May 5, 1959 O. N. COOPER 2,884,650

TUB OVERFLOW

Filed March 26, 1957 3 Sheets-Sheet 1

Fig. 1.

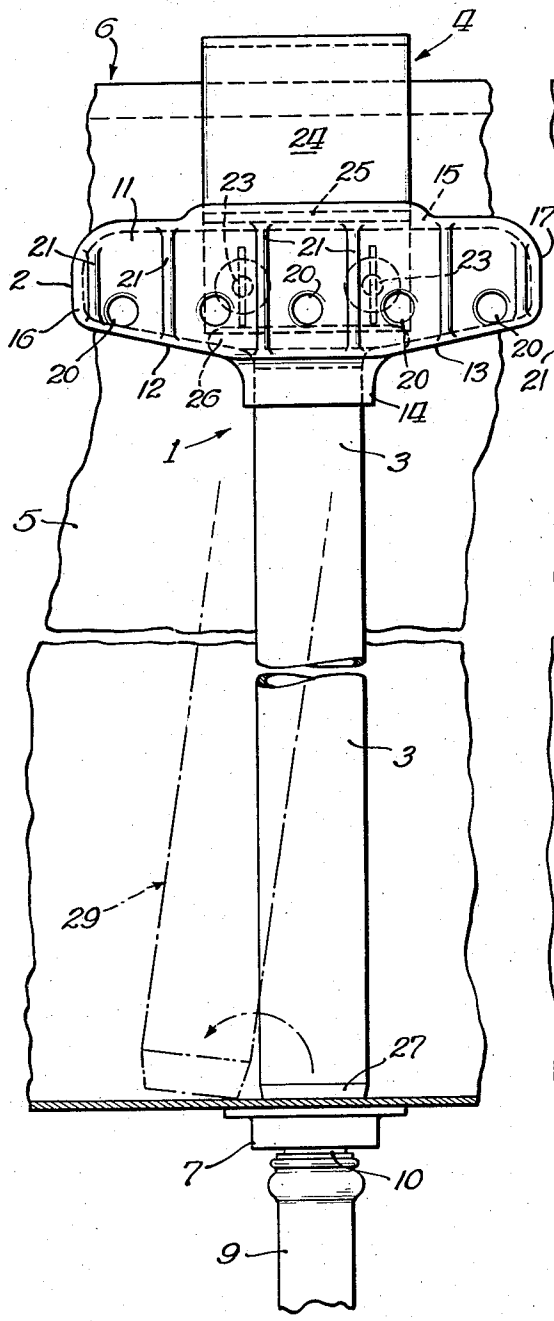
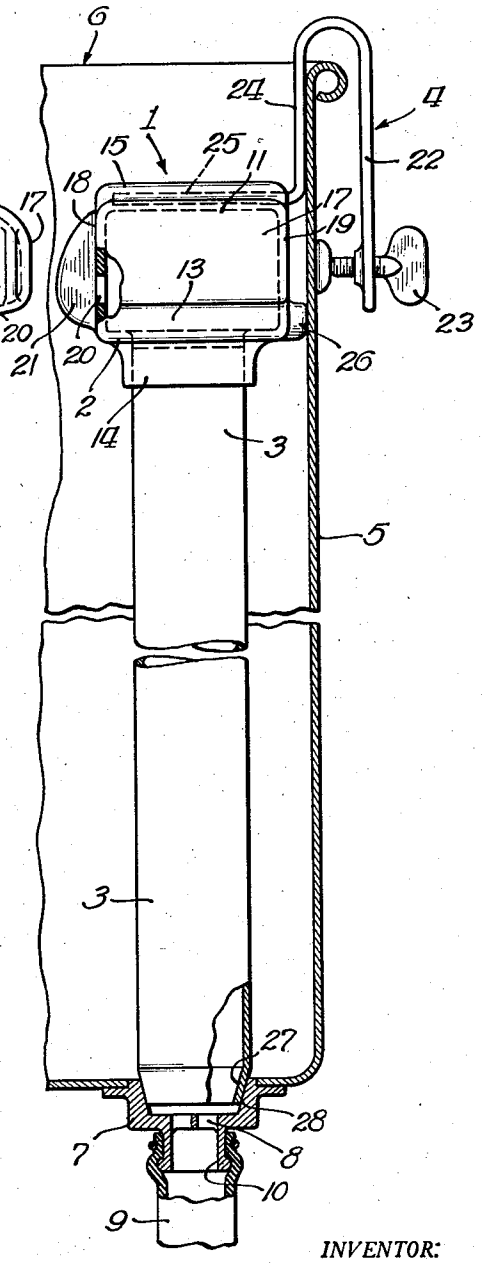


Fig. 2.



