

Oct. 1, 1957

V. E. LIDECKER

2,808,102

ANTI-LOADING CARBURETOR ATTACHMENT

Filed Nov. 7, 1951

3 Sheets-Sheet 1

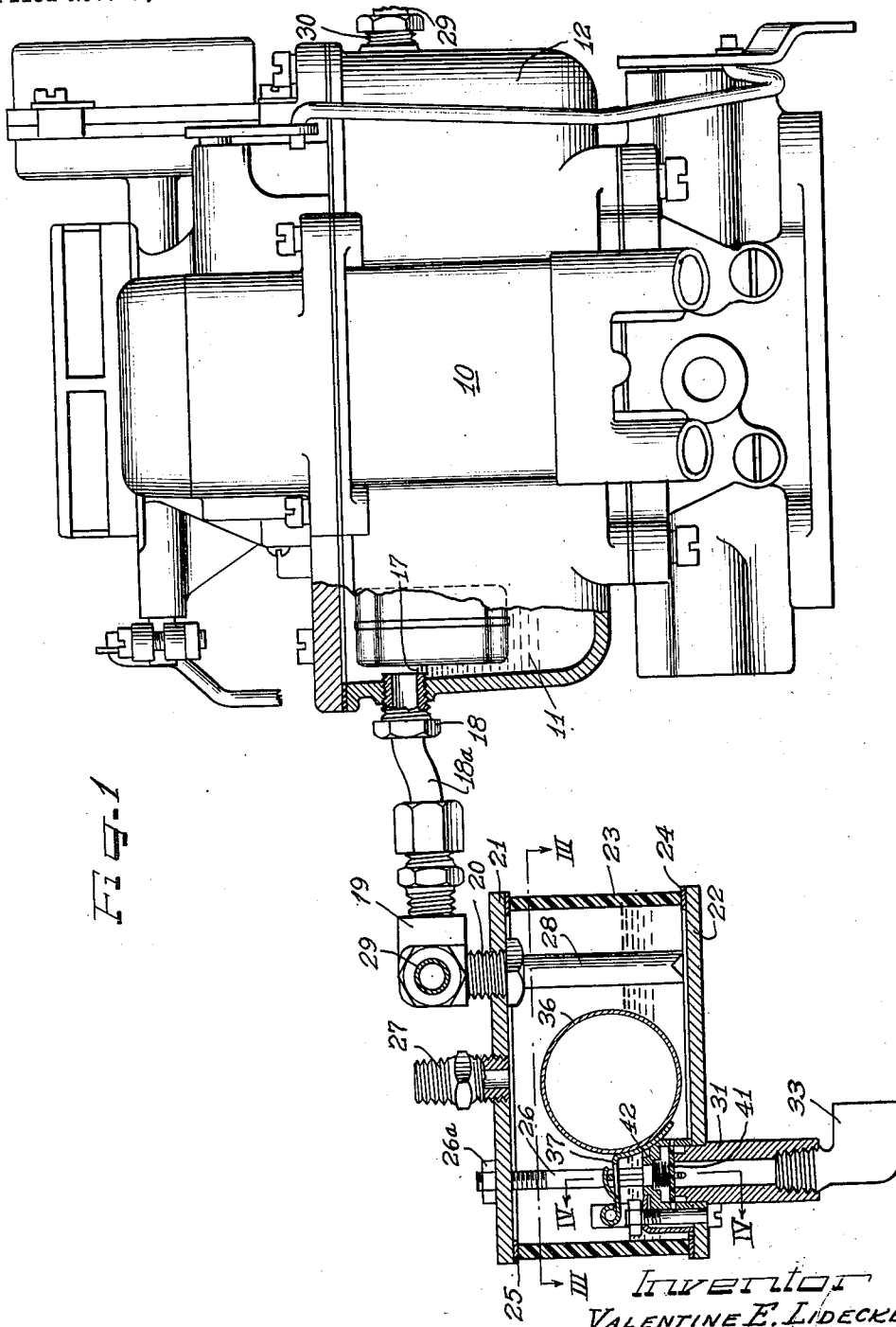


Fig. 1

Inventor
VALENTINE E. LIDECKER

Hill, Sherman, Merani, Gross & Simpson
Attys

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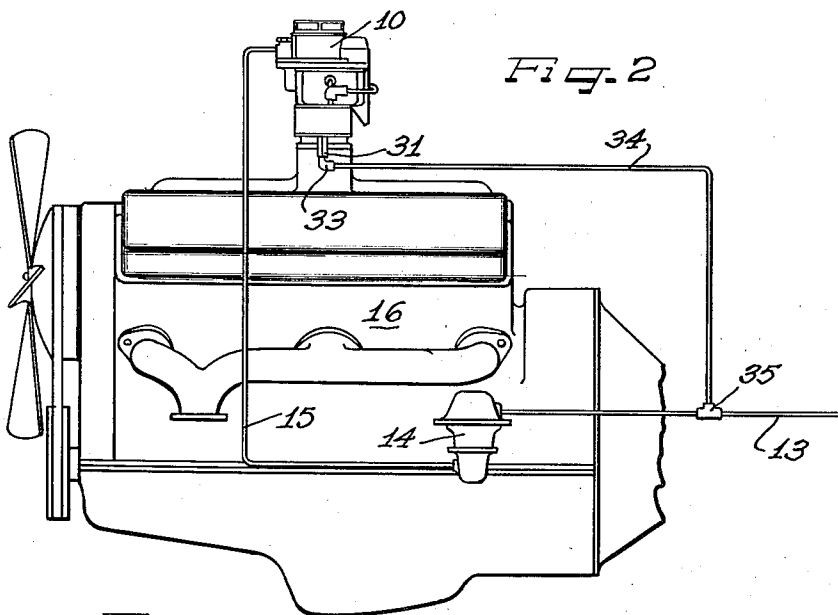
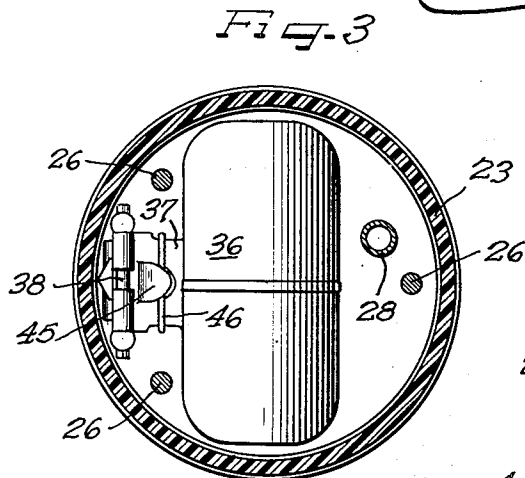
