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ANTI-PERCOLATOR STRUCTURE FOR CARBURETORS

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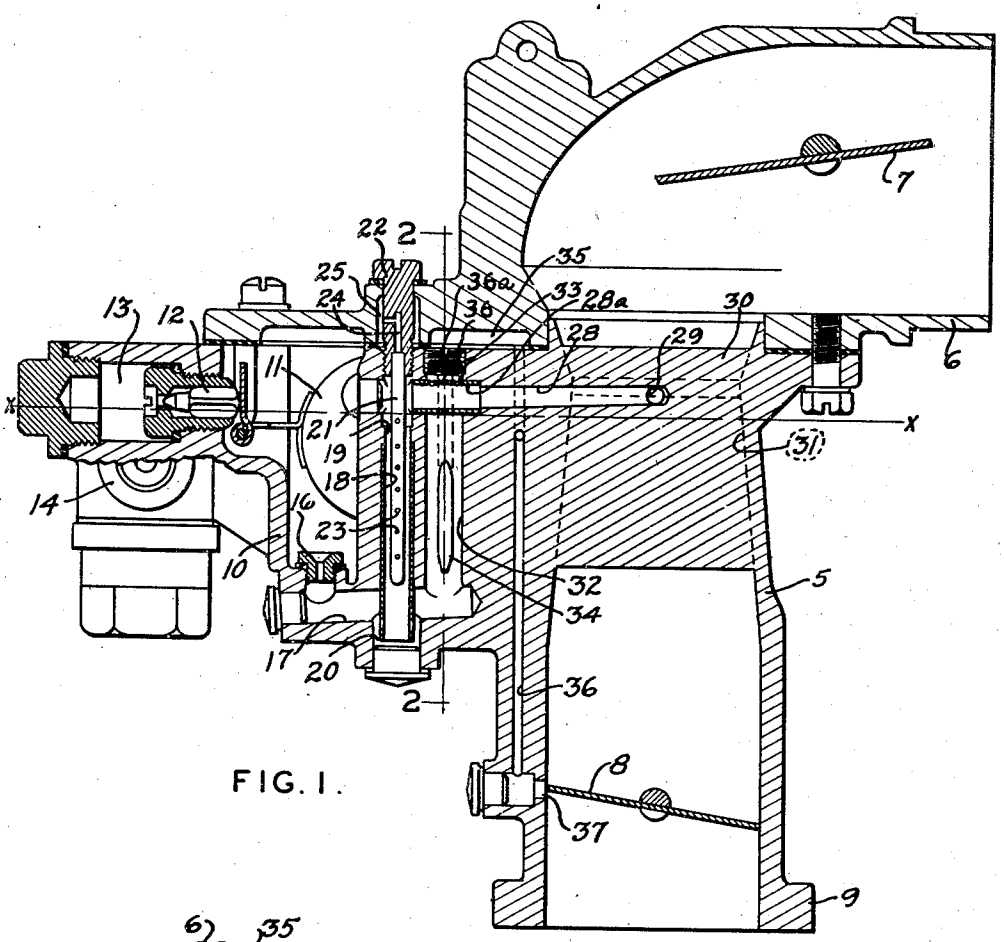


FIG. 1.

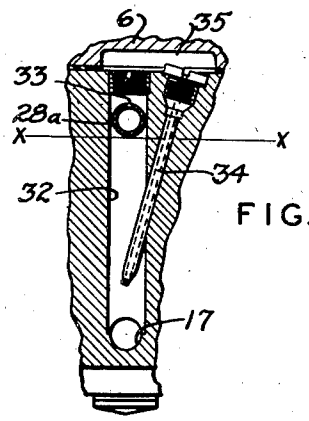


FIG. 2.

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ANTIPERCOLATOR STRUCTURE FOR CARBURETORS

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3 Claims. (Cl. 261—41)

1

This invention relates to carburetors for internal combustion engines and consists particularly in novel means for releasing vapors in the main fuel discharge passage to prevent "percolation."

In the usual form of automotive carburetor, the main fuel passage extends from a restricted metering orifice in the bottom of the constant level chamber upwardly into the mixture conduit. The fuel in the lower part of the passage is subjected to engine heat and, when transmitted heat rises above the boiling point of the fuel, as frequently happens when the engine is stopped in warm weather, the bubbles formed pass upwardly through the nozzle and carry liquid fuel into the carburetor and manifold. This so called "percolation" results in a "loaded" condition of the engine which impedes or prevents restarting of the engine for a considerable period of time. Various arrangements have been devised for eliminating or preventing the formation of bubbles in the base of the main nozzle but these have not proven a hundred per cent successful.

An object of the present invention is to provide an anti-percolator construction for automotive carburetors including means for definitely diverting gaseous bubbles from the main fuel passage into a bubble relief passage.

Another object is to provide such a structure in which the bubbles, after being released from the fuel in the carburetor passage, are directed into the carburetor in harmless gaseous form.

Another object is to utilize the bubble releasing duct as a part of the idling fuel system.

These objects and other more detailed objects hereafter appearing are attained substantially by the structure illustrated in the accompanying drawing in which

Fig. 1 is a vertical section through a form of carburetor embodying the invention.

