May 8, 1934. F. A. SCHOSSOW 1,957,809

TOILET BOWL

Filed Oct. 15, 1932 2 Sheets-Sheet 1

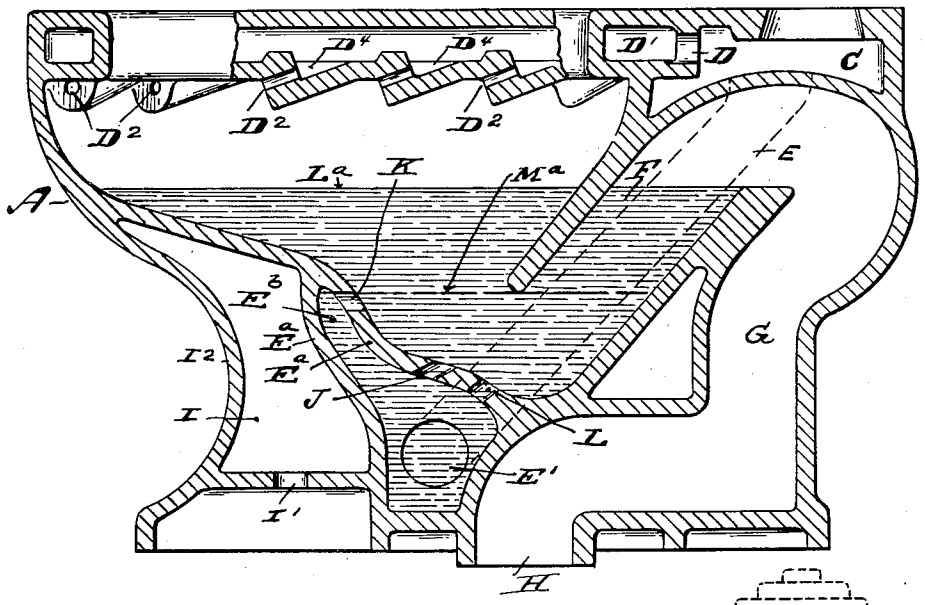


Fig. 1.

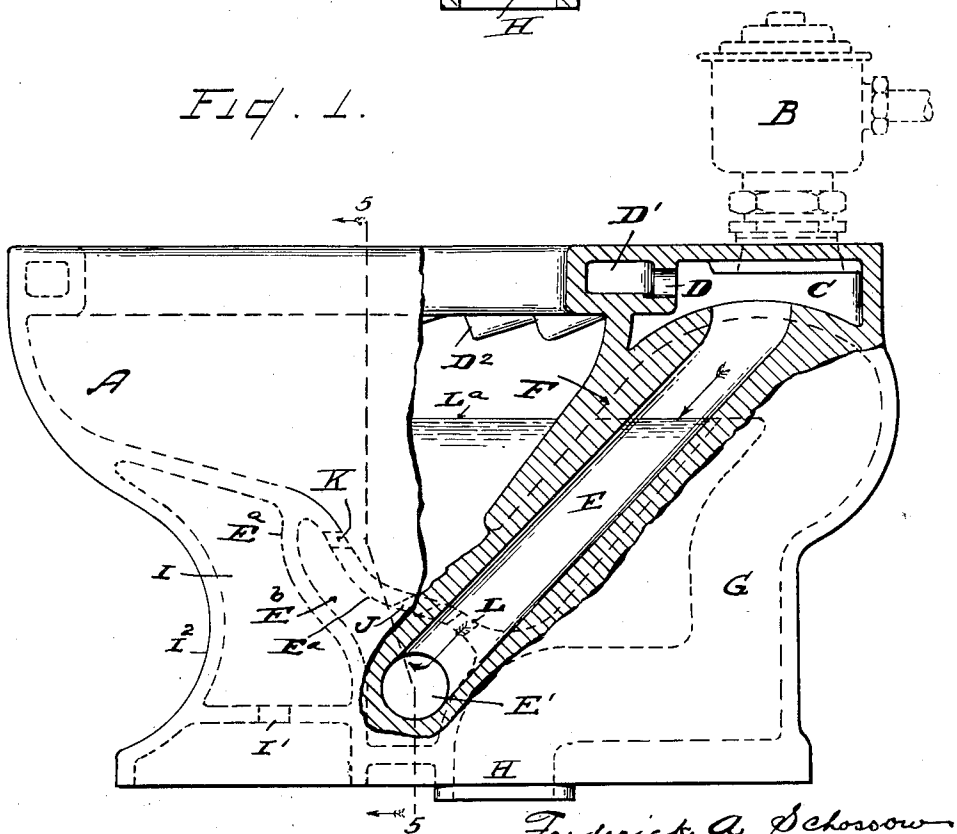


Fig. 2.

