July 12, 1960 W. B. LÖFFLER 2,944,671

FLOOR DRAIN

Filed Sept. 29, 1955

Fig. 1

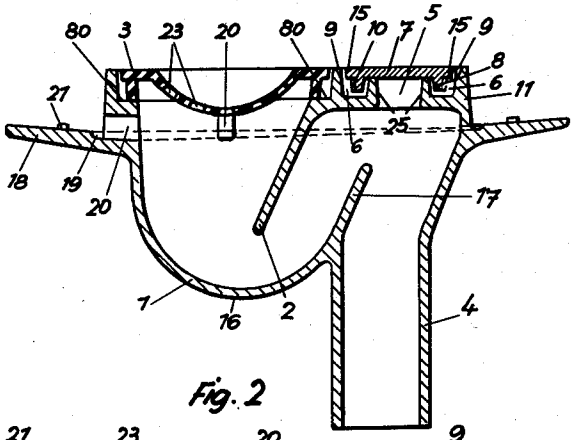


Fig. 3

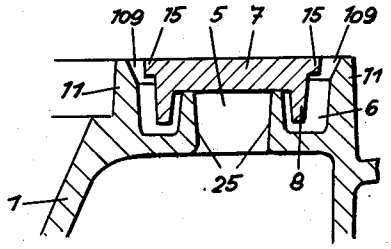


Fig. 2

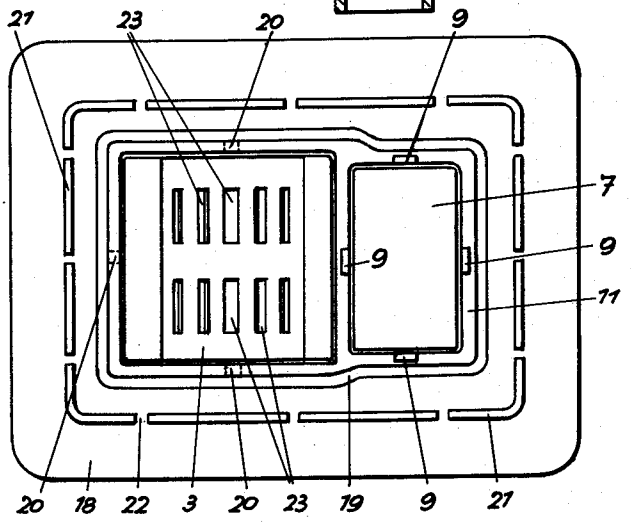


Fig. 4

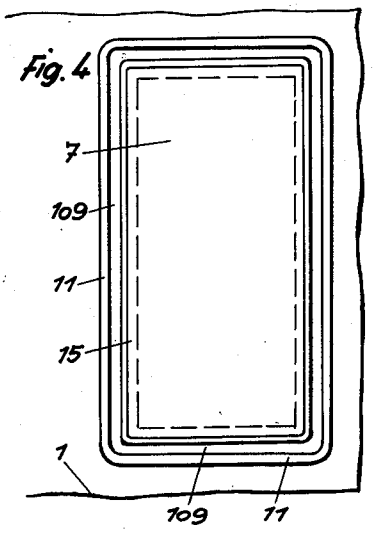


Fig. 5

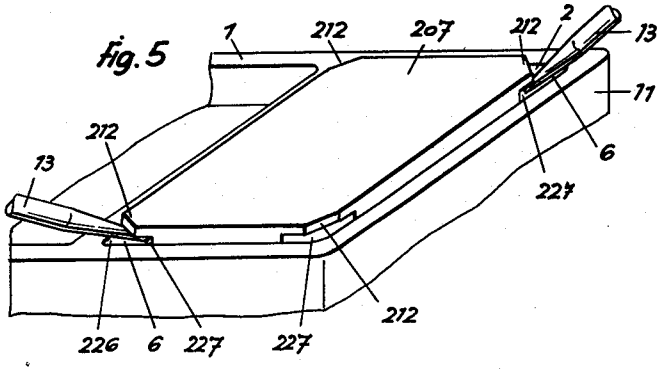
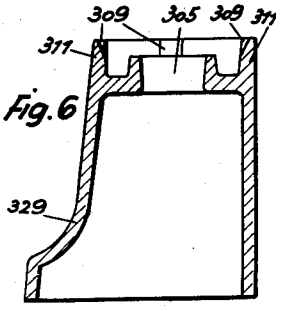


Fig. 6



Inventor:
Walther Bernhard LÖFFLER
by [illegible]
Attorney

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FLOOR DRAIN

Walther Bernhard Löffler, Fr.-Ebert-Str. 43, Markkleeberg-Mitte, Germany

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2 Claims. (Cl. 210—166)

The present invention relates to draining devices and more particularly to a floor drain.

It is an object of the present invention to provide a floor drain with a closure member which may be readily closed and opened or removed from its seat at any time.

It is another object of the present invention to provide a floor drain with a closure member which is not impaired or destroyed by the ammoniacal gases coming from the sewer line to which the floor drain is connected.

