

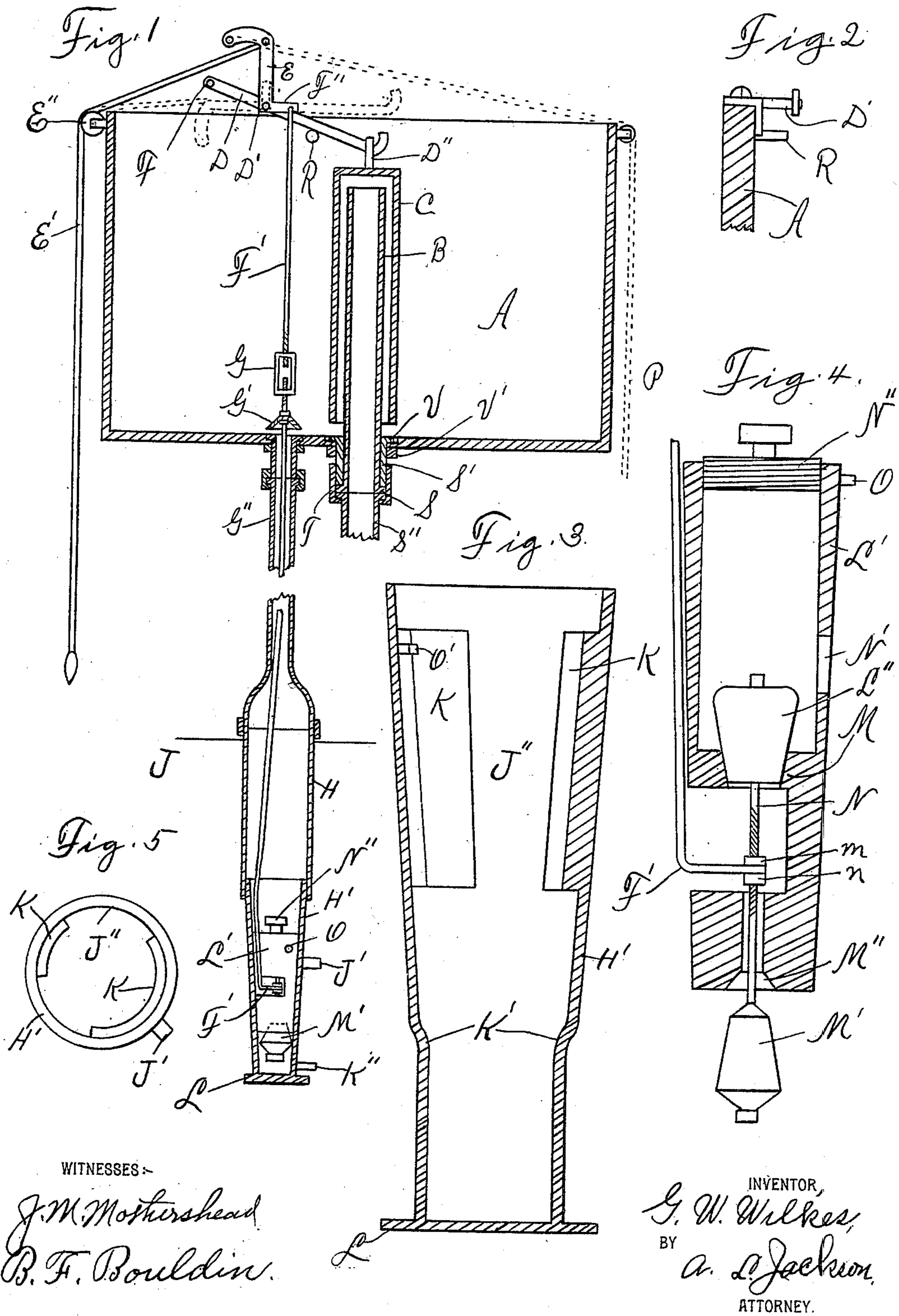
No. 672,468.

Patented Apr. 23, 1901.

G. W. WILKES.
CLOSET CISTERN AND VALVE THEREFOR.

(Application filed Aug. 23, 1898.)

(No Model.)



UNITED STATES PATENT OFFICE.

GEORGE W. WILKES, OF FORT WORTH, TEXAS.

CLOSET-CISTERN AND VALVE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 672,468, dated April 23, 1901.

Application filed August 23, 1898. Serial No. 689,290. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WILKES, a citizen of the United States, residing at Fort Worth, Texas, have invented a new and Improved Antifreezing Closet-Cistern and Valve Therefor, of which the following is a specification.

This invention relates to improvements for flushing the stool-bowl and operating the valve and to a cistern; and the objects are to provide a cistern which needs no valve to start the siphon to work and to construct a valve which can be operated by a rod which runs up through the supply-pipe, thus doing away with the stuffing-box for a rod for operating the valve. I also provide a valve which will be closed by the operation of the siphon shortly after the siphon commences to operate to flush the stool-bowl and at the same time open the waste-valve, so that all the water will be drawn from the pipe leading to the cistern.

