May 23, 1933. M. A. SISK 1,910,186

SURFACE DRAIN

Original Filed Dec. 20, 1928

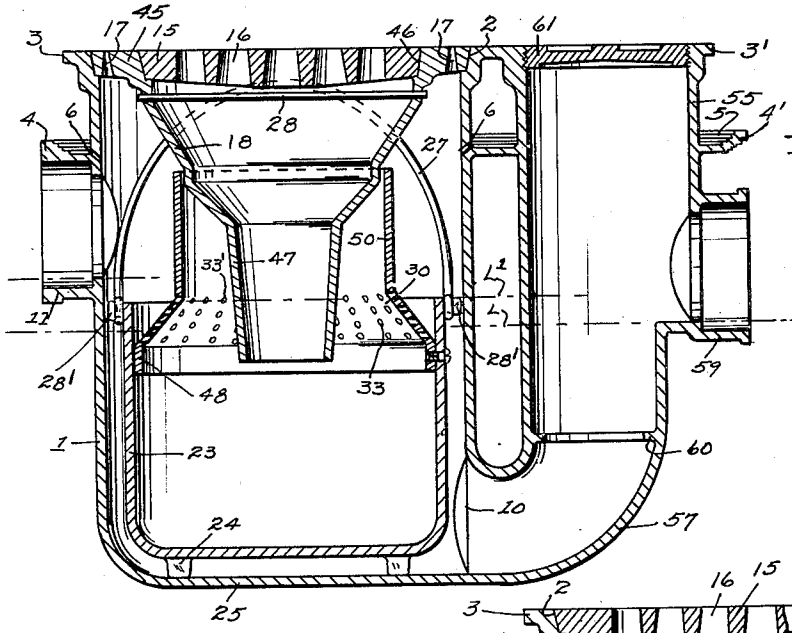


FIG.—1

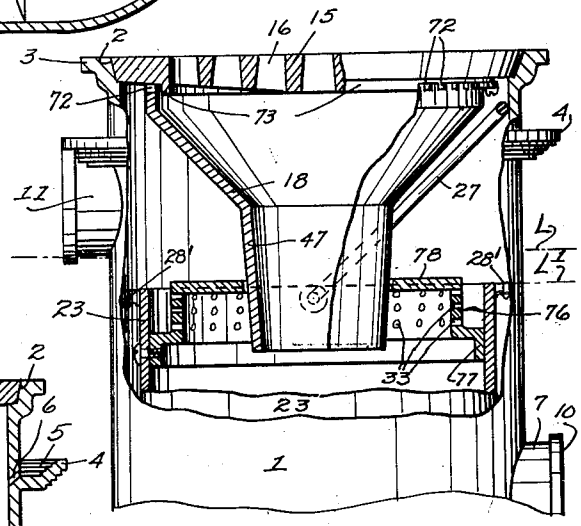


FIG.—2

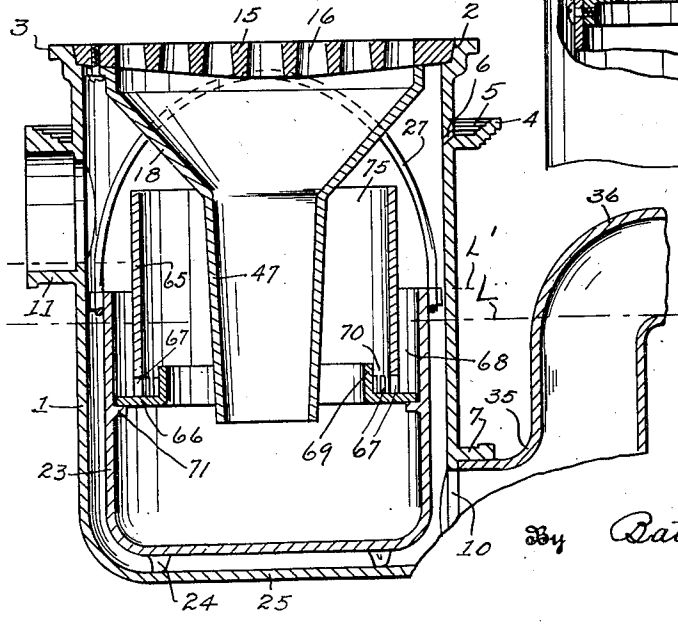


FIG.—3

Inventor

Martin A. Sisk

By Bates, Gothrick & Teare

Attorneys

Patented May 23, 1933 1,910,186

UNITED STATES PATENT OFFICE

MARTIN A. SISK, OF PITTSBURGH, PENNSYLVANIA

SURFACE DRAIN

Original application filed December 20, 1928, Serial No. 327,222. Divided and this application filed October 25, 1930. Serial No. 491,202.

This invention relates to surface drains, and particularly to that type of drain disclosed in my prior application, Serial No. 327,222, filed December 20, 1928, allowed June 30th, 1930, of which the present is a divisional application.

The parent application discloses a non-clog surface drain,—that is to say, one that will admit the free flow of liquids therethrough, but which will prevent refuse from entering the main outlet of the drain and obstructing the same. In brief, my parent application discloses a surface drain, so constructed that it will separate out the floating solids and refuse, as well as the submerged solids and refuse from the fluids entering the drain.

The primary object of the present application is to provide a non-clog surface drain assembly, which shall be so arranged that it will be unlikely or impossible that the attendant who cleans out the drain will leave out certain essential parts thereof after such cleaning. In other words, to provide a "fool-proof" assembly.

Another object is to provide a simple and effective device for retaining both submerged and floating solids, and which will enable the simultaneous removal of both solids mentioned.

Still another object is to provide means to prevent the discharge of hydro-carbon liquids into the main outlet of the drain leading to the sewer line, by which such liquids may be removed with retained solids, floating or submerged.

Another specific object is to provide a floating solids retaining device, which will retain all solids in such a manner that they will not give off obnoxious gases into the air above the drain, but will be allowed to decompose and pass out of the drain in the same manner as liquids.

A still further object is to provide a floating solids retaining device, including a liquids strainer which will act on such solids while still submerged and direct them in such a manner as not to tend to clog the strainer.

