

UNITED STATES PATENT OFFICE

2,026,798

CARBURETOR

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Application September 27, 1935, Serial No. 42,540

8 Claims. (Cl. 261-13)

This invention relates to carburetors suitable for use with internal combustion engines and is an improvement on the carburetors shown in my Patents Nos. 1,938,497, granted December 5, 1933, and 1,997,497, granted April 9, 1935.

In my aforesaid patents an intimate contact between a liquid such as the fuel used for internal combustion engines, and a gas, such as air, is obtained by causing the gas to bubble up through a body of the liquid. The vaporized liquid passes into a vapor chamber which preferably is heated, and any liquid droplets are returned to the body of liquid, with the result that the fuel introduced into the combustion chambers is free of liquid particles, and in the molecular state so that an intimate mixture with the air is obtained to give an explosive mixture from which nearer the maximum energy contained in the liquid fuel is obtained. Moreover, as there are no liquid particles introduced into the combustion chambers there will be no burning of the fuel and consequently the temperature of the engine will not be increased above that at which it operates most efficiently.

In my Patent No. 1,997,497, the air which is to bubble up through the body of liquid fuel is forced into and through the fuel under pressure and the fuel vapors and air pass into a chamber where they are heated and caused to expand. The introduction of the air under pressure and the expansion of the vaporous mixture insures a sufficient pressure being maintained in the vapor heating and expanding chamber to cause at least a portion of it to be expelled therefrom into the intake manifold as soon as the valve controlling the passage thereto is opened.

In accordance with the present invention, improved means are provided for maintaining the vaporous mixture in the vapor heating chamber under a predetermined pressure, and for regulating such pressure so that it will be at the optimum for the particular conditions under which the engine is to operate. Such means preferably comprises a reciprocating pump operated by a vacuum-actuated motor for forcing the vapors into and through said chamber. The pump is provided with a suitable pressure-regulating valve so that when the pressure in the vapor-heating chamber exceeds the predetermined amount a portion of the vaporous mixture will be by-passed from the outlet side to the inlet side of the pump and recirculated.

The invention will be described further in connection with the accompanying drawings, but such further disclosure and description is to be taken merely as an exemplification of the invention, and the same is not limited thereby except as is pointed out in the subjoined claims.

In the drawings:

Fig. 1 is a side elevation of a carburetor embodying the invention.

Fig. 2 is a plan view thereof.

Fig. 3 is an enlarged vertical sectional view.

Fig. 4 is a transverse sectional view on the line 4-4 of Fig. 3.

Fig. 5 is a detail sectional view on line 5-5 of Fig. 3.

Fig. 6 is a transverse sectional view through the pump and actuating motor therefor, taken on line 6-6 of Fig. 2.

Fig. 7 is a longitudinal sectional view through the pump, taken on line 7-7 of Fig. 2, and

Fig. 8 is a longitudinal sectional view through a part of the pump cylinder, showing the piston in elevation.

In the accompanying drawings, a vaporizing and atomizing chamber 1 is located at the bottom of the carburetor and has an outlet at its top for the passage of fuel vapors and air into a primary vapor heating chamber 2.

The vaporizing chamber 1 is provided with a perforated false bottom 3 and is normally filled with liquid fuel to the level indicated in Fig. 1. Atmospheric air from a conduit 4 is introduced 25 into the space below the false bottom 3 and passes upwardly through the body of liquid fuel below the false bottom 3, and then through the perforations 5 in said false bottom, which breaks it up into a myriad of fine bubbles, which pass upwardly through the liquid fuel above the false bottom.

Liquid fuel for maintaining the level indicated in the chamber 1 passes from the usual fuel tank (not shown) through a pipe 6, and is forced by 35 a pump 7 through a pipe 8 into and through a pair of nozzles 9 having their outlets located in the chamber 1, just above the level of the liquid fuel therein. The pump 7 may be of any approved form but is preferably of the diaphragm 40 type, as such fuel pumps are now standard equipment on most automobiles.

The nozzles 9 are externally threaded at their lower ends to facilitate their assembly in the chamber 1 and to permit them to be removed 45 readily, should cleaning be necessary.

The upper ends of the nozzles 9 are surrounded by Venturi tubes 10 having baffles 11 located at their upper ends opposite the outlets of the nozzles, as is shown and described in detail in my aforesaid Patent No. 1,997,497. The liquid fuel being forced from the ends of the nozzles 9 into the restricted portions of the Venturi tubes causes a rapid circulation of the air and vapors in the 55 chamber through the tubes 10 and brings the air and vapors into intimate contact with the liquid fuel, with the result that a portion thereof is vaporized. Unvaporized portions of the liquid fuel strike the baffles 11 and are thereby further 60