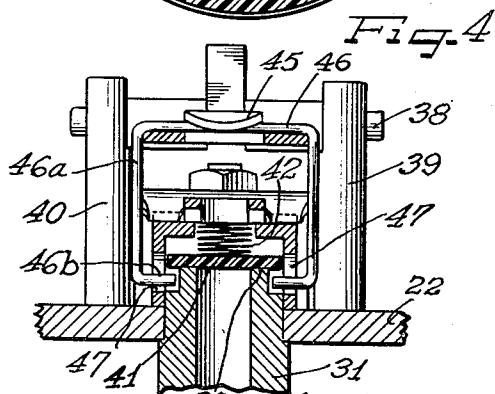
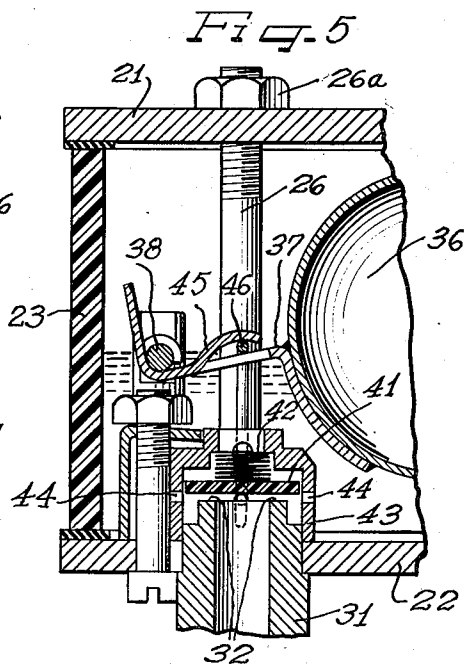
V. E. LIDECKER

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ANTI-LOADING CARBURETOR ATTACHMENT

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3 Sheets-Sheet 2



Inventor
VALENTINE E. LIDECKER

By *Shel Sherman, Thomas R. Rader & Son, Inc.* Attys.

