

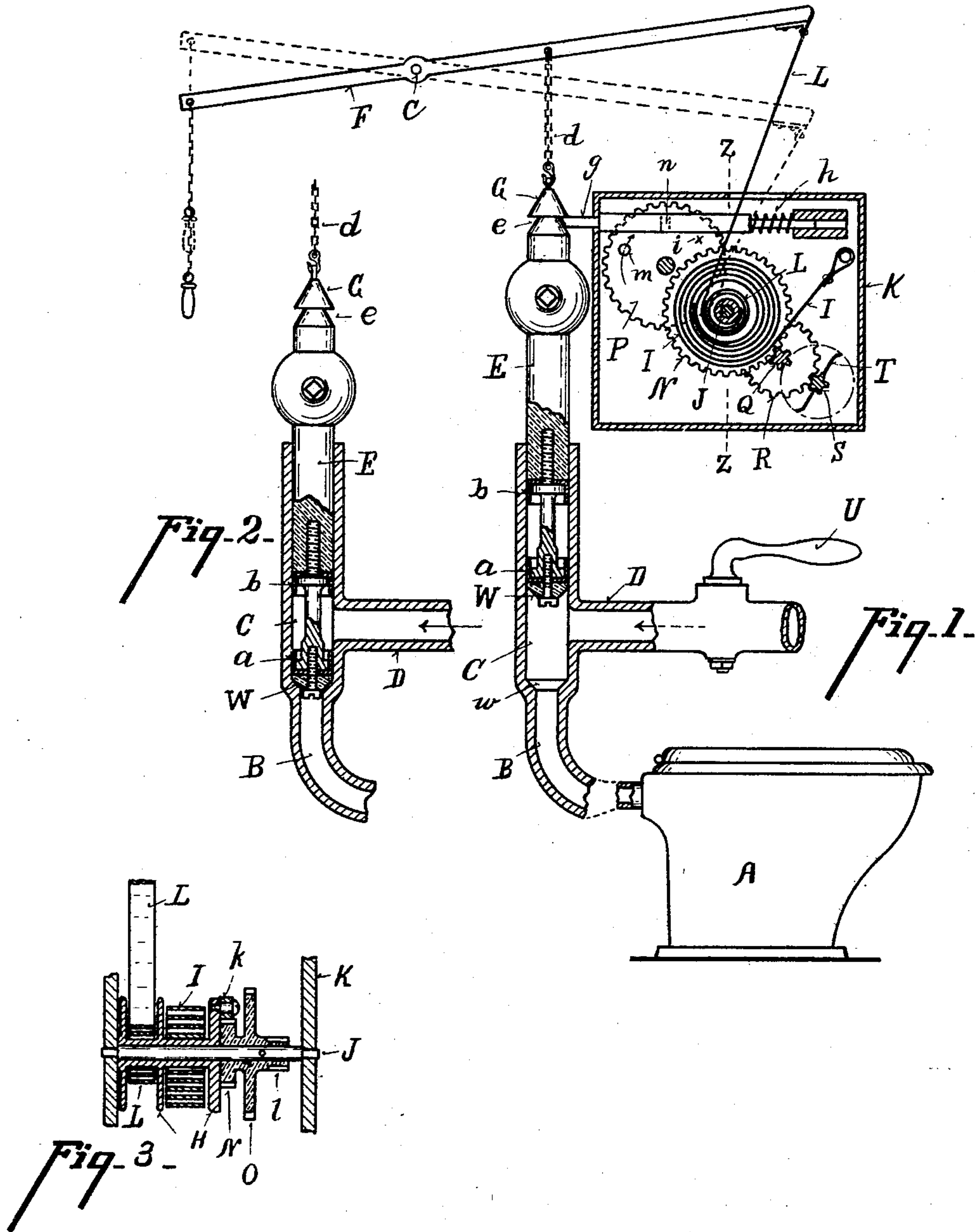
No. 631,025.

Patented Aug. 15, 1899.

R. A. MERRILL.
FLUSHING APPARATUS.

(Application filed Apr. 6, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ROBERT A. MERRILL, OF CINCINNATI, OHIO.

FLUSHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 631,025, dated August 15, 1899.

Application filed April 6, 1899. Serial No. 711,901. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. MERRILL, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain
5 new and useful Improvements in Flushing Apparatus, of which the following is a specification.

My invention relates to flushing apparatus for water-closets.

10 One of the objects of my invention is to obviate the necessity of the ordinary flush-tank.

Another object of my invention is to provide valves and operating mechanism so connected to the service-pipe and closet-bowl that
15 the service-pipe may be turned with full pressure to accomplish the flushing by pulling down a lever, the operating mechanism automatically reseating the valves and shutting off
20 the supply after a suitable interval of time has elapsed to effect a thorough flushing of the closet-bowl or urinal, as the case may be.

The features of my invention are more fully set forth in the description of the accompanying
25 drawings, forming a part of this specification, in which—

Figure 1 is a sectional elevation of my improvement, showing the valves raised for flushing. Fig. 2 is a sectional elevation of the
30 valves and pipe in position when the water-supply is cut off. Fig. 3 is a section on line *z z*, Fig. 1.

A represents the closet-bowl; B, the flush-pipe, which is preferably enlarged, providing
35 a valve-chamber C.

D represents the service-pipe.

E represents a weighted valve-rod. This rod carries two valves *a b*, preferably attached to a common stem.

