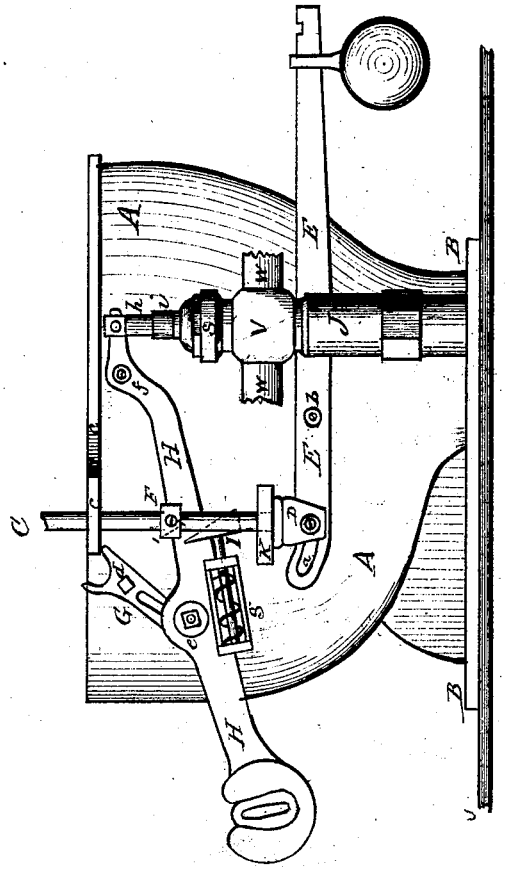
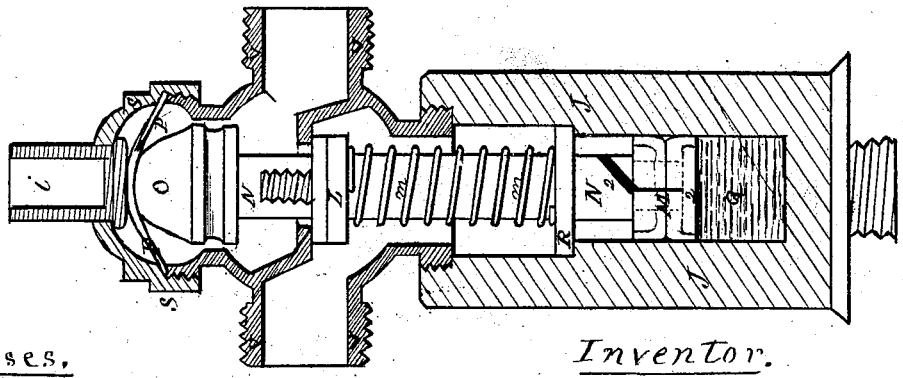
J. Keane,

Water Closet.

No. 107,178. Patented Sept. 6. 1870.





Witnesses.

James Bell.

William Burnett.

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John Keane

United States Patent Office.

JOHN KEANE, OF NEW YORK, N. Y.

Letters Patent No. 107,178, *dated September* 6, 1870.

IMPROVEMENT IN WATER-CLOSET.

The Schedule referred to in these Letters Patent and making part of the same

I, JOHN KEANE, of the city, county, and State of New York, have made certain Improvements in Automatic Water-Closets, of which I give the following description, illustrated by a drawing, and by letters and figures referred to in these specifications.

The nature and objects of my invention are in the construction and combination of the actuating apparatus, to compact it so that it will occupy less space than heretofore, to make the automatic action more positive and reliable, and to prevent the liability of the water running to waste from the clogging up or obstruction of the device which controls its flow, and at the same time to have the closet so constructed with all its parts together that it requires only ordinary mechanical skill to put it up and keep it in running order.

The class of water-closets for which the apparatus of my present invention is intended is that wherein the weight of the occupant upon a hinged seat puts certain of its parts in that position, that the rising therefrom will enable the other portions to complete the requisite movements to cleanse the closet, and be restored to the several positions which its levers, weights, and valves require, to make it ready for the next occupant; and all this without taxing the memory, skill, or manual labor of the former one; cleansing the soil-pan when in the best position to be freed from its foulness, and continuing the flow of the rinsing water for a definite time after the occupant has risen from the seat, and thus, not only insuring very thorough cleanliness, but the closing of the orifice by the water, and preventing the escape of any effluvia.

