July 26, 1949. P. F. DONAHUE 2,477,478

WASTE AND OVERFLOW FITTING

Filed June 12, 1946

Fig. 1.

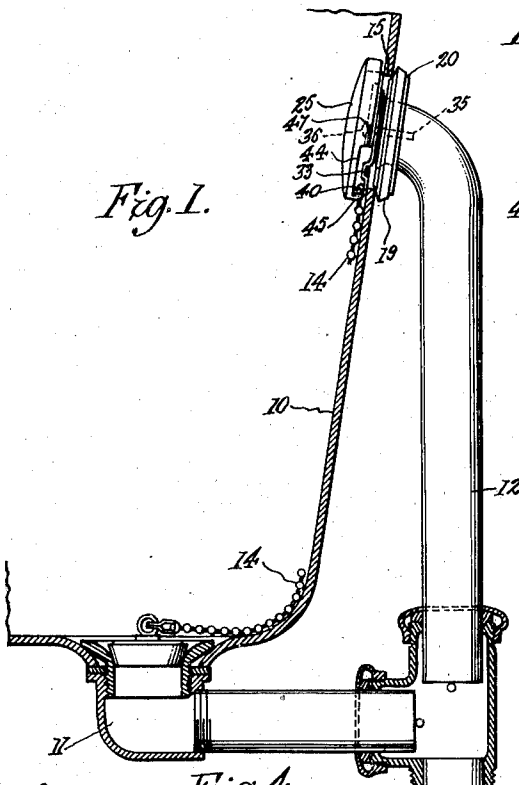
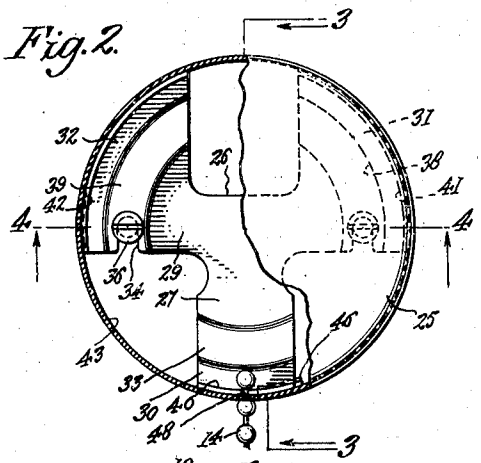



Fig. 2.



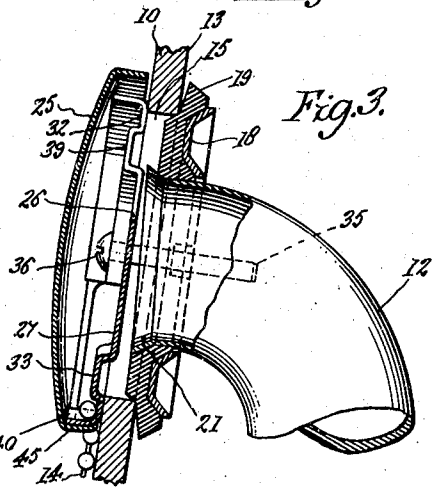




Fig. 3.

Fig. 4.

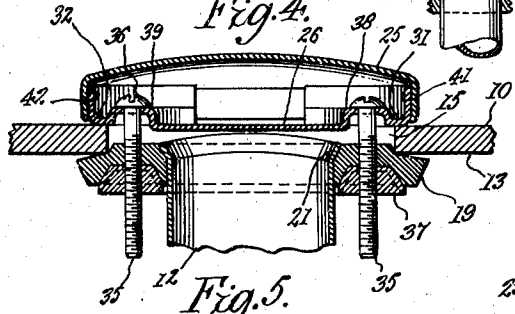



Fig. 5.