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TUB OVERFLOW

Filed March 26, 1957 3 Sheets-Sheet 2

Fig. 3.

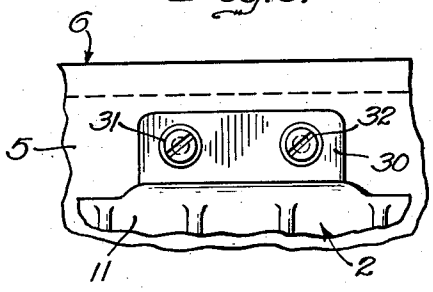


Fig. 4.

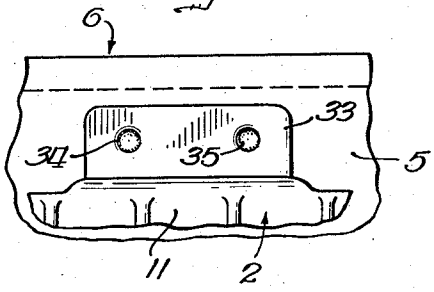


Fig. 5.

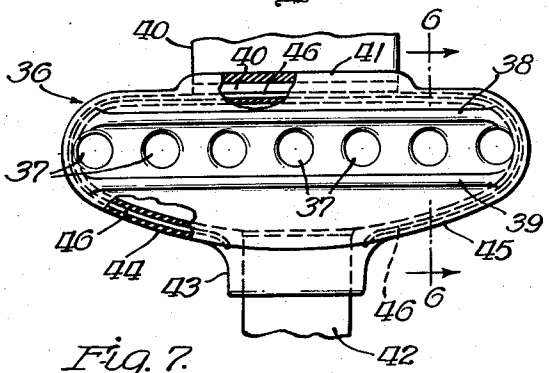


Fig. 6.

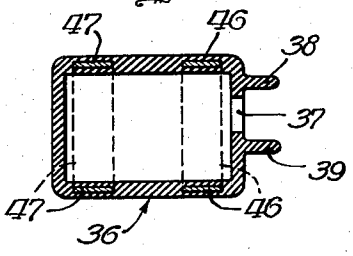


Fig. 7.

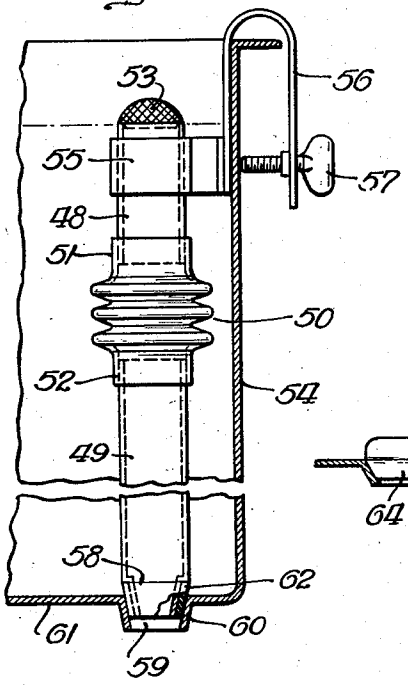
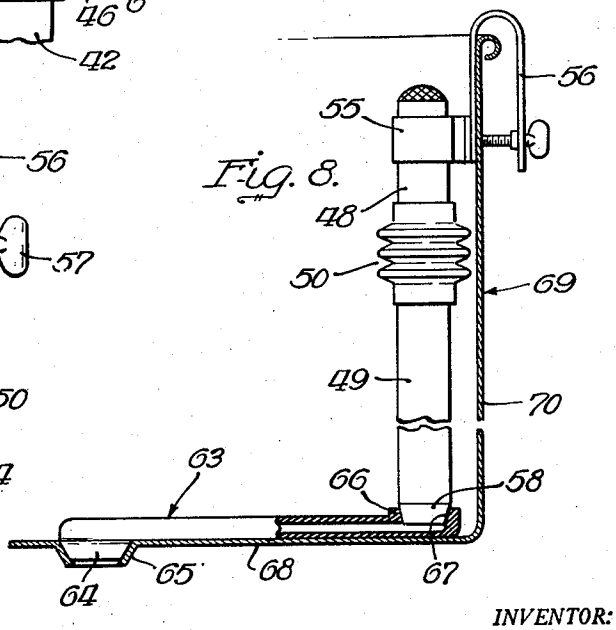


Fig. 8.



