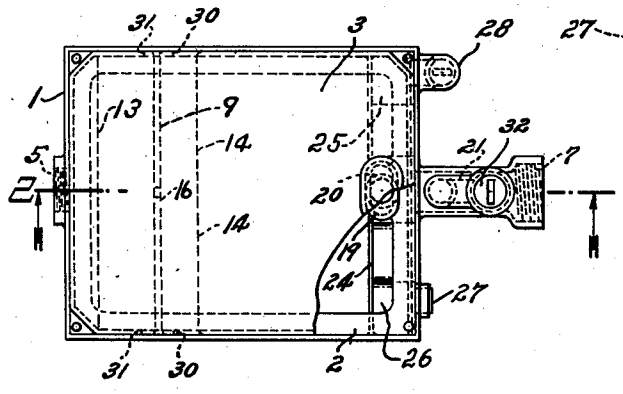
Nov. 14, 1944. E. W. N. BOOSEY 2,362,447

GREASE INTERCEPTOR

Original Filed April 29, 1940

FIG. 1.



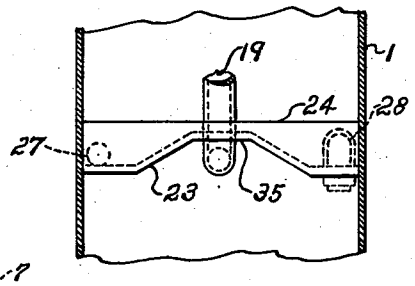




FIG. 4.

FIG. 2.

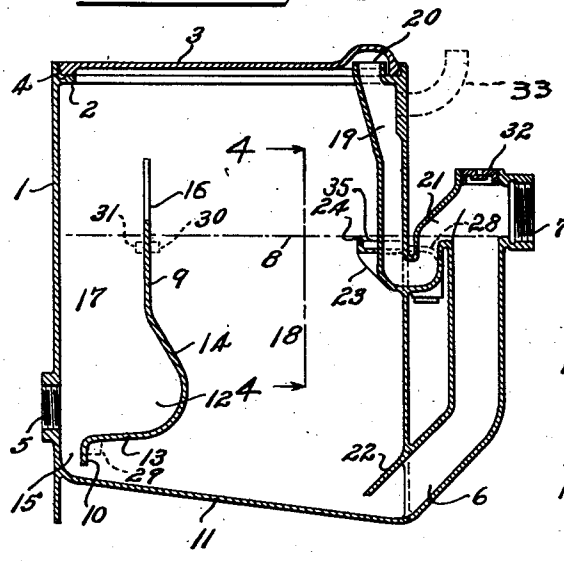
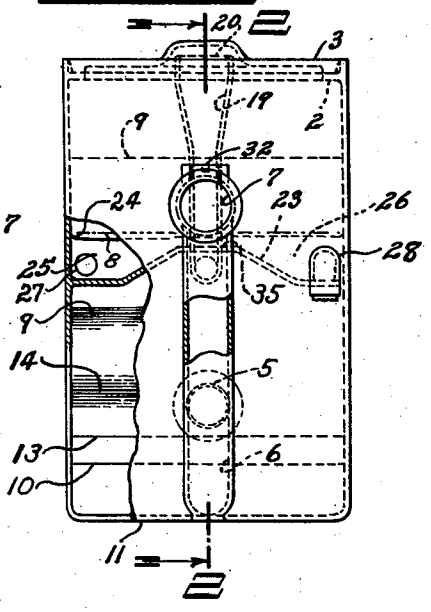



FIG. 3.




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# UNITED STATES PATENT OFFICE

2,362,447

## GREASE INTERCEPTOR

Edward W. N. Boosey, Detroit, Mich.

Continuation of application Serial No. 332,169, April 29, 1940. This application September 30, 1943, Serial No. 504,499

11 Claims. (Cl. 210—56)

This application is a continuation of my application Serial No. 332,169, filed April 29, 1940.

This invention relates to grease interceptors, the object being to provide a structure to which water containing oil and greases may be discharged and the water discharged therefrom and the greases retained therein and including means to cause the greases to rise to the surface of the water in the body of the interceptor and means for withdrawing the oils and greases from the interceptor separately from the water.