Further objects and features of the invention will become apparent from the following description relating to the accompanying drawing, wherein I show preferred forms of the invention, including various modifications. The essential characteristics are summarized in the claims.

In the drawing, Fig. 1 illustrates a drain in substantially central vertical cross-sections, showing particularly various fool-proof assembly features. Fig. 2 is a view similar to Fig. 1 of a modified construction, the modification relating particularly to the retaining means, which is especially adapted to retain comparatively light liquids, such as gasoline, oils, etc., along with solids. Fig. 3 is a view of a drain, partly broken away in central vertical cross-section showing a still further modification relating particularly to the means employed to retain solids during their decomposition.

The general features of the present invention are as follows: There is a hollow drain body open at the top and provided with a grate structure for determining the size of solids which may enter the drain. Beyond this is a liquids and solids conveyor preferably centrally of the drain and communicating with the grate openings, and which carries these liquids and solids toward the bottom of the drain. The conveyor discharges into a sediment chamber located at the bottom of the drain body. The liquids level of the sediment chamber is determined by the highest retaining wall portion of the sediment chamber.

Associated with the sediment chamber is a refuse retention device which may be variously arranged depending on the character of refuse and the manner in which it is desired to retain the same, for example, whether liquids of a particular character or whether solids, and if solids whether these are to be retained above and below the liquids level of the sediment chamber, etc.

A characteristic shown in all figures except Fig. 2, is the provision of auxiliary inlet openings and an auxiliary inlet chamber below such openings which, in the event that solids accumulate within the drain to such an extent that liquids cannot get through in the usual manner to the main outlet, will permit

liquids to be drained off the floor substantially directly into the sewer drain line through the main outlet, by-passing the refuse retainer. This arrangement just discussed also provides venting means to prevent the accumulation of volatile gases, particularly explosive gases, from being trapped and retained in the drain body.

