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CARBURETOR

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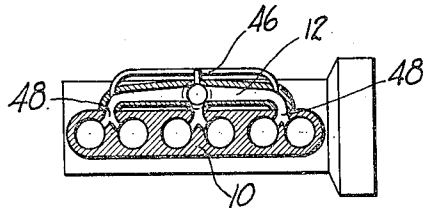


Fig. 1

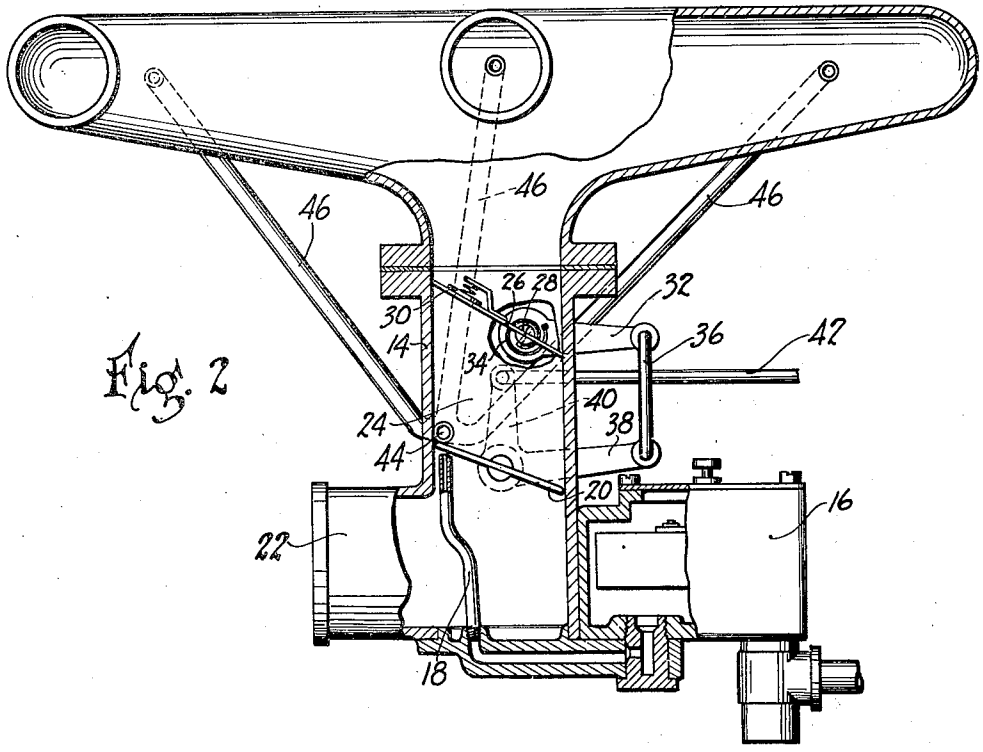


Fig. 2

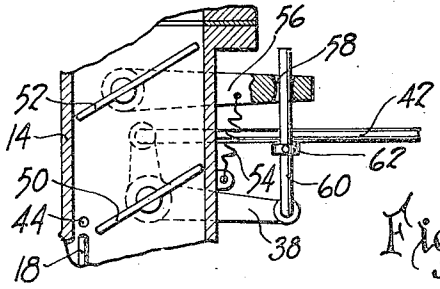


Fig. 3

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CARBURETOR

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1 Claim. (Cl. 123—52)

This invention relates to carburetors, and more particularly to a carbureting mechanism which is especially effective at lower speeds.

In carburetors as usually designed, the air velocity at the lower speeds is not sufficient to make the main nozzle effective, and an additional nozzle is necessary to supply fuel to the engine when it is operating at lower speeds. Such an arrangement has its disadvantages in that it complicates the carburetor structure and in that it frequently happens that the smooth functioning of the carburetor is broken by a lean spot encountered in passing from lower to higher speeds and vice versa.

An object of the present invention is to provide a carbureting apparatus wherein one nozzle is effective to supply fuel in proper proportions at all speeds.

