2 Sheets—Sheet 1.

J. C. KUPFERLE & P. WHITE.

WATER-CLOSET.

No. 189,562. Patented April 17, 1877.

FIG. 1.

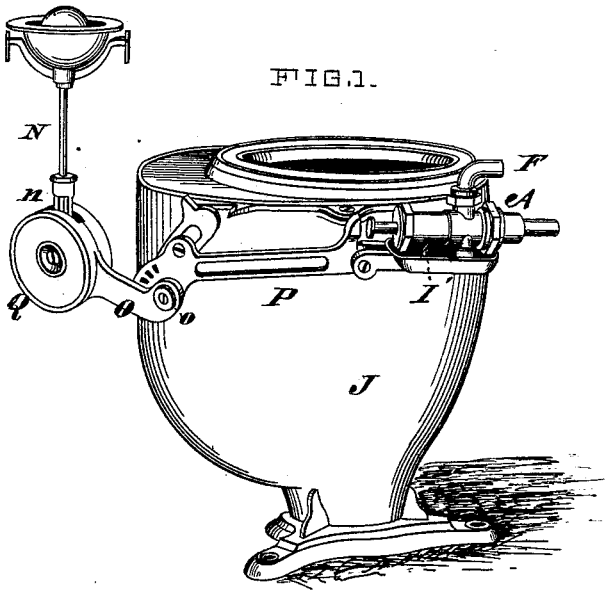


FIG. 2.

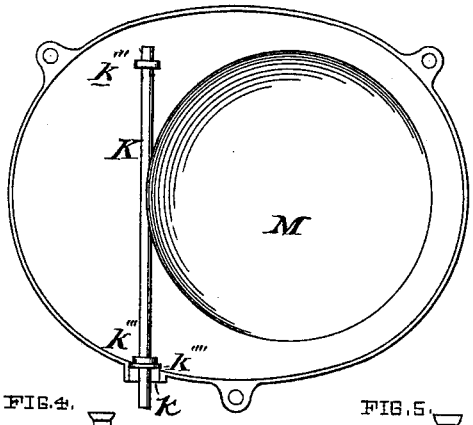


FIG. 3.

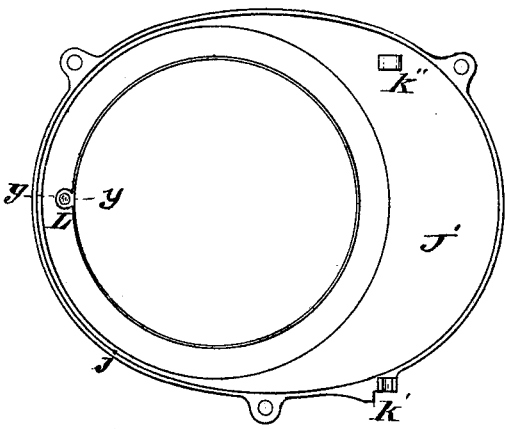


FIG. 4.

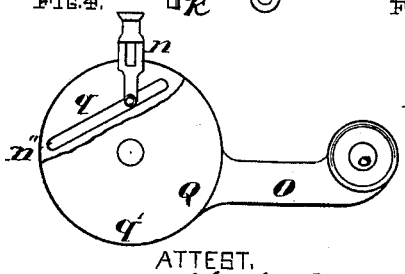


FIG. 5.

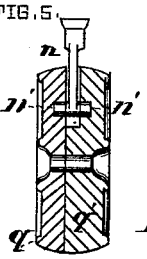


FIG. 6.

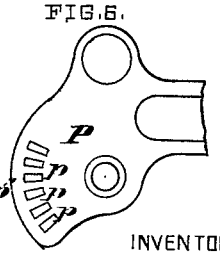


FIG. 7.

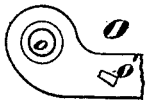
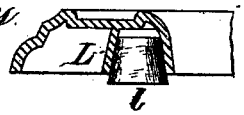


FIG. 8.



