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J. E. HOOPES ET AL

1,924,741

FUEL SUPPLY TANK

Filed March 5, 1931

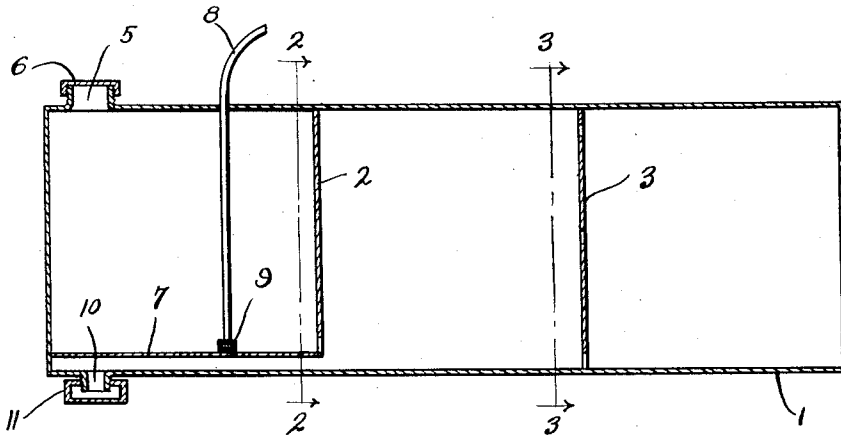


Fig. 1

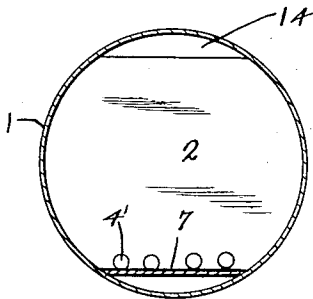


Fig. 2

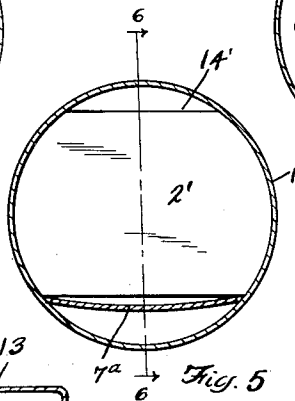


Fig. 3

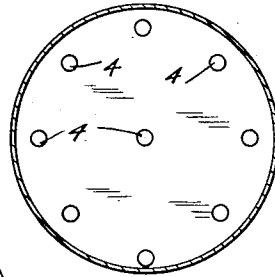


Fig. 4

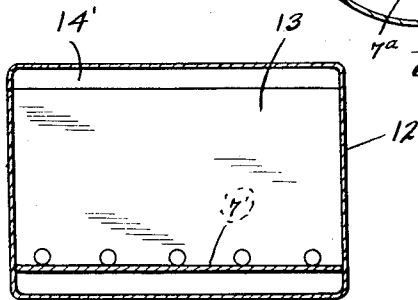
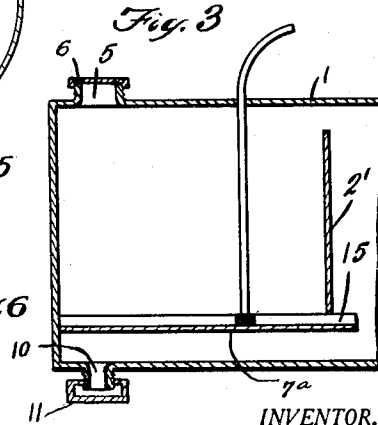


Fig. 5



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FUEL SUPPLY TANK

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16 Claims. (Cl. 220—86)

