

F. F. HAWKINS.
FLUSHING DEVICE.
APPLICATION FILED JULY 9, 1909.

946,130.

Patented Jan. 11, 1910.

2 SHEETS—SHEET 1.

Fig. 1

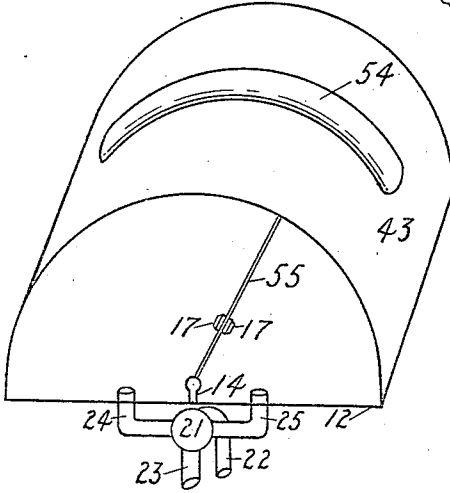
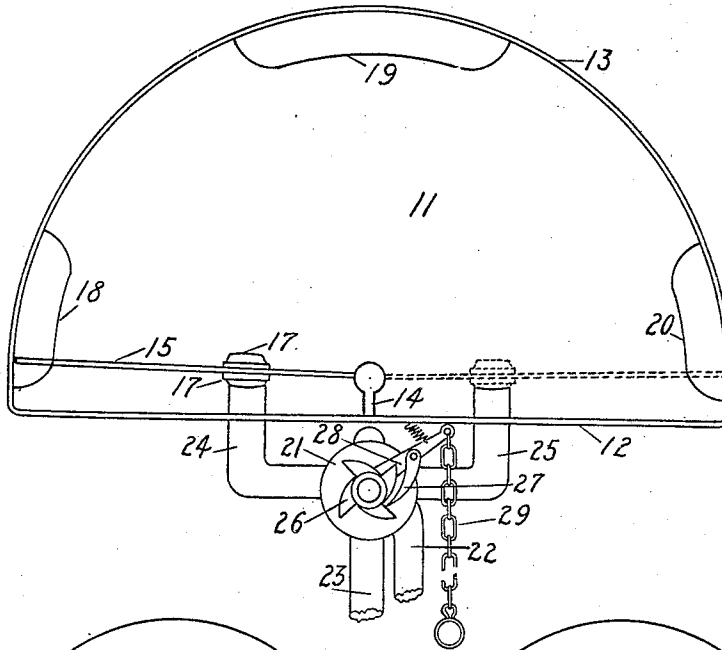


Fig. 5

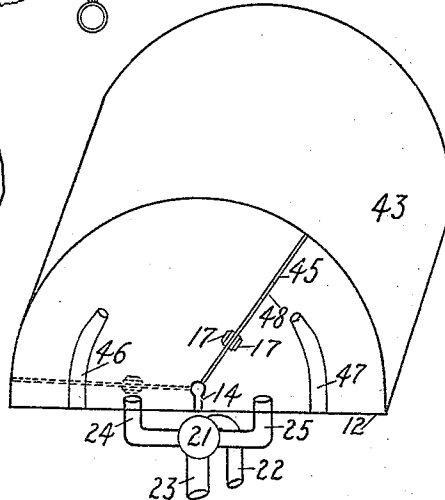


Fig. 4

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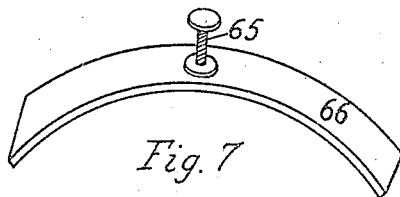
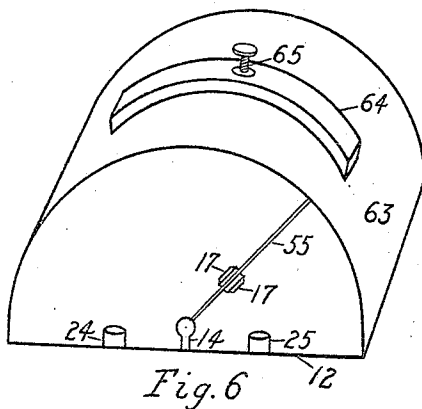
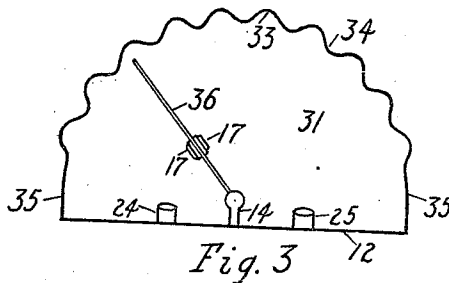
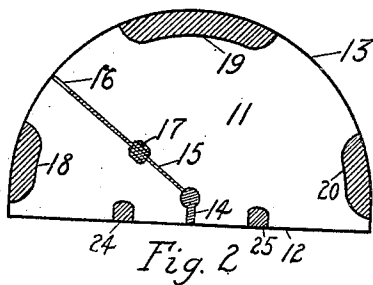
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANCIS F. HAWKINS, OF TROY, NEW YORK.

