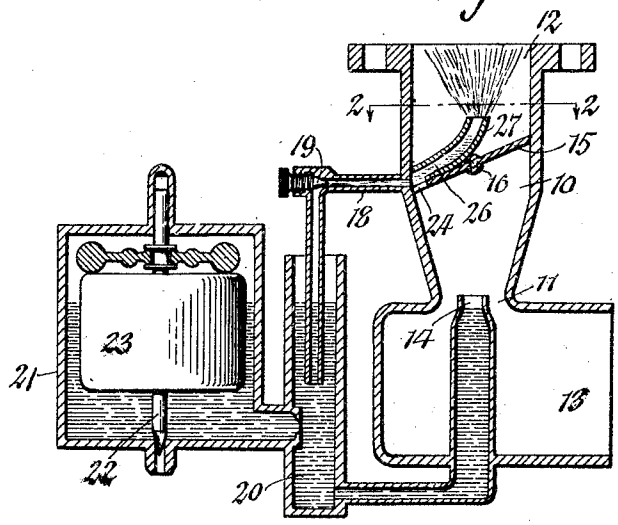
Nov. 13, 1928. 1,691,201

E. T. LARKIN

CARBURETOR

Filed July 2, 1926

Fig. 1.



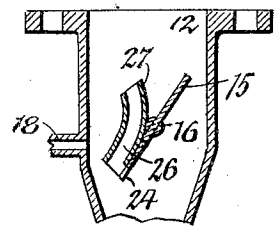
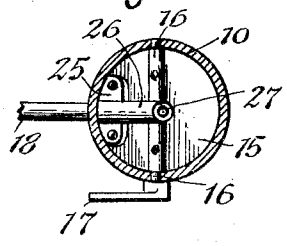


Fig. 3.

Fig. 2.



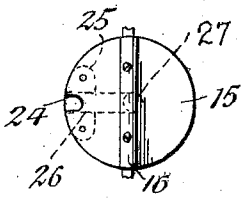


Fig. 4

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UNITED STATES PATENT OFFICE.

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CARBURETOR.

Application filed July 2, 1926. Serial No. 120,202.

This invention relates to carburetors and more particularly to carburetors of the conventional type in which a butterfly throttle valve is employed. Such throttle valves are usually constructed of sheet metal and are arranged within a Venturi tube or mixing chamber and mounted on a horizontal shaft passing diametrically through said chamber, which chamber is usually constructed in the form of a barrel. Many of the well known forms of carburetors contain a plain tubular mixing chamber and depend upon the velocity of the flow of air through the chamber and around a liquid fuel supply conduit for drawing the fuel into the mixing chamber and vaporizing and mixing the same with air preparatory to conducting the same to the places of combustion in the engine. Usually this type of carburetor has such a low air velocity through the Venturi tube or mixing chamber at the main fuel supply conduit when the throttle valve is closed, or nearly so, that the fuel will not be picked up at the main conduit and this necessitates the provision of an auxiliary jet or liquid fuel supply conduit. This auxiliary conduit is usually located on the side of the venturi or mixing chamber above the inlet thereof and adjacent to the throttle valve. Although this is the point of highest velocity of the air when the throttle valve is closed, or approximately so, the outlet of this auxiliary conduit being flush, or substantially so, with the interior of the wall of the mixing chamber causes the fuel, instead of mixing properly with the air, to flow directly along this inner surface of said wall of the gas passage above the throttle valve and to spread out in a film on this wall, due to surface tension, rather than form a mixture or gaseous vapor which is the purpose of the device. Apparently the greater part of the fuel and air mixture obtained is due to evaporation of the liquid fluid film in the mixing chamber rather than by atomization.

It is the object of this invention to provide simple, reliable and inexpensive means whereby the liquid fuel which is supplied to the mixing chamber through the auxiliary fuel supply when the throttle is closed, or nearly so, for obtaining a low speed, will be thoroughly atomized or vaporized instead of being permitted to enter the firing end of the engine cylinder in a raw or liquid state where the same is liable to get into the crank case and produce dilution or thinning of the lubricating oil and render the same less efficient for lubricating the working parts of the engine.

In the accompanying drawings:

Figure 1 is a sectional elevation of a carburetor embodying my invention and showing the throttle valve closed.

Figure 2 is a horizontal section taken on line 2—2, Fig. 1.

Figure 3 is a fragmentary sectional elevation similar to Fig. 1, but showing the throttle valve open.

Figure 4 is a bottom plan view of the throttle valve.

Similar characters of reference indicate corresponding parts throughout the several views.

