

Aug. 16, 1955

J. T. W. MOSELEY ET AL

2,715,523

VENTING MEANS FOR CARBURETOR FLOAT BOWLS

Filed Dec. 26, 1951

2 Sheets-Sheet 1

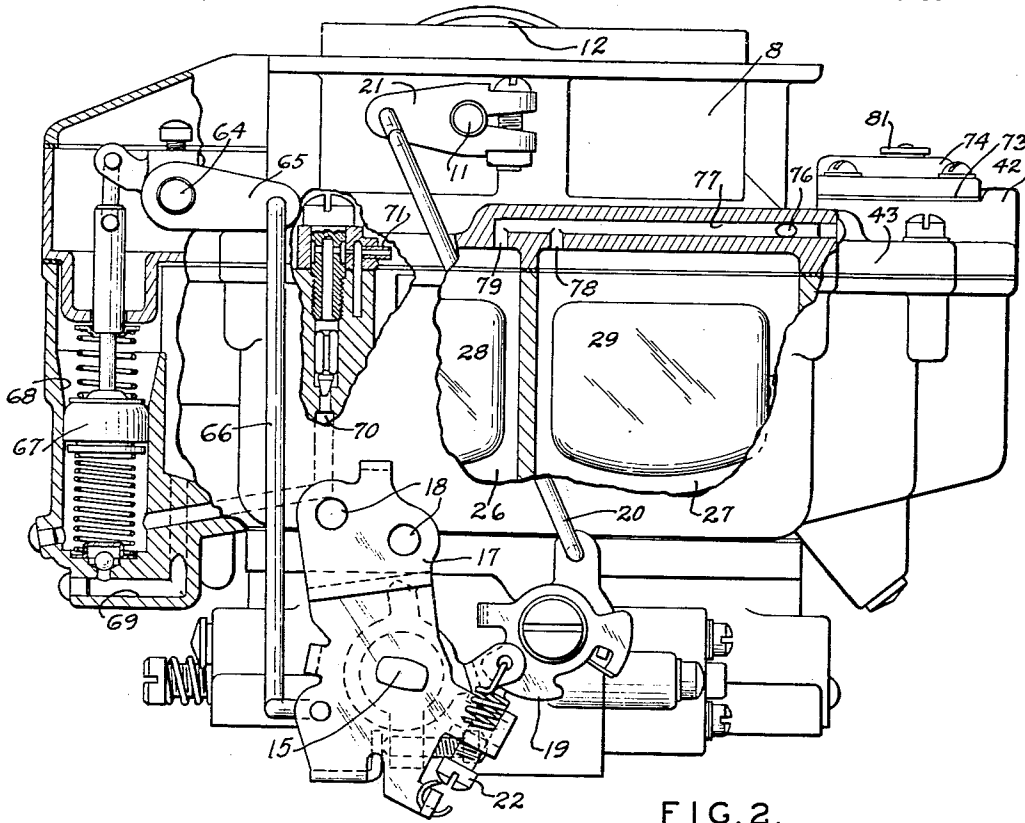


FIG. 2.

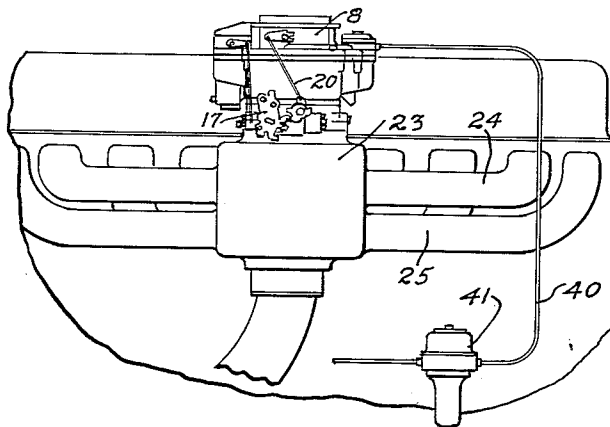


FIG. 1.

