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DEPRESSED TANK CONSTRUCTION FOR WATER CLOSETS

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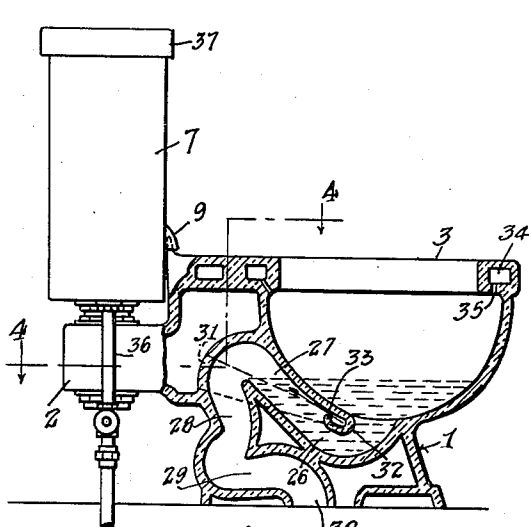


Fig. 1

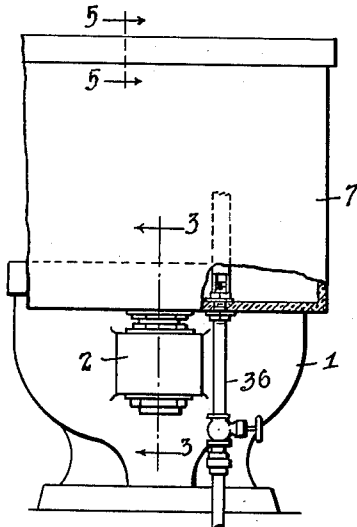


Fig. 2

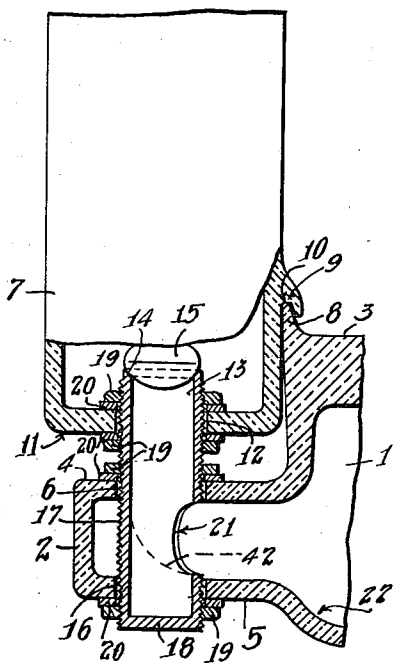


Fig. 3

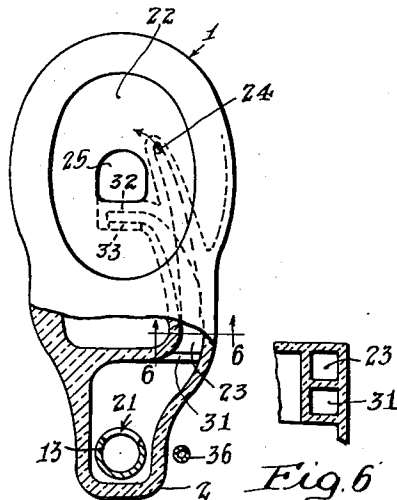


Fig. 4

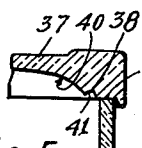


Fig. 5

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DEPRESSED TANK CONSTRUCTION FOR WATER CLOSETS

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5 Claims. (Cl. 4-14)

This invention relates to a water closet. It has been common practice heretofore, to mold the flush tank as an integral part of the bowl member, but this practice has many objections, one of which is that due to warping, the tank may not be in a vertical position, and this is unsightly and may interfere with the sale of the closet. Molding the tank and bowl member as a unit is also objectionable, because the firing of the molded articles is more easily accomplished if the tanks are separate. Furthermore, where the tank and bowl member are molded as a unit, the breakage of one part renders the entire unit useless.

In such a closet it is desirable to have the tank as inconspicuous as possible, and it is desirable to have the tank disposed at as low a level as possible. However, if the position of the tank with respect to the bowl is lowered, this interferes with the flushing action of the water, due to the reduction of the hydrostatic head.

One of the objects of this invention is to produce a water closet in which the tank and bowl member are constructed as separate pieces, and to provide simple means for enabling the tank to be supported on the bowl member; also to provide means for mounting the tank on the bowl member, which will facilitate adjusting the tank into a vertical position.

A further object of the invention is to provide a construction for a water closet, in which the tank is mounted on the bowl member in a depressed position, and to provide flushing means for the bowl, capable of cooperating with depressed tank to insure efficient flushing of the bowl in spite of the reduction of hydrostatic pressure due to the mounting of the tank in the depressed position.

