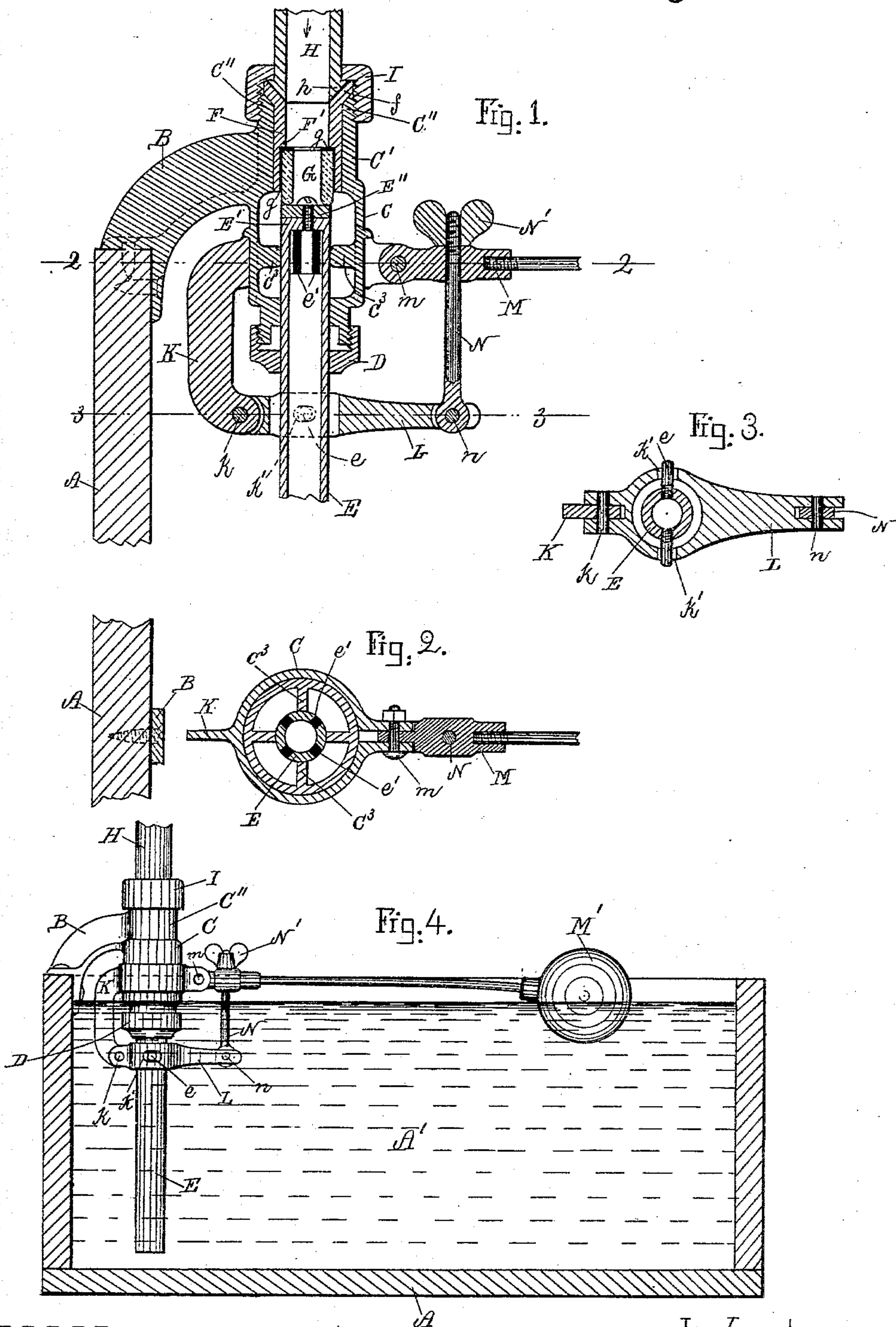


(No Model.)

J. CRAWFORD & J. H. YOUNG.  
BALL COCK FOR WATER CLOSET VALVES.

No. 545,348.

Patented Aug. 27, 1895.



Witnesses.

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# UNITED STATES PATENT OFFICE.

JAMES CRAWFORD AND JOSEPH H. YOUNG, OF BOSTON, MASSACHUSETTS.

## BALL-COCK FOR WATER-CLOSET VALVES.

SPECIFICATION forming part of Letters Patent No. 545,348, dated August 27, 1895.