A further general feature of the invention is the arrangement of retainer walls and strainer openings by which buoyant solids temporarily submerged by agitation of the liquid containing them, are forced in a direction contrary to that which would naturally result in clogging the strainer openings.

With the above general description in view, my invention resides in various arrangements designed to carry out the above objectives and embody the features generally discussed above, as well as other specific features to be later set forth.

Referring again to the drawing, 1 indicates the drain body in all figures. This has a shouldered opening at the top designated 2, and a flange 3 adjacent to the opening which overhangs the side walls of the body, outwardly therefrom, and forms a strengthening rib for the top of the body. Below the flange 3 and extending outwardly from the side wall of the body is a flange 4 which may be considerably varied in construction, but which is preferably terraced as at 5, partly to provide securing anchor surfaces for the concrete formation of the floor, but mainly to direct seepage liquid toward the body.

The flanges 3 and 4 cooperate in holding the drain body in position in the floor structure since, in the event that the body of concrete extends no lower than the lowermost surfaces of the flange 4, the drain will be prevented from shifting either up or down, as will be appreciated from inspection of the drawing. Further, the flange 3 reduces chipping of the concrete at the edge of the fitting by reason of overhanging an annulus of concrete therebeneath and strengthening the same.

Associated with the anchor 4 and extending through the body wall, are a suitable number of seepage openings 6 which drain off any liquid which may accumulate about the body below the flange 3, this seepage discharging into the drain body, and thence to a main outlet to be presently described.

The drain body in all figures is provided with an outlet which is disposed at the bottom of the body while the main discharge opening is indicated at 10 in all figures.

It is usually desirable that the drain body be provided with a main air vent for carrying obnoxious or inflammable gases out of the drain body. This vent may include a hub constructionally integral with the concrete anchor flange and adapted to receive a vent pipe leading to any suitable ventilator or stack. Such an air vent hub is designated 11 in the drawing.

Referring particularly to Fig. 1, 15 is a suitable main inlet closure member in the nature of a grate having enlarged openings 16 therethrough, preferably diverging downwardly to prevent clogging, the outer edges of the grate being seated in the shouldered opening 2, and resting on the shoulder. Below the grate and substantially in intimate contact therewith so as to catch all materials, whether liquids or solids entering the main grate openings 16, is a hollow conveyor member 18 forming a main liquids and solids receiving chamber.

As shown, there is a removable sediment receptacle 23 in the nature of a bucket, having supporting lugs 24, for resting on the bottom of the drain body. In this and similar instances, the sediment receptacle brim determines a liquids level L′ above the general body liquids level L. The sediment receptacle has a suitable number of lugs, preferably four, two of which are arranged to support a bail 27, adapted to lie within the drain body and at one side of the conveyor 18 in easily accessible position. The shape of the lugs is best shown in Fig. 3, wherein it will be seen that these lugs have grooves 28′ for receiving and retaining the eye portions of the bail. The outer ends of the lugs prevent lateral shifting of the receptacle with relation to the body.

It is desirable that, when a removable sediment chamber is provided, the retainer be removed simultaneously therewith to prevent spilling the retained refuse into the body space outwardly from the sediment chamber. The arrangement of Fig. 1, for example, permits this since the bail 27 projects above the top edge of the retainer, hence simply raising the bail results in raising both the receptacle and the retainer.

The retainer member 30, in order to hold back substantially all solids while permitting excess liquids to drain from the sediment receptacle through the body to the main outlet, is provided with liquid discharge channels, shown as small horizontally extending perforations 33 therethrough. The member 30 cooperates with the sediment chamber wall to prevent escape of either submerged or floating solids therebetween. As shown, this cooperation is effected by continuous line contact of the outer edge of the skirt with the sediment chamber wall. When it is desired to discharge floating liquids, the openings 33 are disposed at the liquids level L′ as at 33′ and below this level.

By the arrangement shown in Fig. 1, it will be seen that sediment discharged through the conveyor will be deposited at the bottom of the sediment receptacle while floating refuse, temporarily submerged, will be directed upwardly by the inclined wall 30, and in a di-

rection generally contrary to that favoring a tendency to clog the openings 33, into the imperforate part of the retention means. This imperforate part, as shown in Fig. 1, may comprise part of the retainer but may also be otherwise arranged, as will be presently set forth.

