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G. A. MORTHLAND
SHOWER PAN CONSTRUCTION

2,484,240

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2 Sheets-Sheet 1

Fig. 1.

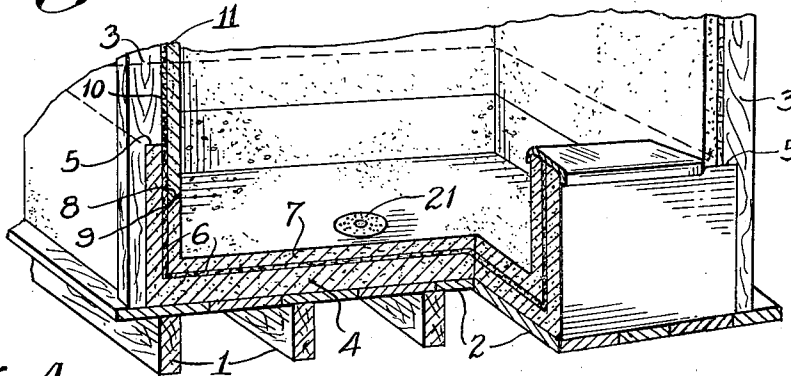


Fig. 4.

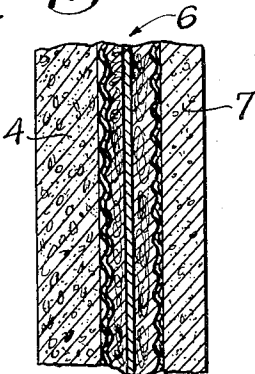


Fig. 3.

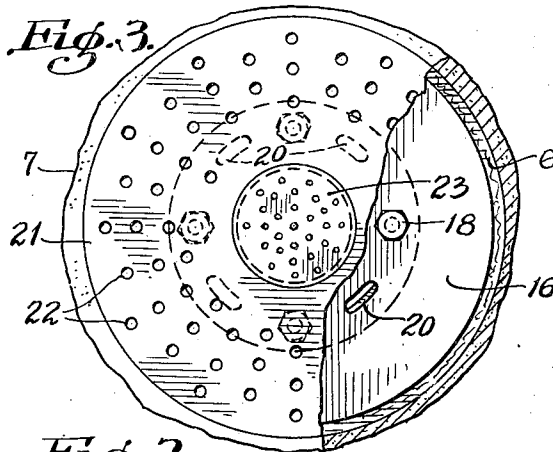


Fig. 5.

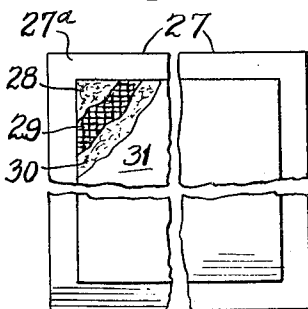
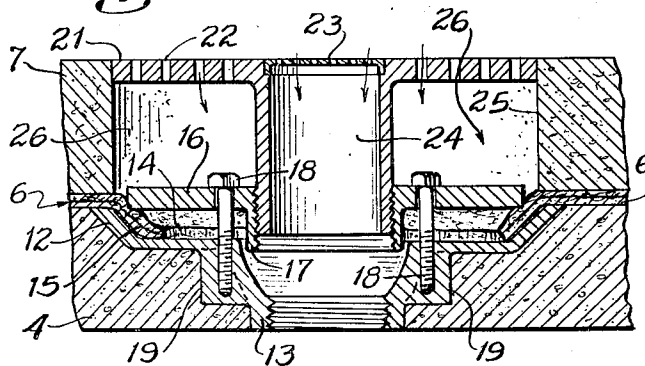


Fig. 2.