40 W represents a metallic valve on the lower end of the valve-stem, seating at *w*.

The valves shown are the ordinary cup-valves. By using two valves, as shown, the upper valve closes the upper end of the flush-
45 pipe, which makes a good water-joint with much less friction than where the stuffing-box is used. This allows a comparatively light weight and valve-rod to be employed and requires much less power to raise and lower the
50 valve-rod.

It is desirable to obtain an interval of time for the water to be supplied to the bowl

through the service-pipe without having to hold the tripping-lever down. To accomplish this, I provide the following means: 55

F represents the tripping-lever, pivoted on the center *c*.

d represents a chain or link connection of the top of the valve-rod G and the tripping-lever F. The valve-rod is provided with a
60 notch or groove E. This is made annular around the rod, so that it may be engaged at any position with the keeper-pin *g*. This keeper-pin holds the valve in the elevated position. It is provided with a coil-spring *h*,
65 so as to keep the pin outwardly when the valve-rod is raised.

I have provided the following means for retracting the keeper-pin after the interval
70 of time above alluded to.

H represents a spool on which is wound a coil-spring I. This spool is mounted upon a shaft J, which is journaled in the box K. This spring is wound up by means, preferably, of
75 a metal tape L, which winds on the spool H. Upon the said shaft J is mounted a ratchet-gear N.

k represents a pawl pivoted to the spool H. This pawl *k* may be weighted or provided with
80 a spring to keep it in engagement with the ratchet-teeth. The ratchet-gear N is rigidly connected with the gear O, which is shown pinned to shaft J. The spring is wound up by pulling the tripping-lever down, the tape
85 L being wound in the reverse direction to the spring. As soon as the spring has been wound up it commences to drive gear O through the pawl connection of the ratchet-gear N with spring-spool. Gear O is provided with a gear
90 *l* on its hub, which meshes with and drives the gear P. Gear P is provided with a pin *m*, which engages with the lug *n* on the keeper-pin *g*, and as the gear-pin turns it retracts the keeper-pin. As soon as it is past the en-
95 gagement-point of said lug with weight of the valve-rod seats the valve. The interval of time which the water is supplied through the service-pipe corresponds to the time that the lug *n* travels from the position *i* around
100 to a point of engagement with said lug.

In order to prolong the movement of the unwinding of the spring, I provide the following slowing or cushioning mechanisms:

Q represents a small gear meshing with the

gear N. R represents a gear on the same shaft, meshing with gear s on another shaft provided with fan-blades T. The resistance of the fan-blades assists in taking power from the spring, slows up the motion, gives the necessary interval of time, and prevents any jar by the engagement of the pin *m* with the lug *n*. Any other well-known slowing mechanism may be employed in lieu of this fan-blade and gear; but I prefer to use some slowing or cushioning device, as the operation of the mechanism is smoother.

U represents the handle of a cock for shutting off the service-pipe. If at any time it is desired to renew or adjust the valves *a b*, the handle U is turned to close the pipe, chain *d* is unhooked, and the valve-rod is easily removed from its cylinder.

It is obvious that the valve-rod and tripping-lever F can be operated to flush the closet-bowl without the use of the keeper-pin and automatic tripping mechanism; but in such case the tripping-lever has to be held down during the interval of time required for flushing, the weighted valve-rod automatically seating the valve when the lever is released, the two valves on the weighted rod rendering this operation feasible without the use of stuffing-box and heavy weight which would otherwise be required, and this constitutes a part of my invention.

Having described my invention, what I claim is—

1. In a flushing apparatus the combination of a pivoted lever, a weighted valve operating in a pipe, and connected to said lever, a shaft, a power-spring and a tape reversely wound on said shaft, one end of the tape being connected to said lever, a spring-actuated keeper-pin projected in the line of the upward travel of said valve and adapted to engage and hold the same, a tripping device actuated by said shaft adapted to engage said keeper-pin and release the valve at a predetermined point in the unwinding of said spring, substantially as specified.

2. In a flushing apparatus the combination of a pivoted lever, a weighted valve operating in a pipe and connected to said lever, a

shaft, a power-spring and a tape reversely wound thereon, the tape being connected to said lever, a spring-actuated keeper-pin projected in the path of movement of said valve adapted to engage and hold the same, a train of gears connected to and actuated by said shaft, a tripping-lug mounted on one of said gears adapted to engage the said pin and release the valve during the unwinding of the spring, substantially as specified.

3. In a flushing apparatus the combination of a pivoted lever, a weighted valve operating in a pipe and connected to said lever, a shaft, a spring and tape wound reversely on said shaft, one end of said tape being connected to said lever, whereby when the lever is operated the tape is unwound and automatically rewound by the unwinding of said spring, a spring-actuated keeper-pin projected in the path of valve movement, a detent on said valve adapted to be engaged by said pin, a gear system connected to and actuated by said shaft, tripping devices mounted respectively on one of said gear-wheels and on said pin, adapted to engage during the unwinding of said spring, to automatically release the valve, substantially as specified.

4. In a flushing apparatus the combination of a pivoted lever, a weighted valve operating in a pipe and connected to said lever, a shaft, a spring and tape reversely wound thereon, the tape connected to the lever, a keeper-pin actuated by a spring, projected normally in the path of valve movement, adapted to engage and hold said valve when the lever is operated, a gear system connected to and actuated by said shaft, a tripping-lug carried by one member of said system adapted to engage the keeper-pin and release the valve at a predetermined point of the automatic unwinding of said spring, substantially as specified.

In testimony whereof I have hereunto set my hand.

ROBERT A. MERRILL.

Witnesses:

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