May 7, 1940. A. H. HABERSTUMP 2,199,792

DRAIN ASSEMBLY FOR WASHING MACHINES AND THE LIKE

Filed June 29, 1937 3 Sheets-Sheet 1

Fig. 1.

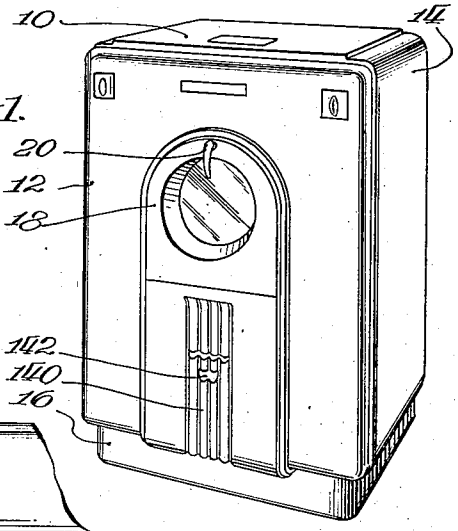
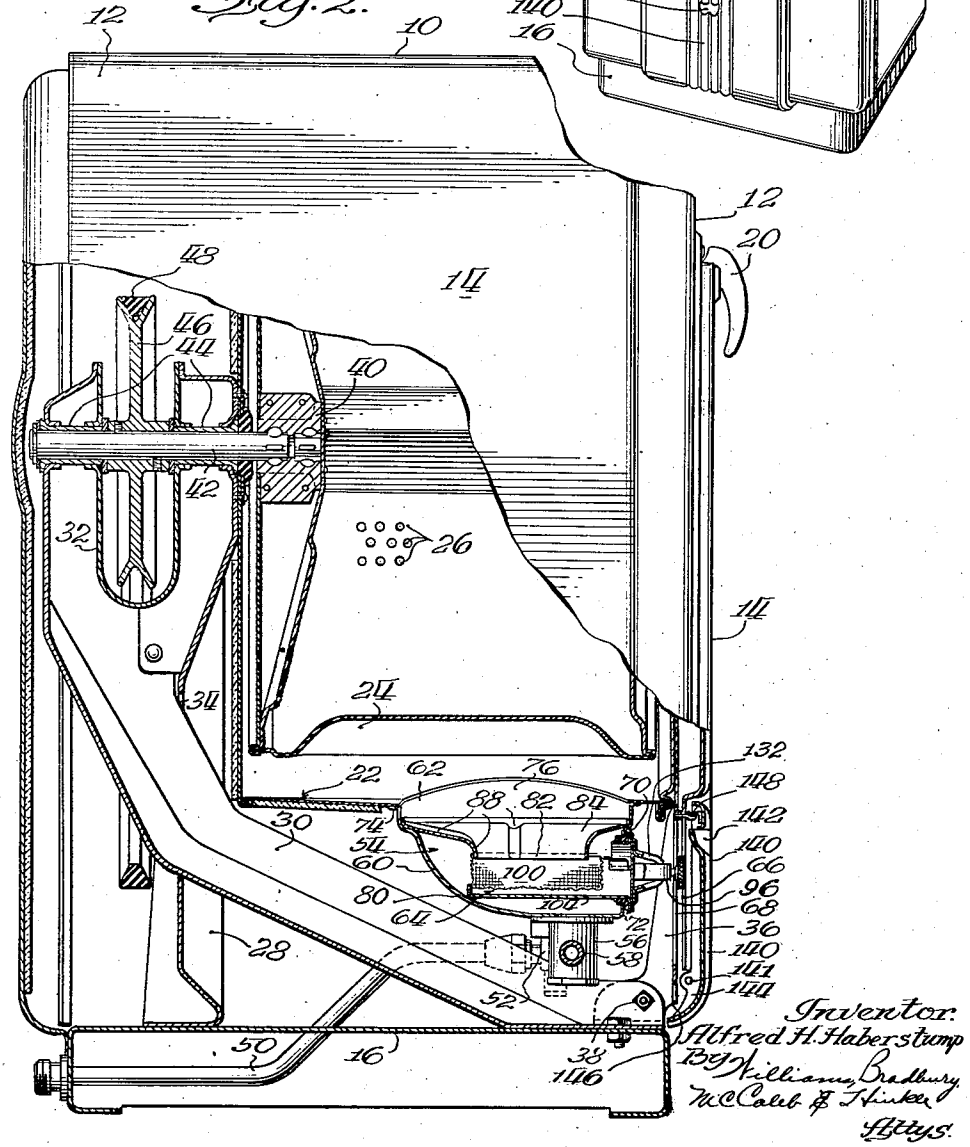


Fig. 2.



