H. J. BAILEY.

WATER-CLOSET.

No. 188,492. Patented March 20, 1877.

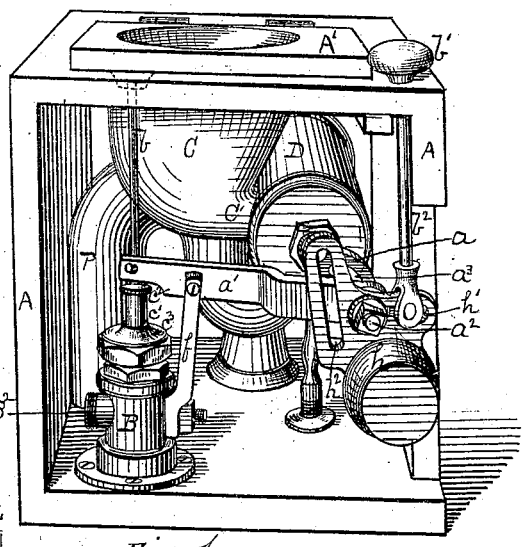

Fig. 1.

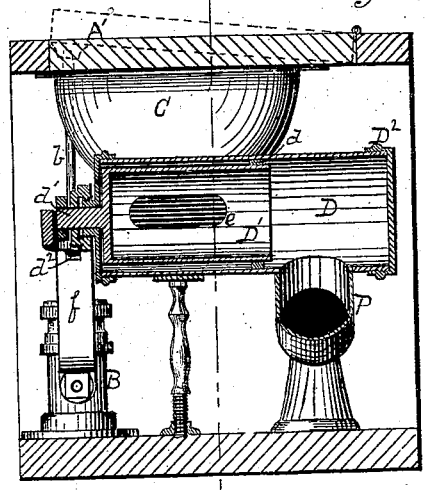

Fig. 2.

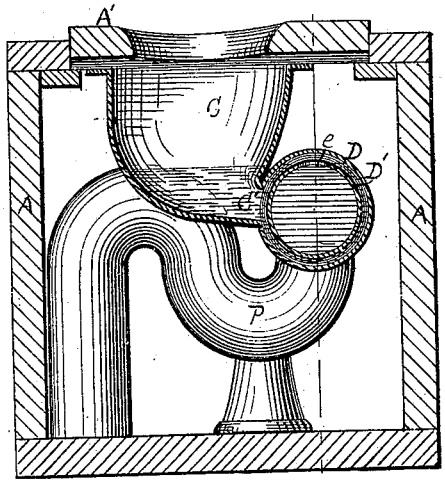

Fig. 3.

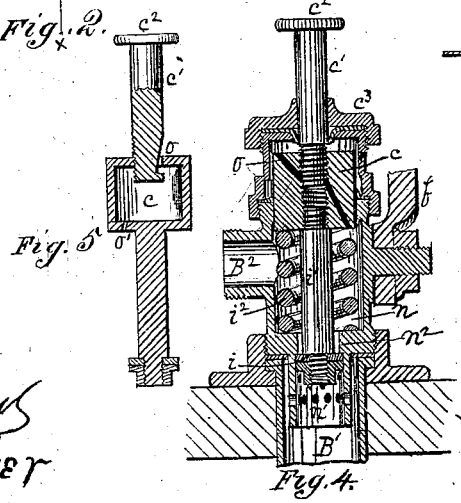

Fig. 4.

Fig. 5.

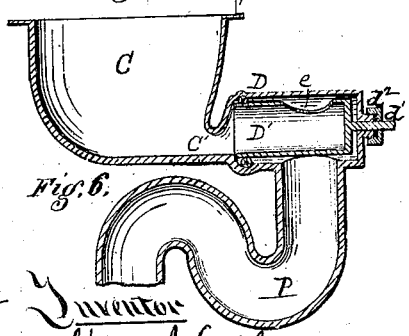

Fig. 6.

Witnesses.

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IMPROVEMENT IN WATER-CLOSETS.

Specification forming part of Letters Patent No. **188,492**, dated March 20, 1877; application filed November 1, 1876.

To all whom it may concern:

Be it known that I, HARRY J. BAILEY, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Water-Closets; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of so much of my improved water-closet and its connecting devices as are requisite to illustrate the invention. Fig. 2 is a vertical sectional view thereof through *x x* of Fig. 3. Fig. 3 is a vertical sectional view through *x' x'* of Fig. 2. Fig. 4 is a vertical sectional view of the flushing-valve and devices for flushing the basin, and Figs. 5 and 6 illustrate certain modifications presently to be described.

The frame or case A is of any suitable construction. The seat A' may be hinged or not, at pleasure, and, when hinged or otherwise movable, it may be employed to operate the flushing-valve B by a stem, *b*; or the usual knob or handle b^1 and stem b^2 may be employed for the same purpose, the seat, in the latter case, being fixed or movable, as may be preferred.