It is a further object of the present invention to provide a floor drain which may also be used for draining liquid or the like to a sewer line, which liquid trickled into cracks or joints of a floor.

It is still another object of the present invention to provide a floor drain with an interceptor of odors which cannot be removed incidentally or arbitrarily.

A further object of the invention is to improve on the construction of floor drains as now customarily made.

Other objects and advantages of the present invention will become apparent from the following detailed description thereof in connection with the accompanying drawings showing, by way of example, some embodiments of the present invention.

In the drawings:

Fig. 1 is a vertical sectional view of a floor drain according to the invention,

Fig. 2 is a top plan view of the floor drain shown in Fig. 1,

Fig. 3 is a vertical sectional view of another embodiment of the closing arrangement which may be used in the floor drain shown in Fig. 1 instead of the closing arrangement shown in the latter figure,

Fig. 4 is a top plan view of the arrangement shown in Fig. 3,

Fig. 5 is a perspective view of a further embodiment of a closure member for use in the floor drain shown in Fig. 1, the closure member being in a somewhat lifted position, and

Fig. 6 is a vertical sectional view of an auxiliary body which may be used in conjunction with the floor drain shown in Fig. 1.

Referring now to the drawings, and first to Figs. 1 and 2, a floor drain 1 according to the invention comprises a compartment 16 adapted to hold a certain amount of a fluid or liquid. The fluid or liquid to be drained may enter the compartment 16 through a grating 3 having a plurality of apertures 23 in its spherical bottom and being removably placed on a shoulder 80 of said compartment 16. The walls of the floor drain 1 consist preferably of one piece and include a partition 2, a portion of which dips into the liquid contained in the compartment 16. The compartment 16 communicates with a downwardly extending outlet or pipe 4 which may be used for connection with a sewer line.

An opening 5 communicates with the portion of the compartment 16 behind the partition 2 and with the outlet 4. Said opening 5 may be used for cleaning purposes.

The opening 5 is formed between the inner walls 25 of a frame 11 of the floor drain 1. A closure member or cover 7 resting on said inner walls 25 has a projection or flange 8 projecting downwardly into a groove 6 of the frame 11 surrounding the inner walls 25. According to the embodiment shown in Fig. 1, the top surface of the cover 7 being of rectangular shape is flush with the top of the frame 11 and the top of the grating 3. The walls of the frame 11 surrounding the groove 6 are provided with a plurality of recesses 9 having inclined rear faces. Normally, the space in the groove 6 between the walls and the cover 7 is filled with sealing means (not shown), for example a cord, oil or the like so as to prevent the escape of obnoxious gases through the space between the cover 7 and the frame 11. Thus, a perfect closure keeping undesirable odors inside is obtained. If it is desired to lift the cover 7 from its closing position shown in Fig. 1, a suitable tool, for example a chisel, may be inserted, into one of the recesses 9, or a plurality of tools may be inserted into a plurality of said recesses 9 for levering up said cover 7 by the tool or tools engaging the lower surface of the projecting edge 15 of the cover 7.

According to the embodiment shown in Figs. 1 and 2, the recesses 9 are arranged opposite each other. The inclined rear surfaces of said recesses 9 are of such a width and length that they permit an abutting engagement with a tool such as a chisel, for lifting the cover 7 by engagement of the tip of the tool with the lower surface of the laterally projecting edge 15 of the cover 7. Also, the angle of the inclination of said inclined rear surface is chosen in such a way that it may serve as an abutting surface for the tool when the latter is used as a lever for levering up the cover 7 in the manner described above. In order to facilitate matters, the flange 8 of the cover 7 is provided with notches 10 or the like opposite the recesses 9, which notches 10 may receive the tip of the tool levering up the cover 7.

The outlet 4 of the floor drain 1 is attached to the bowl-shaped liquid receiving compartment 16. A partition 17 extending upwardly from the bowl 16 forms the water seal in said bowl or compartment 16 in conjunction with the above mentioned downwardly extending partition 2. As the partitions 2 and 17 are integral with the main body of the floor drain 1, they cannot be removed incidentally or arbitrarily. Therefore a willful removal of the sealing means preventing the escape of undersirable odors is rendered impossible. Furthermore, the arrangement described above provides for a simple casting which may be manufactured at low cost.

The floor drain 1 has an upper rim 18 provided with a catching groove 19 arranged for receiving water or liquid which trickles through cracks or joints of the floor. Said groove 19 leads such trickling water or liquid through longitudinal slots 20 into the bowl 16. Preferably, the slots 20 have an upright rectangular cross-section.

When the floor drain 1 is arranged in the floor, preferably a sealing or insulating layer (not shown) surrounding the center portion of the floor drain is cemented to the rim portion 18. In order to avoid a covering and closing of the slots 20 by the sealing layer and to prevent the latter from contacting the center portion of the casting of the floor drain 1, the rim portion 18 is provided with a ledge 21 forming a rectangle provided with a plurality of slots 22 spaced from each other and allowing the trickling water to reach the groove 19. Preferably the ledge 21 is 5 millimeters high and 3 millimeters thick.

