

No. 770,416.

PATENTED SEPT. 20, 1904.

T. C. BEAUMONT.
FLUSHING VALVE.

APPLICATION FILED JAN. 21, 1903.

NO MODEL.

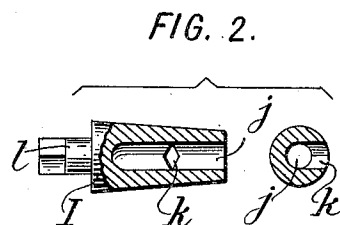
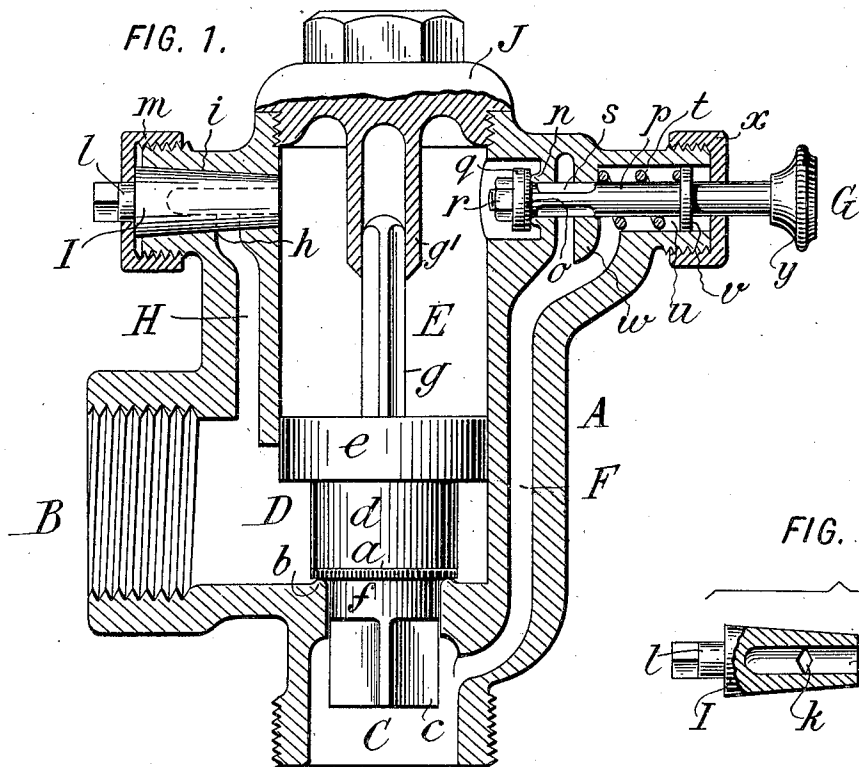
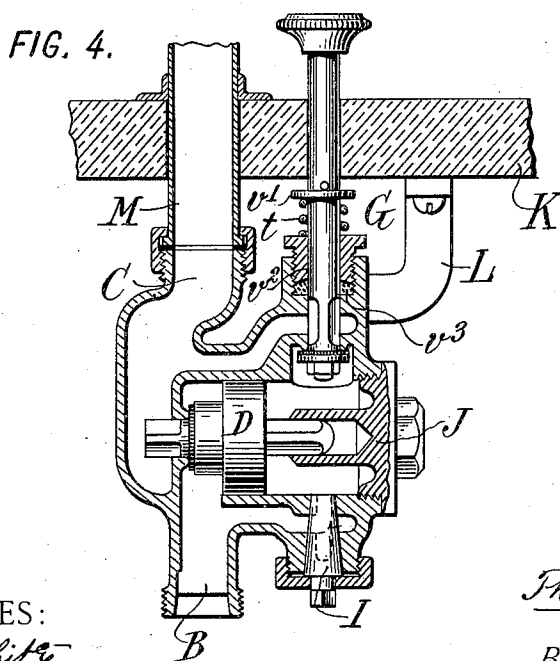


FIG. 3.



WITNESSES:

Fred White
Thomas Malloch

INVENTOR:

Thomas C. Beaumont,

By Attorneys,

Arthur C. Orsen

UNITED STATES PATENT OFFICE.