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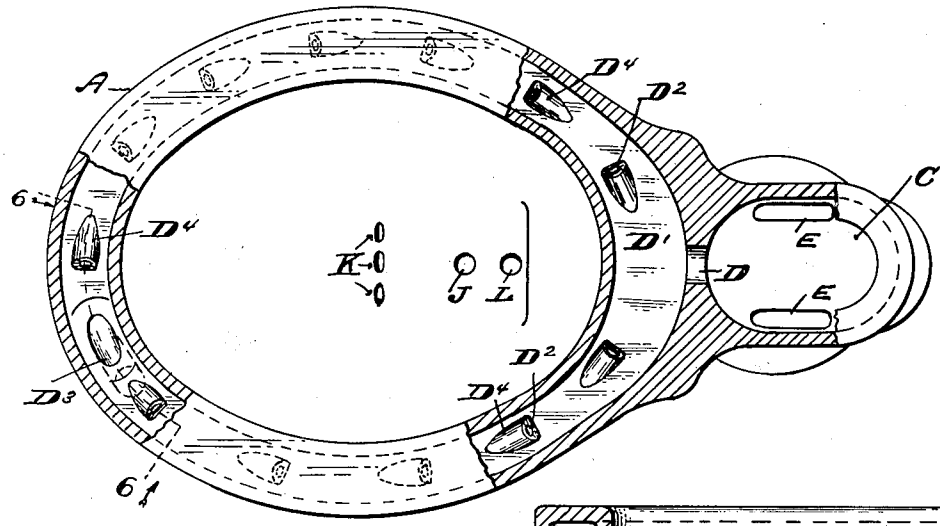


Fig. 3.

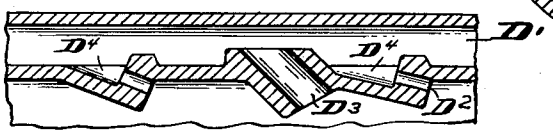


Fig. 6.

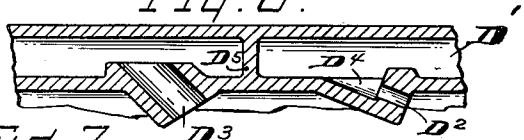


Fig. 7.

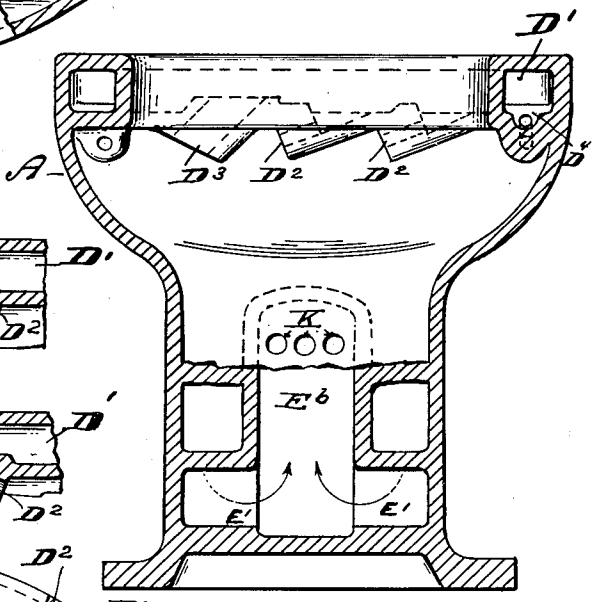


Fig. 5.

