(No Model.)

P. HARVEY.

SIPHON CLOSET FLUSHING AND REGULATING DEVICE.

No. 376,090. Patented Jan. 10, 1888.

Fig. 1.

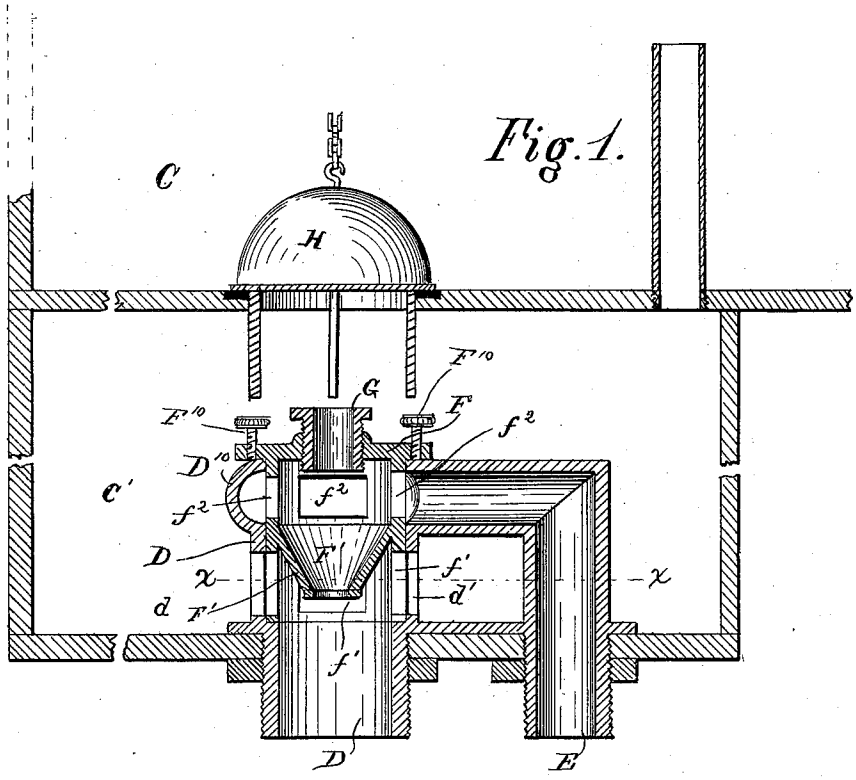


Fig. 2.

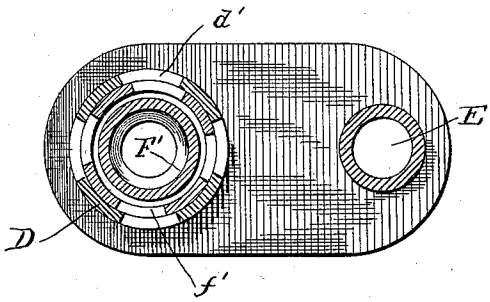
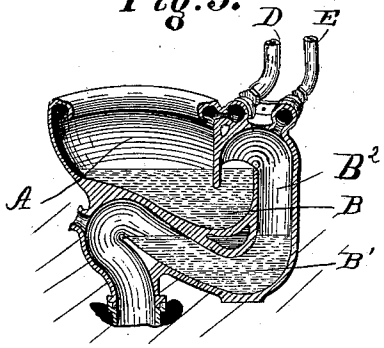


Fig. 3.



Witnesses:
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Cora L Cadwallader.

Inventor:
Patrick Harvey
By Chas. D. Burton.
his Atty.

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UNITED STATES PATENT OFFICE.

PATRICK HARVEY, OF CHICAGO, ILLINOIS.

SIPHON-CLOSET FLUSHING AND REGULATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 376,090, dated January 10, 1888.

Application filed January 31, 1887. Renewed October 13, 1887. Serial No. 252,228. (No model.)

To all whom it may concern:

Be it known that I, PATRICK HARVEY, a citizen of the United States, residing at Chicago, in the county of Cook, and in the State of Illinois, have invented certain new and useful Improvements in Siphon-Closet Flushing and Regulating Devices, which are fully set forth in the following specification.

The purpose of this invention is to provide improved means for furnishing flushing-water to the closets which are evacuated by means of a siphonic discharge-duct, commonly known as "siphon-closets," and to regulate the amount of exhaust force produced for the purpose of exhausting the air from between the traps in order to bring the siphon into operation and to regulate the amount of afterwash.

In the drawings, Figure 1 is a vertical section of a flushing-regulating device which constitutes my invention, and is located in the service-box of the supply-tank. Fig. 2 is a horizontal section at X X in Fig. 1. Fig. 3 is a vertical section of a siphon-closet bowl and traps, such as designed to be operated by my device.

