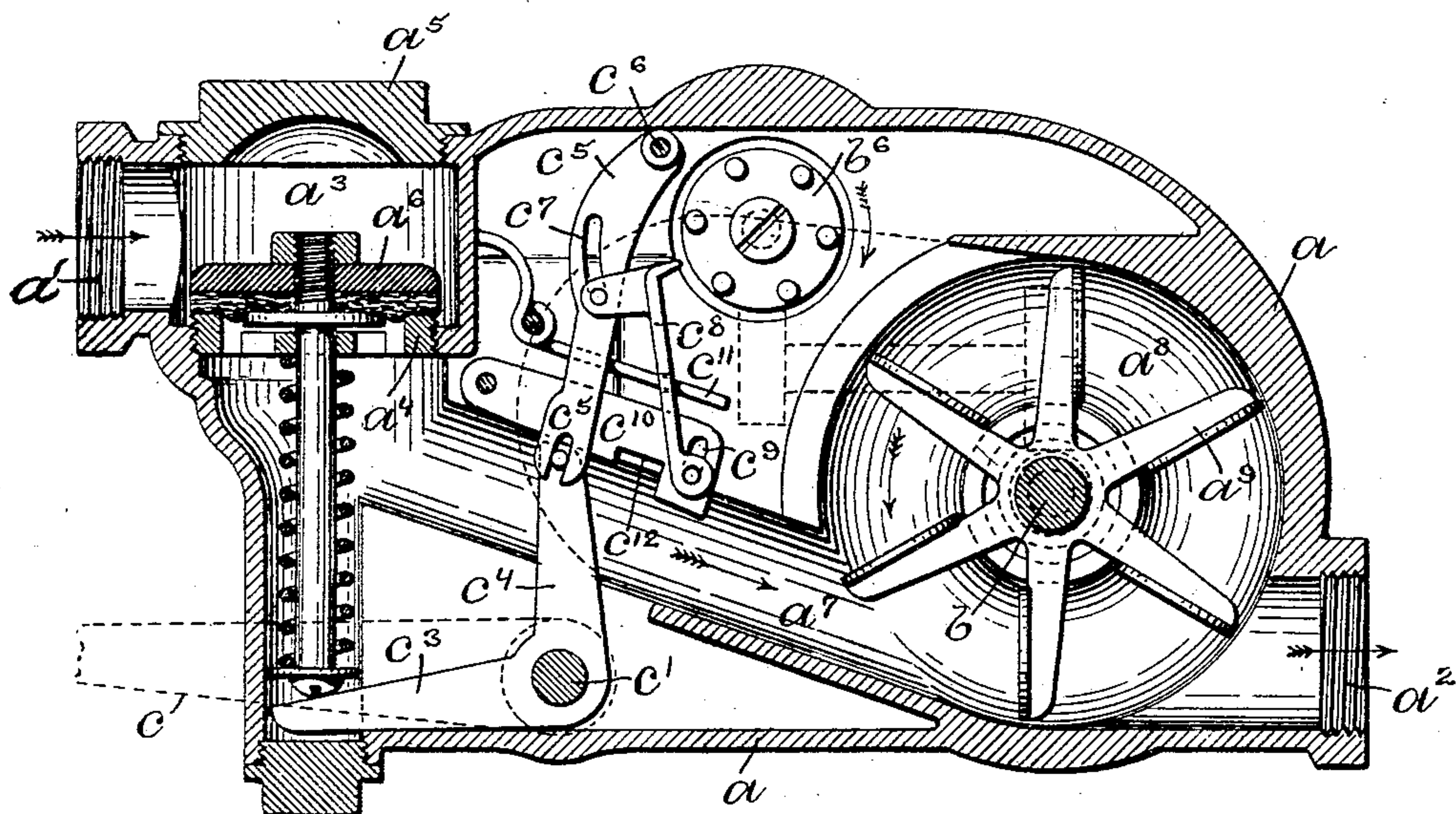
