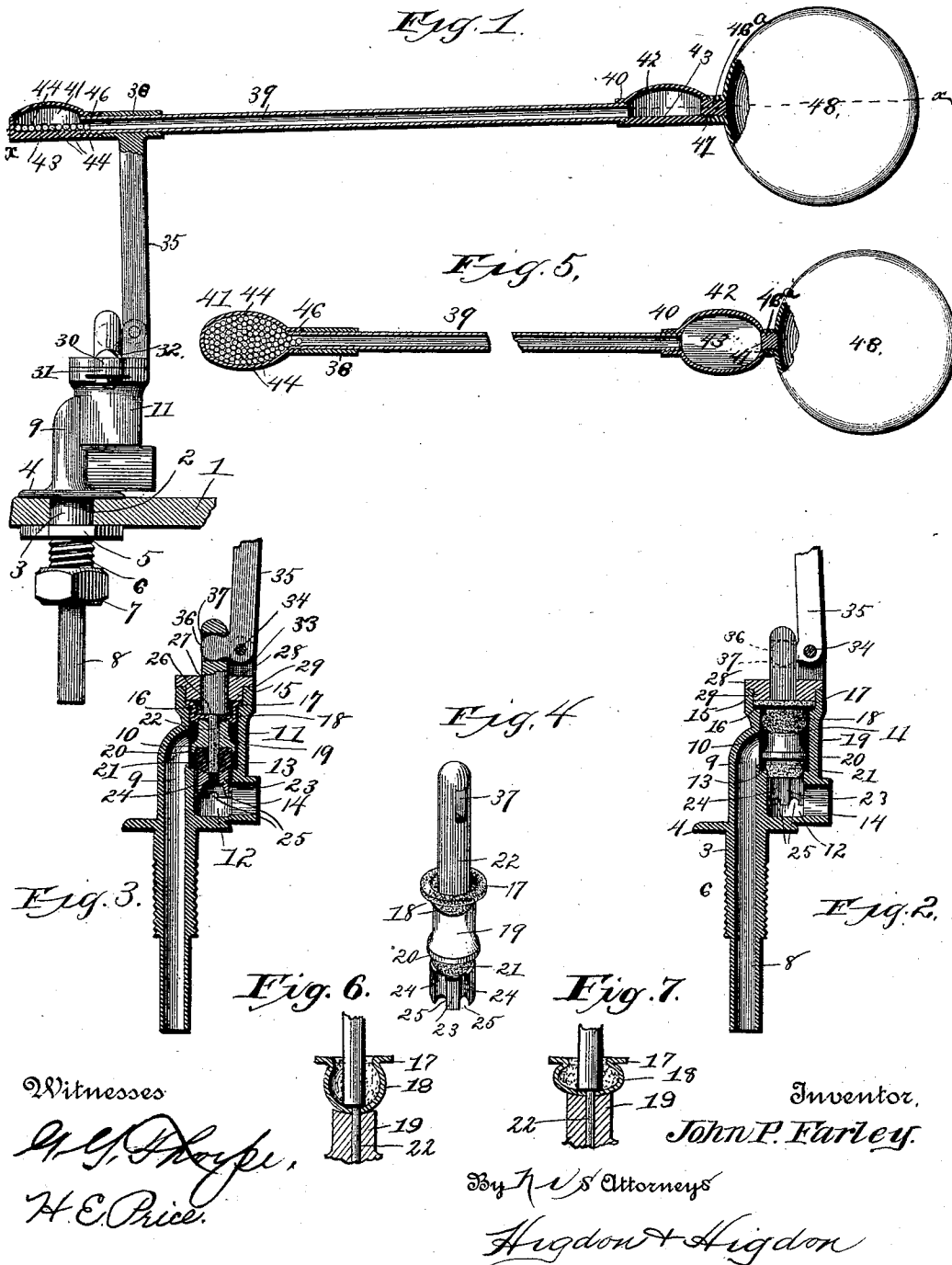


(No Model.)

J. P. FARLEY.
BALANCED BALL COCK.

No. 464,249.

Patented Dec. 1, 1891.



