Oct. 20, 1953 E. M. BIMBERG 2,656,165

CARBURETOR

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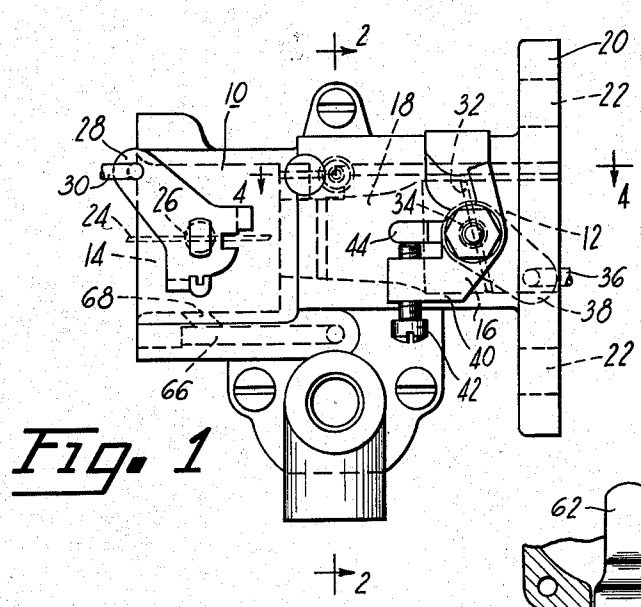


Fig. 1

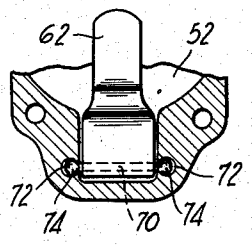


Fig. 6

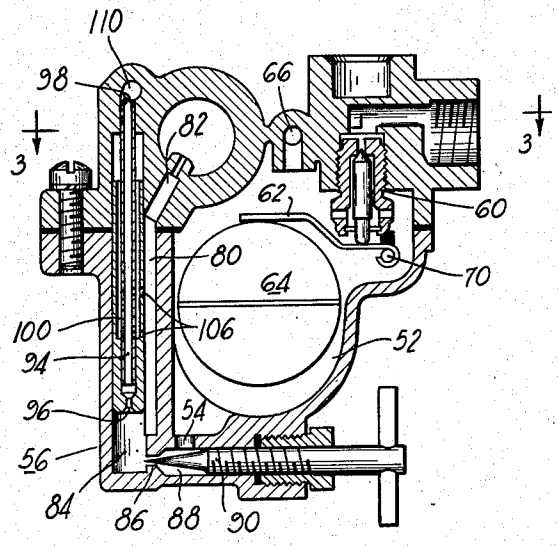


Fig. 2

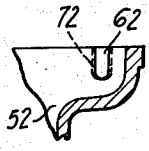


Fig. 7

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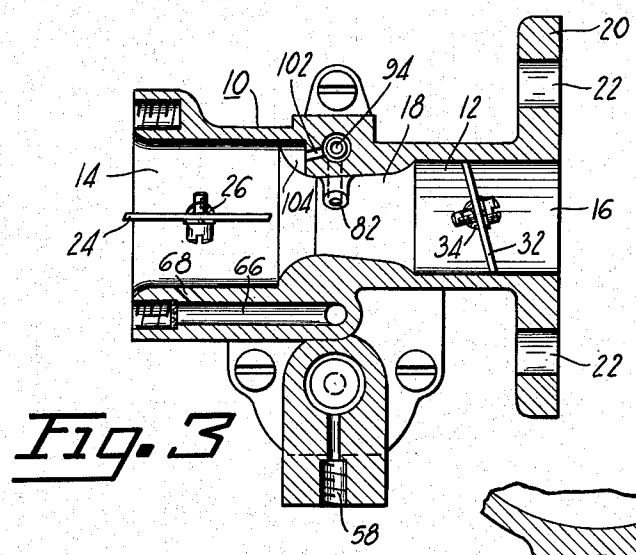


Fig. 3

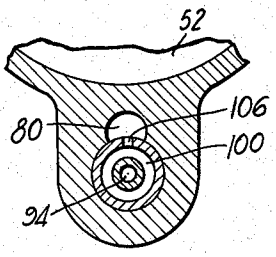


Fig. 5

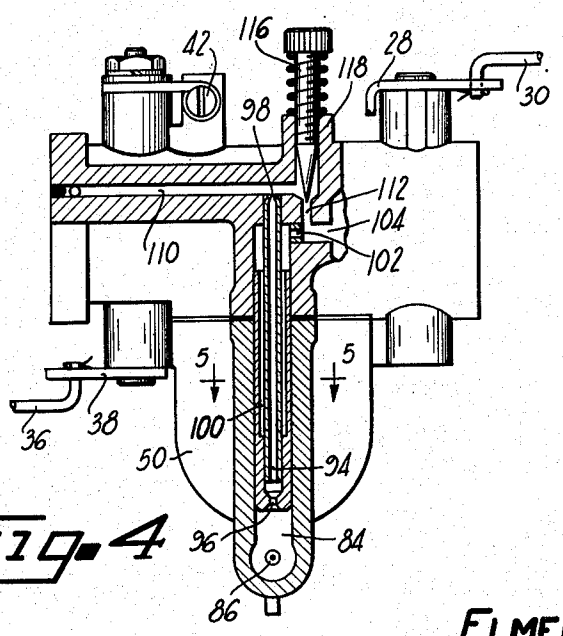


Fig. 4

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CARBURETOR

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4 Claims. (Cl. 261—41)