A further object of the invention is to provide a carbureting apparatus wherein the supply of fuel is uninterrupted by changes in speed or degree of throttle opening.

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 diagrammatic sectional view on a horizontal plane, showing an internal combustion engine with the present invention applied thereto;

Figure 2 is an enlarged vertical section of a carburetor and intake manifold embodying the invention; and

Figure 3 is a fragmentary sectional view similar to Figure 2 but showing a modified form of the invention.

The invention is shown as applied to a conventional six-cylinder engine 10 having an intake manifold 12 and a carburetor 14. The carburetor is provided with a float chamber 16 of any suitable construction which supplies fuel to a fuel nozzle 18. The nozzle has its outlet located adjacent the lip of a throttle 20 which controls the passage of air from the air horn 22 to the mixing chamber 24. Positioned above the mixing chamber 24 is an auxiliary throttle 26 which is of the unbalanced type mounted eccentrically on a shaft 28 and having a spring loaded auxiliary valve 30 controlling an air orifice therein. An actuating lever 32 is connected to shaft 28 by means of a coiled spring 34 and lever 32 is connected by a link 36 to bell crank lever 38 which is fixed to the shaft of throttle 20 and has a vertical arm 40 connected to the usual throttle control rod 42 extending to the driver's position. The throttle control mechanism just described is preferably so adjusted as to prevent throttle 20 from moving to its fully closed position, so that a narrow passageway for air is always open above nozzle 18.

Immediately above the lip of throttle 20 and closely adjacent the outlet of nozzle 18 is a port 44 which communicates with a plurality of tubes 46 leading to the intake manifold at spaced points. In the illustrated embodiment, three tubes 46 are shown, and their outlets are opposite the ports 48 leading to the engine cylinders, but this arrangement may be varied if desired.

In operation, when the engine is rotating at idling speed with the throttles in the positions shown in Figure 2, the throttle 20 will permit the passage of a small volume of air between its upper lip and the wall of the carburetor, and the suction produced by the Venturi effect of the restriction will draw with it fuel from nozzle 18. The resulting mixture does not pass upwardly through mixing chamber 24, however, since the velocity in the mixing chamber is very low. The suction in the intake manifold is relatively high during idling, and is effective at port 44 to draw the fuel mixture through tubes 46 to the manifold, from which it passes directly to the cylinders to maintain the engine at idling speed.

If rod 42 is now actuated to open throttle 20 slightly, the subatmospheric pressure in the mixing chamber rises slightly and at the same time the tension on spring 34 is somewhat relaxed, so that valve 30 and also throttle 26 may open to a degree determined by the speed of the engine. This results in a portion of the fuel mixture from nozzle 18 passing through the mixing chamber and intake manifold to the engine, and a lesser amount passing through tubes 46. Further opening of throttle 20 increases this effect, until when the throttle 20 approaches its fully opened position all the fuel mixture flows through the manifold in the usual manner.

In the embodiment shown in Figure 3, the port 44 is adjacent the lower lip of the main throttle 50, and the upper throttle or air valve 52 is urged toward its closed position with a constant force by a tension spring 54 connected to an actuating arm 56 fixed to the throttle shaft. Arm 56 is provided with an aperture 58 to receive a rod 60 pivoted to the main throttle arm and provided with a stop 62. In this embodiment the upper throttle, instead of following the lower throttle in its opening movement rather closely as in Figure 2, will remain fully closed until stop 62 contacts with arm 56, where-

upon the feed of fuel mixture through tubes 46 will decrease and the carburetor pass quickly to the normal system of fuel feed through the mixing chamber and manifold.

Although the invention has been described with particular reference to specific embodiments thereof, it is not limited to such embodiments, but may be considerably varied within the scope of the following claim.

We claim:

In combination with an internal combustion engine having an intake manifold, a carburetor, a throttle in the carburetor, a fuel nozzle discharging adjacent the lip of the throttle, a plurality of conduits leading from adjacent the nozzle to the manifold, a pressure responsive valve between the carburetor and the manifold, and resilient means influenced by the degree of opening of the throttle for urging said pressure responsive valve toward its closed position.

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