UNITED STATES PATENT OFFICE.

JOHN P. FARLEY, OF KANSAS CITY, MISSOURI.

BALANCED BALL-COCK.

SPECIFICATION forming part of Letters Patent No. 464,249, dated December 1, 1891.

Application filed December 13, 1890. Renewed October 27, 1891. Serial No. 409,969. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. FARLEY, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Self-Graduating Ball-Cocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improvement in a self-graduating ball-cock; and it consists in the novel construction and arrangement of its parts, as will be fully specified hereinafter, and particularly pointed out in the claims.

Referring to the drawings which illustrate this invention, Figure 1 is a side elevation of the invention, partly in section. Fig. 2 is a central vertical sectional view of the same. Fig. 3 is a vertical sectional view showing the plunger in its elevated position to allow the water to pass through the discharge-spout. Fig. 4 is a detail perspective view. Fig. 5 is a section on line *x x* of Fig. 1. Figs. 6 and 7 are detailed views of my improved diaphragm when the stem is in its lower and upper positions, respectively.

Similar numerals refer to similar parts in all the figures, in which—

1 indicates a section of the box or water-receptacle, which is provided with the vertical aperture 2, in which is secured the vertical portion 3 of the supply pipe or channel 8. The said pipe 8 is also provided with the exterior threads 6, which are engaged by the clamping-nut 5, to secure the device in its vertical position with the assistance of the annular flange 4, resting upon the upper surface of the floor, and the ordinary coupling-nut 7. The continuation 9 of the supply-pipe 8 communicates with the interior 10 of vertically-arranged cylindrical casing 11, whose interior 10 is decreased near its lower end, forming the smaller aligned passage 12 and annular shoulder or seat 13.

The discharge pipe or spout 14 communicates with the lower end of passage 12. The casing 11 is also enlarged at 15 near its upper end, forming shoulder or seat 16, upon which the annular flange 17 of the hollow and flexible diaphragm 18, of suitable material, rests, and held and clamped in such position by the circular and depending shoulders 29 of cap 28, which is secured on the upper end

of cylinder 11 by bolts 32, engaging the vertically-aligned and oppositely-extending ears 31 and 30 of said casing and cap, respectively.

The valve-stem or plunger-rod 22 is adapted to operate vertically through the cylindrical aperture 27 of the cap and is decreased diametrically in size, forming the shoulder 26, which bears upon the upper or inner surface of the diaphragm 18, which is provided with an aperture or perforation for the passage of the decreased portion of said valve-stem or plunger-rod. Adjustable casting 19, provided with the vertical passage-way, is slipped upon the valve-stem and has its upper surface concave to bear snugly and firmly against the lower convex surface of the diaphragm. Depending from the lower surface of said casting is the annular flange 20, inclosing and securing firmly thereon the solid rubber valve or plunger 21, which normally rests upon the valve-seat 13. This valve or plunger 21 is semi-spherical in shape and has its lower convex side resting upon or against the upper concave surface of the water-way casting 23, the interior screw-thread of which engages the lower threaded end of valve-stem or plunger-rod 22.

The casting 23 is provided in its outer side with a suitable number of grooves or passages 24, extending vertically through the upper and lower surfaces of the casting, communicating when the valve is open, as shown in Fig. 3, with the interior chamber 10 and passage 12 of the cylindrical casing 11, and thus allowing the water to escape through the discharge spout or pipe 14, as will be readily understood.

Cast integral with the cap 28 are the vertically-extending and parallel ears 33, between which is journaled on the horizontal bolt 34 the heel or lower end of upwardly-extending lever 35, which is provided with the toe or circular portion 36, outstanding perpendicularly to the said lever 35 and engaging the opening or passage 37 in the upper end of the valve-stem or plunger-rod. The lever is also provided at its upper end with sleeve 38, in which is secured the hollow pipe or tube 39, provided at its opposite end with exterior screw-threads engaged by interior threads of sleeves 40 and 46 of elongated castings 41 and 42, the floors 43 of which are flush with the

lower interior surface of the tube or pipe 39, through which the valve operates. The shot 44, or other weighty substance, passes from one casting to the other. The casting 42 is also provided with the screw-threaded projection 46^a upon its end opposite to the sleeve 46, the said sleeve being engaged by the sleeve 47 of ball 48 of ordinary construction.

