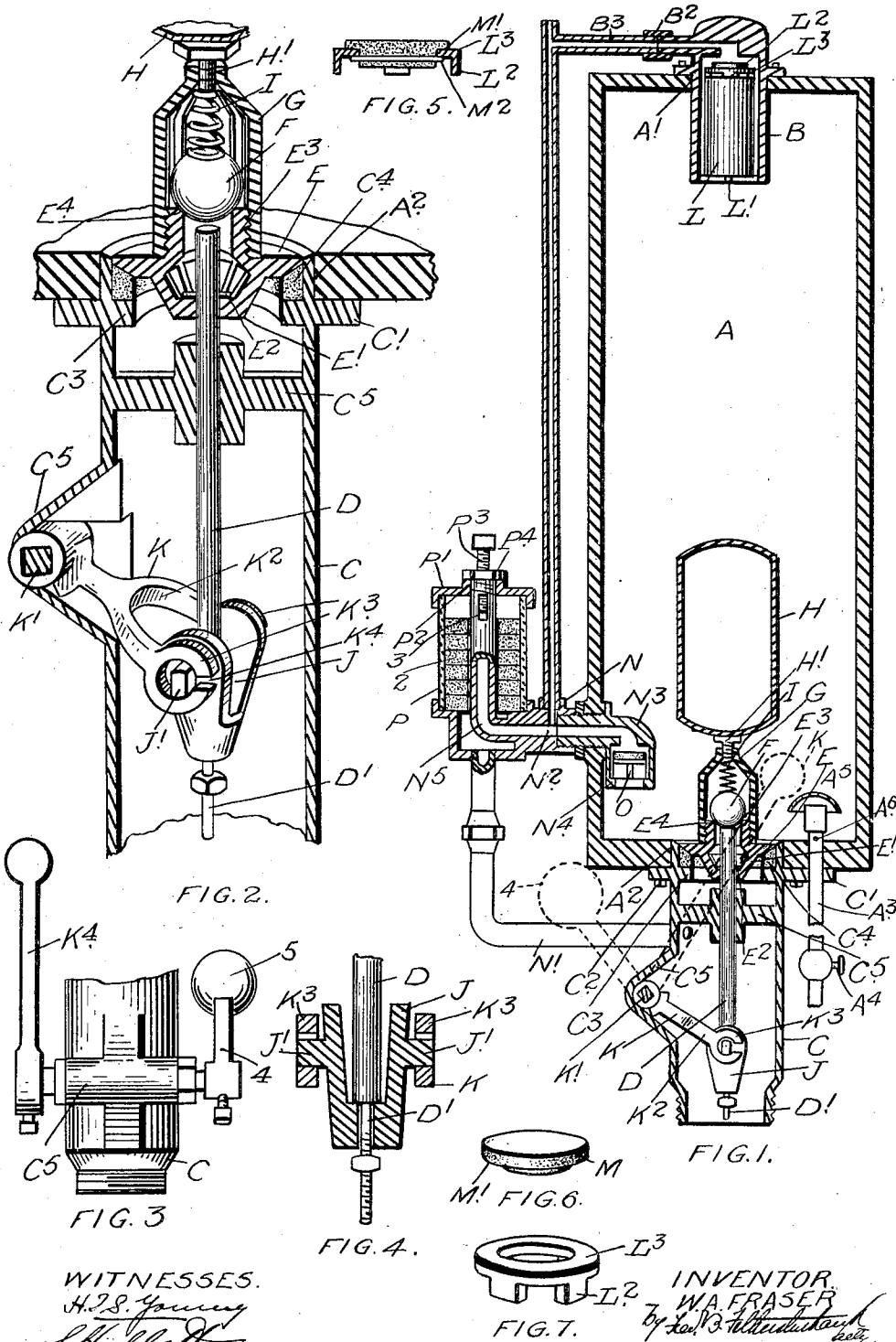


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FLUSHING SYSTEM FOR WATER CLOSETS.
APPLICATION FILED MAR. 21, 1912.