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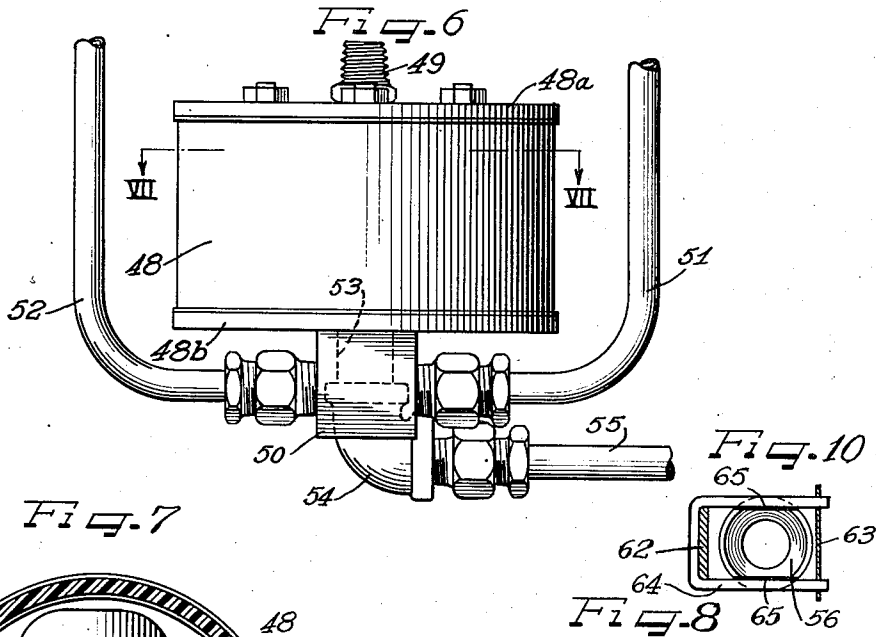
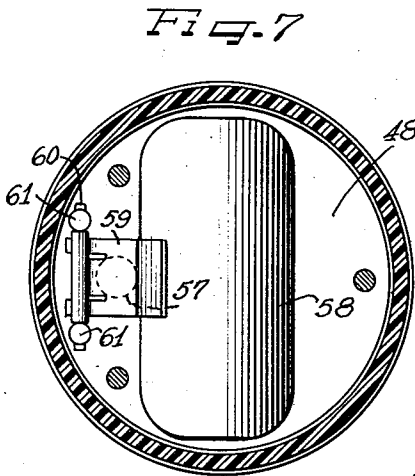
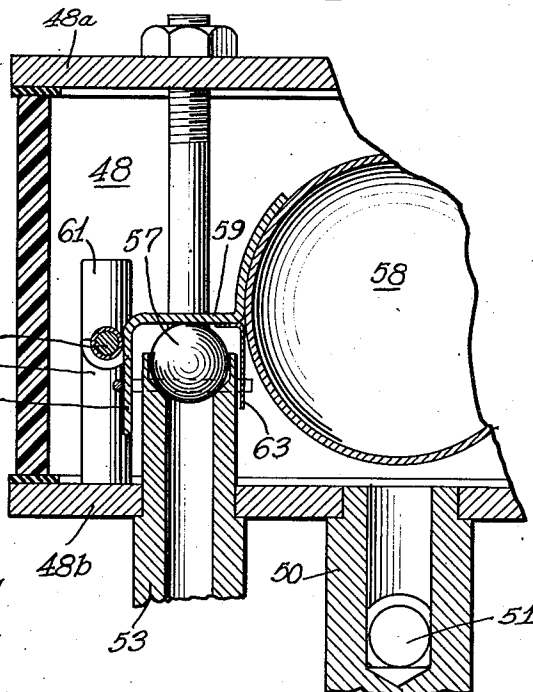
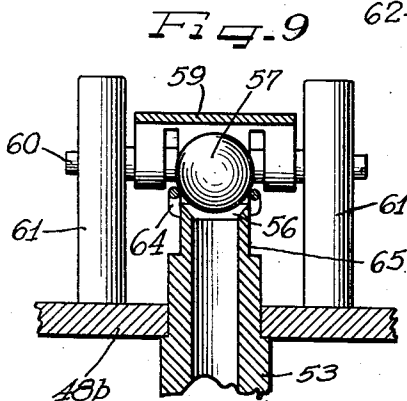
V. E. LIDECKER

2,808,102

ANTI-LOADING CARBURETOR ATTACHMENT

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3 Sheets-Sheet 3



INVENTOR
VALENTINE E. LIDECKER

BY *Willie E. Lidecker, Marie Lidecker* Attys.

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2,808,102

ANTI-LOADING CARBURETOR ATTACHMENT

Valentine E. Lidecker, Chicago, Ill.