Other objects and advantages will be better understood from the following description when read in connection with the accompanying drawings, which form a part of the specification and application.

Figure 1 is a vertical section of the cistern and the valve-chamber, showing means for operating the valve and the siphon. Fig. 2 is a detail view showing the manner of mounting the levers for operating the valves and siphon. Fig. 3 is a vertical section of the valve-chamber, showing the water-channels between the valve-casing and the wall of said chamber. Fig. 4 is a vertical section of the valve-casing, showing the valves in place. Fig. 5 is a top plan view of the valve-chamber.

Similar characters of reference are used to indicate the same parts throughout the several views.

The cistern A is mounted on any convenient support. The pipe B is mounted in the bottom of the cistern by passing the same up through a connection S' and secured therein by means of the union T. The connection S' is secured in position by the annular flange V, integral therewith, which rests on the bottom of the cistern, and by the nut V'. The flush-pipe S'', which forms a continuation of the pipe B, is secured in position by the union

T, the pipe S'' having a flange S on the upper end, which is engaged by the interior flange of the union T. The inverted cylinder C with the open-top pipe B forms a siphon, which is automatic in operation. If the up-limb is, for instance, one-third larger in cross-section area than the down-limb, the siphon will operate, but will not start quick without the use of a valve or other means to start it; but if the cross-section area of the up-limb is about three times the cross-section area of the down-limb after deducting the area of the down-limb nearly all friction is avoided and the siphon will operate quick and with great power as soon as the water commences to run in the top of the down-limb, although the supply is weak. The larger the up-limb the more rapid will be the siphonage up to a certain limit, (which limit is not definitely determined.)

The lever D is pivotally mounted on a lug or bolt D', attached to the side of box A, and engages at one end a ring D'' on the top of the cylinder C. Lever D is operated by a second lever E, mounted on lug D'. Lever E is operated by a cord or strap E', which is attached to the lever and runs over a convenient pulley E'', mounted on box A. When lever E is drawn down by the cord E', it engages a lug F, which projects from the side of lever D, and forces lever D down. This operation raises the cylinder C and opens the valve for a supply of water. The downward motion of cylinder C is limited by the lever D coming to rest on the stop R, which is mounted in the side of the cistern. Lever E is a bell-crank lever, and the rod F' for operating the valves is attached to the short arm F'' of this lever. Rod F' is provided with a turnbuckle G for varying the length of the rod. A funnel-shaped water-stop G' is mounted on rod F' to prevent water from being thrown up and out of the cistern. Rod F' runs on down through the pipes G'' and H to the valve-chamber H'. The line J indicates the floor-level. The valve-chamber has a pipe J', which enters the side for the water-supply. The valve-chamber H' has channels or grooves J'' for water to pass through between the ribs K. The ribs K may extend as far as the offset K' in the lower end of the valve-chamber. The valve-chamber has a

waste-pipe K'' and a flange L for attaching the same to a convenient support. There are two valves mounted in a casing L'. The supply-valve L'' has a seat M, and the waste-valve M' has a seat M'', in the casing L'. The valves are mounted on a rod N, and the rod F' is attached to the rod N, which is threaded and provided with nuts *m* and *n* for holding the rod F' at various and rigid adjustments.

The valve-casing has an aperture N' for receiving water from the pipe J'. The valve-casing L' is detachable from the valve-chamber H' and may be removed without taking up this chamber or the pipe H. A plug N'', having a head, is screwed into the top of the valve-casing. The head on the plug is rectangular and may be engaged by any suitable key for withdrawing the valve-casing. The valve-casing has a lug O, which enters a recess O' in the rib K to hold the casing in place. The casing is inserted in the chamber H' and turned slightly, so that the lug O will enter the recess O'.

The operation may be described as follows:

The cistern, as shown in the drawings, stands empty, the water being cut off. To flush the stool-bowl through pipe B, pull the cord E'. This operates the bell-crank lever E, and this draws rod F', opening valve L'' for the water-supply, which enters pipe J' and aperture N' to the channels J'' and up the pipes H and G'' to the cistern. At the same time the rod F' closes the waste-valve M'. At the same time the lever E strikes the lug F on lever D and forces the same down, raising the inverted cylinder C. During this operation the short arm F'' of lever E is turned until the same is directly over the fulcrum or pivot-point and is on the dead-center. One object in raising the cylinder C is to reduce friction between the up-limb and the down-limb. The friction is reduced, because the parts of the up-limb and the down-limb which will be adjacent to each other when the up-limb is raised will be shorter than when the up-limb is at its lowest position. The inverted cylinder C is about twice as great in diameter as the pipe B. The space surrounding pipe B within cylinder C is about three times the space within the pipe. This makes the suction of water much easier than if the space in each were the same size, because friction is reduced to a minimum. Consequently when the water reaches the top of pipe B it will start the siphon without the use of valves sometimes as used in other siphon-cisterns. There being a considerable chamber above the down-limb of the siphon the air will be somewhat compressed by the descent of the up-limb as soon as siphonic action begins, the up-limb being started and drawn down by suction. This compression of the air will aid in forcing the water down the down-limb. The most important object in raising cylinder C is to acquire space for this cylinder to operate in drawing the short arm F'' off the dead-center. The suction on the cylinder