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

The carburetor in the drawing comprises a downdraft mixture conduit or barrel 5 having an horizontal air inlet horn 6 at its upper end controlled by a choke valve 7. The lower or discharge end of the barrel is controlled by a butterfly throttle valve 8 and is flanged as at 9 for attachment to the engine intake manifold (not shown). Adjacent the barrel there is provided a fuel bowl 10, within which fuel is maintained at a substantially constant level by a float 11 acting upon a needle valve 12 which controls the admission of fuel to the bowl through inlet

2

13 having a fitting 14 for tubing extending to the usual fuel pump. In the bottom of the bowl is a metering orifice element 16 through which fuel is supplied to the lower, slightly inclined cross portion 17 of the main fuel passage. A vertical tube 18 seated in a bore 19 in the carburetor body has its lower extremity depending into a sump 20 formed in cross passage 17. A tube 21, supported in a threaded plug 22 which closes the upper end of bore 19 extends into the tube 18 and has a series of perforations 23. Tube 21 communicates through angle passage 24, in plug 22, and counterbore 25 around the plug with the atmosphere so that tube 21 functions to bleed air into the main fuel supply.

An upper, transverse bore 28 intersects vertical bore 19 and discharges into the mixture conduit through ports 29 in a jet bar 30 which spans venturi 31 in the mixture conduit. Bore 28 has an enlarged portion adjacent vertical bore 19 which receives a tube 28a.

A second vertical duct 32 extends upwardly from cross portion 17 of the main fuel passage immediately posterior to tube 18 and at its upper extremity is spanned by tube 28a in upper main fuel passage 28. Tube 28a has one or more perforations 33 in its upper wall forming fluid communication between duct 32 and cross passage 28. Duct 32 is closed at its upper end by a threaded plug 36 having a screw driver slot 36a. An inclined idle metering tube 34 is seated in the carburetor body, as best shown in Fig. 2, and extends into duct 32 so that its lower extremity is constantly immersed in the gasoline therein. Fuel for idling is supplied through tube 34 and passages 35 and 36 to port 37 located adjacent the edge of throttle valve 8 when closed.

In operation, the portion of main fuel passage tube 18 which depends below the upper wall of cross passage 17 forms baffle structure for diverting gas bubbles in the cross passage into vapor relief duct 32. The bubbles in passage 17, of course, travel along the upper surface thereof and being obstructed by the tube, continue along the slightly inclined cross passage to the relatively large duct where they rise to the surface of the fuel and are released. The resultant vapors then pass through perforations 33 in tube 28a and through ports 29 into the carburetor barrel. However, because of the ample cross section of duct 32 and the location of perforations 33 substantially above the fuel level in the duct, no liquid fuel can be carried by the bubbles into the carburetor barrel. Also, no air will bleed through perforations 33 since the well is sealed.

Any fuel passing through perforation 33, of course, is calibrated with the main fuel supply through tube 18.

It is noted that because of the location of the vertical main fuel passage and, particularly, the high point thereof substantially at the center of the fuel bowl and the "overhead" construction of the main fuel passage 28, the carburetor can operate at a greater angle from the vertical without spilling of fuel into the carburetor barrel than would be the case if the vertical passage were located on the inner wall of the bowl. Such location of vertical tube 18 and passage 19 provides ample space between the passage and the carburetor barrel for relief duct 32.

Tube 18 and duct 32 may be disposed at angles other than vertical but should extend more sharply upwardly than cross passage 17. Various other features of the carburetor shown may be modified as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

What is claimed is:

1. In a carburetor, a mixture conduit having a Venturi tube, a constant level fuel chamber, a main fuel passage including a lower cross portion formed with a downwardly extending well and having a metering connection with said chamber, a second part extending upwardly from said cross portion, and an upper transverse part above the normal fuel level and opening into said Venturi tube, a vapor relief duct in opening communication with and extending upwardly from the lower cross portion of the main fuel passage, said duct extending substantially parallel to the upwardly extending part of the main fuel passage and intersecting the upper transverse portion of same, a perforate wall forming the intersecting portion of the upper transverse portion of the main fuel passage to permit the passage of vapor from the vapor relief duct into the main fuel passage, and an imperforate tubular baffle depending from the upwardly extending part of the main passage into said well for deflecting vapors entering said main fuel passage into said duct.

2. In a carburetor, a mixture conduit, a constant level fuel chamber, a main fuel passageway including a lower cross portion having a metering connection with said chamber at one end

and an upwardly extending portion terminating above the normal fuel level in said bowl, said main fuel passageway having a transverse portion connecting its upper end portion with said mixture conduit, a well formed in the lower cross portion of said passageway, a second upwardly extending passageway extending from the lower cross portion of said main fuel passageway at its inner end portion and being intersected by the transverse portion of said first passageway, a tube forming the intersecting portion of the first passageway, said tube being formed with perforations to permit the escape of vapor accumulating in the second passageway, and a tubular baffle depending from the first upwardly extending passageway into said well.

3. In a carburetor, a mixing conduit, a fuel bowl, a main fuel passageway connecting said fuel bowl and said conduit, and including a substantially horizontally extending elongated chamber, said chamber opening into said bowl through a metering orifice and being formed with a downwardly extending well, a portion of said passageway extending upwardly from said fuel chamber and having a tubular baffle therein depending into said well for conducting liquid fuel from within said well, the upper end of said passageway having a portion extending laterally into said mixing conduit, a second passageway extending upwardly from said chamber, said second passageway forming a part of the idle fuel passage and being intersected by the laterally extending portion of the main fuel passageway, and a foraminous tube forming the intersecting portion of the main passageway for withdrawal of vapor from said second passageway.

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