Oct. 26, 1954 H. A. CARLSON ET AL 2,692,766

CARBURETOR FLOAT VALVE CONTROL

Filed Dec. 26, 1951 2 Sheets-Sheet 1

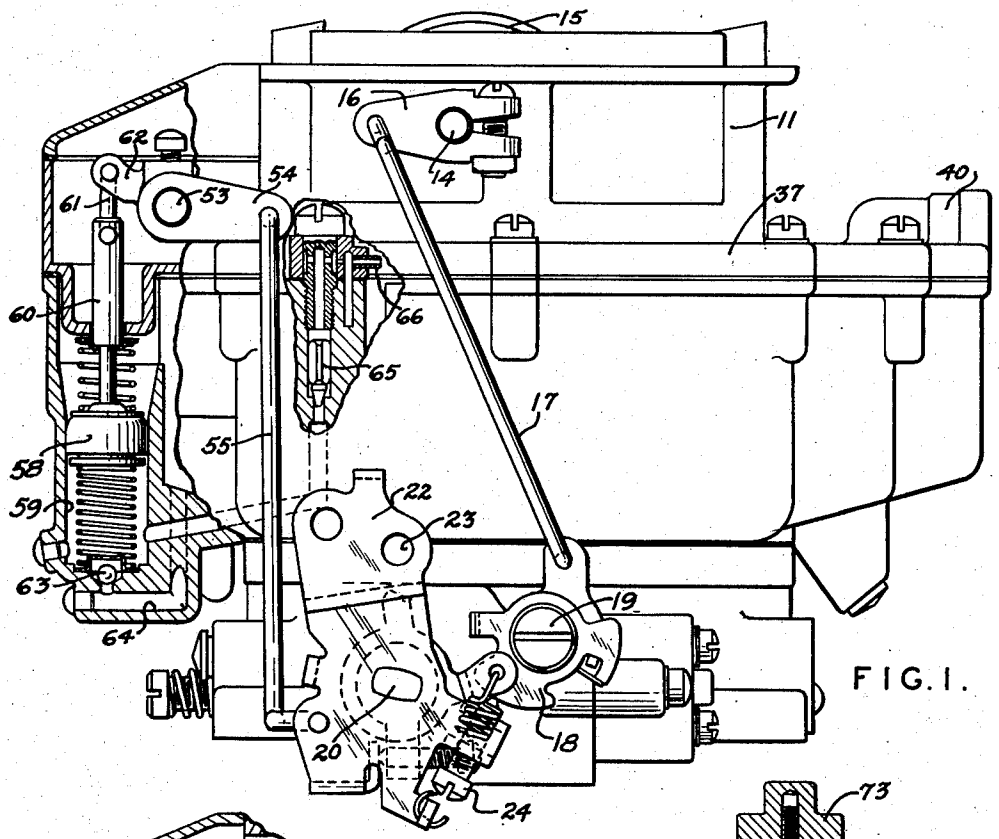


FIG. 1.

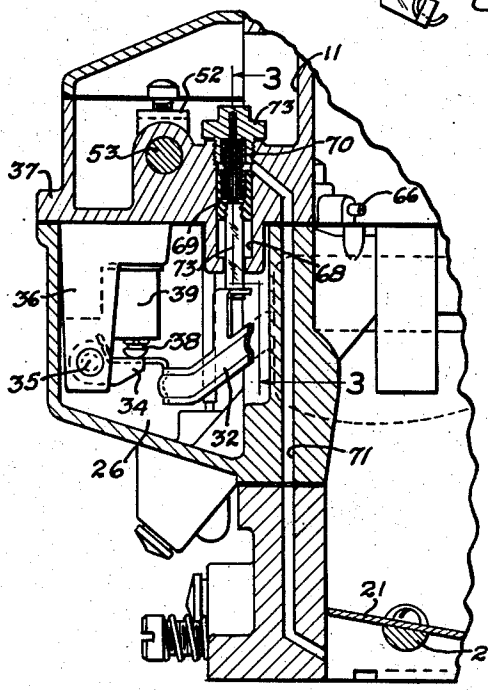


FIG. 2.

