July 6, 1926. 1,591,746

J. J. DELANEY

DISINFECTING APPARATUS

Filed Dec. 4, 1925 2 Sheets-Sheet 1

Fig. 1.

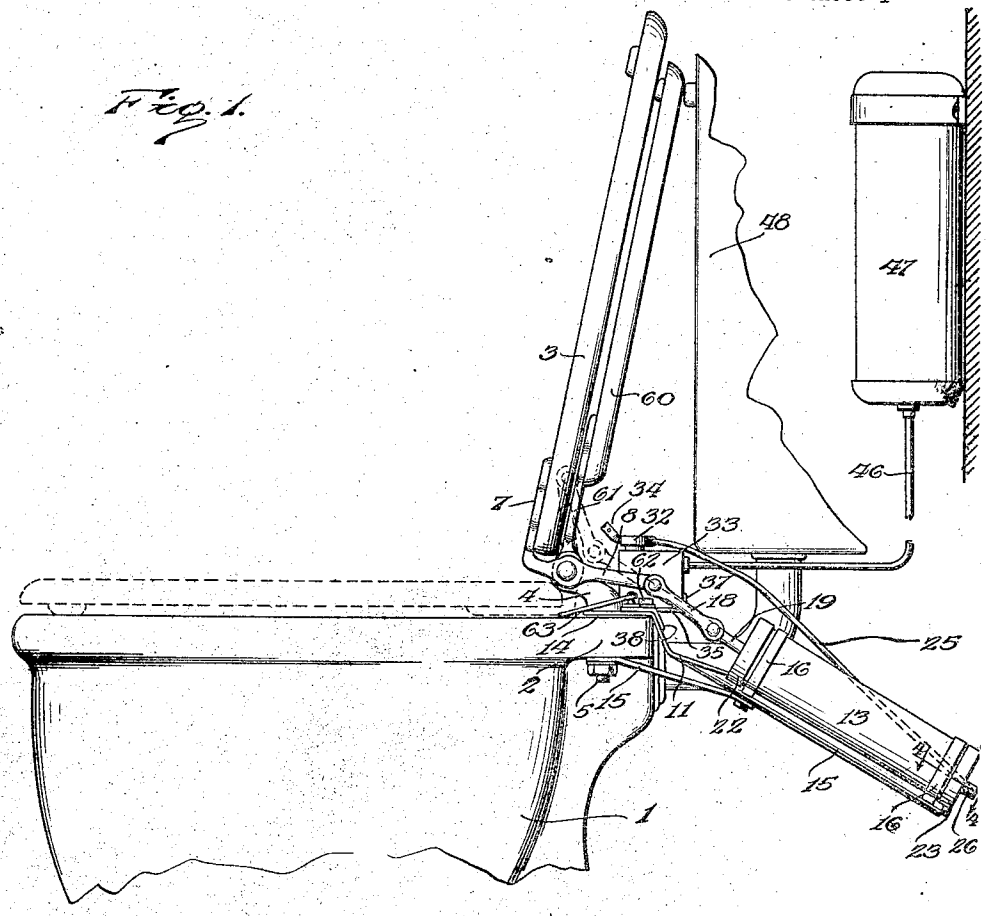
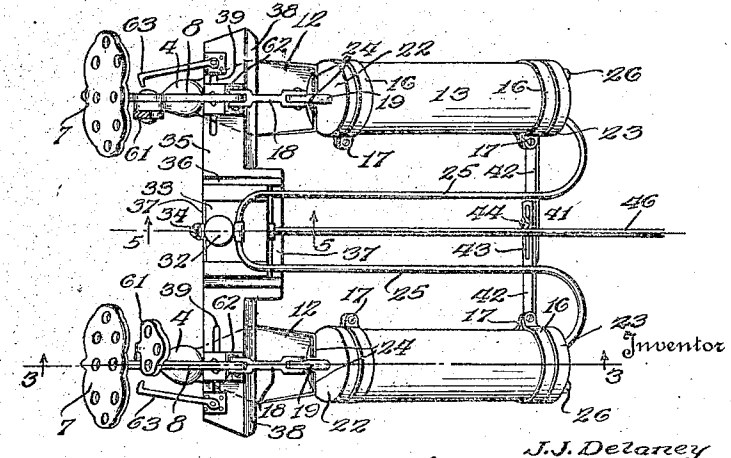


Fig. 2.