INVENTORS
JAMES T. W. MOSELEY
HAROLD A. CARLSON
BY
George R. Ericson
ATTORNEY

Aug. 16, 1955

J. T. W. MOSELEY ET AL

2,715,523

VENTING MEANS FOR CARBURETOR FLOAT BOWLS

Filed Dec. 26, 1951

2 Sheets-Sheet 2

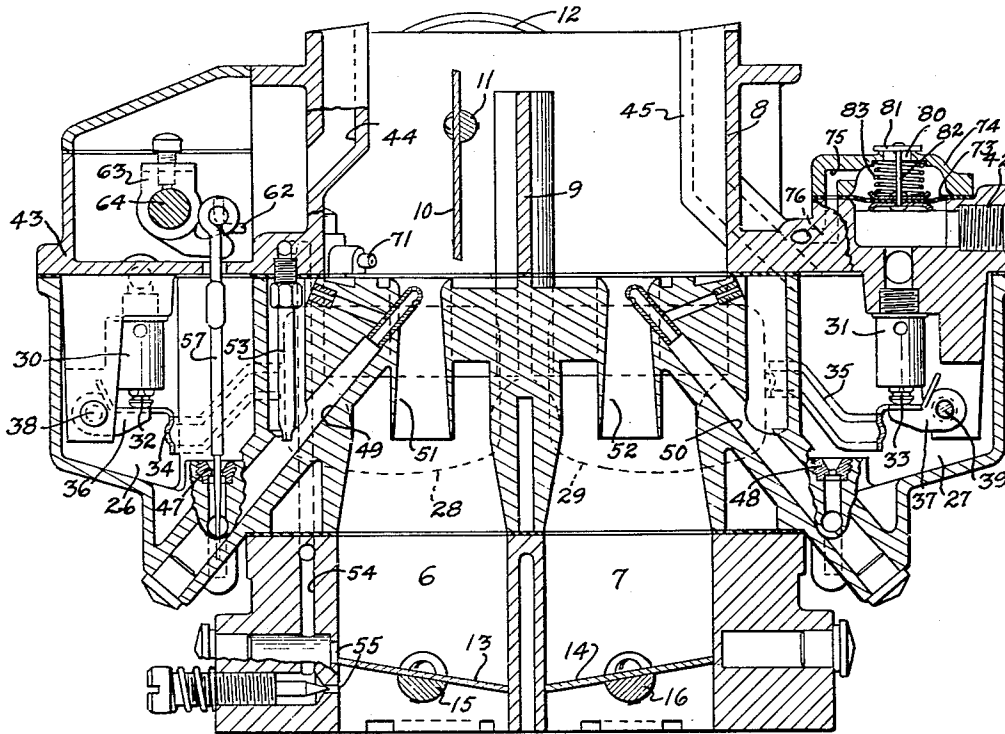


FIG. 3.

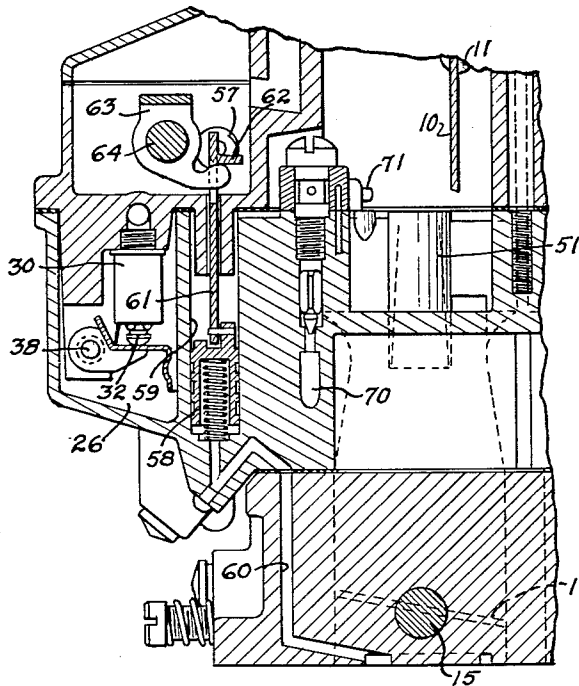


FIG. 4.

