(No Model.)

W. BUNTING, Jr.

VALVE FOR WATER CLOSET SUPPLY TANKS.

No. 332,635. Patented Dec. 15, 1885.

FIG. 1.

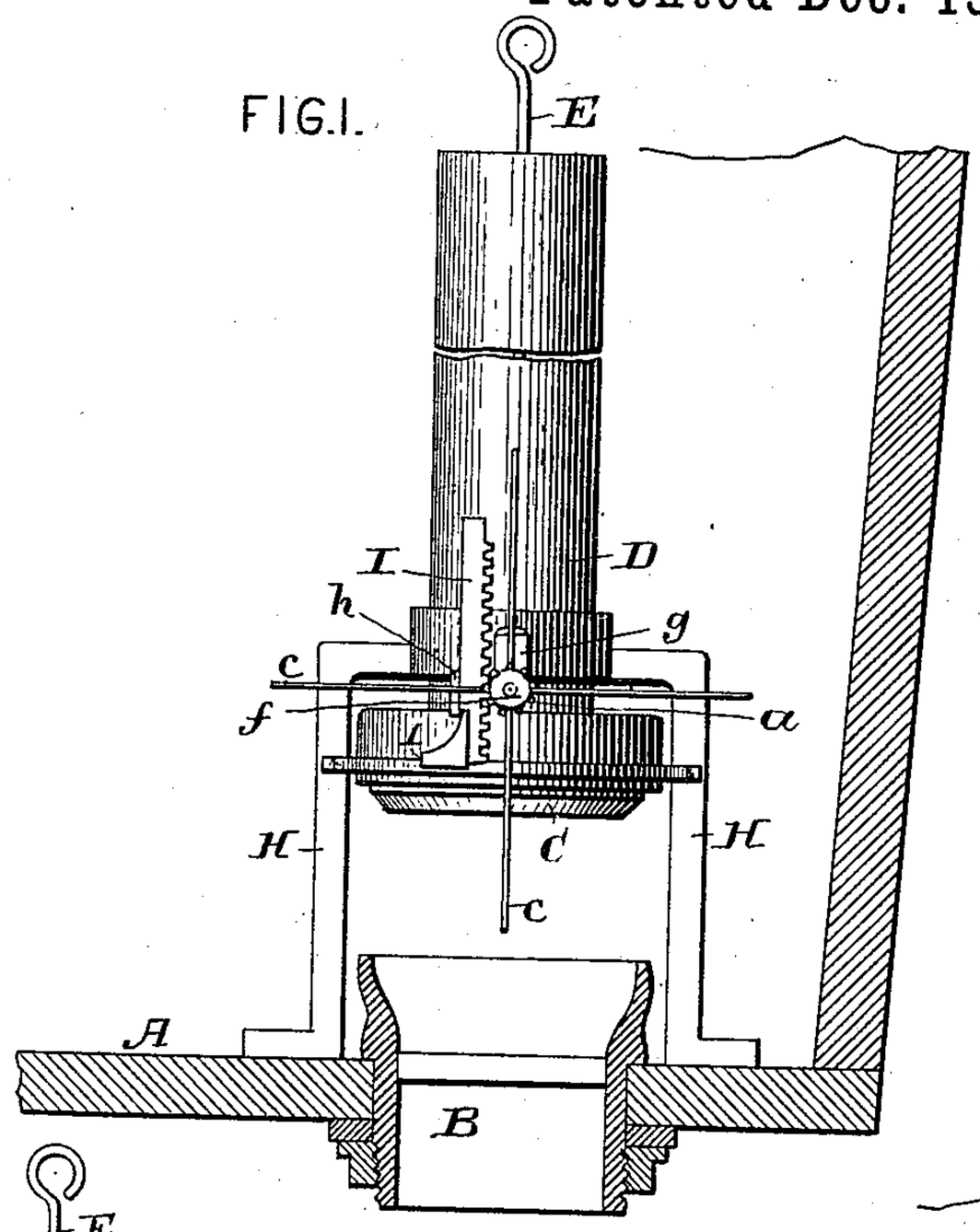


FIG. 2.