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May 5, 1959 O. N. COOPER 2,884,650

TUB OVERFLOW

Filed March 26, 1957 3 Sheets-Sheet 3

Fig. 9.

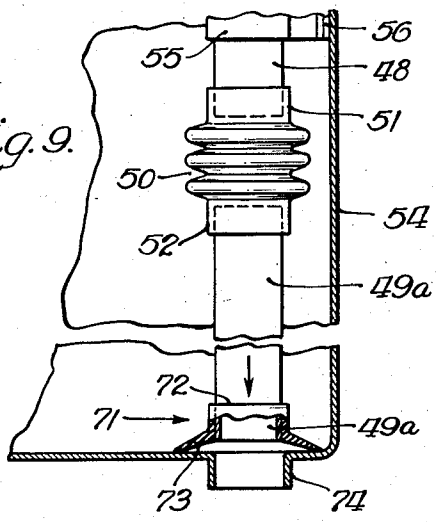


Fig. 10.

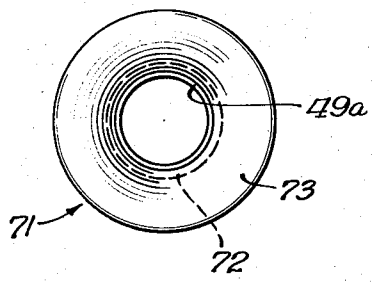


Fig. 11.

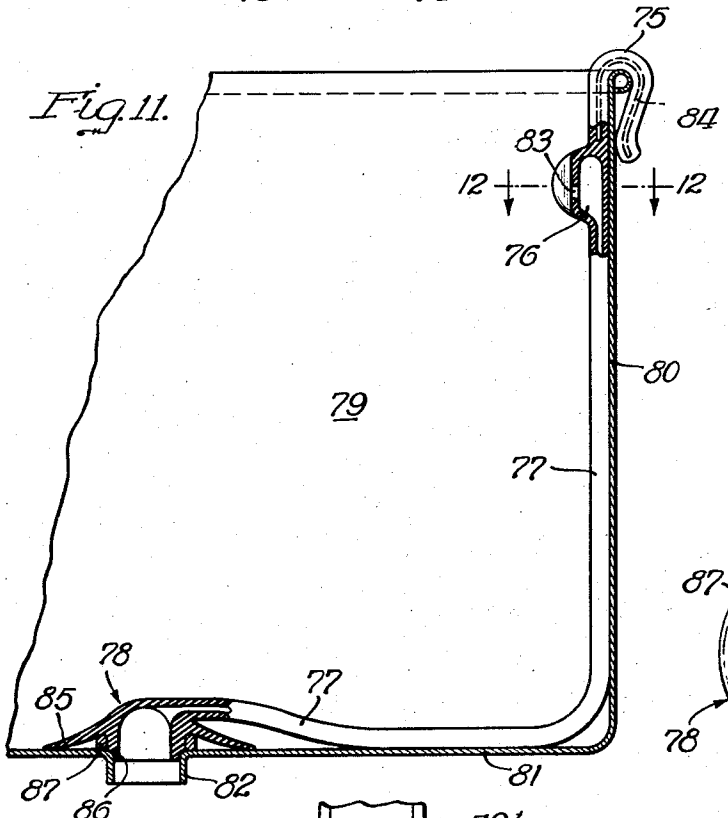


Fig. 12.

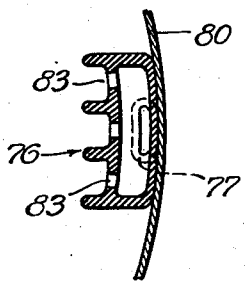


Fig. 13.

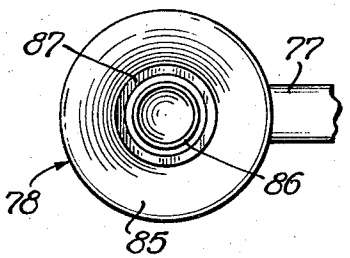
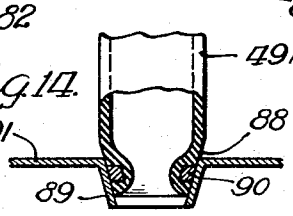


Fig. 14.



