

927,796.

F. F. HAWKINS.
FLUSHING DEVICE.
APPLICATION FILED AUG. 18, 1908.

Patented July 13, 1909.

2 SHEETS—SHEET 1.

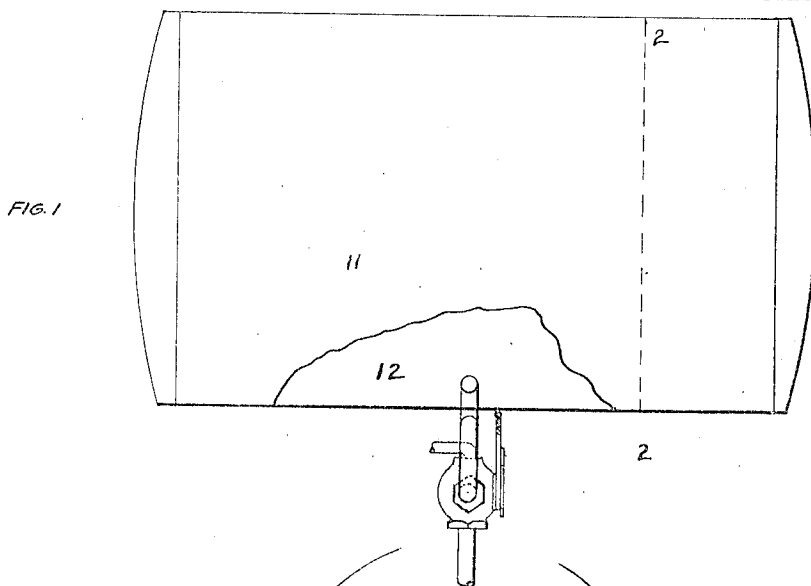


FIG. 2

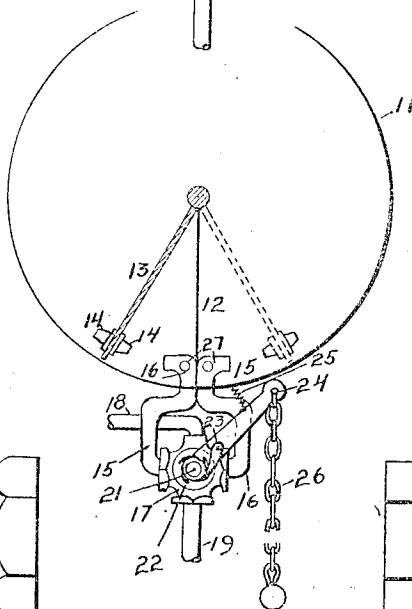


FIG. 3

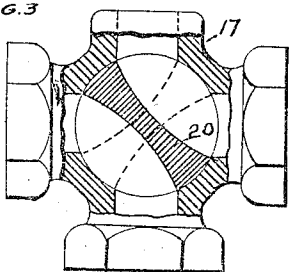
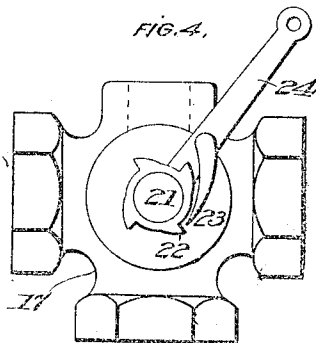


