July 7, 1942. E. W. N. BOOSEY 2,288,989

OIL INTERCEPTOR

Filed June 26, 1941 2 Sheets-Sheet 1

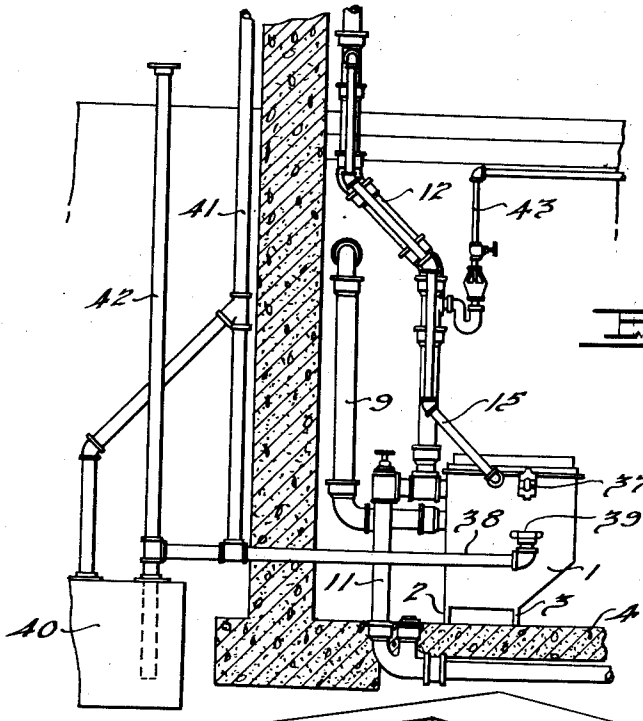


FIG. 1.

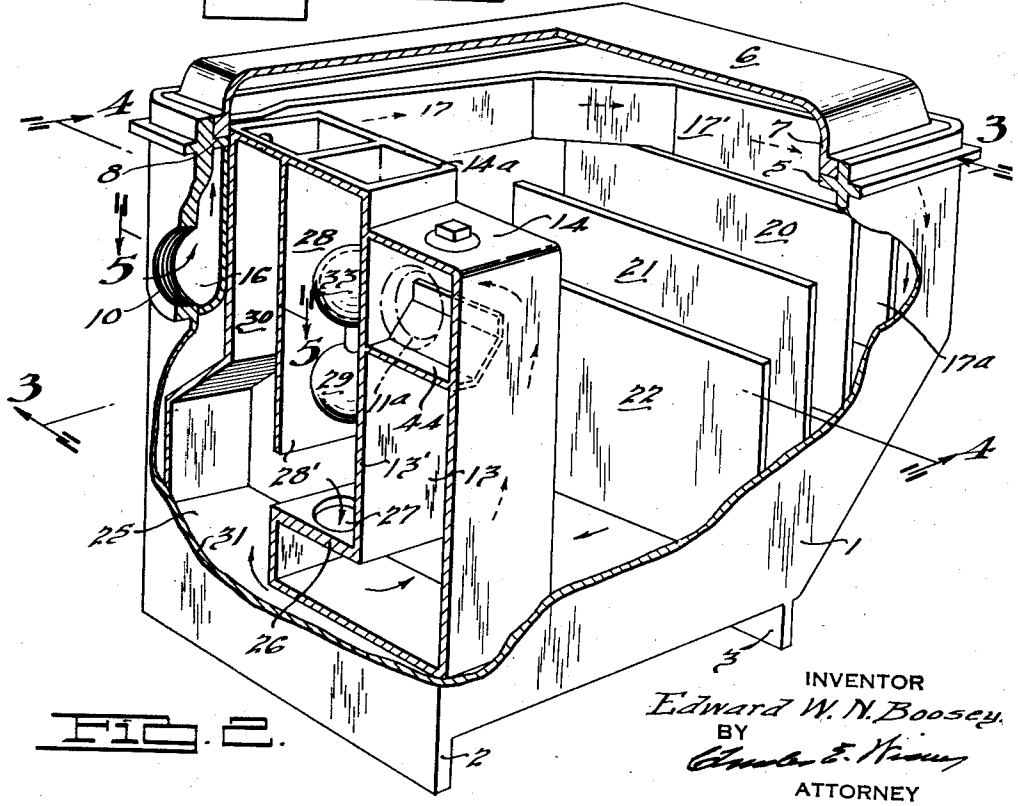


FIG. 2.