INVENTORS
JAMES T. W. MOSELEY
HAROLD A. CARLSON

BY

George R. Ericson

ATTORNEY

1

2,715,523

VENTING MEANS FOR CARBURETOR FLOAT BOWLS

James T. W. Moseley, Richmond Heights, and Harold A. Carlson, Brentwood, Mo., assignors to Carter Carburetor Corporation, St. Louis, Mo., a corporation of Delaware

Application December 26, 1951, Serial No. 263,293

7 Claims. (Cl. 261—72)

This invention relates to carburetors for internal combustion engines, and consists particularly in novel means for preventing stalling due to excessive pressure of hot gases in the carburetor constant level chamber.

After a heated engine is stopped, and during idling thereof, when the circulation of cooling water and air is stopped or reduced, the pressure in the fuel supply line from the fuel pump to the carburetor may build up, due to excessive heating, such that the float control needle valve may be unseated, permitting light ends of fuel to enter the fuel bowl and immediately gasify. Where the bowl is provided with an inside balanced vent, that is, a venting connection between the top of the bowl and the air inlet portion of the carburetor mixture conduit, the resultant vapors may flow into the carburetor mixture conduit and either condense or be trapped in the carburetor air cleaner. The result is that the engine may stall or the next restart may be difficult because of excessive richness.

We have found that the difficulty can be substantially eliminated by providing an additional vent in the top portion of the float bowl for releasing gases into the surrounding atmosphere when excessively high pressures exist in the fuel supply line to the carburetor. We preferably operate the vent valve in accordance with fuel line pressures, which are substantially higher than those existing in the fuel bowl and, consequently, the pressure responsive mechanism need not be so delicate or sensitive as in the case of a simple pressure operated relief valve provided in the top of the float bowl.

In the accompanying drawings illustrating the invention,

Fig. 1 is a side view of an automotive engine with a carburetor applied thereto.

Fig. 2 is an enlarged side view of the carburetor, portions being broken away and sectioned for clearer illustration of the underlying parts.

Fig. 3 is a vertical transverse section through the carburetor, which is shown to be of the multi-barrel type.

Fig. 4 is a partial vertical transverse section showing other parts of the carburetor.

The carburetor illustrated is of the current four-barrel type, two of the barrels, a primary 6 and a secondary 7, are illustrated in Fig. 3. At the upper end of the barrels is an air inlet horn 8, having a dividing partition 9. On the primary side of the partition there is provided a choke valve 10 on a pivoting shaft 11 controlled by automatic choke mechanism in housing 12. At the lower ends of the mixture conduits there are provided primary and secondary throttle valves 13 and 14 mounted on shafts 15 and 16. As shown in Fig. 2, a lever 17, rigidly secured to primary throttle shaft 15, has holes 18 for connection to the usual accelerator linkage. A fast idle cam device 19 is pivotally mounted adjacent throttle lever 17 and connected by link 20 and crank 21 to choke valve shaft 11. An idle adjusting screw 22 is carried by the throttle lever in position to engage the fast idle cam device, when the choke valve

2

is closed, to limit closing movement of the primary throttle valve or valves to the fast idle position. For further description of the throttle actuating parts of the carburetor, reference is made to copending application, Serial No. 263,291, filed December 26, 1951, in the names of the present inventors.

The carburetor is mounted upon the usual "hot spot" 23 formed at the junction of intake manifold 24 and exhaust manifold 25.

