LIQUID LEVEL CONTROL MECHANISM

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The present invention relates to float type carburetors for internal combustion engines such as those generally used in automotive vehicles and the like, and more particularly to a means for maintaining the fuel in the fuel bowl of a float type carburetor at a substantially constant level.

One of the principal objects of the present invention is to provide a carburetor for automotive internal combustion engines wherein the fuel is maintained at a substantially constant level throughout the normal operation of the engine.

Another object of the invention is to provide a float type carburetor for internal combustion engines for automobiles and the like in which the quantity of fuel in the float chamber remains substantially constant irrespective of normal changes in off-level positions of the vehicle or the centrifugal force induced by the motion of said vehicle.

Another object of the invention is to provide in a float type carburetor a fuel control mechanism which is adapted to maintain a predetermined quantity of fuel in the fuel bowl regardless of the normal variations in position of the carburetor or in centrifugal force or inertia resulting from the motion of the vehicle.

Still another object is to provide in a float type carburetor a float lever having a plurality of cooperating floats thereon, which permits said floats to adjust their position in accordance with variations in the plane of the float in the carburettor.

Further objects and advantages of the invention will appear from the following description when read with reference to the accompanying drawings, wherein:

Figure 1 is a vertical cross section through a float type carburetor of an internal combustion engine showing the fuel control mechanism forming the subject matter of the present invention in operative position in said carburetor;

Figure 2 is a section taken on line 2—2 of Figure 1 showing the top plan view of the fuel control mechanism;

Figure 3 is a side elevation of the fuel control mechanism; and

Figure 4 is a perspective view of the fuel valve control mechanism.

With reference to Figure 1 of the drawings, the present fuel control mechanism is shown assembled in a fuel bowl of a horizontal inlet type carburetor. It is to be understood that the purpose of illustrating the present invention, may be considered conventional in design, including all the principal features usually present in float type carburetors for internal combustion engines. In the carburetor, an air intake body 10 connects to an induction passage 12 therethrough having an air inlet 14 on the far side of Figure 1 and an air outlet 16. A large venturi 18 is disposed in the outlet 16 of the induction passage 12 of the air intake body 10 and extends into the top portion of throttle body 20, said venturi being secured in place by the seating of an annular rib 22 of the Venturi tube 18 in the adjacent recesses 24 and 26 of the main and the throttle bodies respectively. A small or secondary venturi 28 is disposed in the large venturi and held in place relative thereto by an arm 30 extending diametrically across the throat of the large venturi and preferably being formed integrally with said small and large venturis.

The throttle body 20 which is secured to the air intake body 10 is mounted on intake manifold 32 and secured thereto by bolts 34 inserted in holes of external flange 38 of the throttle body and flange 40 of the intake manifold. The throttle valve 42 is mounted on shaft 44 in the induction passage of the throttle body and is actuated by a throttle valve lever 46 mounted on one end of shaft 44, the opposite end of shaft 44 being adapted to receive a governor for controlling the position of said throttle valve in accordance with some engine operating condition. A pin 48 seated in the external surface of the throttle body, in cooperation with screw 50 of the throttle valve lever, serves as a stop for limiting the closing movement of said valve.

A float chamber or fuel bowl 60 is mounted directly above the vertical section of the induction passage and contains a fuel discharge nozzle 52 which extends vertically in boss 64 and which receives fuel from the fuel bowl through a main metering jet 66 and discharges it into the throat of the small venturi 28. The central location of the fuel bowl and discharge nozzle in respect to induction passage tends to minimize the effect of changes in carburetor position on the level of the fuel. An accelerating pump 68, a part of which is shown in Figure 2, and a power enrichment system also deliver fuel to the induction passage through the main discharge nozzle and are also contained in said boss 64.