FIG. 4



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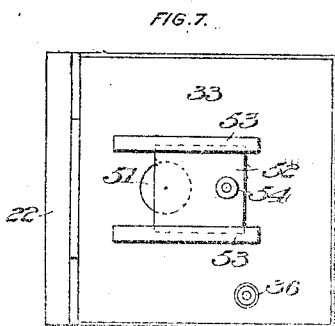
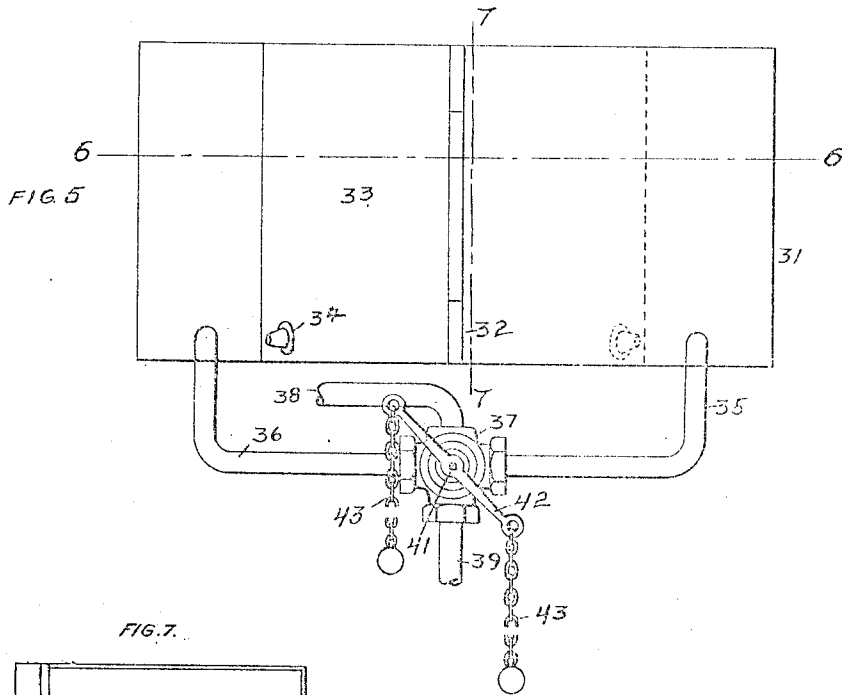
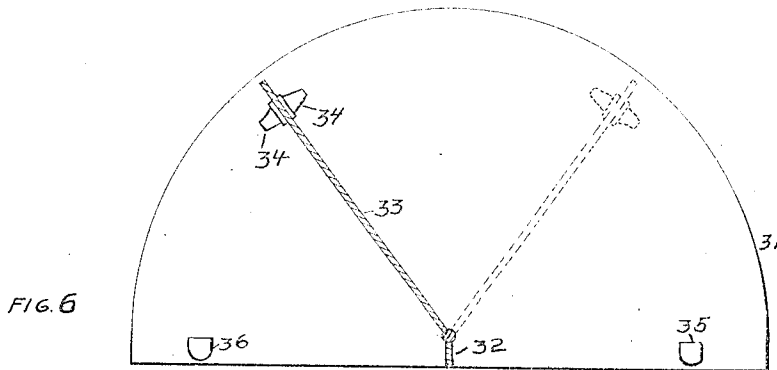
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UNITED STATES PATENT OFFICE.

FRANCIS F. HAWKINS, OF TROY, NEW YORK.

FLUSHING DEVICE.

No. 927,796.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed August 18, 1908. Serial No. 449,125.

To all whom it may concern:

Be it known that I, FRANCIS F. HAWKINS, a citizen of the United States, residing at Troy, Rensselaer county, New York, have invented a new and useful Improvement in Flushing Devices, of which the following is a specification.

My invention relates to flushing devices for furnishing an intermittent supply of liquid for flushing, scouring or like purposes.

It is particularly adapted to flush tanks used in connection with water closets, hoppers, latrines and the like. Its object is to provide a device that shall be simple, economical and durable in construction, as well as efficient and noiseless in operation.

I will show and describe certain forms of my device, it being understood that these may be modified within considerable limits in the practical embodiment of my invention.

In the drawings, Figure 1 is a side elevation, partly broken away, of one form of my device; Fig. 2 is a vertical section through the plane 2-2, Fig. 1; Fig. 3 is an enlarged view, partly broken away, of the valve of Figs. 1 and 2; Fig. 4 is an enlarged front elevation of the same valve; Figs. 5 and 6 show another form of the device, Fig. 5 being an elevation with the front wall removed and Fig. 6 a horizontal section through the plane 6-6, Fig. 5. Fig. 7 is a transverse section of the tank of Fig. 5, showing a modified shutter, the section plane being indicated by the line 7-7; Fig. 5.

Referring to the first four figures, 11 designates a closed tank of cylindrical form, having a vertically extending, radial partition 12, to which is hinged a movable radial partition 13, shown as provided on each of its faces with a plug 14, which may be of rubber or like material. Passing through the wall of the tank 11 on opposite sides of the partition 12 are branch pipes 15, 16, whose open ends are adapted to engage with and be closed by the plugs 14. The other ends of the pipes 15, 16 pass into opposite sides of a four-way valve 17, which is also connected with an inlet pipe 18 and an outlet pipe 19. The plug 20 of the valve 17 has a stem 21, on the free end of which is mounted a four tooth ratchet 22, with which engages a pawl 23, pivoted on a lever 24, which is itself pivoted on the shaft or stem 21. A spring 25 normally holds the lever 24 in its upward position, shown in Fig. 2. From the free end of

the lever 24 depends a chain 26, by which it may be manually operated.