The operation of my invention is as follows:
 10 The box or water-receptacle, situated in a convenient position, has normally a certain quantity of water therein, and the tube to which the ball is attached is in the position shown in Fig. 1—the outer end of the tube in a
 15 slightly-elevated position and the shot accumulated in the casting 41, secured to the opposite end of the tube to that on which the float is secured. When the water is withdrawn, the float-ball, descending therewith,
 20 causes, through the connection of the bell-crank lever 35 with the upper end of the valve-stem or plunger-rod 22, the gradual opening of the valve. When the ball has descended to a position causing the outer end of the tube
 25 to be slightly lower than the end near the sleeve 38, the shot moves or travels to the casting 42, adjacent to the said ball, causing the float-ball to settle deeper in the water by reason of the increased weight, and the wide
 30 opening of the valve allowing the water to refill the box or receptacle and elevate the float. When the outer end of the tube is slightly above the horizontal, the transferring of the shot or other weighty substance from the casting
 35 adjacent to the float to the casting on the opposite end of the tube and beyond the pivotal point of the lever, with the assistance of the diaphragm exerting its pressure downward, the valve is closed, rapidly cutting off
 40 the supply of water to the box or receptacle. The advantage of this movement by weights to close the valve quickly is obvious, as the continued hissing and annoying sound accompanying the closing of ball-cock valves is prevented. I also claim as an advantage the
 45 construction of the diaphragm, making it instead of the usual semi-spherical shape (which wears cut in a short time from the continual pressure on its lower surface of the casting
 50 immediately below) nearly spherical in shape and provided with the usual flange. The idea in this construction is to allow the diaphragm to expand radially and horizontally as the pressure is applied, as shown at Fig. 3, always
 55 affording nearly the same bearing-surface to the casting 19 below it and therefore less liable to be cut or injured by the upper edge of said casting. The semi-spherical diaphragm

in ordinary use, as the pressure is applied below, gives inwardly, allowing the upper edge 60 of said casting to bear squarely against the surface of the diaphragm, injuring them slightly with every operation.

Having thus fully described my invention, what I claim as new, and desire to protect by 65 Letters Patent, is—

1. The combination, with a float 48, of a casting 42, having a threaded projection upon each of its ends, one of the said projections being engaged by the float, a tube having its 70 one end secured to the opposite extension, a casting 41, having a threaded sleeve thereon secured to the opposite end of the said tube, the upper surface of the floors of the casting being flush with the inner lower surface of 75 the said tube, a pivoted arm carrying the said tube and connected therewith between the said castings, and a plurality of globular bodies within the said tube and castings, as described. 80

2. In a faucet, the combination, with a cylindrical casing 11, of induction and eduction pipes connected to the top and bottom thereof, respectively, the said casing having an annular seat 13 above the said eduction-passage, 85 a slotted stem partially contained within the said casing, having a casting with vertical channels therein mounted upon its base within the said seat, a valve mounted upon the said stem above the said casting and adapted 90 to bear upon the said seat, an approximately spherical diaphragm having a flange secured to the said casing 11 above the induction-passage and surrounding a part of the said stem, a float 48, a casting 42, having a threaded 95 projection upon each of its ends, one of the said projections being engaged by the float, a tube having its one end secured to the opposite extension, a casting 41, having a threaded sleeve thereon secured to the opposite end 100 of the said tube, the upper surface of the floors of the said castings 41 and 42 being level with the inner lower surface of the said tube, a pivoted arm carrying the said tube and connected therewith between the said 105 castings 41 and 42 and passing through the slot in the said stem, and a plurality of globular bodies within the said tube and castings 41 and 42, as described.

In testimony whereof I affix my signature in 110 presence of two witnesses.

JOHN P. FARLEY.

Witnesses:

L. A. FARLEY,
 GEO. G. THORPE.