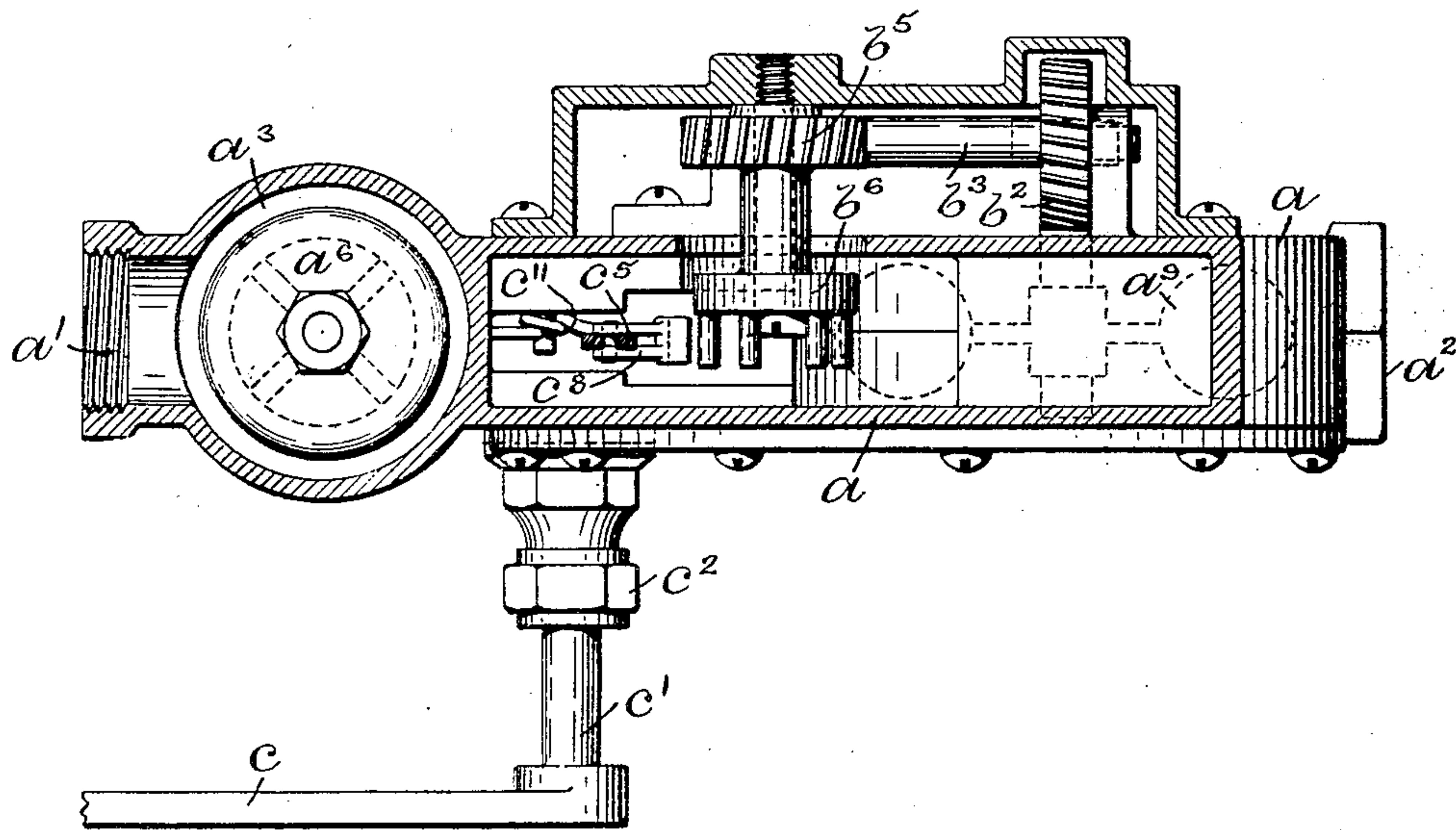


