O. T. RICHEY.

FLUSHING APPARATUS.

APPLICATION FILED MAY 5, 1910.

973,973.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

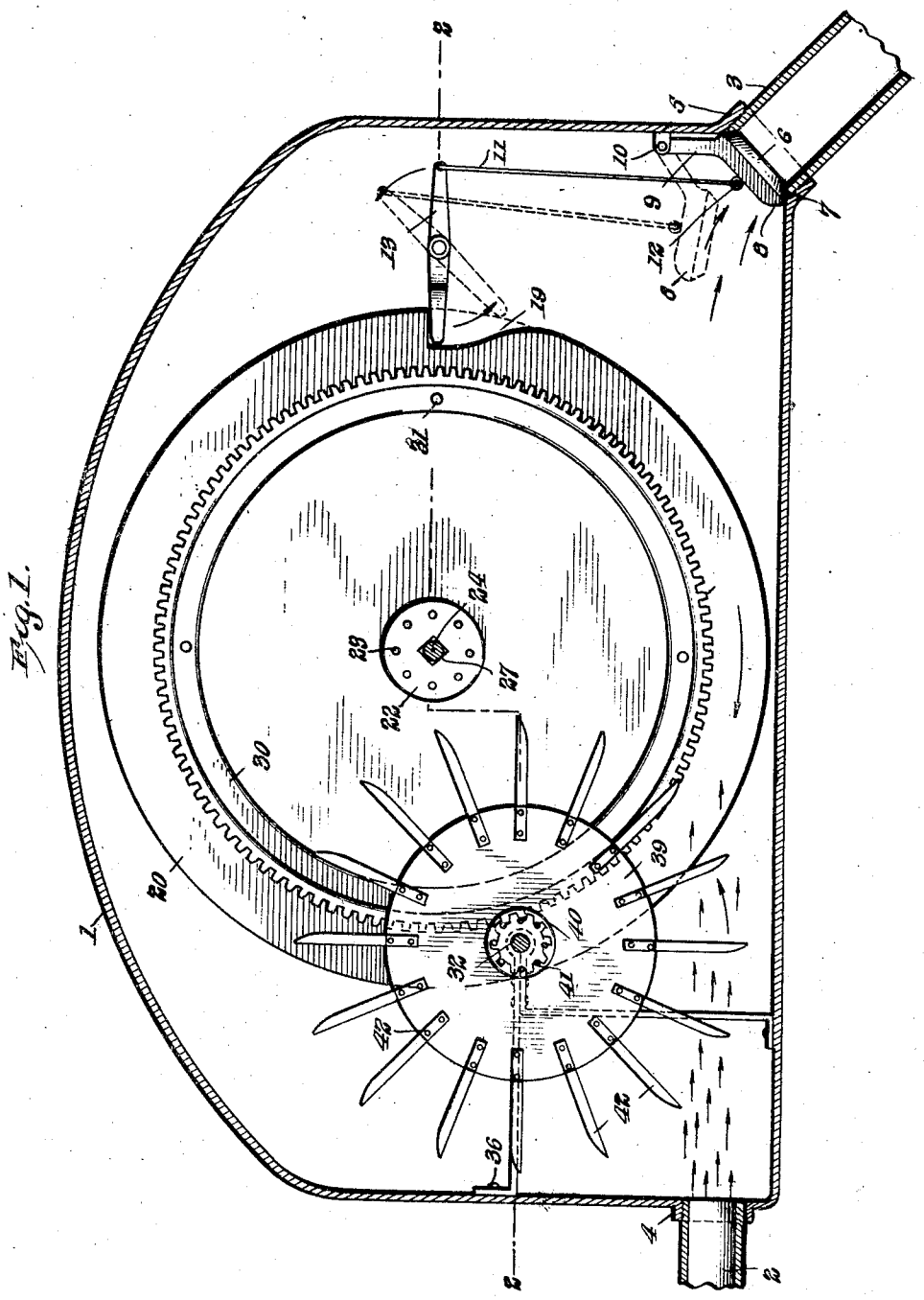

Fig. 1.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

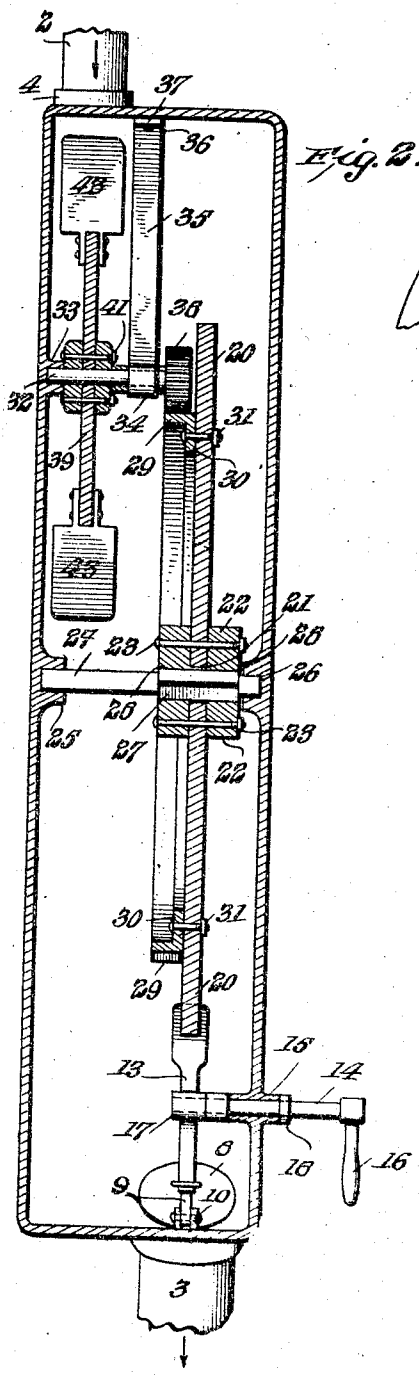


Fig. 3.

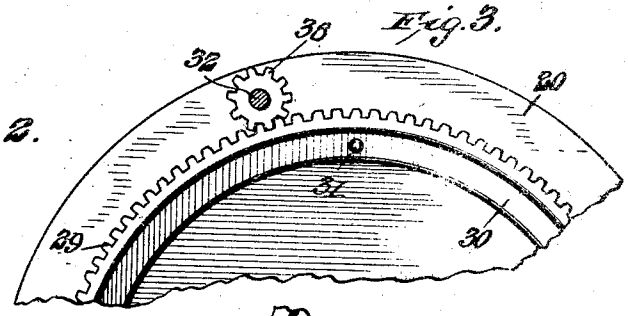


Fig. 4.

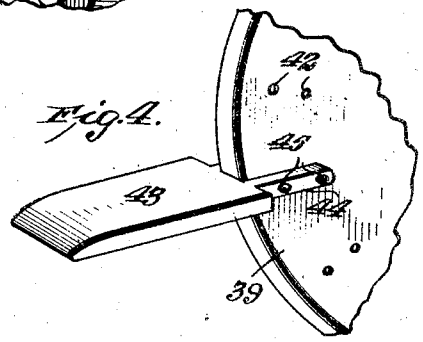
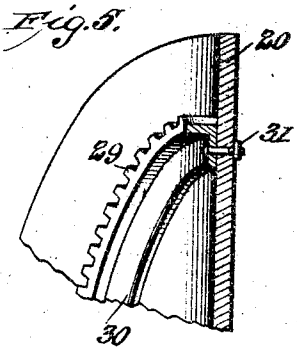


Fig. 5.



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UNITED STATES PATENT OFFICE.

OSCAR TURNER RICHEY, OF TUCSON, ARIZONA TERRITORY.

FLUSHING APPARATUS.

973,973. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed May 5, 1910. Serial No. 559,601.

To all whom it may concern:

Be it known that I, OSCAR T. RICHEY, a citizen of the United States, and a resident of Tucson, in the county of Pima, Territory of Arizona, have invented certain new and useful Improvements in Flushing Apparatus, of which the following is a specification.

My invention is an improvement in flushing apparatus, and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

Referring to the drawings forming a part hereof: Figure 1 is a vertical section through the casing of the improvement; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a rear face view of a part of the disk; Fig. 4 is a perspective view of a portion of the water wheel; and Fig. 5 is a similar view of a portion of the disk.