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FLUSHING SYSTEM FOR WATER-CLOSETS.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM ALEXANDER FRASER, of the town of Georgetown, in the county of Halton, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Flushing Systems for Water-Closets, of which the following is a specification.

My invention relates to improvements in flushing systems particularly adapted for water closets, and the object of the invention is to devise a flushing tank and water controlling mechanism therefor, which will entirely dispense with the intake valve commonly known as the ball float valve and provide a valve so constructed that it can be readily lifted from its seat with the application of but an unappreciable power notwithstanding that a high pressure is maintained in the closed tank in which it is used.

A further object is to eliminate all noise, which heretofore has been caused by the friction of water passing through an intake valve and escaping through a siphon flush valve. A further object is to make the tank compact in form and convenient in size, so that it may be inclosed in a wall, partition or suitable receptacle out of sight or view.

A still further object is to devise a system, which combines the benefits of both pressure flow and storage water systems.

Another object is to make the system independent of variation in pressure, and, therefore, adaptable to any size of intake or water supply pipe, which may be in use, and yet work with equal satisfactory results.

Objects also are to equip the system, so that the tank may be filled quickly to its full capacity and flushed freely, and make the tank drain automatically.

A still further object is to provide a sanitary antiseptic device, which will insure the reflush water as it enters the bowl being treated antiseptically.

To effect these objects my system consists of an inclosed tank having a suitable intake pipe, a flush pipe extending from the bottom of the tank and provided with a double valve or valve within a valve operated by a suitably disposed rod and arms, and a handle operatively connected thereto, an upper valve for the tank connected to an air pipe,

an antiseptic casing also communicating with the air pipe and containing a suitable antiseptic material, and also communicating with the pressure tank by a pipe provided with a valve within the tank and by a pipe to the flushing pipe, the parts being constructed and arranged as hereinafter more particularly explained.

Figure 1, is a vertical section through the flushing tank and co-acting parts forming my flushing system. Fig. 2, is an enlarged detail of the flushing pipe and main to the valve and operating rod. Fig. 3, is a side view of the outside of the flushing tank showing the operating arm. Fig. 4, is a sectional detail of the stirrup in which is held the lower end of the operating rod shown in Fig. 2. Fig. 5, is a sectional detail of the upper air valve of the tank. Figs. 6 and 7 are perspective details of the upper air valve.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the tank, which is a closed tank being provided with an orifice A' at the top closed by the valve casing B depending through the orifice in the top and secured in position by flanges through which bolts extend into the top of the tank. The tank A is also provided with a lower orifice A² into which the top of the flushing pipe C extends, such flushing pipe being provided with flanges C', whereby it is secured to the bottom of the tank by bolts C².

A³ is the main supply pipe, which is provided with a suitable turning off faucet A⁴. The pipe A³ extends into the bottom of the tank and is provided with a deflecting hood A⁵, whereby the water is directed toward the bottom of the tank as it enters instead of passing upwardly in a column.

A⁶ is a drain hole in the pipe A slightly above the level of the bottom of the tank.

The flushing pipe C is provided with an internal annular flange C³, which carries a washer C⁴ preferably of rubber or other suitable material having an inwardly inclined or annularly beveled top.

C⁵ is a spider formed preferably with the flushing pipe C and D is a vertical rod extending through an orifice in the central boss of the spider.

E is the main valve, which is formed with a beveled annular outer edge designed to rest upon the beveled top of the washer C⁴ and with a central spider E' having an orifice through which the rod D extends.

E² is a pin extending through the rod D and designed to limit the downward movement thereof.

The valve E is formed with an upwardly extending annulus E³ exteriorly threaded and provided with a seat E⁴ at the inner edge concentric to the ball valve F, which normally rests thereon.

G is a cage, which extends upwardly being interiorly threaded at the bottom and fitting on the exteriorly threaded annulus E³. The upper end of the cage is contracted and provided with an orifice threaded to receive the screw H' attached to or forming part of the lower end of the hollow float H, which is preferably cylindrical for the most part.

It will now be seen that the float H and main valve E are practically one and consequently move together.