Inventor:
Alfred H. Haberstump
By Williams, Bradbury, McCaleb & Hinkle
Attys.

May 7, 1940. A. H. HABERSTUMP 2,199,792

DRAIN ASSEMBLY FOR WASHING MACHINES AND THE LIKE

Filed June 29, 1937 3 Sheets-Sheet 2

Fig. 3.

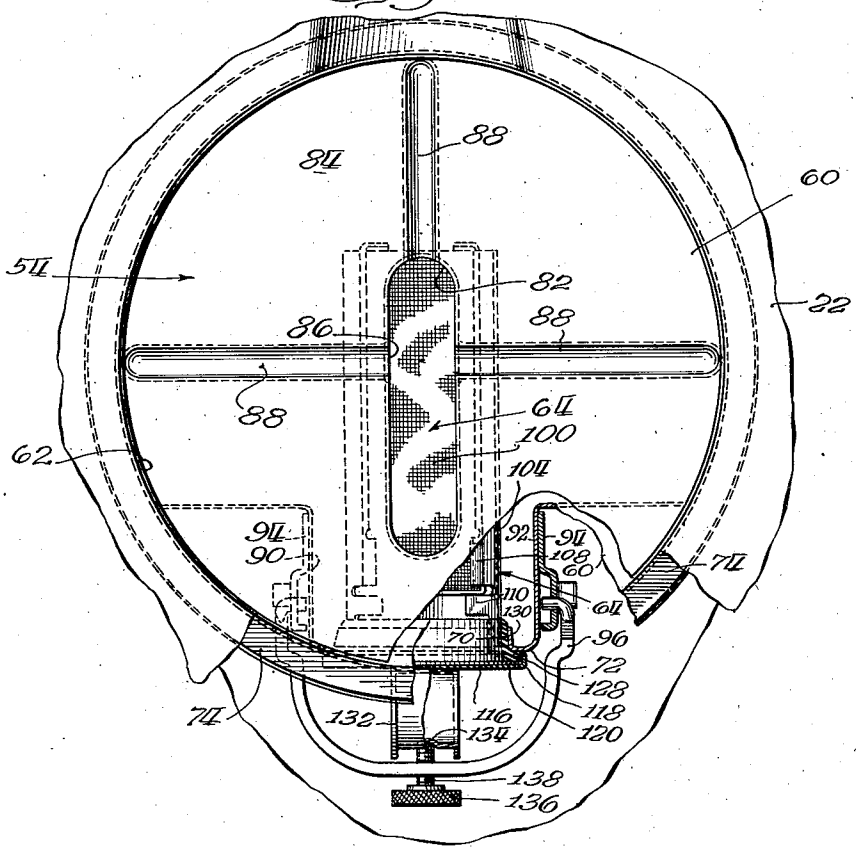
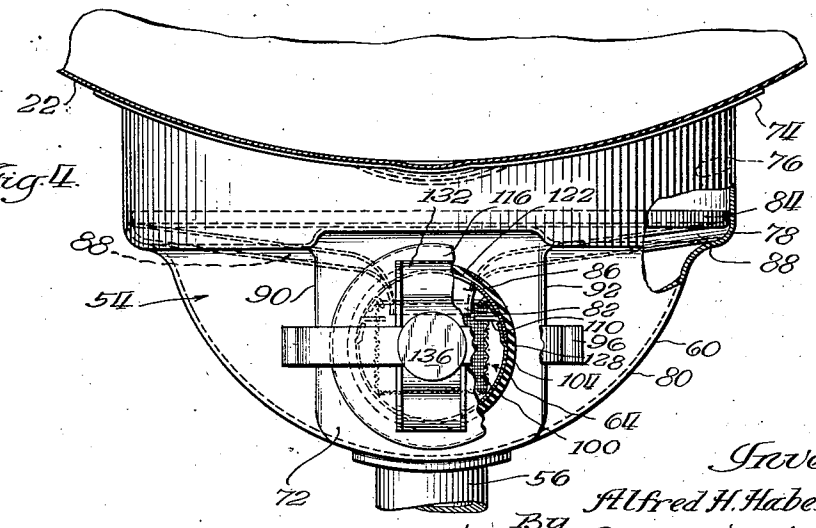


Fig. 4.