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2 Sheets--Sheet 2.

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WATER-CLOSET.

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FIG. 9.

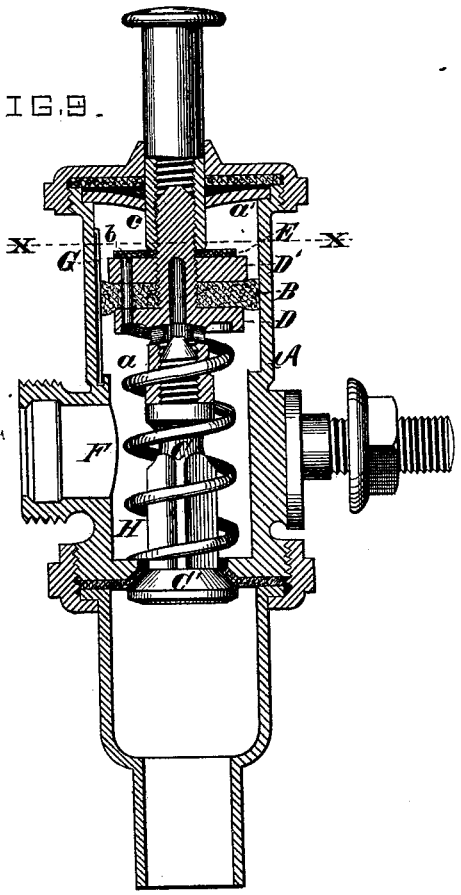
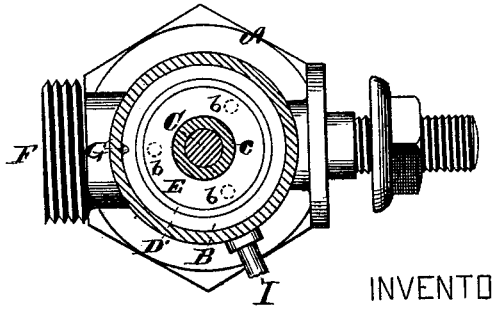


FIG. 10.



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UNITED STATES PATENT OFFICE.

JOHN C. KUPFERLE AND PETER WHITE, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN WATER-CLOSETS.

Specification forming part of Letters Patent No. **189,562**, dated April 17, 1877; application filed March 3, 1877.

To all whom it may concern:

Be it known that we, JOHN C. KUPFERLE and PETER WHITE, of St. Louis, Missouri, have made new and useful Improvements in Water-Closets, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, where—

Figure 1 is a view, in perspective, of a water-closet embodying our improvements, the bowl not being shown; Fig. 2, a plan of the trunk or pot, its top being removed; Fig. 3, a bottom view of the trunk-cover; Fig. 4, an elevation of the weight, a portion being broken away, and of the parts immediately therewith connected; Fig. 5, a cross-section of the weight shown in Fig. 4; Fig. 6, an elevation of the outer end of the lever used in opening the valve; Fig. 7, an elevation (from the opposite side of that of Fig. 4) of the inner end of the weight-lever, being the end that connects with the lever shown in Fig. 6; Fig. 8, a cross-section, on an enlarged scale, taken on the line *y y* of Fig. 3; Fig. 9, a longitudinal section of the valve; and Fig. 10, a cross-section on the line *x x* of Fig. 9.

Similar letters denote similar parts.

The present invention has especial relation to the means used in effecting the gradual closing of the valve. It also relates to the provision for draining the water remaining in the valve-chamber and discharge-pipe after the valve is closed. It further has reference to the construction of the bearings of the pan-hinge, and to the means for thoroughly sealing the trunk; also, to the construction of the buffer that the pan closes against; also, to means used in making the valve and pan-operating mechanism adjustable to seats of different heights, and to the provision for accommodating the pull-rod to the varying height of the valve-lever.

Referring to the annexed drawing, A, Figs. 1, 9, and 10, represents the valve used in admitting the water to the closet. It is connected with the latter in the usual way, and is of the ordinary construction, saving that part of it that is included in the present improvement, and that is used in the closing of the valve.