I is a spiral spring, which extends between the ball valve F and the top of the cage G being designed to normally hold the ball valve F on its seat.

The bottom of the rod D is provided with a reduced end D', which extends through an orifice in the stirrup J and is provided with a nut D² to hold the rod connected to the stirrup. The stirrup J is provided with trunnions J' of oblong form and curved at the top and bottom as indicated clearly in Fig. 2.

K⁴ is an operating arm, which is secured on a rod K' square in the central portion where it extends through the arm K and round at the outer end where it has bearings in the sides of the hollow boss C⁵ forming part of the flushing pipe C. The top and bottom of the hollow boss form a means to limit the upper and lower throw of the arm K. The arm K is a forked arm being provided with a fork K² having substantially annular ends K³ provided with notches K⁴ slightly in excess of the width of the trunnions J'. The object of the notches is to permit of the insertion of the trunnions J. When they are inserted they are turned into the vertical position and by reason of the depth being greater than the width of the notches they are retained in such position in the central opening of the annular ends, thereby avoiding the use of set screws or any other devices, which are liable to get out of order.

The casing B hereinbefore referred to has located within it the cylindrical float L, which is supported on a cross bar L' at the bottom of the casing, which is open. The float L is of less diameter than the interior of the casing and provided at the top with a ring L³ supported on legs L² attached to

the top of the float L. A disk M is provided at the top of the ring L, such disk being provided with a shoulder M', whereby it is supported on the edge of the ring L' and the reduced end of the disk extends through the opening within the ring L and is secured in position by means of a cross pin M² (see Figs. 5, 6, and 7).

The top of the casing B is provided with a thimble B², which is suitably coupled on to a pipe B³ having the outer end bent upwardly into an open mouth to form an air exit and the lower end extending downwardly to a base N. The base N is connected by a pipe N' to the flushing pipe and also by a pipe N² to the elbow N³ located within the tank A. The lower end of the elbow has an internal annular enlargement, at the bottom of which is located the annular rest N⁴, which is screwed into an internal thread in the enlargement and is designed to support a valve O. The valve O is of the type shown in Figs. 5, 6 and 7, that is the same type as the valve at the top of the cylinder L.

The base N has an elbow N⁵ extending upwardly therefrom and forming the center of the cylindrical casing P, which forms a container for an antiseptic disinfecting substance, which I preferably arrange in washers 2 around the vertical portion of the elbow. I provide also a suitable cap P' for the top of the casing having a central orifice P² through which the top of the elbow extends. The top of the elbow is interiorly threaded and is also provided with slots 3 diametrically opposite each other.

P³ is a set screw, which extends into the top of the elbow and is provided with a lock nut P⁴.

The slots 3 are designed to admit water from the tank A to the antiseptic disinfecting washers 2. By adjusting the set screw the amount of water passing through the washers may be regulated as desired according to the substances of which the washers are composed and their solubility, or the water may be entirely shut off, if it is desired to dispense with the use of the antiseptic device. The washers 2 may be made of any antiseptic disinfecting substances and are designed when the water comes in contact therewith that it will take away in its course mixed with it a certain amount of the substance, which will pass down through the pipe N' to reflush the bowl as hereinafter described. The washers are made with sufficient orifices in the center around the elbow N⁵, so as to permit of the ready flow of the water as it contacts with the washers.

Having now described the principal parts involved in my invention I shall briefly describe its operation, and utility.

The water under pressure passes through the pipe A³ and fills the tank and gradually rises until it reaches a point near the top of