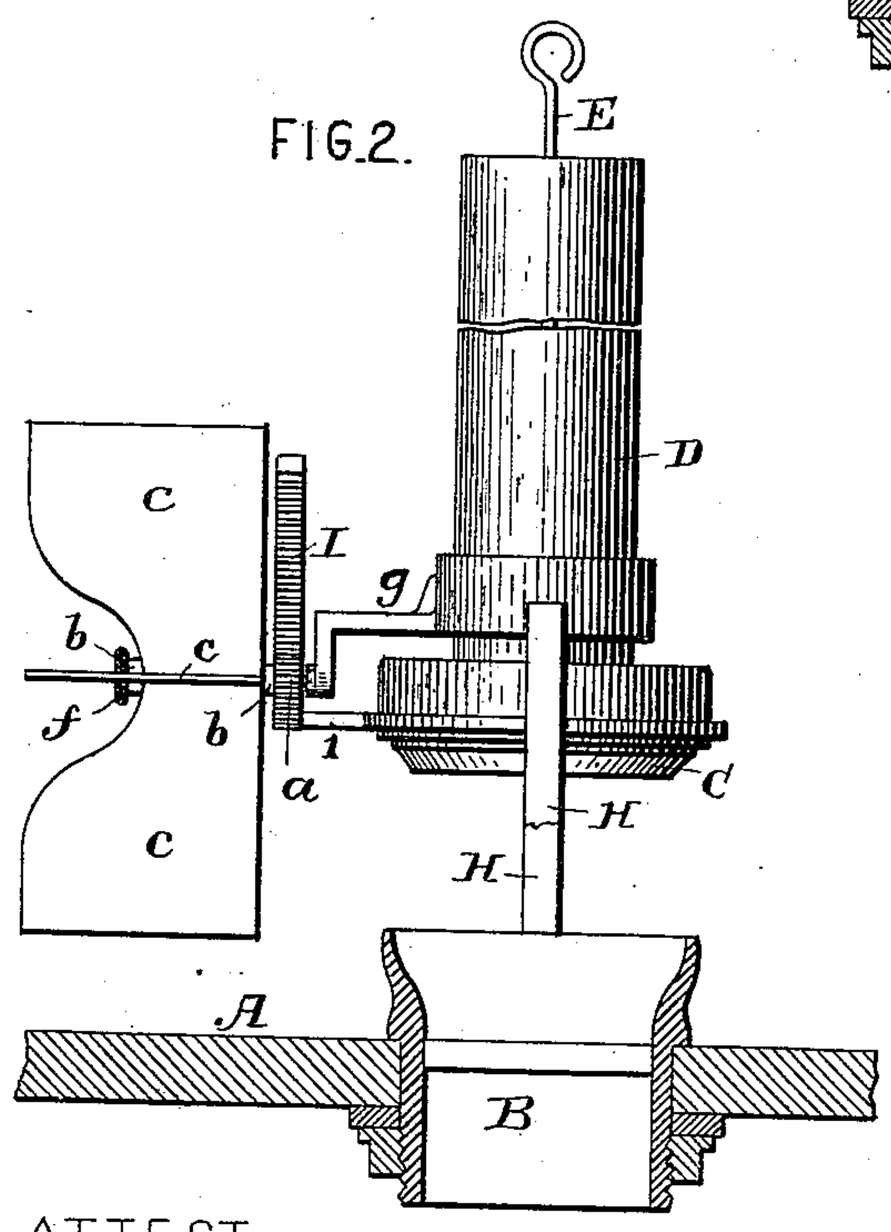
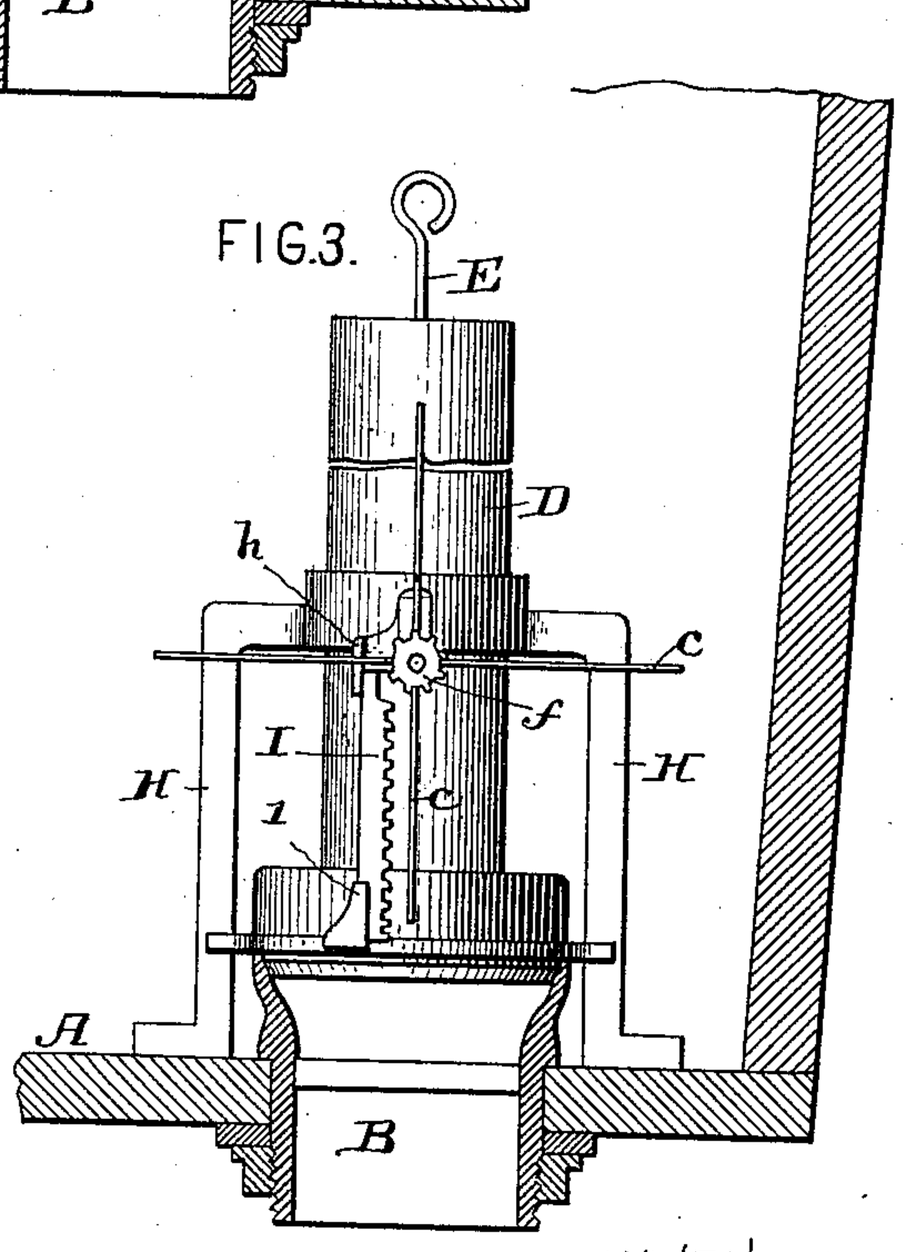