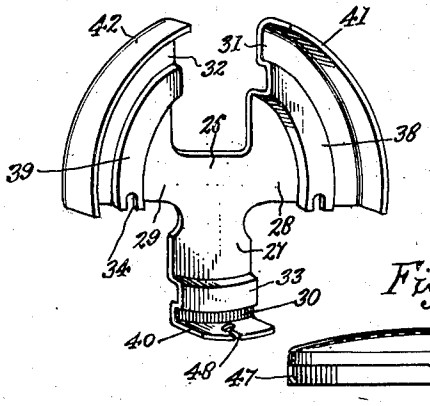



Fig. 6.

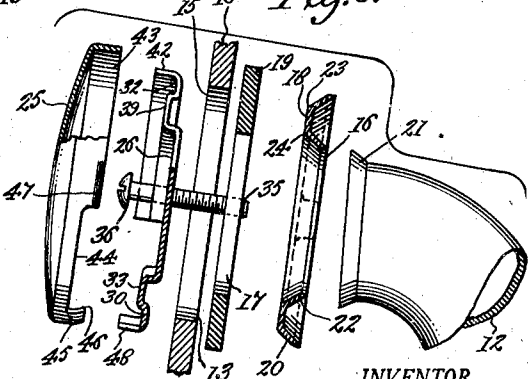



Fig. 7.




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# UNITED STATES PATENT OFFICE

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## WASTE AND OVERFLOW FITTING

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16 Claims. (Cl. 4—198)

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The present invention relates to improvements in waste and overflow fittings, and has for an object certain improvements over the construction illustrated and described in my co-pending similarly-entitled application filed August 31, 1944, Serial No. 552,049, now matured as Patent No. 2,444,340, dated June 29, 1948.

In common with the objects and announced purposes set forth in the specification of my prior application aforesaid, the present invention has for its purpose to provide a fitting for the overflows of bath tubs and the like so constructed and arranged that the internal parts and organization thereof are not revealed but on the other hand are most completely concealed behind the mask of a face plate which will resist removability by the vandalism of those not instructed in the interior construction of the fitting and not instructed in the plumber's art but who are casual laymen frequenting hotels and other public places where bath tub and other kindred fittings are required and which are the random prey to such persons.

Hotel guests will remove anything from public places that is not permanently affixed or so obscured and unobtrusive as to fail their attention, and it is accordingly another object of the invention to so construct and arrange the waste pipe fitting of a bath tub or the like that a face plate of extremely plain character is so mounted as to fully conceal all internal parts but at the same time afford ample port area for the effluent overflow liquid from the tub, and further so constructed and arranged in its relationship and cooperation with the parts of the fitting by which it is carried that it fails to give any clue to the uninitiated as to how it is affixed in place, and more particularly how it may be removed from the permanent parts of the fitting.

The invention aims to achieve the foregoing objects by a construction essentially simple and having desirable characteristics of leak proofness and adaptability to inclinations of tub wall comparatively to the stand or overflow pipe.

With the foregoing and other objects in view the invention will be more fully described hereinafter and will be more fully pointed out in the appended claims.

In the drawings in which like parts are denoted by similar reference characters throughout the several views,

Figure 1 is a fragmentary vertical section taken through a bath tub with a drain and overflow fitting illustrated in edge elevation as constructed in accordance with the present invention.

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Figure 2 is a front elevation of the improved fitting, removed from the bath tub, taken on an enlarged scale, and with parts broken away and parts shown in section.

Figure 3 is a vertical central section taken on the line 3—3 of Figure 2.

Figure 4 is a horizontal section taken on the line 4—4 of Figure 2.

Figure 5 is a perspective view of the face plate holder.

Figure 6 is a fragmentary vertical section taken through a portion of the bath tub wall, overflow pipe and the parts of the invention shown in disassembled relation, and

Figure 7 is an edge elevational view of a form of face plate employed.

Referring more particularly to the drawings 10 designates generally a bath tub having a drain 11 and an overflow 12. A conventional form of drain plug is shown as closing the drain 11 and as coupled to a customary captive chain 14.