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Filed Dec. 4, 1925 2 Sheets-Sheet 2

Fig. 3.

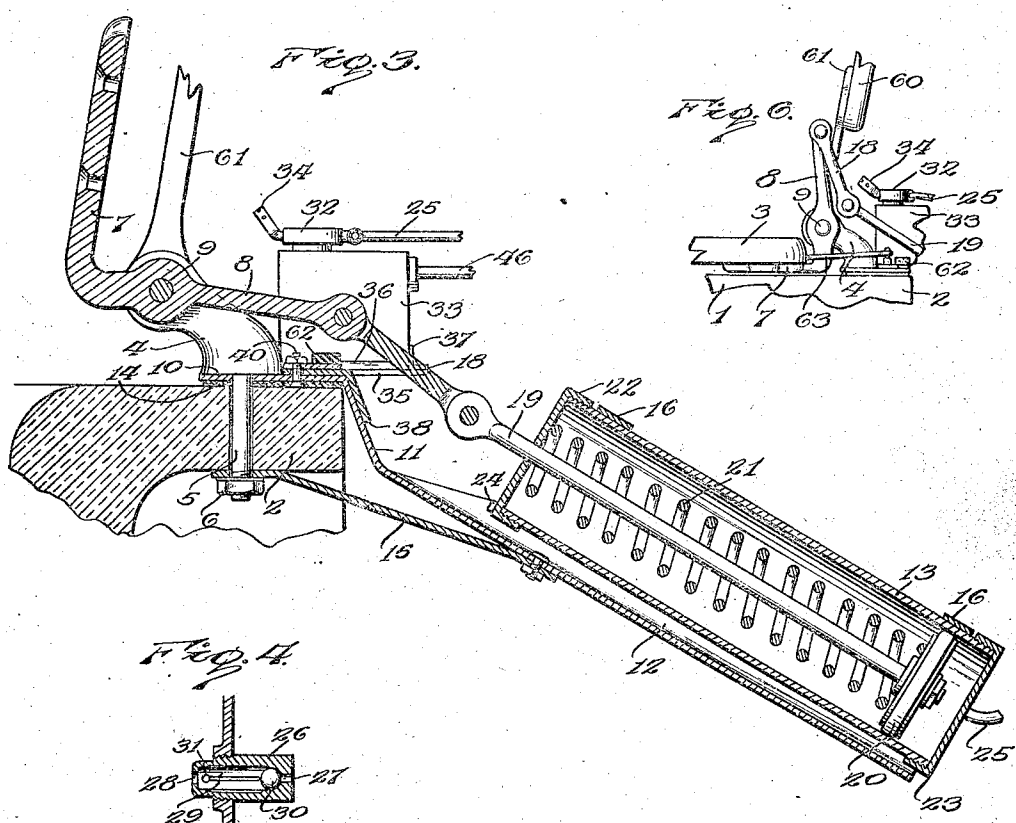
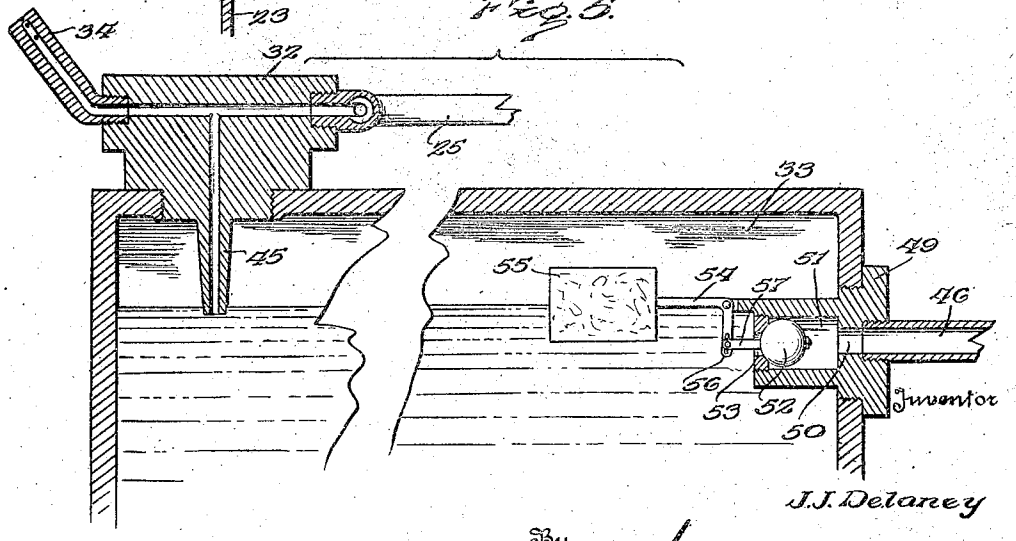