Application November 7, 1951, Serial No. 255,237

10 Claims. (Cl. 158—38)

This invention relates to a carburetor attachment and particularly pertains to an attachment for internal combustion engine carburetors which is designed to receive excess liquid fuel from the supply chamber of such carburetors and to return the same to the main fuel supply source.

Although float operated valve mechanisms are provided to regulate the level of liquid fuel in carburetor supply chambers, conditions of operation frequently cause the level to momentarily exceed the predetermined height and result in the delivery of excess liquid fuel to the engine. This condition is referred to as "loading" and such undesired delivery of excess liquid fuel in addition to being wasteful and causing faulty operation of the engine also dilutes the oil film on the cylinder walls and other parts of the engine contributing to "scuffing" and rapid wear thereof.

Among the conditions causing this temporary increase in the height of liquid fuel in the carburetor supply chamber are sudden cessation of high speed engine operation, passing over road irregularities, sudden deceleration of the vehicle on which the engine is mounted or the parking of the vehicle on an inclined surface.

It is an important object, therefore, of the present invention to provide means whereby all excess fuel, which may temporarily accumulate in a carburetor fuel supply chamber, is promptly removed therefrom and conveyed to the main fuel supply source.

It is a further important object of this invention to provide means for such removal of excess fuel which effects that desired result without affecting predetermined pressure conditions within the carburetor fuel supply chamber.

Another important object of this invention is to provide an excess fuel receptacle for carburetors which may be readily attached to the instrument without changing or altering the construction thereof or interfering with its normal operation.

Structure embodying the present invention comprises a vented, float controlled, liquid fuel receptacle, the bottom of which is connected through a suitable conduit with the interior of the carburetor fuel supply chamber at a point to receive all liquid fuel accumulated therein above the predetermined fuel level, which excess fuel flows by gravity into said receptacle. When a predetermined amount of liquid fuel accumulates in this receptacle, a float controlled valve opens to permit discharge thereof into a conduit leading to the intake side of the engine fuel pump. Sufficient liquid fuel, however, is retained in the receptacle to cover the discharge end of the first mentioned conduit thus obviating any disturbance of predetermined pressure conditions within the carburetor fuel supply chamber.

By use of the present invention, "loading" of the carburetor is, to a large extent, eliminated, dilution of lubricating oil is minimized and a considerable saving of engine fuel is effected.

Other and further important objects of this invention

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will be apparent from the disclosures in the accompanying drawings and the following specification.

The invention (in a preferred form) is shown on the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a view in side elevation showing a typical dual down-draft carburetor and showing the anti-loading attachment of this invention mounted thereon, a part of the carburetor fuel supply chamber being shown in section and the anti-loading attachment of this invention being shown in central vertical section;

Figure 2 is a side elevation of typical installation of a carburetor and the anti-loading attachment of this invention is mounted on a conventional internal combustion engine for an automotive vehicle and is associated with the liquid fuel supply system thereof;

Figure 3 is an enlarged section taken on the line III—III of Figure 1;

Figure 4 is an enlarged section with parts in elevation taken on the line IV—IV of Figure 1;

Figure 5 is an enlarged fragmentary section with parts in elevation of a part of the anti-loading attachment shown in Figure 1;

Figure 6 is a front elevation of a modified form of anti-loading device embodying the principles of this invention with the inlet and discharge pipes broken away;

Figure 7 is a section on the line VII—VII of Fig. 6 with parts shown in elevation;

Figure 8 is an enlarged fragmentary sectional view similar to Fig. 5 showing a modified form of valve structure;

Figure 9 is an enlarged fragmentary section with parts shown in elevation taken at right angles to the view in Fig. 8 and showing the valve open; and

Figure 10 is a top plan view with parts in elevation and with the ball valve removed showing the ball valve seat and a part of the operating yoke for the valve.

As shown on the drawings:

Reference numeral 10 generally designates a typical carburetor, a dual down-draft type of carburetor being here shown for purposes of illustration. These carburetors are ordinarily provided with fuel supply chambers shown at 11 and 12 and each of such fuel supply chambers is provided with a float controlled valve whereby the level of fuel introduced therein is not permitted to exceed a predetermined height. Liquid fuel is ordinarily fed to the carburetor by a supply pipe 13 which runs from the main fuel supply tank by a fuel pump 14 and from that fuel pump 14 through a feed pipe or conduit 15 that communicates with the carburetor 10 and discharges into the fuel supply chambers thereof past the float controlled valves which limit the height of fuel within such chambers. All of the foregoing constitutes standard construction well known to those skilled in the art and since the specific details thereof form no part of this invention such structure will not be further described herein.