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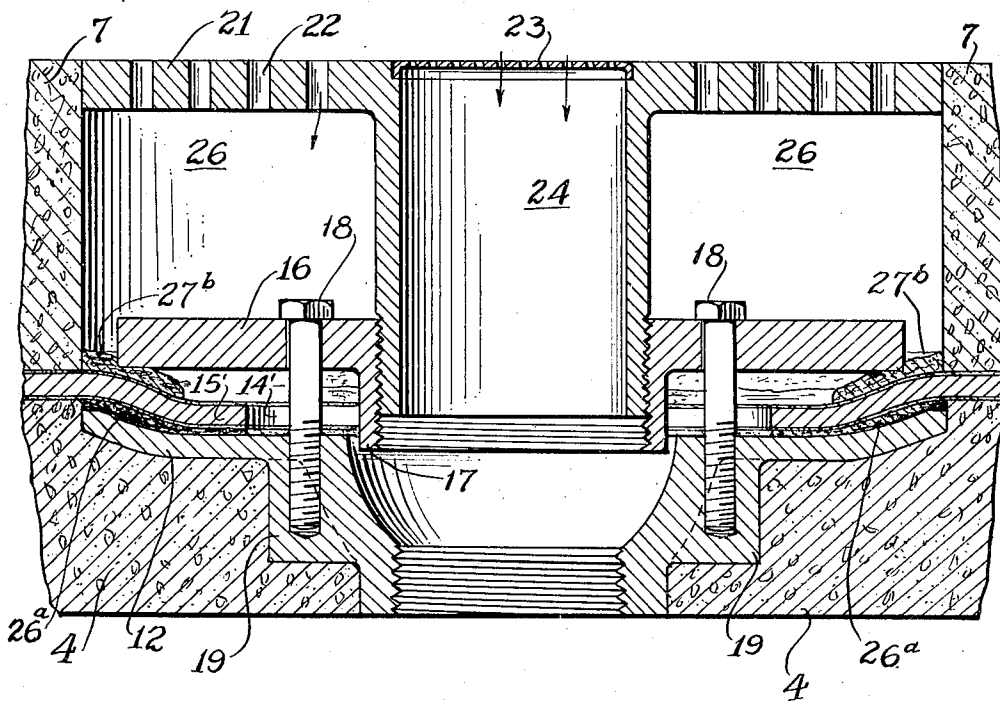
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Fig. 6.



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SHOWER PAN CONSTRUCTION

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6 Claims. (Cl. 4-146)

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This invention relates to shower bath construction, and particularly to the construction of the shower pan.

In my patent No. 2,239,969 I have described a waterproof composition shower pan to replace metal pans theretofore employed in the construction of shower baths such as stall showers. In such construction the composition shower pan was placed on the sub-floor and the usual coating of cement or tile was placed on top of the pan and a sub-drain placed in the floor.

As is well known mortar or concrete is not waterproof and seepage of water through the concrete may readily occur. Additionally, it is subject to cracking due to settling of the house or other structure or to other mechanical shocks.

I have now devised an improved construction which gives a greater assurance against leakage or seepage around the sub-drain or through any cracks or fissures which may be generated in a cement or tile floor laid over the shower pan.

I have devised an improved composition shower pan. The shower pan is constructed by mounting a cement box on the sub-floor. The box has an intermediate layer of asphalt, tar or water impervious plastic, thus forming in effect a composite box of two nesting sections separated by a water impervious diaphragm. Instead of using a layer of asphalt I may and preferably do employ the composite sheet such as is disclosed in the patent referred to above. While I prefer to employ such asphaltic or plastic intermediate barrier layers, I may employ, to obtain some of the advantages of my invention, other types of barrier such as lead sheets or copper sheet, or other corrosion resistant material.

I have also devised a new and useful manner of mounting the sub-drain when employing my novel construction of a shower bath floor and my improved composition shower pan.

The shower bath construction according to my invention is formed by casting or otherwise forming or mounting a mortar or cement or tile box upon the sub-floor or joists. Provisions are made in such box to pass the drain for the shower bath. In the box forming the floor of the shower bath is positioned a layer of asphalt or composition shower pan to form the water impervious diaphragm. This material may be brushed or sprayed onto the interior of the outer box. Thus, when employing asphalt or coal tar, the hot molten asphalt or tar may be mopped onto the interior of the outer box.

A second layer of concrete, mortar, or tile is formed on the interior of the first-mentioned

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box. The second box is also provided with a hole in registry with the hole in the outer box to accommodate the drain. There is thus formed a concrete tile or mortar box containing an intermediate layer of water impervious material which forms a water impervious diaphragm.

Instead of employing a coating of asphalt or tar to form the intermediate diaphragm I may employ a pre-formed shower composition shower pan such as described in my Patent No. 2,239,969. In that patent I have described a composite shower pan formed of layers of felt, burlap, and asphalt encased in paper or other material for convenience of handling and folded and formed into a box-like structure which may then act as a shower pan. Such form of shower pan may be employed in my present invention. After forming the outer box and either before or after the concrete or mortar has set or cured, I may then insert the composition shower pan and then cast or otherwise form the inner concrete or mortar box into the inserted shower pan. I may separately form the inner box of concrete or mortar or tile. It may then be set in place. The composition shower pan is then placed in position, provisions being made for the sub-drain by cutting the necessary registering holes in the several elements of the floor. The inner tile, concrete or mortar box may be separately formed and the formed box may then be set within the composite shower pan.