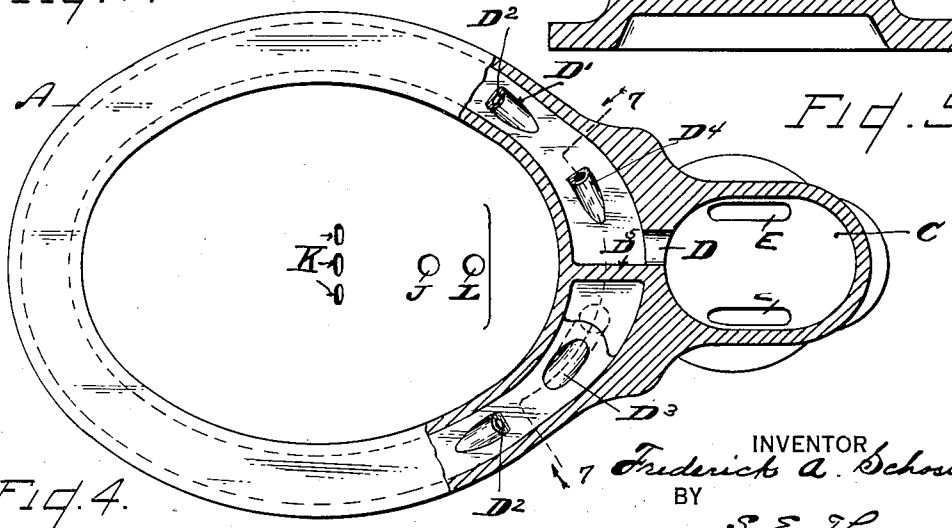


Fig. 4.

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UNITED STATES PATENT OFFICE

1,957,809

TOILET BOWL

Frederick A. Schossow, Detroit, Mich.

Application October 15, 1932, Serial No. 637,890

7 Claims. (Cl. 4—69)

My invention relates to toilet bowls shown in the accompanying drawings and more particularly described in the following specification and claims.

This invention is an improvement upon the toilet bowl shown and described in Letters Patent No. 1,822,378, issued to me September 8th, 1931.

The rim construction of the present bowl is such that the flushing water leaves the rim through a plurality of straight and substantially longitudinal discharge ports which are adapted to deliver the water tangent to the surface of the wall forming the basin of the bowl, thereby imparting a swirling centrifugal movement of the water remaining in the basin of the bowl,—following the previous flushing operation.

It will be noted upon reference to my former patent that the several discharge ports beneath the rim were first directed downwardly and thence at right angles in a horizontal direction substantially parallel with the lower wall of the rim;—in contradistinction to the straight inclined discharge ports through the lower wall of the rim,—shown and described in the instant application, which is a more simple construction, easier to keep clean and very much cheaper to fabricate.

Another feature of the present invention is what is referred to as a "saw tooth" construction of the lower wall of the rim, whereby sufficient material is provided at each end of the discharge ports through the lower wall of the rim, to avoid a knife edge formation at the respective ends of the ports,—which would otherwise be the case if straight discharge ports were extended at an angle through the narrow lower wall of the rim of the bowl.

It will thus be evident that the "saw tooth abutments",—respectively projecting above and below the lower wall of the rim, insure against any possibility of the wall of the rim crumbling or breaking down at either end. Furthermore any undue tendency of foreign matter to clog either the inlet or outlet of the ports is avoided,—but if stoppage should occur, the holes may be readily cleaned without likelihood of fracture.

A further object of the invention is an enlarged port or channel through the rim for the passage of water and air into the basin of the bowl. This port serves a plurality of purposes which will be hereafter fully explained.

With the foregoing and other objects in view which will appear as the description proceeds, the invention further resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention herein disclosed without departing from the spirit of the same.

In the drawings accompanying this specification:

Figure 1 is a vertical longitudinal sectional view through the bowl, with parts in elevation.

Figure 2 is a side elevation with parts broken away and in section, showing a jet-duct leading from the water inlet to a jet well,—also in dotted lines a valve controlling the delivery of water to the bowl from a water main,—not shown.

Figure 3 is a plan view, showing a portion broken away and parts in section.

Figure 4 is a plan and horizontal sectional view of a modification.

Figure 5 is a vertical cross-sectional view through the bowl, taken on or about line 5—5 of Figure 2.

Figure 6 is a vertical sectional view taken medially through the elliptical rim of the bowl, along line 6—6 of Figure 3.

Figure 7 is a similar vertical sectional view through the rim of the bowl, along line 7—7 of Figure 4.

Referring now to the letters of reference spread upon the drawings:

A denotes the closet bowl in its entirety. B indicates a valve controlling the delivery of water from a source of supply—not shown—into the chamber C, from which it passes through a duct D into the flushing rim D^1, and thence downwardly through a plurality of inclined ports D^2, in the lower wall of the rim, into the bowl, thus providing a suitable "wash-down".