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2,884,650

Patented May 5, 1959

2,884,650

TUB OVERFLOW

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Application March 26, 1957, Serial No. 648,608

20 Claims. (Cl. 4—206)

This invention relates to a tub overflow devised to maintain the water level in a tub at a substantially constant level or at least at or below a maximum level in such tub.

It is one of the objects of this invention to provide an overflow unit as an accessory for use with tubs of various kinds and more specifically with drainable tubs of the character that are employed in connection with washing machines and wringers for clothes rinsing purposes.

In some instances wringers or other means may be employed that would supply rinsing water at the wringer to help to thoroughly rinse the clothing and in such cases excess water would drain into the rinse tub. Under operative conditions, the addition of clothing to the rinse tub will also appreciably raise the water level in such a tub.

In all cases, it is another object of this invention to provide an overflow unit that can be attached to such a tub in a given valving relation to the tub drain opening and to provide overflow openings at a predetermined elevation within the tub to hold the water level at or below an ideal level for carrying out the clothes rinsing operation without overflow or objectionable splashing of water out of such a tub.

It is another object of the invention to provide a given tub water depth overflow unit that may be fixedly or releasably secured to the tub in a given relation so as to valve the drain opening against loss of normal tub water content and which unit may be left in such a position and yet be capable of selective valving release from the drain opening to allow the rinse water to empty out of the tub opening.

Another object of the invention is to provide a standpipe arrangement that is constructed from a combination of rigid and resilient materials so combined as to permit of relative movement of one portion of the standpipe arrangement with respect to certain other portions thereof to establish a readily operable valving means for said tub drain for causing said arrangement to function as an overflow for the tub or to selectively permit unvalving of the tub drain to empty the rinsing or tub carried water out of the tub.

A further object of the invention, the latter contemplates the use of a lateral extension unit or duct means in combination with the standpipe arrangement to adapt the latter to certain tubs wherein the drain opening may be positioned centrally of the tub or in other locations that are not next adjacent to a wall portion thereof.

Other objects and advantages relating to the tub overflow of the present invention shall hereinafter appear in or become apparent from the following detailed description directed to certain preferred forms of the invention and having reference to the accompanying drawings forming a part of this specification.

In the drawings:

Fig. 1 is a front elevational view on one preferred construction of the device of this invention as the same appears when connected with one wall of a rinse tub;

Fig. 2 is a side elevational view of the same as viewed from the right in Fig. 1 with certain parts thereof broken away and shown in section;

Figs. 3 and 4 are each fragmentary front elevational views of the upper portions of the device of Fig. 1, but illustrating other modes of securing the unit to a tub wall;

Fig. 5 is a fragmentary front elevational view of the upper portion of a modified arrangement of the tub overflow;

Fig. 6 is a vertical transverse cross sectional view taken along the plane of the line 6—6 in Fig. 5;

Fig. 7 is another modified arrangement of the tub overflow shown in side elevation and as applied to a wall of a rinse tub;

Fig. 8 illustrates a modified arrangement of the invention showing means for combining the tub overflow apparatus with a drain opening in a tub that is located inwardly away from the walls of a tub;

Fig. 9 is a side elevational view of the unit shown in Fig. 7 but modified to illustrate a cupped end of resilient material to engage the tub bottom about the drain opening under the downward pressure of the flexible coupling in the overflow assembly;

Fig. 10 is a bottom view of the cup means shown in Fig. 9;

Fig. 11 illustrates another form of the invention as a variation of the idea shown in Fig. 8 using a single molded assembly that employs a suction cup valving means with a magnetic insert at one end, a hollow extension tube and an overflow chamber thereon, plus an over the tub connection to hold the other end of the assembly in place;

Fig. 12 is a horizontal cross sectional view taken substantially along the plane of the line 12—12 in Fig. 11;

Fig. 13 is a bottom view of the suction cup and its magnetic insert and a fragmentary part of the overflow extension tube; and

Fig. 14 is a fragmentary sectional view of the valving end of a flexible tube that may be embodied into the forms of the invention best shown in Figs. 7 and 9 having tapered drain ends at the valving portion of the tube, the instant example including a magnetic ring molded into the tube body to coact with the peripheral part of the drain opening to hold the tube end in place therein

Referring to Figs. 1 and 2, the tub overflow 1 comprises, in general, an apertured water intake housing 2, a drain tube 3 and a bracket or clamp 4 to secure the unit in a given relation with respect to the wall 5 of the tub 6 and in a given relation with respect to the tub drain fitting 7 that is provided with a drain opening 8. A connected drain hose 9 is secured to a nipple 10 formed on the fitting 7.