The reference numeral 16 designates a typical internal combustion engine for an automotive vehicle and shows the normal position of the carburetor 10 mounted thereon. It will be noted that as so mounted the carburetor may assume different positions of fore-and-aft angularity when the vehicle passes over uneven road surfaces or is parked upon inclined surfaces. Furthermore, the angular relationship of the carburetor in reference to a level plane may change from time to time during operation of the engine or through movement of the engine in reference to the relatively flexible mountings by which such engines are ordinarily affixed to the automotive vehicle.

The normal liquid level maintained in the fuel supply chambers of the carburetor is the same as in level position shown at 17 in the lefthand-side of Fig. 1. Many

standard carburetors are provided with a drilled hole, the bottom of which coincides with the desired maximum level of liquid fuel to be maintained within the supply chamber 11 or 12. These drilled holes are usually tapped and provided with a closure plug so as to permit inspection so that if fuel flows from the hole when the plug is removed, a mechanic is advised to adjust the float valve to lower the normal fuel level. Where the carburetor is provided with such a tapped and drilled hole, the anti-loading attachment of my invention can be affixed thereto by the mere removal of the plug and attachment of the device in a manner to be described hereinafter. Where no such tapped and drilled holes are provided, the carburetor may be readily drilled and tapped at the desired point for attachment of my device.

The device of this invention is attached to the carburetor as shown in Fig. 1 by insertion of a threaded apertured plug 18 therein, the bottom of said apertured plug being of such a height as to coincide with the height of the maximum fuel level normally to be maintained within the carburetor fuel chamber. The apertured plug or fitting 18 communicates through a short conduit 18a which preferably extends downwardly a short distance and communicates with an L fitting 19 having a downwardly threaded conduit extension 20 which is secured in a cover portion 21 of a fluid receptacle which will now be described.

Said receptacle, which is conveniently cylindrical in form, has in addition to the cover member 21 above described, a bottom member 22, the side walls of the receptacle being provided by a cylindrical member 23 which, if desired, may be made of transparent material so as to permit inspection of the operation. The top and bottom portions 21 and 22 are secured in fluid-tight relation by means of gaskets 24 and 25 and raw bolts 26 having nuts 26a as shown in Figs. 1 and 5.

The interior of the receptacle formed by the top and bottom members 21 and 22 and the cylindrical wall member 23 is vented to atmosphere through a vent plug 27 inserted in a threaded opening in the top wall 21. Excess fuel from the fuel supply chamber 11 of the carburetor flows into the receptacle defined by the walls 21, 22 and 23 through the apertured plug 18, the conduit 18a, the L fitting 19, the threaded fitting 20, and a conduit 28 which extends downwardly to a point adjacent the bottom of the receptacle and which communicates with the passage through the L fitting 19. It should be noted that the conduit 28 discharges liquid fuel at a point adjacent the bottom of the receptacle and at a point where the bottom of said conduit 28 is normally immersed in liquid. This arrangement prevents any disturbance of normal predetermined pressure conditions within the carburetor fuel chambers 11 and 12.

Excess fuel from the fuel supply chamber 12 of the carburetor is conveyed through a conduit 29 (shown fragmentarily in Fig. 1) to the L fitting 19. The conduit 29 is connected to the carburetor fuel chamber 12 through an apertured plug 30 identical in construction to the apertured plug 18 and this connection is effected so that the bottom of the aperture through that plug coincides with the desired maximum liquid fuel level within the chamber 12.

Extending through the bottom plate 22 of the receptacle is a discharge fitting 31 which terminates inside the receptacle in a flat valve seat 32 past which liquid fuel may be discharged from the receptacle. It shall be noted that the valve seat 32 and the entrance to the discharge conduit 31 is at a level slightly above the lower or discharge end of the conduit 28 so that such discharge end of said conduit is always immersed in liquid during normal operation of the device.

The discharge conduit 31 communicates through a fitting 33 with a conduit 34 which in turn communicates through a T 35 with the main fuel supply line 13 leading from the supply tank, not shown, to the fuel pump

14. Hence, fuel discharged from the receptacle provided by the walls 21, 22 and 23 will be returned to the main fuel supply and not wasted.

The mechanism which is provided to periodically permit of discharge of fuel from the supplementary receptacle will now be described. This mechanism includes a buoyant float 36 of well known construction which is provided with a laterally extending bracket member 37 supporting a hinge connection to a cross-shaft 38 supported on posts 39 and 40 projecting into the receptacle from the bottom member 22 (see Figs. 4 and 5).