J. O. RATHBUN.
FLUSHING VALVE.

(Application filed Apr. 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.Fig. 2.

WITNESSES:

Chas. H. Lutton Jr.
Ada E. Hagerty

INVENTOR

John O. Rathbun
by Joseph H. Miller & Co.
ATTORNEYS:

J. O. RATHBUN.
FLUSHING VALVE.

(Application filed Apr. 16, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

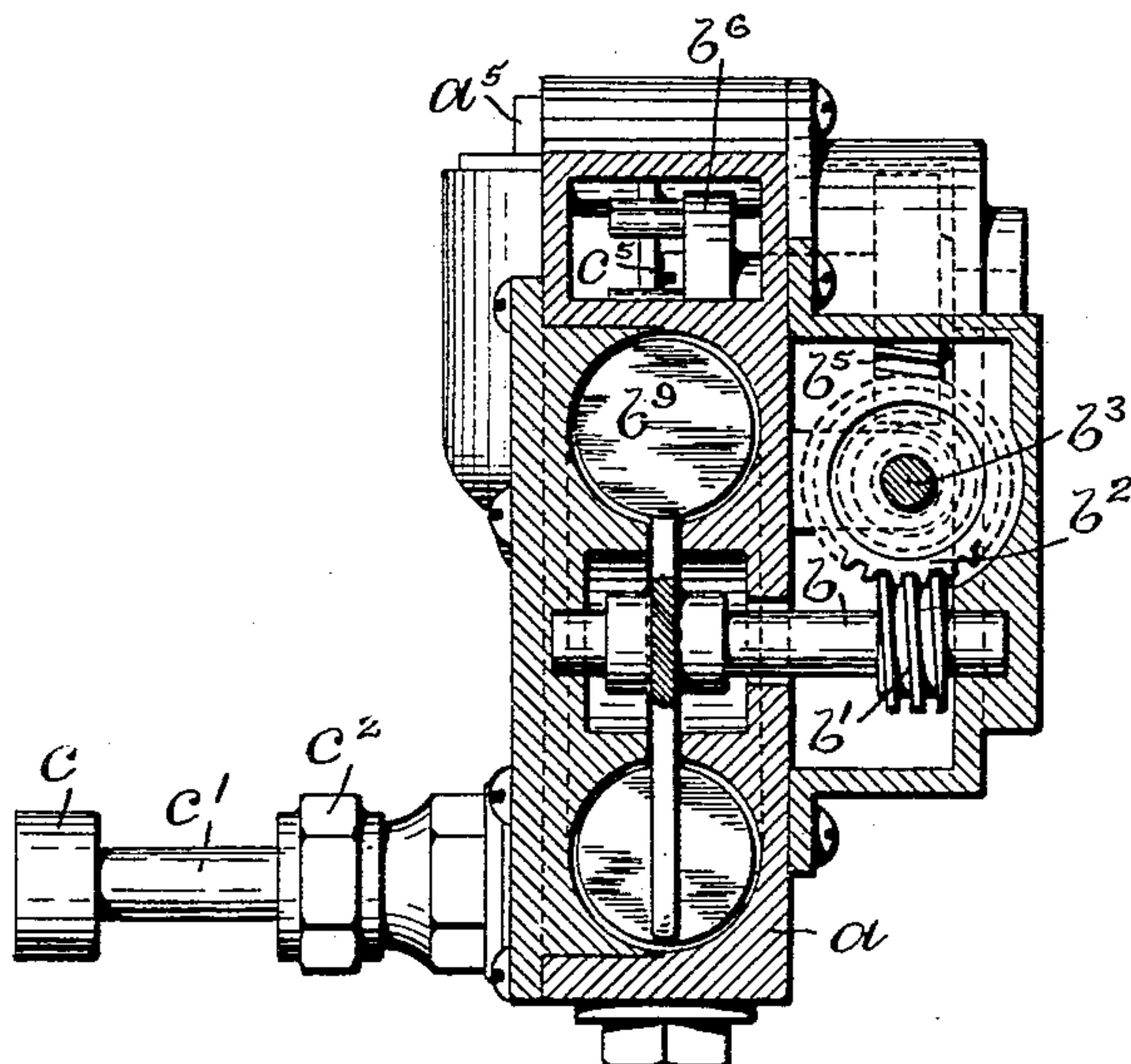
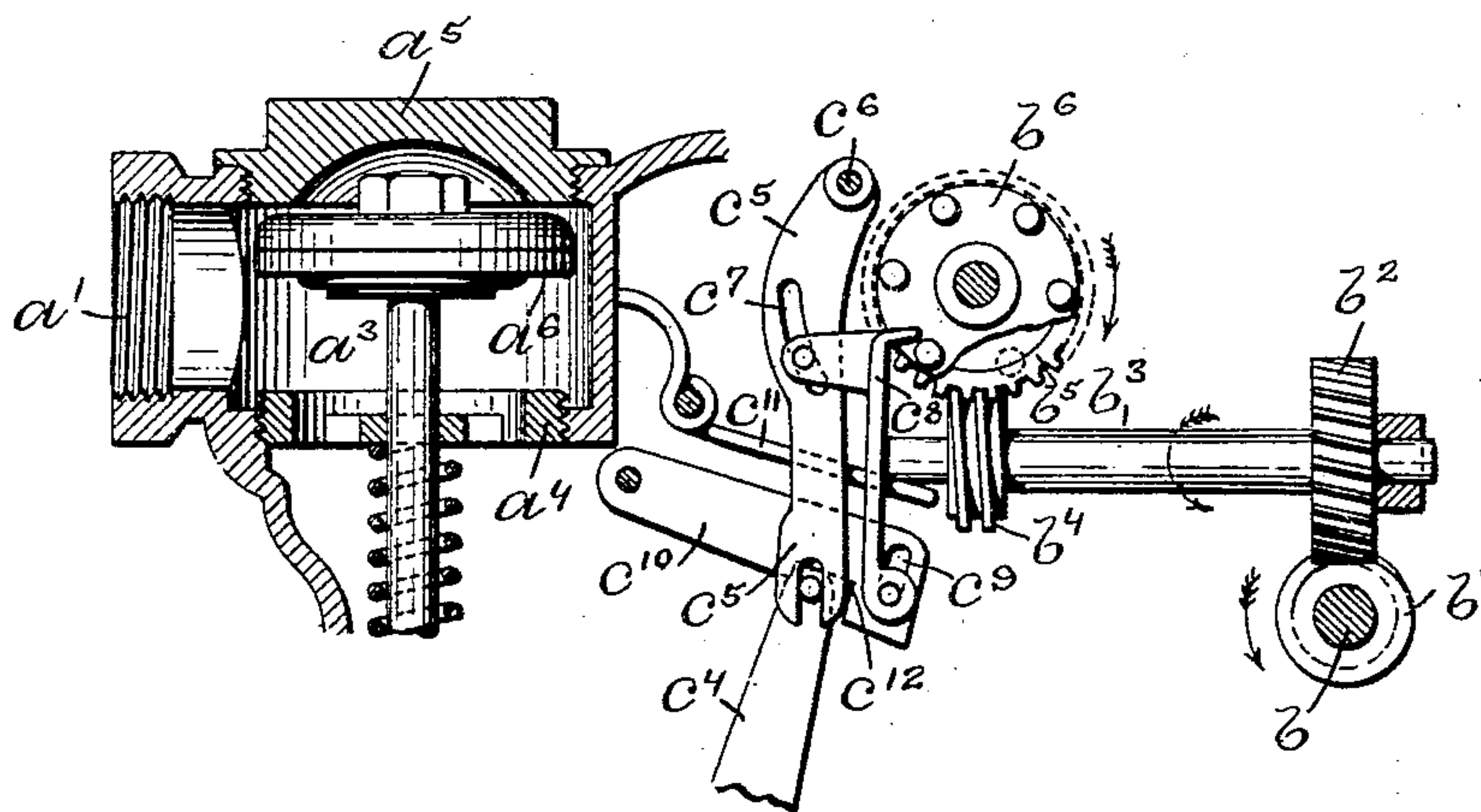


Fig. 4.