As shown to best advantage in Figure 6 the bath tub 10 is provided with an overflow opening 15 with which the upper end of the overflow pipe 12 communicates. The upper curved or elbowed end of the overflow pipe 12 passes through registering openings 16 and 17 in a retainer ring 18 and gasket 19 respectively. The gasket 19 may be of rubber or some other compressible material and may be of a conventional ring type of rubber gasket.

The ring body of the gasket has a radial depth in relation to the tub opening 15 and the diameter and radial dimension of the ring 18 that substantial radial portions of the gasket 19 overlap the rear edge 13 of the overflow opening 15 of the bath tub 10 in both inner and outer directions. Otherwise stated the diameter of the opening 17 in the rubber gasket 19 is substantially smaller than that of the diameter of the tub overflow opening 15, while the overall diameter of the resilient gasket 19 substantially exceeds the diameter of the overflow opening 15. Such construction affords ample quantities of the gasket material at both inner and outer sides of the annular rear edge 13 of the overflow opening 15.

The retainer ring 18 is of rigid metal or other suitable material having the rearwardly divergent annular flanges 20 and 22. The body of the retainer ring 18 between these flanges 20 and 22 is preferably flat for a substantial radial distance although the flanges 20 and 22 might meet together in an elbow or angular formation. It is preferred that the opening 16 in the retaining ring 18 be of a diameter approximating that of

the opening 17 in the gasket 19 although it may be somewhat greater or lesser in diameter. Also the overall diameter of the retainer ring 18 is preferably somewhat in excess of the diameter of the tub overflow opening 15. Annular edges or ridges 23 and 24 are formed between the disc body of the retainer ring 18 and its two flanges 20 and 22. The radial distance between the ridges 23 and 24 marks off the disc or flat portion of the retainer ring 18 and the outer diameter of this disc defined by the edge 23 is somewhat less than the diameter of the bath tub overflow opening 15 to the end that the forward face of the diagonal outer flange 20 will be presented at substantially right angles to the rear edge 13 of the overflow opening 15. On the other hand the forward flat face of the inner diagonal flange 22 which also engages the gasket 19 in the assembled position of the parts as shown in Figure 3 lies substantially parallel to the outwardly flanged end 21 of the overflow pipe 12. The overall diameter of the flange 21 is somewhat greater than the diameter of the openings 16 and 17 in order to provide for a proper sealing joint at this upper end of the overflow pipe 12 and one that is flexible and adjustable. The gasket 19 and ring 18 are slipped over the lower end of the overflow pipe 12 before it is attached to its connection, there being no flange at the bottom end of pipe 12, and moved upwardly to a position to engage the outer face of the flange 21.

On the inside of the tub is arranged the face plate 25 and the face plate holder 26. This holder, as shown more particularly in Figure 5, may be made of a sheet metal stamping of relatively heavy material of a generally disc form having a plurality of arms 27, 28 and 29 of which the arm 27 is lowermost while the upper arms 28 and 29 may be outstretched diametrically in a substantially horizontal line although this is not essential. The arms carry segments 30, 31 and 32. These segments are all separated circumferentially so as to allow for a proper drainage through this spider holder plate 26. Furthermore, the spaces between the segments allow ample room for the plumber's fingers in holding and adjusting the holder 26 in making the assembly with the rear ring 18. Offset arcuate beads 33, 38 and 39 in the segments act to stiffen and reinforce the holder 26 against any resiliency or bending action. Slots 34 are made in the beads 38 and 39 of a width substantially corresponding to the shanks of the attaching screws 35 but narrower than the screw heads 36 to prevent the heads pulling through the slots. As shown in Figure 5 these slots 34 open through the adjacent edges of the beads 38 and 39 to permit assembly of the holder 26 to the screws by a lateral sliding motion of the holder 26. The screws 35 pass through the gasket 19 and are threaded in the threaded bosses 37 which are built up by additions of metal stock to the rear channel like trough of the retaining ring 18.

Flanges 40, 41 and 42 are carried upon the outer edge portions of the segments 30, 31 and 32, these flanges being arcuate and adapted to tightly receive an annular flange 43 projecting rearwardly from the face plate 25 which is also preferably of sheet metal possessing certain inherent resiliency.

