

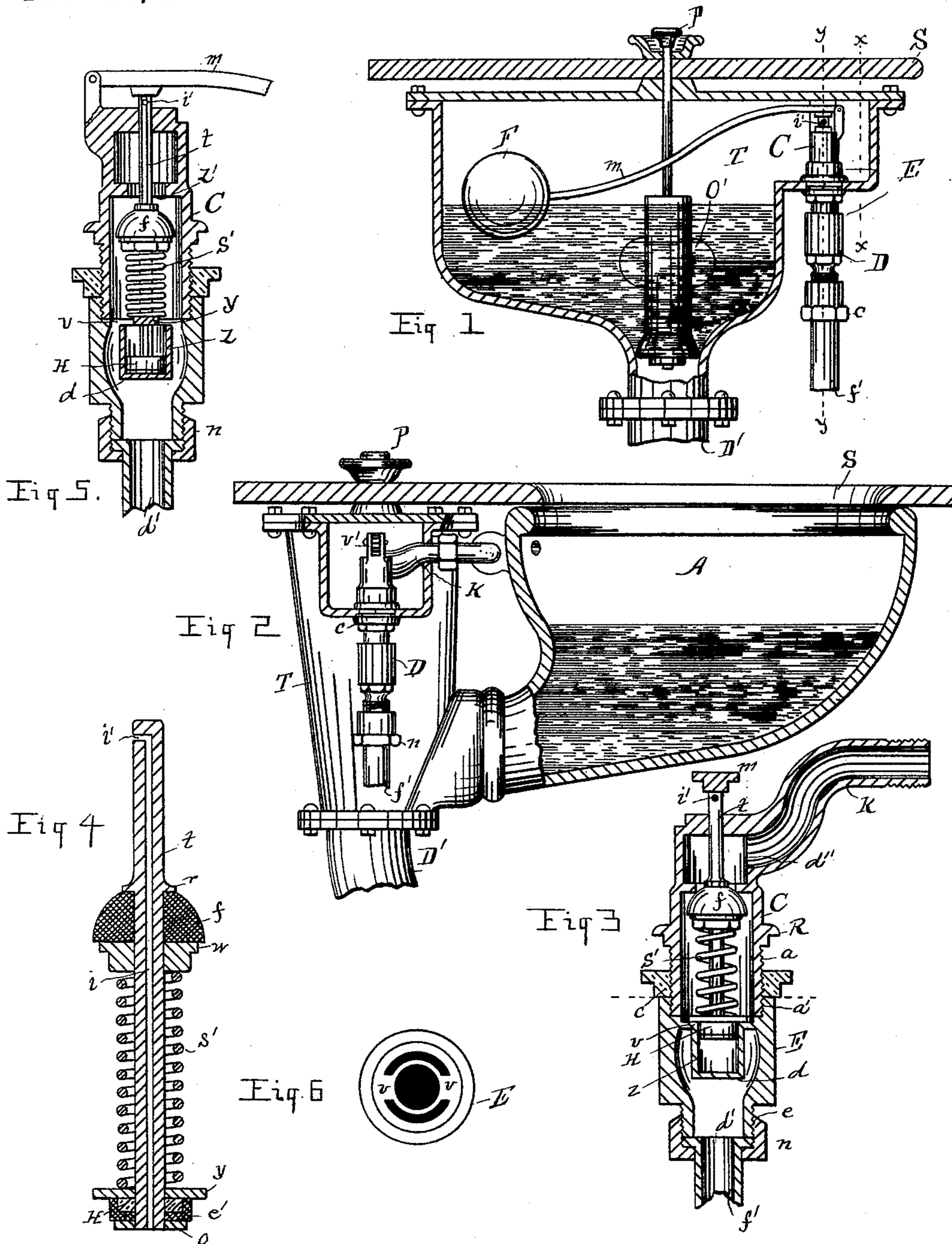
(No Model.)

A. McKAY.

FLUSHING VALVE FOR WATER CLOSETS.

No. 414,158.

Patented Oct. 29, 1889.



Attest.

C. W. Russell.
Edgar S. Wheeler

Inventor.
Alexander McKay
By
Ramon B. Wheeler
att'y

UNITED STATES PATENT OFFICE.

ALEXANDER McKAY, OF DETROIT, MICHIGAN.

FLUSHING-VALVE FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 414,158, dated October 29, 1889.

Application filed May 18, 1889. Serial No. 311,321. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McKAY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Flushing-Valves for Water-Closets; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to flushing-valves for water-closets and to that class of closets in which such valves are operated by a float-lever.

The invention consists in the combination of parts, as hereinafter set forth, and particularly defined in the claims.

In my invention the valve-stem is provided with an aperture or opening through its vertical portion, which communicates with an opening formed in its horizontal portion at the top. The lower end of the stem carries a plunger or piston-head, which works in a cup or cylinder supported in the valve-chamber by bridges, whereby, when the valve is depressed to admit a flow of water, the piston-head is forced into the cup or cylinder, displacing the air therein through the apertures in the stem, and as the valve is closed by the reaction of the spring the plunger or piston-head in rising forms a vacuum in said cup or cylinder, which creates a suction through the apertures in the valve-stem, causing air to flow through into the cylinder from the cistern and thus retard the sudden return of the valve, but allowing it to gradually close with but little, if any, noise, as will be hereinafter more fully set forth, and the essential features of my device pointed out particularly in the claims.