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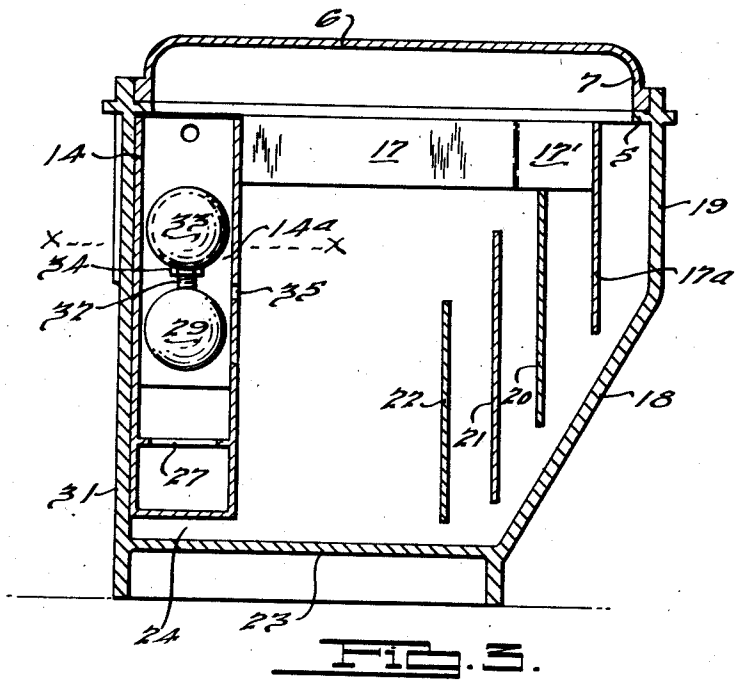


FIG. 3.

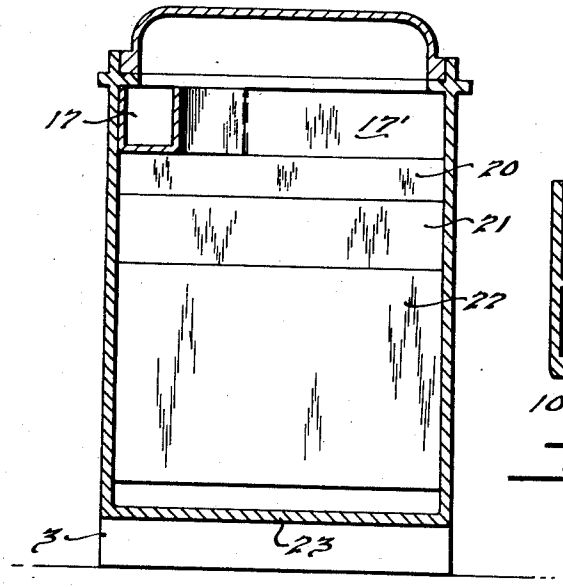


FIG. 4.

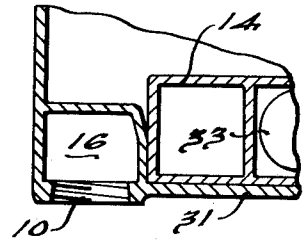


FIG. 5.

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UNITED STATES PATENT OFFICE

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OIL INTERCEPTOR

Edward W. N. Boosey, Detroit, Mich.

