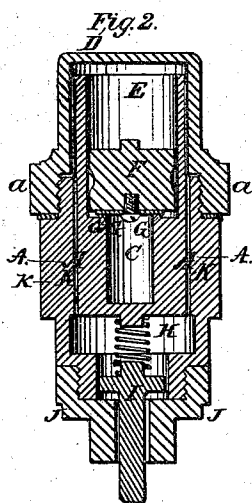
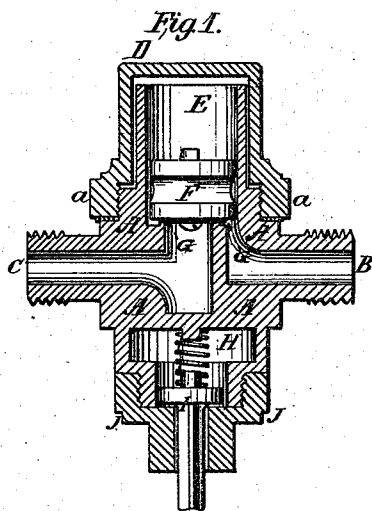


J. E. BOYLE.
Water-Closet Valves.

No. 156,407.

Patented Nov. 3, 1874.



Witnesses;
Geo Stevenson
John S. Berry

Inventor;
J. E. Boyle

UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN WATER-CLOSET VALVES.

Specification forming part of Letters Patent No. **156,407**, dated November 3, 1874; application filed February 27, 1874.

To all whom may it concern:

Be it known that I, JAMES E. BOYLE, of the city of Brooklyn, Kings county and State of New York, have invented certain new and useful Improvements in Cocks or Valves for Water-Closets; and I do declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, making part of this application.

Water-closet valves or cocks have been heretofore made in various forms, nearly all using the ordinary cup-leather piston or diaphragm, having a variable chamber with water-ways leading thereto from the water-supply to insure the closing of the valve. In all these forms the small feed to the variable chamber is liable to become clogged by the sediment or other obstructions in the water, and the cup-leathers are liable to become worn and destroyed. All of these valves require, even under an ordinary pressure of water, a very considerable power to be exerted in opening them; all, or nearly all, are opened against the pressure of the water.

My invention is intended to dispense with cup-leathers, diaphragms, and all other appliances liable to become injured or destroyed by use, and to present the least possible resistance to the opening of the valve under all degrees of pressure of the water. Indeed, so slight will be the resistance that a child having strength sufficient to empty the pan will be able, under the heaviest pressure of water to be found in our cities or towns, to open the valve and insure the wash.

I will now describe the construction and operation of my improved valve or cock, so as to enable those skilled in the art to make and use my invention, referring by letters to the accompanying drawing, in which—

Figure 1 is a vertical longitudinal section. Fig. 2 is a vertical cross-section.

In the several figures the same parts are designated by the same letters of reference.

A is the main body of the valve or cock. B is the induction water-way, leading to the inside of the body of the valve or cock. C is the eduction water-way, leading therefrom to the bowl of the closet. D is the cap of the valve or cock, attached to the body of the valve by screwing it in its place at *a*. The

cap is made so much larger in diameter than the outside of the body of the valve A, which extends up nearly to the top of the inside of the cap D, as to leave a considerable water-way all round the body of the valve and within the cap. E is a chamber within the cock or valve, above the induction and eduction water-ways. F is a gravitating plug of brass, or other suitable material, made to fit loosely the bore of the chamber E, fitted with suitable packing at its lower end, and which packing is held in its place by a screw or other proper and suitable device. G G, in Fig. 1, show the valve-seat, with the gravitating plug F resting thereon, closing the water-ways. H is another chamber—which I will call the wasting-chamber—situated within the body of the valve or cock and underneath the induction and eduction water-ways. I is a small trip-valve at the bottom of the chamber H, and opening into said chamber H with its stem passing through the lower cap J of the cock or valve. K K, in Fig. 2, are holes drilled through the body of the cock or valve from the bottom of the water-way formed by the space between the chamber E and the cap D, connecting the chamber E with the chamber H. Upon the stem of the trip-valve I and within the chamber H I place a spiral spring to insure the closing of the trip-valve.

It will be seen that when the gravitating plug F is resting upon the valve-seat G G, as shown in the drawing, Fig. 1, the communication between the inlet and outlet of the water is closed. This closing of the water-ways is not due solely to the weight of the plug F, but to the pressure of the water, which, having passed the plug F into the chamber E, holds the plug F firmly to the valve-seat G G. In this position all the water-ways and chambers within the valve or cock are filled with water, and the pressure of the water holds in its place upon the valve-seat G G the plug F, as before stated, and also holds firmly to its seat the trip-valve I in chamber H.

Now, it will be observed, if the trip I be opened, the throat or outlet of the trip-valve I being larger than the water-way around plug F in chamber E, and the water being drawn with great force from and through the chamber E to the outlet made by opening the trip-valve

I, the plug F is carried instantly, by the current or pressure of the water to the top of the chamber E. Immediately on closing the trip-valve I—which is closed instantaneously by the pressure of the water, upon the release of the hand of the operator—the plug F travels down or sinks gradually in chamber E until it reaches the seat G G and closes the water-ways, thus giving a sufficient wash to the bowl of the closet.

Having fully described my invention, what I claim and desire to secure by Letters Patent, is—

1. The chambers E and H, in combination with the trip-valve I and the gravitating plug F, in valves of water-closets and other cocks, substantially as described.

2. A small trip-valve, in combination with a gravitating plug in the chambers of valves or cocks for water-closets, for the object specified, substantially as described.

J. E. BOYLE.

Witnesses:

GEO. STEVENSON,
JOHN S. BERRY.