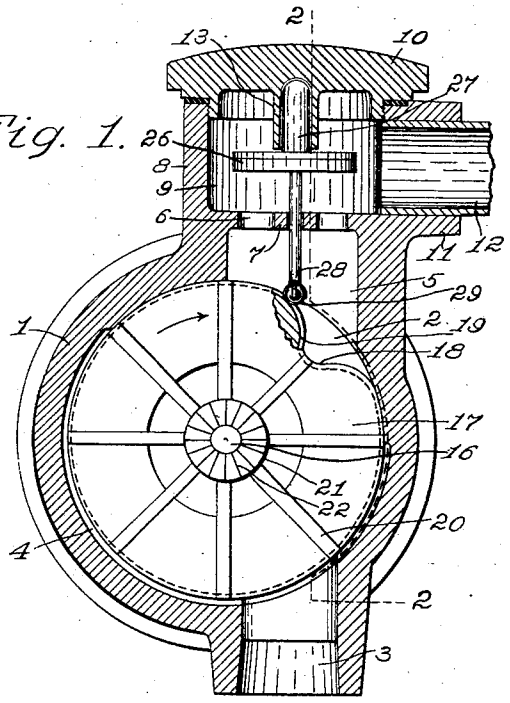
June 17, 1930. W. MOONEY 1,764,276

FLUSH VALVE

Filed Sept. 15, 1928

Fig. 1.



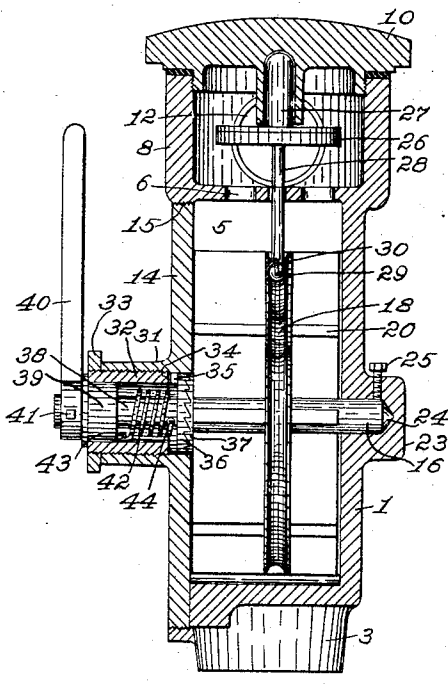


Fig. 2.

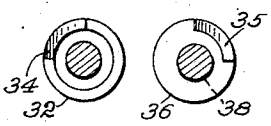


Fig. 3.

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UNITED STATES PATENT OFFICE

WILLIAM MOONEY, OF WATERLOO, IOWA

FLUSH VALVE

Application filed September 15, 1928. Serial No. 306,241.

My invention relates to improvements in flush valves, and the object of my improvement is to supply a device of this character of a compact, simple and economical construction, and including both manual starting means and an automatically controlled flushing rotor adaptable and adjustable for supplying a desired quantity of a flushing liquid for any purpose desired.

This object I have accomplished by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which Fig. 1 is a vertical transverse section of my improved device with parts broken away, and Fig. 2 is a vertical section of said device taken on the dotted line 2—2 of said Fig. 1. Fig. 3 comprises views of the coacting cam-bearing faces of a relatively fixed sleeve and of the outer face of a clutch-member for detachably engaging and initially manually operating or rotating said flushing rotor.

My invention is not restricted to the precise construction and arrangement of parts herein shown and described, nor to the various details thereof, as the same may be modified or rearranged in various particulars without departing from the spirit and scope of my invention, one practical embodiment of which has been herein illustrated and described without attempting to show all of the various forms and modifications in which my invention might be embodied.

My device is particularly appropriated for use in the flushing of water closet bowls and for which it is most suitably adapted.

The device has a hollow cylindrical body 1, preferably a metal casting having an upwardly directed integral valve-chamber 8 whose chamber hollow 9 is open at the top and supplied with a screw closure 10 having a central depending socketed projection 13 to receive and serve as a top guide for a cylindrical stud 27 on the top of a flat circular valve 26 in and of less diameter than said chamber. The bottom of the chamber 8 has ports 6 and an apertured cross member 7 traversed slidingly by a depending stem 28 fixed on the bottom of said valve 26 and having a terminal cage containing an antifriction ball 29 movable in the body chamber 5 below the hollow 2 of the latter chamber and at times downwardly into the hollow 2.

The valve chamber 8 is ported laterally to receive one end of a supply conduit 12 in communication with a supply of water or other liquid under head. The lower part of the rotor chamber 1 is formed with an integral delivery nipple 3 in communication with its interior 2.

The rotor chamber 1 contains a central rotatable shaft 16 from front to back, its rear end seated in a bearing socket 24 in an outwardly projecting boss 23. A headed flat ended screw 25 is mounted in a threaded aperture in said boss 23 to bear at its flat end adjustingly upon said shaft frictionally, with more or less braking force according to its adjustment, to thus allow of the relative retardation of the rotation of the shaft.