By employing the composition shower pan and the sub-drain element hereinafter described I am also enabled to form a water-tight seal around the sub-drain element. To accomplish this purpose the composition shower pan is employed as a sealing member for the inserted sub-drain. By this method I solve one of the great troubles encountered heretofore in using inserted sub-drains in shower bath floors. It is common experience that cracks develop around the edge, the inserted sub-drain causing water seepage through the shower bath floor. By my method I insure a seal which avoids this difficulty.

This and other objects are accomplished by the construction which will be hereinafter described in connection with the figures, in which

Fig. 1 is an isometric assembly showing a partly broken away section of the construction;

Fig. 2 is a section taken through the sub-drain showing the method for sealing the sub-drain into the floor;

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Fig. 3 is a plan view partly broken away showing the elements of the sub-drain;

Fig. 4 is an enlarged section showing the impermeable diaphragm construction;

Fig. 5 is a part broken away showing the sheet of composition to be folded into a box or pan to be inserted into the shower pan of my invention; and

Fig. 6 shows a modification employing a metallic diaphragm.

In Fig. 1, 1 is the joists supporting the sub-floor 2; 3 is the studding or framing of the shower bath. The shower pan floor is formed by casting or otherwise forming a cement or mortar or tile box 4 which is set upon the sub-floor 2 and recessed in the studding as shown at 5. This pan may be cast in place or may be separately prefabricated for insertion. The box 4 may also be formed in sections for assembly on the job.

The water impermeable diaphragm 6 may be formed as previously mentioned or as hereinafter described. This impermeable diaphragm is encased and supported by box 4 and its walls carry up to the top 5 of box 4. The inner box 7, also formed of concrete or mortar or tile, is set upon the impermeable diaphragm 6 but the contiguous walls of the box 7 and diaphragm 6, except at the front end thereof, are not as tall as the walls of the outer box 4 or the diaphragm 6, as is seen at 8. The wall 8 is preferably beveled inwardly as shown at 9. The laths 10 are carried down to the top 5 of the wall of box 4. It is preferable that the surface of the diaphragm 6 be a substantial continuation of the surfaces of the laths 10 so as to permit a plaster or tile coat 11 to be placed on the walls of the shower bath down to the top 8 of inner box 7. The surface 11 then forms a continuous wall surface with the inner wall of the box 7. The described wall construction of the stall shower applies to the side and back walls. As usual in stall showers, the front of the shower stall is open and means are provided for hanging a curtain or door on such open portion. The front of the box thus acts as a sill or guard. The continuous walls of the outer and inner boxes 4 and 7 and the diaphragm 6 are of equal height at the front portion and may be capped as shown to give a pleasing appearance and also to prevent water seeping in between the boxes and the diaphragm. As will be seen, the boxes 4 and 7 are independent of the side walls or the sub-floor of the shower stall in that they are a separate unit apart from the walls or sub-floor. However, the walls of the boxes may be joined to the walls of the stall by the usual construction procedure, such as by tiling or by plaster, etc.

The box 4 carries a drain cup 12 which may be positioned in the mortar or concrete of box 4 before it is set. The cup 12 carries a threaded nipple 13 to which is attached a drain pipe. The composite shower pan when employed as the water impervious diaphragm 6 has a hole 14 cut in the diaphragm of such diameter as to leave an overlap 15 which is tucked into the cup 12.

A plate 16 carrying a depending nipple 17 is held in place by bolts 18 screwed into bosses 19 provided underneath the cup 12. The plate 16, bearing against the overlap 15, makes a tight seal between the underneath side of the overlap 15 and the interior of the cup 12. Due to the plasticity or give of the composite shower pan 6 (for example, that shown in Fig. 5) a water-tight seal between 12 and 15 is thus formed. Means are thus provided for clamping the overlap at the

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edge of the hole in the outer box to seal the surface of contact between 6 and 4 at the edge of the hole in 4. This, as has been stated, prevents any seepage of water between the box 4 and pan 6. The drawing down of the plate 16 by the bolts 18 will not only clamp the pan 6 against the edges of the hole in 4 but also, due to the plasticity and give of the pan 6, will wedge against the contiguous edge of the hole in 7 to seal the edge against passage of water between the underneath side of 7 and the contiguous surface of the pan 6. If desired, in order to assure such water-tight seal the underneath side of the overlap 15 or the interior of the cup 12 at the overlap may be coated with asphalt, tar, or plastic cement impervious to water. The plate 16 carries drain holes 20 for the purposes to be hereinafter described. A drain plate 21 carrying perforations 22 and a removable perforated clean-out plate 23 is carried on plate 16 by means of the nipple 24.