draws the cylinder down. The cylinder draws on lever D, and the lug F forces lever E up and the short arm F'' off the center. Consequently at a short time after the cylinder C starts the short arm F'' is drawn off the dead-center. This leaves valve L'' free to be forced down and close either by the water-pressure on top of the valve or by weight, as in other valves. If desirable, a weight may be attached to rod F' above turnbuckle G. The plug N'' closes the top of the valve-casing L' and forms an air-chamber above the valve L''. This air-chamber will tend to take up water-hammer in the pipe or chamber behind the valve consequent upon sudden closures. The water left in the cistern after flushing escapes down pipes G'' and H through valve M'.

It will be seen that the arrangement of the various parts makes the apparatus strong and durable, and the construction is simple. There are no valves or floats in the cistern to be thrown out of place. The cistern is so constructed that other valves may be used with it. The dotted line P indicates how a cord or chain may be used to operate other stop and waste valves by means of the siphon and levers shown, which valves would take the place of the valves shown.

Various changes in size, shape, proportions, and arrangements of the several parts may be made without departing from the spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a closet-cistern provided with a flushing-pipe, a supply-pipe, a valve-chamber connected to said supply-pipe, and a supply and a waste valve mounted in said chamber; a siphon consisting of said flushing-pipe and an inverted cylinder surrounding said pipe, a lever for raising said cylinder, a bell-crank lever for operating said lever and operating said supply-valve, said siphon being adapted to operate said bell-crank lever for closing the supply-valve and opening the waste-valve.

2. The combination with a closet-cistern of a flushing-pipe, a supply and a waste valve, a siphon consisting of said pipe and an inverted cylinder surrounding said pipe, a lever for raising said cylinder, a bell-crank lever for operating said lever and for operating a supply-valve, the short arm of said lever being drawn to a dead-center in the operation whereby the supply-valve is held open, said siphon being adapted to draw said short arm off the dead-center and open the waste-valve and close the supply-valve.

3. In a cistern for closets provided with a flushing-pipe, a supply-pipe with valve for opening and closing the same and a waste-valve; a rod adapted to operate said valves, a siphon consisting of said flushing-pipe and an inverted cylinder, a lever for raising said cylinder, a bell-crank lever adapted to operate said lever and said rod and to be operated by

said lever, said siphon being adapted to operate said bell-crank lever for closing said supply-valve and opening said waste-valve.

4. In a closet-cistern provided with a supply-pipe; a supply and a waste valve in communication with said supply-pipe and means for operating said valves, said means consisting of a rod on which said valves are mounted, a second rod for operating said rod running up through said supply-pipe into the cistern, levers for operating said second rod, and a casing having seats for said valves.

5. In a closet-cistern provided with a flushing-pipe and siphon and a supply-pipe; a valve-chamber connected to said supply-pipe and valves for supply and waste mounted in said chamber, a valve-casing provided with seats for said valves mounted in said chamber, said chamber being provided with channels for the passage of water by said casing, a rod adapted to operate said valves running up through said supply-pipe, levers for operating said rod, and means for automatically operating said levers to close said supply-valve and to open said waste-valve.

6. In a closet-cistern provided with a flushing-pipe and siphon and a supply-pipe; a valve-chamber connected to said supply-pipe, a supply-valve and a waste-valve and a casing for said valves mounted in said chamber, said chamber having passage-ways for water outside of said casing, said casing having a chamber and seat for said supply-valve and a seat for said waste-valve and a lug for holding said casing in said first-named chamber.

7. In a closet-cistern provided with a supply-pipe and a valve-chamber attached there-

to; a supply and a waste valve mounted in said chamber, a rod for operating said valves, a valve-casing for said valves having a seat and a chamber for said supply-valve and a seat for said waste-valve and a cut-out for said rod whereby said rod has space for up-and-down motion in operating said valves.

8. The combination with antifreezing closet-cistern of a flushing-pipe, a supply-pipe provided with supply and waste valves, a lever for operating said valves, a siphon consisting of an inverted cylinder and a pipe connected to said flushing-pipe and extending up within said cylinder, a lever for raising said cylinder, and means whereby said siphon will automatically close said supply-valve and open said waste-valve shortly after siphonic action begins.

9. In a flushing-cistern for water-closets provided with a supply-pipe, a supply and a waste valve, and a lever for operating said valves; a siphon consisting of an upright tube suitably mounted in an opening in the bottom of the cistern, an inverted cylinder surrounding said tube, and a lever for raising said cylinder and to be actuated by said siphon and whereby said first-named lever is actuated to close the supply-valve and to open the waste-valve.

In testimony whereof I set my hand, in the presence of two witnesses, this 19th day of August, 1898.

GEO. W. WILKES.

Witnesses:

JOS. F. OSBORNE,

JAMES GILFORD BROWNING.