This invention relates as indicated to fluid tanks and has specific reference to a form of construction of a tank or supply chamber designed for use as a fuel supply means for internal combustion engines and the like or any common form of storage tank for liquids in which impurities may occur, the specific gravity of which impurities is greater than such liquid. As is well known to those familiar with the art, considerable difficulty has been experienced in the past in the operation of internal combustion engines in that the fuel such as gasoline and oil, which is consumed by such engines, or power plants, is delivered thereto through relatively small pipes from a supply reservoir and before being actually consumed is caused to pass through a relatively small aperture usually located in the carburetor or like means associated with such engine or power plant. No matter how carefully the fuel is prepared and handled, and regardless of any precautions which may be used to prevent the fuel from coming in contact with foreign material, a certain amount of dirt, dust and water usually comes in contact with the fuel, so that some means must be provided to trap such foreign material to prevent the same from finding its way into the relatively narrow passages through which the fuel is caused to flow. The presence of such foreign material, either dirt or water, or the like, in such narrow or relatively small passageways will choke or clog such passages and prevent the functioning of the engine by cutting off the fuel supply thereto.

Numerous attempts have been made in the past to provide means for catching and trapping any such foreign material which might find its way into the fuel reservoir. All of such attempts have taken the form of catch basins and the like, usually associated with the drain plug for the reservoir, or the line leading from the reservoir to the engine, the operation of such means depending upon the foreign material sought to be trapped, finding its way to such trap before it has had an opportunity to pass to the engine.

All of these devices have been unsatisfactory to efficiently accomplish the purposes for which they have been designed, and further, to absolutely insure against the possibility of any foreign material finding its way into the passage or conduit leading the fuel from the reservoir to the engine or like means. This failure on the part of the forms of construction previously employed has been largely due to the fact that the

foreign material in the fluid has had just as great an opportunity to pass into the delivery conduit as it has had to be trapped by the means provided for such purposes. It is among the objects of our invention to provide a fluid reservoir specifically a fluid reservoir for internal combustion engines and the like, which shall fully accomplish all of the above named desired ends, for which devices of this character have previously been designed, and for which purposes such devices have failed.

More specifically our invention provides a fluid or fuel reservoir which has means associated therewith which will function so that when the fuel is introduced to such reservoir, the incoming stream of such fuel will wash clean that portion of the reservoir from which the fuel is withdrawn and such means will have the additional function of minimizing the return of any foreign material, such as dirt and water or the like having a specific gravity greater than the fuel, to that portion of the tank from which such fuel is to be consumed is withdrawn. Other objects of our invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain structure embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a longitudinal sectional view through one form of apparatus comprising our invention; Fig. 2 is a transverse sectional view of the apparatus illustrated in Fig. 1 taken on a plane substantially indicated by the lines 2—2; Fig. 3 is a transverse sectional view of the apparatus illustrated in Fig. 1 taken on a plane indicated by the line 3—3; Fig. 4 is a transverse sectional view similar to Fig. 2 but showing an alternative view of reservoir construction; Fig. 5 is a transverse sectional view similar to Fig. 2 showing a further alternative form of construction; and Fig. 6 is a fragmentary, sectional view of a tank similar to Fig. 1 showing the alternative form of construction illustrated in Fig. 5.

Referring more specifically to the drawing and more especially to Fig. 1, the device here shown for purposes of illustration consists of a substantially cylindrical tank 1 which has positioned

therein and secured to the inner periphery thereof at axially spaced points, a plurality of baffle plates such as 2 and 3. These baffle plates are placed within the tank 1 to prevent a violent agitation of the fuel contained therein which would occur were such baffles omitted, which, when the vehicle with which such reservoir is associated were to greatly change its direction or rate of motion. The baffle members such as 3, which function solely as a means for restraining such agitation of the fuel, are, however, provided with a plurality of relatively small apertures 4 which permit the fuel in the several compartments formed thereby to come to the same level.