The embodiment of the invention shown in the drawings is in a casing 1 of suitable material, and water-tight, and having an inlet pipe 2 at its lower rear corner and an outlet pipe 3 at the lower front corner. The casing is provided at the inlet and outlet with nipples 4 and 5, into which the respective pipes are threaded. The outlet 3 is normally closed by a valve 6 seating on a valve seat 7 formed at the junction of the pipe with the casing and the valve is mounted on an arm 8 having an angular portion 9, which is pivoted between a pair of lugs 10 on the inner face of the casing, and the valve is opened by a link 11 pivoted at one end to an eye 12 on the arm, and at the other to one end of a lever 13. The lever 13 is secured by its center to the inner end of a shaft 14 which is journaled in a bearing 15 in a side wall of the casing, the shaft extending outside of the casing and having a crank or handle 16 for convenience in oscillating the shaft. The lever 13 is provided with a hub 17 secured to the shaft and engaging the inner end of the bearing, and a collar 18 is secured to the shaft and engages the outer end of the bearing to prevent longitudinal movement of the shaft. When the handle 16 is moved to oscillate the shaft, the lever will be swung and the link will lift the valve into the dotted line position of Fig. 1, thus permitting the contents of the casing to escape through the outlet pipe and into the bowl to flush the same. The inner end of the lever 13 engages in a notch or recess 19 in the periphery of a disk 20, which is provided with a central opening 21 and with a hub plate 22 on each side encircling the opening, and secured to the disk and to each other by a plurality of bolts 23.

A shaft 24 is journaled transversely of the casing in bearings 25 and 26 on the inner faces of the side walls, and the shaft is provided intermediate its ends with a portion 27 which is polygonal in cross section. Each of the hub plates 22 is provided with a central opening 28 fitting the polygonal portion of the shaft and registering with the opening 21 and with each other, the opening 21 being round. A gear ring 29 is provided with a lateral annular flange 30 resting against one face of the disk and secured to the disk by bolts 31, and the ring is arranged concentric with the shaft 24. The ring is of smaller diameter than the disk, so that the edge of the disk extends beyond the ring as shown in Fig. 2. A motor shaft 32 is journaled in a bearing 33 on one face of the casing, and in a bearing 34 on a bracket arm 35 extending from the end of the casing and having an angular portion 36 secured to the casing by a rivet 37, and the shaft has secured thereto a pinion 38 meshing with the gear ring. A disk 39 is provided with a central opening for receiving the shaft and with a hub plate 40 on each side and encircling the opening, and secured to the disk and to each other by bolts 41. Near its periphery the disk is provided with a plurality of radial series 42 of openings, the series being arranged at equal angular distances from each other. A plurality of wings or vanes 43 are connected to the disk 39, each vane having a pair of spaced arms 44 engaging the opposite sides of the disk adjacent to a series of openings, and bolts 45 pass through the openings and registering openings in the arms for securing the vanes in place. The disk 39 and the vanes form a water wheel which, when rotated by the pressure of water, will rotate the disk 20 by means of the pinion and gear ring. The rotation of the disk 20 is comparatively slow, since the diameter of the gear ring is much greater than that of the pinion.

In operation, the inlet 2 being connected with the main, when it is desired to flush the bowl the handle 16 is moved to oscillate the shaft to lift the valve, to permit the water to pass out through the outlet pipe 3. The outer end of the lever 13 is moved toward the top, as shown in dotted lines in Fig. 1, and the inner end is disengaged from

the notch or recess 19 of the disk. The disk 39 is so arranged in the casing that the vanes or weights on one side of the shaft 32 are directly in front of the inlet 2, so that the incoming water impinges directly against the faces of the said vanes. The force of the incoming water moves the vanes and rotates the shaft 32. As the shaft rotates, motion is imparted to the disk 20 in the direction of the arrow, Fig. 1, by means of the pinion and gear ring connection, and the lever 13 is retained in the dotted line position of Fig. 1 on account of the engagement of the inner end thereof with the periphery of the disk 20. The lever is held in this position during a complete rotation of the disk 20, that is, until the notch or recess 19 again comes into position for engagement by the inner end of the lever. As soon as this occurs, the valve is closed by gravity and the pressure of the water, and the movement of the disk ceases. When the valve closes, the pressure is sufficient to hold it closed against the action of the water wheel, thus stopping the wheel and preventing further movement until the shaft is again oscillated by the handle. The water wheel also acts to steady the rotation of the disk 20, and in operation the apparatus is practically noiseless.

The amount of water discharged at each flushing may be regulated by increasing or decreasing the ratio of the pinion and gear ring with respect to each other, and also by varying the relative capacities of the inlet and outlet. In practice the outlet is of greater capacity than the inlet.

I claim:

1. An apparatus of the character specified, comprising a casing having an inlet at one end, and an outlet at the other of greater capacity than the inlet, said outlet having a valve seat at its commencement, a valve normally resting upon and closing the outlet, an arm hinged to the casing at one end and connected at the other end to the valve, a shaft journaled transversely of the casing and extending outside of the same, the extended portion having a crank arm, a lever secured at its center to the shaft, a link connecting the one end of the lever to the valve, a disk journaled for rotation in the casing adjacent to lever and having a recess in its periphery engaged by the inner end of the lever when the valve is closed, a gear ring secured to one of the faces of the disk and concentric therewith, a shaft journaled adjacent to the disk on one side of the outlet, a pinion on the shaft meshing with the gear ring, a disk secured to the shaft, and a plurality of spaced wings extending radially from the disk and extending in front of the inlet on one side of the disk.