The carburetor has an upright mixing chamber 10, the lower part of which tapers downwardly and has an inlet 11, so as to form in effect, a Venturi tube and its upper enlarged end has an outlet 12 from which the combustible gaseous mixture is conducted to the firing end of the gas engine. External air is conducted to the inlet of the mixing chamber by an air supply conduit 13 and the main supply of liquid fuel is delivered into the inlet end of the mixing chamber by a main delivery conduit 14 arranged axially in line with the inlet 11 so that the stream of air from the conduit 13 surrounds the main conduit. Within the mixing chamber about midway between its inlet and outlet is arranged a throttle valve 15 which is preferably of the butterfly type and constructed of a sheet metal disk which is mounted on a shaft or spindle 16 passing diametrically through the mixing chamber and journaled in the wall thereof perpendicular to its axis and having an arm 17 on its outer side for adjusting the throttle valve.

Extending through the wall of the mixing chamber about midway of its height is an auxiliary fuel delivery conduit 18 which contains a regulating valve 19 of the needle type. In this instance the main and auxiliary fuel delivery conduits draw the liquid fuel from an intermediate chamber 20 and the latter is supplied from a float chamber 21 the inlet of which is controlled by a valve 22 which is actuated by a float 23 for maintaining the liquid fuel at the desired level.

The point at which the auxiliary fuel conduit enters the mixing chamber is adjacent to where the lower edge of the butterfly

valve engages or nearly engages the wall of the mixing chamber when the same is closed, or nearly so, this conduit being arranged on a radial line of said butterfly valve and at right angles to the axis of the latter, so that when the throttle valve is closed its lower edge will be below the auxiliary fuel conduit, as shown in Fig. 1. Adjacent to the auxiliary fuel conduit, the throttle valve is provided in its edge with a notch or passage 24, through which air is permitted to pass from the inlet to the outlet of the mixing chamber during low speed of the engine to which the carburetor is connected and thus pick up the liquid fuel supplied by the auxiliary conduit.

In order to permit the liquid fuel to be mixed more thoroughly with air, the same is carried from the auxiliary fuel conduit at the side of the mixing chamber to the axis of the same and directed to the outlet of the mixing chamber. For this purpose, deflecting means are provided which comprise a deflecting tube arranged above the throttle valve and over its notch 24, and secured to the upper side of the throttle valve and having a radial inner part 26 which is adapted to communicate with notch 24 and the auxiliary conduit 18 and an upturned or curved inner part 27 which is arranged axially within the mixing chamber. This movable tube 26, 27 constitutes practically an extension of the auxiliary fuel jet and is preferably provided with laterally projecting ears 25 secured to the upper side of the throttle valve.

When the throttle valve is opened to a considerable extent as shown in Fig. 3, the fuel supply is derived wholly or nearly so by the suction effect of the air on the main fuel conduit 14 but when the throttle valve is closed or nearly so, shown in Fig. 1 and the speed of the engine is lowered accordingly, the extension or deflecting tube 26, 27 of the throttle valve is shifted with its outer inlet end adjacent to the auxiliary fuel conduit 18, whereby the air sucked upwardly through the notch in the throttle valve and the deflecting tube carries the liquid fuel from the auxiliary conduit 18 at the side of the mixing chamber to the center of the latter over the throttle valve. The liquid fuel from the auxiliary conduit is by this means thoroughly vaporized, even though the engine is running at low speed, thereby not only using the fuel efficiently and economically, but also maintaining the proper ratio between the fuel and air in the mixture and preventing or at least reducing the chances of raw or liquid fuel reaching the oil which lubricates the cylinder and piston and the bearings of the shaft in the crank case and reducing the lubricating quality of this oil.

An engine equipped with a carburetor of this construction runs more smoothly and evenly and can be opened up at any time after a long period of running without showing any signs of loading or excess fuel in the intake passage, thereby preventing a large amount of raw or liquid fuel from reaching the lubricated surfaces of the cylinder, piston, crank shaft and bearings which otherwise would have the effect of thinning or diluting the lubricating oil and reducing its efficiency.

I claim as my invention:

A carburetor comprising a mixing chamber having an inlet and an outlet, an air supply conduit communicating with said inlet, an auxiliary conduit for delivering a liquid fuel jet into the side of said mixing chamber, a butterfly throttle valve pivotally supported within the mixing chamber between the inlet and outlet thereof and having a notch in one part of its edge which is adapted to be arranged adjacent to the lower side of said auxiliary conduit in the closed position of said valve, and deflecting means comprising an extension or deflecting tube secured to the upper side of said valve and having a radial lower part which is adapted to communicate at its outer end with said auxiliary conduit and an upwardly turned inner part which is arranged to discharge adjacent to the axis of the mixing chamber.

In testimony whereof I hereby affix my signature.

ELWOOD T. LARKIN.