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The present invention relates to float type carburetors for internal combustion engines and has for its principal object to provide a carburetor of the aforesaid type having efficient, easily adjustable main metering and idling systems and good operating angularity, coupled with simplicity of construction and operation.

Another object of the present invention is to provide a float mechanism in a carburetor which will minimize the effect of engine vibration or the like on the operation of the fuel inlet valve.

Further objects and advantages of the present invention will be apparent from the following description and accompanying drawings, in which one specific embodiment thereof is disclosed, and in which:

Figure 1 is a top plan view of a horizontal carburetor embodying my invention;

Figure 2 is a vertical cross-section of the carburetor taken on line 2—2 of Figure 1;

Figure 3 is a horizontal cross-section of the carburetor taken on line 3—3 of Figure 2;

Figure 4 is a partial vertical cross-section of the carburetor taken on the line 4—4 of Figure 1, showing the construction of the idling system;

Figure 5 is a fragmentary view in cross-section taken on line 5—5 of Figure 4; and

Figures 6 and 7 are fragmentary views of the float lever mechanism.

It is known that in conventional float type carburetors, engine vibration and road jarring transmitted through the vehicle to the carburetor may cause the float to oscillate vertically even though the fuel is at a level normally sufficient to maintain the float at its uppermost position and the fuel valve closed. Inasmuch as the conventional carburetors are generally provided with a rigid float lever and valve engaging arm, as well as a nonyieldable valve construction, any oscillation of the float when the fuel in the bowl is at full level causes successive momentary openings of the fuel valve and a consequent flow of fuel into the bowl. When the engine is consuming fuel at a low rate, as at idling or slow speed, the opening of the fuel valve under the influence of the engine vibration or road jarring permits fuel to enter the fuel bowl at a greater rate than it is being consumed, thus causing fuel to spill from the main discharge jet into the induction passage or to overflow the fuel bowl. The present float mechanism, which will be fully described hereinafter, tends to minimize the effect of engine vibration and road jarring on the fuel inlet valve.

Referring specifically to the drawings, a main body 10 contains an induction passage 12 having

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air inlet 14, a mixture outlet 16 and a venturi 18 between said inlet and outlet, a flange 20 with holes 22 being provided at the mixture outlet end of the main body for mounting the carburetor on the intake manifold of an engine. A manually actuated choke valve 24 is disposed in the air inlet 14 of the induction passage and is mounted on shaft 26 which is rotated by a lever 28 and a rod 30 secured to one end thereof. A throttle valve 32 is mounted on a shaft 34 in the mixture outlet 16 and is actuated by the operator through a rod 36 and lever 38 secured to one end of shaft 34. Mounted on the other end of shaft 34 is an adjustable throttle valve stop consisting of a lever 40 secured to said shaft, a screw 42 threadedly received in the outer end of lever 40 and a lug 44 integrally joined to the main carburetor body 10 against which the end of screw 42 abuts in limiting the closing movement of the throttle valve.

The fuel bowl 50 depends from the lower side of the main body 10 and contains a cylindrically shaped float chamber 52 having a hemispherically shaped bottom connected by a port 54 with a main fuel metering system, generally shown at numeral 56. The fuel enters the float chamber through fuel valve 60, which is controlled by a lever 62 and a spherically shaped float 64 disposed in the cylindrically shaped chamber 52, the diameter of said float being of only slightly smaller diameter than the chamber itself. The lever 62 and float 64 are not joined to one another in order to permit the float to assume various positions in chamber 52 without binding or without substantially affecting its control of valve 60 through the medium of lever 62 as the carburetor tilts from side to side. The disconnected arrangement of the float and float lever operates to minimize the effect of engine vibration and road jarring on the fuel valve. The pressure above the fuel in the float chamber is balanced with that at the intake of the induction passage by a conduit 66 opening into the air inlet at port 68 anterior to choke valve 24.

The float lever 62 is mounted on a pivot pin 70 which is supported at each end in vertical grooves 72, the lower end of said grooves forming the support for the ends of the pin. These vertical grooves are wider throughout their height near the center than at the opening through which the ends of the pivot pin extend. After the pivot pin is mounted in the grooves, as shown in Figures 6 and 7, a holding means 74 such as lead shot is placed in the wider portion of each groove and the fuel bowl cover, which is formed integrally with the main body, is secured in place over the

float chamber, rigidly clamping the holding means and pivot pin in operative position.

