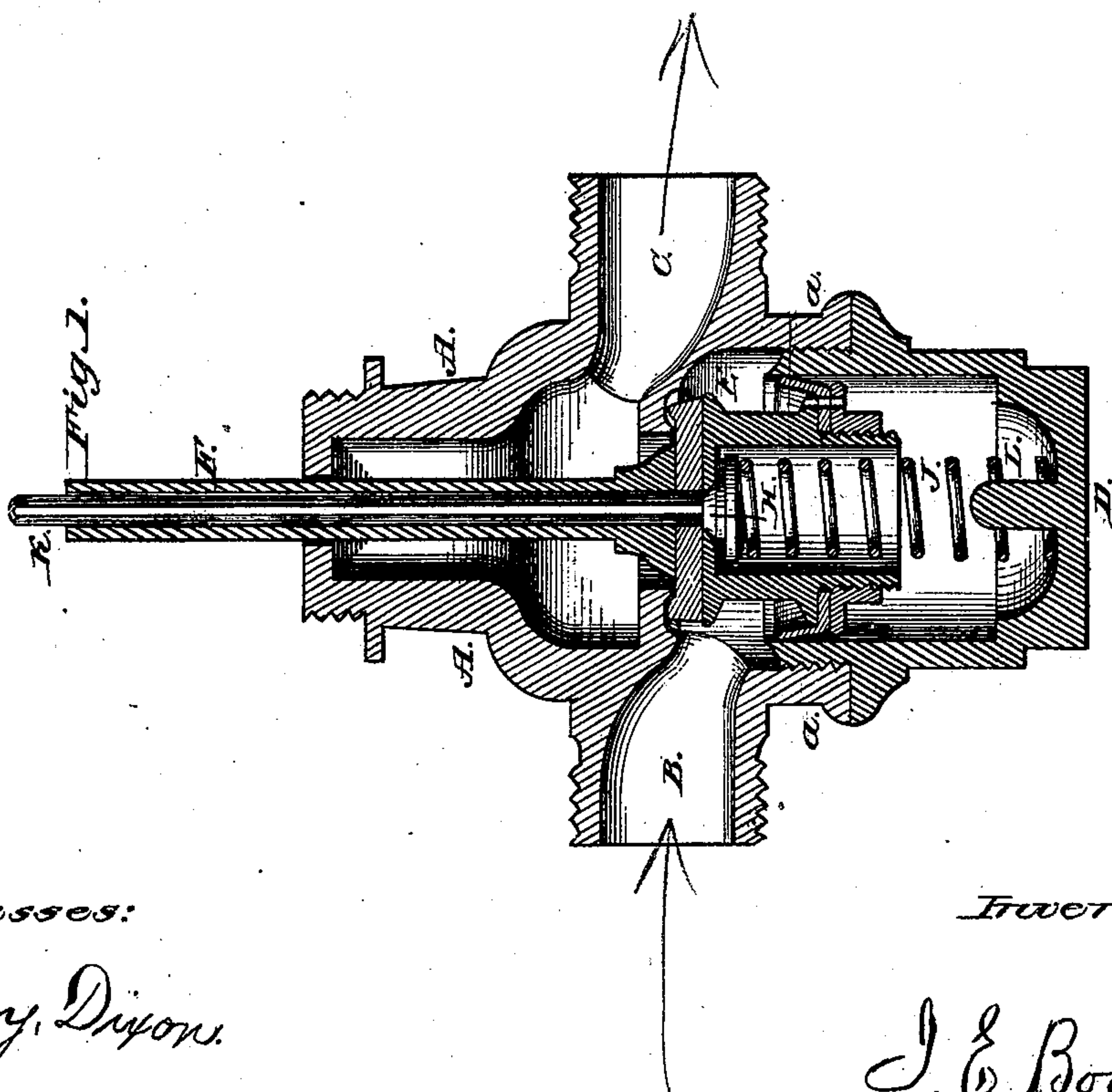
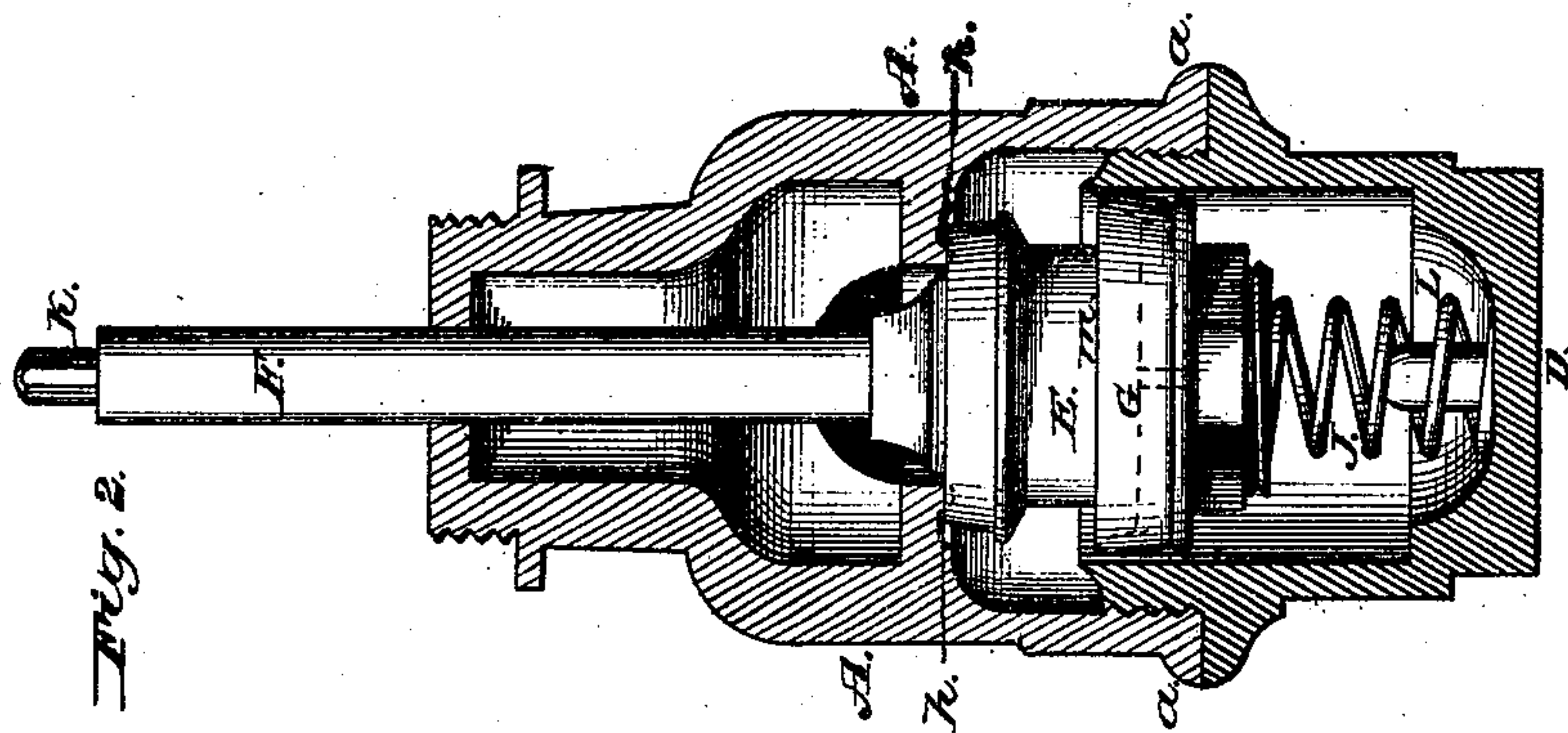