In the accompanying drawings, forming a part of the specification, Figure 1 is a sectional elevation of a closet, showing my improved flushing-valve in connection and relation thereto. Fig. 2 is a front elevation of Fig. 1, partly broken away and in section on dotted line *x x*. Fig. 3 is a central vertical

section of Fig. 1, taken on dotted line *y y*. Fig. 4 is a central vertical section of the valve-stem and coiled spring in normal position. Fig. 5 is a central vertical section of Fig. 3, taken at right angles, showing valve-stem and spring depressed. Fig. 6 is a plan in detail, which will be referred to.

In the letters of reference in the drawings, A represents the bowl, T the cistern or tank, D' the discharge-pipe, S the seat-board, and P the operating-rod to the discharge-valve, all of which are common in water-closets of this class, and will therefore need no special mention.

D represents the flushing-valve containing my invention, the case to which consists of the two parts C E, the upper portion of the part E being screw-threaded at *a'* to receive the lower screw-threaded portion *a* of the part C, on which part is also located a screw-threaded collar *c*, as clearly shown in Fig. 3. *d'* indicates the induct-port.

Suspended centrally within the chamber of the portion E of the case by means of the bridges *v* is a cup or cylinder Z, in which the plunger or piston-head H, attached to the lower end of the valve-stem *t*, works in operating the valve. Said piston-head is provided with a leather or flexible covering, as *e'*, (shown in Fig. 4,) to form an air-tight packing in the cup or cylinder, and is held in position on the piston-head by the washer *o*.

Y shows a yoke or collar, which is supported on the upper edge of the cup or cylinder Z, and forms a support for the lower end of the coiled spring *s'*, and through said yoke and coiled spring the valve-stem passes, rising and falling as the valve closes and opens. The upper end of the spring *s'* rests against the under face of the collar *w*, which collar and the shoulder *r* of the valve-stem serve to secure the valve *f* in position upon the valve-stem *t*. Passing vertically through said stem is an aperture *i*, which communicates with a right-angle aperture *i'*, formed in the stem at the upper end, all of which are clearly shown in Figs. 3 and 4. The valve when in its normal position is held closed against the valve-seat Z' by pressure of the coiled spring *s'*, as shown in Fig. 3.

The part C of the valve-case is provided

with the discharge-port d'' and a flange R , which rests on the inner face of the cistern-wall, while the collar c is screwed against the under face of said wall, whereby the valve-case is suspended in position, as shown in Figs. 1 and 2.

Resting on the upper end of the valve-stem t is an arm or lever m , having one end pivoted within the forked yoke y' of the valve-case, and carries at its other end the ball or float F , which arm and float operate the valve by the rise and fall of the water in the cistern T , as is practiced in this class of closets. (See Fig. 1.) By this arrangement of parts, as the valve-stem t is depressed by the weight of the float and lever as the water is discharged from the bowl and cistern, the piston-head H will be forced into the cylinder, displacing the air therein, which escapes through the openings or apertures $i i'$ into the cistern or tank T above the water-line. At the same time the valve f leaves its seat Z' , admitting a flow of water to the feed-pipe K where it enters the bowl A , and passing through the opening O' refills the cistern, when the float F and lever m will rise and relieve the pressure on the valve-stem, whereby by the action of the coiled spring the valve f will be forced back into its seat Z' , and in so doing the piston-head H in rising forms a vacuum in the cylinder Z and creates a suction through the apertures in the stem, causing air to be drawn into the cylinder, which suction retards the sudden return of the valve f , but allows it to gradually return to its seat and cut off the flow of water to the bowl.

By the combination of the suspended cylinder, the piston-head, and apertures in the valve-stem, a compound or equalizing pressure is brought on the valve in its movements, which obviates the thumping or water-hammer caused by the sudden closure of valves with a single or direct pressure.

I am aware that it is not new to provide the valve-stem with a duct or passage to aid the seating of the valve carried by the valve-stem; but such devices are not the equivalent of my invention herein set forth, for the reason that the horizontal opening in the valve-stem is located at such points as to bring said opening in direct communication with the inflow or outflow of water, whereby, as the valve-stem is raised and lowered in operating its valve, water is caused to be sucked or drawn into the ducts of the valve-stem, passing into the cylinder, thus

causing gravel and sediment to collect in the cylinder, retarding the downward stroke of the valve-stem. It also causes the ducts to become filled with foul matter, and in some instances closing the ducts; but by passing the valve-stem and its ducts $i i'$ through the upper section of the valve-casing and into the cistern or tank above the water-line in the tank, as practiced by me, water is prevented from being drawn into the valve-stem, and by this arrangement of parts, should the packing around the piston-head of the valve-stem become worn so as to cause water to enter the cylinder, the downward movement of the piston-head as the valve drops would force the water out through the ducts of the valve-stem into the tank or cistern. By this arrangement the operator can readily detect any leak caused by the wearing of the piston-head or caused by improper packing or fitting of parts, the leak being detected without removing any of the parts of the device.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the cistern, the valve-case consisting of two parts each having screw-threaded engagement, the discharge-port and valve-seat located in the upper part, the induct-port in the under part, the cylinder suspended in said induct-port, the valve-stem carrying a piston-head at its lower end and a valve near its center, the coiled spring encircling the valve-stem, and the yoke supporting the lower end of said spring, the aperture i in said stem, and aperture i' communicating therewith and opening horizontally through the valve-stem and communicating with the cistern, substantially as specified.

2. In combination with the cistern, the valve-case suspended therefrom, said valve-case consisting of two parts, the upper part having the fixed collar, discharge-port, the valve-seat, the threaded part a , the screw-threaded collar c , the lower part having the induct-port, the cylinder suspended in said induct-port being formed integral with the lower part of the valve-case, which is also internally screw-threaded at a' , as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER MCKAY.

Witnesses:

J. L. HULL,

R. B. WHEELER.