It is further an object and feature of the invention to provide an interceptor including a chambered body into which water containing oils and greases is to be discharged and an outlet associated with which is a means for discharging the gases accumulating in the body to the outlet, said means including a trap and functioning to prevent siphonage of the contents of the interceptor and a skimmer to which oils and greases at the surface of the liquid may flow.

An additional object and feature of the invention is to provide a grease interceptor having an inlet adjacent the bottom on one side and an outlet on the other, which outlet extends to a point for determining the minimum liquid level in the interceptor and between the inlet and outlet a partition like element recessed to receive the inflowing water and grease and providing a time period permitting greases to rise to the surface of the liquid and water to discharge beneath the partition-like element to the outlet.

These and other objects and various novel features of the invention are hereinafter more fully described and claimed, and the preferred form of construction of a grease interceptor embodying my invention is shown in the accompanying drawing in which—

Fig. 1 is a plan view of my improved grease interceptor partly broken away to show internal construction.

Fig. 2 is a vertical section thereof taken on line 2—2 of Fig. 1.

Fig. 3 is an elevation taken from the outlet side of the interceptor and partly broken away to show the skimmer.

Fig. 4 is a sectional elevation taken on line 4—4 of Fig. 2 showing the skimmer in elevation.

In its preferred form, my improved interceptor consists of a chambered body 1 having an inturned flange 2 at the top to receive a cover 3 which may be sealed to prevent an escape of gases from the container as by a sealing material in the space 4 between the edge of the cover and the walls of the body at the top. On one side and adjacent the bottom of the body is an inlet 5 and on the opposite side is an outlet conduit 6 preferably extending upwardly exteriorly of the body and formed with an outturned end portion 7 and determining the minimum liquid level at about the dotted line 8. A partition 9 extends transversely of the body at a right angle to the axis of the inlet and this partition engages opposite side walls of the body and is formed with a depending bottom edge portion 10 spaced from the bottom wall 11 of the body which bottom wall is preferably inclined downwardly to the outlet. Above this terminal bottom edge portion 10, the partition is formed with a bend providing a recess 12.

The bottom wall 13 of the recess is downwardly inclined in respect to the horizontal and the upper portion 14 is upwardly inclined in respect to the vertical and the partition extends vertically upwardly from the upper end of the portion 14.

The plane of said vertical portion is materially inwardly of the plane occupied by the bottom edge portion 10 of the partition. The bottom portion 10 is spaced from the wall of the body adjacent the inlet providing a narrow channel 15.

Fluid containing water, oils and greases discharging into the body through the inlet flows at a sufficiently rapid rate to be projected into the recess 12 and to be there deflected upwardly by the shape of the walls forming the recess thus providing opportunity and time period for the greases and oils to rise to the surface of the water between the partition 9 and the wall on the inlet side of the interceptor and for water to pass outwardly through the channel 15 and along the bottom 11 to the outlet. In the passage of the water from beneath the wall 10 of the partition to the outlet, still further opportunity for rise of greases is provided.

In the discharge of liquid containing oils and greases into the interceptor, a rise in level of the liquid in the interceptor is caused and the upper edge of the partition member 9 is formed with a comparatively narrow slot 16, the bottom edge of which is slightly above the level of the liquid.

With the water and oils discharging into the interceptor on the inlet side of the partition, a comparatively rapid rise in the level of the liquid in the chamber 17 between the partition and the inlet side of the interceptor is caused and the oils therein will begin to pass through the slot 16 to the main chamber 18 of the interceptor and, depending upon the quantity of liquid discharging, the level of the liquid in the chamber 17 between

the partition 9 and the inlet side may cause the same to flow over the top of the partition into the main chamber 18.

This arrangement of parts, including the element 9 and its form for causing a rapid separation of the oils and greases from the water, is of primary importance in that it tends to prevent carrying the greases and oils with the water beneath the lower edge 10 of the partition and thence to the outlet.

In a grease interceptor, there are always some gases forming in the body and air discharged into the body above the liquid level which ordinarily would produce pressure in the chamber and, to prevent an accumulation of gases in the upper part of the body, I provide a trap, one leg 19 of which extends preferably interiorly of the body and is open at the top above the level of the cover which is formed with a recess 20 therefor and gases may pass into this leg of the trap. The other leg 21 of the trap extends to the exterior of the interceptor and is open to the outlet conduit 6 below the normal water level. With this arrangement, if pressure develops within the body of the interceptor liquid may pass out through the trap to the outlet. This arrangement of parts also functions to prevent siphonage of the interceptor.

