Sept. 19, 1944. T. M. BALL 2,358,435

CARBURETOR

Original Filed July 29, 1940

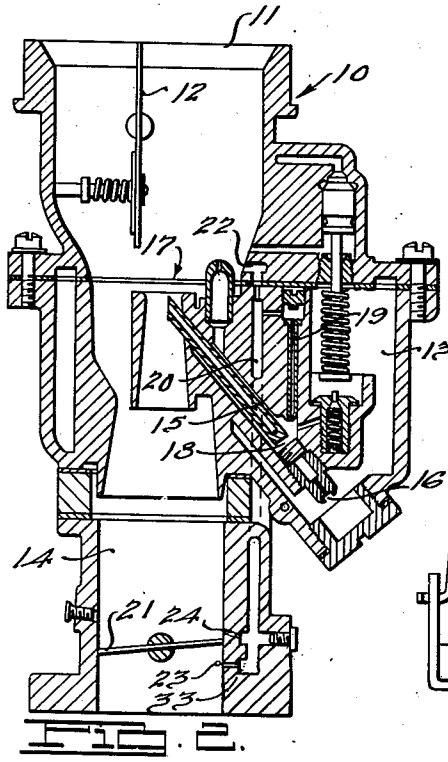
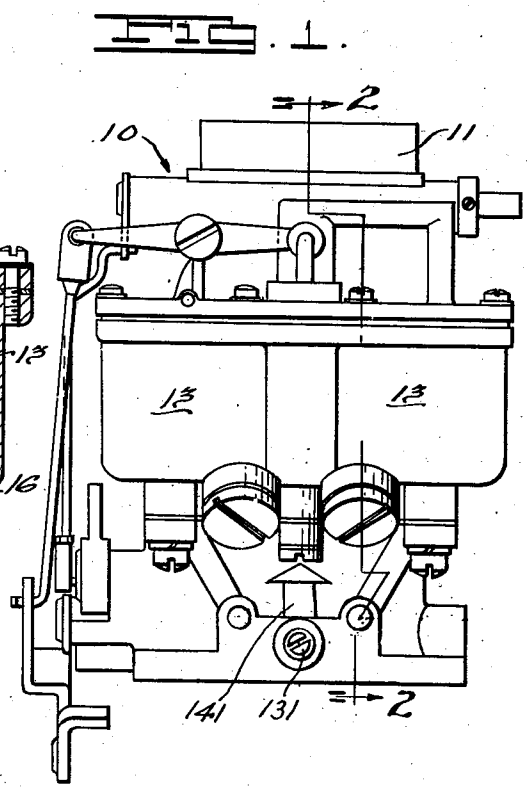


FIG. 2.



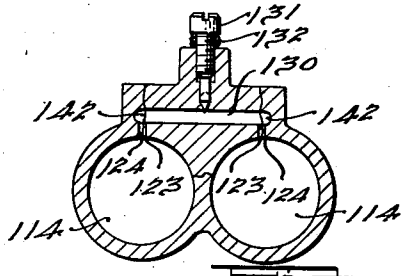


FIG. 4.

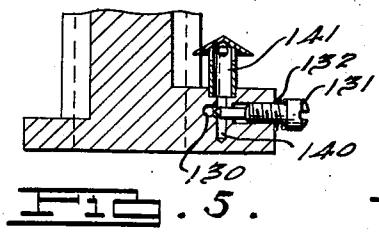


FIG. 5.

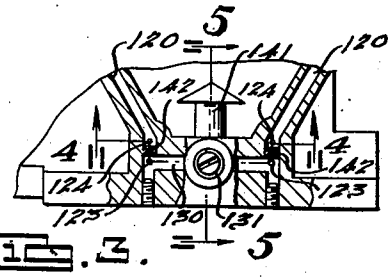


FIG. 3.

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CARBURETOR

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Original application July 29, 1940, Serial No. 348,095. Divided and this application February 9, 1942, Serial No. 429,997

1 Claim. (Cl. 261—23)

The present invention relates to the idling adjustment of a dual throat carburetor for internal combustion engines, and this application is a division of my co-pending application Serial No. 348,095, filed July 29, 1940. Dual throat carburetors are in common use today and comprise a unit consisting of two carburetor devices under the control of a single set of throttle and choke devices. The usual practice in such dual throat carburetors is to provide a separate idle adjustment for each throat, and in practice it has been found extremely difficult, if not impossible, to regulate each idle adjustment to the same extent so that uneven firing of the engine controlled thereby results. It is the principal object of the present invention to place regulation of the idle discharge of the two throats of a dual throat carburetor under control of a single adjusting screw in order that exactly the same fuel and air mixture may be fed to each throat during idling operation of the engine.

An object of the present invention is to provide means whereby the regulation of idling is achieved by adjustment of a single valve controlling the amount of air mixed with the fuel, which valve is adjacent the transfer and idle ports of a carburetor having such ports, and being so positioned as to control the richness of mixture when the engine is idling.

The invention has for its object the provision of means whereby the single adjustment screw admits more air on idling than on transfer action so as to provide for the admission of a richer mixture when transferring to higher speeds without altering the idle adjustment.

The objects and advantages of the present invention should be more readily understood from the following specification taken in connection with the accompanying drawing which sets forth preferred embodiments of the invention and wherein like numerals refer to like parts throughout.