Inventor
Alfred H. Haberstump
By
Williams, Bradbury, McCaleb & Hinkle
Attys.

May 7, 1940. A. H. HABERSTUMP 2,199,792

DRAIN ASSEMBLY FOR WASHING MACHINES AND THE LIKE

Filed June 29, 1937 3 Sheets-Sheet 3

Fig. 5.

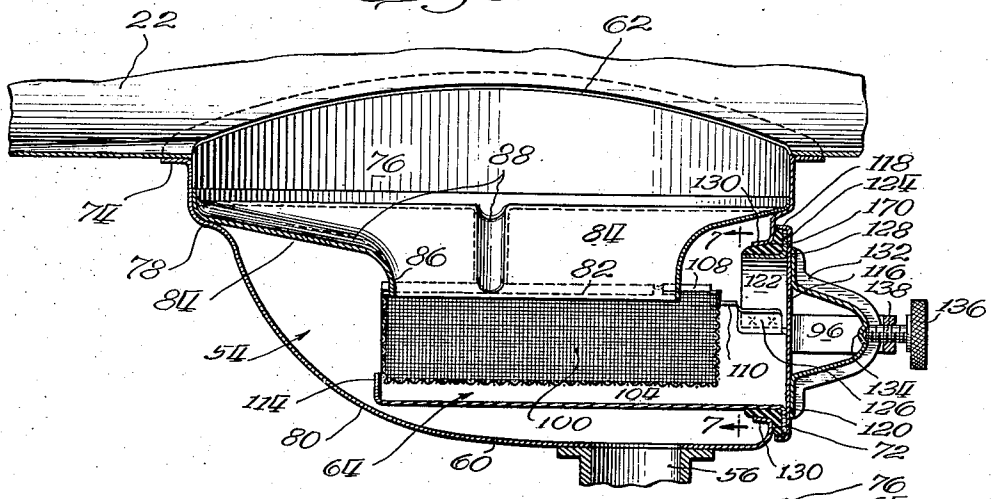


Fig. 7.

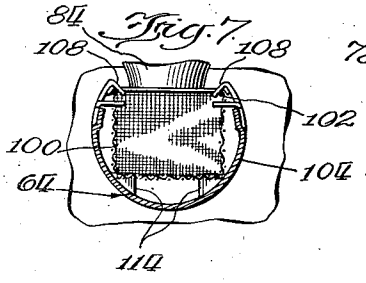


Fig. 6.

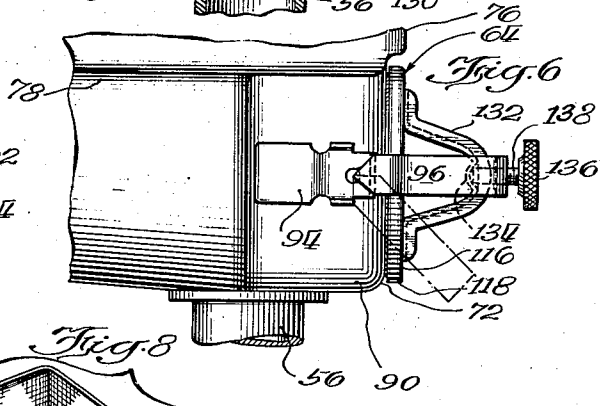
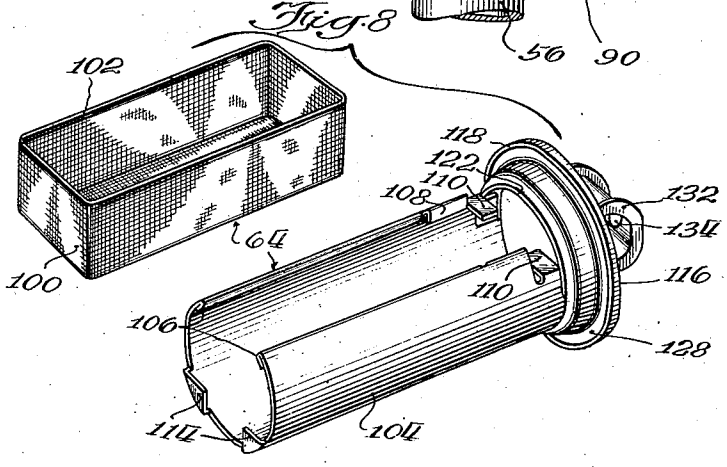


Fig. 8.