It will be noted that in Figs. 1 and 3, the openings such as 33, comprising the outlet of the retention means, are of individually lesser area than those of the main inlet holes 16. The former are preferably much smaller in size to prevent the escape of very small particles of solids.

Suitable means forming a main water seal trap is illustrated in Fig. 2. This may be entirely separate from the drain body and may comprise a pipe 35 having an upward bend as at 36, the lowermost interior surface of which determines the liquids level L within the drain body. It is desirable, particularly where a removable sediment receptacle is provided, to have its liquids level above the level L; as in Fig. 1, for example, so that buoyant liquids discharged through the openings 33 will more readily drain off the top of the receptacle 23, so as not to be removed with the receptacle.

It is manifest that continued use of the drain without cleaning will eventually result in blocking the intended channels by accumulated refuse so that a pool of liquids may be caused to stand above the main inlet to the drain body for a considerable period. This is obviously undesirable. To prevent this, I provide the auxiliary inlet and by-pass discharge, previously mentioned.

The by-passing arrangement, as shown in Fig. 1, comprises a suitable number of small openings 17, outwardly from the larger opening 16, preferably downwardly diverging in shape to prevent clogging by solids. Such openings lie outwardly from the top edge of the main inlet chamber, so as to discharge directly into the body without passing through the sediment chamber, the retainer, etc. Thus, assuming the normal passages are clogged, liquid from the surface to be drained will pass through the openings 17, and run directly down into the drain outlet 10. The auxiliary inlet openings are much smaller than the main inlet openings, hence, although they will serve to drain the surface above of liquid so long as this surface is kept clean of refuse, the device acts as a "tell-tale" to inform the attendant when the solids retention means are obstructed, because liquid will run through the openings 17 much more slowly than through the normal channels.

The openings 17 have a further function in that they will discharge all volatile gases accumulating within the drain body and likely to stand about the conveyor 18, where they might cause an explosion if ignited when the various parts are removed for cleaning.

The auxiliary inlet openings may be variously arranged. In Fig. 1, for example, they are formed in the annular grate supporting member 45; and in Fig. 3, the openings are formed beneath the main grate member, i.e., between the top edge of the conveyor and the main grate.

It is desirable to so arrange the drain that, after cleaning the same of accumulated refuse, the attendant will not leave out certain parts.

One means of accomplishing this is illustrated in Fig. 1, wherein the retainer is ordinarily removable only with the sediment receptacle, and the conveyor is part of the main drain inlet affording means. The attendant is compelled to replace the conveyor and in order to put back the sediment receptacle, he must also completely recondition the retention means. This is accomplished by providing Fig. 1 with an annular grate supporting member designated 45, which as shown, is integral with the conveyor 18. The outer edge of the annular member 45 rests in the shouldered opening 2 of the body, and provides a shouldered opening 46 for supporting the grate 15. It will be obvious that the attendant will not be able to properly replace the grate on to the drain until he replaces the annular member 45 along with the conveyor 18.

Likewise the retainer 30 is shown to be attached as by screws to the removable sediment receptacle 23, hence it will be obvious that the attendant will not be able to replace the receptacle in the drain without also placing the retainer in proper position therein.

In Fig. 1 the auxiliary inlet openings 17 are formed in the rim of the annular member 45, hence, even though the drain is used with the grate removed, as in some instances, the auxilary inlets are still available for serving their function, as previously discussed.

In the drain shown in Fig. 1, the conveyor, previously designated 18, has restricted extension or dip-pipe proper formed at 47, which enters the sediment chamber to a point below the liquids level thereof, making an air seal and causing the discharge into the sediment chamber to be below the liquids level, thus causing light oils and other buoyant liquids, gasoline for example, to overflow the sediment receptacle. In other words, oil and gasoline remaining from previous discharges at the top of the sediment chamber is immediately washed out and does not become emulsified with the water.

