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ANTI-PERCOLATING DEVICE FOR A CARBURETOR

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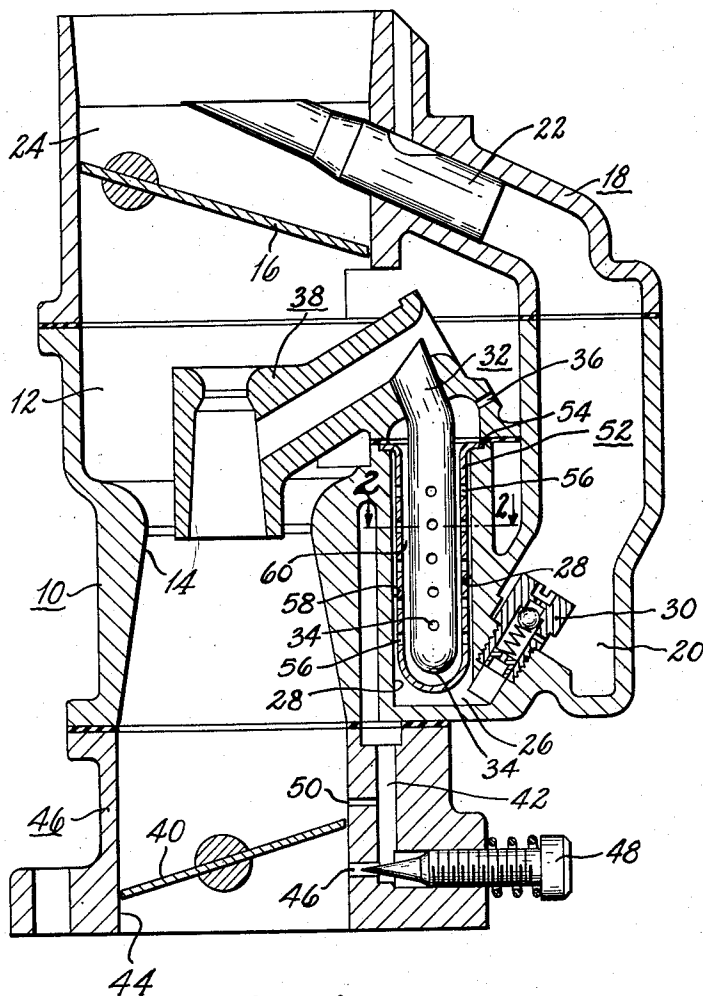


Fig. 1.

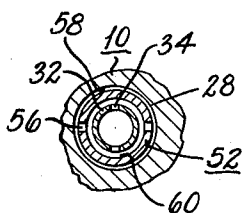


Fig. 2.

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1

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ANTI-PERCOLATING DEVICE FOR A CARBURETOR

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This invention pertains to carburetors and particularly to an anti-percolating device for carburetors of internal combustion engines.

In present day automobile engines, the carburetors are usually located above and directly in the path of heat rising from the engine. Upon stopping a hot engine the heat transmitted to the carburetor float bowl is often sufficient to cause the gasoline to boil or percolate. Percolation of the gasoline in the float bowl, and particularly in the main fuel well, produces bubbles of fuel vapor which force liquid fuel upwardly through the main discharge nozzle. This percolation phenomenon causes liquid fuel to be deposited in the engine intake manifold, thereby causing hard restarting of a hot engine. The present invention relates to means for preventing the formation of vapor bubbles in the main fuel well and thereby eliminating the percolation of fuel therein. Accordingly, among our objects are the provision of means for preventing percolation of fuel in the main fuel well of a carburetor; and the further provision of an anti-percolation tube for a carburetor main fuel well.

The aforementioned and other objects are accomplished in the present invention by incorporating a perforate tube within the main fuel well, the tube being closely spaced to the side walls of the well and concentric with the main fuel nozzle. Specifically, we have discovered that if the formation of vapor bubbles is prevented in the annular space between the main fuel well and the main nozzle, the fuel in the main well will not percolate and hence liquid fuel will not be discharged through the main fuel nozzle and the boost venturi into the intake manifold when a hot engine is stopped.

In order to accomplish this result, an anti-percolating tube having a closed end and perforate side walls is interposed between the main nozzle and the walls of the main fuel well. The annular space between the anti-percolating tube and the side walls of the well is less than the annular space between the anti-percolating tube and the main nozzle. Moreover, the annular space between the anti-percolating tube and the side walls of the main well is small enough so that vapor bubbles cannot enter this space, and therefore, cannot pass through the anti-percolating tube and into the main nozzle.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Figure 1 is a cross sectional view of a carburetor having the anti-percolation device of this invention.

Figure 2 is a fragmentary sectional view taken along line 2—2 of Figure 1.

With particular reference to the drawing a plain-tube downdraft carburetor is disclosed comprising a body member 10 having an air intake passage 12 with a main venturi 14 therein. An unbalanced choke valve 16 of con-

2

ventional construction is disposed in an intake passage extension 24, the choke valve 16 being disposed in a cover member 18 which is secured to the top of the body member 10. The members 10 and 18 form a fuel bowl 20, within which a float, not shown, is disposed so that a constant level of fuel is maintained in the bowl 20. In accordance with conventional practice the fuel bowl 20 is connected by a vent tube 22 to the intake passage extension 24 of the cover member 18 anterior to the choke valve 16.