The housing 2 is constructed from resilient material such as synthetic or natural rubber and is formed into an elongated deformable body 11 having downwardly and inwardly tapered bottom portions or walls 12 and 13 that lead to a hollow depending boss 14 to tightly receive the upper end of the drain tube 3. The housing top wall 15 is generally flat and overlies the tapered bottom walls and such top and bottom walls are connected through rounded end walls 16 and 17. The housing 2 is completed with front and back walls 18 and 19 with a plurality of openings 20 being formed in the front wall or face 18 of the housing to establish a given overflow level for the entire overflow unit. Obviously, the openings 20 could be formed through the rear or back wall 19 if so desired. A plurality of ribs 21 are formed upon the front wall or face to flank the openings 20 and to provide means to prevent articles of clothing from moving over or against the

openings 20 to cut off or impair the drainage of overflow water into the standpipe or tub overflow 1.

The clamp 4 is made as a strap member in the form of an inverted U-shaped bracket having a leg 22 to carry one or more securing screws 23 and a connected leg 24 that flatly engages wall 5 as best shown in Fig. 2. Leg 24 includes an angular extension or ledge 25 that is molded into the top wall 15 of the housing 2 or which may be otherwise firmly secured to the top of the resilient body 11 if so desired.

In the particular form of clamp shown, two securing screws 23 are used and the bracket is made of wide stock material to provide good fastening stability for the entire assembly to contribute to the efficiency and continued operative manipulation of the standpipe arrangement. To further aid in establishing good attachment by the housing 2 to the tub 6, an abutment boss 26 is formed upon the rear wall 19 of the housing 2 to engage the tub wall 5. The screws 23 are made to react against wall 5 of the tub 6 at points that are vertically located intermediate the position of leg 24 of the bracket or clamp 4 and the position of the area of reaction of the boss 26 in its contact with the tub wall 5. This eliminates excessive tilt of the unit and provides an efficient and stabilized fastening arrangement for use in connection with a tub overflow such as shown at 1 and which is of a releasable and removable character.

The tub 3 is made of rigid material such as fiber, brass or other suitable rigid water resistant substance and terminates in a tapered end 27 that is shaped to seat against a tapered seat 28 formed in the fitting 7 thus valving off any possible drain or outflow of the rinse water that is normally carried in the tub 6. At the same time any excess water that rises to a depth extending above the line of openings 20 will run out through such openings and drain out of the fitting 7 into the drain hose 9.

With the arrangement installed as shown in Figs. 1 and 2, the tub may be drained by simply raising the end of tube 3 out of the fitting 7 and shifting the tube sideways or out of line with respect to the drain opening in fitting 7 into an inclined position resting upon the tub bottom such as shown by the dot and dash lines at 29 in Fig. 1.

The foregoing arrangement is a releasable and removable tub overflow control unit or apparatus that is made possible by the use of the tub engaging bracket or clamp unit 4. Fig. 3 shows an identical construction using a short leg 30 in place of the U-shaped bracket and having a pair of screw fastening assemblies 31 and 32 that secure the tub overflow in fixed position upon the tub wall 5. The screw fastening assemblies pass through appropriate openings in the wall of the tub and include any conventional type of water seal washers or other analogous means to prevent leakage at the fastening locations.

Fig. 4 shows an identical short leg bracket 33 which is spot welded at 34 and 35 to the tub wall 5. This form represents a permanent fastening bracket structure that could include a soldered or other appropriate union with the tub wall.

In the three forms discussed, the vertical location of the resilient housing 2 is such as to provide a certain amount of initial upward housing deformation to induce or transfer a given downward thrust on tube 3 for promoting and maintaining a better fluid seal between the tapered end 27 of tube 3 and the tapered seat 28 of the fitting 7. In the forms shown in Figs. 3 and 4 this can be well determined by gauges or jigs in attaching the housing securing brackets in a given position in vertical relation to the valving location of the tube and fitting. In the manual securing tub overflow arrangement of Figs. 1 and 2, the tube 3 can first be inserted into the fitting 7 and a slight downward pressure can be exerted upon the housing 2 or bracket 4 before the screws 23 are tightened against the outer surface of wall 5 of the tub 6. In this latter form it is possible to vary this pressure upon tube 3 if desirable, but for all intents and purposes, a slight downward pressure should be sufficient to hold the tube 3 in operative seated engagement upon the wall surface of the seat of the fitting 7.