The bottom or outlet end of the extension 47 may also extend some distance below the lowermost outlet holes of the retainer, and thus comprise the lowermost portion of the retention means. Thus, submerged solids accumulating within the sediment chamber may reach and obstruct the outlet end of the extension before reaching and obstructing the retainer outlet holes, and preventing forma-

tion of a static head of water within the retention means and beyond the extension pipe. Such formation would be particularly objectionable when, as in Fig. 2, for example, refuse might thus be discharged out of the retainer.

When an extension or dip pipe is employed and extended materially below the liquids level of the sediment chamber, the retainer member may, if desired, be disposed with its lowermost portion substantially engaging the brim of the sediment chamber, and in that instance it does not necessarily extend below such brim.

The outlet of the extension 47 is preferably of lesser area than that of any of the outlets beyond the extension thereby creating an easy discharge through the drain, preventing undue disturbance of solids held therein, and also preventing undue rise of the liquids level which may cause liquids to overflow into the air vent 11, if such vent is employed.

The retention means of Fig. 1 comprises a tubular member having a perforate skirt portion 30 below the liquids level of the sediment chamber and an imperforate continuous portion 50 above this level and spaced outwardly from the conveyor extension. The skirt 30 has a flange 48 which may be attached as by screws to the wall of the removable sediment receptacle. The upper end of the imperforate portion 50 may make continuous contact with the conveyor forming a substantially closed continuous floating solids retaining space above the liquids level of the sediment chamber. Liquids and solids entering the drain shown in Fig. 1 will be projected, first, deep into the sediment receptacle, and then afterward the floating solids will accumulate partly in the dip pipe and partly in the floating solids retaining space. An advantage of this arrangement is that the previously caught floating solids are for the most part kept out of the direct path of new material entering the sediment receptacle, and are therefore not stirred up at each charging of the drain.

The retainer member and extension or dip pipe, and incidentally all the tubular bodies of the illustrated constructions, are preferably circular in cross section, but may be of any desired shape, square for example.

Fig. 1 shows a main outlet trap built onto the drain body. This, as shown, comprises an upright hollow member 55, integrally joined at its top portion, which is flanged similarly to the top of the body as at 3′, and which has cast integral therewith an extension 4′ of the concrete anchor and seepage flange. The hollow member 55 is further connected to the body by an elbow portion 57 forming the main outlet of the body.

The discharge opening of the trap, which determines the liquid's level L, is shown as a hub 59 at one side of the hollow member 55. This is adapted for receiving the usual downwardly extending drain pipe (not shown) leading to the sewer. If desired, I may provide a rib at 60 for supporting a back water valve (not shown) and a clean-out plug 61 for inspecting and cleaning out the trap and valve when necessary. Obviously, the solids retention features of the body and trap combination may be modified in accordance with the other figures.

As has been seen, in some instances it is desirable to eliminate or discharge liquids, such as light oils, gasoline, etc. that may enter the drain, but in other intances, existing ordinances prohibit discharge of such liquids into sewers, because an excess of same may be inflammable, and may also pollute rivers and streams. In view of this, I provide means to collect within and later remove from the drain, not only light oils, gasoline, etc., which ordinarily float at the water level, but also heavy oils, etc. which may submerge within the water. This is accomplished without intereference with the previously described functions, whereby solids of either a floating or submerging character are collected.

Fig. 2 illustrates the preferred arrangement, the conveyor 18 and sediment receptacle 23 being employed together with a modified retainer wherein the oil, etc. is held with the solids and may be readily removed. The retainer includes an unusually deeply discharging extension pipe 47. Encircling and spaced outwardly from the extension is a tubular retainer member 65 imperforate for a considerable distance above and below the liquids level L′. The wall of the sediment chamber is spaced outwardly from and encircles a considerable portion of the member 65.

