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CARBURETOR

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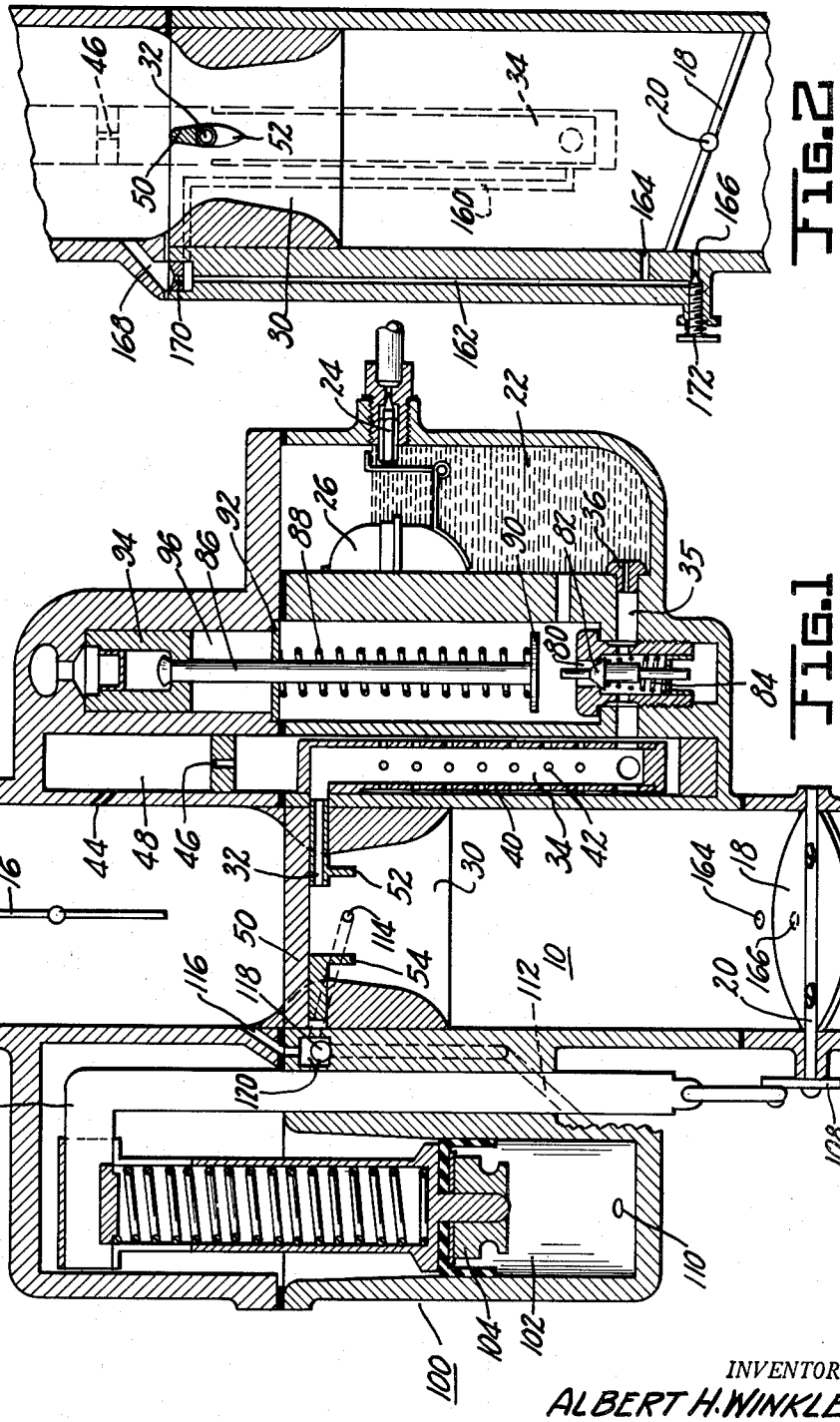


FIG. 2

FIG. 1

INVENTOR.
ALBERT H. WINKLER
BY
M. A. Hobbs
ATTORNEY

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CARBURETOR

Albert H. Winkler, Elmira, N. Y., assignor to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware

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1 Claim. (Cl. 261—41)

The present invention relates to carburetors for internal combustion engines and more particularly to the main fuel system for said carburetors. This is a division of my copending application Serial No. 794,560, filed December 30, 1947, now Patent No. 2,615,440, issued October 28, 1952.

One of the principal objects of the present invention is to provide a compact and efficient main fuel system in a carburetor for an internal combustion engine.

Another object of the invention is to provide a simplified fuel discharge nozzle which can be easily produced and readily assembled in a carburetor and which gives good fuel distribution in the induction passage of a carburetor.

Additional objects and advantages of the present invention will be apparent from the following description and accompanying drawing, in which:

Figure 1 is a vertical cross-section of a carburetor, wherein some of the elements have been rearranged to more clearly show their functional relationship to one another; and

Figure 2 is a fragmentary cross-sectional view through the carburetor showing the venturi, the main discharge jet and idle system of the carburetor shown in Figure 1.