Fig. 6.

Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH JOHN DELANEY, OF SEATTLE, WASHINGTON.

DISINFECTING APPARATUS.

Application filed December 4, 1925. Serial No. 73,239.

This invention relates to disinfecting apparatus and has for its primary object the provision of simple means whereby the seat of a water-closet will be automatically sprayed when it is raised so that it will be kept in a sanitary condition and the communication of disease will be avoided. The invention seeks to provide an apparatus which may be readily applied to any standard toilet and so arranged that when the seat is swung upwardly a spray of disinfectant will be delivered upon the surface of the seat so that all disease germs will be destroyed. The invention is illustrated in the accompanying drawings and will be hereinafter fully described, the novel features being particularly pointed out in the appended claims.

In the accompanying drawings.

Figure 1 is an elevation of a portion of a toilet bowl having my disinfecting spray apparatus applied thereto.

Figure 2 is a plan view of the apparatus removed from the seat.

Figure 3 is an enlarged section on the line 3—3 of Figure 2.

Figure 4 is an enlarged detail section on the line 4—4 of Figure 1.

Figure 5 is an enlarged detail section on the line 5—5 of Figure 2.

Figure 6 is a detail elevation.

Referring now to the drawings more particularly, the reference numeral 1 indicates a portion of a toilet bowl of any approved type and illustrated as having a rear flange or lip 2 upon which the seat 3 is mounted by brackets 4 formed with bolts 5 adapted to extend through said flange and be clamped thereto by nuts 6 in an obvious manner. The seat is carried by seat arms 7 which are of general angular formation and are bolted or otherwise secured to the under side of the seat at the back edge thereof and have branches 8 which are extended rearwardly beyond the brackets 4 and are pivotally mounted thereon, as indicated at 9. Disposed at their front ends between the top surface of the flange or lip 2 and the shoulders 10 of the brackets 4, are the front ends of supporting plates or arms 11 which extend downwardly and rearwardly in rear of the bowl and have their lower rear portions formed into shallow concave plates 12 which are adapted to partially encircle and to support cylinders 13. As shown clearly in Figures 1 and 3, the supporting arms 11 are suitably bent at their front ends to rest flat upon the lip or flange 2 and to obviate marring or cracking of the said flange, a cushioning strip 14 of felt or any other suitable material is fitted between the front end of each arm and the surface of the bowl. These supporting members are reinforced by braces 15 which are secured at their lower rear ends to the shallow cup-like plates 12, and at their front ends are engaged with and held by the bolts 5, as clearly shown in Figure 3, being clamped against the under side of the lip or flange 2 by the nuts 6. The cylinders 13 are held rigidly upon the plates 12 by clamping bands 16 which are engaged around the cylinders and have their ends secured by bolts inserted through mating lugs 17 in an obvious manner. The bands may conveniently be formed integral with the respective edge portions of the plates 12 so that they will be firmly united with the plates and may be easily engaged around and secured to the cylinders. Upon referring to Figure 2, it will be noted that a plate 12 and a corresponding cylinder 13 is provided in alinement with each of the seat-carrying brackets 7 and 8 and each of said arms 8 is connected by a link 18 with the upper forward end of a piston rod 19 extending through the upper head of the cylinder and connected, within the cylinder, to a piston 20. An expansion spring 21 is arranged within each cylinder between the piston 20 and the upper head 22 of the cylinder, as shown clearly in Figure 3, so that when the seat 3 is not in use, the expansion of the springs will automatically raise the seat and operate the pistons to cause the seat to be sprayed. The heads 22 and 23 of the cylinders may be of any convenient or preferred form and are substantially circular cap threaded onto the respective ends of the cylinders in an obvious manner. The supporting plate 12 may be provided with inwardly projecting spurs 24 arranged to bear upon the upper head 22 so as to prevent the same becoming loose under the action of the piston and thereby decreasing the efficiency of the device. The piston rod does not fit tightly within the upper head so that the opening in the head will provide sufficient vent to prevent air being trapped within the cylinder in quantities sufficient to prevent the piston moving through a full stroke. When the seat 3 is lowered for use, the corresponding swinging movement of the brackets and arms 8 will