2. An apparatus of the character specified, comprising a casing having an inlet and an outlet opposite to the inlet and of greater capacity, a valve for the outlet held closed normally by the pressure of the water, a lever pivoted at its center, means outside of the casing for swinging the lever, a connection between one end of the lever and the valve for opening the valve when the lever is swung in one direction, a disk rotatable in the casing and having a recess in its periphery engaged by the free end of the lever when the valve is closed, a shaft journaled adjacent to the inlet and at one side thereof, a driving connection between the shaft and the disk, and a plurality of radial blades on the shaft, the blades on one side of the shaft extending in the path of movement of the water entering through the inlet.

3. An apparatus of the character specified, comprising a casing having an inlet and an outlet opposite to the inlet and of greater capacity, a valve for the outlet held closed normally by the pressure of the water, a lever pivoted at its center, means outside of the casing for swinging the lever, a connection between one end of the lever and the valve for opening the valve when the lever is swung in one direction, a disk rotatable in the casing and having a recess in its periphery engaged by the free end of the lever when the valve is closed, a water wheel in the casing, having one side thereof in front of the inlet, and a driving connection between the shaft and the disk.

4. An apparatus of the character specified, comprising a casing having oppositely arranged inlet and outlet openings, a valve for the outlet normally held closed by the water pressure in the casing, a water wheel arranged in the casing in front of the inlet opening for operation by the incoming water, a rotatable disk having a driving connection with the water wheel, a lever mounted for swinging movement in the casing, a connection between the lever and the valve for opening said valve when the lever is swung in one direction, and means outside of the casing for swinging the lever, the disk having a recess in its periphery for receiving the end of the lever when the valve is closed.

5. An apparatus of the character specified, comprising a casing having oppositely arranged inlet and outlet openings, the outlet being of greater capacity than the inlet, a valve for the outlet normally held closed by the water pressure in the casing, a lever mounted to swing in the casing, a connection between the lever and the valve for opening said valve when the lever is swung in one direction, means outside of the casing for swinging the lever, a water wheel journaled adjacent to the inlet opening and in position for rotation by the incoming water, a disk rotatable in the casing, the

periphery of the disk moving in engagement with the lever and holding said lever in swung position, and a driving connection between the water wheel and the disk, the disk having a recess in its periphery for receiving the end of the lever to permit said lever to swing in the opposite direction to close the valve.

6. An apparatus of the character specified, comprising a casing having oppositely arranged inlet and outlet openings, the outlet being of greater capacity than the inlet, a valve for the outlet normally held closed by the water pressure in the casing, a lever mounted to swing in the casing, a connection between the lever and the valve for opening said valve when the lever is swung in one direction, means outside of the casing for swinging the lever, a rotatable disk in the casing, the periphery thereof moving in engagement with the lever and holding it in swung position with the valve open, the disk having a recess in its periphery for receiving the end of the lever to permit the valve to close, and means operated by the incoming water for rotating the disk.

7. An apparatus of the character specified, comprising a casing having oppositely arranged inlet and outlet openings, the outlet being of greater capacity than the inlet, a valve for the outlet normally held closed by the water pressure in the casing, a lever mounted to swing in the casing, a connection between the lever and the valve for opening said valve when the lever is swung in one direction, means outside of the casing for swinging the lever, means for holding the lever in swung position with the valve open, and means operated by the incoming water for moving the holding means to release the lever after the expiration of a predetermined interval of time.

8. An apparatus of the character specified, comprising a container having an inlet and an outlet, a valve for the outlet held normally closed by the water pressure in the container, a lever for opening the valve, a rotatable disk engaging the lever with its periphery for holding the valve open, the disk having a recess for receiving the end of the lever to permit the valve to close, a water wheel operated by the incoming water, a driving connection between the wheel and the disk, and means outside of the container for moving the lever to open the valve.

9. An apparatus of the character specified, comprising a container having an inlet and an outlet, a valve for the container, normally held closed by the water pressure therein, a lever connected with the valve for opening the same, a rotatable disk against which the lever rests for holding the said valve open, the disk having a recess for receiving the end of the lever to permit the valve to close, a water wheel operated by the incoming water, and a driving connection between the wheel and the disk.

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Witnesses:
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BENTON DICK.