FLUSHING DEVICE.

946,130.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed July 9, 1909. Serial No. 506,802.

To all whom it may concern:

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

My invention relates to flushing devices for furnishing an intermitting 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. A flushing device of similar construction and function is shown in my application for U. S. patent filed Aug. 18, 1908, Serial Number 449,125.

The object of the present invention is to improve upon the former device by providing means for increasing the volume of water or the like delivered by a tank of given capacity without lessening the tightness or efficiency of its closure.

A further object is to provide means for readily varying the volume of liquid delivered.

Other features of the invention will appear in the specification and be pointed out in the claims.

In the drawings, Figure 1 is a front elevation of a device embodying my invention; Fig. 2 is a vertical transverse section of the same device on its middle plane; Fig. 3 is a view similar to Fig. 1 of a modified form of the device; Figs. 4, 5 and 6 are perspective views of other modifications; Fig. 7 shows in perspective a part of the device of Fig. 6 removed from the tank; in the first six views the front wall of the tank is omitted for clearness of illustration.

In Figs. 1 and 2 of the drawings, 11 designates a closed tank of approximately semi-cylindric form, having a flat wall 12 and a curved wall 13, the arc of which is circular and extends somewhat more than 180°. 14 is a stationary partition to which is pivoted at the center of the arc of the wall 13, a movable partition or shutter 15, formed at its free edge with a notch 16 and provided at each side with a plug 17, which may be of rubber or the like. In the arc-shaped wall 13 of the tank are formed three interiorly projecting bosses 18, 19 and 20, which may be conveniently made by a stamping or embossing die, and which correspond in size and position with the notch 16 in the shutter 15, so that the shutter fits tightly against,

i. e., has close moving contact with, those parts of the wall 13 where these bosses are located. Exterior of the tank 11 and adjacent the wall 12 is a four-way valve 21, of ordinary construction, to which is connected an inlet pipe 22 leading from a street main, elevated tank or other source of water under pressure, an outlet pipe 23 leading to a closet bowl or the like, and two branch pipes 24, 25, leading into the tank one at each side of the partition 14. Manual means, as a ratchet 26, pawl 27, lever 28 and chains 29, are provided for turning the valve 21 step by step, so that water may be alternately admitted from the inlet pipe 22 through either of the branch pipes and simultaneously expelled through the other branch pipe and the outlet pipe 23. It will be noted that the plugs 17 are so placed as to enter and close the ends of the branch pipes 24, 25, and that the bosses 18 and 20 are so placed as to fill the notch 16 when the shutter 15 is in or near either of its terminal or pipe closing positions. The operation of this form of my device is as follows: Assuming that the parts are in the position shown in Fig. 1, the turning of the valve 21 to connect the inlet pipe 22 with the branch pipe 24 will admit water to the tank at the left of the partitions 14, 15, thereby forcing the movable partition or shutter 15 to the right and expelling the water previously left in the tank through the pipes 25 and 23. During the early part of its travel, the notch 16 of the shutter is closed by the boss 18, so that the shutter receives the full force of the water pressure. After the shutter has moved past this boss, as shown in Fig. 2, a portion of the admitted water will flow past the shutter, which will move with decreased velocity. When the shutter reaches the central boss 19, the bypass of water will be cut off and the shutter will again receive the full pressure. A second passage of water through the notch and decreased speed of the shutter will occur as the shutter passes between the bosses 19 and 20. Finally the shutter will move to its pipe closing position, shown in dotted lines, Fig. 1, in close contact with the wall 13 and boss 20, so that the plug 17 will act to firmly close the branch pipe 25. Obviously, the next manual or other operation of the valve 21 will connect the inlet pipe 22 with the right branch pipe 25, and the branch pipe 24, at the left of the figure, with the outlet pipe 23, whereby the shutter 15 will be moved to

the left to its full line position, and the water in the tank together with a portion of the admitted water will be expelled as before. By varying the dimensions of the bosses, a tank of given capacity may be arranged to deliver almost any desired volume of water; while at the same time, the full pressure is employed, both to start the shutter from its pipe closing position when the water is admitted beneath it and to hold it in such position until the valve is again operated.

In Fig. 3 of the drawings, the tank 31 has a flat wall 12 and is provided with a four-way valve and connections like those shown in Fig. 1, only the ends of the branch pipes 24, 25, within the tank being shown. The wall 33 is of general arc-shape, but is formed with a series of longitudinal wave-like corrugations 34 except for the true arc-shaped portions 35, 35 adjacent its juncture with the wall 12. As before, the stationary portion 14 is secured to the wall 12, and carries the pivoted shutter 36, provided with plugs 17 to close the ends of the pipes 24 and 25, the shutter being of such a length as to have a close moving fit against the parts 35 of the wall 33 and to touch the inner crests of the corrugations 34. Clearly, the operation of the device will be similar to that of the form already described, in that the shutter will have a substantially water-tight fit against the arc-shaped wall when in either of its pipe closing positions, and will permit the passage of water thereby as it passes between the inner crests of the corrugations 34.

