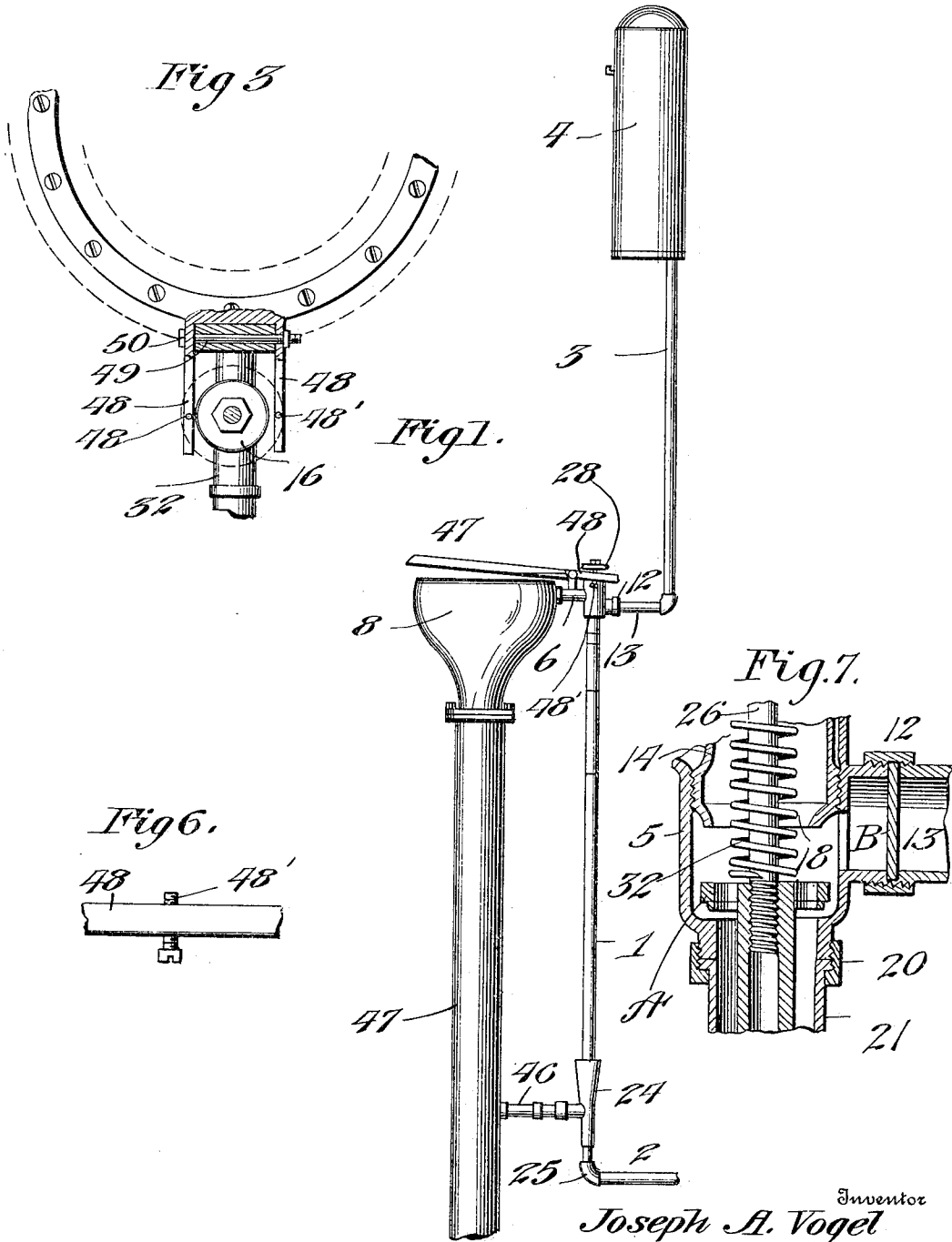


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FLUSHING APPARATUS FOR WATER CLOSETS.

APPLICATION FILED APR. 11, 1905.