One of the baffles, specifically baffle 2 which is the one next adjacent the inlet aperture 5 for the reservoir, which aperture is normally closed by a cover 6, has associated therewith and preferably formed integrally therewith a bottom partition member 7 which is secured along its edges to the sides and end of the tank, so as to produce a false bottom. The baffle member 2 has a segmental portion omitted adjacent the top of the tank so as to provide an aperture 14 for the purposes hereinafter more fully explained. This baffle 2 has likewise a plurality of relatively small apertures 4' extending therethrough adjacent the upper surface of the partition member 7, so as to permit a flow of fluid between the compartments on opposite sides of this baffle, so that the fuel may come to a common level in such compartment. The supply or delivery conduit 8 by means of which the fuel is withdrawn from the tank 1 extends into that compartment of the tank above the false bottom 7 and on the same side of the baffle plate 2 as the inlet 5 for the fuel. The conduit 8 will extend into close proximity to such false bottom 7 and may be provided with a screen 9 or the like. While a screen 9 or the like need not be employed in association with the end of the conduit 8 for the purpose of preventing the entry of foreign material having a specific gravity greater than the fuel to such conduit, nevertheless such screen is effective to prevent light materials having a specific gravity less than the fuel from entering the conduit.

Underneath the bottom member 7, which is in effect a transversely extending partition member, the discharge or draining aperture 10 is formed in the outer wall of the tank 1. This discharge aperture is preferably formed in a struck up portion which is exteriorly threaded, so as to threadably engage a closure cap 11. This cap is provided with a shallow reservoir for entrapping any foreign material finding its way therein. The apertures 4' in the baffle member 2 will preferably be arranged tangentially to the upper surface of the bottom or partition member 7 for the purposes hereinafter more fully explained.

While the above form of construction has been explained, in connection with a reservoir, substantially cylindrical in form and having a circular cross section, it will be noted that the principles comprising our invention are applicable to fuel supply tanks regardless of their cross sectional contour. The cross section of the reservoir illustrated in Fig. 4, it will be noted, is substantially rectangular, such reservoir tank 12 having baffles such as 13 therein, and such baffles 13 adjacent the supply and discharge means for the tank will have a partition or false bottom member 7' associated therewith, for the same purposes

for which the bottom or partition member 7 is designed.

A further modification of the structure comprising our invention, and for some purposes the preferred form of construction, is illustrated specifically in Figs. 5 and 6. In the form of construction illustrated in these figures, the cylindrical tank 1 is of the form disclosed in Fig. 1, the only change residing in the formation and arrangement of the baffle 2' and the false bottom 7a. In this form of construction, the baffle 2' which is similar to the baffle 2 described in connection with the previous figures, has an aperture 14' therein along its upper side which is similar to the aperture 14 in Fig. 2 and formed for the same purpose. In the modification illustrated in Fig. 5, instead of having the baffle 2' and the false bottom 7a formed integrally, these elements are separate units, and the baffle 2' terminates a short distance above the upper surface of the false bottom, so that a narrow slot is formed between the baffle and the false bottom. The false bottom 7a will be secured to the sides and end of the tank, and will preferably extend as at 15 for a distance beyond the baffle 2'. It will be noted that in this form of construction the false bottom 7a slopes slightly toward the baffle 2', and further, such false bottom is slightly concave as most clearly illustrated in Fig. 5 for the purposes hereinafter more fully explained.

During the use of a fuel reservoir constructed in accordance with the principles comprising our invention, when the fuel is introduced to the reservoir through the aperture 5 provided therefor, such fuel flowing to the right of the tank, in order to maintain a uniform level, will wash clean the upper surface of the partition member 7 and will remove therefrom all foreign material having a specific gravity greater than the fuel, such as dirt and water. This flow of the incoming fuel will likewise scour and wash clean the lower or ingress end of the supply conduit 8 and its associated screen 9. After the reservoir has been filled or partly filled and the apparatus placed in operation, then any foreign material such as dirt, water and the like which would have a tendency to clog the fuel supply conduit 8 or any means associated therewith, will when the same proceeds to the left of the tank move under the partition members 7 or 7a. The arrangement of the partition members 7 and 7a in association with the baffles 2 and 2' also materially assists in preventing any foreign material which may be in the fuel in the reservoir from passing to that portion of the reservoir from which the fuel is withdrawn. The fuel in attempting to flow from the right end of the tank, as illustrated in Fig. 1, to that compartment from which it is withdrawn, must of necessity pass through the baffle or element 2, and this baffle will effectively arrest and cause all foreign material to settle, so that the passage of such foreign material into the compartment from which the fuel is withdrawn is fully prevented. It will be noted that when the apparatus comprising our invention is employed, the chamber or compartment from which the fuel is withdrawn is at all times free from any foreign material which might be present in such fuel, due to the same having been washed out of such compartment when the reservoir was filled. There is therefore no possibility of any of the foreign material finding its way into the discharge conduit 8, but all of such foreign material which, if it should move to the

discharge end of the container or tank will be trapped either under the partition plates 7 and 7a, or in the cap 11 associated with the drain orifice.

