Feb. 9, 1954 J. E. EBERHARDT 2,668,696

CARBURETOR ANTIFLOODING DEVICE

Filed Nov. 6, 1951 3 Sheets-Sheet 1

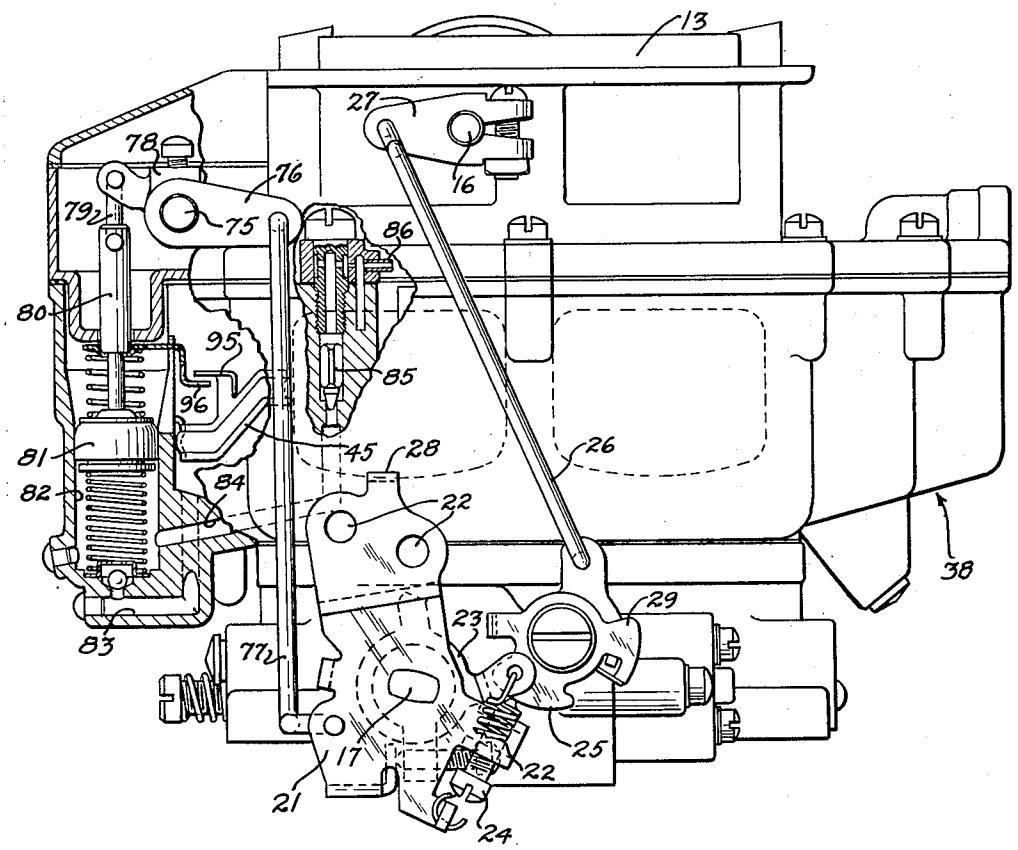


FIG. 1.

