Oct. 3, 1944. H. F. WEAVER 2,359,701

WATER CLOSET CONSTRUCTION

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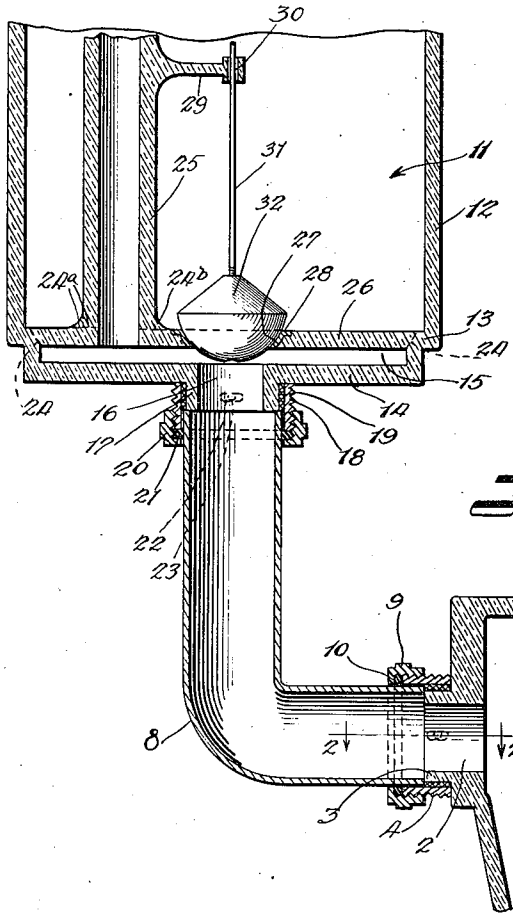


Fig. 1.

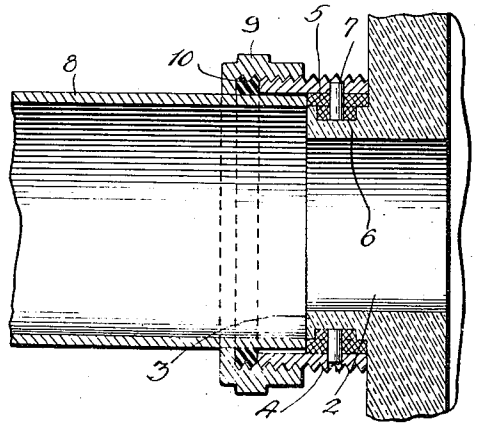


Fig. 2.

Inventor:
Harry F. Weaver.
By Thiess, Olson & McKeelunger.
Attys.

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WATER CLOSET CONSTRUCTION

Harry F. Weaver, Evansville, Ind.

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6 Claims. (Cl. 285—4)

This invention relates to water closet assemblies including various co-operating details of the bowl and tank construction and connections therefor.

In the past, metal has ordinarily been used for the couplings, conduit, connections and overflow fittings in connection with vitreous china sanitary ware in toilet accessories of the type disclosed herein.

The present invention is particularly intended to conserve metal, and at the same time, to provide an improved construction which will enable easier assembly of the device, and will so dispose the few metal elements, which may be used, that corrosion thereof is prevented. The construction therefore enables the use, if desired, of otherwise corrosive metal in whatever small amounts may be desirable.

The present invention also provides a construction, which may, if desired, be made almost entirely of non-metallic material, such, for instance, as vitreous china. Also certain elements may be formed of plastics.

It is also an object to provide a coupling for the conduit to the bowl or tank in which a threaded coupling nipple or bushing may be rigidly affixed to a vitreous non-uniform or otherwise deformed annular outlet or inlet flange, to form a packing gland, so that the usual packing nut may be used to secure a conduit in sealed relationship to the opening through said flange. The threaded bushing may be formed of any suitable material, such, for instance, as plastic, iron, brass, zinc or the like, and may be cemented to the bowl with any suitable cement which will resist water and acid.

A further object is the provision of a tank assembly including a tank and overflow pipe, both formed of molded vitreous material or the like, and in which the cementing or otherwise securing together of the elements provides an integral structure having an unobstructed conduit from the overflow pipe to the tank outlet.