2 SHEETS—SHEET 1.



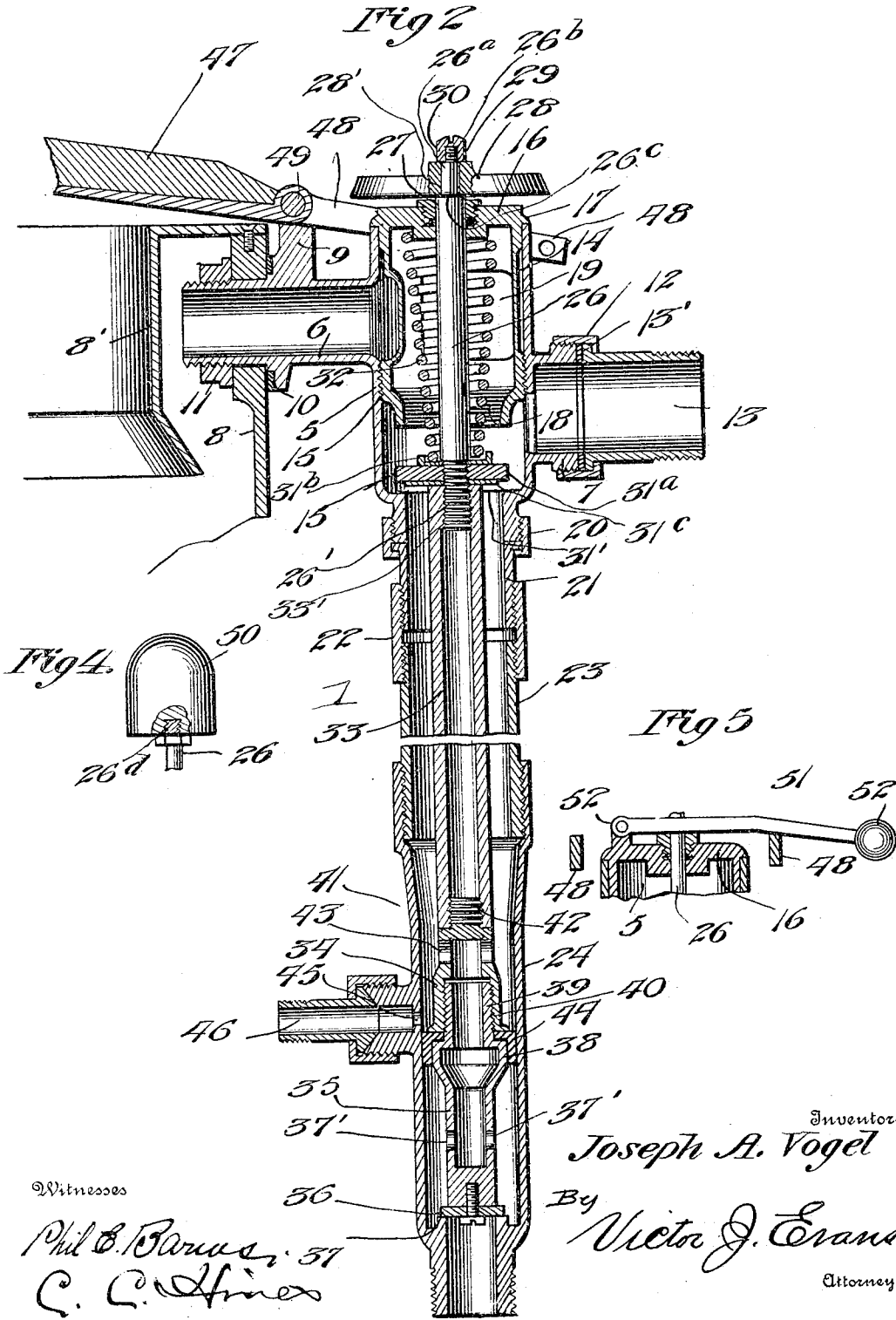
Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH A. VOGEL, OF WILMINGTON, DELAWARE.

FLUSHING APPARATUS FOR WATER-CLOSETS.

No. 801,754.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed April 11, 1905. Serial No. 254,965.

To all whom it may concern:

Be it known that I, JOSEPH A. VOGEL, a citizen of the United States, residing at Wilmington, in the county of Newcastle and State of Delaware, have invented new and useful Improvements in Flushing Apparatus for Water-Closets, of which the following is a specification.

This invention relates to improvements in flushing apparatus for water-closets, the object of the invention being to provide improved means for securing an after or immediately-acting flush and draining off all waste water, the construction being such as to secure durability and certainty and efficiency of operation and to enable the working parts to be conveniently removed for repairs.