The flange 43 of the face plate is cut away or provided with slots 44 in its lower quadrants opposite the cut-away portions in the lower part of the holder 26 at opposite sides of the bottom radial arm 27. These slots 44 in cooperation with the removed portions at the lower quadrants afford egress to the overflow water in the tub 10.



A lug 45 divides the slots 44 and is given an inward cant 46 in the radial direction toward the center of the fitting so as to increase its frictional factor of grip upon the flange 40 when the face plate 25 is assembled upon the holder or spider 26. The flange 43 is also provided with one or more indented portions 47 preferably in areas bordering upon the slots 44, which indented portions are adapted to increase the frictional grip upon the flanges 41 and 42 of the holder or spider 26.

A slot 48 in the lower flange 40 is adapted to receive the chain 14. The flanged retainer ring 18 may be conveniently made as a cast ring of channel construction, except at the places where the attaching screws 35 are assembled to the ring. Here built-up sections 37 of the ring are made as integral parts of the casting through which are tapped the holes for the screws 35.

In the present application the gasket 19 is an ordinary annular washer which replaces the gasket of my prior application which was odd shape and therefore more expensive.

In the present application the spider member or holder 26 may be of a sheet metal stamping which takes the place of the casting of the prior application.

It will be noted that the cap member 25 has no screws or even the head of a screw showing on its external face which is completely and perfectly plain. The openings 44 are provided in the flanged portion 43 of the cap to facilitate better drainage. The cap member or face plate 25 is held in place in that its flange 43 has a slip fit over the flanges 40, 41 and 42 of the spider arms.

From an inspection of Figure 2 it will be understood that the lug 45 that divides the slots or openings 44 in the flange 43 of the face plate is off center so as not to interfere with the bead chain 14 when the cap is assembled in place. The face plate 25 is entered upon the holder 26 by originally rotating the face plate 25 to a position where the lug 45 is to the right of the bottom flange 40 in which case the left hand indentation 47 will be opposite the space between the lower arm 27 and the left projecting arm 28. In this position the face plate 25 is forced axially inward so that its flange 43 fits over the flanges 41 and 42 of the holder 26. Subsequently the face plate 25 is rotated in a clockwise direction through an angular distance substantially equal to the width of the lug 45 so as to bring this lug to the position indicated in Figure 2 in which it laps substantially the lower right hand half of the lower flange 40, its leading edge stopping short of the chain 14. This clockwise rotation also moves the left indentation 47 up upon the lower left hand area of the holder flange 42. The crimped or indented portions 47 thus clamp the flanges 41 and 42 while the inwardly canted portion 46 of the lug 45 frictionally engages the right hand portion of the lower flange 40. Due to the indentations and resiliency of the face plate, the frictional binding between the parts will be enhanced. The fact that the canted parts 46 and 47 are adjacent the slots 44 also enhances the resiliency through which these parts grip the flanges 40, 41 and 42 of the holder 26.

It will be noted that the slots 44 are not cut all the way through the flange 43 to the disc of the face plate 25 but that such slots have a forward wall which is adapted to engage be-

tween beads of the chain 14 and push the chain to the position shown in Figure 3 in which such chain is locked in the slot 48. In other words that part of flange 43 which is not removed by the slots 44 engages the outer portion of the flange 40.

In use, the overflow is caused to flow around the outer plain and imperforate disc of the face plate 25 to the flange 43 at the side thereof where such overflow may enter through the slots 44 and pass through the openings between the arms of the holder 26, thence through the opening 15 in the bath tub 10 and directly into the open elbow end of the overflow pipe 12.

When installed the unit exposes no visible screws but all that one sees is the entirely plain round ornamental flat plate 25 which conceals the fact that there are screws 35 beneath and which is held so tightly in place by the indentations 47 and canted portion 48 in cooperation with the flanges 40, 41 and 42 of the holder 26 that such face plate can not readily be removed and it has no gripping surfaces for this purpose. The fact that the face plate 25 is rotated into and out of place is a matter of mystery to the ordinary layman who will thus be confounded in his inexpert efforts to remove the same.