Further objects will be apparent from the specification and the appended claims.

In the drawing:

Figure 1 is a vertical sectional view through a closet and tank assembly, and illustrates one embodiment of the invention.

Fig. 2 is an enlarged view of the bowl coupling assembly shown in Fig. 1.

Referring to the drawing in detail, the embodiment illustrated comprises a bowl 1, which may be of the usual type, preferably of molded vitreous china sanitary ware, and is provided with a water inlet opening 2 having an integral outwardly extending annular flange 3.

In the manufacture of these bowls, when the bowl comes from the mold in which it is cast, there is usually a solid clay projection or lug, and the material of this lug is then punched while the clay is soft to form the inlet hole 2 and the laterally extending annular flange 3. The hole may of course be punched to any required size. The flange 3 may extend outwardly any desired distance, preferably about ⅜ or ½ inch from the body of the bowl. The clay bowl is then burned so that it is thoroughly set and hardened, and on account of the variation in shrinkage, the hole 2 in the bowl and the annular flange 3 may, after burning, be slightly oblong or otherwise somewhat distorted. It is, therefore, impossible to snugly fit a coupling either in the hole 2 or on the flange 3.

In order to provide a properly sealed connection with the conduit leading to the tank, a bushing or nipple 4 is provided, and the internal diameter of this bushing is of sufficient size to telescope freely over the flange 2 irrespective of any ordinary irregularities in the flange. The bushing is preferably externally threaded, as shown.

A layer of cement 5 is inserted between the bushing and the flange and a perfect sealed joint is therefore provided, and the bushing is held snugly in alignment against the outer surface of the bowl 1. The outer surface of the flange 3 is provided with one or more depressions 6, and projections on the bushing 4, which may be in the form of pins 7 inserted through complementary openings in the bushing, extend into the depression 6, as illustrated, and are retained snugly in place by means of the cement layer 5. The pins 7 are for the purpose of resisting any turning stress applied to the bushing.

A conduit 8, which may be of the usual elbow type, is preferably made of plastic material, and one end is telescoped through a packing nut 9 and into the bushing 4, so that the end of the conduit rests snugly against the end of the flange 3.

A suitable packing 10 is inserted between the packing nut 9 and the bushing 4, and the packing nut is snugly threaded on the bushing in the usual packing box manner to provide a sealed slip joint between the bushing and conduit.

A tank 11 is also formed of vitreous molded material and is provided with side walls 12 and a bottom wall 13. A restricted depression 14 is formed in the bottom wall to provide a shallow chamber 15. The chamber 15 is preferably rectangular although it may be circular or any other suitable contour. The tank is provided with an outlet 16 having an outwardly extending annular flange 17, which latter is formed in the same manner and may be substantially identical with the annular flange 3 and inlet 2 of the bowl 1.

A bushing or nipple 18 is secured to the flange 17 by means of a layer of cement 19 between the nipple and flange, in exactly the same manner as previously described. A packing nut 20 is threaded on the bushing 18 and provides a sealed

connection with the conduit 8 by means of packing 21.

It will be apparent that the fittings for the tank and bowl may be interchangeable and are applied in the same manner in either location.

The annular flange 17 is also provided with one or more external depressions 22 in which pins 23 may be inserted through the bushing 18 in the same manner as previously described for the bowl bushing 4. The side walls of the restricted chamber 15, formed by the depression in the bottom wall of the tank, are preferably angularly chamfered as shown at 24. An overflow pipe 25 is also formed of molded vitreous material, or it may be of plastic, and is provided at its lower end with a flange 26. The edges of this flange are angularly formed to fit the chamfered portion 24 of the tank, and the flange is secured in the depressed portion of the tank to form a sealed cover for the restricted chamber 15 in the manner illustrated.

