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ANTI-VAPOR LOCK SYSTEMS

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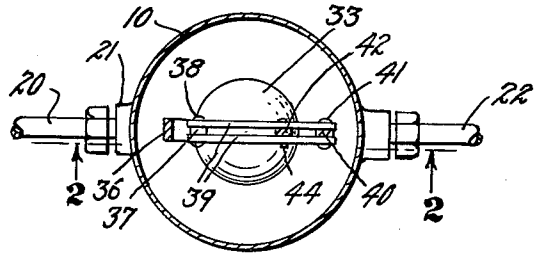

FIG 1

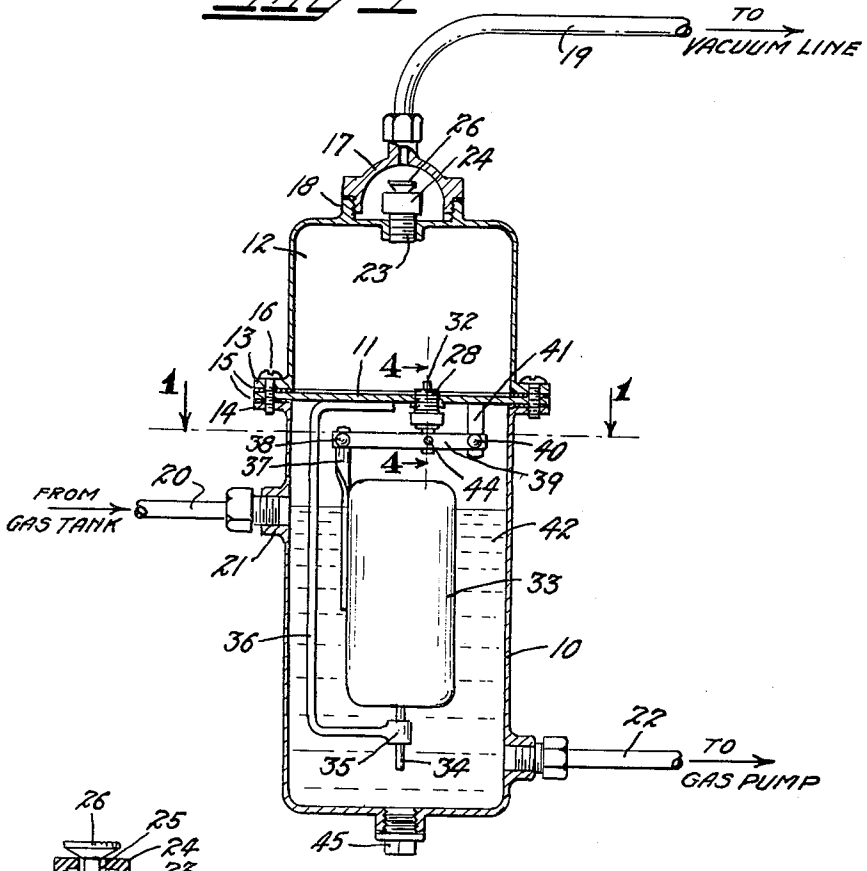

FIG 2

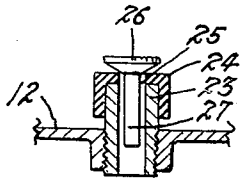

FIG 3

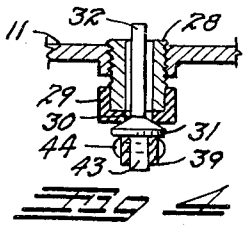

FIG 4

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ANTI-VAPOR LOCK SYSTEMS

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This invention relates to a device for providing positive feed of gasoline to the engine of a motor vehicle. Interruptions of fuel flow are frequently occasioned by air or vaporized fuel being entrapped in the fuel line from the reservoir. Such entrapped air or fuel prevents "priming" of the fuel pump and results in a stoppage of the flow of fuel to the carburetor. Such stoppages, usually termed "vapor locks," are aggravated by heat reaching the fuel line either from a heated portion of the engine or from excessive atmospheric temperatures.

The principal object of this invention is to provide a simple, economical, highly-efficient device for automotive vehicles which will instantly and constantly remove all gaseous accumulations from the fuel lines so that liquid fuel will be constantly furnished to the fuel pump and the carburetor regardless of conditions which might normally produce "vapor lock."

Another object of the invention is to so construct the improved vapor lock eliminator that it can be positioned at any desired point and at any desired elevation in a conventional engine fuel system and quickly and easily connected into the present fuel and vacuum lines of the engine with a minimum of labor.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a cross section through the improved vapor lock eliminator looking downwardly on the line 1—1, FIG. 2;

FIG. 2 is a vertical section therethrough taken on the line 2—2, FIG. 1;

FIG. 3 is a detail enlarged sectional view illustrating a type of check valve employed in the improved vapor lock eliminator; and

FIG. 4 is a similarly enlarged detail sectional view taken on the line 4—4, FIG. 2, illustrating a vacuum control valve as employed in the invention.

The improved vapor lock eliminator comprises a cup-shaped fluid-fuel reservoir 10 the top of which is sealed by an apparatus plate 11 which separates the reservoir 10 from an inverted cup-shaped, vacuum chamber 12. The vacuum chamber 12 may be sealed to the reservoir 10 in any desired manner. As illustrated, the chamber and the reservoir are flanged as indicated at 13 and 14, respectively, and the flanges are sealed to the opposite faces of the plate 11 by means of suitable sealing gaskets 15 and cap screws 16. A valve shell 17 is mounted on the vacuum chamber 12. As illustrated, the valve shell is threaded into an annular flange 18 formed on the top of the vacuum chamber 12.