The inner and outer surface of the lower wall of the flushing rim D^1, presents when viewed in section,—see Figures 1, 6 and 7,—a jagged or saw-tooth appearance. It will also be noted that the grooves D^4, which guide the flushing water into the inclined straighway ports D^2, are preferably larger than the diameter of the ports which direct the water at an angle tangentially over the wall of the bowl,—thereby causing a swirling centrifugal movement of the flushing water.

D^3 denotes an enlarged discharge port for the passage of water and air into the basin of the bowl. In Figures 3, 5 and 6 this port is located at the front, near the center of the bowl, and in Figures 4 and 7 at the rear of the bowl, near the center of the latter.

The enlarged discharge port D^3 is formed by adding to the normal thickness of the flushing

rim, thus elongating the port passage, the water flowing through the channel being diverted to a given predetermined direction.

The discharge port D^3 serves four purposes;—first, as a vent for the air which is normally entrained within the flushing rim and in the chamber C, thereby avoiding the rasping noises which ensue when this air is forced through the small rim ports found in ordinary closet bowls.

Second, by diverting this considerable volume of water to one side of the basin of the bowl, whence it flows noiselessly toward, into, and up the leg F of the siphon trap, instead of the splashing noise which would obtain if this volume of water was directed to flow centrally into the entrance of the trapway, as in ordinary bowls. In my construction, the water is diverted at a predetermined angle to insure quietude for any desired contour of basin containing a water seal.

The third function of the channel D^3 is to augment and hasten the swirling movement of the water in the bowl to create a vortex into which foreign matter is drawn downwardly and into the up-leg of the trapway prior to the moment when siphonic action within the trapway lowers the altitude within the basin to the line M^a, see Figure 1.

The fourth function of the channel D^3 is to prevent the noise which ensues in ordinary bowls through siphonic action. As the volume of water which enters one side of the trapway is always greater than the volume entering at the other side, the moment air attempts to enter the trapway, the added volume of water from one side flows into any air opening which may occur, hence siphonage is continuous and efficient during the entire period that valve B, or by any suitable source of supply delivers a sufficient volume of water to maintain the siphon in action. When the volume of water delivered to the bowl is reduced to a predetermined flow, siphonage ceases noiselessly, while the remainder of the water flowing into the basin serves to refill the basin to the upper normal water level L^a.

In Figure 3 is shown a construction in which the flushing water enters the flushing rim through a port D and is delivered concurrently to both sides of the flushing rim, terminating at the front of the bowl.

In Figure 4 is shown a modification in which is a partition D^5 within the flushing rim, with the port D adjacent the partition. In this construction the flushing water flows in one direction throughout the length of the flushing rim, terminating at the channel D^3 located at the rear near the center of the flushing rim.

The construction shown in Figure 4 is preferable for bowls having a basin contour differing from a number of accepted standards of present bowl construction.

E^5 denotes a jet chamber within the walls E^a. Flushing water enters said jet chambers through the transverse channels E^1 which connect with the jet ducts E E, in turn connected with the chamber C.

The flushing water is delivered into the lower portion of the bowl basin through the port J, multiple ports K, and port L.

The ports deliver the water at predetermined angles which preferably converge at a point within the up-leg of the trapway F. This construction tends to hasten the commencement of siphonic action within the trapway.

When siphonic action has lowered the altitude of the water to the line M^a, the water flowing from the jets K prevents or materially checks any considerable volume of air from entering the trapway, thereby overcoming the formation of air pockets at the entrance of the siphonic trap. Foreign matter is thus prevented from lodging at or near the entrance of the trapway, while the force of the water flowing from the jets K carries the foreign matter into the trapway forcing it upwardly and outwardly into a soil pipe connection—not shown.

The ports K are preferably constructed to deliver water parallel to and slightly below the water line M^a,—thereby carrying floating objects into the trapway and into the path of the water flowing through ports J and L.

Ports J and L also serve to quicken the formation of a vortex within the basin and to hasten and augment a siphonic action within the trapway F, G and H.

I denotes a chamber open at I^1 to the atmosphere,—the outer wall I^2 of which serves to support the overhanging portion of the bowl.