The closet-bowl is represented at C, made with a drain or escape opening, C', leading into a valve-chamber, D, from which latter the usual trapped pipe P leads to the waste. Inside the valve-chamber D I arrange a rotary hollow cylindrical valve, D^1, preferably so that one open end shall discharge directly or indirectly into the pipe P, as illustrated in Fig. 2. This valve, at or near its open end, has between it and its chamber D a packing, *d*, made water-tight, or practically so, and its opposite end is made close, and with a stem, d^1, projecting from its end cap through a stuffing nut, d^2, on the end cap. The valve D^1 has also a lateral port, *e*, of suitable size or capacity for the drainage, at pleasure, of the contents of the bowl C. This valve is rotated by means of a crank, *a*, affixed to the stem d^1, a connection being made to such crank from either operating-stem *b* or b^2, at pleasure, or from both, as presently to be explained. For greater clearness of illustration I have omitted the flushing-pipe, which leads from the port B^2 of the flushing-valve B to the bowl C, in the usual or any desired way. This flushing-valve has a water-pipe connection at B^1, Fig. 4. The depressing seat-stem *b* (when such is used) is connected to the adjacent end of the operating-lever a^1, which latter rests on the head c^2 of the piston-stem c^1, and this latter, passing through a stuffing-nut, c^3, is screwed into a tapped hole in the piston *c*. Into the opposite or lower end of the piston *c* I secure the end of the valve-stem i^1, which latter passes through the chamber *n*, and carries a valve, *i*, which, in turn, plays up and down in the perforated barrel n^1, and seats upward against a valve-seat, n^2, so as to open and close communication between the supply-pipe B^1 and flushing-port B^2 through chamber *n*. A spiral or other suitable spring, i^2, serves to close and hold the valve to its seat when not depressed or open by other agencies. The lateral water-supply perforations in the sides of the barrel n^1 are arranged at various points along the length of the barrel, so that the valve *i*, passing the same like a piston, will open and close them in succession or progressively during its motion, instead of opening or closing all, or a single main supply-port, at once.

The object of this arrangement is to prevent a too sudden shock, and consequent reaction, from the sudden and abrupt cutting off of the water-supply.

Angularly through the piston *c* I make a small water-port, *o*, which crosses the eye into which is screwed the piston-stem c^1, such port crossing the eye at such point that it may be closed partially, and to a greater or less degree, by screwing the piston-stem c^1 in or out. On the depression of this piston-stem, piston, and the valve *i*, water will flow through the port *o* into the space above the piston, and, escaping slowly through the port *o* when the valve *i* moves toward its seat, will prevent the too sudden closing of the valve *i*, and thereby permit the flushing operation to go on long enough to supply the bowl C with the desired quantity of water. As shown in the drawing, the port *o* is entirely closed; but in

practical use it will be opened more or less by the proper adjustment of the piston-stem c^1.

The joints of the valve-case are to be packed in the usual or any convenient way.

A bracket, *f*, is provided as a fulcrum for the lever a^1. One end of this lever, as already stated, rests upon the head c^2 of the piston-stem c^1, and its opposite end, by a loose wrist, a^2, is connected with the crank *a* of the rotary valve D^1. In order to secure the proper throw of this valve I make a curved slot, a^3, in the crank *a*, so that the wrist a^2 may, while moving in a vertical line, actuate the crank, so as to effect the partial rotation of the valve D^1.

Rigidly attached to this same end of the lever a^1 is a weighted block, *h*, to which I attach, by a clip and socket, the lifting hand-stem b^2, preferably by an adjustable connection, through the use of a slot, h^1, so that the point of lift may be varied at pleasure. The other slot, h^2, is made simply to provide additional means of adjustment when desired, by turning the block *h* so that the slot h^2 shall take the place of the slot h^1. The function of the weight forming a part of this block is to effect a reverse motion of the valve D^1 at the proper time and hold it with the port *e* up, as shown in Fig. 3.

The devices now being in the position shown in Figs. 1, 3, and 4, the port *e* of the rotating valve D^1 will be up or on top of the valve, so that the bottom of the bowl will be filled with water up to the level of the port *e*, and a seal or trap thereby provided in addition to that afforded by the trapped pipe P. Then, by the depression of the seat A′ or the raising of the handle b^1, (according to which device is used,) the valve D^1 will be rotated till the port *e* comes down to the position shown in Fig. 2, and with its lower edge even or about even with the bottom of the bowl. The entire contents of the bowl will then pass through the port *e* out at the open end of the valve D^1, and thence into the pipe P. At the same time and by the same means the flushing-valve is opened with the usual result. The valve D^1 being thrown back to the position shown in Fig. 3, the bowl again fills up to the level of the port *e*, which now is at or near its highest point of adjustment. The annular space between the valve D^1 and the case constituting the valve-chamber D will be filled with water to the level of the port *e*, and the rotation of the valve D^1 in opening, as well as the low position of the port *e* in discharging the contents of the closet, enables me to renew the supply of fresh clear water in this annular space, as well as in the bottom of the bowl. The end cap D^2 of the valve-chamber D is made removable by the use of a packed screw-joint, or by other suitable means, so that ready access may be had to the upper open receiving end of the trap P in case any obstructions to the flow of water should be deposited at any time therein, or in the lower elbow of the trap. The opposite cap may, if so preferred, be made removable along with the valve D^1 for the same purpose, as well as for renewing, repairing, or cleaning the valve.

