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CARBURETOR

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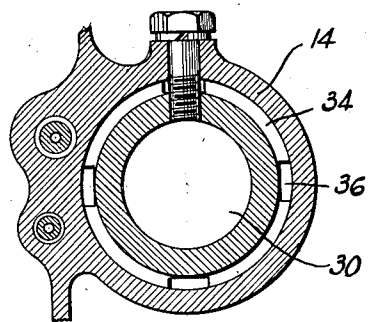


FIG.2

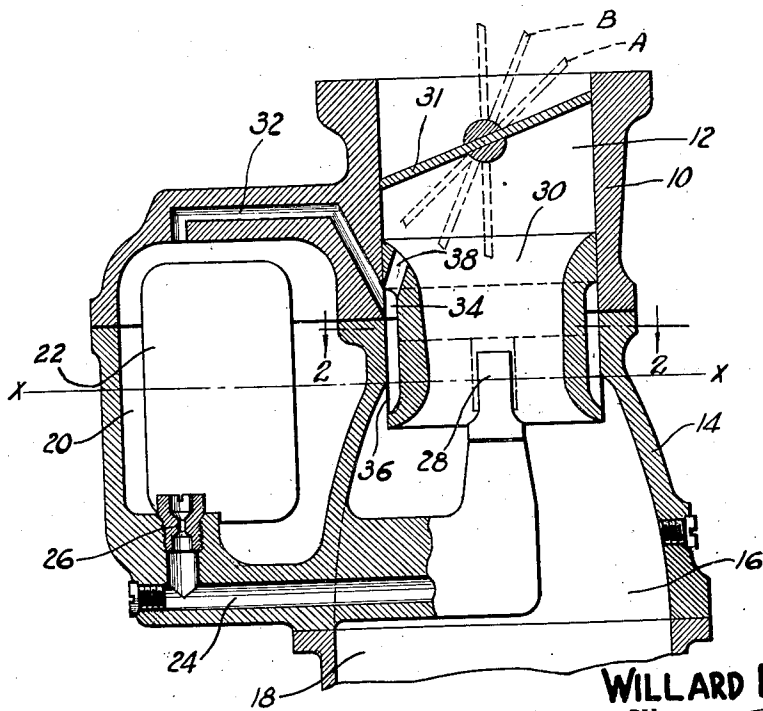


FIG. 1.

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CARBURETOR

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4 Claims. (Cl. 261—72)

This invention relates to carburetors, and more particularly to means for controlling the discharge of fuel from the main nozzle of a carburetor in accordance with pressures existing in the carburetor.

In carburetors as now usually designed, the discharge of fuel from the main nozzle is dependent on the differential of pressure existing between the float chamber and the point of discharge at the main nozzle, the air pressure at the main nozzle being manually controlled by means of a throttle. For a given throttle setting and engine speed, however, the pressure at the main nozzle may vary due to varying atmospheric pressure and due to different designs of air intake producing differential frictional effects upon the air passing therethrough, as well as to other causes.

It is desirable to have only a moderate pressure differential between the float chamber and the main nozzle when the throttle is partially opened, thereby obtaining a relatively lean mixture, and to have a greater pressure differential when the throttle is fully opened, thereby obtaining a richer mixture. It is also desirable to have this effect independent of the atmospheric pressure existing by reason of altitude, air intake design, and other factors.

An object of this invention is to control the pressure differential between the float chamber and the main nozzle independently of the factors above mentioned.

A further object of the invention is to provide an economizer which shall be simple to construct and efficient in operation.

A further object is to provide an economizer having no moving parts and which may be incorporated in carburetors of present day design.

Further objects and advantages of the invention will be apparent from the following description, taken in connection with the appended drawing, in which:

Figure 1 is a vertical section through a carburetor embodying the invention; and

Figure 2 is a horizontal section taken on the line 2—2 of Figure 1.

The carburetor illustrated comprises an upper casting or member 10, forming a mixing chamber 12, and a lower casting or member 14, forming an air horn 16 to which leads an air intake 18 of any suitable form. A float chamber 20 is formed integral with members 10 and 14 and is provided with any suitable type of float 22 designed to maintain the fuel in the chamber at a constant level indicated by the line X—X. A conduit 24

having a metering orifice 26 leads from the float chamber to a main nozzle 28 which terminates adjacent the most restricted portion of a venturi 30. A throttle 31 of usual construction controls the flow of air through the carburetor.