5 The form of construction illustrated in Figs. 5 and 6 has advantages which it is believed merit special consideration. In this form of construction, as above indicated, the baffle 2' is substantially a solid wall terminating short of the upper portion of the inner periphery of the tank, and also a short distance above the surface of the false bottom 7a. When the tank constructed in this manner is filled with fuel through the orifice 5, such fuel in flowing to the other compartment within the tank in order to seek a common level, will be forced to pass through the narrow slot between the baffle and the false bottom, and due to the relative small size of such slot, the velocity of the fuel will be sufficiently great to scour and sweep clean the upper surface of the false bottom of any foreign material which may lie thereon. Any foreign material which may occur in the fuel in the compartment to the left of the baffle 2', as illustrated in Fig. 6, will settle onto the false bottom. As the vehicle with which the tank is associated is in motion, thereby effecting an agitation of the fuel within the tank 1, such fuel, due to a change in direction of motion of the vehicle, will be caused to flow from one end of the tank to the other. The fuel in flowing from the right end of the tank to the left end will fill up sufficiently to spill over the upper edge of the baffle 2', i. e., through the aperture 14', such fuel then returning to the other compartments in order to establish a common level of the fuel in the other compartments will be caused to flow through the narrow slot of the baffle and over the false bottom, thereby washing such false bottom clean of any foreign material which may have been deposited thereon by a precipitation of the body of the fuel contained in the compartments of the left of the baffle 2'. By carrying the false bottom 7a for a distance such as is indicated at 15 in Fig. 6, beyond the baffle 2' the effectiveness of such false bottom to trap the foreign material thereunder may be increased.

It will be understood that the compartment within the tank to the left of the baffle 2' will preferably be made as small as possible by positioning such baffle as closely as possible to the end of the tank, leaving only sufficient room in such compartment for the conduit 8 and its associated screen 9 and the ingress orifice 5. The compartment hereinbefore described and into which the fuel conduit 8 extends and with which the false bottom is associated, it will be noted, may well be positioned at either end of the fuel tank, without departing from the principles of our invention.

The area of the apertures 4' or the slot occupying a similar position will be such of course so that the tank may be filled quickly and without the fuel building up to too great an extent between the baffle and the end of the tank.

A further description of the principles comprising our invention is believed unnecessary to those familiar with the art. Suffice it to say that the construction herein illustrated and described may be modified to accomplish the same desirable results but such various forms of construction are so numerous that a detailed disclosure of all of such forms in this description is unnecessary.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the

structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:

1. A fluid reservoir having a horizontally extending partition so arranged that the fluid, when the reservoir is filled, will flow thereacross, and means extending into close proximity to one side of said partition for drawing off the contents of said reservoir.

2. A fluid reservoir having a horizontally extending partition so arranged that the fluid, when the reservoir is filled, will flow thereacross, and means disposed in the path of such fluid flow and extending into close proximity to one side of said partition for drawing off the contents of said reservoir.

3. In a fluid reservoir, a confining shell, a horizontal partition secured to said shell and spaced from the bottom thereof, a fluid ingress orifice in said shell arranged so that the fluid during the filling operation will sweep across such partition, and means for drawing off the contents of said reservoir, said means extending into close proximity to such partition.

4. In a fluid reservoir, a confining shell, a horizontal partition secured to said shell and spaced from the bottom thereof, a fluid ingress orifice in said shell arranged so that the fluid during the filling operation will sweep across such partition, and means for drawing off the contents of said reservoir, said means extending into close proximity to such partition between said ingress orifice and the center of said reservoir.

