

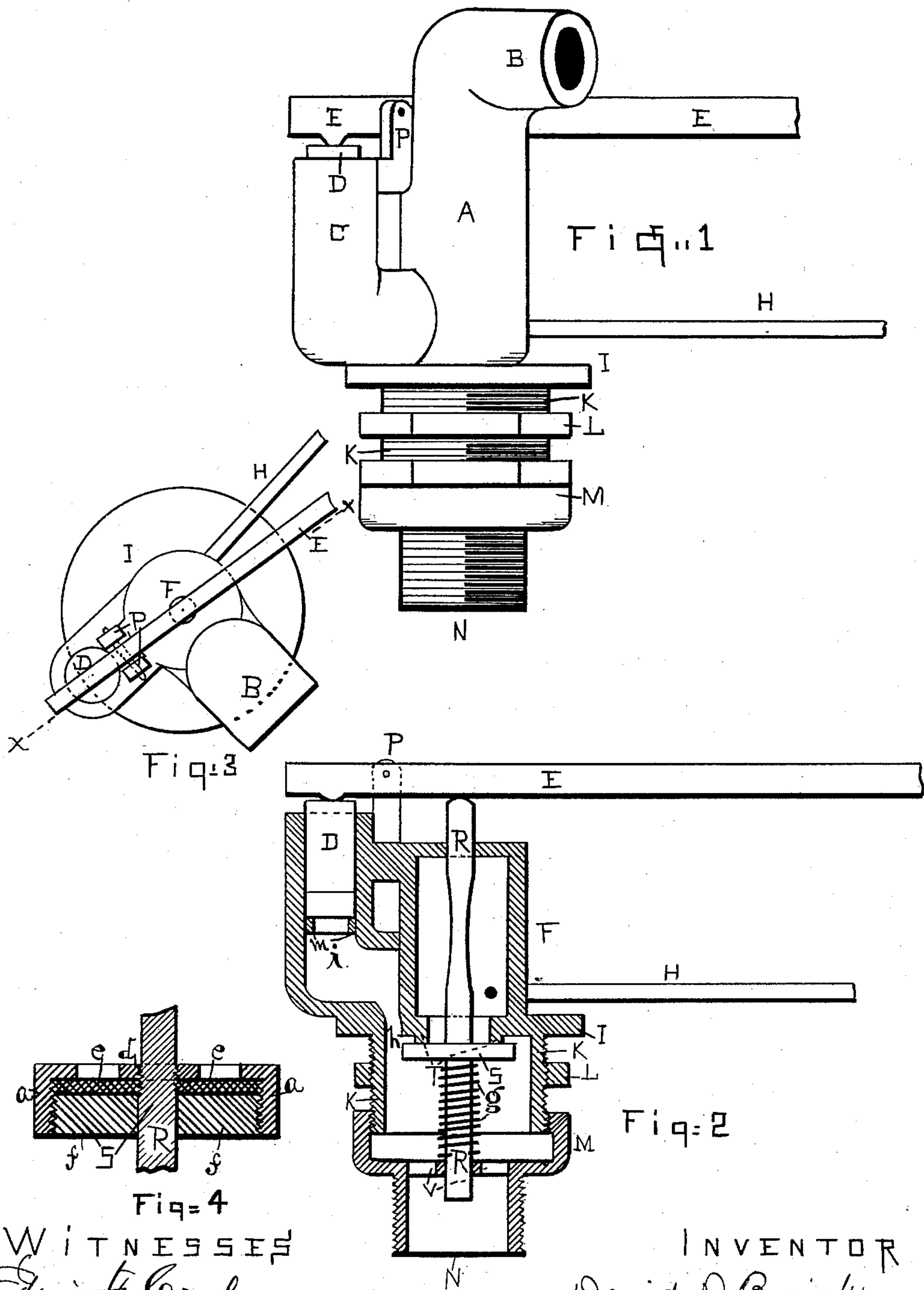
(No Model.)

D. D. BUICK.

BALL VALVE.

No. 338,477.

Patented Mar. 23, 1886.



WITNESSES
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UNITED STATES PATENT OFFICE.

DAVID D. BUICK, OF DETROIT, MICHIGAN.

BALL-VALVE.

SPECIFICATION forming part of Letters Patent No. 338,477, dated March 23, 1886.

Application filed August 21, 1885. Serial No. 174,994. (No model.)

To all whom it may concern:

Be it known that I, DAVID D. BUICK, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Ball-Valves, of which the following is a specification.

My invention consists in an improvement in ball-valves, hereinafter fully pointed out in the claims.