INVENTOR.
JAMES E. EBERHARDT
BY
George R. Ericson
ATTORNEY

Feb. 9, 1954 J. E. EBERHARDT 2,668,696

CARBURETOR ANTIFLOODING DEVICE

Filed Nov. 6, 1951 3 Sheets-Sheet 2

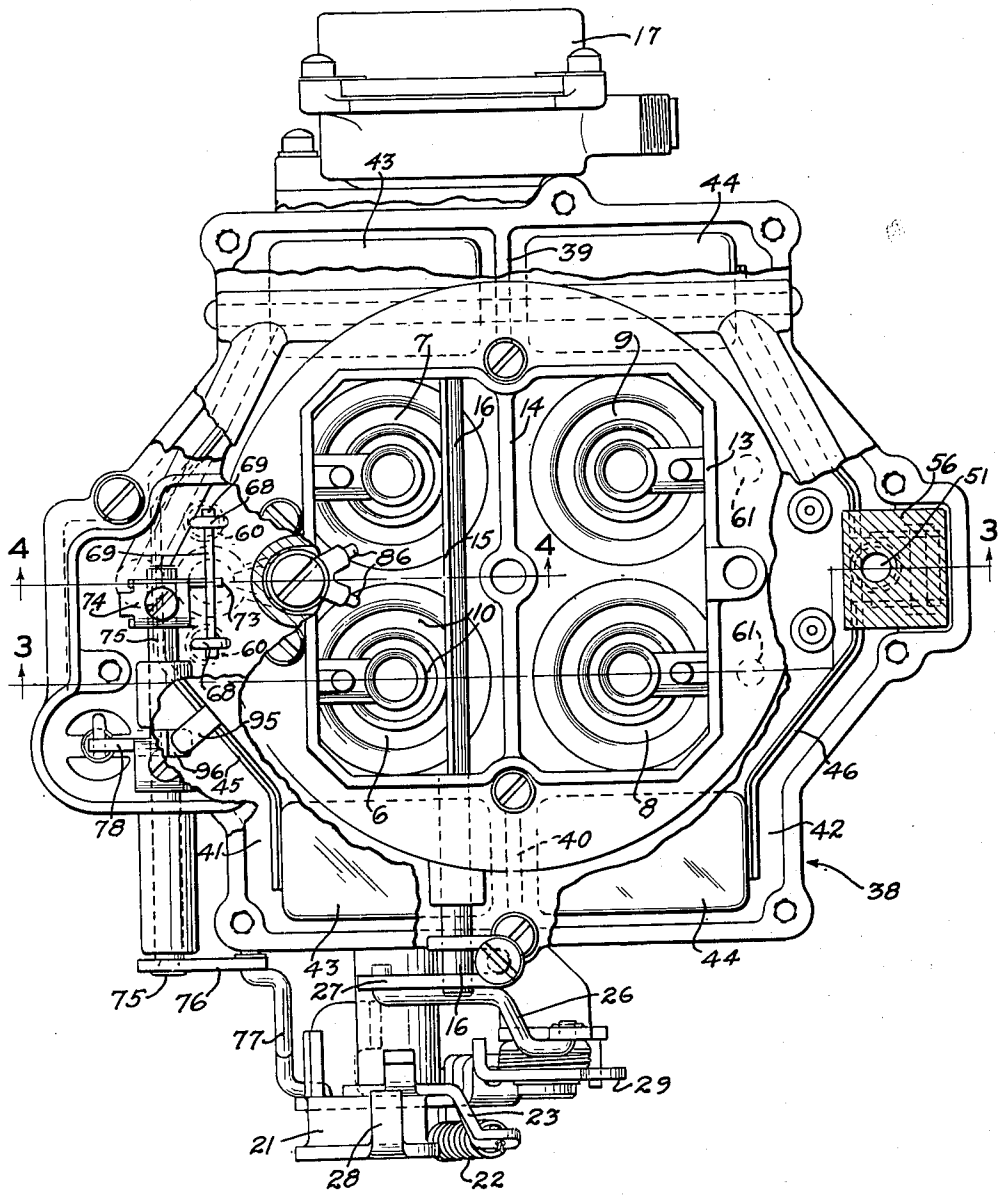


FIG. 2.