The invention in one phase resides in the unit provided by the association of the face plate 25 and the holder 26 and in this aspect it is immaterial what type of gasket or retainer ring or other member that may be used in rear of the tub to connect with the overflow pipe 12.

In another aspect the invention consists in the combination of the peculiarly shaped retainer ring 18 with a plain ordinary washer 19 in relation to the bath tub opening 15 as described; and this without relation to the specific type of holder and face plate employed.

In still another aspect the invention comprises the combination of the units which are in front of and behind the bath tub wall 10 with the screws 35 which form the connecting means between these related and cooperating couples.

The presence of the flange 43 enhances the mystery of the construction and assembly of the fitting in that prying eyes or probing instruments are excluded thereby from gaining any access which would be successful in solving the problem of removing the face plate 25.

The radially inturned resilient lip 46 is shown in Figure 2 as interlocking behind the lower holder segment 30, the lug 45 not appearing in this figure as it is in the same plane with the face plate flange 43. This Figure 2 also shows that the lug 45 and its spring lip 46 are of a circumferential width generally comparable to one-half that of the bottom flange 40 of the holder 26, it being understood that the lug 45 engages only that half of the flange 40 that lies between slot 48 and the right hand edge of the flange 40. When the face plate 25 is rotated clockwise into place the leading edge of the lug 45 will contact the link between the two outer balls of the chain 14 if need be to act as a stop in the interlocked position of the face plate on the holder.

As shown in Figure 3 the annular ridge 23 of the retainer ring 18 because of its smaller diameter than that of the bath tub aperture 15 pinches the resilient material of the gasket at an intermediate portion of its mass between such ridge 23 and the rear corner portion of the aperture 15; so that the mass of the washer body is separated into inner and outer portions. The outer portion is shown as substantially wedge shape in cross section and is adapted to be rotated up against the rear wall of the bath tub 10 at that portion surrounding the aperture 15. The inner portion of the gasket mass which confronts the flat disc 18 of the retainer ring which forms the central portion of this ring is pushed into the aperture by the advancing retainer ring and the upper portion of this inner mass tends to rotate clockwise about the rear edge of aperture 15 and up against the wall of the aperture. A third mass of the gasket is encountered by the inner flange 22 and deflected downwardly and compressed against the wall of the overflow pipe 12 and against the flange 21. Thus the gasket 19 is readily deformable into these three separate fractions by the peculiar conformation of the sealing ring 18 in its relation to the diameters of the apertures 15 and 17.

It will further be noted that the holder 26 cooperates with the retainer ring 18 in the act of exerting forward pressure against the gasket 19 because of the screws or other fastenings 35 which engage both holder 26 and retainer ring 18. When the holder firmly engages the bath tub wall at the front side of the opening 15 it forms a stiff and rigid abutment for the heads 36 of the screws 35 to take against. The tightened screws 35 thus have a forward thrust movement tending to pull the retainer ring 18 against the gasket 19. The elastic gasket 19 reacts to force this holder 26 firmly against the front wall portion of the bath tub. The face plate and its rim may also be of metal which is inherently resilient to cooperate in the resilient snap action of the lug and indentations in moving into and out of interlocking relation with the holder.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. An overflow fitting comprising a spider holder having spaced members, and a face plate having a slotted flange removably supported on said members, the slot of the flange adapted to register with a space between said members.

2. An overflow fitting comprising a spider holder having spaced members with reinforcing flanges, a face plate having a slotted flange with inwardly-offset portions adapted to slip over said reinforcing flanges, the offset portions adapted to inwardly grip said reinforcing flanges.

3. An overflow fitting comprising a holder of rigid metal having radial arms circumferentially separated and carrying segmental portions having raised beads and terminal flanges, said beads having open ended slots, and a face plate having a flange adapted to seat with a slip fit upon the flanges of said holder and having means to interlock with the flanges of the holder, and fastening means for securing said holder in place positioned to be received by the slots in said beads.

