

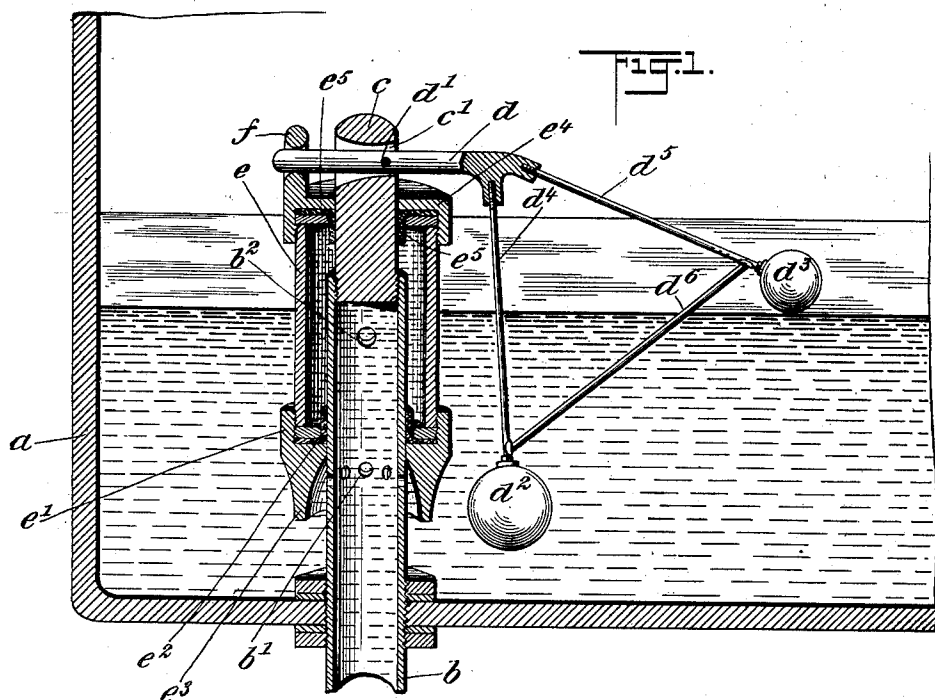
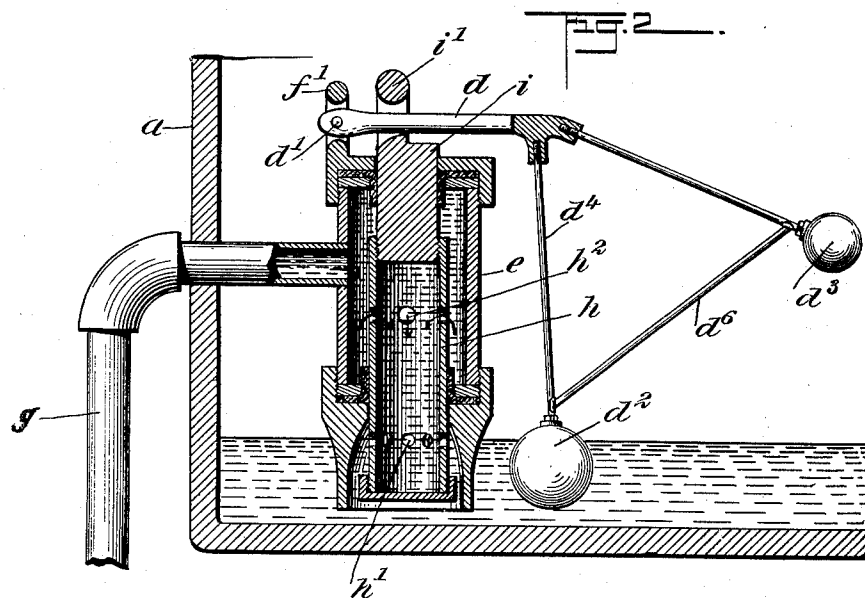
No. 737,955.

PATENTED SEPT. 1, 1903.

A. NELSON.  
BALL COCK.

APPLICATION FILED JAN. 12, 1903.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ALBERT NELSON, OF QUINCY, MASSACHUSETTS.

## BALL-COCK.

SPECIFICATION forming part of Letters Patent No. 737,955, dated September 1, 1903.

Application filed January 12, 1903. Serial No. 138,716. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT NELSON, a citizen of the United States, and a resident of Quincy, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Ball-Cock, of which the following is a full, clear, and exact description.

This invention relates to a ball-cock especially applicable to flush-tanks, but useful also in other connections, as will be apparent to skilled mechanics.

The prime object of the invention is to provide a mechanism which will quickly and with certainty open and close the water-supply, and by thus avoiding a slow-closing movement I attain not only a valve which enables the tank to be quickly filled, but also one which avoids those uncertain movements of the float which occur in many ball-cocks of known construction during the period in which the closing operation takes place. In attaining this end I provide a pipe and a shell inclosing the same, said parts being relatively movable and the water being supplied to one. The pipe is perforated at two points and has an extension projecting through one end of the shell, to which is connected a float device for imparting the relative movement referred to. At the other end of the shell a flaring skirt is provided, which, as one of the perforations in the pipe is uncovered by the relative movement of the pipe and shell, acts as a guard to prevent splashing the water as it is discharged.

