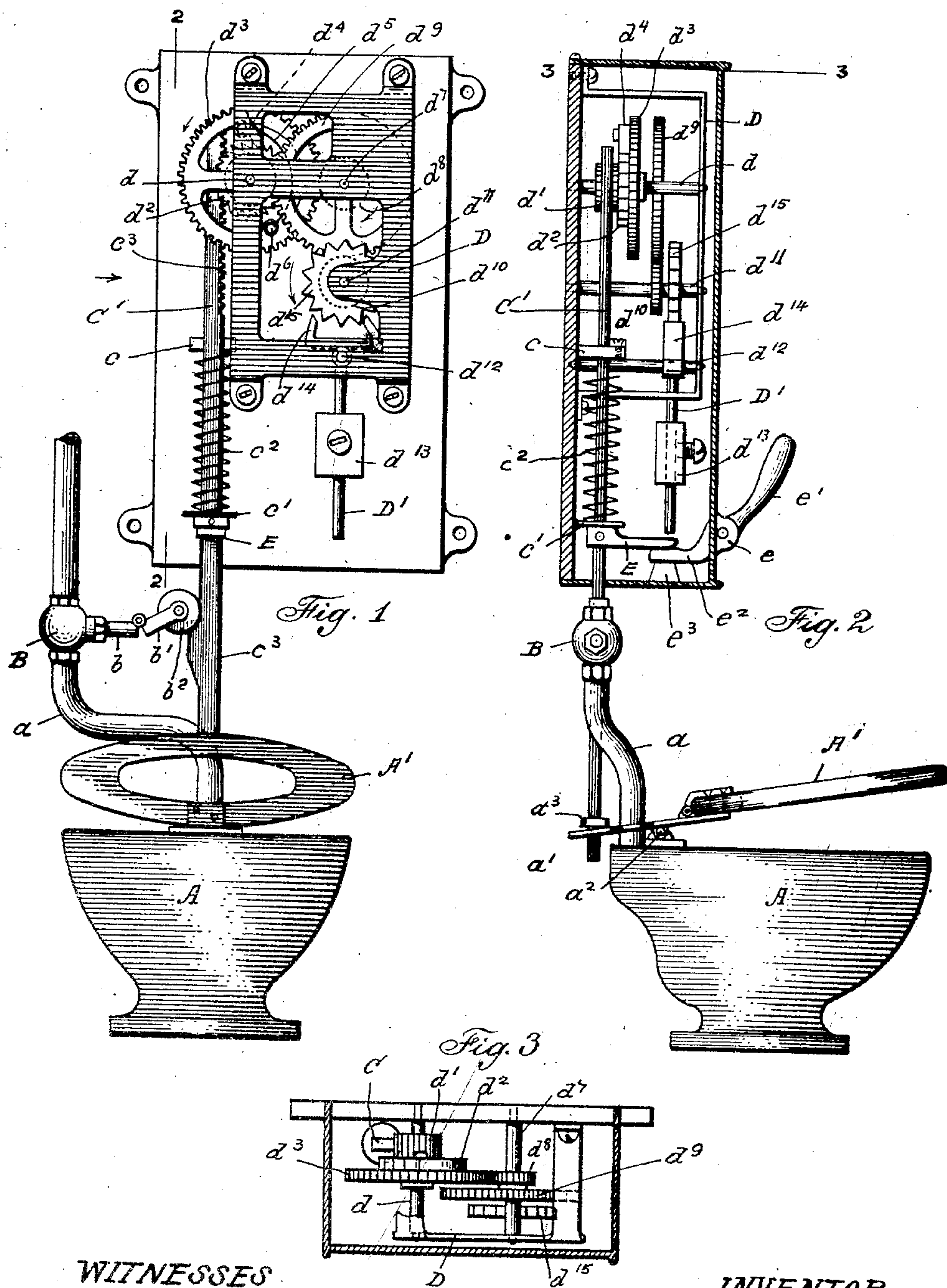


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FLUSHING VALVE.

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UNITED STATES PATENT OFFICE.

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FLUSHING-VALVE.

No. 930,124.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL BARR, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Flushing-Valves, of which the following is a complete specification.

This invention relates to improvements in flushing valves and more particularly to a flushing valve of that class having means for automatically timing its closing movement.