4. An overflow fitting comprising a holder having spaced segmental portions with rigid flanges, and a face plate having a flange adapted to slip over the flanges of the holder and be rotated thereon, said face plate flange having inturned portions adapted to frictionally engage with said holder flanges and place the holder under tension.

5. For use with an apertured bath tub wall and

an overflow pipe, a compressible gasket of conventional form surrounding the overflow pipe and adapted to engage against the corner of the aperture with portions lying radially inward and outward of such corner, and a retainer member adapted to slide on the overflow pipe and movable against said gasket to force it against the edge of the aperture, said member having an annular ridge of smaller diameter than the edge of the aperture.

6. For use with an apertured bath tub wall and an overflow pipe, a sealing device comprising a compressible gasket of conventional cross section adapted to seat against an edge of the aperture with portions thereof lying inwardly and outwardly of such edge, and a retainer member for forcing said gasket against the edge and having a flange retreating backwardly from the gasket at the outer edge portion of the retainer member.

7. A sealing device as claimed in claim 6 characterized by the fact that said flange is rearwardly divergent and its forward edge which merges with the body of the retainer member constitutes an annular ridge lesser in diameter than the diameter of the aperture.

8. A sealing device as claimed in claim 6 wherein a second inner flange retreats rearwardly from the body portion of the retainer member and is positioned to engage the inner body portion of the gasket and compress the same against the overflow pipe.

9. A sealing device as claimed in claim 6 in which the retainer member has a second inner flange and a body portion of disc form joining the forward annular edges of said flanges, said body portion having a flat forward face presented to an intermediate portion of the gasket body, the gasket being pinched between the edge of the aperture and the edge between the outer flange and the body portion of the retainer member to produce an outer ring gasket substantially wedge shape in cross section and adapted to fit against the rear wall of the bath tub, an intermediate body of gasket material forwardly about the body portion of the retainer member with a part adapted to seat against the internal wall of the aperture and a third portion of gasket material adapted to be compressed by the inner flange against said overflow pipe.

10. A sealing device as claimed in claim 6 in which the retainer member is in ring form having a body portion and an inner flange in addition to said outer flange, said flanges joined to the body portion by spaced annular ridges.

11. For use with an apertured bath tub wall and an overflow pipe, an overflow fitting comprising a compressible gasket adapted to seat against the rear edge of the aperture, retainer means extending about the overflow pipe and constructed and arranged to force said gasket against the aperture edge and against the overflow pipe and to place the same under tension, a holder having reinforcing raised and slotted beads, fastenings detachably engaging with the slots in said beads and also for detachable connection with said retainer means, and a face plate detachably and interlockingly engaged with said holder.



12. An outlet fitting as claimed in claim 11 characterized by the fact that the fastenings are screws which engage the tapped nut portions in said retainer ring which is in channel form.

13. An overflow fitting comprising a holder having circumferentially spaced flanges, one flange being slotted, a chain detachably received in the slot, a face plate having a flange to fit over the flanges of the holder and having slots for the passage of water.

14. An overflow fitting comprising a holder having circumferentially spaced flanges, one flange being slotted, a chain detachably received in the slot, a face plate having a flange to fit over the flanges of the holder and having slots for the passaged water, one of the flange portions between the slots of said face plate serving to interlock said chain in the flange slot of said holder.

15. An overflow fitting comprising a holder having circumferentially spaced flanges, an imperforate face plate having a circumferential flange with spaced openings, said plate flange fitted over the flanges of said holder, and cooperative means on said plate and holder permitting assembly by relative rotary motion and to only one position such that the spaced openings in said plate flange will rest in a downward position.

16. For use with an apertured bath tub wall and an overflow pipe having a flanged end, a sealing device comprising a compressible gasket of a size to fit about said overflow pipe and larger than said tub aperture, and a retaining member having wedging surfaces for forcing said gasket against the aperture edge and pipe flange as a means for sealing and flexibly supporting said pipe to said tub wall.

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