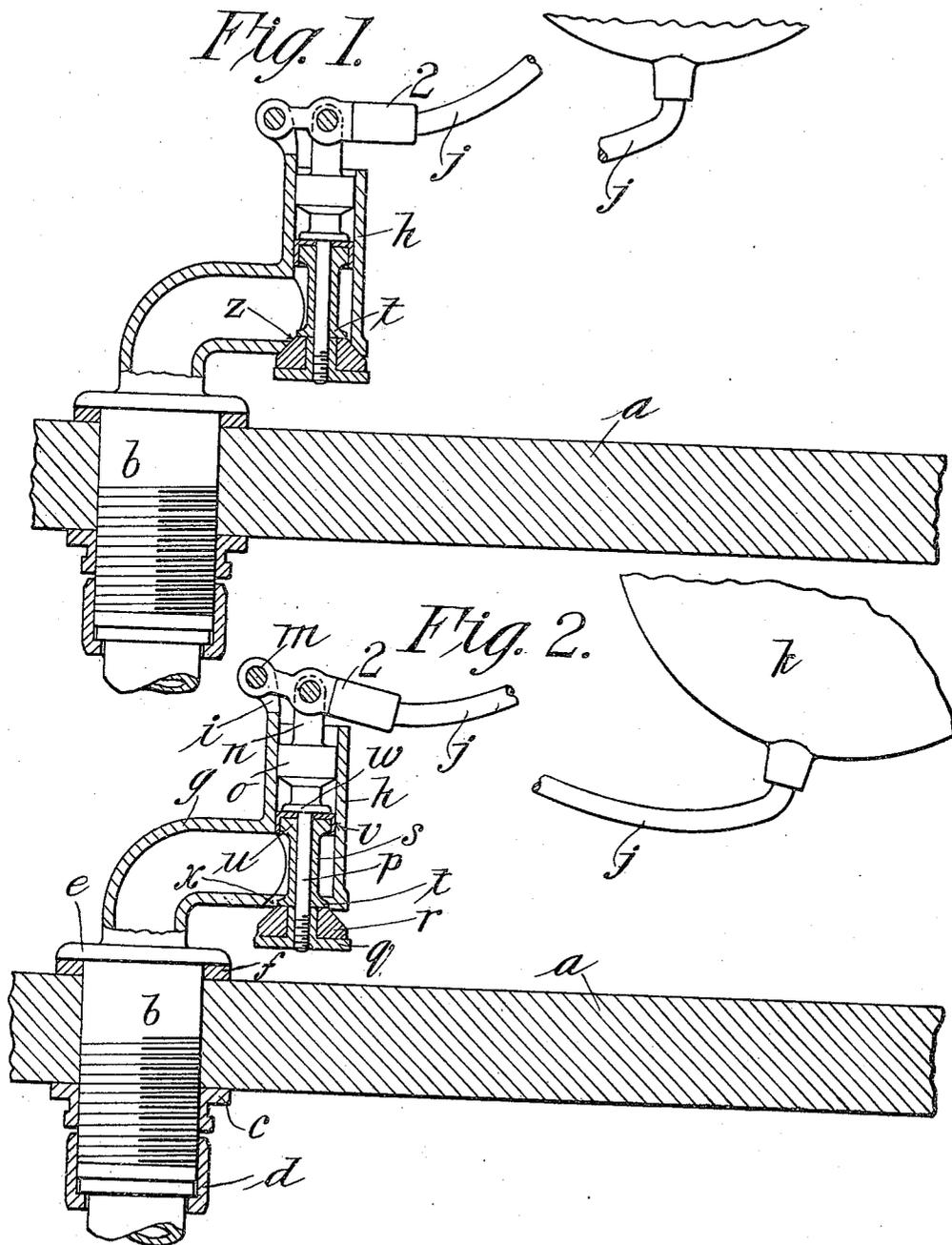


C. H. ATKINS.
BALL COCK.

APPLICATION FILED AUG. 25, 1908.

966,417.

Patented Aug. 9, 1910.



WITNESSES:

R. M. Murray
Harry W. Bowin

INVENTOR.

Charles Henry Atkins

BY

Chapin & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES H. ATKINS, OF SPRINGFIELD, MASSACHUSETTS.

BALL-COCK.

966,417. *

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed August 25, 1908. Serial No. 450,203.

To all whom it may concern:

Be it known that I, CHARLES H. ATKINS, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Ball-Cocks, of which the following is a specification.

This invention relates to improvements in valves of the type known in the trade as "ball-cocks," and is designed, primarily, for use in connection with flush tanks but is not limited to such use.

One of the objects of the invention is to provide a device that is simple in construction, effective and efficient in operation, and one that is self-contained or balanced in its closed position.