Inventor:
Alfred H. Haberstump
By Williams, Bradbury, McCaleb & Hinkle
Attys.

Patented May 7, 1940 2,199,792

UNITED STATES PATENT OFFICE

2,199,792

DRAIN ASSEMBLY FOR WASHING MACHINES AND THE LIKE

Alfred H. Haberstump, Detroit, Mich., assignor, by mesne assignments, to Bendix Home Appliances, Inc., Detroit, Mich., a corporation of Delaware

Application June 29, 1937, Serial No. 150,945

12 Claims. (Cl. 210—149)

The present invention relates to improvements in a drain assembly for washing machines and the like, and particularly to those of the type disclosed in the contemporaneously filed application of Everett W. Rouch, Serial No. 150,973.

It is desirable to provide washing machines of the type in which the washing machine per se is housed within a surrounding cabinet with drain screen units readily and conveniently removable from the drain outlet so that they may be cleaned and any article caught therein removed. A drain screen unit of the type constructed particularly to catch pins and similar articles flowing through the drain outlet is disclosed in the aforementioned Rouch application. The drain assembly disclosed therein consists of a housing surrounding the drain opening of the washing machine tub and removably mounting a drain screen unit comprising a perforate screen and an imperforate shield spaced a short distance from the screen in the direction of liquid flow. The space between the screen and shield is so designed that pins and similar articles are maintained at an angle by the shield and the wires from which the screen is made and prevented from passing through the drain screen unit. The unit also comprises a shaft rotatably mounted with respect to the shield and screen and extending outside the cabinet to provide a means for readily securing the unit in place and removing it for cleaning or repairs.

The primary object of the present invention is to provide a new and improved drain screen unit that may be economically and easily manufactured.

A further object of the invention is to provide a new and improved drain screen construction whereby the desired spacing between the screen and its associated shield may be obtained in a simple manner.

Another object of the invention is to provide a new and improved drain screen unit in which the screen is removably mounted in the unit and yet positively held therein when once properly positioned.

A still further object of the invention is to provide a new and improved arrangement of the drain assembly with respect to the cabinet whereby the drain screen unit of the drain assembly is located entirely within the cabinet but readily accessible from outside the cabinet.

Further objects and advantages of the invention will become apparent from the ensuing description, in the course of which reference is had to the accompanying drawings, in which

Fig. 1 is a perspective view of a washing machine provided with a drain assembly constructed in accordance with the present invention.

Fig. 2 is a side elevation view, partly in section, of the machine shown in Fig. 1 showing the location and details of construction of the drain assembly and the drain screen unit comprising a part thereof.

Fig. 3 is a fragmentary top plan view, partly in section, of the drain assembly alone.

Fig. 4 is a fragmentary front elevation, partly in section, of the drain assembly shown in Fig. 3.

Fig. 5 is a longitudinal vertical section through the drain assembly.

Fig. 6 is a fragmentary side elevation of the drain assembly showing details of the means for securing the drain screen unit.

Fig. 7 is a fragmentary transverse vertical section taken along the line 7—7 of Fig. 5; and

Fig. 8 is an exploded perspective view showing the construction of the screen and shield which together comprise the drain screen unit of the present invention.

The washing machine illustrated in Figs. 1 and 2 comprises an outer cabinet consisting of a top, front and side panels 10, 12 and 14, respectively, removably mounted in any suitable manner upon a base 16. A hinged door 18, provided with a suitable handle 20, is mounted upon and comprises a part of the front panel of the cabinet so that the user may have easy access to the washing machine itself which is mounted within the cabinet.

For the purpose of describing the present invention the washing machine has been illustrated as comprising a cylindrical stationary imperforate tub 22 and a cylinder 24 rotatably mounted therein. The cylinder is provided, in accordance with well known principles, with peripheral perforations 26 so that the liquid within the tub may enter the cylinder and contact the goods disposed therein during performance of the washing and rinsing operations.