Having thus described my invention, what I claim is:

1. In a toilet bowl, a valve controlled water chamber adapted for connection with a source of water supply; a channel-rim integral with and encircling the bowl, connected with the water chamber, having a plurality of straight-line ports, inclined downwardly but substantially in a horizontal direction tangent to the wall of the bowl, whereby the flushing water is adapted to impart a swirling centrifugal movement to the water in the bowl, and a jet chamber inclosed within the walls of the bowl, connected by ducts with the water chamber, said jet chamber having a plurality of jet ports directed horizontally toward and close to the upper lip of the entrance into the trapway.

2. In a toilet bowl, a valve controlled chamber adapted for connection with a source of water supply; a flushing channel-rim encircling the bowl and integral therewith connected with the water chamber, the inner and outer surface of the lower wall of said rim having a saw-tooth formation, through the notches of which extend a plurality of straight-line ports inclined downwardly in substantially a horizontal direction tangent to the wall surface of the bowl, the notched integral walls of said ports being approximately formed at right angles to the inlet and discharge ends of the port openings, and of substantially the same thickness throughout.

3. In a toilet bowl, a valve controlled water chamber adapted for connection with a source of water supply; a channel-rim encircling the bowl and connected with the water chamber having a plurality of straight-line ports through the lower wall of the channel-rim, inclined downwardly but in a substantially horizontal direction, whereby the flushing water may be directed tangent to the surface of the bowl to impart a swirling centrifugal movement to the water remaining in the bowl following a prior flushing operation, the lower wall of said channel-rim being formed with inclined grooves in advance of and leading to said respective straight-line ports, for guiding the flushing water thereto.

4. In a toilet bowl, a valve controlled water chamber adapted for connection with a source of water supply; a channel-rim encircling and integral with the bowl connected with the water chamber, the inner and outer surface of the lower wall of said channel-rim having a notched saw-tooth formation, the wall of which is of uniform

thickness surrounding a plurality of straight-line ports extending respectively through the said notched formation, adapted to direct the flushing water tangent to the surface of the bowl, the wall of said channel-rim being also formed with a relatively large inclined discharge port having an annular wall extending upwardly into the air space within the channel-rim for the passage of water and air into the basin of the bowl, whereby air entrained within the flushing rim may be released with the flushing water with a minimum of noise.

5. In a toilet bowl, a valve controlled water chamber adapted for connection with a source of water supply; a flushing channel-rim encircling the bowl connected with the water chamber, the inner and outer surface of the lower wall of said rim having a saw-tooth formation of substantially uniform thickness, through the notches of which extend a plurality of straight-line ports with walls of substantially uniform thickness inclined downwardly but in substantially a horizontal direction, said channel-rim having also a relatively large air and water discharge port having an annular wall extending upwardly into the air-space within the channel-rim and a passage extending downwardly at an angle through its lower rim, whereby the water flowing through said port may be diverted in a predetermined direction.

6. In a toilet bowl, a valve controlled water chamber adapted for connection with a source of water supply; a flushing channel-rim integral with and encircling the bowl connected with the water chamber, the inner and outer surface of the lower wall of said rim having a saw-tooth formation providing a wall of uniform thickness throughout, through the notches of which extend a plurality of straight-line ports inclined downwardly but in substantially a horizontal direction, said channel-rim having also a relatively large discharge port and passage extending downwardly at an angle through its lower rim, whereby the water flowing through said port may be diverted tangentially to the wall of the bowl; a siphon trap having an inlet from the bowl also a discharge outlet for connection with a soil pipe; and a jet chamber inclosed within the walls of the bowl, connected by ducts with a water chamber, said jet chamber having a plurality of jet ports, directed horizontally toward and close to the upper lip of the entrance into the siphon trap.

7. In a toilet bowl, the combination of a valve controlled water chamber adapted for connection with a source of water supply; a flushing channel-rim encircling and integral with the bowl, connected with the water chamber, the inner and outer surface of the lower wall of said rim having a saw-tooth formation, through the notches of which extend a plurality of straight-line ports inclined downwardly in substantially a horizontal direction to direct the flushing water tangent to the surface of the bowl, said channel-rim having a transverse partition wall adjacent the connection between the valve controlled chamber and the channel-rim, whereby the flushing water on leaving said chamber is forced to travel in one direction entirely around the channel-rim, said channel-rim having a relatively large discharge port in its lower wall adjacent to the opposite side of the partition wall, through which the water may freely pass, that it may not back up and thereby retard its flow around the rim of the bowl.

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