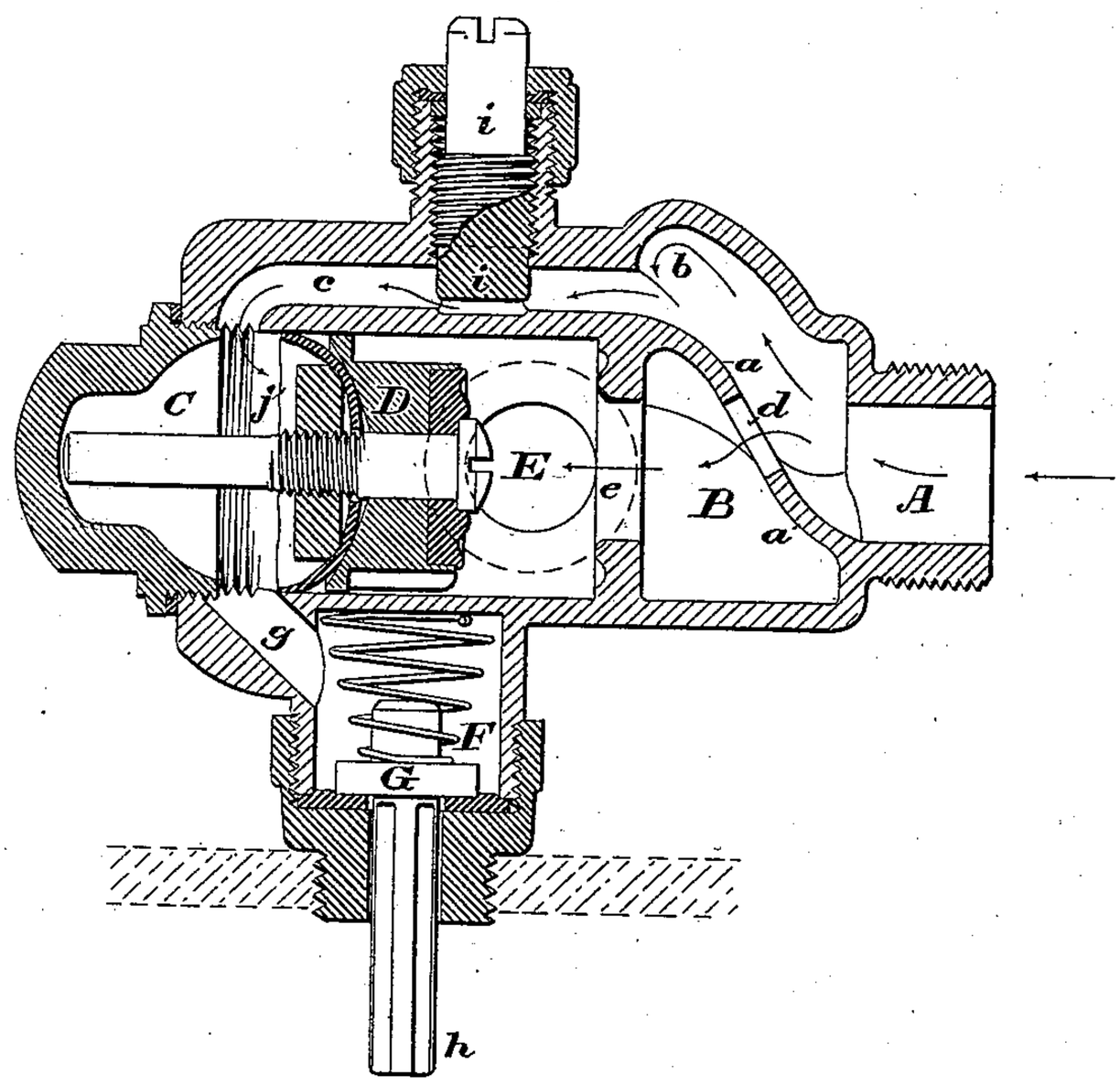
W. McELROY.
Water-Closet Valve.

No. 207,615. Patented Sept. 3, 1878.



ATTEST:

Thomas P. Pemberton.

Walter W. Scott.

INVENTOR:

William McElroy.

By his Attorneys,

Burke, Fraser & Connell

UNITED STATES PATENT OFFICE.

WILLIAM McELROY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN WATER-CLOSET VALVES.

Specification forming part of Letters Patent No. **207,615,** dated September 3, 1878; application filed June 27, 1878.

To all whom it may concern:

Be it known that I, WILLIAM MCELROY, of Brooklyn, Kings county, in the State of New York, have invented certain Improvements in Flush-Valves for Closets, of which the following is a specification:

This invention relates to that class of flush-valves in which an excess of pressure upon the valve which keeps it upon its seat is removed by tilting the pan, when the valve is forced from its seat and the closet flushed. Righting the pan restores the pressure on the valve, and it slowly closes.