Below the liquids level of the sediment chamber, the lowermost portion of the member 65 is provided with a horizontally disposed and outwardly extending flange 66, which engages the wall of the sediment chamber, there being outlet holes 67 formed between the flange and the imperforate portion of the retainer member. An outlet chamber 68, constituting a water trap, is thus formed between the wall of the sediment chamber and the wall of the retainer. The outlet holes 67 provide access for flow from the retainer to the water trap.

In order to direct the liquids entering through the extension pipe, first upwardly and then downwardly before they may enter the holes 67, a baffle 69 is provided, preferably formed as an extension of the flange 66. This extends inwardly and upwardly, its top level being somewhat higher than the top level of the outlet holes 67, the space between the vertical wall or baffle and retainer forming an inlet chamber 70 leading to the outlet holes, creating a downward flow from the re-

tainer to the outlet holes, and preventing direct vertical or horizontal flow out of the retainer.

The water level of the sediment chamber is a considerable distance above the top level of the baffle, thus oil and floating refuse which becomes entrapped, are held at a comparatively high level, beneath which and extending downwardly to the top level of the baffle, a water seal is formed to prevent the escape of the oil and floating refuse. The depth of water seal is variable, and depends upon the depth or height of the oil and floating refuse disposed at the water level, and the extension or height of the water seal above the top level of the baffle may be varied as desired to suit various conditions. The extension or height of the retainer above the normal water level may be in proportion to the depth of the water seal.

Oil and floating refuse received in the drain will not enter the inlet chamber 70 but will be carried upwardly within the retainer member 65 to a point higher than the outlet holes 67, from which point the flow into the outlet holes is downward. From that point, the floating materials contained in the water are carried upwardly by flotation or gravity to the higher water level. At the same time the surplus water will overflow the top edge of the baffle and being heavier, will readily flow downwardly through the inlet chamber 70 and out through the outlet holes 67 and outlet chamber 68 of the water trap.

During this operation, the oil and floating refuse previously held or contained at the water level within the retainer will not be unduly disturbed or agitated, nor is it emulsified to any extent. It is obvious that the baffle 69, by its extension above the top level of outlet holes 67, will deflect floating materials to the higher water level of the sediment chamber. In this instance, the outlet holes are not necessarily of lesser area than main inlet holes 16 of the drain, the retaining function for floating materials being obtained in this instance by means of the baffle, rather than by limiting the size of the outlet holes 67.

As in other instances, the retainer member 65 is a portion of the retention means, but in this instance it should not be attached to or formed integral with the conveyor and extension pipe, and it is preferably disposed within and rests upon lugs 71 formed within the receptacle 23, and is withdrawn therewith to prevent escape of oil and floating refuse to the main outlet.

The extension pipe 47 may be advantageously extended a considerable distance below the flange 66 of the retainer, so that discharges into the drain will enter the sediment chamber well below the retainer, and thus provide a comparatively large area between the lower end of the retainer and the outlet end of the extension pipe, from which area, flow can take place beforehand of water contained therein from previous discharges, and oils of certain viscosities, very close to that of water, may become separated and rise to the water level during the intervals between successive discharges.

It will be seen that the reduced area of the outlet of the extension pipe 47 and its extension downwardly beyond the flange 66 and baffle 69 of the retainer, will invariably cause obstruction of flow, by reason of accumulated solids, to take place at the outlet end of the extension pipe, and this will prevent formation of a static head of water within the retension means, which might otherwise discharge the oil, etc. out of the top of the retainer.

Gases rising from oil, gasoline, etc. contained within the retainer pass out through its top into the drain body, the top of the retainer being purposely open to provide such passage, and constitutes a retainer air vent 75. Either the air vent branch provided at 11, or auxiliary inlet openings, such as 17, shown in Fig. 1, may remove these gases from the drain body. In order to prevent flooding the air vent, the branch 11 is preferably located a suitable distance above the highest liquids level established by heavy discharges into the drain.

Fig. 3 illustrates a modified arrangement, previously mentioned, of auxiliary inlet, by which drainage for the surface may be had, even though the sediment chamber and retention means become entirely clogged. This comprises openings formed as notches 72 at the upper edge of the conveyor member 18, this being shown attached as by screws to the grate 15. The grate has a protecting depending rib 73 on its underside.