Adjacent the carburetor barrels are fuel bowls 26 and 27 enclosing floats 28 and 29. Each fuel bowl is provided with a fuel inlet valve seat as at 30 and 31, receiving a needle valve, as at 32 and 33. Each float is secured to a yoke 34 or 35, having a lip 36 or 37 pivotally mounted at 38 or 39 to the float bowl. The lips are in position to actuate the needle valves, as shown, to maintain a substantially constant level of fuel in the fuel bowls. A fuel supply line 40 from the usual fuel pump 41 is connected to a threaded boss 42 on the right-hand portion of bowl cover structure 43. Fuel from boss 42 is also supplied to left-hand needle valve seat 30 by passages (not shown) extending around the carburetor, so that the single supply line is connected to both fuel bowls. As best shown in Fig. 3, each bowl is supplied with an inside bowl balancing vent, as at 44 and 45, for normally applying to the bowls the pressures existing in the carburetor air horn, which are reduced slightly by the restriction of the air cleaner.

In the lower central portion of each bowl there is provided a main metering orifice element 47 or 48, which communicates with upwardly and inwardly inclined main fuel nozzle passage 49 and 50, which discharges into a primary venturi tube 51 or 52 in one of the mixture conduits. The primary mixture conduit is provided with an idle system including a metering tube 53 and passages 54 leading to the usual idling ports 55 adjacent and posterior to the edge of the primary throttle disk when closed. No idling system is shown on the secondary side, although one may be provided, and it may be interconnected with the secondary main nozzle, or may operate independently thereof. Primary metering orifice 47 is controlled by a metering pin 57 operated by a suction piston 58 slidable in a cylinder 59 connected by passage 60 to the carburetor suction posterior to the primary throttle valve. Piston rod 61 carries a cross bar 62 at its upper extremity, which directly supports metering pin or pins 57. The metering pin is controlled from the primary throttle valve by means of a crank 63 rigid with a countershaft 64 journaled above the fuel bowl and connected by a crank 65 and link 66 to throttle-operating lever 17. Also located in the primary constant level chamber 26 is an accelerating pump including a piston 67 working in pump cylinder 68 connected to the fuel bowl by inlet passage 69 and to the primary mixture conduit by outlet passage 70 and jet 71.

As best shown in Fig. 3, there is mounted immediately adjacent threaded fuel inlet boss 42, and exposed to the fuel passing therethrough, a diaphragm 73 secured in position by a cap 74, which has an angular passage 75 communicating with a passage 76 in the bowl cover structure which connects by means of a passage 77 and venting ports 78 and 79 with each of the float bowls. Formed in the center of cap 74 is an opening 80, upon which is normally seated a check valve disk 81, which closes the opening. A stem 82 operatively connects disk 81 and diaphragm 73. A coil spring 83 received about the stem constantly urges the diaphragm downwardly so as to maintain vent valve 81 normally closed.

In operation, the spring 83 is of sufficient strength to resist normal fuel pressures in inlet connection 42, which, ordinarily, run between three and four pounds per square inch during normal operation, while yielding to pressures

3

greater than normal to cause opening of disk valve 81 and, thereby, permit release of vapors from the constant level fuel chambers out through the atmospheric vent opening 80, rather than through the inside vent connections 44 and 45. This is important, since excessive fuel pressures in the fuel inlet line also act directly upon needle valves 32 and 33, forcing them downwardly against their supporting floats, so as to admit hot fuel to the bowls, which, except for outside vent 80, would escape through the inside vent connections into the interior of the mixture conduits.

Although the fuel supply line pressures are not directly vented, it is preferable that vent control valve 81 be operated thereby, since these line pressures are considerably higher than exist in the float bowls, and, consequently, the valve-operating mechanism need not be so delicate or sensitive. Furthermore, since the fuel line pressure ordinarily increases ahead of the bowl pressure, this device acts to sense impending entry of hot vapors into the bowl and, thereby, insures that the outside vent 80 is opened immediately. Another advantage of the fuel line pressure control is that no build-up at all in the bowls is necessary to open vent 80.