This specification is an exact description of two examples of my invention, while the claim defines the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a sectional view of the invention, showing a form in which the shell is movable on the supply-pipe; and Fig. 2 is a section showing a modified form of the invention, in which the shell is stationary.

*a* indicates the flush-tank, and *b* indicates the supply-pipe, which, according to the construction shown in Fig. 1, passes up through the bottom of the tank and is formed with a series of openings *b'*, through which the water is adapted to be discharged into the tank, and

an opening or openings *b''*, the purpose of which will be fully described hereinafter. In the top of the supply-pipe is rigidly fastened an extension or plug *c*, having an eye *c'* at its upper end, through which eye the float-lever *d* passes and which carries the fulcrum *d'* of the lever. Two balls or floats *d''* and *d'''* are provided, these being connected to the lever *d* by rods *d''* and *d'''*, respectively, and said rods being braced apart by a rod *d''''*. By these devices, disposed as shown, the main float *d''* (when the floats are in lowermost position) is held close to the vertical line of the fulcrum *d'*. Therefore the water rising in the tank will submerge the float *d''*, having no material rising effect thereon during the short leverage. When, however, the water reaches the float *d'''*, (see Fig. 1,) this float, being outward from the fulcrum *d'* and affording the necessary leverage, will move upward and in turn swing the float *d''* outward. As soon as this outward movement of the float *d''* begins its leverage increases and finally it rises with great rapidity, shutting off the valve, as will be hereinafter described.

*e* indicates the shell, which has a lower head *e'* sliding on the supply-pipe *b* and fitted with a packing-gasket *e''*, in the form of a cup-leather, which is disposed inwardly with respect to the shell, so that the water-pressure therein will expand and make a tight joint. The head *e'* is provided with a downwardly-disposed skirt *e'''*, which serves to deflect the water downward as it flows from the openings *b'*. The upper end of the shell *e* is provided with a head *e''''*, having a packing-gasket *e'''''*, similar to the gasket *e''*, before described. This head *e''''* slides on the plug or extension *c* of the supply-pipe. Fastened to or formed integral with the head *e''''* of the shell *e* and extending upward therefrom is an ear *f*, through which passes loosely the end of the lever *d*.

The parts are shown in Fig. 1 in the position which they assume when the cock is open. The water rising in the float will submerge the ball *d''*, but will not impart any material movement thereto. This action continues until the water reaches the ball *d'''*, and then the lever *d* will be swung rapidly upward, moving down the shell *e* and cutting off the water. The parts are so timed or positioned that this movement of the float-lever

will take place the instant before the tank is filled to the desired level, thus allowing the shell *e* to drop instantly by its own weight and by the pressure of the float-lever thereon.

5 By these means the valve is instantly and effectively closed. As the water drops in the tank the balls fall, and thus the shell is raised to open the orifices *b'*, the parts reassuming the position shown in Fig. 1. The openings  
10 *b'* are exclusively for the discharge of the water into the tank, and of course when the shell drops it incloses these openings and the supply-pipe *b* is closed. The opening *b<sup>2</sup>* is for the purpose of allowing the water from the  
15 supply-pipe *b* to enter the shell at all times, thus equalizing the pressure on the shell.

It will be observed in connection with this valve that there are no seats and that the only parts past which leakage is possible are  
20 the heads *e'* and *e<sup>4</sup>* and the shell *e*. At these points leakage may be effectively prevented by the form of packing employed, and the contact being a sliding contact, such as that of a rod in a packing-gland, it is clear that  
25 all leakage may be avoided.

The construction shown in Fig. 2 differs from that shown in Fig. 1 only in that the shell *e* is immovable, it being fastened to the pipe *g*, which leads the water into the tank *a*.  
30 Said pipe *g* discharges into the shell *e*, and within the shell is arranged the supply-pipe *h*, this pipe taking the place of the pipe *b* in Fig. 1 and being provided with openings *h'* and *h<sup>2</sup>*, the same as the openings *b'* and *b<sup>2</sup>*, before described. The float-lever *d*, with its two  
35 balls *d<sup>2</sup>* and *d<sup>3</sup>*, before described, is passed loosely through an ear *i'*, formed on a plug or extension *i* of the tube *h*, and the shell *e* has

its ear *f'* arranged to carry the fulcrum *d'* of the lever *d*. Therefore as the lever *d* moves  
40 it slides the pipe *h* instead of the shell; but in other respects the action is precisely the same as that before described.

Various changes in the form, proportions, and minor details of my invention may be  
45 resorted to at will without departing from the spirit and scope thereof. Hence I consider myself entitled to all such variations as may lie within the intent of my claim.

Having thus described my invention, I  
50 claim as new and desire to secure by Letters Patent—

The combination of a pipe, a shell inclosing the same, said parts being relatively movable, and one of said parts having water supplied  
55 thereto, the pipe being perforated at two points and having one end projected loosely through one end of the shell, whereby upon the relative movement of the pipe and shell, one of the perforations is uncovered, a flaring skirt attached to the shell and serving to  
60 inclose the uncovered perforations to prevent splashing the water discharged therethrough, the second end of the pipe having an extension projected through the corresponding end  
65 of the shell, a lever having connection with the shell and with the said pipe extension, and a float in connection with the lever.

In testimony whereof I have signed my name to this specification in the presence of  
70 two subscribing witnesses.

ALBERT NELSON.

Witnesses:

JOHN E. ERICSON,

ANDREW WESTERBERG.