Application June 26, 1941, Serial No. 399,871

8 Claims. (Cl. 182—9)

This invention relates to oil interceptors for automobile garages and like structures wherein oil and water may be discharged to a sewer, the object being to provide a new and improved apparatus providing for a higher efficiency in the separation of oil and non-hardening greases from the liquid discharging thereinto and preventing discharge of oil and greases to the outlet and sewer.

A particular feature of the invention resides in the provision of a valve comprising an upper float member and a lower weighted member which when the apparatus becomes filled to a certain depth with oil on the surface of the liquid permits the weighted member to move downward to close an outlet to thereby prevent possibility of oil passing to the sewer as the interceptor becomes filled.

Other features of the invention are involved in the association with a chambered means containing the said valve element and positioned at the discharge end of the interceptor and to which liquid practically freed from oil may pass through an opening to the outlet which opening is closed by the valve member due to the float element thereof being sustained at the water surface.

These and other objects and novel features of construction are hereinafter more fully described and claimed and the preferred form of construction of an oil interceptor embodying my invention is shown in the accompanying drawings in which—

Fig. 1 is an elevation showing my improved oil interceptor and its preferred manner of installation in a plumbing system.

Fig. 2 is a perspective view partly broken away to show the interior construction.

Fig. 3 is a section taken on line 3—3 of Fig. 2.

Fig. 4 is a section taken on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary section taken on line 5—5 of Fig. 2.

In its preferred form, the interceptor consists of the body 1 preferably of rectangular form and having integral supporting strips 2 and 3 at the bottom to rest on a foundation 4 as shown in Fig. 1. The interceptor has an inner flange 5 below the upper edge of the body 1 providing a seat for a cover 6 having a depending rim 7 engaging the seat. Preferably, there is a sealing bead 8 on the flange 5 on which the rim 7 of the cover seats to prevent an escape of gas to atmosphere. The body 1 is provided with an inlet conduit 9 connected with the opening 10 shown in Fig. 2 and further has an outlet 11 connected with the opening 11a in the side wall of the interceptor body through which said inlet 10 opens and at a level above the inlet as will be understood from Fig. 1. 12 is a vent stack opening to the outlet conduit 11 which vents the outlet chamber 13 formed in the chambered element 14 to which liquid flows from the main chamber of the body. To vent the main chamber of the body, a vent conduit 15 is provided opening to the upper end of the body separately from the chamber 13 to which the outlet 11 is connected.

Liquids discharging through the conduit 9 and opening 10 to the interceptor discharge into a vertical channel 16 which, as shown in Fig. 2, opens at the upper end to the trough 17 extending across one side of the interceptor body and end thereof opposite the chambered member 14 by an open bottomed trough 17' and at the said end is provided with a baffle plate 17a which, as shown in Fig. 3, terminates a distance above the downwardly sloping wall 18 of the interceptor body. Water thus flowing through the trough member 17 discharges between the baffle 17a and the side wall 19 of the body as will be seen in Fig. 3.

There are a series of similar baffles 20, 21 and 22 extending across the body of the interceptor and spaced from the sloping wall and bottom thereof which tend to separate oils and non-hardening greases from the liquid flowing therefrom into from the trough 17 and causing the liquid to pass across the bottom 23 of the interceptor to the space 24 beneath the chambered member 14 in the direction of the arrow shown in Fig. 2 which thence pass into the area 25 in the chambered member 14. The outlet section 13 of the chambered element 14 is L-shaped in form as shown in Fig. 2 and providing a horizontal wall 26 having an aperture 27 through which liquid may pass into the chamber 13 and thence to the outlet.