The inner box 7 has a hole 25 of a diameter equal to the plate 22 to form a chamber 26. Water run-off from the floor of the shower bath passes through the perforated plate 23 into the nipple 24, from nipple 24 into the interior of the cup 12, and into the drain 13. Run-off may also pass through perforations 22 into chamber 26, through openings 20 into the interior of the cup 12, thence through the drain pipe 13. The edges of 14 and 17 are sufficiently spaced to prevent accumulation of water under plate 16.

While a specific and highly useful form of sub-drain has been described above, my invention may be employed with various forms of sub-drains. Such sub-drains are particularly useful in any invention if the overlap 15, as described above, may be sealed into the sub-drain to form a water-tight joint to produce the functions described above.

In forming the composite floor according to my invention, the boxes 4 and 7 may be cast in place or be separately prefabricated. In either case the box is sturdy with considerable mechanical strength sufficient in itself to form a structural member of the stall shower, as, for instance, to form the continuation of the wall 11 and to add to the supporting power of the joists 3. The water impervious coat may be applied on the job by mopping in the asphalt or tar, as has been indicated, or, preferably, by employing the composite shower pan previously described. In utilizing the composite shower pan, I have found the following method of construction of the shower pan to be preferred.

I lay a sheet of paper such as kraft paper or ordinary wrapping paper 27. Upon sheet 27 I lay a sheet of asphalt impregnated roofing felt 28 so as to leave a strip 27a at the edge which may be folded over, as will be described below. On top of the asphalt saturated felt 28 I lay a layer of burlap 29. I then mop the burlap with hot asphalt so that it will saturate the burlap and seep between the burlap 29 and felt 28 and coat the surface of 28 as well as the burlap 29. For this purpose I use a road oil or coal tar or cut-back asphalt or an asphalt of relatively low melting point. On top of the asphalt coated burlap and before the asphalt is cool enough to become viscous or tacky I lay a sheet of asphalt impregnated felt 30 similar to the sheet 28. The sheet 28 and burlap 29 and sheet 30 are all of the same size and are so positioned as to leave the edge 27a previously referred to. Upon the 75 sheet of felt 30 is placed a sheet of paper 31 of

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the same size. The strip 27a is coated with asphalt or other cementing material, such as rubber latex or plastic cement and the edge 27a is laid over to overlap the sheet 31. As a result of this construction the asphalt saturated burlap is cemented between two layers of asphalt impregnated roofing felt by a thin coat of asphalt or tar, as distinguished from a relatively thick layer of plastic material. The thin coat, just sufficient to coat the burlap and the adjacent layers of roofing felt, gives a lighter bond and a better seal between the layers. Such a composition will have superior water resistant properties and will be a better barrier to water seepage. A hole 14 is then cut in the center of the sheet as previously described. The four ends of the composite sheet are then creased to form a pan or box for insertion into the shower floor as previously described.

If it is desired to ship this pan for erection on the job, the edge 27a may be folded over to form a flat sheet and the sheet suitably creased to form a box or pan but the upright wall of the pan folded over to form a flat sheet, as is shown in my above mentioned patent, for ease of shipment. The pan 6 is then formed on the job by unfolding the creases to reconstitute the pan. It is nested into the outer box and the inner box placed or nested into the pan 6 as described above.

As has been stated above, I may employ a metallic diaphragm formed of copper, lead, or galvanized iron or other suitable metal. The metal diaphragm or pan may be formed as by stamping to fit inside the box 4 (see Fig. 6). A suitable drain hole 14' similar to 14 is provided to register with the drain hole in 4. An overlap 15' is also provided so that it may fit between 16 and 12 similar to the overlap 15. The overlap is dishd to fit snugly against the cup 12. I also coat the metallic diaphragm with asphalt or tar so that an asphalt layer separates the metallic diaphragm from 4 and from 7. This protects the metal from corrosion by the box 7 or 4. This feature is of considerable importance, particularly if the boxes are formed of cement or other corrosive material. It also prevents any electrolytic corrosion of the metal. The asphalt coating also permits of a seal at the edges of the holes in boxes 7 and 4.