A vacuum pipe 19 is coupled to the shell 17 in any conventional manner and leads to a vacuum line on the automotive engine, such as to the intake manifold of the engine or the windshield wiper conduits. A fuel feed conduit 20 is connected, through the medium of a nipple 21, through the side of the reservoir adjacent the upper extremity of the latter. The conduit 20 leads to the gasoline tank of the automotive vehicle and serves to supply gasoline from the tank to the reservoir 10. A discharge tube 22 communicates through the wall of the

reservoir 10 adjacent the bottom of the reservoir and leads to the conventional fuel pump or to the engine carburetor in those cases where there is no fuel pump.

A removable sediment plug 45 is positioned in the bottom of the reservoir for draining and cleaning sediment from the latter. A check valve nipple 23 is threaded through the top of the vacuum chamber 12 within the valve shell 17. The nipple 23 is provided with a neoprene cap 24 having a central valve port 25 communicating with the interior of the nipple 23. A valve stem 27 extends through the port 25 and downwardly into the hollow interior of the nipple 23. An inverted conical valve disc 26 is formed on the upper extremity of the valve stem 27 and rests upon the cap 24 to close the port 25.

It can be seen that excess pressure in the vacuum chamber 12 will lift the valve disc 26 from its seat and excess pressure in the valve shell 17 will force the valve 26 to its seat so as to prevent back flow through the vacuum pipe 19.

A vacuum control nipple 28 communicates through and extends downwardly from the plate 11. The control nipple 28 is also provided with a neoprene cap 29 having a central port 30 communicating with the interior of the nipple. The port 30 is closed by means of a second conical valve disc 31 mounted on the lower extremity of a valve stem 32 extending upwardly into the hollow interior of the nipple 28. The second valve disc 31 is arranged to be urged to the closed position on the cap 29 by means of a float 33 positioned within the reservoir 10.

The float 33 is maintained in concentric position within the reservoir by means of a guide pin 34 mounted on and extending downwardly from the float through a guide sleeve 35 carried on the extremity of a float bracket 36. The float bracket 36 extends upwardly to a fixed mounting in the lower surface of the plate 11.

A valve-actuating arm 37 is fixedly mounted on and extends upwardly from the float 33 to a pivotal connection 38 with one extremity of a bifurcated valve-actuating lever 39 which extends to a pivotal connection 40 on a fulcrum post 41 at its other extremity. The fulcrum post is secured to and extends downwardly from the plate 11. The lever 29 passes directly beneath the second valve disc 31 and an attachment ear 43 formed on the disc 31 is pivoted to the lever 29 by means of a suitable pivot pin 44.

When in use, the reservoir 10 is filled with gasoline, indicated at 42, to approximately the level of the fuel feed conduit 20. Let us assume that the vacuum pipe 19 is connected to the vacuum line of the engine. The fuel conduit 20 is connected to the fuel tank of the automobile and the discharge tube 22 is connected to the fuel pump of the automobile. Normally, the reservoir 10 forms simply a part or section in the fuel supply line between the conduit 20 and the tube 22 so that if gasoline is drawn from the tube 22 by the fuel pump, it will be constantly replaced by gasoline flowing in from the conduit 20. Should vapor or air, however, accumulate in the top of the reservoir or in the conduit 20, the fuel level in the reservoir will gradually descend due to the demand of the fuel pump. This will cause the float 33 to gradually descend so that the lever 39 will pull the valve disc 31 downwardly to open the vacuum port 30. This causes all accumulated air and vapors from the conduit 20 and from the reservoir 10 to be drawn through the port 30 into the vacuum chamber 12 and to the intake of the engine. As the vapors are removed, the fuel level in the reservoir 10 will gradually return to its normal position causing the float 33 to close the vacuum valve 31 so that the device will continue to operate in the normal manner.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention what is claimed and desired secured by Letters Patent is:

1. A vapor lock eliminator to be positioned in the fuel supply line which supplies gasoline from a storage tank to a fuel pump in an automotive vehicle comprising: a cup-shaped fluid fuel reservoir; an inverted-cup-shaped vacuum chamber positioned over said reservoir; a partition plate positioned between and separating said reservoir from said vacuum chamber; means clamping said chamber and said reservoir to opposite sides of said plate in sealed relation thereto; a valve shell removably mounted on the exterior of said vacuum chamber; means for connecting said valve shell to a vacuum source; means for connecting said reservoir in the circuit of said fuel line; a no-return check valve between said valve shell and said vacuum chamber allowing air to be drawn from said chamber and to maintain a partial vacuum in the latter; and a float-operated valve in said partition plate acting to open said reservoir to said vacuum chamber so as to create a partial vacuum in the latter when the fluid level therein descends below a predetermined level.

2. A vapor lock eliminator as described in claim 1 in which the float-operated valve comprises a vacuum control nipple threaded concentrically through said partition plate; a fulcrum post mounted on said partition plate and extending downwardly therefrom at one side of said nipple; a valve-actuating lever pivotally mounted at its first extremity on said post and extending diametrically across and below said nipple; a valve mounted on said lever and positioned to close said nipple as said lever is moved upwardly; and a float in said reservoir connected to said second extremity of said lever.

3. A vapor lock eliminator as described in claim 2 having means for mounting said float on said partition plate so as to be removable with said plate, said means comprising a guide pin extending downwardly from said float and a float bracket mounted on said partition plate and extending downwardly therefrom into said reservoir alongside said float to a position to slidably engage said guide pin.

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