Heretofore it has been customary to control the closing of flushing valves either by means of the flushing fluid passing through the valve or through an auxiliary valve controlling the same, or by means of a separate operating fluid passing through auxiliary controlling valves or ports. These methods are objectionable by reason of the high degree of skill required in the manufacture of the mechanism to prevent the operating fluid from leaking.

The object of this invention is to provide a flushing valve in which the closing operation of the valve is regulated by a clock movement which is capable of being adjusted to vary the time required for the valve to close.

It is also an object of the invention to provide a very cheap and simple device, not likely to get out of repair and by means of which the necessity of a high degree of care to prevent leakage is entirely obviated.

The invention consists of the matters hereinafter described in the specification and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a front elevation of a device embodying my invention, with parts removed. Fig. 2 is a section taken on line 2--2 of Fig. 1. Fig. 3 is a section taken on line 3--3 of Fig. 2.

As shown in said drawings: A indicates a closet bowl of any desired construction and into which a supply pipe *a*, leading from any suitable source of water supply, is connected. Said pipe is provided at a suitable point above the bowl with an ordinary spring controlled push valve B, the stem *b* of which has a hinged section *b'* thereon adapted to swing upwardly and provided at its outer end with a roller *b²*.

Rigidly supported in any preferred manner above the bowl is a casing C adapted to contain the valve operating mechanism.

Slidably engaged in a suitable bearing *c* carried on the side wall of the casing, and in the bottom of the casing is a rack-bar *C'*, which projects downwardly below the casing to a point adjacent the rear side of the bowl. A collar *c'* is secured on the bar below said bearing *c* and a coiled spring *c²* is carried on the bar and engages at its ends against said collar and bearing respectively and acts to normally hold the bar at the lower limit of its movement.

A frame D is rigidly engaged on said casing and a shaft *d* is journaled therein and in the side wall of the casing. Rotatively mounted on said shaft is a pinion *d'* adapted to mesh with and be driven by the rack *c³* on said bar, and rigidly engaged to said pinion is a ratchet wheel *d²*. Rigidly engaged on said shaft adjacent said ratchet wheel is a gear *d³*, having a pawl *d⁴* pivoted thereon and adapted to engage the teeth of the ratchet wheel when the latter is rotated by the downward movement of said bar and thus rotate the shaft, but when the ratchet wheel is rotated by the upward movement of said bar the pawl slides over the teeth and permits the pinion and ratchet to rotate on the shaft. Said pawl is held in contact with said teeth by means of a spring *d⁵* engaged at *d⁶* on the gear *d³* and bearing thereagainst.

A shaft *d⁷* is journaled in the frame and side of the casing and a pinion *d⁸* is rigidly engaged thereon and meshes with the gear *d³*. A gear *d⁹* is rigidly engaged on the shaft *d⁷* and meshes with and drives a pinion *d¹⁰*, which is rigidly engaged on a shaft *d¹¹* journaled in said frame and side wall beneath the shaft *d⁷*. A shaft *d¹²* is journaled in the frame and side wall beneath the shaft *d¹¹* and rigidly engaged thereon is a pendulum *D'* having an adjustable weight *d¹³* thereon. On the upper end of said pendulum is a fork or double pawl *d¹⁴* adapted to engage a ratchet *d¹⁵* which is rigidly engaged on the shaft *d¹¹*.

The rack-bar C is provided adjacent said valve with a shoulder or cam *c³* adapted to engage the roller *b²*. Said cam is provided with a long bevel on its lower end and a relatively short bevel at its top, on the latter of which the roller rests with the hinged section of the valve stem turned slightly upward when said bar is at the lower limit of its movement, as shown more clearly in Fig. 1.

A seat lever a' is pivoted at a^2 on the rear of the bowl and a seat A' is hinged thereon. Said lever extends rearwardly and engages beneath a collar a^3 on the lower end of the rack bar C' and normally holds the seat in an inclined position, as shown in Fig. 2.

If preferred, and as shown in Fig. 2, a stop arm E is rigidly engaged on the bar within the casing, and pivoted on a suitable lug e on the front of the casing is a lever e' , the inner end e^2 of which engages beneath said arm and is adapted to normally raise said bar. A stop e^3 is carried on the bottom of the casing and is adapted to be engaged by the end e^2 of said lever and limit the downward movement of the rack-bar.