The asphalt layer is also placed on both sides of the overlap. Additional protection against corrosion is also provided by setting a felt washer 26a or an asphalt or tar-saturated asphalt washer 26a between the overlap and the cup 12, and, if desired, an additional like washer 27b between the overlap and the plate 16. This reduces the corrosion which may occur at this point either in the diaphragm or in the plates 12 and 16.

Where I employ a composite pan described above and illustrated in Figs. 2, 4, and 5, the separation of the plate 16 from the cup 12 by the composite pan protects the plate 16 and cup 12 against corrosion which is present due to the contact of the plate 16 and cup 12.

While I have described a particular embodiment of my invention for the purpose of illustration, it should be understood that various modifications and adaptations thereof may be made within the spirit of the invention as set forth in the appended claims.

I claim:

1. A composite shower pan for a shower stall forming a floor therefor, which comprises an outer box independent of the walls of the stall, an inner box independent of the walls of the stall and adapted to be joined thereto, a water

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impermeable diaphragm between said boxes, said boxes and diaphragm having a drain hole there-through, and a drain fixture disposed in said hole.

2. A composite shower pan for a stall shower, which comprises an outer box adapted to be mounted in a stall shower, a drain hole in said box, a water impermeable diaphragm formed into a box adapted to nest inside said first mentioned box, said diaphragm being composed of a plurality of sheets of asphalt impregnated felt and an intermediate layer of asphalt saturated burlap cemented to said felt sheets, a hole in said diaphragm in registry with, but of diameter less than, said first mentioned hole so as to provide an overlap, an inner box nesting with said diaphragm, a drain hole in said inner box in registry with said first mentioned hole of a diameter greater than said hole in said diaphragm, and a sub-drain in said holes comprising means for clamping said overlap at the edges of said first mentioned hole to seal the surfaces of contact of said outer box and said diaphragm at the edges of said first mentioned hole.

3. A composite shower pan for a stall shower, which comprises an outer box adapted to be mounted in a stall shower, a drain hole in said box, a water impermeable diaphragm formed into a box adapted to nest inside said first mentioned box, said diaphragm being composed of a plurality of sheets of asphalt impregnated felt and an intermediate layer of asphalt saturated burlap cemented to said felt sheets, a hole in said diaphragm in registry with, but of diameter less than, said first mentioned hole so as to provide an overlap, an inner box nesting within said diaphragm, a drain hole in said inner box in registry with said first mentioned hole, of a diameter greater than said hole in said diaphragm, and a sub-drain in said holes comprising means for clamping said overlap at the contiguous edges of the holes in said inner and outer boxes to seal the surfaces of contact of said inner and outer boxes and said diaphragm at the contiguous edges of said holes in said boxes.

4. A composite shower pan for a stall shower, which comprises an outer box adapted to be mounted in a stall shower, a drain hole in said box, a water impermeable diaphragm formed into a box adapted to nest inside said first mentioned box, said diaphragm being composed of a plurality of sheets of asphalt impregnated felt and an intermediate layer of asphalt saturated burlap cemented to said felt sheets, the walls of said outer box and said diaphragm adapted to align with the wall of said stall shower and being substantially equal in height, a hole in said diaphragm and registering with, but of a diameter less than, said first mentioned hole so as to provide an overlap, an inner box nesting in said diaphragm, the walls of said inner box being shorter than the contiguous walls of said outer box and said diaphragm where they are adapted to align with the walls of the stall shower and substantially equal to the other wall of said boxes and diaphragm, a drain hole in said inner box in registry with said first mentioned hole of a diameter greater than said hole in said diaphragm, and a sub-drain in said holes comprising means for clamping said overlap at the contiguous edges of the holes in said inner and outer boxes to seal the surfaces of contact of said inner and outer boxes and said diaphragm at the contiguous edges of said holes in said boxes.

5. A composite shower pan for a shower stall forming a floor therefor which comprises an

outer box adapted to be mounted in a shower stall, the box having a drain hole in its bottom, a metallic water impermeable diaphragm formed into a box nesting inside the first mentioned box, the diaphragm having a hole in registry with the first mentioned hole, an inner box nesting in said diaphragm having a drain hole in registry with the other holes, and drainage fixtures disposed in said holes.

6. A composite shower pan for a shower stall forming a floor therefor, which comprises an outer box independent of the walls of the stall, an inner box independent of the walls of the stall and adapted to be joined thereto, an asphalt coated metallic diaphragm nested between said boxes, said boxes and diaphragm having registering drain holes therethrough, and drain fixtures disposed within said holes including means for clamping said diaphragm at the contiguous edges of the holes.

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