The tub and cylinder are conveniently mounted upon supporting means of the type disclosed in the copending application of Alfred H. Haberstump (case 2), Serial No. 135,955, filed April 9, 1937, comprising a triangular vertically disposed front bearing support 28, and a generally diagonally disposed relatively narrow rear bearing support 30, connected together at their upper ends by a U-shaped intermediate member 32. The peripheral portion of the triangular support 28 is provided with a channel section to give it the desired strength and rigidity. The

diagonal support 30 is made of a narrow channel section that extends through an aperture 34 located substantially centrally of the triangular support 28 to a point of attachment at the front end of the base 16. A second vertically disposed support 36 is secured to the horizontally disposed front end of the diagonal support 30 by suitable securing means, such as bolts 38 (only one of which is shown).

A cylindrical tub 22 is rigidly mounted upon the supports 28 and 36 in suitable manner, and the cylinder 24 is mounted upon a hub 40 die cast upon the front end of a shaft 42 that is journalled for rotation in a pair of bearings 44 carried in the upper vertical portions of the bearing supports. The shaft and cylinder are rotated by means of a pulley 46 suitably fixed upon the shaft 42 intermediate the bearing supports and rotated by a belt 48, driven by a motor (not shown) which may be mounted upon the base 16.

It should be understood at this point that the present invention is not limited to the washing machine specifically described above. It may be applied equally well to other types of washing machines, whether these be manually or motor driven, or whether they be manually or automatically controlled.

Liquid is supplied to the tub 22 through a pair of inlet pipes 50 (only one of which is shown) under the control of electromagnetically actuated valves 52 (only one of which is shown). These valves may be controlled in desired manner to regulate the supply of liquid to the tub and, if desired, may be controlled in the manner shown and described in the copending application of John W. Chamberlin and Rex Earl Bassett, Jr., Serial No. 129,429, filed March 6, 1937.

Liquid is drained from the tub through the drain assembly of the present invention, indicated generally by the reference numeral 54, to the bottom of which is secured a sump 56 from which there leads an outlet conduit 58. The flow of liquid through the outlet conduit may be regulated by a suitable electromagnetic valve (not shown) and, if desired, the rate of flow may be increased by suitable fluid impelling means located in the outlet conduit, also as illustrated in the aforementioned application of Chamberlin and Bassett.

The drain assembly comprises a cup-like housing 60 surrounding and located below a substantially circular drain opening 62 provided at the bottom of the tub 22, and a removable drain screen unit, indicated generally by reference numeral 64, adapted to be inserted into the housing through aligned apertures 66, 68 and 70 in the front panel 14, the front support 36 and the front wall 72 of the housing 60, respectively.

The housing 60 is provided with an upper outwardly extending peripheral flange 74 adapted to be secured to the tub 22 in liquid-tight fashion, as by welding or soldering. The upper portion 76 of the housing 60, or drain collar, as it will be referred to hereinafter, is made with a substantially circular section. This upper circular portion terminates in a horizontally disposed, inwardly extending, annular shoulder 78 from which depends the curved lower portion 80, to the bottom of which the sump 56 is secured.

The flow of water from the tub is restricted to a relatively narrow opening 82 formed centrally of a baffle plate 84 supported at its edges by the previously mentioned shoulder 78. The baffle plate may be secured to the housing 60 in a suitable manner such as by soldering or welding. The baffle plate extends downward from its peripheral edges, and the central portion 86 thereof extends substantially vertically to define the opening 82. The plate is made rigid by providing it with a plurality of radial downwardly extending ridges 88. The forward end of the lower portion of the drain collar 60 is made substantially square in section in order to provide a pair of vertical side walls 90 and 92, respectively, upon which may be welded ears 94 adapted pivotally to mount a bail 96, providing a ready means of securing the drain screen unit in installed position in a manner hereinafter to be described.

The drain screen unit construction is illustrated best in Figs. 5 and 8, from which it may be seen to comprise a polygonal box-like screen 100 formed with a wire rim 102 and adapted to be removably mounted with the sides and bottom thereof in spaced relation to a shield 104 having an arcuate section. The front end of the screen may be inserted in the shield 104 through the open top portion of the latter, defined by the bent-over portions 106, after which it may be slid forwardly until the front end of the rim 102 is caught under the downwardly extending flanges 108. The screen is prevented from moving lengthwise with respect to the shield by the opposed horizontally disposed ears 110 at the forward end of the shield 104 abutting against the upper portion of the front end of the screen, and by vertically extending opposed quadrant-like ears 114 formed at the lower portion of the rear end of the shield 104. The front end of the drain screen unit is closed by a substantially circular plate 116 provided with an annular rearwardly extending flange 118. The shield 104 is secured to the plate by welding the transverse peripheral flange 120, formed at the front end thereof, to the plate 116. The front end of the drain screen unit is constructed in the form of a cylinder by closing the upper side thereof by a semi-circular plate 122 provided with an outwardly extending flange 124 welded to the front plate 116. The outer surface of the cylindrical front end of the drain screen unit is made smooth by forming internal ears 126 at the upper front corners of the shield 104 adapted to receive the opposed lower corners of the plate 122. The ears 126 are welded to the plate in order to provide a rigid construction.