Entrance to the discharge fitting 31 past the valve seat 32 is normally prevented by a flap valve 41 which is urged against said seat by a light spring 42 confined between the upper face of the valve and a cage 43 which surrounds the valve and the inner end of the discharge fitting 31 as shown in Fig. 5. Liquid is permitted to flow into the cage 43 through ports 44 provided for that purpose. A bracket or extension 37 is provided with an integral offset portion 45 so that a bail 46 may be received between said bracket and said offset portion. The two arms of that bail, which are designated by the reference numeral 46a, extend downwardly outside of the cage 43 which is provided with slots 47 through which inwardly projecting portions 46b of said bail project. These inwardly extending projections 46b extend sufficiently far inwardly through the slots 47 in the cage 43 to engage beneath the overhanging portion of the disk valve 41 so that when the bail is lifted by upward movement of the float said valve will be lifted from its seat against the pressure of the spring 42. When the valve is so lifted from its seat fuel within the receptacle will discharge therefrom down to the level of the inner end of the discharge fitting 31. This lowering of the fuel level within the receptacle will, of course, permit the float 36 to be lowered so that the projections 46b on the bail 46 are moved to the lower ends of the slots 47 and thus permit the valve 41 to again be seated on the seat 32. This mechanism thus provides for periodic dumping or discharge of the contents of the receptacle down to the level mentioned and a refilling thereof by reason of overflow from the carburetor fuel supply chambers 11 and 12. As previously mentioned, liquid discharged from the receptacle does not fall to a level below the discharge end of the conduit 28, wherefore the use of this device in no way interferes with predetermined pressure conditions within the fuel supply chambers 11 and 12.

In Figs. 6 to 10, inclusive, I have shown a modified form of construction particularly adapted for use with dual carburetors of the type engines where the carburetor is mounted transversely of the engine. In this modification there is shown an improved form of valve which under certain circumstances of operation is more positive in its action than the valve previously shown and described, which valve construction eliminates the need for a valve seating spring.

In this modified form a receptacle constructed generally as the receptacle previously described and designated by the reference numeral 48 the top and bottom walls thereof being designated respectively by the reference numerals 48a and 48b. The upper wall 48a of the receptacle 48 is provided with a vent inlet 49 of the same general construction and for the same purpose as the vent inlet 27 previously described.

In the modification shown in Figs. 6 to 10, inclusive, overflow of fuel from the float bowls of the carburetor is admitted to the receptacle 48 through a manifold connection 50 opening into the bottom wall 48b and communicating through pipes 51 and 52 of suitable fittings like the fitting 18 opening into the float bowls of the carburetor at the normal fuel level thereof. This particular arrangement facilitates attachment of the device to the front end of the carburetor—transversely of an engine such, for example, as a V-type engine.

Discharge of fuel from the receptacle 48 is through

an outlet pipe 53 which communicates through an elbow 54 and a discharge pipe 55 preferably leading to the fuel feed line of the engine. The outlet pipe 53 projects into the receptacle 48 for a substantial distance above the bottom wall 48b of said receptacle so that a residual body of fuel remains within the receptacle at all times thus avoiding the disturbance of atmospheric conditions within the carburetor float bowl. The inner end of the pipe 53 is reduced and provided with a tapered circular valve seat 56 which is adapted to receive a ball valve 57 which controls the discharge of fuel from the receptacle.

The mechanism for positively operating the ball valve 57 to unseat the same or to firmly seat the same on the valve seat 56 will now be described with particular reference to Figs. 7 to 10, inclusive.

The float 58 is mounted within the receptacle 48 and has secured thereto a laterally extending hinge bracket 59 which has a portion hinged to a shaft 60 extending laterally and horizontally between two vertical posts 61 secured to the bottom wall 48b of the receptacle extending upwardly therefrom. By virtue of this arrangement, the float 58 and its associated hinge bracket 59 oscillate about the shaft 60 as the fuel level within the receptacle 48 rises or descends. When the float is in lowermost position the underside of the hinge bracket 59 engages the top of the ball valve 57 to retain the same in seated position on the seat 56 as shown in Fig. 8.

The mechanism for lifting the ball valve 57 from its seat consists of a downwardly turned extension 62 on the hinge bracket 59 which cooperates with a bracket 63 also supported by said hinge bracket 59 and extending downwardly therefrom to carry a yoke member 64 which straddles the inner end of the pipe 53 adjacent the seat 56 and is engageable beneath the median diameter of the ball valve 57 by reason of its movement in cut-away flat portions 65 (Fig. 9) formed on either side of the inner end of the pipe 53.