The operation of this form of my device is as follows: It is of course understood that the stationary partition 12 and the movable partition 13 both extend from end to end of the tank 11, and they together form a substantially water-tight wall therein. If now the valve plug 20 be in the position shown in solid lines, Fig. 3, water—or other liquid—will flow from the inlet pipe 18, connected to the upper arm or way of the four-way valve 17, to the branch pipe 15, connected to its right end way. The water thus entering the tank at the right of the partition 12 will swing the movable partition 13 to the left, anti-clockwise, until the plug 14 closes the end of the branch pipe 16. Then if the lever 24 be pulled down by the chain 26, the plug 20 will be rotated one-quarter turn to the position shown in dotted lines, Fig. 3. The inlet pipe 18 will then be connected with the left branch pipe 16, the branch pipe 15 being simultaneously connected with the outlet or discharge pipe 19. The water flowing in at the left of the partition 12 will then swing the partition 13 to the right, driving out all the water in the tank, without loss of pressure, through the pipes 15 and 19. When the operator releases the chain 26, the spring 25 will return the lever 24 to its normal position, leaving the tank ready for a second simultaneous filling and emptying, the directions of motion being the reverse of those last described.

The form of my device shown in Figs. 5 and 6 of the drawings differs from that already described chiefly in its shape and in the fact that the movable partition swings on a vertical axis. As shown, one wall is in the form of a semi-circle with short tangential extensions. The tank 31 has a narrow stationary partition 32, to which is hinged the pivoted partition 33, which swings nearly or quite in contact with the arc-shaped wall of the tank. As before, the partition 33 is provided with plugs 34 to close the ends of the branch pipes 35 and 36. The connection of these branch pipes with the four-way valve 37, as well as the connections of the inlet pipe 38 and the discharge pipe 39 are similar to those above described. The movement of the valve plug is modified by securing to its stem 41 a two-armed lever 42, to each end of which is attached a chain 43. It is evident

that the operation of the device will not be altered, except that the valve plug will have a reciprocatory movement instead of the step-by-step motion of the first construction.

5 In addition, the partition 33, being independent of gravity, will move with great freedom. By giving the partition 33 a somewhat loose fit, so that one or more of its edges is slightly removed from the wall of the tank, part of
10 the inflowing water will pass the partition, without practically retarding its movement, and in no wise lessening the force of the discharge. In this way, a tank of relatively small capacity and consequent cheapness
15 may be caused to deliver say from 50 to 100% more than it actually holds. Since the movable partition is a pivoted, swinging, one, it cannot, by reason of its reduced size, be caused to cramp or bind in the tank.
20 Where, however, the movable partition which for convenience I may designate as a shutter, is fitted to the wall of the tank, as in Fig. 2, it may be advantageous to pierce the branch pipes 15, 16 within the tank with
25 small holes 27 to serve as "wasters" or "bleed-holes", so that the water confined between the partitions 12 and 13 may escape, thus allowing the full water pressure to act on the shutter 15, thereby holding the plug
30 14 in still more secure contact with the end of the branch pipe.

In Fig. 7 of the drawings, I have shown an additional adjustable means for increasing the delivery of water from the tank. This is
35 accomplished by providing the shutter 33 with an aperture 51, wholly or partly closable by a gate 52, sliding in guides 53, and conveniently provided with a knob or handle 54. To permit the adjustment of the gate 52, the
40 front wall of the tank 31 may be provided with a tightly closable aperture, not shown in the drawing, as the provision of such aperture is so easily within the skill of the mechanic.

45 By reason of the compactness of my device, especially where the shutter is loosely fitted in the tank; of its requiring a minimum of attention or repair; and of the fact that its action is substantially independent of gravity,
50 it may be placed in any desired relation to the closet or vessel to be flushed or it may be inverted or turned to any convenient position.

What I claim is:

55 1. A flushing device comprising a closed tank of arc-shaped contour; a pivot entirely within said tank and located at substantially the center of the arc thereof; a shutter movably mounted on said pivot so as to form a
60 movable partition in said tank; and alternatively operative means, including pipes extending into said tank and alternatively and directly closable by said shutter, for
65 admitting water under pressure to said tank at one side of said shutter and for simul-

taneously expelling it at the other side of said shutter, substantially for the purposes specified.