Referring more specifically to the drawing wherein one embodiment of my invention is shown, numeral 10 designates an induction passage of the carburetor, 12 the air inlet, 14 the mixture outlet, 16 a choke valve, and 18 a throttle valve, said throttle valve being mounted on a throttle valve shaft 20 journaled in the throttle body of the carburetor. A conventional fuel bowl 22 is formed integrally with the main body of the carburetor and is provided with a fuel inlet valve 24 and a float mechanism 26 for controlling the flow of fuel through inlet valve 24. The fuel is discharged into the induction passage at the throat of the venturi 30 through a discharge nozzle 32 which communicates with the fuel bowl through a well 34, conduit 35 and a main fuel metering jet 36. A sleeve 40, having several small holes 42 in the wall thereof, is disposed in said well and is spaced from the internal wall thereof to permit air and fuel to surround the sleeve and pass through holes 42 into the internal portion of said sleeve. The air entering well 34 and sleeve 40 is admitted from the air intake end 12 of the induction passage through a port 44 and is metered at orifice 46 as it passes downwardly through passage 48 to the annular space between sleeve 40 and the side wall of well 34. In this construction, the fuel flows from bowl 22 through metering orifice 36 into well 34 and into the lower end of sleeve 40 and passes upwardly through said sleeve where it forms an emulsion with the air admitted through the holes 42. The fuel-air emulsion so formed is discharged through nozzle 32 into the throat of the venturi 30.

The fuel nozzle 32 is arranged to discharge fuel adjacent the under side of a horizontal bar 50 and is provided near the discharge end thereof with a downwardly tapering ear 52 to prevent fuel from flowing along the

under side of said nozzle to the venturi and thence down the side wall of the induction passage. A similar ear 54 is disposed on the opposite side of the venturi under bar 50. Irregularities may be provided on bar 50, such as one or more grooves or ribs on the sides or bottom thereof, to obtain the desired distribution of the fuel in the induction passage.

A power enrichment jet 80 connects the fuel bowl with conduit 35 and is controlled by a valve 82 urged to its closed position by a spring 84. Valve 82 is operated by a reciprocable rod 86 which is urged in the direction to open said valve by a spring 88 reacting between a plate 90 secured to the lower end of said rod and a disc-like plate 92 secured to the fuel bowl cover. The rod 86 is secured to and actuated by a piston 94 mounted in cylinder 96 which is connected at its upper end by a conduit, not shown, with the induction passage on the engine side of the throttle valve. During high power output when manifold vacuum is low, spring 88 urges plate 90 against the stem of valve 82 and opens the valve to permit additional fuel to flow through conduit 35 into well 34 to supply an enriched fuel-air mixture.

A manually actuated accelerating pump generally shown at 100 consists of a cylinder 102, a piston 104 and a lever 106 connecting the upper portion of said piston with the throttle valve actuating mechanism 108 mounted on one end of shaft 20, as shown in Figure 1. When piston 104 is raised, fuel flows from the fuel bowl into the lower portion of cylinder 102 through a check valve controlled conduit 110, and as the piston is moved downwardly on the opening movement of the throttle valve, the fuel is discharged from the lower end of cylinder 102 through conduit 112 and discharge orifice 114 disposed near the throat of venturi 30. An air duct 116 connects the upper end of conduit 112 with the induction passage 10 above venturi 30 to break the effect of venturi vacuum on the fuel in conduit 112. A ball check valve 118 is disposed in an enlarged portion 120 of conduit 112 and is adapted to seat over the fuel inlet of the enlarged portion when the accelerating pump is not in operation and to seat over the air inlet, i. e. the lower end of duct 116 when the fuel is being discharged from the accelerating pump. This ball check valve thus permits air to bleed through the pump discharge orifice when the pump is not in operation and prevents the suction in the throat of the venturi from drawing fuel from the pump cylinder. During the time the pump is discharging, the ball 118 is seated over the lower end of duct 116 to prevent fuel from being discharged by the pump through said duct.

The idle system of the carburetor, which is shown in Figure 2, consists of two vertically arranged conduits 160 and 162 which connect the lower portion of well 34 with idle discharge ports 164 and 166 above and below throttle valve 18, respectively. A bleed 168 having an orifice 170 is provided to admit air into the system for forming an emulsion with the fuel as it enters conduit 162. When the throttle valve is in closed or nearly closed position, fuel flows from well 34 through conduits 160 and 162 and after mixing with air admitted through the idle air bleed 168, discharges through port 166. Additional air is bled into the idle air system at port 164 when the edge of throttle valve 16 is below said port. As the throttle valve is opened and the edge thereof passes above port 164, fuel discharges through both ports 164 and 166, thus providing additional fuel for the increased flow of air. An idle adjustment valve 172 controls the quantity of fuel-air emulsion discharged through port 166.

It is contemplated that other arrangements of elements than those shown in the accompanying drawing may be provided without departing from the scope of the present

invention. Further, other elements may be incorporated in the carburetor and additional modifications of the main fuel and idle systems may be made to satisfy requirements.

I claim:

A carburetor comprising a body having straight walls, an induction passage in said body having an air inlet and a mixture outlet, a fuel well in said body having walls disposed in parallel relation with said passage, a conduit forming an extension of said well, a port in said body connecting said conduit with the inlet of said passage, a perforated tube secured at its upper end in said well and having a lower portion extending substantially to the bottom thereof, said tube being spaced in close proximity to the walls of said well throughout the entire length of said lower portion, a restriction in said conduit between

said port and tube, a fuel bowl in said body, a passage connecting said bowl with said well near the bottom thereof, an opening in said tube located near the bottom thereof and being substantially larger than the perforations in said tube, and a conduit connecting the tube with the induction passage intermediate said inlet and said outlet.

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