By reason of the foregoing construction it will be appreciated that upward movement of the float will be transmitted to the yoke 64 through the brackets 62 and 63 and that consequently when the float is moved upwardly a predetermined distance, the ball valve 57 will be unseated as shown in Fig. 9 to permit fluid flow from the receptacle 48 down to the level of the valve seat 56 at the inner end of the outlet pipe 53.

It will be further apparent that the valve mechanism for controlling discharge through the pipe 53 is free of springs, is positive in action both as to seating and unseating and is consequently trouble-free in operation.

It will be obvious that whenever the level of liquid fuel within the fuel supply chambers even momentarily exceeds the predetermined desired level, as by reason of a surge, the inclination of the carburetor or a sudden build-up of supply due to cessation of high speed operation, such excess will immediately flow into the receptacle thence to be discharged periodically back into the main fuel supply line 13 as above described.

By reason of this attachment, "loading" of the carburetor with its attendant evils is greatly minimized. In tests of devices of this character it has been found that with a moderate sized automobile equipped with a dual carburetor, as much as two quarts of liquid fuel is removed during 100 miles of normal driving. Were that amount of excess fuel to have found its way into the engine, loading of the carburetor and faulty operation of the engine would have ensued as well as dilution of the engine lubricant. Furthermore, the excess fuel so supplied to the engine would have been wasted.

Although I have shown my attachment affixed to a dual carburetor in two convenient ways, it is obvious that methods of connection thereof to the carburetor may be varied and it is further obvious that the device, by a mere variation in fittings well known to those skilled in the pipe-fitting or mechanic trade, may be readily attached

to and used with carburetors having one, two, or more fuel supply chambers.

I am aware that various details of construction may be varied without departing from the principles of this invention and I, therefore, do not propose limiting the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim:

1. In an overflow fluid receptacle attachment device for combination with a carburetor exteriorly thereof and to prevent the liquid level in the carburetor from rising above a predetermined level therein, a casing having a closed chamber vented to atmosphere at its top, an inlet pipe secured to the casing for supporting the same and opening into the casing at the bottom thereof, an outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the opening of the inlet pipe, a float pivotally mounted within the chamber and movable in response to variations in level of fluid therein, a valve for closing the entrance to the outlet pipe operable by the float to open position when the fluid in the chamber reaches a predetermined height, and a connection member between the float and the valve to transmit movement of the latter to the former.

2. In an attachment device of the class described for combination with a carburetor exteriorly thereof and to prevent the liquid level in the carburetor from rising above a predetermined level therein, a casing providing a closed chamber vented to atmosphere, an inlet conduit extending into the interior of the casing and opening into the casing at the bottom thereof, an outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the opening of the inlet pipe, a spring-urged valve normally closing the inner end of the outlet pipe, a float within the casing adapted to rise as the fluid level therein rises, an extension on the float affording a pivotal connection therefor, a transverse shaft to which said extension is pivoted, a bail engaged over said extension and having portions engaging with the underside of the valve exteriorly of the outlet pipe whereby upward motion of the float and its connection is transmitted to open the valve.

3. In an attachment device of the class described for combination with a carburetor exteriorly thereof and to prevent the liquid level in the carburetor from rising above a predetermined level therein, a casing providing a closed chamber vented to atmosphere, an inlet conduit extending into the interior of the casing and opening into the casing at the bottom thereof, an outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the opening of the inlet pipe, a flap valve for normally closing the entrance end of the outlet pipe, a cage surrounding the end of the outlet pipe within the casing and permitting the ingress of fluid thereto, a spring interposed between the inside of the cage and the upper face of the valve to normally retain the valve in closed position, a shaft mounted transversely of the interior of the casing, a hinge connection with the shaft extending laterally therefrom over the valve cage, a float secured to the hinge connection, a bail secured to the hinge connection between the shaft and the float having depending portions extending through slots in the cage underneath the valve, said depending portions being of such length that they do not engage the valve until the float has moved upwardly for a predetermined distance by reason of a rise of fluid level within the casing.

4. In combination, a carburetor having a fuel supply chamber wherein liquid fuel is maintained at a predetermined level, a conduit fitting secured to the carburetor and communicating with the interior of said fuel chamber at said fuel level to receive all fuel above said level, a conduit extension depending from said fitting, an enclosed vented receptacle carried by said conduit extension, an inlet conduit secured to and opening into said

receptacle with its discharge end at a point adjacent the bottom of said receptacle, an outlet pipe for said receptacle opening into the interior thereof at a level above the discharge end of said inlet conduit and a float operated valve for controlling the flow of fuel from the receptacle to the outlet conduit.