Referring now to Figs. 5 and 6, this form of the invention shows a resilient housing 36 having a row of fluid openings 37 flanked by ribs 38 and 39. A bracket 40 is secured to the top wall 41 of the housing to position and orient the entire tub overflow unit while the tube 42 (like tube 3) is secured to the boss 43 attached to the bottom flexible wall portions 44 and 45 of the housing 36. This housing bottom is adapted to readily flex upwardly to accommodate the movements of the tube 42 for opening or closing the tub drain opening to draw off the tub water or to retain such water as the case may be. The flexing structure of the housing 36 also provides the means to induce the initial axially directed working pressure upon tube 42 to induce proper seating of the tube into the tub drain opening seating arrangement.

The housing 36 in Figs. 5 and 6 further includes one or more spring metal or resilient insert straps such as 46 and 47 to augment the action of the resilient housing material from which the body of the housing 36 is fabricated.

In Fig. 7, another modified form of tub overflow is illustrated that includes similar standpipe apparatus using a somewhat different combination of resilient and rigid elements to obtain the same general results previously explained. This apparatus comprises two rigid overflow tubes 48 and 49 connected by a hollow flexible coupling 50 made from a suitable shape retaining, but deformable material. The coupling 50 is constructed as a bellows unit to flex laterally and out of line or away from a normal vertical axial position and to also be capable of vertical axial contraction and expansion. The coupling 50 has two end sleeves 51 and 52 to tightly receive the tubes 48 and 49 which can be cemented or otherwise secured to the coupling as by means of molding or the like.

As further shown, tube 48 has a screened or otherwise shielded top such as 53 and the upper terminal end of tube 48 provides a given high water level limit in the tub 54. A band 55 encircles tube 48 and connects with a bracket 56 that fastens to the tub wall by means of screws 57 or the like. Tube 49 terminates with a tapered end 58 to fit into an annular seat 59 formed into a drain opening or fitting 60 projecting through the bottom 61 of the tub 54. The tapered end 58 of tube 49 may include an annular resilient tapered sleeve 62 to provide a better sealing arrangement and a sleeve that can be replaced from time to time if such procedure is deemed necessary.

Fig. 8 shows an arrangement using any one of the standpipe structures described such as the one illustrated in Fig. 7, for example, in combination with an auxiliary drain conduit 63 that has a discharge spout 64 fitting into the tapered tub drain annulus 65 and which conduit presents an upwardly positioned inlet funnel 66 having a tapered seat 67 to accommodate the lower tapered end 58 of the standpipe unit pipe or duct such as 49. The drain conduit may be cemented or otherwise secured to the bottom 68 of the tub 69. This type of a drain means can be employed to accommodate any one of the tub overflow units under conditions wherein the tub drain opeining is remote from any one of the tub walls such as 70. Otherwise the functions and operations of the overflow units are the same.

In Figs. 9 and 10, the tube 49*a* of the standpipe assembly equipped with a flexible cup 71 having a sleeve 72 to securely receive tube 49*a* and a disc shaped bottom 73 to engage the bottom wall of the tub 54 in an area surrounding the drain opening in the drain conduit 74. Thus with the downward pressure of the expandible coupling 50 and the sealing action of the cup 71, the tub drain conduit can be held well sealed. A lift on tube 49*a* and a shift to one side will open the tub drain conduit to drain out tub water.

Referring to Figs. 11 to 13, this arrangement com-

prises a flexible overflow in the form of a single molded unit consisting of a retaining hook **75**, an overflow head **76**, an extension tube **77** and a valve **78**. The tub **79** has a side wall **80** and a bottom **81** provided with a drain spout **82**. The head **76** contains the overflow holes **83** to carry off excess water. The hook **75** that orients the overflow means may include a resilient metal spring member **84**.

The valve **78** is a combination member having a suction cup **85** with a depending sleeve **86** to fit into the opening of spout **82** as an orientation means, and a magnetic ring **87** is carried by the unit to engage the tub bottom surrounding the spout **82**. A downward pressure on top of valve **78** will set the cup with sleeve **86** in the spout and also cause contact of the magnetic ring with the tub to hold the valve in operative relation to the spout **82**.