The invention, of course, is applicable to various types of carburetors. Exclusive use of all modifications as come within the scope of the appended claims is contemplated.

We claim:

1. In a carburetor, a fuel reservoir, a fuel supply line therefor, a valve regulating the admission of fuel from said line to said reservoir, a vent in the upper part of said reservoir, a valve controlling said vent, and a device insensitive within a normal range of pressures but actuable by excessive pressure beyond said normal range in said supply line anterior to said fuel valve for opening said vent valve.

2. In a carburetor, a fuel reservoir, a fuel supply line therefor, a valve regulating the admission of fuel from said line to said reservoir, a vent in the upper part of said reservoir, a normally closed valve in said vent, and a device exposed to the pressure in said supply line anterior to said fuel valve and operatively connected to said vent valve, said device being insensitive within a normal range of pressures but actuable by excessive supply line pressure beyond said normal range for opening said vent valve.

3. In a carburetor, a fuel reservoir, a fuel supply line therefor, and a gas relief vent in the upper part of said reservoir, means for maintaining a substantially constant level of fuel in said reservoir including an inlet valve in said supply line, a vent valve controlling said vent, a device exposed to pressures in said supply line, and an operative connection between said device and said vent valve, said device being insensitive within a normal range of pressures but actuable by excessive pressures beyond said normal range in said line anterior to said inlet valve for causing opening of said vent valve.

4

4. A carburetor as described in claim 3, further including a float in said reservoir for yieldingly closing said inlet valve when fuel stands in said reservoir at least to the normal level, said float having sufficient buoyancy to resist normal fuel pressure in said supply and prevent unseating of said inlet valve.

5. In a carburetor, a fuel reservoir having a gas vent with a control valve, a mixture conduit, a fuel delivery passage connecting said reservoir and said conduit, a fuel line connected to said reservoir for supplying fuel thereto, constant level means for said reservoir, including a float in said reservoir and an inlet valve in said line, said float having sufficient buoyancy to prevent opening of said inlet valve due to the application thereto of normal fuel pressures in said line while permitting opening of said inlet valve upon the application thereto of excessive fuel line pressures, and a pressure-sensitive device exposed to said fuel line pressure and operatively connected to said vent valve, said device being actuated by excessive pressure in said line anterior to said inlet valve to open said vent valve.

6. In a carburetor, a fuel reservoir, a mixture conduit, a fuel delivery passage connecting said reservoir and said conduit, a fuel line connected to said reservoir for supplying fuel thereto, constant level means for said reservoir including a float in said reservoir and an inlet valve in said line, said float having sufficient buoyancy to prevent opening of said inlet valve due to the application thereto of normal fuel pressures in said line while permitting opening of said inlet valve upon the application thereto of excessive fuel line pressures, a balancing vent connecting said reservoir and said mixture conduit, and means for preventing excessive enrichment of the fuel mixture by gasses flowing through said balancing vent connections into said mixture conduit, said means including a gas relief vent in the upper part of said reservoir and a control valve therefor, and a pressure-sensitive device exposed to said fuel line pressure and operatively connected to said vent valve, said device being actuated by excessive pressure in said line anterior to said inlet valve to open said vent valve.

7. In a carburetor, a mixture conduit, constant level fuel supply reservoir means for said conduit including a fuel inlet, a valve therein, and a valve controlling float, and a normally closed atmospheric vent in the upper part of said reservoir means and a control for said vent insensitive within a normal range of pressures but operable by excessive pressure beyond said normal range in said inlet anterior to said valve to release vapors.

References Cited in the file of this patent

UNITED STATES PATENTS

2,138,069	Nicholas	Nov. 29, 1938
2,316,416	Gregg	Apr. 13, 1943
2,316,882	Moseley et al.	Apr. 20, 1943
2,407,258	Del Mar	Sept. 10, 1946