In water-closets, as is well understood, it has been the custom to retard the closing of the valve in order that, after the pan has been flushed and emptied and returned to its position, an additional amount of water may be introduced for the purpose of keeping the pan filled, and also to trap the closet and prevent the escape of unwholesome and disagreeable gases. To delay the closing movement of the valve, it has been usual heretofore to provide the valve-stem, at a point beyond the discharge-outlet to the bowl, with an additional valve, in order that a portion of the water entering the valve-chamber might pass into that division of the chamber that is beyond this supplementary valve, and there (and until it has been forced therefrom through a narrow circuitous channel) offer resistance to the return movement of the main valve. This supplementary valve has heretofore been made of a flexible material, like leather, and cup-shaped, so that the water might easily pass it from beneath, but be prevented from returning in consequence of the water forcing the flange of the cup outward against the wall of the valve-chamber and closing the passage.

Now, to provide a more reliable supplementary valve, and a simpler and more economical construction for discharging the water that collects above it, is our present aim. In place of a cup-shaped valve, we employ the construction shown in Figs. 9 and 10, consisting of a disk or plunger, B, of elastic (preferably leather) material, made to fit snugly in the valve-chamber, and attached to the valve-stem C, and held thereon between the flange D of the valve-stem and a lock-nut, D′, both of which being of smaller diameter than the disk.

Perforations *b b b* extend through the disk, as well as the flange and lock-nut, to establish communication between the main division *a* of the valve-chamber and the division *a′* beyond the disk. A flexible washer, E, in diameter large enough to cover the perforations *b b b* and close them, as hereinafter described, is attached to the stem C just above the lock-nut D′, and held against the latter, within the line of the perforations *b b b*, by means of an enlarged extension, *c*, of the stem C.

Now, as the main valve C′ is depressed to admit the water to the closet, a portion passes

through the perforations *b b b* into the chamber *a'*, beyond the supplementary valve B. The washer E lifts to admit the water, but closes upon the perforations to prevent its return. The closet having been flushed by the water passing through the discharge-pipe F, in the usual manner, the closing of the main valve C' is retarded until the water in the chamber *a'* has been discharged therefrom. To this end the following means are used: A wire, G, is arranged longitudinally in that part of the valve-chamber traversed by the supplementary valve B, and directly against the wall of the chamber. It is attached at one or both ends to the chamber to steady it in position, but between its ends is loose therefrom. The valve B, being of yielding material, accommodates itself in use to the wire, and closes around it as shown in Fig. 10. The wire is preferably round. The spring H, now acting to close the main valve, and aided by the hydrostatic pressure, the water in the chamber *a'* is forced between the chamber wall and the wire, causing the latter to embed itself slightly in the valve B, and to open from the wall sufficiently for the water to gradually pass into the main chamber *a*, when the main valve shuts, and the wire closes against the chamber-wall.

I represents a pipe leading from the valve-chamber to the trunk J.

The water remaining in the valve-chamber and discharge-pipe after the valve is shut is, by means of it, drained into the trunk, obviating the difficulty arising from freezing.