With this and other objects in view the invention consists of the features of construction, combination, and arrangements of parts hereinafter fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete apparatus, showing it as secured in place for utilization. Fig. 2 is a central vertical sectional view of the water-conduit pipe, the valves, and a portion of the bowl and the lid. Fig. 3 is a plan view, partially in section, showing a portion of the seat and the actuating-arms carried thereby and the upper valve-chamber, the lifting-head being removed and indicated by dotted lines. Fig. 4 is a detail view showing the mode of mounting a weight which may be used in place of the disk-shaped lifting-head and closing-spring illustrated in Fig. 5. Fig. 5 is a transverse sectional view through the actuating-arms and upper portion of the upper valve-casing, showing the use of a weighted lever for restoring the valves to their normal position. Fig. 6 is a detail view of one of the actuating-arms. Fig. 7 is a fragmentary sectional view through the valve-casing and associate parts, showing the construction when the device is arranged to perform the function of an "immediately-acting" flush.

Referring now more particularly to the drawings, the numeral 1 designates the water-supply pipe or conduit, which is of sectional construction, as hereinafter described, and is connected at its lower end with a pipe 2, leading from any suitable source of water-supply, and at its upper end with a pipe 3, leading to an air-tight water-tank 4.

The connection between the upper end of the water-supply pipe, bowl, and tank is made

through a valve casing or chamber 5, provided with connections 6 and 7. The connection 6 is disposed above the connection 7 and leads through the wall of the bowl 8 to the interior thereof and forms an outlet-pipe for conducting water to flush the bowl. The connection 6 carries a bracket 9, formed integrally therewith, the outer face of said bracket being arranged to bear against the outer wall of the bowl 8 and recessed to receive a suitable packing-ring or washer 10. The outer end of the connection 6 is externally threaded to receive a nut 11, whereby said connection 6 is clamped to the wall of the bowl. The connection 7 communicates with the lower end of the casing 5 and is attached by a cap or coupling 12 to a union 13, connecting with the proximate end of the pipe 3, leading to the tank 4, a packing-ring or gasket 13' being interposed between the connection and the union to form a water-tight joint.

In the casing 5 is arranged a partition-tube 14, which is externally threaded at its lower end to engage internal threads on the casing 5, the threaded connection being indicated at 15 and which is closed at its upper end by a head 16, having an annular flange 17 to rest upon the upper edge of the casing, the head 16 thus serving to close the upper ends of both the partition and the valve-casing. The lower end of the partition 14 is contracted and left open to form an inlet port or passage 18, and above this port or passage the partition is provided with one or more ports 19, through which the water entering the same may pass therefrom to the connection 6 and from said connection to the bowl 8. The bowl 8 may be of any suitable construction, but is preferably provided with a depending circular partition 8' of less diameter than the bowl and extending the desired distance thereinto, the connection 6 being arranged to discharge the entering water between the wall of the bowl and the partition.

The lower end of the valve-casing 5 is externally threaded to receive an internally-threaded coupling 20, which clamps the upper section 21 of the supply-pipe 1 thereto. This connection 21 is connected by a coupling-sleeve 22 to the intermediate section 23 of the supply-pipe, which section 23 has a threaded connection at its lower end with the lower or base section 24 of the supply-pipe, which is connected in turn by an elbow or other suitable coupling 25 to the pipe 2. These couplings permit the sections of the supply-pipe

to be conveniently disconnected for repairs and afford ready access to the valve members, hereinafter described, and also permit a pipe of any desired length to be conveniently
 5 formed or constructed. Extending through the supply-pipe and valve-casing is a sectional valve-operating rod, the upper section 26 of which is solid and extends at its upper end through an opening in the head 6 and through
 10 a screw-plug or packing member 27, threaded into a socket formed in said head. The exterior upwardly-projecting end of the rod-section 26 carries a rod-lifting disk-head 28, which is removably mounted thereon, preferably
 15 by providing the rod with a reduced polygonal portion 26^a and a threaded stem 26^b, the portion 26^a fitting in a correspondingly-shaped opening 28^a in the head and forming a shoulder 26^c on the rod, against which the head seats, a nut 30, applied to the stem 26^b,
 20 holding the head clamped against said seat.

The lower end of the rod-section 26 is threaded to receive a flush-valve 31, disposed in the lower end of the valve-chamber 5 and adapted
 25 to govern the port 18 in the circular partition 14. This valve comprises a rubber or fibrous composition body 31^a, arranged between metallic disks 31^b and 31^c, removably engaging and clamped upon the lower threaded end 26'
 30 of the rod-section 26. A coil-spring 32 bears on the upper disk 31^b of this valve and surrounds the rod-section 26 and bears at its upper end against the head 16, said spring serving to force said rod-section and valve down-
 35 ward to the position shown in Fig. 2.