Fig. 4 shows a form of my device in which the flat wall 12, partition 14, together with the valve 21 and connected parts, are as before. The wall 43 is of smooth arc-shape, so that the free edge of the shutter 45 fits smoothly thereagainst during its entire travel. Secured to the inner side of the wall 12 are two arc-shaped rods 46, 47, adapted to pass into and close an aperture 48 in the shutter 45 as it nears its pipe closing position at either end of its path. It will be seen that, as above, the shutter receives the full water pressure in its starting and pipe closing positions, and that a portion of the admitted water will pass through the aperture 48 in the shutter during a part of its travel.

In Fig. 5, the wall 12, partition 14, valve 21 and its pipes are unchanged, while the curved wall 53 has a single outwardly projecting hollow boss 54, the shutter 55 sweeping against the entire non-embossed part of this wall, which includes the ends thereof, where the plugs 17 are contacted with the open ends of the branch pipes 24, 25. In operation, it is clear that some of the admitted water will pass the free edge of the shutter through the boss 54 during the intermediate travel of the shutter. The device of Figs. 6 and 7 is similar to that shown

in Fig. 5, and similarly numbered, except that the arc-shaped wall 63 is formed with a boss 64 the side and end walls of which are straight. In the top of this boss is a nut in which plays a set screw 65, the head of which is exterior to the tank. The inner end of the screw 65 is free to rotate, but fixed as to longitudinal movement in a plate 66, which forms a piston having substantially water tight fit in the boss 64 and adapted to move radially therein. This piston is curved to correspond with the arc of the wall 63, and it is obvious that by turning the set screw 65 the water carrying capacity of the boss 64 may be varied as desired; or, in other words, the volume of water delivered, in addition to that held by the tank, may be increased to a greater or less extent.

It will be seen that my device may be set in any position, inverted or otherwise, and in any desired relation to the closet or the like to be flushed. Also that many mechanical changes may be made therein without departing from my invention.

What I claim is:

1. A flushing device comprising a closed tank of general 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 alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being so constructed with relation to said tank as to have a substantially water-tight fit therein when in either of its pipe closing positions and to permit a portion of the admitted water to pass said shutter during a part of its travel, substantially for the purposes set forth.

2. A flushing device comprising a closed tank of general 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 alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being so constructed with relation to the wall of said tank as to have a substantially water-tight fit therein when in either of its pipe closing positions and to permit a portion of the admitted water to pass thereby during a part of its travel, substantially for the purposes set forth.

3. A flushing device comprising a closed tank of general arc-shaped contour and having a hollow boss in one of its walls; a shutter within said tank and pivoted at substan-

tially the center of the arc thereof, so as to form a movable partition therein; and alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being so constructed with relation to said bossed wall as to have a substantially water-tight fit therein when in either of its pipe closing positions and to permit a portion of the admitted water to pass thereby during a part of its travel, substantially for the purposes set forth.

4. A flushing device comprising a closed tank of general arc-shaped contour and having an outwardly projecting hollow boss in one of its walls; a shutter within said tank and pivoted at substantially the center of the arc thereof, so as to form a movable partition therein; and alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being fitted for close moving contact with the non-embossed portion of the walls of said tank when in either of its pipe closing positions; said boss being adapted to permit a portion of the admitted water to pass said shutter during a part of its travel, substantially for the purposes set forth.

5. A flushing device comprising a closed tank of general 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 alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being so constructed with relation to said tank as to have a substantially water-tight fit therein when in either of its pipe closing positions and to permit a portion of the admitted water to pass said shutter during a part of its travel; and means for regu-

lating the volume of water so permitted to pass said shutter, substantially for the purposes set forth.

6. A flushing device comprising a closed tank of general 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 alternately operative means, including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being so constructed with relation to said tank as to have a substantially water-tight fit therein when in either of its pipe closing positions and to permit a portion of the admitted water to pass said shutter during a part of its travel; and means adjustable from the exterior of said tank for regulating the volume of water so permitted to pass said shutter, substantially for the purposes set forth.

7. A flushing device comprising a closed tank of general arc-shaped contour and having an outwardly projecting hollow boss in one of its walls; a shutter within said tank and pivoted at substantially the center of the arc thereof, so as to form a movable partition therein; alternately operative means including pipes opening into said tank and alternately closable by said shutter, for admitting water under pressure to said tank through one of said pipes and simultaneously expelling water through the other of said pipes; said shutter being fitted for close moving contact with the non-embossed portion of the walls of said tank when in either of its pipe closing positions; said boss being adapted to permit a portion of the admitted water to pass said shutter during a part of its travel; and a movable part within said boss and adjustable from the exterior of said tank for varying the water carrying capacity of said boss, substantially for the purposes set forth.

FRANCIS F. HAWKINS.

Witnesses:

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BESSIE M. TOLHURST.