5. In combination, a carburetor having a plurality of fuel supply chambers having outlet means operative to maintain liquid fuel therein at a predetermined level, an enclosed vented liquid receptacle in fluid communication with and below said fuel supply chambers to receive fuel therefrom by gravity flow whenever the predetermined level therein is exceeded, an inlet conduit leading to a point adjacent the bottom of said receptacle, an outlet conduit opening into said receptacle at a level above the discharge end of the inlet conduit whereby the latter is immersed in liquid fuel at all times and a float operated valve for controlling the discharge of liquid fuel from the outlet conduit.

6. In combination, a carburetor having a plurality of fuel supply chambers having outlet means operative to maintain liquid fuel therein at a predetermined level, an enclosed vented liquid receptacle in fluid communication with and below said fuel supply chambers to receive fuel therefrom by gravity flow whenever the predetermined level therein is exceeded, an inlet conduit leading to a point adjacent the bottom of said receptacle, an outlet conduit opening into said receptacle at a level above the discharge end of the inlet conduit whereby the latter is immersed in liquid fuel at all times and a float operated ball valve for controlling the discharge of liquid fuel from the outlet conduit.

7. In a device of the class described, a casing providing a closed chamber vented to atmosphere, an inlet conduit secured to and opening into the interior of the casing and opening therein near the bottom thereof, and outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the bottom of the inlet pipe, a ball valve normally closing the inner end of the outlet pipe, a float within the casing adapted to rise as the fluid level therein rises, an extension on the float affording a pivotal connection therefor, a transverse shaft to which said extension is pivoted, a yoke engaging either side of the ball valve at a point above the seat thereof but below the median diameter thereof, and connections between the float extension and said yoke whereby upward movement of the float is transmitted through the yoke to lift the ball from its seat and whereby downward movement of the float to its lowermost position permits seating of the valve and holds the same on its seat by reason of engagement of the float extension with the upper face of the ball.

8. A float operated valve mechanism for controlling the flow of fluid through the open end of a conduit comprising a buoyant float, a lateral extension on the float affording a pivotal connection therefor, a fluid pipe having a seat for a ball valve formed at its inner end, a ball valve adapted to engage said seat to prevent the flow of fluid through the pipe, laterally spaced downward extensions carried by the lateral extension and extending downwardly on either side of the pipe, a yoke carried by said extensions and movable in recesses formed in the exterior

of the pipe at right angles to the downward extensions, said yoke engaging the underside of the ball to lift the same from its seat when the valve moves upwardly said hinge extension on the float engaging the upper side of the ball when the same is seated.

9. In an attachment device of the class described for combination with a carburetor exteriorly thereof and to prevent the liquid level in the carburetor from rising above a predetermined level therein, a casing providing a closed chamber vented to atmosphere, an inlet conduit secured to and opening into the interior of the casing and opening into the casing at the bottom thereof, an outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the opening of the inlet pipe, a valve for normally closing the entrance end of the outlet pipe, a shaft mounted transversely of the interior of the casing, a hinge connection between the shaft extending laterally therefrom over the valve, a float secured to the hinge connection, a member secured to the hinge connection between the shaft and the float having portions extending underneath the valve, said portions being of such length and being so spaced that they do not engage the valve until the float has moved upwardly for a predetermined distance by reason of a rise of fluid level within the casing and thereafter engaging the valve to open the outlet pipe.

10. In an attachment device of the class described for combination with a carburetor exteriorly thereof and to prevent the liquid level in the carburetor from rising above a predetermined level therein, a casing providing a closed chamber vented to atmosphere, an inlet conduit secured to and opening into the interior of the casing and opening into the casing at the bottom thereof, an outlet pipe extending from the bottom of the casing and communicating with the interior thereof at a level above the opening of the inlet pipe, a ball valve for normally closing the entrance end of the outlet pipe, a shaft mounted transversely of the interior of the casing, a hinge connection between the shaft extending laterally therefrom over the ball valve, a float secured to the hinge connection, a means secured to the hinge connection between the shaft and the float having portions extending underneath the ball valve, said portions being of such length and being so spaced that they do not engage the ball valve until the float has moved upwardly for a predetermined distance by reason of a rise of fluid level within the casing and thereafter engaging the ball valve to open the outlet pipe.

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