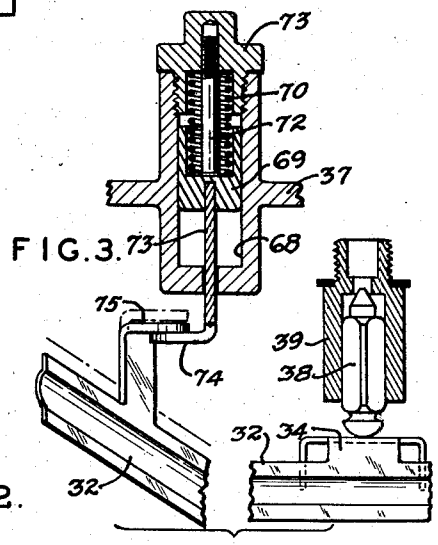


FIG. 3.

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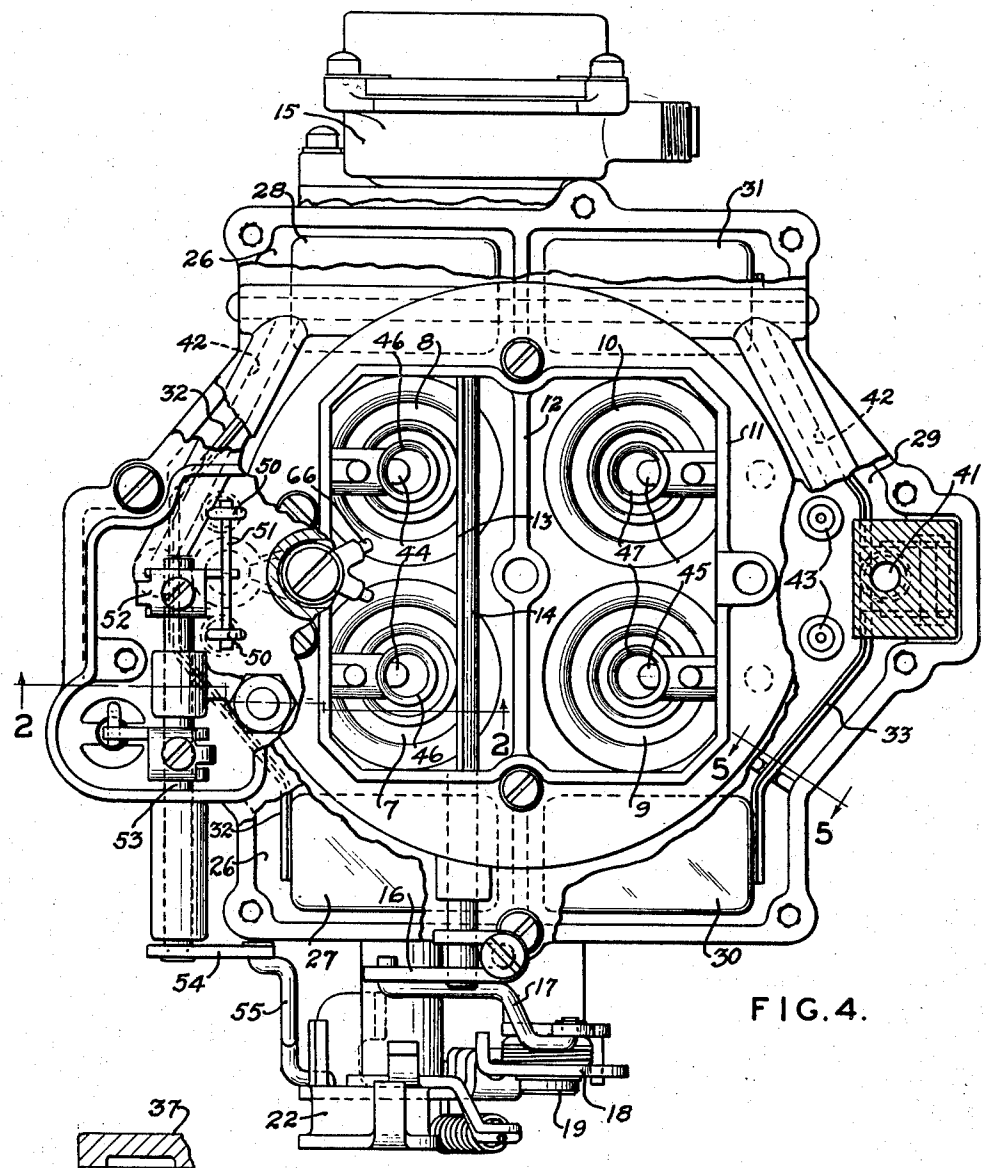


FIG. 4.