Preferably, the outlet at the bottom of the body has a portion inclined to the vertical and a downwardly inclined wall 22 thereof extends into the interior of the body providing a hood in spaced relation with the bottom of the interceptor substantially as shown. The wall 22 tends to confine the flow to the outlet in a stratum along the bottom 11 of the body and liquid tending to flow to the outlet from above the wall 22 is deflected inwardly of the body and thus there is a tendency to agitate the liquid within the chamber 18 particularly adjacent the lower part thereof tending to permit any oils or greases still contained therein to pass upwardly in the body.

The oils and greases accumulate on the surface of the liquid in the body and means is provided to draw off the oil. For this purpose, I provide what I have termed a "skimmer" 23 which has a shape in elevation as indicated in Fig. 3 and the skimmer has an upper edge 24 extending horizontally from side to side of the body just below the normal liquid level in the body. The skimmer is thus of shallow depth in its mid section indicated at 35 and increases in depth each side of the central portion to form the similar chambers 25 and 26. Thus the oils and greases will flow over into the skimmer or container which is formed at the greatest depth on each of the opposite sides of the device providing similar chambers 25 and 26. The wall of the receptacle on the outlet side is formed with a plugged opening 27 on one side and a draw off cock 28 is provided on the opposite side which may be of any approved form. The plugged opening 27 and the draw off cock 28 open to the respective chambers 25 and 26 to enable the liquid to be withdrawn from the skimmer. The plugged opening on the one side will permit access to the interior of the skimmer for removal of grease and the draw off cock may also be removed for the same purpose.

By the described arrangement of parts, a comparatively inexpensive structure is provided and may be cast in one piece if desired and as is shown. The partition member 9, however, may be removably mounted in position by provision of a lug 29 on the opposite side walls indicated by dotted lines in Fig. 2 and a pair of lugs 30 and 31 adjacent the top which would support a removable wall in the desired position.

It is further pointed out that it is not necessary to provide a partition extending the full width of the body as a lesser width of plate provided with a recess for the function described may be used.

The construction of a trap at the point of connection with the outlet is such as to provide an opening having a removable plug 32 in alignment with the vertical portion of the outlet which permits access thereto and to the trap for the cleaning of the same.

It is also further desirable in some installations and sometimes required to provide a vent to atmosphere to prevent accumulation of gases in the body. For this purpose, I provide a wall of the body forming part of the conduit 19 of sufficient thickness to permit the same to be tapped to receive a vent pipe 33 as shown in Fig. 2. With such a vent to atmosphere, gases in the upper part of the body may pass to the inlet 20 of the trapped vent 19 and thence to atmosphere through the pipe 33.

From the foregoing description, it is believed evident that the various features and objects of the invention are attained by the construction described which includes inexpensiveness of construction and a relationship of parts providing for an efficient separation of the oils and greases from the water and the removal of gases from the body of the container as well as prevention of siphonage and it is pointed out that various changes in the construction of the device may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus briefly 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 chambered body having an inlet on one side near the bottom and an outlet on the opposite side opening to the body near the bottom and arranged to determine the minimum liquid level therein, a partition adjacent the inlet having a recess in its face opposite the inlet, the bottom wall of the recess being practically aligned with the lower side of the inlet, and a bottom edge extending to close spaced relation with and below the inlet and spaced from the bottom of the body, said recessed portion receiving the liquid discharging into the body and shaped to deflect the same upwardly between the partition and the wall on the inlet side of the body by force of inflow whereby the lighter oils and greases may have opportunity to rise to the surface and the liquid and water thus freed of matter having less specific gravity may pass beneath the partition to the outlet.