the tank. As it rises the air passes out around the cylinder L and through the pipe B³ and the upwardly bent exit of the pipe B³. As the water rises to the top of the tank the float L is caused to ascend and by means of the disk of the valve L³ closes the orifice and thus the water is maintained at a pressure. As the water is rising it also necessarily follows that when the pressure is raised sufficiently the valve O will rise and close off the egress of water through the pipe N' and elbow N⁵. Such water passing through the elbow N⁵ as the tank is being filled will pass through the antiseptic casing and then passes as an antiseptic fluid down into the flush pipe and thus provides a reflux water for the bowl of the closet (not shown). The passage of this water to the bowl is as hereinbefore described stopped by the valve E. Now taking it for granted that the tank is filled with water under pressure it is desired to flush the bowl I merely pull on the operating arm K⁴ shown in full lines in Fig. 3 and mostly in dotted lines in Fig. 1, in the direction indicated by arrow in Fig. 1, thereby raising the forked arm K stirrup J and rod D, thus dislodging the ball F from its seat against the pressure of the spring I. By this means the pressure of the water in the tank is immediately relieved upon the top of the valve F and the stream passes out through the center of the valve E. As the arm K is still being pushed forwardly the valve E, cage G and float H all connected as hereinbefore described are raised without any appreciable effort and the water will pass out immediately in a rush through the flushing pipe C, and into the closet bowl (not shown). When the tank is practically empty the valve E will immediately resume its position again, the arm K passing backwardly into the normal position. The water then passes into the tank again through the pipe A³ and the same action as hereinbefore described is repeated. The reflux water again passes through the antiseptic casing P and out through the pipe N and partially fills the closet bowl.

I wish it to be understood that where I use my tank and where the arm is operated by hand that I do not use the supplemental arm 4 shown in dotted lines in Fig. 1 and full lines in Fig. 3. This arm is only used when I wish to have the tank operate automatically. The arm 4 is provided with a weight 5 at one end and the normal position is that shown by dotted lines in Fig. 1. In this case there is no pressure in the tank and the ball valve F rests continually on its seat, and the arm 4 acting as a counterpoise assists the float to raise the valve E. When the water rises sufficiently in the tank A and consequently lifts the valve E, the flush water will pass through the pipe C into the closet

bowl (not shown). In this case it will, of course, be understood that the water will not rise the full height in the tank but only partially and my flushing system would not then be a pressure system at all, but a storage system.

The hole A⁶ shown in the pipe is utilized to drain the water out from the tank in case the pressure is cut off. In this case it will pass backwardly through the pipe A³ and outwardly through any suitable open drain tap.

Although I have described with great particularity the various parts involved in my invention it will, of course, be understood that various changes may be made in the construction and arrangement of the co-operating devices set forth without departing from the spirit of my invention and I wish it to be understood that this specification is to be taken not in a limited sense but as broadly as the scope of the claims will allow.

What I claim as my invention is—

1. The combination with a valve and flushing pipe having a hollow angular boss at one side, of a rod supported in suitable bearings in the flushing pipe and having a reduced lower end, a stirrup on the reduced lower end and provided with trunnions of narrower width than depth, a nut on the reduced lower end, a forked arm provided with an annular end having a notch of substantially the width of the trunnions, a rod extending through the opposite end of the forked arm and means for operating the rod as and for the purpose specified.

2. The combination with a valve and flushing pipe having a hollow angular boss at one side, of a rod supported in suitable bearings in the flushing pipe and having a reduced lower end, a stirrup on the reduced lower end provided with trunnions of narrower width than depth, a nut on the reduced lower end, a forked arm provided with annular ends having a notch of substantially the width of the trunnions, a rod extending through the opposite end of the forked arm and means for operating the rod, the top and bottom of the bosses forming a stop to limit the movement of the forked arm as and for the purpose specified.

3. In a device of the class described, the combination with the rod and stirrup connected thereto, and having trunnions narrower in width than depth, of an operating arm provided with an annular end having a notch of substantially the same depth as the width of the trunnions as and for the purpose specified.

4. In a device of the kind described, an outlet pipe having an internal annular flange, a main valve formed with a beveled annular outer edge, a washer located between said internal flange and said beveled

edge, said main valve having an upwardly
extending seat and being provided with a
centrally perforated spider, a minor valve
seat, a stem passing through said spider, a
ball on said minor valve adapted to nor-
mally rest upon said seat, a cage secured to
said seat, resilient means extending between

the ball of the minor valve seat and the top
of the cage and means for operating said
minor valve.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."