Instead of the usual vent to atmosphere or directly to the air horn, the float chamber is provided with a duct 32 leading from the top thereof and thence downwardly to communicate with an annular groove 34 formed in the outer wall of venturi 30 and cooperating with the wall of the main air passage to form an air duct. This air duct communicates with the air horn by means of vertical slots 36 formed in the venturi, a plurality of these slots being provided so that in case various pressures exist at different points around the periphery of the venturi, these different pressures will tend to equalize each other.

In the operation of the device as thus far described, it will be understood that any variation in pressure existing in the float chamber by reason of vaporization or other causes will be dissipated through the duct 32, and any variation in pressure existing in the air horn 16 will be transmitted to the float chamber 20 so that the pressure differential between the float chamber and the main nozzle will be independent of incidental factors such as altitude, temperature, or the frictional effect of the air intake.

A port 38 connects passage 34 with the mixing chamber 12 immediately below the lower lip of the throttle 31. With this construction, the pressure differential between the float chamber and the main nozzle is independent of the design of the air intake, but both pressures are modified by the position of the throttle. Thus, when the throttle is closed and the engine is idling the air pressure below the throttle is practically atmospheric, but when the throttle is partially opened to the position indicated in dotted lines at A in Figure 1 the port 38 is subjected to a slight suction due to the fact that a part of the relatively high suction above the throttle is transmitted to the port, and also due to the venturi effect of the air stream passing the restricted space between the throttle and the port. The suction in port 38 is partially transmitted to the float chamber through passage 32, causing a decrease of pressure on the fuel therein, and is partially transmitted to the air horn 16, where it has no appreciable effect. The result is that the pressure differential between the float chamber and the main nozzle is lowered somewhat, causing a decrease in the discharge from nozzle 28 as compared with the

discharge at the same throttle opening if the port 38 were not provided.

When the throttle is further opened to the position B the suction on port 38 is considerably increased, causing a further decrease in the pressure differential, but at full open throttle, indicated at C, the suction on port 38 decreases due to the decrease in the velocity of the air stream adjacent the port and also due to the rise in the pressure existing above the throttle. This results in the pressure in the float chamber rising and the discharge from nozzle 28 is increased, giving the desired enrichment of the mixture at full throttle. The amount of enrichment and the point in engine speed at which it takes place may be controlled by varying the size of port 38 and its location relative to the throttle valve, or by varying the total cross-sectional area of slots 36.

While an illustrative embodiment of the invention has been described, it will be understood that the invention is not limited thereto, or otherwise, except in accordance with the terms of the following claims.

I claim:

1. In a carburetor having a fuel reservoir, an air passage, and a throttle, venturi, and main nozzle within the air passage; a conduit for gas pressure communicating with the fuel reservoir above the liquid level thereof, communicating with the air passage below the point of discharge of the main nozzle and communicating with the venturi passage through a port formed in the venturi immediately anterior to the throttle in such relation that the edge of the throttle will sweep over it in close proximity.

2. In a carburetor having a fuel reservoir, an induction conduit, and a throttle and fuel nozzle therein; an air duct between the venturi and the wall of the induction conduit, said duct communicating with the conduit at the lower edge of the venturi and with the upper portion of the bore of the venturi in close proximity to the edge of the throttle when the throttle is partly open, and a pressure equalizing connection between the air duct and the fuel reservoir.

3. In a carburetor having a fuel reservoir, an induction conduit, and a throttle and fuel nozzle therein; a venturi recessed to provide an annular air duct between the venturi and the wall of the induction conduit, said duct communicating with the conduit through a plurality of ports adjacent the lower edge of the venturi, a passage leading from said air duct to the interior of the venturi adjacent the throttle, and a pressure equalizing connection between the air duct and the fuel reservoir above the fuel level therein.

4. In a carburetor, a constant level fuel reservoir, an induction conduit supplied with fuel from said reservoir, a venturi in the conduit, a pressure equalizing conduit formed in the outer wall of the venturi and communicating with the fuel reservoir above the fuel level, with the conduit at the anterior edge of the venturi, and with an outlet adjacent the posterior edge of the venturi, and a butterfly valve in the conduit so mounted that one of its lips sweeps across said outlet during opening movement of the throttle.

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