A further object of the invention is to provide improved means for effecting adjustments of the tank on the bowl member through the agency of the water connection from the bottom of the tank to the bowl member.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient depressed tank construction for water closets.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a side elevation and partial section through a water closet embodying my invention,

the bowl member being shown partially in vertical section.

Figure 2 is a rear elevation of the water closet, a portion of the tank being broken away, and another portion of the tank being broken away and shown partially in section.

Figure 3 is a vertical section upon an enlarged scale, showing a portion of the bowl member contiguous to the tank and particularly illustrating the water connection between the tank and the bowl member, together with the means for mounting the tank on the bowl member; this view shows a portion of the tank broken away, and the lower portion of the tank in vertical section.

Figure 4 is a plan in partial section taken about on the line 4-4 of Figure 1, and particularly illustrating the arrangement of water ducts for increasing the efficiency of the flushing action to enable a depressed tank to be used in this closet.

Figure 5 is a section on line 5-5 of Fig. 2, upon an enlarged scale.

Figure 6 is a fragmentary vertical section on the line 6-6 of Figure 4.

Before proceeding to a more detailed description of the invention, it should be stated that in practicing the invention, the bowl member is provided with a depressed inlet extension for receiving the flushing water from the tank, which is depressed below the upper face of the bowl member. This enables the tank to be attached to the bowl member in a depressed position, and facilitates connecting these parts together through the agency of the water connection between the tank and the inlet extension. But when the tank is mounted in a depressed position in this way, a considerable amount of the flushing effect is lost due to the reduction in the hydrostatic head. However, I overcome this difficulty by combining with this depressed tank, a most efficient means for attaining a flushing action, which will be sufficient to flush the basin properly in spite of the relatively low hydrostatic head due to the depression of the tank.

The tank is mounted on the bowl member in such a way as to enable the tank to be supported on a transverse line at the rear of the bowl member on which the tank can rock for adjustment; and through the medium of the water connection to the inlet extension, I am enabled to adjust the tank into a vertical position when securing it to the bowl member.

Referring more particularly to the parts, 1 represents the bowl member which is formed at its rear side with a rearwardly projecting inlet extension or manifold, and this extension is de-

pressed a considerable distance below the upper face 3 of the bowl member. The inlet extension 2 has a substantially horizontal upper wall 4 and a substantially horizontal lower wall 5. The upper wall is provided with an opening 6 through it for making a water connection to the tank 7. I provide interlocking means between the bowl member and the tank 7, to enable the tank to be supported on the bowl member for rocking adjustment. For this purpose I provide the rear portion of the bowl member preferably above the face 3, with an upwardly projecting extension or rib 8, and on the forward face of the tank 7 I provide means to rest on this rib. This means is preferably in the form of a forwardly disposed rib or abutment 9 projecting forwardly over the rib 8 and having a notch 10 in its under face to receive the rib 8.

When the tank is in position its bottom 11 is supported a slight distance above the upper wall 4 of the inlet extension 5. The bottom of the tank is provided with an opening 12 through which the water connection 13 passes. This connection is preferably in the form of a metal sleeve, the upper end of which is formed into a seat 14 for the flush valve 15. The lower end of the sleeve passes down through the opening 6, and the sleeve is provided with means for making a water-tight connection through the bottom 11 and through the wall 4. In the present instance, the sleeve 13 is made of sufficient length to enable its lower end to pass through an opening 16 in the lower wall 5, which is in alignment with the opening 6 already referred to.

The sleeve is provided with external threads 17, and the lower end of the sleeve is preferably closed by an integral wall or head 18. The openings 6 and 16 are of considerably larger diameter than the outside diameter of the sleeve, so as to permit some freedom of movement of the sleeve laterally and up and down in these openings when adjusting the tank 7 into its vertical position. This adjustment is effected by means of nuts 19 received on the threads, and which clamp down on gaskets or washers 20 of some cushioning material such as rubber or leather. These nuts are placed above and below the bottom 11 and on the upper side of the wall 4 and the lower side of the wall 5. The sleeve 13 has an opening 21 in its side, which is preferably disposed toward the basin 22 of the bowl member.

In order to enable a depressed tank of this character to be employed in this construction, I provide the basin 22 with very efficient flushing means. For this purpose I provide the bowl member with a swirl duct 23 (see Fig. 4) that extends around to the forward side of the bowl, at which point a port 24 is provided, which directs the swirl water current in a substantially tangential direction in the water in the basin, as indicated by the arrow in Fig. 4. This produces an effective swirl in the water in the bowl.

The bowl has a discharge passage 25 extending down at about its center and forming an outlet 26 from the bowl. This outlet bends upwardly as indicated in Fig. 1, so as to form the ascending leg 27 of a trap, the lower leg 28 of the trap being connected to a rear passage 29 with a discharge outlet 30 to connect to the soil pipe.