2. A flushing device comprising a closed tank of arc-shaped contour; a shutter within
70 said tank and pivoted at substantially the center of the arc thereof so as to form a movable partition therein; and alternatively operative means, including pipes extending into said tank and alternatively and directly
75 closable by said shutter, for admitting water under pressure to said tank at one side of said shutter and for simultaneously expelling it at the other side of said shutter, said
80 shutter being so constructed and fitted as to permit the passage of a portion of the admitted water thereby, substantially for the purposes specified.

3. A flushing device comprising a closed tank of arc-shaped contour; a shutter within
85 said tank and pivoted at substantially the center of the arc thereof so as to form a movable partition therein; and manually controlled means, including pipes extending into said tank and alternatively and directly
90 closable by said shutter, for admitting water under pressure to said tank at one side of said shutter and for simultaneously expelling it at the other side of said shutter, substantially for the purposes specified. 95

4. A flushing device comprising a closed tank of arc-shaped contour; a shutter within
said tank and pivoted at substantially the center of the arc thereof so as to form a
100 movable partition therein; two branch pipes entering said tank, one at each side of the pivotal point of said shutter; an inlet and an outlet pipe each connectible with both of said branch pipes; manually controlled means for
105 alternatively connecting said inlet pipe with one of said branch pipes and simultaneously connecting said outlet pipe with the other of said branch pipes; and means on said shutter for alternatively closing the ends of said
110 branch pipes, substantially for the purposes specified.

5. A flushing device comprising a closed tank of arc-shaped contour; a shutter within
said tank and pivoted at substantially the center of the arc thereof so as to form a mov-
115 able partition therein; two branch pipes entering said tank, one at each side of the pivotal point of said shutter; an inlet and an outlet pipe; a four-way valve connected to all said pipes and arranged to alternatively
120 direct a flow of water from said inlet pipe through one of said branch pipes and to simultaneously permit the expulsion of water from the tank through the other of said
125 branch pipes; and means on said shutter for alternatively closing the ends of said branch pipes, substantially for the purposes specified.

6. A flushing device comprising a closed tank of arc-shaped contour; a shutter within
130

said tank and pivoted at substantially the center of the arc thereof so as to form a movable partition therein; two branch pipes entering said tank, one at each side of the pivotal point of said shutter; an inlet and outlet pipe; a four-way valve connected to all said pipes and arranged to alternatively direct a flow of water from said inlet pipe through one of said branch pipes and to simultaneously permit the expulsion of water from the tank through the other of said branch pipes; and plugs on each side of said shutter for alternatively closing the inner ends of said branch pipes, substantially for the purposes specified.

7. A flushing device comprising a closed tank of arc-shaped contour; a stationary partition within said tank and extending substantially to the center of its arc; a shutter within said tank and hinged to the free edge of said partition and extending approximately to the arc-shaped wall of said tank; and alternatively operative means, including pipes extending into said tank and alternatively and directly closable by said shutter, for admitting water under pressure at one side of said partition and for simultaneously expelling water at the other side of said partition, substantially for the purposes specified.

8. A flushing device comprising a closed tank of arc-shaped contour; a shutter within said tank and pivoted at substantially the center of the arc thereof so as to form a movable partition therein; and alternatively operative means, including pipes extending

into said tank and alternatively and directly closable by said shutter, for admitting water under pressure to said tank at one side of said shutter and for simultaneously expelling water at the other side of said shutter, said shutter being adapted to permit a portion of the admitted water to be expelled during its movement, substantially for the purposes specified.

9. A flushing device comprising a closed tank of arc-shaped contour; a shutter within said tank and pivoted at substantially the center of the arc thereof; alternatively operative means for admitting water under pressure to said tank at one side of said shutter and for simultaneously expelling water at the other side of said shutter; and adjustable means on said shutter for permitting a portion of the admitted water to flow through, substantially for the purposes specified.

10. A flushing device comprising a closed tank of arc-shaped contour; a shutter within said tank and pivoted at substantially the center of the arc thereof; alternately operative means for admitting water under pressure to said tank at one side of said shutter and for simultaneously expelling water at the other side of said shutter; an aperture in said shutter; and adjustable means for wholly or partly closing said aperture, substantially for the purposes specified.

FRANCIS F. HAWKINS.

Witnesses:

GEO. L. COOPER,
GRACE V. MANNING.