The parts for the tank may be made and assembled as follows: The tank 12, the overflow pipe 25, and the flange 26 may each be molded as a separate unit, as indicated by the dotted lines 24 and 24*a*, and, while the material is still soft but sufficiently hard to be handled, the joint edges are coated with the same vitreous material as used in the molded parts. The parts are then assembled as shown and, if desired, a fillet also of the same vitreous material may be applied as at 24*b*. The flange 26 may, of course be molded integrally with the overflow pipe, if desired. The assembled tank is then burned and becomes an integral structure in which the joints are at least as hard and strong as any other portion. A completely integral structure is, therefore, provided with a continuous conduit from the overflow pipe to the outlet.

The flange 26 is provided with a valve seat opening 27 preferably in alignment with the tank outlet 17, and this valve seat opening may be spherically ground to provide a suitable valve seat, or it may be provided with a spherical valve seat lining 28, which lining may be of metal, plastic, or other suitable material and may be cemented into the flange 26, as shown. The molded overflow pipe 25 is provided with an integral laterally extending arm 29, and the outer end of this arm is provided with a guide hole 30 through which the guide rod 31 of a ball valve 32 extends. This construction provides an integral tank including a casing and overflow pipe of molded vitreous material, and the restricted chamber 15 provides an overflow conduit communicating with the overflow pipe and the outlet opening 16.

As previously stated, the conduit or elbow 8 is preferably made of plastic or vitreous material, and, therefore, the entire conduit from the tank to the bowl, including the overflow pipe, may be of non-corrosive material, and the small amount of metal used for the couplings may be of any suitable material. It will, of course, be understood that the coupling members may also be of suitable non-metallic material, if desired.

It is intended, of course, that the invention should not be limited to the specific embodiment or embodiments disclosed herein, since modifications may be made, and it is contemplated, therefore, by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. A water closet tank and bowl assembly comprising a tank having an outlet and a bowl having an inlet, said tank and bowl being made of vitreous molded material, said tank outlet and said bowl inlet each including an outwardly extending integral annular flange of vitreous molded material, an externally threaded bushing telescoped over each flange and cemented thereto, a conduit having an end telescoped into each bushing, a packing nut threaded onto each bushing, and clamping an annular packing in sealing relation between said nut and said bushing and said conduit.

2. In a molded vitreous chinaware water closet bowl having an inlet hole for water from a tank conduit and an annular outwardly extending flange of vitreous molded material around said hole, and a threaded bushing telescoped over and cemented to said flange and overhanging the outer end of said flange to receive a conduit in said overhanging end, said bushing being adapted to receive a packing nut thereon to seal said conduit in said bushing.

3. In a molded vitreous chinaware water closet bowl having an inlet hole for water from a tank conduit and an annular outwardly extending flange around said hole, said flange having one or more depressions in its outer annular surface, an externally threaded bushing telescoped on said flange with a layer of cement therebetween, and one or more projections on said bushing, each projection extending into a corresponding depression to resist turning stress applied to said bushing.

4. A water closet coupling construction comprising a vitreous molded bowl having a conduit inlet, an integral rough cast outwardly extending flange of vitreous molded material around said opening, an externally threaded bushing loosely telescoped over said flange, and a layer of cement filling the interstices between said flange and bushing and cementing said bushing rigidly to said flange.

5. A water closet coupling construction comprising a vitreous molded bowl having a conduit inlet, an integral rough cast outwardly extending flange of vitreous molded material around said opening, an externally threaded bushing loosely telescoped over said flange, and a layer of cement filling the interstices between said flange and bushing and cementing said bushing rigidly to said flange, a conduit in said bushing and abutting the end of said flange, and a packing nut threaded on said bushing and adapted to retain said packing in sealing relation between said bushing, said nut, and said conduit.

6. A water closet coupling construction comprising a vitreous molded receptacle having a conduit passage, an integral rough cast outwardly-extending flange of molded vitreous material around said passage, an externally-threaded bushing loosely telescoped over said flange, a layer of cement filling the interstices between said flange and bushing and cementing said bushing rigidly to said flange, a conduit in said bushing, and a packing nut threaded on said bushing and adapted to retain said packing in sealing relation between said bushing, said nut and said conduit.

HARRY F. WEAVER.