The operation is as follows: When the seat is forced down onto the bowl the rack-bar is elevated by the lever a' and the cam c^3 moves above the roller b^2 . During the upward movement of said bar the spring c^2 is compressed and the pinion d' and the ratchet wheel d^2 rotate loosely on the shaft d . As soon as the weight is removed from the seat the spring c^2 acts to force the bar downwardly and the pawl d^4 engages the ratchet teeth and by driving the chain of gears operates the pendulum which serves to regulate the downward speed of the rack-bar. As the rack-bar descends the pressure of the cam c^3 on the roller b^2 acts to force the hinged section b' of the valve stem downwardly into alinement with said stem and forces the stem inwardly, thereby opening the valve and flushing the bowl. As soon as the cam c^3 has passed below the roller b^2 the stem moves outwardly and again closes the valve.

When it is desired to manually operate the valve the bar is elevated by means of the lever e' and the flushing operation is performed as before described. Obviously the downward speed of the bar, and consequently the interval during which the valve is held open, may be regulated by adjusting the weight on the pendulum and, obviously an automatic valve operating mechanism constructed in accordance with my invention is not likely to get out of repair and does not require as high a degree of skill for its construction as does the fluid controlled valves. Obviously also many details of form and construction may be varied without departing from the principles of my invention.

I claim as my invention:

1. In a device of the class described the combination with a valve of a jointed, slidable valve stem therefor, a longitudinally movable bar adjacent said stem adapted to operate the valve when moved in one direction, means on said bar adapted to bend the stem when the bar is moved in the opposite direction and means adapted to regulate the speed of said bar during its operative movement.

2. In a device of the class described the

combination with a valve of a slidable, jointed valve stem therefor, a longitudinally movable bar adapted to operate said valve stem when moved in one direction and to throw it out of operative position when moved in the other direction, means adapted to move said bar to operate the valve and adjustable means adapted to regulate the movement thereof.

3. In a device of the class described the combination with a valve of a jointed valve stem therefor, a longitudinally movable bar adjacent said stem and having a cam thereon adapted to operate the valve when the bar moves in one direction and to throw the valve stem out of operative position when the bar moves in the opposite direction, means adapted to move said bar to operate the valve, a pendulum supported adjacent the bar and means operatively connecting said pendulum with said bar and adapted to regulate the speed of the bar.

4. In a device of the class described the combination with a valve of a jointed valve stem therefor, a roller on the outer end of said stem, a rack-bar supported adjacent said stem and having a cam thereon adapted to engage said roller, means adapted to elevate said bar, means adapted to lower said bar and force the valve stem inwardly, and a clock mechanism adapted to control the lowering movement of said bar.

5. In a device of the class described the combination with a casing of a rack-bar therein and projecting outwardly therefrom, a cam on said bar, a valve supported adjacent said cam, a slidable jointed valve stem in said valve adapted to be forced inwardly by said cam when the bar is moved in one direction and to be bent at its joint when the bar is moved in the opposite direction, and a clock movement in said casing adapted to move the bar for a given interval.

6. In a device of the class described the combination with a casing of a rack-bar therein and projecting therefrom, a pendulum pivoted in said casing, gears connecting said pendulum with said rack-bar, a spring adapted to move the bar outwardly, a valve adjacent said bar, a jointed stem on said valve, a roller on said stem, a cam on said bar adapted to engage the roller and operate the valve stem when the bar is moved by said spring, and means for moving the bar into said casing.

7. In a device of the class described the combination with a casing of a rack-bar slidably engaged therein and projecting therefrom, a spring on said bar adapted to normally hold it at the outer limit of its movement, means adapted to move said bar into the casing against the action of said spring, a cam on the projecting end of said bar, a valve supported adjacent the same, a slidable valve stem on said valve having a

hinged section on its outer end adapted to
turn upwardly when the bar is moved toward
the casing, a roller on said section adapted to
engage said cam, and a clock mechanism in
5 said casing adapted when the bar is moved
outwardly by said spring to regulate the
speed thereof.

In witness whereof I have hereunto sub-
scribed my name in the presence of two wit-
nesses.

CARL BARR.

Witnesses:

FR. LOESER,
ROBT. KLOTZ.