INVENTOR.
JAMES E. EBERHARDT
BY George R. Erickson
ATTORNEY

Feb. 9, 1954 J. E. EBERHARDT 2,668,696

CARBURETOR ANTIFLOODING DEVICE

Filed Nov. 6, 1951 3 Sheets-Sheet 3

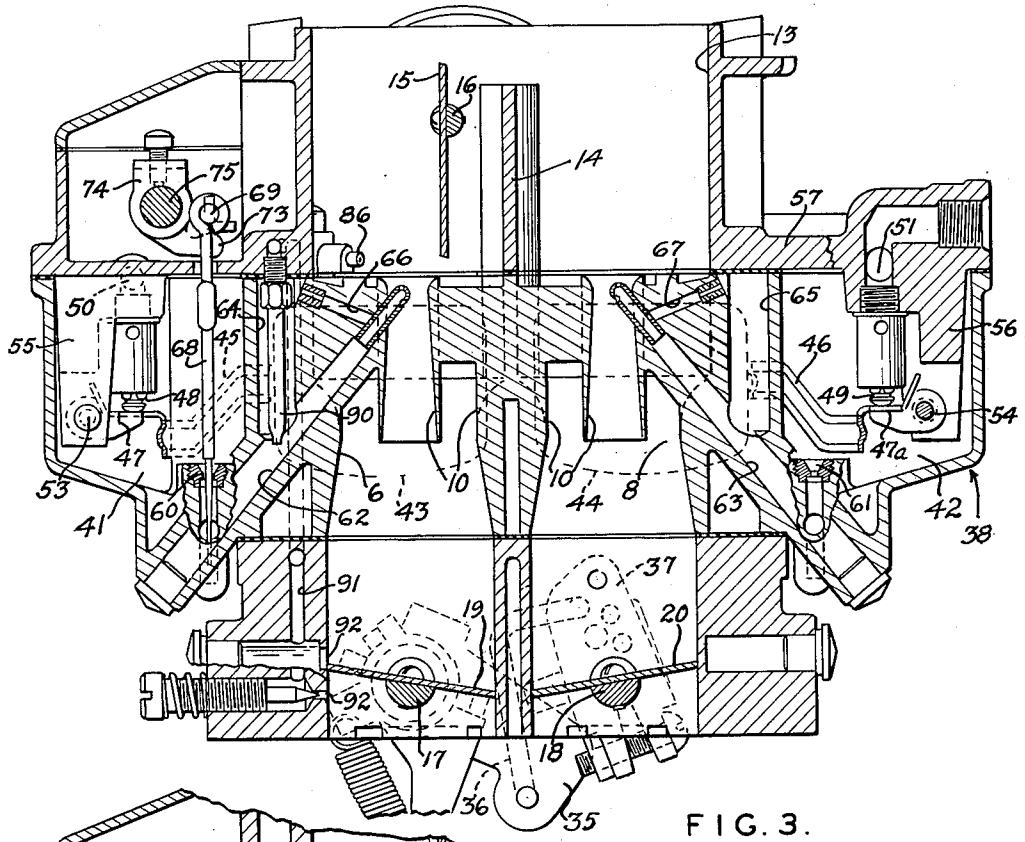


FIG. 3.

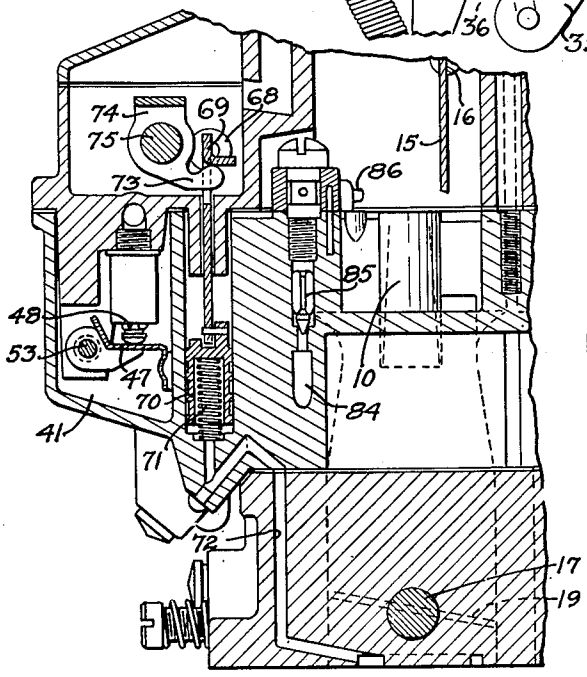


FIG. 4.

INVENTOR.
JAMES E. EBERHARDT
BY
George R. Ericson
ATTORNEY

Patented Feb. 9, 1954 2,668,696

UNITED STATES PATENT OFFICE

2,668,696

CARBURETOR ANTIFLOODING DEVICE

James E. Eberhardt, Webster Groves, Mo., assignor to Carter Carburetor Corporation, St. Louis, Mo., a corporation of Delaware

Application November 6, 1951, Serial No. 255,041

4 Claims. (Cl. 261—34)

1

This invention relates to carburetors for internal combustion engines of the automotive type and consists, particularly, in novel means for preventing excessive overflow of fuel into the engine intake manifold when the vehicle is suddenly slowed down causing surging of fuel in the constant level chamber.

When a motor vehicle equipped with a carburetor having a conventional float operated constant level chamber is subjected to a sudden change of direction or speed, as in case of sudden slowing down, the fuel in the constant level chamber is caused to surge, due to inertia, in the direction of previous movement. In some cases, this may cause the float to drop momentarily, permitting a rush of fuel into the float bowl, which may overflow through the main fuel passage into the carburetor mixture conduit and the intake manifold. The consequent flooding may cause stalling of the engine due to excessive richness.