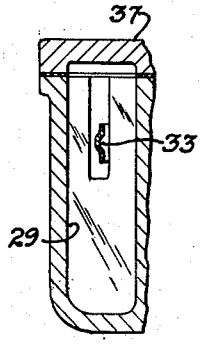


FIG. 5.

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CARBURETOR FLOAT VALVE CONTROL

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Application December 26, 1951, Serial No. 263,292

5 Claims. (Cl. 261—72)

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This invention relates to carburetors for internal combustion engines and consists, particularly, in novel means for preventing flooding of the associated engine in case of surging of the fuel in the carburetor fuel bowl.

When the fuel in a carburetor constant level chamber is caused to surge, because of a change of direction or speed of the vehicle, the float may be lowered, momentarily, to permit an extra quantity of fuel to enter the bowl past the opened needle valve. When the fuel again settles within the bowl, its level may be raised sufficiently to cause liquid fuel to pour over the fuel nozzle and collect in the manifold. An extra rich or even a stall condition of the fuel charge may result. This adverse effect of surging is increased in proportion to the size of the fuel bowl and becomes accentuated in large, multi-barrel carburetors.

According to the present invention, a device is provided for preventing excessive opening of the fuel inlet needle valve in case of a surge. The device is responsive to relatively high suction posterior to the carburetor throttle valve, such as exists when the throttle valve is closed and the engine in operation, to prevent opening of the float operated needle valve beyond a slightly open, idling position.

In the accompanying drawings which illustrate the invention,

Fig. 1 is a side view of a carburetor embodying the invention, portions being broken away and sectioned to illustrate the underlying structure.

Fig. 2 is a detail, vertical transverse section taken substantially on line 2—2 of Fig. 4.

Fig. 3 is an enlarged fragmentary section taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a top view of the carburetor with portions broken away and sectioned.

Fig. 5 is a detail section taken on line 5—5 of Fig. 4.

The carburetor illustrated is of the four-barrel, downdraft type including a pair of forward main mixture conduits 7 and 8 and a pair of rear, auxiliary or secondary mixture conduits 9 and 10. A generally rectangular air inlet portion 11 is provided at the top of the carburetor and is divided by a transverse partition 12. At the forward side of the partition, an unbalanced choke valve 13 is mounted on a shaft 14 which, at one end, extends into a housing 15 for automatic choke control mechanism. At its opposite end, choke shaft 14 is connected by a crank 16 and link 17 to a fast idle cam device 18 pivoted, as at 19, to the carburetor body.

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The lower ends of main mixture conduits 7 and 8 are traversed by a throttle shaft 20. A lever 22, rigid with the end of shaft 20, has apertures 23 for attachment to the usual accelerator linkage (not shown). The lever carries an idle adjusting screw 24 for engagement with the fast idle cam device 18 to limit the closing movement of the main throttle valves, during cold starting and warm-up, to a slightly more open position than the normal idling position. This type of throttle control and choke interconnection mechanism is further illustrated and described in Carlson Patent No. 2,307,486. Throttle valves (not shown) are also provided in the lower portions of auxiliary mixture conduits 9 and 10, and the main and secondary throttles may be serially controlled as described in Moseley and Carlson application, Serial No. 263,291, filed December 26, 1951.

Surrounding the mixture conduits is the fuel bowl or constant level chamber structure including forward portion 26, in which are enclosed floats 27 and 28, and rear portion 29 enclosing floats 30 and 31. The pairs of floats 27 and 28 and 30 and 31 are rigidly connected by yokes 32 and 33, each of which, centrally, has an outward projection 34 (Fig. 2), pivoted as at 35 to depending structure 36 on bowl cover 37. Each projection 34 normally supports and actuates a fuel inlet control needle valve 38 located in an inlet valve seat device 39 controlling the supply of fuel to the associated constant level fuel bowl. The main supply of fuel to the carburetor is through a fitting 40 located on the right-hand side of the float bowl cover and connected to right-hand, auxiliary float bowl 29 by means of passage 41 through the bowl cover structure and with left-hand, main float bowl 26 by means of passages 42. A supply of fuel under a few pounds pressure is maintained in the bowl inlets by means of the usual fuel pump or other pressure producing source.