The inner wall 13' of the chamber 13 forms one side of the chamber 28 which contains the valve comprising a heavy ball 29 and float 33 and this chamber 28 is open at the upper end to the upper end of the body. The bottom end of the wall 28' forming the opposite side of the chamber 28 terminates vertically above the horizontal wall 26 so that the liquid passing into the area 25 may pass to the outlet. The structure of the valve element and its function is hereinafter more fully described. The wall 28' forms one side of a vertical chamber 30 which is narrower at the top than at the bottom to permit the chambered member 14 to occupy a position in contact with the side wall 31 of the interceptor as more clearly

shown in Fig. 3, and the portion of the chambered member 14 having the chambers 28 and 30 terminates practically level with the upper edge of the trough 17 and less in vertical height than the vertical height of the interceptor and the recessed cover therefor. Thus, liquid may flow in considerable volume into the chambered element 14 as both the passageway 28 and 30 are open at the top to the upper end of the interceptor.

The float device consists of a weighted ball-like element 29 on the lower end of a bar or rod 32 and on the upper end of the said rod is a hollow ball 33. The rod is preferably threaded and there is a threaded opening in the ball 33 so that the two balls may be varied in distance apart, a lock-nut 34 being provided for retaining the hollow ball 33 in a fixed position. This character of float valve is of particular importance, its purpose being to occupy substantially the position shown in Fig. 3 when the water level is at approximately the line X—X but, as oil accumulates in the chamber, the weighted ball 29 will drop and close the aperture 27 through which liquid flows from the body of the interceptor due to the fact that the ball 33 floats on the water surface and not on the oil surface.

Preferably I provide an aperture 35 in the inner wall 14*a* of the outlet chamber 14 so that oil accumulating in the upper part of the body when at certain depth will flow through the aperture 35 and thus oil will accumulate on the top of the liquid in the chamber 28 to substantially the same depth as in the body of the interceptor and permit the inlet 27 to further flow prior to a detrimental accumulation of oil in the body of the interceptor. A draw-off valve 37 is provided through which oil may be discharged into a conduit 38 which has an opening at 39 below the valve 37 and which discharges to a storage tank 40 and both the conduit 38 and the storage tank are vented through a common vent line 41 and there is also a conduit 42 extending to above the floor line of a building and preferably on the exterior thereof enabling the oil, as by means of a pump, to be withdrawn from the tank 40. Thus the apparatus functions to discharge liquids free from oils and greases to the sewer connection 11 and the oil to be separately disposed of.

As it is sometimes desirable to thoroughly flush the interceptor for the purpose of cleaning the same, I have shown a water inlet 43 for such purpose. Also, preferably, I provide a baffle 44 as shown in Fig. 2 extending inwardly of the outlet opening 11 as shown and over the top of which the liquid passes to the outlet as indicated by the dotted arrows.

In operation of the device, the lower part of the chambered member 14 and of the body contain water practically free from oils and non-hardening greases and therefore the water in the chamber 13 is practically entirely free from oil but the grease and oil will accumulate in the valve chamber 28 by reason of the provision of the aperture 35 and the depth of the oil in the chamber 28 never falls low enough to be drawn into the opening 27 to the chamber 13 as the ball 29 will have dropped considerably prior to the oil accumulating to such depth.

This character of float valve, as it is herein termed, provides for a better control of the oil level than has heretofore been possible with a single ball because it is the ball 33 that is floating at the surface of the water and sustains the ball 29 above the opening 27 but, as oil accumulates, the ball 33 drops in level due to its weight and yet the oil does not attain a depth to enable it to be sucked through the opening 27 as would be the case if only a single ball float were used and, in fact, it is the hollow ball providing the floating element that sustains the ball 29 above the opening 27 until the float ball 33 is nearly or fully immersed in the oil or grease floating on the liquid in the chamber 28. Thus, the ball 29 seals the opening 27 prior to the oil accumulating to a detrimental depth in the body of the interceptor.

Both the chambers 28 and 30 are open at the upper end to the interior of the interceptor body. Thus there is no accumulation of air or gas in the top of the chamber 28 which would change the level of liquid therein and the chamber 30 permits liquid to pass through the open top into the interceptor body when the inrush of liquid through the interceptor is of large volume. Thus any oil that still may be contained in the liquid flowing into the chambered element 14 would tend to pass upwardly in the chamber 30 and back into the interceptor and not into the chamber 28.