A is the bowl; B and B', two traps in the siphonic evacuating-duct. B^2 is the air space between the two traps. C is the tank. C' is the service-box. D is the flushing-pipe; E, the air-pipe which communicates with the air-space B^2 of the closet and also with the flushing-pipe.

As illustrated, and preferably, the upper terminals of the flushing-pipe and the air-pipe are formed integrally in a single fitting which is inserted through the bottom of the service-box and protrudes thereinto. The flushing-pipe, therefore, may be said to protrude upward into the service-box, the portion D' being above the bottom of the service-box; and, as illustrated in the drawings, the air-pipe E also protrudes up into the service-box and enters the flushing-pipe in the portion D' thereof. The part D' of the flushing-pipe has the lateral ports d' located at the lower part of said portion D', and therefore near the interior of the bottom of the service-box. Said portion D' of the flushing-pipe is preferably expanded above said ports, and into said expanded portion D^{10} the air-pipe E enters laterally. The flushing-pipe is entirely opened at the upper end, except as it is closed by the thimble or sleeve F, which is in effect a hollow turn-cock entirely open downward, and having also the lateral ports f', which, when said sleeve F is inserted within the portion D' of the flushing-pipe, as illustrated in the drawings, registers longitudinally with the ports d' of said flushing-pipe. Said sleeve F has also above the ports f' lateral ports f^2, which register longitudinally with the expanded portion D^{10} of the flushing-pipe extension D'. From the wall of said sleeve longitudinally between the ports f' and f^2 there is thrown out interiorly the flange F', which projects downward and inward, forming a conical or funnel-shaped annulus within the said sleeve and within the circle in which are located the ports d' and f'. Through the upper end or head of the sleeve F is an opening into which is screwed the pipe G, for the purpose hereinafter explained.

The operation of this device is as follows: When by any means the valve H, which controls communication between the tank and the service-box, is opened to admit water to the service-box, the same flows out through the ports d' and f' into the flushing-pipe, and continues thus to flow, constituting a forewash to the closet, until the water rises above the mouth of the pipe G and cuts off the air from the air-pipe E. Thereafter the water flowing through the ports f', discharging against the funnel F', forms a sheet of water around the mouth of said annulus and operates in a familiar manner to draw the air through said annulus, thus exhausting it from the pipe E and from the air-space B^2 between the traps of the siphonic evactuating-duct of the closet. This process continues until the valve H, having been closed and the supply of water to the service-box thereby cut off, the water again falls below the level of the induction-mouth of the pipe G, whereby the air is again admitted through said pipe by way of ports f^2 of the sleeve F into the air-pipe E. The siphon is "broken" by the admission of air thus to the air-space B^2, and the water in the service-box, which subsequently passes out through the ports f' and d', constitutes an afterwash for the closet, and primes the traps in a familiar manner and for the usual purpose. The amount of this afterwash is determined by the depth

of the water in the service-box below the induction-mouth of the pipe G, since the height of that mouth determines the point at which the air begins to enter the air-pipe, and by making said pipe G adjustable vertically at its connection with the sleeve F, as by threading it through the same, as illustrated, I provide for varying the amount of the afterwash according to the capacity of the traps and other circumstances affecting the quantity desired.

The degree of vacuum produced in the air-space B^2—that is to say, the amount of air withdrawn therefrom in producing this siphonic action—will depend chiefly upon the amount of water discharged around the mouth of the air-pipe within the flushing-pipe—that is to say, around the funnel F'. I provide for regulating this discharge by adapting said sleeve F to turn within the portion d' of the flushing-pipe, so that the ports f' may coincide with the ports d' to a greater or less extent, thereby admitting greater or less quantity of water from the service-box into the flushing-pipe.

It will be observed that after the water rises above the induction-mouth of the pipe G it might flow outward toward the closet through the air-pipe E, as well as through the flushing-pipe D; but by making an aperture on the pipe G less than the aperture through the funnel F' this result is prevented, because the water that enters through G falls immediately through the annulus F' and through the flushing-pipe D, so that this water co-operates with the water discharged through the ports f' outside the funnel in drawing the air from the pipe E.

If in any case the upper communication, G, becomes stopped, there will still be a fore-wash and afterwash made up of the quantity of water below the lower point of the funnel F', and said funnel may be so locked that all necessary fore and after wash may be afforded in that way, and the said funnel and the said sleeve to which it is attached may be made vertically adjustable to vary the amount of the fore and after wash.

The screws F^{10}, set through the top flanges of the sleeve F against the top of the flushing-pipe, may effect such adjustment.

I claim—

1. In combination with the flushing-pipe having water-induction ports and the air-pipe communicating with the flushing-pipe above such ports, the sleeve F, concentric with the flushing-pipe and having ports corresponding in position with its said water-induction ports, said sleeve being rotatable with respect to the flushing-pipe to vary the extent of the coincidence of said ports with the water-induction ports of the flushing-pipe, substantially as and for the purpose set forth.