The means by which I effect these results will be best explained by a

Description of the Drawing.

Figure 1 shows my invention in side views perspective.

A A is a cast-iron hopper and stand, of which the base B B forms a part.

c is a flange projecting from the rim of the hopper. Other projections or bosses are cast upon the hopper at proper points, for attaching the moving parts of the apparatus.

C is a stiff iron rod passing this flange *c* and the boss or projection K, the upper end of the rod fitting into a socket or other convenient attachment fastened to the under side of the ordinary hinged water-closet seat, the lower end terminating in a piece of bronze or other metal, D, carrying the bolt or pin that slides in the slot *a* of the weighted lever E E, this latter pivoted at *b*.

The rod C has fastened upon it, and made adjustable by means of a set-screw, the square collar F, one side of which is beveled, as shown by the dotted lines 1 1.

The soil-pan, which is of the ordinary construction, (not shown in the drawing,) is pivoted at *d*, and is moved by the action of the short slotted lever G, a pin or bolt, *e*, attached to the lever H H, being the means of producing this movement.

The lever H H moves upon the center *f*, and upon its long arm is cast a small frame, which carries a beveled headed locking-bolt, I, this being thrown forward by the spiral spring *g*.

The office and operation of this bolt I will be explained further on.

The short arm of the lever H H is attached by joint to the plunger or short rod *h*, this fitting with some free play into a socket-shaped piston-rod *i*, shown also in section in fig. 2, this rod actuating the interior mechanism of the globe-valve or water-way, and the retarding-cylinder, which I proceed to describe in detail. This part of the apparatus is seen in external form in fig. 1.

J is the retarding-cylinder, whose office is to control the flow of the water, and prevent shocks and concussions in the moving parts connected therewith.

r is a two-way globe-valve, secured upon the top of the retarding-cylinder.

S is a metal cap-attachment to the globe-valve, through the center of which the socket piston-rod *i* moves.

W W show the inlet and outlet-pipes attached to the globe-valve, but represented as broken off, because they may be connected with the hopper and the main supply-pipe at any convenient points.

The retarding-cylinder and valve are secured to the base B B at such distance from the hopper as will allow the lever E E to move without interference. The center of it, of course, must be placed under the plunger, which is jointed to the short arm of lever H H.

Figure 2 will be used to explain the details and operation of this part of my invention, the details being shown mostly in section.

J J is the retarding-cylinder.

V V, the two-way globe-valve for the water, and secured into the upper end of the retarding cylinder.

L is the valve which closes the water-way.

M is the piston of the retarding-cylinder, made tight by two cup-shaped leather disks or packings attached to the piston-head, with the cups in opposite directions.

N N is the piston-rod, which operates both the piston M and the valve L, and is terminated with a conical head, O.

P is an elastic rubber diaphragm, interposed be-

tween the conical head O and the rounded end of the socket piston-rod *i*, and secured in place by compression between the caps *s s* and the end of the globe-valve screw.

The use of this diaphragm is to prevent leakage of water through the orifice in cap *s* through which the hollow piston-rod *i* moves.

m is a spiral spring, abutting at its lower end against the metal collar R, which, it will be seen, fits closely into an enlargement of the cylinder J.

Through the center of this collar, with a tight fit, the piston-rod N N moves.

The upper end of the spiral spring *m* bears against the under side of the valve L.

The lower portion of the cylinder J is filled with mercury, Q.

A small hole is drilled through the piston-rod from beneath, leading into a larger one made from the upper side of the piston, shown in the dark lines 2 2, the small hole being about one one-hundredth of an inch in diameter.

The operation of the apparatus is as follows:

As seen in fig. 1, the parts are all in proper position for the occupancy of the closet.

On sitting down upon the hinged seat, the rod C is thrust downward, moving the weighted lever E E upward at its weighted end.

Moving with the rod, the collar F thrusts back the spring-bolt *i* till it locks upon the upper face of the collar. Now, on rising from the seat, the weighted lever E carries up the lever H by means of the spring bolt and collar, at the same time turning down the soil-pan through the intervention of the bolt or pin in H working in the slot in the lever G.