The above condition has been noticed in the cases of multi-barrel carburetors which have rather large constant level chambers and the level controlling float or floats located at one side of the constant level chamber. I have found that flooding of the engine, particularly in case of rapid deceleration, can be materially reduced or eliminated by substantially limiting opening of the float valve whenever the carburetor throttle valve is substantially closed.

Accordingly, the main object of the present invention is to provide novel means for preventing excessive flooding of the engine during deceleration.

A more detailed object is to provide a novel interconnection between the carburetor throttle or accelerating pump and the float control needle valve for restricting opening of the needle valve under conditions when only a relatively small fuel flow to the bowl is indicated.

These objects and other more detailed objects hereafter appearing are attained by the structure illustrated in the accompanying drawings, in which

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

Fig. 2 is a top view of the carburetor in Fig. 1 with parts broken away and sectioned.

Fig. 3 is a vertical transverse section taken on broken line 3—3 of Fig. 2.

Fig. 4 is a similar section taken on line 4—4 of Fig. 2.

The carburetor shown is of the four-barrel, downdraft type, including a pair of forward main mixture conduits 6 and 7, and rear auxiliary mixture conduits 8 and 9, each having multiple Venturi tubes, as at 10. All of the mixture conduits merge in an air inlet horn 13 of rectangular section, having a transverse partition 14. On the left side of partition 14 (Fig. 3), an unbalanced choke valve 15 is mounted on a shaft 16 projecting at one end into an automatic choke control housing 17. Extending across the lower portions of the pairs of mixture conduits are shafts 17 and 18 upon which are mounted throttle disks 19 and 20. Shaft 17 projects in one direction beyond the carburetor body and mounts an arm 21 having apertures 22 for attachment by suitable linkage to the accelerator pedal located in the driver's compartment. Lever 21 is connected by a tension spring 22 to an arm 23 loosely pivoted about shaft 17 and carrying a throttle adjusting screw 24 positioned to engage a fast-idle cam 25. The cam is connected by a link 26 to an arm 27 rigid with choke shaft 16 whereby the fast-idle cam is positioned in accordance with the choke position, as is well known. Upon full opening of main throttle valves 19, a lug 28 on arm 21 engages a finger 29 on cam 25 to rotate the cam counter-clockwise and force the choke valve partly open. This combination fast-idle and unloader structure is covered in Carlson Patent No. 2,307,486.

On the opposite end of throttle shaft 17, as shown in dotted lines in Fig. 3, an arm 35 on main throttle shaft 17 is connected by a link 36 to an arm 37 on auxiliary throttle shaft 18 to provide for opening of the auxiliary throttle valves during the latter part of the opening movement of the main throttle valves. Suitable throttle control mechanism constitutes the subject matter of a co-pending application, Serial No. 263,291, filed December 26, 1951, in the names of H. A. Carlson and J. T. W. Moseley. Such mechanism in itself does not constitute the present invention and is not illustrated in detail here.

Extending entirely around the mixture conduits is the fuel reservoir structure 38 having cross partitions 39 and 40 dividing the reservoir into a main or forward constant level chamber 41 and an auxiliary, rear constant level chamber 42. Located in the side portions of the constant level chambers are pairs of floats 43 and 44, each pair being connected by arms 45 and 46 to a central ledge 47 or 47a which underlies needle valve 48 or 49 controlling the supply of fuel through inlet 50 or 51 so as to maintain a substantially constant level of fuel in the reservoir. The ledges are pivoted by means of pins 53 and

54 to bifurcated blocks 55 and 56 depending from bowl cover 57.

Located in the central, inner portion of each constant level chamber are a pair of fuel metering orifice members 60 and 61 through which fuel is supplied to main fuel passages 62 and 63 discharging in primary Venturi tubes 10. An antipercolating well 64 or 65 projects vertically from each main fuel passage near the base thereof, and these wells are connected by cross passages 66 and 67 to the upper portions of the main fuel passages for relieving vapors which, otherwise, would pass upwardly through the main fuel passages, carrying fuel with them, as is taught in Carlson Patent No. 2,241,655.