The body 10 has formed therein a cylindrical main fuel well 26 having side walls denoted by the numeral 28. In accordance with conventional practice the main fuel well 26 is connected to the fuel bowl 20 through a main metering orifice 30. A conventional main fuel nozzle 32 having side wall openings 34 is concentrically disposed within the main fuel well 26. Moreover, the main fuel well is formed with an air bleed as indicated by numeral 36, the air bleed being formed in a boost venturi 38 which is attached to the body 10 and into which the main fuel nozzle 32 discharges fuel.

The flow of combustible mixture from the carburetor is controlled by a conventional throttle valve 40. The discharge portion of an idling system is also shown in Figure 1, which system comprises emulsion channel 42 which discharges into the mixture passage 44 of a throttle body 46 which is attached to the body 10. The emulsion tube 42 discharges into the passage 44 posterior to the throttle valve 40 through an idle fuel jet 46. The quantity of fuel emulsion discharged through the idle jet 46 is controlled by an idle adjustment screw 48, and in addition the emulsion channel 42 is connected with the discharge passage 44 through an opening 50 which is located anterior to the throttle 40 when the throttle valve 40 is in the closed position. The idle opening 50 also functions as a fuel discharge passage when the throttle valve 40 is opened slightly beyond the closed position depicted in Figure 1.

As alluded to hereinbefore, due to the location of downdraft carburetors on internal combustion engines of automobiles, when a hot engine is stopped, the fuel in the main well 26 tends to percolate and thereby produces vapor bubbles which force fuel upwardly through the main nozzle 32 and through the boost venturi 38, which fuel is thereafter deposited in the intake manifold, not shown, of an engine and causes hard restarting of a hot engine. In order to prevent percolation of fuel in the main well 26, an anti-percolation tube 52 is disposed within the main well 26. The tube 52 has a flanged open end 54 disposed between the boost venturi 38 and the body 10, the tube 52 being concentric with the main fuel nozzle 32 and the well 26. The tube 52 has side wall openings 56, and the lower end of the tube is closed. The closed end of the tube 52 is of hemispherical shape as depicted in Fig. 1. The anti-percolation tube 52 is only slightly spaced from the side walls 28 of the main well 26 and forms an annular space 58 therebetween the upper portion of which is closed by the flanged end 54 of the tube. The anti-percolation tube 52 also forms an annular space 60 between the inner side walls thereof and the outer walls of the main discharge nozzle 32, the annular space 60 being larger than the annular space 58.

The annular space 58 between the tube 52 and the side walls 28 of the main fuel well is such that vapor bubbles cannot form therein and hence fuel cannot be forced through the side wall openings 56 of tube 52 and into the nozzle 32. In the particular carburetor under consideration the diameter of the main fuel well 26 is .301 inch and the outside diameter of the anti-percolation tube 52 is .277 inch. By concentrically locating the tube 52 within the well 26 the annular space 60 has a radial dimension

of .012 inch, which space is insufficient to permit the formation of vapor bubbles therein.

During operation of the carburetor with the throttle valve 40 open, main fuel nozzle 32 picks up fuel from the well 26 in a conventional manner through the side wall openings 56 into anti-percolation tube 52 and the openings 34 in the nozzle. This fuel is drawn into the boost venturi 38 to form an air-fuel mixture, which is then mixed with additional air in the main venturi 14 after which it passes through the discharge passage 14 of the throttle body 46. Upon stopping a hot engine, the heat rising from the engine manifolds raises the temperature of the carburetor body 10, but since the annular space 58 is so small that vapor bubbles cannot form therein the fuel in the main well 26 will not percolate so as to cause hard restarting of a hot engine.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In a carburetor, a body member having an air intake passage with a main venturi and a main fuel well having side walls, a boost venturi discharging into the main venturi, a main fuel nozzle having a portion disposed within said main well and spaced from the side walls thereof, said main fuel nozzle discharging into the boost venturi, a throttle valve for controlling the flow of combustible mixture from the carburetor, and an anti-percolation tube disposed in the main fuel well between

the main fuel nozzle and the side walls of the main well, said anti-percolation tube having perforate side walls and a closed end, said anti-percolation tube being located concentrically with respect to the main fuel nozzle and spaced only slightly from the side walls of the main fuel well so as to prevent the formation of vapor bubbles between the main fuel nozzle and the side walls of the main fuel well.

2. In a carburetor having an air intake, a venturi therein, a mixture outlet passage, a fuel supply chamber, a main fuel metering orifice, a main fuel well having side walls and connected to the supply chamber through said orifice, a main fuel nozzle having a portion disposed within said fuel well and discharging into said venturi, and an anti-percolation tube concentric with the main fuel nozzle and disposed between the main fuel well between the nozzle and the side walls of the main fuel well, said anti-percolation tube having perforate side walls and a closed end so as to prevent the formation of vapor bubbles between the side walls of the well and the nozzle.

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