The flushing action with this depressed tank is made possible through the agency of an entraining port or passage 31 (see Fig. 4), which extends forwardly from the inlet extension 2, and which terminates at the point 32 just to the rear of the outlet 25 from the bowl, and this passage 32 has a delivery opening 33 from which the en-

training water is directed in an upward current in the outlet 26 and the ascending leg 27 of the trap. Neither the swirl current nor the current through port 33 is sufficient to flush this bowl with water from a depressed tank, and it is necessary to employ both these features to effect the flushing operation.

The bowl member may be provided with the usual annular passage 34, which is supplied with water for directing small streams of water down the inner and elevated face of the bowl. This water passes down through small ports 35. These ports are made so that they will direct their water in the same general direction as the water flowing through port 24 for creating the swirl.

The inlet connection for supplying water to the tank, comprises a pipe connection 36 that passes up alongside the inlet extension 2.

In order to prevent water of condensation forming on the inner surface of the cover 37 from passing out of the tank, I provide the under face of the cover with means to prevent passage of this water. This means preferably consists of a marginal groove 38 (see Fig. 5), that extends all around the inner face of the cover adjacent its seat face 39 that rests on the upper edge of the tank. This groove may have any form that will enable it to cause this water to drip down before it reaches the seat face 39. This groove is preferably of V-form, and the cover preferably has a curved face 40 that intersects with this notch or groove to form a projecting dihedral angle, 41, from which the water will drip. In this way the groove prevents this water from reaching the seat 39 so that it could pass out over the edge of the tank.

If desired, a plug may be placed at the bottom of the sleeve 13 having a curved face indicated by the dotted line 42 to ease the water out of the sleeve without causing turbulence.

It is understood that the embodiment of the invention described herein, is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, nor in the claims, to the particular embodiment set forth.

What I claim is:

1. In a water closet construction, the combination of a bowl member having a flush basin, and having an inlet extension at its rear side depressed below the upper face of the bowl member, a tank supported at the rear of the bowl member with its bottom in a depressed position below the upper face of the bowl member, a water connection for the flush basin between the tank and the inlet extension, said bowl member having a swirl duct for leading water from the inlet extension, with a port in the side of the said basin for directing a current of water in a general tangential direction in the basin to cause a swirling movement in the water in the basin, said basin having a basin outlet duct with a trap therebeyond, said bowl member further having an entraining duct for leading water from the said inlet extension with an outlet into the said basin outlet for directing a stream of water in the same direction as the flow through the said outlet and toward the trap to induce an outward flow of the swirling water and thereby flush the basin.

2. In a water closet construction, the combination of a bowl member having a flush basin with an inlet extension at its rear side depressed below the upper face of the bowl, said bowl having a transverse rib adjacent its upper face, a tank

having means adjacent its forward face supported on the said rib, with the bottom of the tank depressed below the upper face of the bowl and lying adjacent to the said inlet extension, a connection through the bottom of the tank to the said inlet extension for conducting water from the tank to the inlet extension, said bowl member having a swirl duct for leading water from the inlet extension, with a port through the side of the said basin for directing a current substantially tangentially in the basin to cause a swirling movement of the water in the basin, said basin having a basin outlet duct with a trap therebeyond, said bowl member further having an entraining duct located where the outlet leads into the trap for leading water from the said inlet extension, with an outlet into the said basin outlet for directing a stream of water in the same direction as the flow through the said outlet from the basin and toward the trap to induce an outward flow of the swirling water in the basin.

3. In a water closet construction, the combination of a bowl member and a tank member, said bowl member having an inlet extension depressed below the upper face of the bowl member, said tank having its bottom located below the upper face of the bowl member and above the said inlet extension, said bowl member having a transverse rib at its rear edge and adjacent the forward side of the tank member, the forward face of said tank member having an abutment projecting over the rib, and an adjustable water connection between the bottom of the tank and said inlet extension enabling the tank to be attached to the bowl member in a substantially vertical position.

4. In a water closet construction, the combina-

tion of a bowl member and a tank member, said bowl member having an inlet extension depressed below the upper face of the bowl member, said tank having its bottom located below the upper face of the bowl member and above the said inlet extension, the rear portion of the bowl member having a transverse rib, said tank member having an abutment adjacent its forward side to project over the said rib and concealing the upper edge of the rib, and an adjustable water connection between the bottom of the tank and said inlet extension enabling the tank to be attached to the bowl member in a substantially vertical position.

5. In a water closet construction, the combination of a bowl member having a bowl, and having an inlet extension at its rear side depressed below the upper face of the bowl member, a tank supported at the rear of the bowl member with its bottom in a depressed position below the upper face of the bowl member, a water connection for the bowl between the tank and the inlet extension, said bowl member having a swirl duct for leading water from the inlet extension, with a port in the side of the said bowl and located toward the front for directing a current of water in a general tangential direction in the bowl across the front to cause a swirling movement in the water in the bowl, said bowl having a bowl outlet duct with a trap therebeyond, said bowl member further having an entraining duct for leading water from the said inlet extension with an outlet into the said bowl outlet for directing a stream of water in the same direction as the flow through the said outlet and toward the trap to induce an outward flow of the swirling water and thereby flush the bowl.

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