The invention consists, partly, in mechanism whereby the time of the flow is regulated, and partly in other improvements in the construction, whereby the operation of the valve is rendered more positive and effective, all as will be hereinafter more fully set forth.

In the drawing is shown a longitudinal mid-section of a flush-valve embodying my improvements.

A is the inlet, screw-threaded to receive the water-pipe coupling, and opening into a chamber, B. This chamber is divided obliquely by a diaphragm, *a*, which directs the incoming current toward a reverberatory cavity, *b*, and the mouth of the narrow passage *c*, which admits the water to a chamber, C, above or beyond the piston-valve D. The diaphragm *a* is perforated at *d* to admit the retarded current to and through the valve-opening *e*, and thence out at the flush-pipe E. A passage, *g*, leads from the chamber C into a side chamber, F, which has an outlet closed by a spring-valve, G, with fluted projecting stem *h*. The cap through which the valve-stem passes is screw-threaded, and may be screwed into the top of the closet-trunk, as indicated in dotted lines; and some projection on the rock-shaft, to which the closet-pan is attached, may be arranged to engage the stem *h* when the pan is tilted. When the pan is tilted the stem *h* is pressed in so as to lift the valve G and allow the water in the chamber C to escape, and thus relieve the pressure on the valve D, which has heretofore been resting on its seat at *e*. As soon as this pressure is relieved the valve is driven from its seat to the position shown in the drawing by the force of the current entering through A *d e*, which then passes freely out through the flush-pipe E. The valve G being only momentarily opened, and at once closed by its spring, the water passes through *c* into the chamber C, and slowly presses the valve D back to its seat, thus cutting off the escape of the water at the pipe E.

The operation, so far as above described, is common to this form of valve; and it is obvious that, without additional regulating mechanism to adapt it to the flow, the closets on the lower floors of city buildings, as ordinarily plumbed, would get a much more thorough flushing than those above. Indeed, if the valve were adapted to suit the lower closets, the upper ones would not be properly flushed.

It must be obvious that the rapidity with which the piston-valve D returns to its seat after the valve G is closed depends entirely, other things being equal, upon the capacity of the tube or passage *c*. If this passage is large, the valve will return quickly and the flush will be scanty; but if the passage be small, or contracted, or obstructed, the flush will be large, the ratio being inverse.

I provide for regulating the time of the flow as follows: I make the passage *c* of ample size for the lower closets, or those nearest the street-main, and then fix a screw-plug, *i*, or some equivalent adjustable stop or obstruction, in the said passage, so as to choke or cut off the flow through the same, either in whole or in part. This may be simply a screw-plug of about the same diameter as the passage *c*, arranged to enter it at right angles and entirely close it by being screwed down into a seat, as shown. The closer this plug is screwed down the longer the valve D will be in returning to its seat, and consequently the longer will the flush continue. Thus it will be seen that the valve can be adjusted exactly to the amount of water available.

The diaphragm *a* serves to render more free the passage of water from A into *c*, and to retard the rush of water through *c*. The cavity *b*, by providing a backward cross-current, tends also to retard the too great rush of the water through the orifice *e*.

To enable the piston-valve D to move from its seat freely and quickly, and to retard its rapid return, I provide a cup-packing, *j*, of

leather or other equivalent or suitable material. The inward pressure of the water at the moment the valve lifts causes this packing to fit less tightly, and consequently the valve moves quickly, which is very desirable; but pressure in the other direction causes the packing to press tightly against the walls of the chamber, and thus retard the progress of the valve to its seat, which is also desirable.

I claim—

1. In a flush-valve for closets having a valve-piston, D, arranged to move to and fro in its chamber in response to the excess of pressure exerted by the water on either side of it, a relief-valve, G, and passage *g*, to relieve the pressure back of the valve, a passage, *c*, connecting the valve-chamber C with the chamber B below the valve-seat, and a stop or plug, *i*, arranged to obstruct the passage *c*, all combined and arranged substantially as set forth.

2. In a flush-valve for closets, the arrangement of an oblique diaphragm, *a*, across the chamber B, perforated at *d*, and arranged to deflect the current entering at A toward the mouth of the passage *c*, substantially as set forth.

3. In a flush-valve for closets, the combination of the diaphragm *a*, arranged as shown, with the cavity or chamber *b* and passage *c*, substantially as set forth.

4. In a flush-valve for closets, the piston-valve D, provided with a cup-packing, *j*, of leather or other suitable material, so arranged that when the valve is driven from its seat it may move freely, but when driven to its seat the packing will retard its progress, substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM McELROY.

Witnesses:

ARTHUR C. FRASER,

JEREMIAH McAULIFFE.