2. In a grease interceptor, a chambered body having a bottom wall and an inlet on one side near the bottom wall and an outlet on the opposite side at the bottom, said bottom wall being downwardly inclined from the inlet toward the outlet, a partition member within the body having the bottom edge thereof adjacent the inlet and spaced from the inlet wall and bottom wall of the body, an upper vertical portion spaced a greater distance from the inlet wall than the said lower edge, a curved portion providing a recess opposite the inlet and connecting the said upper and lower portions of the partition whereby liquid flowing into the body through the inlet

enters the said recess and is deflected upwardly before passing beneath the partition thereby providing a time interval permitting oils, greases, etc., to pass to the top of the liquid in the body, said outlet being of a construction determining the minimum water level and the upper edge of the partition member having a slot above the normal liquid level and through which the greases may pass on the raising of the liquid level by inflowing liquid, said body having a cover in sealed relation therewith preventing an escape of gases from the top of the body, and a trap having a leg opening to the body above the liquid level, and a leg opening to the outlet below the normal liquid level.

3. In a grease interceptor, a chambered body having a bottom wall, an inlet on one side of the body near the bottom wall thereof and an outlet on the opposite side at the bottom, said bottom wall being downwardly inclined from the inlet toward the outlet, a partition member within the body having the bottom edge thereof adjacent the inlet and spaced from the inlet wall and bottom wall of the body, an upper vertical portion spaced a greater distance from the inlet wall than the said lower edge, a curved portion providing a recess opposite the inlet and connecting the said upper and lower portions of the partition whereby liquid flowing into the body through the inlet enters the said recess and is deflected upwardly before passing beneath the partition thereby providing a time interval permitting oils, greases etc., to pass to the top of the liquid in the body, said outlet being of a construction determining the minimum water level and the upper edge of the partition member having a slot above the normal liquid level and through which the greases may pass on the raising of the liquid level by inflowing liquid, said body having a cover in sealed relation therewith preventing an escape of gases from the top of the body, a trap having a leg opening to the body above the liquid level, and a leg opening to the outlet below the normal liquid level, and means for withdrawing greases and oils from the surface of the liquid.

4. In a grease interceptor, a chambered body having an inlet on one side adjacent the bottom and an outlet on the opposite side adjacent the bottom, a member mounted within the body adjacent the inlet and spaced from the bottom thereof, said member having a recess in its face opposite the inlet into which the liquid discharges from the inlet, said recess having an upwardly extending wall inclined to the vertical toward the inlet wall providing a means for deflecting the inflowing liquid upwardly and toward the inlet wall before it passes between the member and the said inlet wall to the outlet thereby providing a time interval for material of less specific gravity than water to rise to the surface of the liquid in the body, said outlet being constructed to maintain a minimum level of liquid in the body, a skimmer formed integrally with the outlet member and providing a horizontal edge portion extending transversely of the body and positioned below the liquid level within the body, said skimmer having a chamber on each side of the body for receiving grease passing over the skimmer edge, and means associated with each chamber through which greases may be withdrawn therefrom.

5. In a grease interceptor, a chambered body having a cover and further having an inlet thereto through one wall and an outlet therefrom, a partition in the chamber of said body having its upper edge spaced from the cover and a portion of its face opposite to the inlet and a bottom portion located below the inlet and spaced from the inlet wall and from the chamber bottom, that portion of the partition which is opposite the inlet being formed to provide a bottom wall inclined downwardly toward the inlet and a vertical wall having an arcuate recess extending inwardly of its plane to receive the impact of liquid discharged into the chamber and to deflect the liquid upwardly on the inlet side of the partition and thereby promote and assist in rise of the lighter oils and grease and downward flow of the heavier water beneath the partition toward the outlet.

6. In a grease interceptor, a chambered body having an inlet thereto through one wall and an outlet therefrom, a partition in the chamber of said body having a portion of its face opposite to the inlet and a bottom portion located below the inlet and spaced from the inlet wall and from the chamber bottom, that portion of the partition which is opposite the inlet being adapted to receive the impact of liquid discharged into the chamber and being shaped to deflect the liquid on the inlet side of the partition and thereby promote and assist in rise of the lighter oils and grease and downward flow of the heavier water beneath the partition toward the outlet, the upper portion of said partition being spaced further than its bottom portion from the inlet wall and being provided with a narrow vertically extending slot whose lower end lies above the minimum liquid level in said chamber and through which oil and grease pass when the liquid level rises on the inlet side of the partition.