J. E. BOYLE.
WATER-CLOSET VALVE.

No. 172,843.

Patented Feb. 1, 1876.



Witnesses:

Dudley Dixon.
Geo. Stevenson.

Inventor:

J. E. Boyle.

UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF HIS
RIGHT TO GEORGE STEVENSON, OF NEW YORK CITY.

IMPROVEMENT IN WATER-CLOSET VALVES.

Specification forming part of Letters Patent No. **172,843**, dated February 1, 1876; application filed
June 10, 1875.

To all whom it may concern:

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

Valves or cocks heretofore made, in which is used 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, all require the use of a very considerable power to open them, and nearly all are opened against the pressure of the water.

My invention is intended to relieve the pressure instantaneously in all cup-leather or diaphragm valves or cocks, so that the slightest effort will enable a person to open the valve or cock against the heaviest pressure of the water.

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 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 cup of the valve or cock, attached to the body of the valve by screwing it in its place at *a a*. E is the main valve, made hollow or in cup form, with a continuation of a hollow stem, F, and packed in the body of the main valve by means of a cup-leather diaphragm, or packed piston, or their equivalent, at G. *h h* is the seat of the main valve E. Within the hollow stem of the main valve E is arranged a small trip or balance valve, H, the stem K of which reaches beyond the end of the stem F of the valve E about one-eighth of an inch, so that

whenever the main valve E is operated, the lever or power used in opening shall strike first upon the stem K of the said trip-valve H, and lift the said trip-valve from its seat. J is a spiral spring, placed within the body of the valve or cock A A, one end of the said spring being held in its place by a projection in the interior of the cap D at L, and the other end resting upon the top of the valve H, and holding the valve H and valve E firmly to their respective seats. Through the side of the main or cup-formed valve E an opening of small diameter is made at *m*, to supply water to the chamber of the cup-valve E, slowly or gradually, to insure the closing of said valve E.

It will be observed that when the valves are at rest the whole pressure of the water is above the valves, holding them firmly to their respective seats, and preventing the passage of any water to the bowl of the closet, or through the eduction-pipe C.

Now, if the trip-valve H be opened, the outlet of the trip-valve H being much greater than the hole, aperture, or feed *m* in the side of the main valve E, the water in the body of the valve E is instantaneously discharged through the hollow stem F, and the main valve E is raised from its seat by the pressure of the water. The main valve E is suspended open so long as the trip-valve H remains open, the water having a free passage through the valve E to the bowl of the closet. As soon as the trip-valve H is closed, which it is instantaneously upon the release of the hand of the operator, and which closing is effected by means of the spring J, the valve E is closed gradually, the slow closing being due to the filling of the body of the cock or valve E with water through the small aperture *m*.

The stem of the valves E and H may be constructed in one piece, or solid, and the trip-valve H may be made by cutting away the stem at the point where it passes through the bottom of the main or cup valve E, and discharging the water from the body of the valve E into the bowl of the closet through the eduction-pipe C, or any other equivalent form of the trip-valve may be used; but I prefer to discharge the water into the trunk of the closet

through the hollow stem of the valve E, as above described.

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

The combination of the hollow stem F, valve E, piston G, provided with aperture *m*, and

the trip-valve H, substantially as and for the purpose specified.

J. E. BOYLE.

Witnesses:

GEO. STEVENSON,
G. L. ISHAM.