cause the pistons 20 to move toward the front heads of the respective cylinders and a supply of air is then drawn into the cylinders through the lower heads of the same while upon the reverse stroke of the pistons, the air will be driven out through the discharge tube 25. To control the inlet of air, I secure in the lower head 23 of each cylinder, a nipple 26 having an inlet port 27 in its outer end and provided with an escape port 28 at its inner end, the bore of the nipple being of greater diameter than the said ports and accommodating a ball valve 30 which may play freely between the two ports, as will be understood upon reference to Figure 4. Upon a suction stroke of the piston, the ball will will be drawn away from the inlet port 27 so that air may then flow through the nipple into the cylinder, escaping from the nipple through the lateral ports 31 adjacent the inner end thereof. Upon the force stroke of the piston, the valve will be driven to seat against the port 27 and thereby cut off the flow of air through said port so that as the compression stroke continues, the air will be driven out through the discharge tubes 25 under considerable pressure.

The discharge tubes 25 lead from the respective cylinders to a spray nozzle 32 which may be of any convenient or approved detail construction, and is mounted upon the top of a spray chamber 33 which is secured upon the lip or flange 2 of the bowl at the center of the same. The outlet nipple 34 of the spray nozzle is directed upwardly at the proper angle to deliver a spray upon the seat as the same assumes or closely approaches the position shown in Figure 1. The spray chamber 33 may be mounted upon the bowl in any preferred manner and I have shown it seated upon a plate 35 between flanges 36 and held against movement by plates or brackets 37 secured upon the said plate 35 between the flanges 36 and bearing against the opposite sides of the spray chamber. The plate 35, which provides the support for the spray chamber, is extended between the brackets 11 and has its extremities resting upon and secured to said brackets, the said extremities being formed with downturned flanges 38 at their rear edges bearing closely against the intermediate portions of the said brackets 11 whereby the plate will be firmly supported. It will also be noted, upon reference to Figure 2, that the plate is provided with slots 39 disposed transversely of the supporting brackets so that the securing bolts 40 may be accommodated notwithstanding variations in the distance between the brackets 4, due to different forms or proportions in the toilet bowl. In order, also, to accommodate the device to bowls of different widths, the outer ends of the supporting plates 12 are connected by a brace 41 consisting of flat straps 42 having their inner ends overlapped, as shown in Figure 2, and provided with longitudinal slots 43 through which a securing bolt 44 is passed.

The spray chamber 33 is intended to hold a supply of disinfectant convenient to the spray nozzle 32, which has a nipple 45 extending downwardly through the top of the spray chamber so as to be immersed in the liquid within the chamber. When the pistons 20 are operated to compress the air in the cylinders and drive the air under pressure through the discharge pipes 25, a stream of air will be caused to flow through the spray nozzle and the suction created thereby will draw some of the liquid through the nipple 45 to mingle with the compressed air and escape through the nipple 34 over the seat 3 in the form of a very fine mist. The chamber 33 is in direct communication, through a pipe 46, with a supply reservoir 47, which may be mounted in any convenient manner and will preferably be supported immediately adjacent one end of the flush tank 48. The pipe 46 leads from the bottom of the reservoir or supply tank 47 into the spray chamber 33, through the side of the same, and is connected with the chamber by a coupling head 49 in which the end of the pipe is threaded so as to aline axially with a port 50 in the said coupling head. The coupling projects into the chamber 33, as shown clearly in Figure 5, and has a bore 51 accommodating a ball valve 52 which is adapted to seat over an outlet port 53 in the inner end of the coupling. Fulcrumed upon the coupling above the outlet port is an angle lever 54, to the upper arm of which is secured a float 55, the depending arm of said lever being connected by a pin and slot connection, indicated at 56, with the stem 57 of the valve 52, which stem extends through the port 53. Obviously, as the level of the liquid chemical in the chamber 33 falls through use of the chemical, the float 55 will descend and rock the lever 54 about its fulcrum so that the valve 52 will be unseated and an additional supply of the chemical may flow from the tank 47 into the chamber 33. As the level of the liquid rises, the float will, of course, be returned to its normal position and eventually the ball 52 will be seated so as to cut off further flow of the liquid. This arrangement maintains a substantially constant level of the liquid in the chamber 33 and thereby prevents overflow through the spray nozzle and the outlet nipple of the latter, notwithstanding that the reservoir may be placed at a considerable elevation. The reservoir may also be of substantially greater capacity than the chamber 33 and may be refilled without requiring access to the said chamber.