Located in the central, lower portion of each float bowl are a pair of metering orifice elements, as shown at 43 in Fig. 4, through which fuel is supplied from the fuel bowls to the associated primary and secondary main fuel nozzles 44 and 45, each discharging into a venturi tube 46 or 47. The main and auxiliary mixture conduits may be provided with idling systems (not shown) and the main metering orifices are controlled by graduated metering pins 50 carried by a cross bar 51 operated from the main thottle valves by an arm 52 rigid with a countershaft 53 and a second arm 54 on the end of the countershaft

and connected by a link 55 to throttle operating lever 22. Also located in forward, main float bowl 26 is an accelerating pump including a piston 58 working in a cylinder 59 and connected to the main throttle valves by a piston stem 60, a link 61, and an arm 62 rigid with the aforementioned countershaft 53. Fuel is drawn into the pump from bowl 26 past inlet check 63 and is discharged through an outlet passage 64, past outlet check 65 and through discharge jets 66 into main mixture conduits 7 and 8. No accelerating pump or metering pins are provided in the auxiliary fuel bowl 29 and, if desired, the idling system on this side may be omitted, and it may be independent of or interconnected with the secondary, main nozzles 45. For further description of the internal mechanism of the carburetor, reference is made to our abovementioned copending application, Serial No. 263,291, filed December 26, 1951.

As best shown in Figs. 2 and 3, a small cylinder 68 is formed in bowl cover structure 37 and receives a piston 69 constantly urged downwardly by a coiled compression spring 70. The space in cylinder 68 above the piston is connected by a passage 71 to one (or both) of the main mixture conduits 7 and 8 posterior to throttle valve disks 21 therein. Thus, during operation of the associated engine, the suction at this point is applied to piston 69 tending to move it upwardly against spring 70. The upward motion of the piston is limited by a pin 72. A downward projection 73 from piston 69 passes through the lower portion of cylinder 68, and has a lateral finger 74 at its lower extremity which underlies an angular lug 75 projecting from yoke 32 connecting floats 27 and 28. Since yoke 32 is connected through its projection 34 to fuel inlet needle valve 38, the suction motor device formed by piston 69 and cylinder 68 is operatively connected to and assists in the control of the admission of fuel to forward bowl 26. If desired, a similar suction control for the rear needle valve in inlet 41 may be provided.

In operation, when a change of speed or direction of the carburetor causes surging in the fuel bowls and, consequently, lowering of the floats, provided the engine is in operation and the main throttle valve closed, as will usually be the case, there will be sufficient suction applied to the upper surface of piston 69 to hold the same against stop 72 and support lug 75 and floats 27 and 28 in a position to maintain needle valve 38 open just sufficient to supply the small amount of fuel needed for idling of the engine. Obviously, the floats will be supported, likewise, whenever the engine is idling, but this support will not be a disadvantage because of the continuous supply of a small quantity of fuel past the needle valve, even though piston 69 is supported in its uppermost position, as determined by piston stop 72.

In the present embodiment, the suction responsive mechanism acts directly upon the floats and thence, upon the fuel inlet needle valve. However, the suction device may act directly upon the needle valve, it being necessary, only, that when less than idling suction exists in the carburetor barrel posterior to the throttle, the suction control for the needle valve permits adequate movement of the floats and/or opening of the needle valve to supply the maximum needed fuel. The invention may be modified in this and other respects 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.

We claim:

1. In a carburetor for an internal combustion engine, a mixture conduit having a throttle therein, a constant level fuel supply chamber, a fuel inlet for said chamber, a control valve for said inlet, and a suction motor device responsive to high suction in said conduit posterior to said throttle for preventing full opening of said valve regardless of the level of fuel in said supply chamber.

2. A carburetor as described in claim 1 further including a stop for establishing the limit position of said inlet valve under the influence of said motor device.

3. In a carburetor for an internal combustion engine, a mixture conduit having a throttle therein, a fuel chamber, a fuel inlet for said chamber and a valve in said inlet, a float in said chamber having an operative connection to said valve for normally maintaining a substantially constant level of fuel in said chamber, and a device responsive to high suction in said conduit posterior to said throttle for preventing full opening of said valve independently of the fuel level in said chamber.

4. A carburetor as described in claim 3, in which said suction responsive device acts directly upon said operative connection between said float and said inlet valve.

5. A carburetor as described in claim 3 in which said suction responsive device includes a part for supporting said float in its inlet valve restricting position whenever idling suction exists in said conduit posterior to said throttle.

References Cited in the file of this patent

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