The operation of the floor drain is as follows:

The liquid collecting on the floor flows through the slots of the cover 3 shaped as a grating and collects in

the lower portion of the compartment **16**. If sufficient liquid has accumulated therein, the upper level thereof rises above the upper edge of the partition **17**, the channel provided between the two partitions **2** and **17** forming a water seal within the bowl **16**. When the water level rises beyond the upper edge of the partition **17** the water flows into the outlet or outflow pipe **4** from which it is conveyed by its own weight into a conduit (not shown), for example sewer line, or the like. The sealed cover **7** prevents any gases separated from the liquid, such as ammonia, from escaping through the opening **5**.

However, when it is intended to clean the floor drain and/or outflow pipe **4** the cover **7** may be temporarily removed from the opening **5** by inserting a tool or tools such as a chisel or the like into the recesses **9** for levering up the cover **7** and removing same temporarily.

The embodiment shown in Figs. 3 and 4 substantially corresponds to that shown in Figs. 1 and 2. However the four recesses **9** of the embodiment shown in Figs. 1 and 2 are replaced by a chamfered edge **109** (Figs. 3 and 4) of the frame **11** of the floor drain **1** surrounding the rim of the cover **7** along its entire length. Again the cover **7** resting on the top of the inner walls **25** and entering the groove **6** by its downward flange **8** may be levered up (for opening the passage **5**) by means of one or more tools (chisels or screw-drivers, for example) inserted at suitable places into the recess **109** and engaged with the lower side of the projecting edge **15** of the cover **7**. Preferably two tools inserted into the recess **109** at opposite sides of the cover **7** are used for lifting up the latter. If desired, however, the recess **109** and the corresponding projecting edge **15** must not necessarily surround the entire cover **7**. For example the recess **109** and the corresponding projecting edge **15** may be arranged only at two opposite sides of the frame **11**.

According to the embodiment of a closure member shown in Fig. 5 of the drawing, the cover **207** to be inserted into the aperture of the frame **11** of the floor drain **1** so as to prevent odors from escaping is provided with beveled corners **212** leaving a substantially triangular space **226** at the corners of the groove **6**. Furthermore the cover **207** is provided with undercuts **227** at said beveled corners **212**. Thus if the cover **207** shall be levered up for opening the aperture of the frame **11** for cleaning purposes, one or more tools **13**, for example chisels, are inserted into the triangular spaces **226** for engagement of their tips with the surfaces of the undercuts **227**. Thus, the cover **207** may be readily removed from the aperture of the frame **11**. Instead of arranging four beveled corners **212** and four undercuts **227** as shown in Fig. 5, only two beveled corners **212** and two undercuts **227** could be arranged at opposite corners of the cover **207**; such an arrangement could also be sufficient for lifting the cover by means of tools, such as chisels or screw-drivers.

Fig. 6 illustrates a hollow auxiliary body **329** which may be placed into the groove **6** of the floor drain **1** shown in Fig. 1 upon removal of the cover **7**, if so desired. The auxiliary body **329** has an opening **305** arranged at a high level which may be closed by a cover (not shown) similar to the cover **7** shown in Fig. 1. The wall **311** of the auxiliary body has a plurality of inclined recesses **309** corresponding to the recesses **9** of the frame **11** shown in Fig. 1. The use of the auxiliary body **329** for an elevated arrangement of the cleaning opening **305** (Fig. 6) above the grating **3** (Fig. 1) of the floor drain is of special advantage in lavatories as this protects the attendant from contacting urine flowing or collecting in grooves.

I have described hereinbefore preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration, and that various omissions and changes in shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for the arrangements shown and described may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. A floor drain comprising walls defining a bowl portion, a substantially vertical downwardly extending discharge conduit portion connected to the upper end of one side of said bowl portion, a top portion above said bowl portion having side by side pair of openings including an inlet opening in alignment with said bowl and an access opening in alignment with said discharge conduit portion, said top portion including a downwardly extending baffle wall spaced from the side of said bowl adjacent said discharge conduit portion and extending downwardly into said bowl to a position spaced from the bottom of said bowl whereby to define a substantially U-shaped passage from said inlet opening in said cover to said discharge conduit portion, a floor level flange extending around the outside of said drain at a location spaced downwardly from said cover portion, said flange including spaced upstanding portions with small openings therebetween to trap waste material thereon, said flange being sloped downwardly toward said bowl, at least one opening in said bowl at the inner end of said flange, said cover including an interior shoulder extending around said inlet opening and a shoulder extending around said access opening, a perforated drain plate positioned on said cover inlet opening interior shoulder and closing said inlet opening, and a cover plate closing said access opening.

2. A floor drain according to claim 1 wherein said access opening has an upstanding peripheral wall at the inside of said shoulder portion and including a removable extension portion having walls which are positioned in said access opening and rest on the shoulder thereof on the outside of said interior upstanding peripheral wall.

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