

(No Model.)

J. CLIFFORD.

WATER CLOSET SUPPLY TANK.

No. 360,658.

Patented Apr. 5, 1887.

FIG. 1.

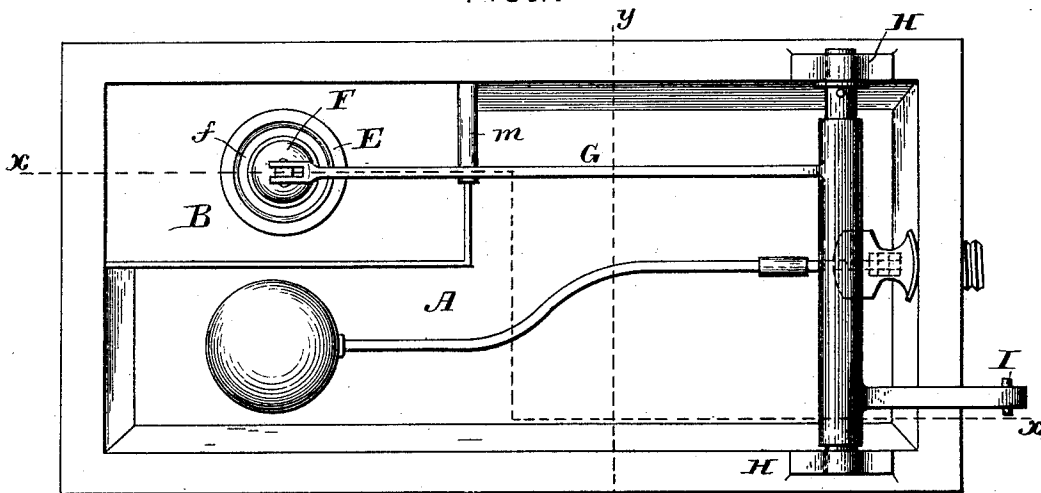


FIG. 2.

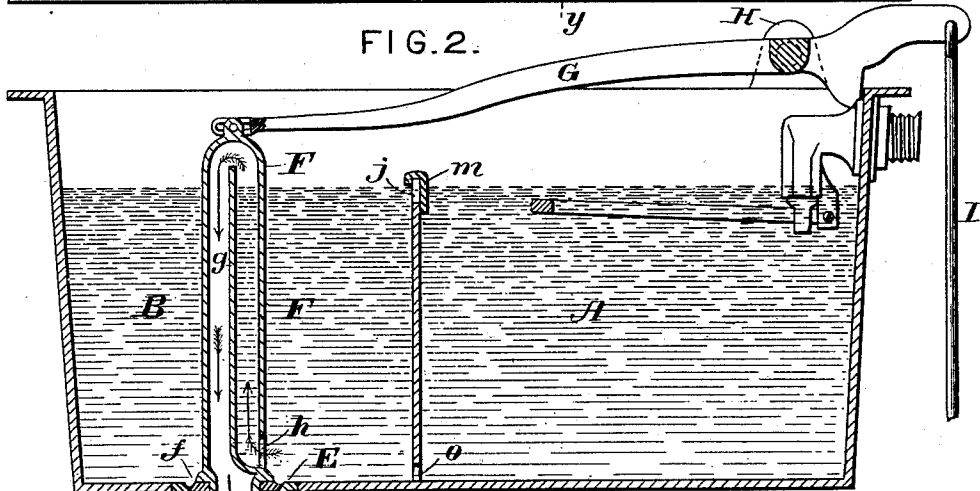
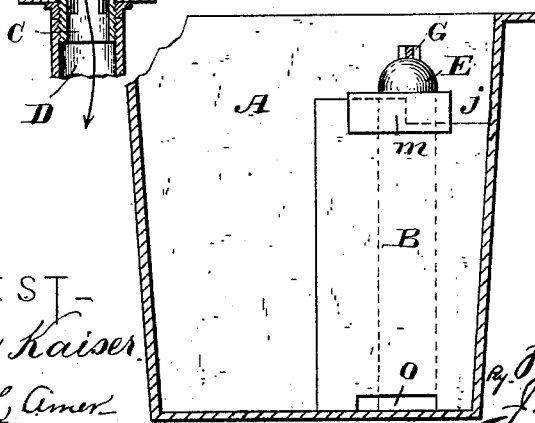


FIG. 3.



ATTEST-
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WATER-CLOSET SUPPLY-TANK.

SPECIFICATION forming part of Letters Patent No. 360,658, dated April 5, 1887.

Application filed November 19, 1886. Serial No. 219,365. (No model.)