The outer diameter of the cylindrical front portion of the drain screen unit is somewhat less than the aperture 70 provided in the front wall of the drain collar. In order that a gasket 128, made of rubber or the like, may be interposed between the drain screen unit and the aperture 70, the aperture is provided with an annular internal flange 130 that is slightly inclined in order better to receive the inclined outer edge of the gasket 128. The drain screen unit is provided with a substantially U-shaped handle 132 whereby it may be grasped to insert it in position in the drain housing, as well as removed therefrom. The handle is provided with a slight indentation 134 adapted to receive the end of a thumb nut 136 provided with a portion 138 threaded through an aperture in the bail 96. A considerable pressure may be exerted upon the drain screen unit by means of the thumb nut securely to hold the unit in position within the drain collar, substantially as shown in Fig. 5.

In order to provide easy access to the drain screen unit from outside the cabinet, the front panel 12 of the latter is provided with a fluted door 140 pivotally mounted at 141 upon the front

panel 14. The door is provided with a slot 142 into which the hand may be inserted to pull it down forwardly to open it and with a pair of downwardly and forwardly extending tips 144 (only one of which is shown) adapted to enter slots 146 (only one of which is shown) formed in the support 36 to limit the downward movement of the door after it is opened. The door is held in closed position by a spring latch 148.

For the purpose of describing the insertion and removal of the drain screen unit in the drain collar it will be assumed that the unit has been installed in the position illustrated in Fig. 5.

Whenever it is desired to remove the drain screen unit for cleaning or repairs the door 140 is first opened to permit access to the drain screen unit. The thumb nut 136 is then rotated to release the pressure applied thereby to the drain screen unit, and the bail 96 allowed to drop to a vertical position, thereby permitting the handle 132 of the unit to be grasped by the fingers. The drain screen unit may be removed from within the drain collar by pulling upon the handle 132 and, after removal, the drain screen 100 may be separated from the shield 104 by tipping the rear end thereof upwardly a sufficient amount to disengage the bottom thereof from the ears 114 and then pulling it rearwardly an amount sufficient to remove the forward end thereof from beneath the flanges 108. Once separated, it is a simple matter thoroughly to clean both the screen and the shield.

When it is desired to re-insert the drain screen unit within the drain collar, the unit is first assembled by placing the screen within the shield in a manner that is now believed to be apparent from the above description. Thereafter the assembled unit may be inserted within the drain collar and a sufficient pressure applied by the thumb nut and bail to prevent any leakage of liquid around the aperture 70, through which the unit is inserted into the collar. It is apparent from Figs. 4 and 5 that the lowermost portions 86 of the baffle plate 84 extend below the top of the screen and shield when the unit is in its installed position. This construction guarantees the proper positioning of the drain screen unit within the drain collar. The construction, furthermore, is such as to discharge all the water from the tub 22 directly into the screen through which the water must flow to reach the sump 56. Practically all of the water flows transversely to the screen rather than through the open ends thereof because of the limited area of the latter as compared to the entire area of the screen. Consequently, any pins and similar articles are trapped by the screen and shield because of the fact that they cannot negotiate a turn in the small distance between the sides of the screen and shield.

While only the details of a single modification of the present invention have been described above, it should be apparent to those skilled in the art that it is susceptible of various other modifications, and it is contemplated that the invention is limited only by the following claims.

I claim:

1. A drain screen unit adapted to be placed in a liquid outlet including in combination an imperforate shield open at its top and one end and substantially channel-shaped in section, a perforate screen substantially channel-shaped in section and having closed ends and fitting loosely in said shield and lying substantially transverse to the flow of liquid when the unit is positioned in the liquid outlet, and means on the shield for supporting the screen therein against endwise movement with the greater portion of the area of the screen spaced a relatively short distance from the shield.