In the construction illustrated in Fig. 14, the tube **49*b*** replaces such tubes as **49** or **49*a***, and tube **49*b*** is made from a flexible material tapered at **88** to fit into a tapered drain spout **89** and includes a magnetic ring **90** to provide securement means for retention of the tube end within the spout **89** of a tube **91**.

While the dsecription and disclosures accompanying the same have been directed to certain preferred constructions of the present invention, certain changes in the individual elements thereof or in their combinations may be contemplated without departure from the fundamental concept of the invention presented. The extent of such modifications shall, however, be governed by the breadth and scope of the language of the appended claims or claims directed to the tub overflow apparatus of the present invention.

What I claim is:

1. A tub overflow comprising, in combination, a tub having a drain opening, a fluid inlet housing, securing means to attach said housing in fixed vertical relation to said tub, an overflow duct means having one end removably connected to the tub drain opening to prevent tub water drainage out of said tub, and movable means on said housing to suspend said duct means and to permit relative movement of said duct means with respect to said housing and to the tub.

2. A tub overflow aparatus to maintain a predetermined maximum water level in a tub comprising, in combination, a tub having a drain opening therein, and a standpipe structure fixedly secured to said tub presenting overflow openings at a given elevation in said tub and providing valving means seated in said tub drain opening to prevent loss of the water normally carried in said tub, said standpipe structure including vertically shiftable means comprising a part of the overall length of said structure and being connected with said valving means to provide for the selective opening and closing of said drain opening by upward displacement of said valving means relatively to said tub.

3. A tub overflow apparatus to maintain the water in a tub below a predetermined maximum level comprising, in combination, a tub having a bottom drain opening therein, a vertically positioned hollow apparatus having one end thereof seated in said drain opening in said tub and having overflow inlet openings for disposition at a given elevation within said tub, a securing means to normally hold said apparatus in a given relation with respect to said tub and to said drain opening, and resilient means constituting a part of the length of said hollow apparatus and functioning to permit withdrawal and displacement of said one end of said hollow apparatus from the tub drain opening.

4. A tub overflow apparatus comprising, in combination, a tub having a drain opening therein, a hollow overflow unit having a discharge duct member seated in said drain opening to counteract loss of the tub water, an inlet housing member for said duct having openings therein to form the high water overflow level for said tub, one of said members being constructed from resilient material to permit withdrawal of said duct member from within said drain opening, and attachment means to secure said hollow overflow unit in a given relation within said tub.

5. A tub overflow apparatus comprising a tub having a drain fitting, a deformable housing having openings therein to receive excess tub water, a bracket member connected with said housing and having fixed connection with said tub, and a drain tube connected with said housing and seated in said tub drain fitting to prevent leakage of normally carried tub water through said fitting, said deformable housing comprising means to permit withdrawal of said tube from said drain fitting of the tub to empty said tub.

6. In a tub overflow apparatus of the kind set forth in claim 5 wherein said deformable housing is constructed from resilient material and wherein metallic spring means are used in combination with said resilient material to augment the resiliency and effectiveness of such deformable housing.

7. A tub overflow apparatus comprising, in combination, a tub having a drain opening therein, a hollow overflow unit having a discharge duct member seated in said drain opening to counteract loss of the tub water, an inlet housing member for said duct having openings therein to form the high water overflow level for said tub, one of said members being constructed from resilient material to permit withdrawal of said duct member from within said drain opening, and attachment means to secure said hollow overflow unit in a given relation within said tub, said one resilient member being constructed and arranged for compression and expansion in a direction toward or away from said tub drain opening, and said attachment means being adapted for fixed connection with said tub at a given elevation above said drain opening of the tub to induce a given initial reaction into the resilient member to transmit such pressure to said duct member to aid in normally seating said duct member within the drain opening in said tub.

8. A tub overflow mechanism comprising, in combination, a tub, a drain fitting in said tub, and an overflow unit for said tub arranged to discharge excess water through said tub drain fitting comprising a water inlet housing, a drain tube depending therefrom for insertion into the drain fitting to prevent loss of the water normally carried in said tub, and a bracket connected with said housing and adapted for securement to said tub, said bracket being connected with the top portion of said housing and said tube being connected with the bottom portion of said same housing whereby axial shifting of said tube is permitted by the deformation of said housing to lift the tube out of said fitting to drain the tub, said housing also providing means to incline said tube for angular repose against the tub bottom adjacent said drain fitting.