WITNESSES:

Chas. H. Luther Jr.
Ada E. Hagerty.

INVENTOR:

John G. Rathbun
Joseph H. Miller & Co.
ATTORNEYS:

UNITED STATES PATENT OFFICE.

JOHN O. RATHBUN, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO WILLIAM A. HATHAWAY, OF EDGEWOOD, RHODE ISLAND.

FLUSHING-VALVE.

SPECIFICATION forming part of Letters Patent No. 704,211, dated July 8, 1902.

Application filed April 16, 1901. Serial No. 56,070. (No model.)

To all whom it may concern:

Be it known that I, JOHN O. RATHBUN, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Flushing-Valves, of which the following is a specification.

This invention has reference to a mechanically-controlled flushing-valve for washing out water-closets, urinals, and other vessels.

The object of the invention is to utilize the full force of the flushing-stream during a predetermined interval and then close the valve automatically.

The invention consists in the peculiar and novel construction and the combination whereby the flushing-valve when opened is automatically closed by mechanism operated by the flushing-water, as will be more fully set forth hereinafter.

Flushing-valves have been controlled so as to close gradually after they have been opened. With such a valve the effect of the flushing-stream is confined to the portion of time when the valve is wide open. The subsequent discharge when the valve is partly closed is only useful for sealing the outlets of the sanitary vessel. My improved flushing-valve when opened is automatically locked in the open position and remains locked until the out-rushing stream, acting on a motor, operates mechanism by which after a predetermined interval the valve is released and closed.

Figure 1 is a longitudinal sectional view of the valve-casing, showing the locking and actuating mechanism. Fig. 2 is a transverse sectional view of the same. Fig. 3 is a vertical sectional view taken on a line with the axis of the motor-shaft. Fig. 4 is a diagrammatic view of the unlocking mechanism.

Similar marks of reference indicate corresponding parts in all the figures.

In the drawings, *a* indicates the valve-body, having at one end the inlet *a*¹ and at the opposite end the outlet *a*². Near the inlet is the valve-chamber *a*³, in which is secured the valve-seat *a*⁴. The valve-chamber is closed by the plug *a*⁵. The valve *a*⁶ is provided with a valve-stem, around which extends a spiral spring, one end of which bears against a washer on the end of the valve-stem and

the other end against a spider forming part of the valve-seat through which the valve-stem extends. The duct *a*⁷ connects the valve-chamber with the outlet *a*², tangential to the circular duct *a*⁸, in which the floats of the motor *a*⁹ revolve when the valve is in operation.

On the shaft *b* of the motor *a*⁹ is secured the worm *b*¹, which engages with the worm-wheel *b*² on the shaft *b*³, which has near its opposite end the worm *b*⁴, engaging with the worm-gear *b*⁵ on a sleeve having on its opposite end the pin-gear *b*⁶, acting as a pawl-lifter. This train of worm-gearing has the shafts supported in suitable journals.

The valve-actuating lever *c*, which may be operated by hand or in any other suitable manner, is connected with the rock-shaft *c*¹, which extends through the stuffing-box *c*² into the valve-body and has secured to it a bell-crank lever, the arm *c*³ of which extends under the stem of the valve *a*⁶. The other arm *c*⁴ has a pin near its outer pawl-shaped end, which pin engages with the fork on the end of the lever *c*⁵, pivoted at *c*⁶ and provided with the segmental slot *c*⁷. The pawl *c*⁸ is pivotally connected with the locking-arm *c*¹⁰ by a pin extending into the slot *c*⁹ near the outer end of the arm. The pawl *c*⁸ is also connected with the lever *c*⁵ by a pin extending into the segmental slot *c*⁷, and the pawl is held in the position shown in Fig. 1 by the spring-arm *c*¹¹.