To all whom it may concern:

Be it known that I, JOHN CLIFFORD, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Water-Closet Supply-Tanks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to certain new and useful improvements in what are known as "supply-tanks" for water-closet apparatus, which tanks are provided with means for automatically maintaining a given supply of water from a supply-pipe, and for discharging a given quantity of water to the closet each time the latter is used, for a purpose well known to those skilled in the art.

Previous to my invention such supply-tanks, either having what is called a "service-box" or constructed without, have been provided with various forms of valvular contrivances, possessing such a principle of operation that upon the lifting of said valve from its seat (usually by means of a pull-handle and cord acting through the medium of a suitably-weighted lever for actuating the valve) the flow of water from the tank would be started through the valvular opening, and would continue until the required or predetermined quantity should be discharged into the closet, even though the valve should be reseated immediately after having been lifted; but in all such contrivances with which I am familiar the valvular device has always been more or less complicated in its construction and expensive of manufacture, while at the same time it has been less efficient in operation than is desirable; and, furthermore, there have been no means provided by which the quantity of water to be discharged (at each operation of the valve) might be regulated according to the necessities or circumstances of the case or the character of the closet in connection with which the tank contrivance might be used.

I propose by my invention to provide for use a water-closet supply-tank provided with a valvular contrivance not only of exceedingly simple construction, but more than usually

efficient in its operation for the desired purposes, and also provided with means by which, through the adjustment of certain devices, the predetermined quantity of water to be discharged (at each use of the valvular contrivance) may be made greater or less, according to a mere sufficiency or a superabundance in the water supply that there may be in any particular place in which the improved apparatus may be set up for use, and according, also, to the kind of water-closet that may be used.

To these main ends and objects my invention may be said to consist, first, in a novel construction of valvular device, such as will be hereinafter more fully explained, and that will be most particularly pointed out and defined in the claims of this specification; second, in the combination, with a tank and service-box, of means for causing the contents of the service-box to be supplemented by a greater or less additional supply of water from the main tank at pleasure, all as will be hereinafter more fully explained, and as will be more particularly pointed out and defined in the claims of this specification.

To enable those skilled in the art to which my invention relates to make and use the same, I will now proceed to more fully describe the separate features of my improvement by reference to the accompanying drawings, which form a part of this specification, and in which I have shown my improvements carried out in the forms in which I have so far practiced my invention, and which are about the best now known to me.

In the drawings, Figure 1 is a top view of a water-closet supply-tank embracing my improvements, and showing so much of the connected appliances as seems to be necessary for the purpose of illustrating my improvements. Fig. 2 is a vertical longitudinal section of the same at the line *xx* of Fig. 1. Fig. 3 is a vertical cross-section at the line *yy* of Fig. 1.

In the several figures the same parts will be found designated by the same letters of reference.

A represents the main tank or reservoir of the usual form and of proper capacity; and B represents a compartment therein, designated, usually, as a "service-box," and designed to

determine the quantity of water to be discharged or supplied to the closet at each operation of the tank-valve.

C represents the usual outlet or discharge nozzle from the bottom of the service-box, that is connected to a pipe, D, which leads to the bowl of the closet.

E is the valve-seat, and F the weighted valve, which, as usual, is of tubular form exteriorly, and the lowermost or seating portion, *f*, of which is adapted to rest upon the valve-seat E and prevent the escape of any water from the service-box B whenever the valve is in its closed position. Said valve is lifted at pleasure through the medium of a weighted lever, G, that is fulcrumed in the supporting-stand H, mounted on the tank, and that is provided at its outer end with the usual rod, cord, or chain, I, which extends down to a locality at which its lower end may be conveniently pulled upon or manipulated by the user of the closet, all in a manner well known to those skilled in the art. The siphon-valve F is, however, of a novel construction, which not only renders it exceedingly simple and economic of manufacture, but makes it capable of more efficient operation than the ordinary siphon-valves heretofore used and composed of two concentrically-arranged cylinders or tubes. It is, as shown, of a single tubular piece formed or provided with a sort of centrally-arranged vertical partition or division plate, *g*, which extends from a point a short distance below the upper dome-like end of the said tubular piece down to a point in the vicinity of the seating end of said tube, and there turns laterally and closes against one side of the tube immediately below a lateral ingress-opening, *h*. It will be understood that in a siphon-valve thus constructed the superficial area of the surface against which the ascending column of water in the valve has to move in frictional contact is much less for a column of a given area or volume than in the case of a valve in which the ascending column of water is in the form of a cylindrical shell and moves in frictional contact with the external wall or surface of one cylinder and the interior of another (surrounding) cylinder. In practice I have usually constructed this siphon-valve F with the upper end of its vertical partition-like device *g* extended up to within five-eighths to three-quarters of an inch of the dome-like top of the tubular device, and the height of the valve or the position of its uppermost end when seated must be such that the upper end of said vertical partition *g* shall be a short distance—say, from a half to five-eighths of an inch—above the water-level of the tank. These necessary features of the construction and arrangement of the parts (although the exact dimensions I have mentioned are, of course, not material) are clearly illustrated at Fig. 2, in which it will be seen that the end of the vertical partition *g* extends up somewhat above the level of the water in the service-box and main tank, while the closed top of the tubular body of the valve is a suffi-