Figure 1 is an elevation of the valve complete, except the ball. Fig. 2 is a vertical central section through Fig. 1. Fig. 3 is a top plan view of the valve, and Fig. 4 is a vertical central section through a portion of the valve-spindle and the valve.

A represents the shell of the valve, B being the outlet-port, N the inlet-port, and C a cylinder on one side of the shell communicating with the inlet-port.

I represents a flange extending around the shell, and below this the shell is screw-threaded, as shown at K, and has a nut, L, thereon, so that when it is desired to connect the valve with a tank or other vessel into which water is to be discharged a hole can be made through the wall of the vessel, the threaded part K slipped through the hole, a washer having been first put under the flange I, and then by screwing on the nut L a tight joint can be made. The inlet-port N has an enlargement, M, having a female screw-thread to engage with the thread K.

T represents the valve-seat, and S represents the valve, which I usually make of a spindle, R, long enough to reach through the top of the shell, which serves as a guide, and down through a guide, V, in the inlet-port. On spindle R is a flange, *f*, the diameter of which is greater than the valve-seat, and on the circumference of this flange is a screw-thread.

e represents a washer, of leather or other suitable packing material, resting on the top of flange *f*, and held in position by a small nut, *d*, which screws on spindle R, and by an annular nut, *a*, which screws on flange *f*, thus leaving the washer *e* exposed between the nuts, as shown in Fig. 4.

h represents a passage, which leads from the valve below the seat into the cylinder C, and D represents a piston, fitting and moving in said cylinder, the bottom of said piston being packed with an ordinary cup-leather, *m*.

g represents a spiral spring surrounding spindle R between flange *f* and guide V, and tends to hold the valve against its seat.

P P represent two standards rising from the shell of the valve, and between them is pivoted the ball-lever E, in such position that its short arm is directly over the piston D, and will bear on said piston when forced up. The long arm of lever E passes directly over the end of spindle R, and at its end carries an ordinary ball or float. (Not shown.)

H represents a small pipe, tapped into the shell above the valve-seat, and its object is to wash the sides of the tank in which the ball works when the valve is opened.

The operation of the valve is as follows: When the valve is closed, as shown in Fig. 2, the water-pressure resisted by the valve forces the piston D against the short arm of the lever E, and thus tends to depress the long arm; but this is counteracted by the buoyancy of the ball, and also by the pressure of water on the flange *f* and the pressure of spring *g*. When the water which buoys up the ball is withdrawn, the long arm of the lever falls and presses the spindle R downward, thus forcing the flange *f* and washer *e* away from the valve-seat T, and permitting water to pass through the seat and escape through the outlet B. As the valve opens against the water-pressure, the weight of the ball would not be always sufficient to depress spindle R, especially in cases of great pressure, without using a very long lever; but the resistance offered by spindle R to the downward movement of the long arm of lever E is counterbalanced by the pressure of piston D on the short arm thereof, so that by making the distances from the fulcrum of said lever to its bearings on piston D and spindle R equal, and making the areas of the valve-seat and of cylinder C equal, the only resistance to the downward movement of the long arm of lever E will be that offered by the spring *g*; and by varying the proportional size of the valve-seat and the cylinder the balance of the valve may be changed at will.

This construction enables me to use this valve for water-closets, which are subjected to widely-varying pressures in different cities, and still keep the float-lever within the limits of the small tank usually employed for such purposes, instead of being obliged to use a

valve which closes against the water-pressure as usual.

What I claim as my invention, and desire to secure by Letters Patent, is—

5 1. In a float-valve which closes with the water-pressure, a float-lever pivoted on the shell, a cylinder having therein a piston constantly subjected to the water-pressure confined by the valve and bearing upon the short
10 arm of the float-lever, and a spindle passing through the valve-seat and bearing upon the long arm of the float-lever, substantially as shown and described.

15 2. In a float-valve, the combination of the shell containing the outlet and inlet pipes B N and seat T, with the cylinder C, communicating with the shell below the seat by the passage *h*, and having therein the piston D, valve S, hav-

ing the spindle R rising through the seat and shell and extending below the valve, and 2c spring *g*, surrounding the spindle below the valve, substantially as shown and described.

3. In a float-valve which closes with the water-pressure, a float-lever pivoted on the shell, a cylinder having therein a piston con- 25 stantly subjected to the water-pressure confined by the valve and bearing upon the short arm of the float-lever, a valve, S, consisting of washer *e*, flange *f*, and nuts *a d*, and spindle R, passing through the valve-seat and bearing 30 upon the long arm of the float-lever, substantially as described.

DAVID D. BUICK.

Witnesses:

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