A lid 60 is shown in the drawings carried by arms 61 which are pivoted upon the bolts 9, and pads or cushions 62 are provided to

receive possible impact of the seat arms and thereby avoid cracking of the flange 2. I also provide latches 63 which are pivoted upon the plank 35 and are adapted to be engaged around the seat arm 7, as shown in Figure 6, to hold the seat lowered if desired.

It will be readily noted from the foregoing description, taken in connection with the accompanying drawings, that I have provided a very simple, compact and automatically operating apparatus whereby the seat of a toilet bowl will be maintained in a sanitary condition without any special attention upon the part of the users. The apparatus is of such form and so arranged that it may be disposed below the flush tank and at the rear of the bowl, as clearly shown, so that it will be out of the way and will not be apt to be damaged by chance blows. The construction of the several parts is very simple so that the apparatus is not apt to get out of order and repairs will seldom be needed.

Having thus described the invention, what I claim is:

1. An apparatus for the purpose set forth comprising a spray nozzle, means for supporting said nozzle adjacent the seat of a toilet bowl, means for delivering a disinfectant to the said nozzle, and means operable by the toilet seat for delivering air under pressure to the said nozzle whereby to deliver the disinfectant from the nozzle in a mist over the toilet seat.

2. An apparatus for the purpose set forth comprising an air cylinder, means for supporting said cylinder upon a toilet bowl, a piston working within the cylinder and operable by the movement of the toilet seat, a spray nozzle arranged upon the toilet bowl adjacent the seat thereof, means for controlling the inflow of air to the cylinder, a discharge pipe leading from the cylinder to the spray nozzle, a container for a disinfectant in communication with the spray nozzle, and means for maintaining the supply of disinfectant within the container substantially constant.

3. An apparatus for the purpose set forth comprising a support, means for securing the said support to a toilet bowl, a bracket to be secured to the seat of the toilet bowl and pivotally mounted upon the bowl, an arm extending rearwardly from the seat bracket, a cylinder secured upon the support, a piston working in said cylinder, a piston rod extending from the piston through the head of the cylinder, a link connecting the piston rod with the said arm, an expansion spring within the cylinder between the head of the same and the piston, a spray nozzle, a discharge pipe connecting the discharge end of said cylinder with the spray nozzle, means for maintaining a supply of disinfectant in communication with the spray nozzle, and means for controlling the flow of air into the cylinder.

4. An apparatus for the purpose set forth comprising a pair of supports, means for securing the said supports upon a toilet bowl, air cylinders carried by said supports and secured thereon, an extensible connection between the ends of the said supports, a supporting plate resting upon the toilet bowl and extending between said supports, operable connections between the toilet seat and the air cylinders whereby upon downward movement of the seat air will be drawn into the cylinders and upon reverse movement of the seat air will be expelled from the cylinders, discharge pipes leading from the cylinders to discharge the escaping air, a spray nozzle connected with said discharge pipes, a spray chamber communicating with the spray nozzle, and means for maintaining a substantially constant supply of disinfectant within said chamber.

5. The combination of a water-closet, means for raising the seat upon release of pressure thereon, and means operated by the seat-raising means for spraying the seat.

6. The combination of a water-closet, means for raising the seat upon release of pressure thereon, means operated by the seat-raising means for spraying the seat, and means for holding the seat lowered at will.

In testimony whereof I affix my signature.

JOSEPH JOHN DELANEY. [L. S.]