In order to effectively maintain the valve in a closed position I employ differential pressure areas for operating the valve proper requiring therefore very little force to be exerted by the float to close the valve and to maintain the same in a closed position, it being understood that the water pressure is exerted in equal and opposite directions on these areas.

A further object of the invention is to provide a valve that is practically silent in its operation and one that will require little or no attention as to repairs after being installed.

Broadly stated, therefore, the improved valve consists of an inlet and an outlet passage, and means associated with the ordinary float to control these passages, said means including a closing valve proper, a piston connected thereto, a piston-rod or valve stem for supporting the same, a guiding member carried by the piston-rod for always maintaining the valve in a straight line during its movements, and a space or chamber between the valve and piston constituting a compartment for the water pressure to act in equal and opposite directions on said valve and piston, whereby a balanced condition of the valve is maintained in its closed position.

Referring briefly to the drawings forming a part of this application and wherein like reference characters are used to indicate corresponding parts: Figure 1 is a vertical sectional view through the axis of the piston-rod or valve-stem showing the valve in its closed position, that is with the float elevated by the water in the tank. Fig. 2 is

a similar view showing the valve open and the float having assumed the lower position and permitting the water to enter and fill the tank.

Referring to the drawings, *a* designates the bottom portion of the tank through which passes the threaded end *b* of the valve for receiving the tightening nut *c* and the union or coupling element *d*. The upper portion of the threaded end *b* of the valve is provided with a collar *e* between which and the bottom portion of the tank is located a suitable packing ring *f*.

Extending at right angles to the threaded end *b* is an elbow element *g* and extending at right angles to this elbow element and parallel with the threaded end *b* is a barrel *h* the upper extremity of which is provided with ears *i* to which is pivotally connected the upwardly curved float-rod *j*, the usual float being designated by *k*.

Pivotally connected to the float-rod *j*, and adjacent the pivot *m* are the ears *n* only one of which appears in the figures which are integral with the cylindrical or guiding element *o* that is loosely mounted for reciprocation in the barrel *h*, and integral with the guiding element *o* is a piston-rod or valve-stem *p* threaded at its lower end for receiving the clamping-nut *q* which retains the rubber packing *r* and spool *s* firmly in place on the rod *p*. It will be understood that the spool *s* affords a bearing at *t* for the packing *r* at one end and a clamping element *u* at the other end for the cup washer *v* which is located between the element *u* and the integral cylindrical portion *w* of the stem *p*. The conical valve-seat and outlet is designated at *x* against which the conical shaped valve *r* seats in its closed position.

An important feature of my invention is the cylindrical guiding element *o* which, together with the cup-washer *v*, causes the valve *r* to move in a straight line during its opening and closing movements thereby bringing the valve accurately against the seat *x* without any danger of leakage. The area of the cup-washer *v* and the upper end of the spool *s* is designed to be somewhat less than the portion of the valve *r* which protrudes through the seat *x*, as shown at *z* in Fig. 1, and the lower end of the spool *s*, whereby the tendency of the water is to retain the valve open or in a downward position by the pressure of the water acting

through the elbow-portion g ; but the buoyant effect of the water in the tank acting on the float h in the usual manner serves, however, to keep the valve closed. At the same time, when the tank is emptied, the downward movement of the float will move the valve to open position permitting the water to flow into the tank through the opening x . The conical surface of the valve r further has the effect of spreading the incoming stream out into an umbrella form which results in greatly lessening the noise during the re-filling of the tank.

It will be observed that on account of the location of the ball-cock being near the bottom portion a of the tank, it is necessary to form or curve the float-rod upward, as shown, so as to bring the float near the upper edge of the tank; otherwise, the tank would not completely fill before the valve closes. It should also be stated that the rod j is permanently attached to the float-rod stem, preferably by "sweating" as shown at 2, and that the necessary adjustment of the float is effected by bending the rod j the necessary amount so as to correctly position the float in the tank, thus doing away with all necessary features and rendering the device more certain in its operations and less liable to get out of repair.

It will be seen that I have designed a ball-cock valve that is simple in construction and one that can be made at small expense and with very remote possibility of its getting out of order and causing a loss of water. 35

What I claim, is:—

The combination in a ball-cock, of a barrel element h arranged to direct the supply outward in a cone-shaped manner, by means of a conical-shaped closing valve r that is adapted to engage the outlet opening of the barrel having a conical-shaped seat x with which the valve engages, the valve-chamber being integral with the inlet portion g , a valve-stem p , a guiding cylindrical element o integral with the stem, a spool s , a cup-washer v between the spool and cylindrical element, the conical valve r being secured on the stem p by means of the clamping nut q , the axis of the inlet portion g of the valve being arranged parallel with the axis of the barrel element, and a float connected to the valve, the valve r being arranged to move against the flow of the incoming water, substantially as described. 40 45 50

CHARLES H. ATKINS.

Witnesses:

K. I. CLEMONS,
H. W. BOWEN.