5. In a fuel tank, a lateral confining shell having closed ends, a horizontal partition member overlying a portion of the bottom of said tank, and means for introducing fluid to and drawing the same from said tank, said means overlying said partition member.

6. In a fuel tank, a lateral confining shell having closed ends, a horizontal partition member overlying a portion of the bottom of said tank, means for introducing fluid to and drawing the same from said tank, said means overlying said partition member, and a sediment trap under said partition member.

7. In a fuel tank, a transversely extending baffle substantially dividing such tank into a plurality of compartments, a horizontally arranged partition overlying the bottom of one of said compartments, an ingress orifice in the wall of said compartment, and means for withdrawing the contents of said tank extending into close proximity to said partition.

8. In a fuel tank, a transversely extending baffle substantially dividing such tank into a plurality of compartments, a horizontally arranged partition overlying the bottom of one of said compartments, an ingress orifice in the wall of said compartment, and means for withdrawing the contents of said tank extending into close proximity to said partition intermediately of said ingress orifice and said baffle.

9. In a fuel tank, a closed shell, a baffle extending transversely of such shell and terminating a short distance above the bottom of the tank, a horizontally arranged partition overlying the bottom of said tank on one side of said baffle and secured to the lower edge thereof, an ingress orifice adjacent one end of said tank over said partition, and means for drawing off the contents of said tank, said means extending

into close proximity to the upper surface of said partition and intermediately of said ingress orifice and said baffle.

10. In a fuel tank, a closed shell, a baffle extending transversely of such shell and terminating a short distance above the bottom of the tank, a horizontally arranged partition overlying the bottom of said tank on one side of said baffle and secured to the lower edge thereof, an ingress orifice adjacent one end of said tank over said partition, a sediment trap under said partition, and means for drawing off the contents of said tank, said means extending into close proximity to the upper surface of said partition and intermediately of said ingress orifice and said baffle.

11. In a fuel tank, a closed shell, a baffle extending transversely of the shell and terminating a short distance above the bottom of said tank, a horizontally arranged partition overlying the bottom of said tank on one side of said partition, said partition spaced vertically from the lower edge of said partition and extending beyond the same on one side thereof, an ingress orifice adjacent one end of said tank over said partition, a sediment trap under said partition, and means for drawing off the contents of said tank, said means extending into close proximity to the upper surface of said partition and intermediately of said ingress orifice and said baffle.

12. In a fuel tank, a closed shell, a baffle extending transversely of the shell and terminating a short distance above the bottom of said tank, a return flow orifice in the upper portion of said partition, a horizontally inclined partition overlying the bottom of said tank on one side of said partition, said partition spaced vertically from the lower edge of said partition and extending beyond the same on one side thereof, an

ingress orifice adjacent one end of said tank over said partition, a sediment trap under said partition, and means for drawing off the contents of said tank, said means extending into close proximity to the upper surface of said partition and intermediately of said ingress orifice and said baffle.

13. In a fuel tank, a lateral confining shell having closed ends, a horizontally inclined partition member overlying a portion of the bottom of said tank, and means for introducing fluid to and drawing the same from said tank, said means overlying said partition member.

14. In a fuel tank, a lateral confining shell having closed ends, a dished horizontally inclined partition member overlying a portion of the bottom of said tank, and means for introducing fluid to and drawing the same from said tank, said means overlying said partition member.

15. In a fuel tank, a lateral confining shell having closed ends, a horizontally inclined partition member overlying a portion of the bottom of said tank, a transversely extending baffle in said tank adjacent said partition and forming therewith a restricted passage for the flow of fluid, and means for introducing fluid to and drawing the same from said tank, said means overlying said partition member.

16. In a fuel tank, a lateral confining shell having closed ends, a dished horizontally inclined partition member overlying a portion of the bottom of said tank, a transversely extending baffle in said tank adjacent said partition and forming therewith a restricted passage for the flow of fluid, and means for introducing fluid to and drawing the same from said tank, said means overlying said partition member.

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