During these motions, which are gradual, (owing to the action of the retarding device,) the short arm of lever H presses down the plunger *h*; this acting, by means of the socket piston-rod *i*, upon the rod N N, opens the water-valve L, and presses the piston M upon the mercury; this, slowly percolating through the orifice 2 2, allows the water to be gradually turned on and shut off, and continuing the flow for a definite period after the soil-pan has been returned to its place, which is done when the spring-bolt slips from the collar in the upward motion of the rod C; the object of this after-flow being to make a water-joint, to prevent the escape of effluvia.

The time during which these operations are continued depends on the size of the orifice 2 2, through which the mercury is transferred from the under to the upper side of the piston M, though this may also be modified by the position of the weight upon the lever E E

After the tripping of the spring bolt from the collar, the fall of the lever H draws up the plunger from the socket piston-rod; this leaves the spiral spring to carry up the piston-rod N N close to the valve L, while the mercury is, through the orifice 2 2, transferred again to the bottom of the cylinder. While the water is flowing through the globe, leakage through the cap *s s* is prevented by means of the rubber diaphragm P.

I am aware that automatic water-closets have been made before, and that retarding devices have been known, as in the invention of J. Downs, patented in England many years since, in which a fly-wheel and pinion-rack was used to make the action of the parts gradual; but this was both complex and uncertain; and I have also received Letters Patent for inventions having the same objects in view, as in No. 89,151, April 20, 1869, and No. 90,453, May 25, 1869, but the devices therein described had defects which my present invention obviates

For instance, in my previous inventions, the retarding-chamber or cylinder has been separate and detached from the water-valve instead of being connected; again, the retarding medium which I formerly used was oil, glycerine, or water.

I found by experience that oil would become gummy after a little time, and, its being lighter than water, prevents its use in a cylinder connected with a water-valve, as it would float off in a waste-pipe.

Glycerine, being soluble, is subject to the same objection; and water would soon become so filled with sediment that the retarding-cylinder would be inoperative, and I have found, in many years' experience in the manufacture and putting up of water-closets, that whatever obstructs or deranges the flow and shutting off the water with certainty is the great cause of trouble in all inventions that I have ever met with or made myself.

Again, the retarding-cylinder in my former inventions was made with a side duct, regulated by a cock, and I have found that gumming oil, viscid glycerine, or water charged with sediment, would clog this duct so as to require frequent cleaning out.

The advantages which I claim for my present invention over my own or the devices of others are these:

Firstly, it is more compact, allowing the operating parts to occupy less space;

Secondly, a shorter traverse for the hinged seat, because the locking bolt and collar will allow them to engage with less motion than in the gravity catch I have heretofore used;

Thirdly, the spring-bolt or collar is more positive and reliable than the slide and catch above alluded to; and

Fourthly, the substituting of mercury for the retarding medium allows the water-way or valve to be constructed and operated in connection with the retarding-cylinder, for the reason that, being of great specific gravity, it will not float off with the water, nor become deteriorated by it; again, while it has a sufficient solidity of body to clear from the orifice any obstructions that may gather there, its particles are so mobile that it does not obstruct the working of the piston, and the right rate of flow being once established, this is never changed by its becoming viscid or gummy.

I would here remark that all the parts of the retarding-cylinder and its details, as the piston, collar, spiral springs, and piston-rod, should be made of iron and steel, or some metal which does not readily amalgamate with mercury.

I am aware that mercury has been used as a packing in gas-pipe joints, and also in the pump-valves of some kinds of philosophical instruments. Therefore, while I do not claim broadly an automatic water-closet, nor broadly a retarding-cylinder for regulating the flow of the water, nor of mercury, as applicable to gas-joints and pump-valves,

What I do claim as novel and useful, and desire to secure by Letters Patent, is—

1. The inclined-faced adjustable collar F and the spring-bolt I, in their combination with and relation to each other.

2. These, in their combinations with and relations to the rod C and the levers E G H.

3. All these, in their combinations with and relations to the retarding-cylinder J, the globe or water-way V, and the operating parts thereof.

4. A water-closet apparatus, consisting of a bowl, levers E and H, and a retarding-valve, adjustable collar, and spring-bolt, constructed substantially as described, and in which mercury is applied as a retarding medium, as and for the purposes set forth,

JOHN KEANE.

Witnesses:
JAMES BELL,
WILLIAM BURNET.