Forward metering orifices 60 are controlled by metering pins 68 carried on a bar 69 and controlled jointly by a suction piston 70 (Fig. 4) constantly urged upwardly by a coiled spring 71 and exposed to intake manifold suction through a passage 72 and a finger 73 on an arm 74 rigid with countershaft 75, pivoted above the float bowl cover. Shaft 73 is connected to throttle control lever 21 by means of an arm 76 and a link 77. This arrangement causes lifting of the metering pins to enrich the mixture either when the main throttle valves are substantially opened or when the manifold suction drops excessively, as explained in Read Patent No. 2,208,702. Also secured to countershaft 75 is a second arm 78 connected by link 79 and actuating stem 80 to an accelerating pump piston 81 working in a pump cylinder 82. The pump is likewise controlled from the throttle valve by link 77, so that the pump piston will be in its upper or charged position, drawing in fuel through a checked inlet passage 83, when the throttle valve is substantially closed. Opening of the throttle valve causes the supplying of a pickup charge to the main mixture conduits through outlet passage 84, past outlet check 85, and through pump nozzles 86 into the main mixture conduits.

Fuel for idling is supplied to the forward, main mixture conduits through a restricted idling jet tube 90 and depending passages 91 opening through ports 92 on opposite sides of main throttle disks 19 when closed. No idling system is shown for the rear auxiliary mixture conduits, though these may be provided, if desired. Likewise, no metering pins or accelerating pump are provided for the auxiliary mixture conduits.

Since the carburetor is mounted with the main constant level chamber 41 located at the forward portion of the carburetor, with relation to the vehicle, fuel therein will be caused to surge forwardly in case of rapid deceleration. This, in turn, will partially evacuate the side portions of the forward fuel chamber 41 and, thus, permit floats 43 to drop, causing excessive opening of forward needle valves 48 and an undesired gush of fuel into the forward fuel bowl. Such excessive fuel frequently overflows through main fuel passages 62 into the carburetor and intake manifold, causing an excessively rich condition and, possibly, stalling. In order to prevent this, there is provided on one of the arms 45 connected to a float 43, a projecting lip 95 which overlies an angular element 96 secured to pump actuator stem 80 so as to move therewith. Element 96 is positioned, when the main throttle valves are substantially closed, and when pump piston 81 is in its upper, charged position, so as to permit only slight dropping of main floats 43 and, consequently, only sufficient opening of needle valve 48 to supply idling fuel. Accordingly, even

though a surge in any direction within fuel bowl 41 should occur, excessive supplying of fuel to this bowl is prevented.

The needle valve limiting means may be effected by a suitable stop directly connected to the throttle valve and without, necessarily, affecting the floats, or the needle valve stop may be controlled from the accelerating pump, irrespective of whether or not the pump is throttle controlled.

The invention may be modified in these and other respects as will occur to those skilled in the art, and exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. In a carburetor, a mixture conduit, a throttle valve therein, a fuel reservoir, a level controlling float in said reservoir, a support bracket projecting from said float, a fuel supply passage connecting said reservoir and said conduit, a stop positioned adjacent said bracket and limiting the lowering of said bracket and float, and a mechanical connection between said throttle valve and said stop for positioning said stop to decrease the permissive lowering of said float when said throttle valve is substantially closed.

2. In a carburetor, a mixture conduit, a fuel reservoir adjacent the same, a float in said reservoir having a pivotally mounted support arm, a fuel inlet for said reservoir, a needle valve controlling said inlet, said float arm having a part positioned to actuate said needle valve so as to maintain a substantially constant level of fuel in said reservoir, an accelerating pump communicating with said reservoir, including a movable wall shiftable from charged to discharge position to supply a pick-up charge to said mixture conduit, an actuating stem projecting from said movable wall adjacent said float arm, and a projection on said stem underlying said arm and movable when said movable wall is shifted to its charged position to substantially restrict opening of said needle valve.

3. In a carburetor, a mixture conduit, a throttle valve therein, a fuel reservoir, a fuel supply passage communicating with said reservoir, a valve in said passage, a float in said reservoir for actuating said valve to maintain a substantially constant level of fuel in said reservoir, a bracket on said float, a fuel supply nozzle connecting said reservoir and said conduit, a stop positioned adjacent said bracket, and a mechanical connection between said throttle valve and said stop for positioning said stop to substantially limit lowering of said bracket and opening of said valve when said throttle valve is substantially closed.

4. The combination specified in claim 3 further including a throttle operated accelerating pump having a mechanical connection with said throttle valve, said stop being carried by a portion of said mechanical connection located adjacent said bracket.

JAMES E. EBERHARDT.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,448,709	Gilbert	Sept. 7, 1948
2,633,342	Baker	Mar. 31, 1953

FOREIGN PATENTS

Number	Country	Date
617,094	France	Nov. 10, 1926