2. In combination with the flushing-pipe having water-induction ports, the air-pipe communicating with the flushing-pipe above said ports, and the funnel F' within the flushing-pipe commencing between the air-pipe communication and the water-induction ports and extending down into the belt or zone of said ports, substantially as set forth.

3. In combination with the flushing-pipe having water-induction ports and the air-pipe communicating with the flushing-pipe above such ports, the sleeve F, concentric with the flushing-pipe and having ports corresponding in position with the water-induction ports of the flushing-pipe, and the flange F', commencing above said ports of the flushing-pipe and below the air-pipe communication and extending within the belt or zone of the water-induction ports of the flushing-pipe, the sleeve being rotatable with respect to the flushing-pipe to vary the extent of coincidence of its said ports with the water-induction ports of the flushing-pipe, whereby a variable quantity of flushing-water is admitted through said ports against said funnel and discharged past the edge of the funnel in a continuous sheet, substantially as and for the purpose set forth.

4. In combination with the service-box, the flushing-pipe protruding up through the bottom thereof, and the air-pipe, the flushing-pipe having communication with the service-box at two levels, both within the box, and having a communication with the air-pipe between said levels, substantially as and for the purpose set forth.

5. In combination with the service-box, the flushing-pipe protruding up through the bottom thereof, and the air-pipe, the flushing-pipe having communication with the service-box at the two levels, both within the box, and having communication with the air-pipe between said levels, the lower one of said communications with the service-box being by ports disposed about a vertical line through the mouth of the upper communication, substantially as and for the purpose set forth.

6. In combination with the service-box, the flushing-pipe protruding up through the bottom thereof, and the air-pipe, the flushing-pipe having communication with the service-box at two levels, both within the box, and having communication with the air-pipe between said levels, and the funnel F', commencing between the air-pipe communication and the lower of said service-box communications of the flushing-pipe, said lower communication being by ports disposed about the axis of said funnel, and the upper said communication having its discharge-mouth over the mouth of the funnel, substantially as and for the purpose set forth.

7. In combination with the service-box, the flushing-pipe protruding up through the bottom thereof, and the air-pipe, the flushing-pipe having communication with the service-box at two levels, both within the box, and having communication with the air-pipe between said levels, the upper of said communications with the service-box being by a mouth-piece adjustable vertically to vary the height at which said communication is made, substantially as set forth.

8. In combination with the service-box, the

flushing-pipe protruding up through the bottom thereof, and the air-pipe, the flushing-pipe having communication with the service-box at two levels, both within the box, and having communication with the air-pipe between said levels, the lower of said communications being by ports disposed in a circle about the axis of the flushing-pipe, and the sleeve F, concentric with said pipe, and having ports corresponding to the said lower ports of the flushing-pipe and rotatable with respect to said pipe to vary the extent of coincidence of its said ports with the ports of said pipe, and the upper of said communications being by means of a mouth-piece adjustable vertically to vary the level at which said communication is made, whereby the depth of water in the service-box available for the forewash and the speed of flow through the lower ports of the flushing-pipe, which tends to exhaust the air from the air-pipe, may be correspondingly regulated, substantially as and for the purpose set forth.

9. In combination with the flushing-pipe having water-induction ports and the air-pipe communicating with the flushing-pipe above said ports, the sleeve F, within the flushing-pipe having ports corresponding in position to the water-induction ports of the flushing-pipe, communicating above with the air-pipe, and provided below such communication with a funnel-shaped flange, F′, extending downward within the belt or zone of the water-induction ports of the flushing-pipe, said sleeve being rotatable within the flushing-pipe to vary the extent of coincidence of said ports with the water-induction ports of the flushing-pipe, substantially as and for the purpose set forth.

10. In combination with the service-box, the flushing-pipe protruding up through the bottom of the box, and the air-pipe communicating with the flushing-pipe above said ports, the sleeve F, within the flushing-pipe having ports corresponding to the water-induction ports of said pipe and having an interior funnel-shaped flange, F′, opening upward and protruding downward within the belt or zone of said ports, said sleeve communicating above said funnel with the air-pipe, and also communicating upward with the service-box, said last-named communication being by means of a mouth-piece adjustable vertically to vary the level at which said communication is made, said sleeve being rotatable with respect to the flushing-pipe to vary the extent of coincidence of its ports with the water-induction ports of the flushing-pipe, whereby said sleeve comprises means for regulating both the degree of exhaustion of air from the air-pipe and the extent of a fore and after wash, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 26th day of January, A. D. 1887.

PATRICK HARVEY.

Witnesses:
CHAS. S. BURTON,
FRANCIS W. PARKER.