FIG. 3.



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VALVE FOR WATER-CLOSET SUPPLY-TANKS.

SPECIFICATION forming part of Letters Patent No. 332,635, dated December 15, 1885.

Application filed October 5, 1885. Serial No. 179,013. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BUNTING, Jr., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Valves of 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 a novel valvular contrivance adapted especially for use in connection with water-closet supply-tanks, although it may be employed in any case in which it may be desired to retard the descent onto its seat of a valve, which is lifted therefrom and then allowed to descend by gravity, in any sort of reservoir or receptacle containing water or other fluid.

In the use of valvular contrivances in water-closet supply-tanks in which the valve is usually postively lifted by some sort of device actuated either from the seat of the closet or from a pull-up handle, and is usually or frequently allowed to drop by gravity onto its seat again, it has always been a desideratum to have the contrivance so constructed and so operated that the descent of the valve onto its seat shall be more or less retarded, in order that the water in the tank may be allowed to flow for a sufficient time from the valvular opening, for the purpose of sufficiently and properly flushing out the bowl of the water-closet; and various devices have been devised for the purpose of making the valve close slowly enough to permit the desired quantity of water to escape to the closet. In all such devices, however, so far as I know, there has either been a comparative complication of parts or inefficiency of operation.

I propose by my invention to provide means for the purpose above alluded to, which shall be simple and economic of construction, and at the same time exceedingly efficient in its desired operation; and to this main end and object my invention consists in the use, in connection with a valve of the usual or any analogous construction and adapted to be positively lifted, of a revolving or rotatory fan-like device mounted on a fixed axis, the vanes or paddles of which are designed to work against the water contained in the tank or receptacle, and which is rotated, through the medium of suitable devices, by the valve or its stem, all as will be hereinafter more fully explained.

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 it, referring by letters of reference to the accompanying drawings, which form part of this specification, and in which I have illustrated my said invention carried out in that form in which I have so far successfully practiced it.

In the drawings, Figure 1 is a side elevation of the valvular portion of a water-closet tank having embodied therein my invention. Fig. 2 is another side view or elevation taken from a point of view transverse to that at which Fig. 1 is drawn. Fig. 3 is a view similar to Fig. 1, but with the parts in a different position.

At Figs. 1 and 2 I have represented the valve in its most elevated position, while at Fig. 3 I have shown it in its lowermost position, or seated.

In the several figures the same part will be found designated by the same letter of reference.

A represents a portion of the bottom of an ordinary water-closet supply-tank, and B the valvular opening, on which is seated the valve C, which is of about the usual construction, and is provided with the ordinary tubular or hollow stem D and a wire lifter or connecting-rod, E, the upper hooked end of which is supposed to be coupled to any one of the usual forms of lifter mechanisms in water-closet apparatus, for either lifting and holding open the valve, or for lifting the valve-stem and then letting it fall.