When the flushing-valve is in use and the lever *c* is operated to open the valve, the arm *c*³ of the bell-crank lever acts on the valve-stem and moves the valve into the open position. (Shown in Fig. 4.) The end of the arm *c*⁴ lifts the locking-arm *c*¹⁰ and the pawl *c*⁸ until the pawl end of the arm *c*⁴ engages with the notch *c*¹² on the under side of the locking-arm *c*¹⁰. The pin on the arm *c*⁴ swings at the same time the lever *c*⁵ does, and with it the upper end of the pawl *c*⁸, into the path of the pins on the pin-gear *b*⁶, all parts assuming the positions shown in Fig. 4. The flushing-stream under full pressure now rushes through the duct *a*⁷ and is discharged with little loss of force into the vessel or device to be flushed. The stream encounters the floats of the motor *a*⁹ and rotates the same, trans-

mitting the motion at diminishing speed through the two sets of worms and worm-gears to the pin-gear or pawl-lifter b^6 , which when it encounters the pawl c^8 lifts the same to the upper limit of the slot c^9 and then lifts the end of the locking-arm c^{10} , releasing the arm c^4 and causing the coiled spring on the valve-stem, together with the pressure of the water, to close the valve, rock the bell-crank lever, swing the upper end of the pawl away from the pawl-lifter, and move by the action of the spring-arm c^{11} all the parts into the position shown in Fig. 1, ready to repeat the operation. The power required of the motor is so slight that the motor does not materially affect the velocity of the flushing-stream.

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

1. In a flushing-valve, the combination with the valve-body, the inlet and outlet openings, the ducts and cavities in the body, and a spring-controlled valve, of a rock-shaft, levers connected with the rock-shaft for opening the valve, a locking-arm for locking the valve and the actuating-levers in the open position, a pawl on the locking-arm, a motor operated by the flushing-stream, a pawl-lifter and worm and worm-gear mechanism intermediate the motor and the pawl-lifter, whereby at a predetermined interval the valve is released and closed automatically, as described.

2. A flushing-valve having a motor operated by the stream flowing through the valve-body, means, comprising a bell-crank lever, for opening the valve, a locking-arm for locking the bell-crank lever, and mechanism, comprising a pawl-lifter, a worm and worm-gear,

operated by the motor for releasing the valve at a predetermined interval, as described.

3. In an automatic self-closing valve, a self-closing valve, a lever for opening the valve, a locking-arm for locking the valve in the open position, and means comprising a motor operated by the flushing-stream, a pawl connected to the locking-arm, a pawl-lifter, and worm and worm-gear mechanism intermediate the motor and the pawl-lifter; whereby at a predetermined interval the valve is released and closed automatically, as described.

4. In combination in a flushing-valve, a spring-pressed valve, a rock-shaft, an arm on the rock-shaft engaging with the valve, an arm on the rock-shaft engaging with a locking-arm to hold the valve in the open position, mechanism comprising a pawl, a pawl-lifter, a worm, and a worm-gear, operated by a motor actuated by the stream passing through the valve for moving the locking-arm out of engagement with the arm on the rock-shaft, and a case inclosing the parts, as described.

5. In a flushing-valve, the combination with the stem of the valve a^6 , the rock-shaft c' and the arms c^3 and c^4 , of the notched locking-arm c^{10} , the lever c^5 , the pawl c^8 pivotally connected with the arm c^{10} and lever c^5 , and the pawl-lifter, of means, actuated by the stream passing through the valve, to operate the pawl-lifter, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN O. RATHBUN.

Witnesses:

B. M. SIMMS,

J. A. MILLER, Jr.