THOMAS C. BEAUMONT, OF NEW YORK, N. Y., ASSIGNOR TO THE HENRY HUBER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

FLUSHING-VALVE.

SPECIFICATION forming part of Letters Patent No. 770,416, dated September 20, 1904.

Application filed January 21, 1903. Serial No. 139,937. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. BEAUMONT, a citizen of the United States, and a resident of the borough of Bronx, city, county, and State of New York, have invented certain new and useful Improvements in Flushing-Valves, of which the following is a specification.

This invention relates to improvements in valves, and particularly to those which automatically close after a predetermined flow of water, this type of valve being chiefly used as a flushing device for water-closets and the like.

My invention is especially directed to simplify the construction of the valve and rendering it more compact in shape and economical in manufacture, as well as increasing its efficiency of operation.

My invention also includes certain features by which the valve is more easily inspected and its parts more conveniently assembled or replaced than those now in use.

Referring to the accompanying drawings, which illustrate my invention, Figure 1 is a view of a water-closet-flushing valve, showing the valve-shell in vertical section and the valves, &c., in elevation. Fig. 2 is a detail view of the plug-valve in longitudinal and transverse section. Fig. 3 is a diagram illustrating the adjustment of the plug-valve; and Fig. 4 is a view similar to Fig. 1, showing my improvements as applied to a basin-valve.

Referring to the drawings, let A indicate the valve-shell, which is formed with an inlet B, leading from the water-supply, and an outlet C, leading to the closet-bowl. The outlet C is normally closed by a piston-valve D, which carries a gasket *a*, seating upon a seat *b*. The valve is provided below the gasket *a* with the usual guide-wings *c*. Above the gasket *a* is a cylindrical portion *d*, which is designed to reduce the area of the piston *e* upon its under side, so that when pressure is admitted to both sides of the piston it will be forced downwardly to its seat. The piston *e* works in a cylindrical chamber E, formed in the upper part of the shell A, the piston mak-

ing a tight working fit to prevent passage of water around it to or from the chamber.

F is a passage cored in the shell leading from the upper part of the chamber E to the lower part of the shell below the valve-seat *b*. The passage F is normally closed by a relief-valve G; but when the latter is pressed in the water in the chamber E (with which it is normally filled) escapes through the passage F to the closet-bowl. This is due to the fact that the opening of the relief-valve practically reduces the pressure in the chamber E to *nil*, while the full head is acting upon the under side of the piston *e*, thus rapidly moving the piston to its upper position and forcing out the water in the chamber above it. This movement of the piston unseats the valve D and permits the flushing of the bowl. The flow continues until the valve D slowly returns to its seat, which is caused by the refilling of the chamber E, the water therein acting against the upper side of the piston, and thus overcoming the pressure upon the reduced area of the under side. This refilling takes place through a passage H, cored in the shell A and extending from the inlet B to the top of the chamber E. This passage is controlled by a plug-valve, which, while designed to be always open, is adjustable to graduate the rate of flow through the passage. This rate of flow is less than that which takes place through the passage F; but when the latter is closed by the relief-valve G the chamber refills at a rate dependent upon the effective opening of the plug I. During the latter part of the seating movement of the piston-valve D a cylindrical portion *f* with which the valve is provided below its gasket *a* enters the passage through the seat *b* and being of a diameter which is nearly equal to that of the seat so restricts the outflow-opening that only a small quantity of water can pass through it. This produces a diminished afterflow, which is desirable in water-closet valves.

Broadly speaking, the provision of the various parts of the valve hereinbefore described is not new—that is to say, flushing-valves

have heretofore been provided with valves and passages which are adapted to operate in the manner described. It is to the form of these various parts and their relative arrangement that my invention is chiefly directed, although I also introduce certain features of construction which are novel in flushing-valves and the like.

I aim to provide a valve which shall be of simple construction, the various parts of which shall be contained in a compact and symmetrical shell, within which they may be easily and quickly assembled or from which they may be conveniently removed for inspection or replacement. One of the more important features of construction which contribute to this result is the formation of the chamber E as an unobstructed cylinder which is closed at its top by a cap J of a diameter equaling that of the cylinder E, so that by unscrewing the cap the entire valve D may be lifted bodily out of the cylinder. Preferably the valve has a stem *g*, which works in a guide *g'*, formed on the under side of the cap, this stem thus serving the double purpose of guiding the valve and providing a convenient means for removing the latter.

