





# UNITED STATES PATENT OFFICE.

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## FLUSHING APPARATUS FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 745,823, dated December 1, 1903.

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*To all whom it may concern:*

Be it known that I, WILLIAM U. GRIFFITHS, a citizen of the United States, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Flushing Apparatus for Water-Closets, of which the following is a specification.

My invention relates to the particular type of flushing apparatus in which in connection with the flush tank and the outlet pipe leading from said tank to the structure to be flushed, is employed a siphon mounted within said tank.

It is the object of my invention to arrange the siphon in such manner and to provide it with operating devices of such character as to produce a very useful and efficient apparatus.

In the accompanying drawings I illustrate a good form or embodiment of my invention. Many variations in construction and arrangement may, however, be employed without departure from the spirit of invention.

In the accompanying drawings, Figure 1 is a view in central vertical sectional elevation of a flush tank containing a siphon, a closet, the pipe through which water passes from the tank to the closet, and the associated working parts of the apparatus, the parts being shown in the position they occupy when the closet is not in use.

Figure 2 is a view of the siphon and adjacent parts, showing the relation of the lever to the cam during the time the motion transmitting rod remains elevated while the weight of a person rests upon the closet seat.

Similar letters of reference indicate corresponding parts.

The closet *a* of any ordinary and preferred character, having a hinged seat *b*, is connected in any preferred manner through the pipe *c* with the tank *d*.

The supply pipe *e* of the tank is equipped with any suitable valve *f* by a float *g*, mounted on a suitable arm such as *h*.

The parts of the apparatus so far described are not novel with me.

The upper end of the pipe *c* or a connection thereof extends through the bottom of the tank *d* and is suitably packed to prevent the escape of liquid. The upwardly extend-

ing lip at the mouth or port of said pipe is encircled by a flange *i* which rests upon the floor of the tank. A suitable packing ring encircles said lip and rests on said flange. *m* is a movable siphon structure hingedly connected through a lug *n* or otherwise to a suitable lateral extension connected to the upper end of the pipe *c*.

Obviously the hinge connection between the siphon and a fixed portion of the tank may be located at any point which the form and arrangement of tank and siphon employed may render desirable.

The lower end of the longer leg of the siphon rests, when the siphon is in its normally closed position as in the drawing, upon the packing ring upon the upper face of the flange *i*.

The pipe *c*, as will be understood, constitutes in effect a continuation of the longer leg of the siphon.

*o* is a cam mounted upon that face of the shorter leg of the siphon *m* which is farthest from the hinged connection of the siphon with the pipe *c*.

*p* is a lever conveniently pivoted upon the bracket *q* at the edge of the tank, and at its inner end provided with a roller *r* adapted to travel up and down in contact with the face of the cam *o*.

*s* is an extension of the seat *b*, provided, if necessary, with a weight *t*.

*j* is a motion-transmitting rod, pivotally connected to the outer end of the lever *p*,—and normally depending in the position shown. Said motion-transmitting rod conveniently extends through a suitable guide *w*, and may be provided with a stay pin or enlargement *k* which by encounter with said guide limits the descent of said rod.

The operation of the apparatus will be readily understood.

The weight *t* normally maintains the hinged seat *b* in the elevated position shown. When the weight of an occupant rests upon said seat its consequent depression will, of course, occasion the elevation of the extension *s*, which extension, in rising, encounters the end of the motion-transmitting rod *j* and occasions its elevation.

The elevation of the rod *j* occasions the tilt-



ing movement of the lever *p*, in which movement, of course, the outer end of the lever rises and the inner end descends.

In the descent of the inner end of said lever, the roller *r*, riding downward across the face of the cam *o*, occasions the tilting of the siphon upon its hinge.

The arrangement is manifestly such that the force exerted by the roller *r* upon the siphon through the cam is applied upon that side of the siphon opposite the hinge, and consequently the ready tilting of the siphon is assured.

In the tilting movement of the siphon the lower end of the longer leg of the siphon is transiently elevated away from the mouth or inlet port of the outlet pipe, said tilting movement, first rearwardly, and then, by gravity, back to normal position, occurring in the period of time during which the roller *r* is passing from the upper end of the cam *o* to its lower end.

In such period, however, the mass of water in the tank has access to the mouth of the pipe *c*, and a considerable quantity descends into said pipe, with the result that, so soon as the movable siphon returns to normal position, a siphoning action is established through the siphon and pipe, which continues until the water level in the tank descends to the open end of the shorter leg of the siphon.

During the time the weight of the occupant rests upon the seat *b*, the rod *j* is maintained elevated, the lever *h* tilted, and the roller *r* at the lower end of the cam *o*.

After the first siphoning action referred to, in which the water of the tank is when the weight of the occupant first rests upon the seat, discharged from the tank in a flushing operation, — the water continues to flow through the supply pipe *e* into and accumulate in the tank.

Upon the subsequent removal of the weight of the occupant from the seat *b*, said seat automatically rises to its normal position, being that shown in the drawing, whereupon the weight of the arm *j* depresses the outer and elevates the inner end of the lever *p*, causing the roller *r* to ride upward over the face of the cam *o* until it reaches the normal position shown in Fig. 1 of the drawings, thus causing a second movement of the siphon upon its hinge.

In such second tilting of the siphon upon its hinge, the water which has accumulated in the tank subsequent to the flushing operation first described, will, in the momentary uncovering of the mouth of the pipe *c*, have access to the pipe *c*, and again, so soon as the siphon is restored to its normal position, there will be a siphoning action established, with the result that the water will be discharged from the tank to the closet.