That portion of the valve-rod which is arranged in the supply-pipe 1 is composed of a series of tubular sections 33, 34, and 35, the section 33 being provided at its upper end
 40 with a screw-threaded socket 33' to receive the lower screw-threaded extremity 26' of the upper rod-section 26, whereby it is coupled thereto. The lower section 35 is closed at its lower end and carries a supply-valve 36, governing an inlet-port 37 at the lower end of
 45 the pipe-section 24. Above its closed end the rod-section 35 is provided with inlet-ports 37' and above said inlet-ports is formed to provide a hollow piston-valve body 38, having
 50 an upwardly-extending externally-threaded tubular stem 39. The section 34 of the pipe serves as a coupling uniting the sections 33 and 35 and has an internally-threaded portion 40, engaging the threaded stem 39, and an externally-threaded upper end 41, which is
 55 screwed into the lower internally-threaded end 42 of the section 33. Below the portion 41 the section 34 is provided with outlets 43 for the passage of the water therefrom into
 60 the upper portion of the section 24 of the supply-pipe 1. A cup packing-disk 44 is clamped by the member 34 against the valve-body 38, thus making a water-tight connection between said body and the wall of the
 65 pipe-section 24 and completing the formation

of a hollow piston-valve, which valve controls one or more drain-openings 45, formed in the pipe-section 24 and communicating with a drain-pipe 46, leading to the waste-pipe 47 of the bowl. When the valve 36 is opened
 70 by the raising of the valve-rod, the piston-valve closes the waste-outlet 45 and the entering water passes upwardly by way of the ports 37' and through the sections 35 and 34 of the valve-rod and thence discharges
 75 through the ports 43 into the upper portion of the section 24 of the supply-pipe 1. By this means a by-pass is provided to permit the entering water to pass the piston-valve.

The bowl-lid 47, which may be of any preferred construction, is provided with a pair of rearwardly-extending arms 48, which are pivotally connected to the bracket 9 by a pivot-bolt 49 passing through the arms and a knuckle or sleeve formed on the bracket 9,
 80 said bolt 49 being provided with a securing-nut 50. The arms 48 straddle the casing 5 and project beneath the lifting-head 28, so that when the seat 47 is depressed they will lift said head and raise the valve-rod and the
 85 inlet, drain, and flush valves against the resistance of the spring 32. When the lid 47 is released, the spring 32 will expand, thus drawing down the head 28 and tilting the lid to open position, the spring at the same time
 90 forcing the valve-rod and valves downward to their normal positions again. Preferably the arms 48 are provided with set-screws 48' to engage the head 28, the adjustability of the screws permitting all variations in the relative
 95 arrangement of these parts to be compensated for.

The device stands normally with the flushing-valve 31 open and the inlet-valve 36 closed. When the lid 47 is pressed down, it lifts the
 100 head 28 in the manner described, thus raising the valve-rod and elevating the several valves, the valve 31 being moved to close the port 18, the valve 36 elevated to open the port 37, and the drain-valve elevated to close the drain-ports
 105 45. The water now has free course from the pipe 2 through the port 27 into the lower end of the pipe-section 24, thence upwardly through the ports 27' and hollow rod-sections 34 and 35 past the piston-valve, thence through the
 110 ports 43 into the upper end of the pipe-section 24, and finally upward through the several sections of the pipe 1 through the connection 13 into the pipe 3 to the tank 4, into which latter it continues to flow until an equilibrium is established between the air-cushion
 115 in the tank and the water-pressure, or until the pressure on the lid 47 is removed. As soon as this latter occurs the spring 32 forces the valve-rod downward, thereby closing the
 120 valve 36 and opening the valve 31, so that the water in the tank will flow down and rush upward through the port 18 in the partition 14 and thence through the port or ports 19 and connection 6 into the bowl, thereby flushing
 125 130

the bowl. The downward movement of the valve-rod simultaneously opens the drain-valve, thus allowing the water in the supply-pipe above the ports 45 to drain downward through said ports into the waste-pipe 47. It will thus be perceived that the supply-pipe remains practically empty except when the lower valve is open to admit the water and is filled only during the time the lid is pressed down to hold that valve open and that after the flushing has been accomplished the waste water in the pipe is immediately drained off. It will further be perceived that by simply unscrewing the partition-tube 14 said tube, the valve-rod, and all the valves may be simultaneously removed therewith from the supply-pipe and valve-chamber, so that they may be conveniently repaired.