By such an arrangement as shown, the auxiliary drainage openings are entirely protected against clogging until such time as they become necessary for surface draining.

It is sometimes desirable to provide for the retention of solids, particularly those likely to decompose, in such manner that these solids will not give off obnoxious gases into the air above the drain. It may also be desired that such solids be allowed to decompose and pass out of the drain in the same manner as liquids without building up an increasing accumulation. The arrangement shown in Fig. 3 is adapted with the above in view.

Fig. 3 shows a grate and liquids and solids conveyor arrangement very similar to that of Fig. 1, but the auxiliary drainage openings are shown beneath the grate. This includes a dip pipe portion 47 of the conveyor extending downwardly materially beyond the brim of the sediment receptacle 23. This feature of the arrangement, particularly the dip pipe, is largely essential, as will be presently understood. Surrounding the dip pipe, and substantially entirely submerged below the

liquids level of the sediment chamber, is a retainer having a flat top 78 even with the receptacle brim and provided with a contiguous vertical wall 76 having the usual horizontal openings therethrough at 33. Considerably below the top of the sediment chamber the retainer flanges outwardly and then downwardly as at 77 to provide for suitable attachment for the retainer directly onto the wall of the sediment receptacle.

It will be seen that floating refuse will not accumulate above the water line, except within the conveyor, because the horizontal wall or roof of the retainer is submerged. Consequently, this floating refuse will accumulate adjacent the openings 33, and as this refuse disintegrates, the particles flow outwardly through the openings, thence over the brim of the sediment receptacle into the discharge outlet of the drain body. During the decomposition, the refuse is entirely below the surface of liquid in the sediment receptacle, hence, obnoxious gases have less tendency to form.

In the above description, the term "floating" and "submerged" have been used extensively as modifying solids. It will be understood, however, that in certain instances, the parts of the solids retention means function without regard to the character of solids. In Fig. 1, for example, it will be clear that the extension 47 which clearly forms part of the floating solids retention means also functions to prevent submerged solids from entering the main drain outlet, since whenever submerged solids accumulate to the level of the discharge end of the extension (i. e. before reaching the brim of the receptacle 23) further discharge of material through the regular channels is stopped. The terms "floating" and "submerged" as appearing in the claims are, therefore, in general not to be construed as limiting but rather explanatory terms.

I claim:

1. In a surface drain, a hollow drain body adapted to have its top edge flush with the surface to be drained, a removable main inlet member at the top of the fitting, means suspended beneath said inlet member for conveying liquid and solid material from said surface, a sediment receptacle in the lower part of the drain body and having the normal liquids level thereof above the lower end of said conveying means, a solids retainer member disposed within the receptacle and supported by the wall of the receptacle and lying outwardly from the conveying means, said retainer member having openings therethrough, substantially all the openings being below the plane of said liquids level, whereby retained floating refuse will not obstruct the openings.

2. In a drain, a hollow body, a removable perforate top closure therefor, means below the closure for conveying and discharging liquids and solids toward the bottom of the body, a removable sediment receptacle below the first named means, tubular retainer means arranged to prevent submerged and floating solids from escaping from the receptacle into the body space exteriorly of the retainer, the retainer extending above and below the brim of the receptacle and positioned within the same, said retainer providing an outlet therefrom for liquids, and means to insure removal of the retainer simultaneously with the receptacle.

3. A drain comprising, a body having a main inlet arranged to admit liquids and solids, tubular means forming a main inlet chamber within the body and communicating with the main inlet, a sediment chamber within the body, and solids retaining means associated therewith arranged for holding solids in the vicinity of the sediment chamber, a main outlet for the body to receive and drain excess liquids from the sediment chamber, and an auxiliary liquids inlet including means having an inlet opening communicating with the surface above the drain body and directly with the interior of the body between the wall thereof and the main inlet chamber, for by-passing the main flow directly into the main outlet through the body in the event either the inlet chamber or sediment chamber become blocked by accumulation of refuse, the auxiliary inlet being disposed below the main inlet and associated with the main inlet chamber forming means.