The fuel inlet control mechanism shown suspended in the fuel bowl about boss 64 is designed to maintain a substantially constant quantity of fuel in the fuel bowl regardless of any normal off-vertical positions assumed by the carburetor during vehicle operation. In the embodiment shown...
in the drawings, two hollow metallic floats 74 and 76 are suspended in the fuel bowl on opposite sides of boss 78 and are secured to and supported by an arm 78. This arm is pivoted at its center on a rod 80 and secured thereto by a rivet 82, said arm preferably being adapted to rotate on the rod, though it may be so mounted on said rod that the arm and rod rotate in unison. Rod 80 is supported by a bifurcated member 84 having a hole in each prong in which the rod is adapted to rotate when the floats change position as the carburetor moves from one position to another. Arm 78 is spaced from said member by a washer 86 mounted on rod 80 which in turn is secured against longitudinal movement in member 84 by a spring clip 88 inserted in a groove in the end of the rod opposite arm 78. Extending downwardly from the sides of the horizontal section of the bifurcated member 84 are short arms 90 and 91, each provided with a hole, the hole in each arm being aligned with the hole in the other arm. Member 84 is supported by a bracket 92 secured to the fuel bowl cover adjacent the fuel inlet valve, generally shown at 93, and is pivoted on rod 94 mounted in holes in said bracket.

The fuel is supplied from a suitable source through inlet conduit 96, orifice 100 and valve guide 102 and is thence discharged into the fuel bowl. The flow of fuel is controlled by a valve 104 having a fluted or three-sided stem 106 which rests on the top side of bifurcated member 84. While a one-way connection is provided between the member 84 and valve stem 106, it may be desirable to provide a linkage between said member and stem to positively move the valve 104 in either direction. With such a linkage, the weight of the floats and float arm would assist in unseating the valve in the event it should become stuck and fail to open of its own accord.

In the operation of the present invention, while the carburetor is in vertical position, the fuel control mechanism functions the same as conventional float controlled fuel inlet means. When the carburetor tips from off-vertical position to the left or right so that the fuel level is no longer at right angles to the center line of the carburetor, unlike conventional float mechanisms, the float lever 78 remains parallel to the surface of the fuel and continues to regulate the fuel valve as if no change in carburetor position had occurred. Inasmuch as the rotation of the float lever is about rod 80 which in turn rotates independently of member 84, variations in position of said float lever relative to member 84 do not affect the operation of the fuel inlet valve. It is thus seen that the present carburetor in which the fuel bowl is over the center of gravity and in which the fuel inlet valve is controlled by the present float mechanism is substantially unaffected by any sideways off-level position assumed by the carburetor in the normal operation of the vehicle.

Although the detailed description and drawings disclose but one embodiment of my fuel control mechanism in combination with only one type of carburetor, it is understood that variations in structure of the elements comprising the invention, as well as adaptations of the invention to other type carburetors are possible without departing from the scope of the present invention.

I claim:

1. In a carburetor having a fuel inlet valve and a fuel bowl with two spaced floats therein, a pivotal means disposed adjacent said inlet valve, a lever mounted on said pivotal means and adapted to rotate in a vertical plane to operate said valve in response to changes in quantity of fuel in said bowl, and a lever secured to said floats and pivoted therebetween on said first mentioned lever on an axis transverse to said pivotal means for rotation in a vertical plane normal to the plane of rotation of said first mentioned lever in response to changes in off-level positions of the carburetor.

2. A fuel flow control mechanism for an inlet valve of a carburetor fuel bowl in which two spaced floats are disposed, comprising a pivotal means disposed adjacent said inlet valve, a lever mounted at one end on said pivotal means for rotation in a vertical plane to operate said valve in response to changes in quantity of fuel in said bowl, a rotatable rod supported by said lever on an axis transverse to said pivotal means, and a lever secured to said floats and pivoted therebetween on said rod for rotation in a vertical plane normal to the plane of rotation of said first mentioned lever in response to changes in off-level positions of the carburetor.

3. In a carburetor having a fuel inlet valve and a fuel bowl with two spaced floats therein, a pivotal means disposed adjacent said inlet valve, a lever mounted at one end on said pivotal means for rotation in a vertical plane and having a lateral projection at each end, a rotatable rod journaled in said projections on an axis transverse to said pivotal means, and a lever secured to said floats and pivoted therebetween on said rod for rotation in a vertical plane normal to the plane of rotation of said first mentioned lever.

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