Application filed March 11, 1895. Serial No. 541,309. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES CRAWFORD and JOSEPH H. YOUNG, citizens of the United States, and residents of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Ball-Cocks for Water-Closet Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in ball-cocks for water-closet tanks, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a central vertical section of the improved ball-cock. Fig. 2 represents a horizontal section on the line 2 2 shown in Fig. 1. Fig. 3 represents a horizontal section on the line 3 3 shown in Fig. 1; and Fig. 4 represents a side elevation of the improved ball-cock, showing the tank in which it is arranged in section.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A in Figs. 1 and 4 represents a flush-tank, as usual, to one end of which is secured a bracket B, supporting the cylindrical valve-case C, the lower end of which is open and provided with a suitable stuffing-box D, through which projects downwardly the delivery-tube E, the lower end of which extends below the liquid A' in the tank A and nearly to the bottom of the latter, as shown in Fig. 4. The upper end of the tube E is closed, as shown at E' in Fig. 1, and to it is attached at this place a valve E'', preferably made of leather, rubber, or other similar material.

C' is the upwardly-projecting neck of the valve-case C, and within it is detachably secured the valve-seat holder F, within the lower portion of which is fitted the cylindrical glass valve-seat G, the upper end of which abuts against an annular shoulder F' on the interior of the valve-seat holder F, as shown in Fig. 1. By this arrangement the glass valve may easily be removed in case of breakage or repairs.

g is a rubber packing located between the exterior of the glass valve-seat G and interior of the valve-seat holder F, so as to effect a water-tight joint at this place. The upper

end of the removable valve-seat holder F is preferably made outwardly flaring or conical, as shown at f in Fig. 1, and made to fit against a corresponding conical ground-surface C'' in the upper end of the valve-case neck C', as shown. To the upper end of the valve-seat holder F is fitted the water-supply pipe H, having a ground tapering or conical lower end h, adapted to fit against the interior upper conical surface of the valve-seat holder F, as shown in Fig. 4, and secured in such position preferably by means of an annular shouldered nut I, as shown.

On the outside of the valve-case C is clamped the vertically-adjustable bracket K, to the lower end of which is pivoted at k the lever L, which surrounds the pipe E and is provided with slots k' k', through which project pins e e, secured to the pipe E, as shown in Figs. 1, 3, and 4.

M is the float-lever, which is pivoted at m to the bracket K and provided with the usual float-ball M', as shown in Fig. 4.

The free end of the lever L is pivoted at n to a link N, the upper screw-threaded end of which projects through a perforation in the float-lever M, and is provided above the latter with an adjustable nut N', as shown, for the purpose of changing the normal level of the water desired to be maintained in the tank A. By the use of the intermediate lever L, connected to the float-lever and the valve-pipe E, a shorter ball-lever may be employed, as on account of the double leverage shown a ball-lever of the ordinary length will serve to close the valve against an increased pressure in the supply-pipe H.

The glass valve-seat G above mentioned is non-corrosive, smoother, and more perfect than a metallic seat. It is very hard, and the soft leather or rubber valve which acts against it retains its softness and thereby causes when brought against it to form a perfect closing fit not attainable in other kinds of valve-seats.

Below the upper end of the valve-pipe E are made side perforations e' e', as shown in Figs. 1 and 2, through which the liquid from pipe H is conducted through the pipe E into the tank A when the valve E'' is moved away from its seat G.



On the inside of the valve-case C are preferably made radial projections  $C^3 C^3$ , adapted to serve as guides for the upper end of the valve-pipe E, as fully shown in Figs. 1 and 2.

5 In this device it will be seen that all the liquid-pressure from the pipe H is brought to bear against the valve E'' and no pressure is brought against the stuffing-box D. Consequently a tight joint is always produced and  
10 maintained at the lower end of the valve-case.

When the liquid in the tank A falls below the desired normal one, the falling of the ball M' causes the valve E'' to be withdrawn from its seat G, thus enabling the liquid from the  
15 supply-pipe H to flow by said valve into the valve-case C and through side perforations  $e' e'$  into the pipe E and to the lower sealed portion of the liquid contents of the tank A in a quiet and noiseless manner. As the liq-  
20 uid in the tank A rises to its normal level, the float-lever M and its float M' cause the valve E'' to be closed against its seat G, preventing any flow of the liquid from the supply-pipe H until the level in the tank A falls below the  
25 normal one, and so on.

What we wish to secure by Letters Patent and claim is—

In a ball cock for water closet tanks, a valve case having arranged within it a valve seat and a vertically movable valve pipe arranged 30 in said valve case and opening downward by the pressure of the water, combined with a float lever carrying at one end a float ball and its other end pivoted to a fixed support, a lift-  
35 ing lever pivoted to the valve pipe and fulcrumed at one end to a fixed support, and a connecting rod pivotally connected at one end to the free end of the lifting lever and at its other end adjustably secured to the float le-  
40 ver, and means for effecting the adjustment of said lever, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 26th day of February, A. D. 1895.

JAMES CRAWFORD.  
JOSEPH H. YOUNG.

Witnesses:

ALBAN ANDRÉN,  
LAURITZ N. MÖLLER.