4. A drain, comprising a hollow body having a main inlet and a main outlet, retention means communicating with the inlet and outlet, said means including a sediment chamber within the drain body arranged to determine a liquids level within the body including a bucket being disposed within the lower region of the body, a conveyor associated with the inlet and arranged to discharge material deeply into the sediment chamber below said liquids level, a retainer disposed within the bucket and positioned between the conveyor and the sides of the bucket, said retainer extending above and below said liquids level, but arranged to pass material from one side thereof to the other, and a baffle interposed between the discharge end of the conveyor and said retainer and arranged to deflect material discharged by said conveyor upwardly toward the said liquids level, thereby preventing direct passage of material from the discharge end of the conveyor past said retainer.

5. In a drain, a drain body having an inlet and an outlet, tubular conveying means below said inlet and communicating therewith, a sediment bucket disposed below said conveying means, the top of the sediment bucket being below the normal liquids level of the drain body and means associated with said

sediment bucket, adapted to allow liquids to escape therefrom to the outlet and to hold all solids within said bucket and below the normal liquids level.

6. In a drain, a drain body having an inlet and an outlet, tubular conveying means below said inlet and communicating therewith, a sediment bucket disposed below said conveying means, the conveying means extending below the top of said sediment bucket, a cover member for said sediment bucket, the cover member having one large opening therethrough and a plurality of smaller openings, the conveying means extending through said large opening, the smaller openings being adapted to allow liquids to pass from the sediment bucket to the outlet, said cover being disposed below the normal liquid level of the drain body, whereby floating solids likely to disintegrate are retained entirely submerged during disintegration thereof.

7. A drain comprising a body having a main inlet member arranged to admit liquids and solids, tubular means forming a main inlet chamber within the body and communicating with the main inlet, said inlet member having a projection extending into the inlet chamber forming means, a sediment chamber within the body and solids retaining means associated therewith arranged for holding solids in the vicinity of the sediment chamber, a main outlet for the body adapted to receive and drain excess liquids from the sediment chamber, the tubular means having an opening at the top thereof above the bottom of the projection on said inlet member for by-passing the main flow directly into the main outlet through the body, in the event either the inlet chamber or sediment chamber becomes blocked by accumulation of refuse.

8. The combination, in a drain, of a body having an inlet and an outlet, a removable sediment bucket disposed within said body, a conveyor member extending into said bucket and adapted to conveyed liquids and solids from the inlet to the bucket, a baffle member within the bucket adapted to direct the liquids entering the bucket upward adjacent the conveyor member, and a solids retaining member within the bucket and surrounding said conveyor member, said retaining member extending above and below the top of the bucket, there being openings adjacent the bottom of said retaining member and below the top of the baffle member, forming an outlet for said bucket.

9. A drain according to claim 3, wherein the main inlet comprises a removable member having a plurality of openings near the surface to be drained, and wherein the auxiliary inlet comprises a plurality of openings of individually lesser area than the main inlet openings.

10. A drain comprising a body having a main inlet arranged to admit liquids and solids, tubular means forming a main inlet chamber within the body and communicating with the main inlet, a sediment chamber within the body and solids retaining means associated therewith arranged for holding solids in the vicinity of the sediment chamber, a main outlet for the drain body adapted to receive and drain excess liquids from the sediment chamber, and an auxiliary liquid inlet adapted to by-pass liquids from the surface to be drained, directly to the outlet, through the body of the drain, in the event either the inlet chamber or sediment chamber become blocked by accumulation of refuse.

11. In a surface drain, a drain body having an inlet and an outlet, a removable sediment receptacle within said body, a conveyor within the drain body adapted to receive liquids entering the inlet and convey them to the sediment receptacle, and a floating solids retaining member, provided with openings therethrough to drain liquids from the sediment chamber, said member extending down into the sediment receptacle and surrounding the conveyor member, said floating solids retaining member being adapted to prevent floating solids from entering the drain outlet.

In testimony whereof, I hereunto affix my signature.

MARTIN A. SISK.