The main fuel metering system 56 includes a main discharge conduit having a vertical section 80 connected at one end with a main fuel discharge nozzle 82 opening into the throat of venturi 18 and at the other end with a chamber 84 communicating with the fuel bowl through main metering jet 86, conduit 88 and port 54. A valve member 90 threadedly received in a boss at the base of the fuel bowl is provided to vary the effective area of the main metering jet 86. Adajcent the vertical section 80 of the main fuel conduit is a tubular shaped well 94 having a fuel inlet 96 in the bottom thereof and a calibrated outlet 98 at the top. An annular chamber 100 surrounds well 94 and is connected at the top with the induction passage near air inlet 14 by a port 102 and conduit 104. A plurality of holes 106 arranged in a vertical row are provided in one side of chamber 100 to connect said chamber with the vertical section 80 of the main fuel discharge conduit and are adapted to admit air into said section for forming a fuel-air emulsion which is discharged through nozzle 82 into the induction passage.

The idling system of the present carburetor is clearly shown in Figure 4 of the drawings and includes a horizontal conduit 110 connected at one end with the induction passage on the engine side of the throttle valve and at the other end with a source of fuel by well 94 and with a source of air by inlet port 112, the fuel for idling being metered through port 98 and the air being controlled by a valve 116 threadedly received in a boss 118 in the main body.

In the operation of the carburetor, with the throttle valve in closed or nearly closed position, fuel flows from the float chamber through port 54, conduit 88, metering orifice 86, and thence through chamber 84, inlet 96, well 94, metering orifice 98 into conduit 110. As the fuel passes into conduit 110, air flowing through inlet port 112 mixes with the fuel and forms an emulsion which passes through conduit 110 into the induction passage on the engine side of the throttle valve. As the throttle valve is opened and the source of fuel for the engine shifts from the idling system to the main metering system, fuel flows from chamber 84 upwardly through vertical section 80 of the main discharge conduit, where it mixes with air admitted through holes 106 from chamber 100, forming an emulsion which is discharged through nozzle 82 into the induction passage at the throat of the venturi.

Although only one embodiment of the invention has been illustrated herein, various changes may be made to suit requirements.

I claim:

1. In a carburetor having a horizontal induction passage, a source of fuel beneath said passage, a conduit connecting said source with the induction passage and having a vertical section, a chamber extending parallel with and offset from said vertical section and communicating with said passage, and a plurality of ports connecting said chamber with said conduit for supplying air to said fuel conduit to form a fuel-air emulsion.

2. In a carburetor having a horizontal induction passage, a fuel bowl beneath said passage, a conduit connecting said fuel bowl with the induction passage and having a substantially vertical section, a chamber extending parallel with and offset from said section and communicating with said passage, and a plurality of vertically arranged ports connecting said chamber with said conduit for supplying air to said fuel conduit to form a fuel-air emulsion.

3. In a carburetor having a horizontal induction passage with a throttle therein, a fuel bowl beneath said passage, a conduit connecting said fuel bowl with the induction passage anterior to the throttle and having a substantially vertical section, a cylindrical chamber extending parallel with and offset from said section and communicating at the top with said passage, a plurality of ports connecting said chamber with said conduit for supplying air to said fuel conduit to form a fuel-air emulsion, a passageway connecting said fuel bowl with the induction passage posterior to said throttle and having a tubular portion extending through said chamber, and a port for bleeding air into said passageway posterior to said chamber.

4. In a carburetor having a horizontal induction passage with a throttle therein, a fuel bowl beneath said passage, a conduit connecting said fuel bowl with the induction passage anterior to the throttle and having a susbtantially vertical section, a cylindrical chamber extending parallel with said section at one side thereof and in close proximity therewith and communicating at the top with said passage, a plurality of ports connecting said chamber with said conduit for supplying air to said fuel conduit to form a fuel-air emulsion, and a passageway connecting said chamber with the induction passage posterior to the throttle and having a tubular portion extending downwardly through said chamber to a fuel inlet port in the bottom thereof.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,362,305	Hawxhurst	Dec. 14, 1920
1,631,716	Bavery	June 7, 1927
1,872,559	Bicknell	Aug. 16, 1932
1,893,920	Winfield	Jan. 10, 1933
1,895,785	Claudel	Jan. 31, 1933
1,919,793	Linga	July 25, 1933
1,958,690	Ball et al.	May 15, 1934
1,976,452	Mock	Oct. 9, 1934
2,048,428	Chandler et al.	July 21, 1936
2,057,739	Prentiss	Oct. 20, 1936
2,186,480	Ensign	Jan. 9, 1940
2,291,418	Storer	July 28, 1942
2,346,711	Stupecky	Apr. 18, 1944
2,414,577	Adair et al.	Jan. 21, 1947
2,418,011	Carlson	Mar. 25, 1947