It is also to be noted that although I have shown the chambered element 14 as a separate element, it may be formed integral with the interceptor body in which case the inner wall 14*a* may be made detachable.

It is believed evident from the foregoing description that the various objects and novel features of the invention are secured by the structure and arrangements of parts as described and that various changes may be made in the interceptor structure without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by letters patent of the United States is:

1. In a grease interceptor, a hollow body having an inlet, a chambered element within the body at one end, an outlet connected to the said end of the body, said chambered element including a vertical chamber to which the outlet is connected, said vertical chamber having an offset side at the bottom including a horizontal wall spaced from the bottom, said horizontal wall having an opening, the parts being so arranged that liquid flowing into the body passes into the chambered element and thence through the said opening into the outlet chamber, a second vertical chamber in the said chambered element positioned above the offset portion of the first vertical chamber and open at the top to the interior of the body, and a float element within the said second chamber comprising a weighted ball and a floating ball connected together in vertical spaced relationship, means within the body providing for separation of the grease and oils from the liquid discharging thereinto and permitting the same to rise to the surface of the liquid in the body, the remaining liquid practically free from greases and oils passing into the first vertical chamber and thence to the outlet, the wall of the second vertical chamber facing the interior of the body having an opening permitting oil and greases to pass into the second vertical chamber from the interior of the body upon accumulation thereof on the surface of the liquid in the interceptor body to a depth to permit the same to pass through the said opening into the second vertical chamber

whereby oil and grease accumulate on the surface of the liquid in the float chamber and permits the ball to float in lowered position, and upon sufficient accumulation of oil in the float chamber to permit the lower ball of the pair to seat in the said opening in the horizontal wall of the first vertical chamber.

2. In a grease interceptor, a hollow body having an inlet at one end, a trough-way within the body at the upper end for transferring liquid discharging from the inlet to opposite end of the body, means between the last-named end of the body and the inlet end for causing separation of oils and greases from the inflowing liquid to permit the same to rise to the surface of the liquid within the body, a chambered element at the inlet end of the body including a vertical transverse wall separating the chambers of said element from the interior of the body and providing an opening at the bottom of the chambered element through which liquid may pass from the bottom of the body into the chambered element practically free from oils and greases, said chambered element including a vertical chamber having an offset portion at the bottom including a horizontal wall spaced from the bottom, said horizontal wall having an opening through which liquid entering the chambered element may pass into the vertical chamber, a float valve in the chambered element for closing the said opening in the horizontal wall of said vertical chamber, an outlet conduit for said interceptor opening adjacent the top of the said vertical chamber, means restricting the float valve means to vertical movement in alignment with said opening in the said horizontal wall, said chambered element having an opening in the wall thereof providing for flow of oils and grease into the portion of the chambered element containing the float valve upon accumulation of oils and greases in the interceptor body to a depth at the level of the said opening, said float valve including a heavy ball and a hollow ball connected together in vertically spaced relation whereby the hollow ball, by reason of its tendency to float in water, normally sustains the heavy ball in a position above the said opening in the horizontal wall and, upon sufficient accumulation of greases in the float valve portion of the chambered element, permits the said valve means to lower in position and permit the heavy ball to close the opening in the horizontal wall prior to oil accumulating in the said chambered element to a depth to come within the influence of liquid discharging through said opening in the horizontal wall to the vertical chamber.

3. In a grease interceptor, a hollow body having an inlet, a chambered element within the body including a vertical outlet chamber, an outlet connected with the upper end of the vertical chamber, said vertical chamber having an offset portion at its lower end including a horizontal wall having an opening through which liquid may pass from the interceptor body into the vertical outlet chamber and thence to the outlet, means within the interceptor body for separating the oils and greases from the liquid passing through the said opening to the vertical outlet chamber, valve means in the chambered element above the said opening in the horizontal wall, comprising a weighted element for closing the opening and a hollow floating element attached to the weighted element in vertical spaced relation thereabove, said chambered element having an opening to the interior of the body at a distance below the top through which oil and greases may pass upon accumulation thereof in the body to a depth at the level of the opening, the accumulation of oil on the surface of the liquid in the portion of the chambered element in which the weighted valve element is positioned permitting the valve to lower in position and, upon sufficient accumulation, causing the weighted valve element to close the inlet opening to the vertical outlet chamber.