As usual, the valve-stem and valve are guided by means of the frame or cage H, the lower end or foot-like portion of which is bolted to the bottom of the tank.

I is a rack or toothed bar, which, as shown, is securely fastened at its lower end to the laterally-projecting portion *i* of the valve, (though said rack may of course be formed integrally with the valve-casting,) and which rack engages with a spur-pinion, *a*, which is

formed integrally with or made fast on a hollow shaft, *b*, which carries a series of paddle-like vanes, *c*, and which is mounted to turn freely on a shaft or spindle, *f*, which projects laterally from the stand-like portion *g* of the cage or guide-frame before mentioned.

From the stand-like portion just referred to projects a guide-plate, *h*, against which the back of the rack or toothed bar works, and which performs the office of preventing said rack or bar from springing, thus keeping it up to its place and always in proper engagement with the pinion. The length of the rack and the relative arrangement of the stationary shaft or spindle on which the pinion is mounted are such that when the valve is in its lowermost position, or is seated, the rack is out of engagement with the pinion, although its upper end remains always in contact with the guide-plate just above referred to.

The operation and effect of the combination of devices shown and so far described, as to their construction and arrangement together, are about as follows: Whenever the tubular valve-stem D, together with the valve C, is lifted up by any of the usual water-closet appliances, the rack I moves in engagement with the pinion *a* and rotates the vanes or paddle-wheel devices *c* in a certain direction, which, however, does not impede the lifting of the valve-stem and its attachments perceptibly, and when the lifted valve-stem has been released from the lifting mechanism (in the usual manner) and begins to descend by gravity, or when the lifting mechanism is no longer held by the pull-up handle, the rack I again rotates the paddle-like devices, but in an opposite direction; and this rotation of said paddle-like devices operates, as will be readily understood, to materially impede the descent of the valve and its stem, since the gravity of the freed valve and its stem has to overcome the resistance offered by the water to the rotation of the paddle-like devices; and the result of this impediment of the valve by gravity is that the valve takes much longer to descend onto its seat, and hence the valvular opening in the bottom of the tank remains open longer and a sufficient time to insure an ample supply of water to thoroughly flush out the bowl of the closet.

Of course the form, number, and structure of the vanes or paddles of the rotatory valve-retarding device may be varied without departing from the principle of my invention, and in lieu of the rack and pinion shown for rotating upon its stationary axis the paddle-wheel, other means may be employed for causing the rectilinear movements of the valvular device to rotate the paddle-wheel in substantially the manner shown; and it will also be understood that said impeding rotatory devices may be applied to the valves of either tank contrivances in which the valve is lifted once, or to supply-tanks in which the valve is lifted twice for the purposes of giving what are called a "preliminary flush" and an "after flush;" and the extent of the retardation of the descending valve may of course be varied according to circumstances and the judgment of the manufacturer by varying the number, size, and shape of the paddle-like devices, or by varying the speed or number of revolutions which the rotatory device has to make during the descending stroke of the valve-stem, or in other ways.

The object of having the rack run out of engagement with the pinion before the valve gets to its lowermost position is that no side strain or other influencing pressure can possibly be exerted on the valve or its stem by the valve-retarding mechanism that might possibly tend or operate to prevent the valve from centrally and perfectly seating itself on the valvular opening, which is supposed to be perfectly closed when the valve is down.

The gist of my invention, it will be seen, consists, essentially, in the use, in connection with the valve-stem of any of the usual forms of valves which are lifted up by some positive connection with the valve lifting or opening mechanism of the water-closet, of a rotatory device mounted on a fixed axis and operated by the valve or its attachments, and acting, somewhat after the fashion of a paddle-wheel, on the contained liquid for the purpose of affording opposition to the too rapid descent of the valve and its stem for the purposes hereinbefore explained.

What I therefore claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the stem or body of any of the usual forms of lifting and dropping valves elevated by a positive connection with the valve-lifting mechanism of the water-closet, a rotatory fan-like device geared to the valve-stem, or some attachment thereof, and mounted upon a fixed axis, all substantially in the manner and for the purposes hereinbefore set forth.

2. In a valve mechanism composed of a valve of any of the usual forms of lifting and dropping valves, and a rotatory fan-like device geared therewith and turning upon a fixed axis of motion, the arrangement of the toothed rack of the valve and the pinion of the fan-like device or paddle-wheel relatively with the valve-seat, so that the said rack and pinion will run out of engagement before the valve reaches its seat, substantially as and for the purpose specified.

In witness whereof I have hereunto set my hand this 24th day of September, 1885.

WILLIAM BUNTING, JR.

In presence of—
GEORGE Z. HAMBLER,
F. A. TITUS.