As will be understood, therefore, my invention in its preferred embodiment, provides an apparatus in which a siphon is hingedly mounted within a tank and is caused

to be automatically tilted for the establishment of a siphoning action twice in connection with each use of the closet.

Both in the first flushing operation in which the roller *r* descends across the face of the cam, and in the second flushing operation in which it ascends across said face, said roller, in riding to the crest of the cam, forces the siphon outwardly and upwardly upon an arc concentric with its hinge pivot; said roller *r* after reaching and passing along said crest, will, in riding to the foot of the incline of the cam, permit the siphon to return by gravity to its normal position.

My invention may be applied in many different forms or embodiments without departure from the spirit of my invention.

Having thus described my invention, I claim—

1. In combination with a flush tank having an outlet pipe embodying a port within said tank, a siphon hingedly disposed within said tank in such arrangement that when in one position its longer leg is in communication with said port and when in another position exposes said port so that water from the tank may rush directly thereinto, and means for occasioning the movement of said siphon upon its hinge, said means comprising a cam mounted on the siphon and beveled in opposite directions, a hinged closet seat having an arm or extension, a pivoted lever mounted upon the flushing tank, a rod depending from said lever, the lower end of which is in proximity to said arm or extension.

2. A flush tank provided with an outlet pipe the mouth of which is within said tank, a siphon hingedly disposed within said tank and with its longer leg normally in communication with said outlet an oppositely beveled cam mounted upon said siphon, a tilting lever mounted on the tank, one end of which by its engagement with said cam occasions the tilting of the said siphon and the other end of which is provided with a depending bar, and a closet having a hinged seat provided with an arm which extends beneath and in proximity to the lower end of the said depending bar substantially as set forth.

3. A flush tank provided with an outlet pipe the mouth of which is within said tank, a siphon hingedly disposed within said tank and with its longer leg normally in communication with said outlet, an oppositely beveled cam mounted on the said siphon a tilting lever mounted in the tank one end of which by its engagement with said cam occasions the tilting of the said siphon and the other end of which is provided with a depending bar, and a closet having a hinged seat having an extension or portion beneath said depending bar and adapted to encounter said bar in its movement, the said extension and the depending bar being out of engagement when in their normal positions substantially as set forth.

4. In a flushing apparatus, in combination,



a tank having an outlet pipe, a siphon mounted in said tank with its longer leg in communication with said outlet pipe, a hinged connection through which the siphon is secured at a point in the vicinity of the mouth of the upper end of said outlet pipe, a cam mounted on said siphon, and an oscillating lever adapted to act upon said cam to occasion the tilting movement of the siphon, during each oscillation thereof substantially as set forth.

5. In a flushing apparatus, in combination, a tank having an outlet pipe, a siphon mounted in said tank with its longer leg in communication with said outlet pipe, a hinged connection through which the siphon is secured at a point in the vicinity of the mouth of the upper end of said outlet pipe, a cam beveled in opposite directions mounted on said siphon, an oscillating lever adapted to act upon said cam to occasion the tilting movement of the siphon during each oscillation thereof, a rod depending from the outer end of said lever, a closet situated in the vicinity of the lower end of said rod, a hinged seat mounted on said closet, and having a portion or extension adapted to encounter and elevate said rod in the movement of said seat, substantially as set forth.

6. In combination, the flush tank, the outlet pipe leading from said flush tank, the siphon hingedly mounted in said tank in position to alternately make communication with and expose the mouth of the outlet pipe, a closet to which said pipe leads, a normally elevated hinged seat connected with said closet and having an extension, and devices through which upon the depression of said seat said siphon is tilted to expose the mouth of the pipe and through which also upon the elevation of said seat said siphon is again tilted to expose said mouth, said means consisting of a cam on the siphon, the said cam being beveled in opposite directions and an oscillating lever adapted to act against said cam, and a depending motion transmitting rod connected to said lever and adapted to be encountered by the seat extension, substantially as set forth.

7. In combination with a flush tank having

an outlet pipe embodying a port within said tank, a siphon hingedly disposed within said tank, the normal position of the siphon being such that its longer leg is in communication with said port and closes the same, a closet, a hinged seat connected thereto, and means through which each upward and downward movement of the said seat occasions a movement of the said siphon to open the said port, the said means comprising a cam mounted on the siphon.

8. In combination with a flush tank having an outlet pipe embodying a port within said tank, a siphon hingedly disposed within said tank, the normal position of the siphon being such that one of its legs is in communication with said port and closes the same, a cam mounted on said siphon, a pivoted lever mounted on said tank, the inner end of which is adapted to contact with the said cam and move completely over the same in two directions to tilt the siphon and permit it to return to normal position after each movement, and means for operating the said lever, substantially as described.

9. In combination with a flush tank having an outlet pipe embodying a port within said tank, a siphon hingedly disposed within said tank, the normal position of the siphon being such that one of its legs is in communication with said port and closes the same, a cam mounted on said siphon, a pivoted lever mounted on said tank, the inner end of which is adapted to contact with the said cam and move completely over the same in both directions to tilt the siphon and permit it to return to normal position after each movement, a closet, a hinged seat connected thereto, and means through which each upward and each downward movement of the said seat occasions movement of the said lever, substantially as described.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 8th day of February, A. D. 1902.

WILLIAM U. GRIFFITHS.

In presence of—

S. SALOME BROOKE,  
F. NORMAN DIXON.