If desired, the arms 48 may be provided with weights to supplement the action of the spring 32 to raise the seat-lid 47. In some cases the spring 32 may also be dispensed with and weighted operating means employed in lieu thereof to lift the lid and depress the valve-rod. Such a construction of weighted operating means is shown in Figs. 4 and 5. In Fig. 4 a weighted head 50 is shown, which may be used in place of the disk-shaped head 28. This head is formed in its base with a threaded socket to receive the upper end of the valve-rod section 26, which is here shown threaded at 26^a to engage the threads of said socket. The head 50 is intended to be engaged and lifted by the arms 48 and is intended to be of sufficient weight to force the valve-rod downward without the use of the spring 32. In Fig. 5 a weighted lever-arm 51 is provided, which is fulcrumed at one end, as indicated at 52, to the head 16 and is provided at its opposite or free end with a counterbalancing-weight 52'. The lever lies above one of the actuating-arms 48 of the seat-lid 47 and is raised when said lid is depressed by said arm to lift the head 28. When the seat-lid 47 is released, the weight 52 will cause the lever to drop, thereby forcing the seat-lid to its open position and permitting the head 28, the valve-rod, and the valves associated therewith to move downward and assume the normal position. (Shown in Fig. 2.)

By making the partition-tube 14 removable and the supply-pipe sectional, as described, access may be conveniently obtained to all the parts of the valve mechanism with or without removing the same from the pipe, as will be readily understood.

As illustrated in the drawings, particularly in Fig. 2, the device is shown as an "after-flush;" but it may be readily arranged to perform the function of an immediately-acting flush. This is accomplished by removing or substituting a perforated valve A for the valve 31 and substituting a solid disk B for the washer 13', so that the water will pass immediately from the pipe 1 to the bowl.

Having thus described the invention, what I claim as new is—

1. In a flushing apparatus, the combination with a bowl, of a valve-chamber communicating therewith, a ported partition-tube disposed within and closing the upper end of said casing, a water-supply pipe communicating with the casing, a valve-rod disposed in the pipe and casing and carrying inlet and flushing valves, the latter controlling the flush through said partition-tube, and means for actuating said valve-rod, the construction being such that the partition-tube may be detached from the casing and withdrawn by an endwise movement therefrom with the valve-rod and valves.

2. In a flushing apparatus, the combination with a bowl, of a valve-casing communicating with the bowl, a supply-pipe connected to the valve-casing, a partition-tube disposed within and closing the upper end of the valve-casing and having an admission-port communicating with the supply-pipe and discharge-ports communicating with the bowl, a valve-rod extending through the pipe, casing and tube and provided with inlet and flushing valves, the latter controlling the inlet-valve in the tube, a seat-lid, means carried thereby for raising said valve-rod, and means for lowering the valve-rod and moving the valves to normal position.

3. In a flushing apparatus, the combination with a bowl, of a valve-casing communicating therewith, a supply-pipe communicating with the valve-casing, a partition-tube within the valve-casing provided with an inlet-port communicating with the pipe and a discharge-pipe communicating with the bowl, a valve-rod extending through the pipe, casing and tube and provided with inlet and flushing valves, the latter controlling the inlet-port in the tube, means for raising the valve-rod, and a spring within the partition-tube for depressing the valve-rod, substantially as described.

4. In a flushing apparatus, the combination with a bowl, of a valve-casing communicating with the bowl, a conducting-pipe communicating with the valve-casing, a valve-rod extending through said pipe and casing and provided with inlet and flushing valves, a seat-lid, arms carried by said seat to engage and lift the valve-rod, and means for depressing the valve-rod and restoring the lid or seat to its normal position.

5. In a flushing apparatus, the combination of a bowl, a tank, a valve-casing communicating with the bowl and tank, a supply-pipe communicating with the valve-casing and provided with an inlet and drain apertures, a rod extending through said pipe and casing and carrying inlet and flushing valves, the latter controlling the flow of water between the supply-pipe and tank and between the tank and bowl, said rod being provided with a by-pass for the flow of entering water between the inlet to the pipe and the valve-casing, a seat-

lid, means operated when the seat-lid is depressed to raise the rod to open the inlet-valve and close the flush-valve, and a spring within the valve-casing adapted to force the rod downward to open the flush-valve and close the inlet-valve and normally maintain said parts in such position.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH A. VOGEL.

Witnesses:

ALFRED L. HUGHES,
ELIJAH L. YOUNG.