The front of the chamber or body 1 is open but has an interiorly threaded seat at 15 to seat a front circular closure 14 removably, said closure having an outwardly projecting central hollow boss 31 having an interior thread. The forward end of the shaft 16 terminates in a wider diameter disk 37 having radial clutch teeth on its front face, said disk being rotatably seated in the inner end of the hollow of the boss 31. Upon the shaft 16 are a number of circumferentially spaced radial vanes 20 terminating closely to the inner circumferential wall of the chamber hollow 2. These vanes are connected a little to the rear of the middles of said vanes by a flat annular web 17 whose peripheral edge is troughed around shallowly at 19 to seat said anti-friction ball 29 therein, and this peripheral edge has an

inwardly curved recess 18 which makes it a locking cam for said valve stem 28 and the ball 29.

The numeral 36 denotes a mating clutch disk with teeth to mate with the teeth on the disk 37 at times, and the disk 36 is also rotatably mounted in the hollow of the boss 31 at its inner unthreaded end. The disk 36 is integral with the end of a short shaft 38 alined with said shaft 16 and carrying an enlarged cylindrical part 39 mounted both rotatably and slidably in the hollow sleeve 32 which latter is exteriorly threaded to be seated adjustingly in the threaded inner wall of said boss 31. An annular nut 33 on the outwardly projecting end of the sleeve 32 holds it in a desired adjustment longitudinally in the boss 31.

On the outer extremity of the shaft 38 is fastened a short starter handle 40 removably. A short coiled spring 42 is mounted around the shaft 38 within the hollow of the sleeve 32, having one end fastened thereto at 43 and its inner end fastened to said shaft, at 44. On the inner end of the sleeve 32 is an inwardly projecting cam 34 of ramp shape, and a like but reversed cam 35 on the outer face of the toothed disk 36 is located thereon to, at times, ride upon the cam 34 when the handle 40 is rocked in one direction, tensioning said spring 42, and the mating cams then operate in thrusting the clutch disk 36 to engage its teeth with the teeth of the clutch disk 37, so that the handle 40 in its further movement rocks the rotor with the shaft 16 to cause the cam edge of the annular web 17 to push upwardly the stem 28 and valve 26, this initial position of the parts being shown in Fig. 1. The valve 26 being thus opened, water or other liquid under head from the conduit 12 traverses the valve chamber 9 and the ports 6, impinging upon the vanes 20 of the rotor in succession while rotating the latter, the moving water then being delivered through the flushing nipple 3. The rotor makes but one rotation, as the ball and stem 29 and 28 drop into the cam depression 18 and lock the cam and the rotor against further rotation. A single flushing charge of liquid is thus delivered by the device, the quantity being dependent upon the retardation of rotation of the rotor by the adjusted friction of the screw 25 upon the rotor shaft 16.

The operator has need only to rock the handle 40 about a one quarter rotation to cause the action of the cam projections 34 and 35 to engage the clutch disks 36 and 37 and then cause sufficient initial rotation of the rotor cam 18 to lift the ball 29 and stem 28 up to ride upon the circular edge of the cam in the peripheral groove 19, the groove preventing sidewise displacements of the ball. The operator releases the handle, allowing the tensioned spring 42 to react, shifting the shaft 38 outwardly to disengage the cams 34 and 35, the rotor then freely and automatically being rotated by the water pressure upon its vanes as before stated, until the ball returns into the cam depression 18, locking the cam and rotor.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a device of the character described, a casing having oppositely located inlet and outlet ports, a valve chamber in communication between said inlet port and a supply of liquid under head, a valve in said chamber to close said inlet port, an adjustable movable device in said casing coacting with said valve to intermittently cause the opening of the valve while movably adjustably controlling the passage of liquid from said inlet port through the casing to said outlet port, and resiliently controlled manually operable starting means axially longitudinally shiftable and releasably engageable with said movable device, said movable device having a releasable locking engagement with said valve at each actuation of the movable device to restrict the device to a single action induced by said starting means.

2. In a device of the character described, a casing having inlet and outlet ports, a rotor in said casing having vanes partitionally dividing the interior of the casing into circumferentially opening pockets, a valve chamber in communication between said inlet port and a supply of liquid under head, a valve in said valve chamber having a stem extending through the casing reciprocatingly into its interior and having an antifriction ball mounted on its extremity, said rotor comprising a circular cam having a depression with like curvate shoulders to render the cam reversibly rotatable in its cam edge, its cam edge being troughed around to seat said ball therein, an adjustable contact member for frictionally retarding adjustably the rotatory speed of said rotor.

3. In a device of the character described, a casing having inlet and outlet ports, a valve chamber in communication between said inlet port and a supply of liquid under pressure, a valve in said valve chamber having a depending stem traversing the casing wall, a reversible vaned rotor in and fitting said casing whose vanes subdivide said casing and having a medial circular cam provided with a synclinal depression, said valve stem having a terminal contact with the cam edge to be interlocked with said depression at each rotation of the rotor with said valve closing the inlet port, and a manually operable resiliently controlled starting device including mating clutch members for longitudinal separation and for an initial rota-

tory impulse to be given thereby in starting rotation of the rotor to shift said valve stem out of the cam depression and upon its circular edge, said clutch members being resiliently controlled when the starting device is manually released to disconnect, permitting the rotor to rotate one revolution in passing liquid from said valve chamber through the casing to the outlet port by impact of the liquid with the rotor vanes in filling the pockets of the rotor in succession.

In testimony whereof I affix my signature.

WILLIAM MOONEY.