cient distance above the top of the partition *g* to permit a free discharge of the water over the top of said partition in a manner and for a purpose to be presently explained. The lateral ingress-opening *h* should be of such a capacity compared with the discharge-orifice of the service-box as to afford an ample supply to said discharge-opening.

Instead of having the walls or partitions which divide the service-box B from the main tank or reservoir A solid or impervious up to the usual and proper height, I form one of these walls, preferably at the point *j*, with a cut-away or opening, which I term a "gateway," and combine with this opening in this wall a register-like slide or gate, *m*, by means of an adjustment of which I can, at pleasure, either cut off all water communication (practically) between the service-box B and the tank A at a level below the top edge of the wall or partition between said service-box and said main tank; or I can open a communication between said compartments of greater or less capacity below the level referred to for a purpose to be presently explained.

In the operation of my improved contrivance or apparatus, upon lifting the valve E, by the means shown and in the usual manner, the water in the service-box begins to flow beneath the lower end of the lifted valve into the discharge-orifice of the service-box in the usual manner, and upon a reseating of the valve the well-known siphonage action occurs and induces a flow of water from the service-box through the ingress-opening or communication *h*, upwardly through the tubular (closed) valve F on one side of the partition *g*, and thence over the top of said partition downwardly (by gravity and by the siphonage action or atmospheric pressure) into the discharge-nozzle C of the service-box, this flow of water being continued until the contents of the service-box shall have been exhausted down to a level at which the siphon will be necessarily broken by the admission of atmospheric air into the valvular device through its lateral aperture *h*. At Fig. 2 the direction of the current or flow of water during this operation is indicated by arrows.

It will be seen that while the desired discharge of the contents of the service-box is thus effected, as usual, after the reseating of the valve, the latter device is exceedingly simple of construction and economic of manufacture, being composed of a single casting or piece, as shown, while at the same time said valvular contrivance performs perfectly and more efficiently all its intended functions by reason of there being less frictional resistance offered to the ascending column in the valve.

By means of the gateway and slide used in one of the partitions or walls separating the service-box B from the main reservoir A, I am enabled whenever the supply of water happens to be sufficient for the purpose or superabundant, or the character of the closet requires it, to increase the quantity of water

supplied from the service-box (at each use of the closet) by opening to a greater or less extent the gateway or slide *m*, so that in addition to the water actually contained in the service-box a certain quantity or strata of water taken from the main reservoir *A* will flow freely into the service-box during the discharge of the latter's contents, thus increasing the amount of flushing-water supplied to the closet. In other words, by means of this feature of my improvement or invention I am enabled to provide for use a supply-tank contrivance or apparatus which, by a simple adjustment of the slide *m*, may be set or adapted to use either the minimum amount of water necessary for the flushing operation or a larger quantity, which latter, of course, is always desirable in cases where the water-supply is sufficient to warrant or permit a bountiful use for flushing purposes.

The general mode of operation with reference to the refilling of the service-box up to the proper level through the usual aperture or small communication at the point *o*, and the automatic refilling of the main tank up to the proper level by means of the usual ball-cock, &c., may be substantially the same as in supply-tanks now in use, and, so far as the novel construction of valvular device shown and the means for regulating or varying the ca-

capacity of the flushing-box are concerned, more or less variation in the details of construction and many mere modifications may of course be made without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a water-closet supply-tank, a siphon-valve composed of a single tubular device subdivided by a vertical partition, *g*, into two compartments, which communicate with each other at their upper ends, and at their lower ends communicate, respectively, with the ingress and egress openings of the said tubular device, substantially as and for the purposes set forth.

2. In combination with the main compartment of a supply-tank, and a service-box arranged therein in about the usual manner, a supplemental communication between said compartment and said service-box, the capacity of which may be varied, as specified, for the purposes set forth.

In witness whereof I have hereunto set my hand this 11th day of October, 1886.

JOHN CLIFFORD.

In presence of—

WM. B. CLIFFORD,
E. M. FORD.