4. In a grease interceptor, a hollow body having an inlet and an outlet, means within the body causing separation of the oils and greases from the liquid passing thereinto through the inlet, a chamber element with the upper end of which the outlet is associated, said chambered element having an opening through which liquid normally passes to the outlet, means in the chambered element of a character to close the said opening, said means including a valve element comprising an upper floating element and a lower weighted element in vertical spaced relation, said floating element normally tending to suspend the weighted element in the liquid in the chambered element above said opening to the outlet, the wall of the chambered element also having an opening to the interceptor body at a predetermined distance below the upper end and above said opening through which oil may pass from the interceptor body into the chamber upon accumulation in the interceptor body to a depth equal to the distance of the said opening from the top of the chamber whereby oil may accumulate in the chamber to the same depth as in the interceptor body.

5. In a grease interceptor, a hollow body having an inlet, a chambered element within the body including an outlet chamber, an outlet conduit connected with the upper end of the outlet chamber, means within the body for causing a separation of oils and greases from the liquid passing thereinto from the inlet, means in the chambered element associated with the outlet for preventing flow of liquid thereto, said means including a valve element functioning to close the outlet upon accumulation of oil to a predetermined depth on the body of the liquid within the interceptor.

6. In an oil interceptor, a hollow body having an inlet at one end and an outlet chamber therewithin to which liquid passes from the bottom of the interceptor body, an outlet conduit connected to the upper end of the outlet chamber, means within the body for causing separation of the oils and non-hardening greases from the liquid passing therethrough to the outlet, there being an opening in the chambered body through which liquid from the interceptor body passes thereinto, a valve means for closing the said opening, said valve including a float and a depending element functioning to close the opening as the water level lowers due to accumulation of oil in the interceptor.

7. In an oil interceptor for a drainage system through which water containing oil may be discharged, a hollow body having an inlet, means in the body of a character to cause separation of the oils from the liquid passing thereinto, and a chambered element within the body to which the liquid practically free from oils discharges, the said chambered element including an outlet chamber having a horizontal wall provided with an opening, an outlet conduit therefor opening to the said outlet chamber adjacent the top, a valve means including an element for closing the said opening and an element adapted to float on the

surface of the water in the chambered element and normally maintain the ball at a level above the opening, a second vertical chamber in which the valve is positioned and maintained substantially in vertical alignment with the opening, and a third chamber in said chambered element to which the liquid first passes prior to passing through the said outlet opening, both said second and third chambers being open at the top to the interior of the interceptor.

8. In an oil interceptor for a drainage system through which water containing oil may be discharged, a hollow body having an inlet, means in the body of a character to cause separation of the oils from the liquid passing thereinto, and a chambered element within the body to which the liquid practically free from oils discharges, the said chambered element including an outlet chamber having a horizontal wall provided with an opening, an outlet conduit therefor opening to the said outlet chamber adjacent the top, a valve means including an element for closing the said opening and an element adapted to float on the surface of the water in the chambered element and normally maintain the ball at a level above the opening, a second vertical chamber in which the valve is positioned and maintained substantially in vertical alignment with the opening, and a third chamber in said chambered element to which the liquid first passes prior to passing through the said outlet opening, both said second and third chambers being open at the top to the interior of the interceptor, said third chamber having its upper end in engagement with the side wall of the inlet trough above the normal level of liquid in the trough whereby any oils accumulating on the surface of the liquid in the third chamber may flow into the trough and thence again be discharged into the interceptor body.

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