Our invention, further, has reference to the manner of constructing the trunk or pot and the parts immediately connected therewith, partly to cheapen the construction and partly to more effectually prevent the escape of gas. Referring to Figs. 2 and 3, J represents the trunk and J' its cover. In place of a detachable box for the outer bearing of the pan-hinge K we form, by casting it in one piece, the lower part *k* of the bearing directly in the trunk, and the upper part *k'* in the cover J', as shown. Water-closets heretofore have been provided with a detachable boxing inserted in the trunk, but by making the pan-hinge bearing directly in the trunk the construction is not only cheapened but all difficulty arising from the misplacement, a frequent occurrence hitherto, of a detachable boxing, and consequent escape of the stench from the trunk, is avoided. The inner bearing of the pan-hinge is formed by casting the cover J' with a perforated lug, *k''*. The hinge is furnished with shoulders *k''' k'''* to keep it in its bearings, and between the outer shoulders and the bearing *k k'* is also provided with a washer, *k''''*, preferably of leather, which serves as a packing at that point. The cover J' at its periphery is provided with a downwardly-projecting flange, *j*, by means whereof the putty used in forming the joint between the trunk and cover can be held in place, and the packing thereby made more effectual. The cover J' is further provided with a lug, L, Figs. 3 and 8, having a recess, preferably tapering, therein, to receive a rubber or other elastic plug, *l*, to operate as a fender for the rim of the pan M to strike against as it closes, preventing wear and noise. Fenders have been used before in this connection, but they have been made in the form of a nut or washer, screwed onto a screw or bolt that projects downward from the trunk-cover. They are liable to work out of place, and are expensive. The present form, however, is easily attached, and, under the action of the pan, is only the more firmly kept in place.

The improvement further has relation to the peculiar manner of constructing the lever used in transmitting the movement of the pull N to the lever operating the pan and valve. We form this lever in two parts, O and P. The two parts are hinged together at *o*, and the outer part O is made adjustable vertically upon the inner part P, and in the following manner: The part O is provided with a lug, *o'*, that (when the parts O P are joined) can be set to engage in any one of a series of openings, *p p p p*, in an extension of *p'* in the part P. As the closet-seat is higher or lower, or as the other conditions of the closet, such as the adjustment of the weight Q require, the lug can be inserted in the proper opening, and the part O readily and suitably adjusted. Q represents the weight used to close the pan. It is attached to the outer end of the lever O, and is made in two parts, *q* and *q'*, shaped as shown in Figs 1, 4, and 5, and to receive between them, when put together, an extension, *n*, of the pull-rod N, that at its lower end is provided with lugs *n' n'*, one at each side, that engage respectively, in corresponding grooves *n'' n''* in the parts *q* and *q'*, respectively. These grooves are arranged, preferably, at an angle with the lever O, as shown. The lugs are furnished with rollers. Now, as the pull-rod N is raised, the extension *n* moves toward the outer end of the grooves *n'' n''*. This enables the rod N always to retain its perpendicular position, and to move easily.

What we claim is—

1. The combination of the stem C, disk B, flange D, lock-nut D', having the perforations *b b b*, washer E, and valve-case A, substantially as described.

2. The combination of the valve-case A, stem C, extension *c*, flange D, disk B, nut D', having the perforations *b b b* and washer E, substantially as described.

3. The combination of the valve-case A, wire G, and valve B, substantially as described.

4. The combination of the valve-case A, wire G, valve B, flange D, nut D', having the perforations *b b b*, washer E, and stem C, substantially as described.

5. The combination of the nut D', having the perforations *b b b*, washer E, stem C, and extension *c*, substantially as described.

6. The combination of the valve-case A, pipe I, and trunk J, the said pipe leading from the valve-case at a point above the main valve therein to the trunk, and to provide means for draining the valve-case after the main valve is closed.

7. In a water-closet, the trunk J, having the bearing *k*, and the cover J′ having the bearing *k′*, said bearings, for the purpose set forth, being cast directly in said trunk and cover, respectively, substantially as described.

8. In a water-closet, the trunk J, having the bearing *k*, the cover J′, having the bearing *k′*, said bearings, for the purpose set forth, being cast directly in said trunk and cover, respectively, and the hinge K, having the shoulder *k‴* and washer *k⁗* combined, substantially as shown.

9. The cover J′, having the tapering recessed lug L and plug *l*, in combination with the pan M, substantially as shown, for the purpose set forth.

10. The lever O, having the lug *o′*, and the lever P, having the openings *p p p*, combined and operating substantially as described.

11. The weight Q, having the grooves *n″ n″*, and the pull-rod extension *n*, having the lug *n′ n′*, combined and operating substantially as set forth and described.

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Witnesses:
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