7. In a grease interceptor, a chambered body having an inlet and an outlet and a cover, a partition adjacent the inlet the upper edge of which is spaced from the cover and having a deflecting portion of its face opposite the inlet and a bottom portion extending to close spaced relation with and below the inlet and spaced from the bottom of the body, said partition extending upwardly to above the liquid level and being provided with a vertical slot open through the upper edge thereof, said deflecting portion receiving liquid discharged into the body and having a form to deflect liquid upwardly substantially as described to deflect the same upwardly between the partition and the wall on the inlet side of the body by force of inflow, whereby the lighter oils and greases may have opportunity to rise to the surface and the liquid and water thus freed of matter having less specific gravity may pass beneath the partition to the outlet.

8. In a grease interceptor, a chambered body having an inlet and an outlet, a partition member within the body having a bottom portion adjacent the inlet and spaced from the inlet wall and from the bottom wall of the body and an upper portion spaced a greater distance from the inlet wall than the said bottom portion and a curved portion providing oil deflecting means lying opposite the inlet and connecting the said upper and lower portions of the partition, whereby liquid flowing into the body through the inlet engages the oil deflecting means and is deflected upwardly before passing beneath the partition, thereby providing a time interval permitting oils, greases and so forth, to pass to the top of the liquid in the body, the upper edge of the partition member having a slot above the normal liquid level and through which the greases may pass on rise of the liquid level by inflowing liquid,

said body having a cover in sealed relation therewith preventing escape of gases from the top of the body chamber, and liquid sealing means opening both to the body chamber and to the outlet.

9. In a grease interceptor, a chambered body having an inlet and an outlet, a partition member within the body having a bottom portion adjacent the inlet and spaced from the inlet wall and from the bottom wall of the body and an upper portion spaced a greater distance from the inlet wall than the said bottom portion and a curved portion providing oil deflecting means lying opposite the inlet and connecting the said upper and lower portions of the partition, whereby liquid flowing into the body through the inlet engages the oil deflecting means and is deflected upwardly before passing beneath the partition, thereby providing a time interval permitting oils, greases and so forth, to pass to the top of the liquid in the body, the upper edge of the partition member having a slot above the normal liquid level and through which the greases may pass on rise of the liquid level by inflowing liquid, said body having a cover in sealed relation therewith preventing escape of gases from the top of the body chamber, liquid sealing means opening both to the body chamber and to the outlet, and beans for withdrawing greases and oils from the surface of the liquid.

10. In a grease interceptor, a chambered body having an inlet on one side thereof adjacent the bottom and an outlet manifold exteriorly of the body on another side thereof and adapted at its upper end for connection with an outlet conduit and at its lower end opening to the bottom of the chambered body, said outlet manifold determining the normal liquid level in the body, means for venting the gas and air space in the body to the outlet manifold comprising a U shaped trap having one leg interiorly of the body and open at its top to the air and gas space of the body and the other leg exteriorly of the body and connected to the outlet manifold and opening thereto below the normal liquid level in the body, and an oil skimmer mounted on the said vent means within the body and having a closable opening for removal of greases and oils from the surface of liquid in the interceptor body to the exterior thereof, the whole providing a structure whereby accumulation of gases above the liquid level in the body under certain pressure forces the liquid from the trap thereby permitting the gases accumulated in the body above the liquid level to pass to the outlet manifold and thence to the outlet conduit.

11. In a grease interceptor, a chambered body having an inlet on one side thereof adjacent the bottom and an outlet manifold exteriorly of the body on another side thereof and adapted at its upper end for connection with an outlet conduit and at its lower end opening to the bottom of the chambered body, said outlet manifold determining the normal liquid level in the body, means for venting the gas and air space in the body to the outlet manifold compriisng a U shaped trap having one leg interiorly of the body and open at its top to the air and gas space of the body and the other leg exteriorly of the body and connected to the outlet manifold and opening thereto below the normal liquid level in the body, and an oil skimmer mounted on the said vent means within the body and having a closable opening for removal of greases and oils from the surface of liquid in the interceptor body to the exterior thereof, the whole providing a structure whereby accumulation of gases above the liquid level in the body under certain pressure forces the liquid from the trap thereby permitting the gases accumulated in the body above the liquid level to pass to the outlet manifold and thence to the outlet conduit.

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