In the drawing,

Fig. 1 is a partially cut-away view in elevation of a dual throat carburetor having a form of the present invention applied thereto;

Fig. 2 is a vertical section taken substantially along line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a partially cut-away view in elevation of the lower end of a dual throat carburetor embodying the invention;

Fig. 4 is a section taken substantially along line 4—4 of Fig. 3 and looking in the direction of the arrows; and

Fig. 5 is a vertical section taken substantially along line 5—5 of Fig. 3 and looking in the direction of the arrows.

The present invention is applied to a dual throat carburetor 10 having the usual air inlet 11 and choke device 12 under control of the usual choke operating mechanism. The carburetor is provided with a plurality of fuel inlet reservoirs 13 each of which feeds fuel into an associated throat 14 through the usual fuel inlet nozzle 15 and nozzle inlet 16. Fuel is sucked through the inlet 16 and nozzle 15 by the rush of air through a Venturi device broadly designated at 17. Incorporated in the inlet nozzle construction is a well 18 from which extends vertically an idle snatcher tube 19 having an outlet communicating with an idling passage 120 leading downward to the vicinity of the throttle valve 21. Fuel is admitted to the idling passage 120 from the idle snatcher tube 19 by the aspirating effect of air drawn from the air inlet 11 through an opening 22 at the upper end of the idling passage 120, which movement of air is induced by the engine suction on the fuel jet 123 which is located below the throttle valve 21. A transfer port 124 opens into the throat 14 above the throttle valve 21 when in closed position from the idle passage 120 for the purpose of admitting fuel mixture to the engine during transfer from idling to high speeds. The construction heretofore described is old and well known in the art and details thereof are accordingly not fully illustrated nor described.

In this device the transfer ports 124 through which air is admitted during idling operation become fuel injection ports when the throttle valve is opened slightly. Since it is the purpose of the transfer ports to feed fuel mixture to the engine in greater amount than required for idling prior to the time that the main inlet becomes effective it is desirable to increase the suction on the idle snatcher tube 19 at this moment. Figs. 3, 4, and and 5 disclose an embodiment of the invention whereby this result is achieved. In these figures it is apparent that the mixture regulating passage 130 is so arranged as to extend between the individual idle inlet ports 123 which are placed at the junctions of the idle fuel inlet tubes 120 and the passage 130. The central portion of the passage 130 is provided with a valve seat in which is placed the needle point of a needle valve 131 provided with a spring take-up device 132, the needle valve seat extending from the passage 130 to a vertical air inlet passage 140 leading from an air horn 141 communicating with the outside at-

mosphere. Regulation of the needle valve 131 regulates the amount of air which passes into the passage 130 for admixture with the fuel mixture passing through the idle inlet ports 123, whereby equal and simultaneous adjustment of the fuel mixture during idling operation is achieved.

Between each of the transfer ports 124 and the idle inlet ports 123 there is placed a restriction 142. When the throttle valve is in closed position, such as seen in Fig. 2, the fuel mixture, composed of air entering through the inlet from above the venturi, such as inlet 22 of the modification shown in Fig. 1, fuel entering from the idle snatcher tube, and air entering from the transfer ports 124, passes through restrictions 142 to be finally proportioned with air admitted through the air horn 141 and passage 130. When the throttle valve is slightly opened so as to cause the transfer ports to become effective the richness of the mixture is increased since the tendency is for more air to be drawn through the inlet above the venturi, thus increasing the amount of fuel drawn through the idle snatcher tube, this increase in fuel being such as to increase the proportion of fuel to air. Some air might be drawn back through the restriction 142 from the idle ports 123 and the air horn 141, but due to the action of the restrictions 142 the amount of air drawn from these sources is less than the amount of air which was previously drawn through the air horn 141 and the transfer ports 124. In this form of the invention the quantity of fuel and the richness of the mixture increases at the moment of activity of the transfer ports.

Having described an embodiment of the present invention, it should be apparent to those skilled in the art that the same permit of modification in arrangement and detail, all such modifications as come within the scope of the following claim are considered a part of my invention.

I claim:

A carburetor having a plurality of fuel mixture ducts each adapted to be connected to a different section of an internal combustion engine and a plurality of carbureting devices each associated with one of said fuel mixture ducts, a throttle valve in each fuel mixture duct, an idling fuel intake device associated with each carbureting device and including an idle inlet tube leading to an idle inlet port located in the wall of the associated fuel mixture duct effectively on the engine side of said throttle valve when in closed position whereby the engine suction becomes effective to draw an idling mixture through said idle inlet tube during idling operation of the engine, a mixture regulating passage connecting said plurality of idle inlet tubes, said idle inlet ports being placed at the junctions of said mixture regulating passage and said idle inlet tubes, means to admit auxiliary air into said passage during idling operation including an auxiliary air inlet passage, a needle valve in said auxiliary air inlet passage controlling the amount of air admitted through said means during idling operation whereby the richness of the mixture admitted through each of said idle inlet ports may be equally and simultaneously adjusted, a transfer port connecting each idle inlet tube with one of said mixture ducts respectively at a point on the opposite side of said throttle valve when said throttle valve is in closed position, and a restriction in each idle inlet tube between the transfer port and the idle inlet port associated therewith whereby the richness of the mixture drawn into said idle inlet tube is increased during transfer operation.

THOMAS M. BALL.