As a modification, the piston *c* may be made hollow, as in Fig. 5, with a port, *o′*, opening from below, and the graduating-port *o*, which leads to the space above the piston, may be made by filing a flat place in the side of the stem c^1, at a little distance from the end. With this construction, if this port *o* be set so as to give a maximum area of opening, an adjustment by turning the stem either way will diminish the size of such opening, which feature gives an obvious advantage over other similar devices which, in order to lessen the opening, can be turned only one way. The stem, flattened at a little distance from the end, may be used with the piston *c* and port *o* of Fig. 4 in like manner and with like useful result.

In Fig. 6 I have shown also a modified arrangement of the rotating valve D^1 and valve-chamber D. In this figure both are in line with the discharge from the bowl, instead of standing horizontally across it, as in Figs. 1 and 3, and the discharge is through the open end of the valve D^1 and out at the port *e*, (the valve D′ for such purpose receiving a semi-revolution,) instead of through the port *e* and out at the open end of the valve. These and other like modifications may be made without any substantial departure from the scope of the present invention.

The form of the valve D^1 may be varied at pleasure, provided only it have a receiving and discharge port properly arranged with reference to the discharge-opening of the bowl and the waste-conduit, with packing to prevent communication except through the ports, and be operated by a rotary motion in carrying off the contents of the bowl, and sealing the discharge-opening of the bowl, and also shall provide for the escape, through the valve, of the excess or overflow of water admitted to the bowl in the flushing operation.

Any suitable means of effecting such rotation may be employed. I also believe it to be, broadly, new to combine a flushing-valve opened by the seat with a bowl, trap, and seal intermediate between the trap and bowl.

And while I claim certain features of the flushing-valve as new, I do not limit myself to the particular construction of valve described as an element of the combinations, in which it is hereinafter claimed.

It should, perhaps, be added that when the valve D^1 is in position for the discharge of the contents of the bowl, the lowest part of the drain-ports of the valve should, in order to secure the best results, be fully down to or below the level of the bottom of the drain-opening C′ at its mouth, and when rotated to the reverse position one of its two ports should be above the level of the top or roof of the mouth of drain-opening C′; and for such purpose one port may always be

down to or below the lowest level referred to, and the other be capable, by the rotation of the valve, of being shifted from at or below such lowest level to a point above the level of the top or roof of the basin drain-opening.

I claim herein as my invention—

1. In combination with a water-closet bowl or basin, a valve-case and rotating valve arranged in one adjustment, to drain the contents of the bowl or basin through the valve, and, by being rotated to the other position, to seal the discharge-orifice of the bowl or basin, and at the same time leave an opening through the valve for the escape of the excess of water admitted in flushing, substantially as set forth.

2. A rotary valve, D^1, having two communicating ports arranged, with suitable packing, in a valve-chamber, D, and in combination with the discharge-opening C′ of the bowl or basin C, such ports being open not only when draining the contents of the bowl, but also when the escape-opening of the bowl is sealed, substantially as set forth.

3. The valve-case D, having a removable cap or caps, arranged in line with the trap P, whereby access may be had through the valve-case to the trap for cleaning the same when obstructed, the combination being substantially as set forth.

4. In a water-closet flushing-valve, a piston, *c*, having a water-port entering the piston a little to one side of the tapped eye, and communicating thence with the eye, in combination with a piston-stem, c^1, arranged to regulate the flow of water through such port, substantially in the manner set forth.

5. The stem c^1, flattened at a little distance from its end, whereby the area of port-opening in the piston may be varied from a maximum by the adjustment either way of the stem, in combination with a perforated piston having no water-way through or past the same, except that water-way the effective area of which is regulated by the stem, substantially as set forth.

6. The valve *i*, operated in opening by external pressure, and in closing by a spring, i^2, in combination with a series of ports in the barrel n^1, for progressively increasing or lessening the supply, and a valve-seat, n^2, to cut off the supply completely, substantially as set forth.

7. The curved slot a^3 in the crank *a* of the rotary valve D^1, in combination with such rotary valve, with the loose wrist playing in such slot, and with the vertically-moving operating-stem, substantially as set forth.

8. The barrel n^1, having a series of water-inlet ports arranged at different points along its length, in combination with the valve *i*, which opens and closes such ports progressively or in succession during its motion, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HARRY J. BAILEY.

Witnesses:
J. J. McCORMICK,
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