2. A drain screen unit adapted to be placed in a liquid outlet including in combination an imperforate shield open at its top and at one end and adapted to lie substantially transversely to the flow of liquid when the unit is properly positioned in said outlet, a box-like perforate screen also adapted to lie substantially transversely to the flow of liquid when the unit is properly positioned in said unit, said screen being supported within and solely by the shield with the greater portion of the area of the screen spaced a relatively short distance from the shield.

3. A drain screen unit, including in combination, a shield having an arcuate section, and a polygonal box-like perforate screen mounted within and supported by the interior of the shield.

4. A drain screen unit including in combination, an imperforate shield having a substantially semi-circular section and a box-like perforate screen of rectangular section mounted within and supported by the interior surface of the shield.

5. A drain screen unit adapted to be placed in a liquid outlet including in combination, a box-like perforate screen, a shield member having a substantially semi-circular section of a size to receive the screen, the opening at the top thereof comprising a portion sufficiently wide to permit insertion of said screen within the shield of a length less than the screen whereby the latter may be inserted into and removed from the shield only by angular and longitudinal movement with respect to the shield.

6. A drain screen unit adapted to be placed in a liquid outlet including in combination, a box-like screen, a shield member having a substantially semi-circular section of a size to receive the screen, the opening at the top thereof comprising a portion sufficiently wide to permit insertion of one end of said screen within the shield and of a length less than the screen whereby the latter may be inserted into and removed from the shield by angular and longitudinal movement thereof within the shield, and means for holding said screen against movement when inserted within said shield.

7. A drain screen unit adapted to be placed in a liquid outlet including in combination, a box-like screen, a shield member having a substantially semi-circular section of a size to receive the screen, the opening at the top thereof comprising a portion sufficiently wide to permit insertion of one end of said screen within the shield and of a length less than the screen whereby the latter may be inserted into and removed from the shield by angular and longitudinal movement thereof within the shield, and means including projections upon the shield positioned to engage the ends of the screen and the top near one end thereof for holding said screen against movement when inserted within said shield.

8. A drain screen unit adapted to be placed in a liquid outlet including in combination, a box-like screen, a shield member having a substantially semi-circular section of a size to receive the screen, the opening at the top thereof comprising a portion sufficiently wide to permit insertion of one end of said screen within the shield and of a length less than the screen whereby the

latter may be inserted into and removed from the shield by angular and longitudinal movement thereof within the shield, and means for holding said screen against movement when inserted within said shield, said means including projections formed integrally with said shield and positioned to abut against the upper portion of the front end of the screen and the lower portion of the rear end when the screen is positioned within said shield.

9. A drain screen unit, including in combination, an imperforate shield having a substantially semi-circular section and an open end, a box-like perforate screen of rectangular section demountably mounted within and supported by the interior surface of the shield, said screen adapted to be inserted within and removed from the interior of said shield by movement in an arcuate line, and projections upon said shield positioned to prevent movement of the screen other than in said arcuate line when said screen is inserted within said shield.

10. In a receptacle adapted to contain liquid and having a drain opening in its bottom, the combination of an apertured drain collar beneath said opening, and a drain screen unit insertable into said collar through the aperture, said unit comprising a shield having a portion of arcuate section, and a polygonal box-like perforate screen mounted loosely within and supported by the interior of the shield, whereby the screen may be readily detached from the shield after the unit has been removed from within the drain collar.

11. In a receptacle adapted to contain liquid and having a drain opening in its bottom, the combination of an apertured drain collar beneath said opening, and a drain screen unit insertable into said collar through the aperture, said unit comprising a shield having a portion of arcuate section, a disc member forming a closure for said aperture and secured to the shield, a channel-section perforate screen having closed ends and loosely mounted within and supported in spaced relation over the greater part of its area to the interior of the shield, and means on the drain collar for holding said disc in closing position over the aperture with the shield and screen beneath the drain opening, said shield being formed with another opening for the outlet of liquid flowing thereinto through said screen.

12. In a washing machine including a receptacle adapted to contain liquid and an apertured front support for said receptacle and having a cabinet surrounding said receptacle and support, said cabinet comprising a front wall provided with an aperture in alignment with said first-mentioned aperture and a door hingedly mounted on said front wall, said receptacle having a drain opening, the combination of a housing surrounding said drain opening provided with an aperture in alignment with said first-mentioned apertures, a drain screen unit adapted to be inserted into said housing through said aligned apertures when said door is opened, and means including projections on said door and cooperating slots in said front support for defining the open position of the door.

ALFRED H. HABERSTUMP.