9. In a tub overflow as defined in claim 8 wherein said housing is an elongated body structure having relatively thin walls with said drain tube connected centrally thereof for greater vertical and lateral flexing of said body structure, and said body structure being provided with a plurality of aligned openings for determining the high water level of said tub, said body structure including ribs thereon to flank said openings and to prevent blockage of said openings by articles carried in said tub water.

10. A tub overflow apparatus comprising a pair of duct members, one of said members having bracket means to attach said member to a tub, the other of said duct members having a tapered end to seat in a drain opening in said tub, and a universally resilient coupling interposed between said members to permit relative axial movement between said two members and lateral displacement of one of said members relatively to the other member thereof.

11. An overflow standpipe structure for a tub having a drain opening located remotely from one tub wall comprising a vertically arranged overflow unit connected with said tub, means to secure said unit to said tub wall, a laterally arranged conduit carried adjacent the tub bottom and having a discharge spout seated in the tub drain opening, an upwardly formed funnel on said conduit positioned adjacent said tub wall, and said overflow unit having one end thereof seated in said conduit funnel, said overflow unit including vertically contractible and extensible means to permit withdrawal or seating of said one end of said overflow unit in respect to said funnel.

12. A tub overflow comprising, in combination, a tub, a fluid inlet housing, securing means to attach said housing in fixed relation to said tub, and an overflow duct means movably connected with said housing and having one end removably seated in the tub drain opening to prevent tub water drainage out of said tub, said one end of said overflow duct means having a magnetic unit thereon to engage the tub drain to aid in holding the end of said duct means seated.

13. A tub overflow apparatus comprising an overflow housing, bracket means to support said housing in a given relation to a tub, and conduit means connected with said housing and terminating in the vicinity of the tub drain spout, resilient means to urge said conduit means toward said spout, and a resilient cup element carried by said conduit means to engage the tub area about said spout to seal off the latter.

14. A tub overflow apparatus comprising hollow means providing overflow openings at a given level within said tub, a support to maintain said hollow means at the selected position, and valve means connected with said hollow means and adapted for sealing off the tub drain spout, said valve means including a magnetic member to engage the tub and to maintain said valve means in its operative position in relation to said drain spout.

15. A tub overflow apparatus comprising hollow means providing overflow openings at a given level within said tub, a support to maintain said hollow means at the selected position, and valve means connected with said hollow means and adapted for sealing off the tub drain spout, said valve means including a magnetic member to engage the tub and to maintain said valve means in its operative position in relation to said drain spout, said valve means comprising a suction cup unit to seat upon the tub in a position surrounding the drain spout opening, said magnetic member being connected to said suction cup unit to aid in holding said cup in sealing position against the tub.

16. A tub overflow apparatus comprising hollow means providing overflow openings at a given level within said tub, a support to maintain said hollow means at the selected position, and valve means connected with said hollow means and adapted for sealing off the tub drain spout, said valve means including a magnetic member to engage the tub and to maintain said valve means in its operative position in relation to said drain spout, said valve means comprising a hollow valve element communicating with said hollow means, said valve element being constructed of resilient material, and said magnetic member being connected with said valve element and functioning to hold the same in sealing contact in relation to said tub drain spout.

17. An overflow apparatus to control fluid drainage out of the drain opening of a fluid tub comprising a tubular structure having a valve end seated in the drain opening in the tub, said structure including a section having overflow apertures therein arranged at a given elevation above said valve end of the structure, securing means adapted for connection with the tub and having connection with a selected part of said tubular structure to fix said part of said structure in a given relation with respect to the tub and to the drain opening therein, and shiftable means interposed between said selected fixed part of said tubular structure and said valve end of said structure to permit selective withdrawal and replacement of said valve end of the structure with respect to said tub drain opening.

18. An overflow apparatus as in claim 17 wherein said securing means and the connected selected part of said structure include said structure section having said overflow apertures therein.

19. An overflow apparatus as in claim 17 wherein said shiftable means consists of a deformable element provided to normally urge said valve end of said tubular structure into closing position with said drain opening of said tub at all times when said element assumes its normal undeformed shape.

20. An overflow apparatus as in claim 17 wherein said shiftable means comprises a resilient member having vertically flexing motion in a direction toward and away from said tub drain opening, and said member being arranged for angular flexing motion to permit lateral swinging of said valve end of said tubular structure whereby to move said valve end laterally out of line with said tub drain opening upon retraction of said valve end therefrom.

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