The passage H extends directly upward from the inlet B and terminates at *h*, at which point it joins a conical recess *i*, which receives the plug-valve I, the valve and its recess preferably making a ground fit. The plug I (best seen in Fig. 2) has a central bore *j* and is formed at one side with an opening *k*, which is designed to register with the end of the passage H when the valve is turned to its proper position, so that water may flow through the passage H and opening *k* into the bore *j*, and thence to the chamber E. To accurately graduate this flow so as to adjust the rate of closure of the piston-valve D, I form the opening in the shape of a diamond or tapered toward both its ends, and the plug is turned to adjust the degree of lap of this opening over the end of the passage H. The effective opening may be thus adjusted to a minute degree. The diagram Fig. 3 shows the two openings, *k* indicating the plug-opening and *h* the end of the passage H. The plug I is formed with a stem *l*, which has a squared end designed to be engaged by a wrench, the stem passing out through a follower *m*, as shown.

The passage F is preferably formed directly opposite the passage H, so that the relief-valve G may be in a convenient position for use. This valve consists, as shown, of a stem *p*, carrying on its inner end the valve proper, *q*, and on its outer end a knob *y*. The valve *q* is faced with a gasket *o*, held in place by a nut *p*, and closes against a seat *n*, formed in the shell A. The stem *p* is formed with the usual grooves or longitudinal recesses *s* near its end. A spring *t*, confined in a lateral chamber *u* between a collar *v* on the stem *p*

and a depending partition *w* of the shell, serves to keep the valve pressed to its seat. The valve-stem passes out through a cap *x*. To avoid the need of a packing for making a tight fit between the stem *p* and cap *x*, I provide the partition *w*, which extends downwardly opposite the opening of the valve-seat and serves as a shield to deflect the water passing through the seat into the passage F. To assist in this result, the collar *v* on the stem *p* is made to closely fit the cylindrical chamber *u*, and any water which may reach the chamber is thus prevented from escaping outside the shell. To return any water which may pass through the shield *w*, the chamber *u* is connected with the passage F, as shown. I have found that if the parts thus described are made with a reasonably close fit the water passing from the chamber E (which is under only slight pressure) will flow to the passage F without any liability of leakage to the outside of the shell. It will be observed that the valve G in its normal position is entirely outside the chamber E, as is also the plug I, so that the chamber is left entirely unobstructed by these two parts.

My improvements are in the main applicable to basin-valves, and in Fig. 4 I have illustrated such a construction. The valve, generally speaking, is turned so that the relief-valve G and plug I extend vertically, while the piston-valve D, cylinder E, and cap J extend horizontally. The valve is fixed to the usual marble slab K by an arm L, carried by the valve-shell, and the outlet G instead of leading downwardly to the water-closet bowl extends upwardly and is coupled to the usual gooseneck, the lower part of which is shown at M. In this construction the spring *t* is preferably located outside of the valve-shell, as shown, being confined between a collar *v'* and the top of a follower *v''*, which serves to compress a packing *v'''* in the usual manner.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

In a flushing-valve, a shell having a valve-chamber therein, a piston-valve adapted to move in said chamber toward and from its seat, said valve having a stem *g*, a cap J for said chamber having a guide *g'* engaging the stem *g*, a passage H leading from the water-supply to said valve-chamber, a plug-valve I controlling flow of water through said passage, a relief-passage F leading from said valve-chamber to the discharge end of the valve-shell, a relief-valve controlling flow through said relief-passage, and having a stem *p* adapted to project into said valve-chamber when the relief-valve is open, and to be retracted from said chamber when the relief-valve is closed, a shield formed integrally with the valve-shell, and surrounding said stem, a cylindrical chamber *u* at the rear of said shield, a collar fitting said cylindrical

chamber, a cap fixed to the valve-shell and
having an aperture for the passage of said
stem, said collar and shield being adapted to
prevent flow through said cap around said
5 stem, and a spring confined between said
shield and collar adapted to press said valve
to its seat.

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

THOMAS C. BEAUMONT.

Witnesses:

EUGENE V. MYERS,
THOMAS F. WALLACE.