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1,808,537

CARBURETOR

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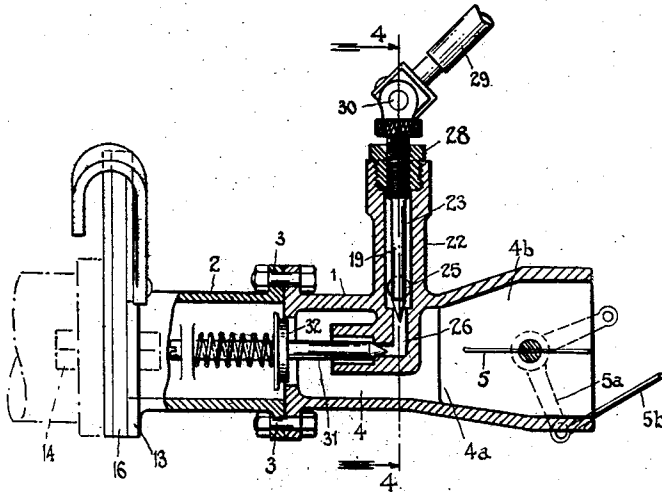


Fig. 1.

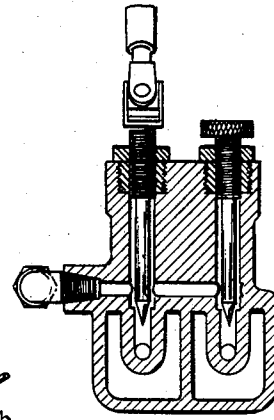


Fig. 4.

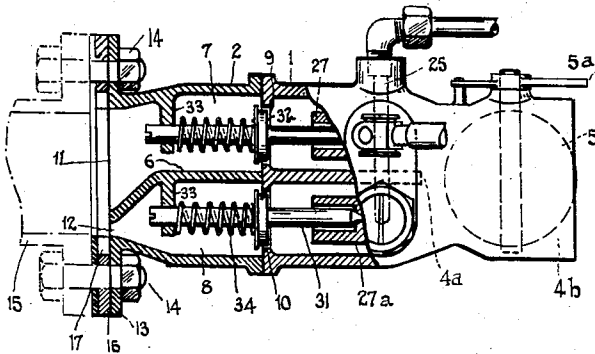


Fig. 2.

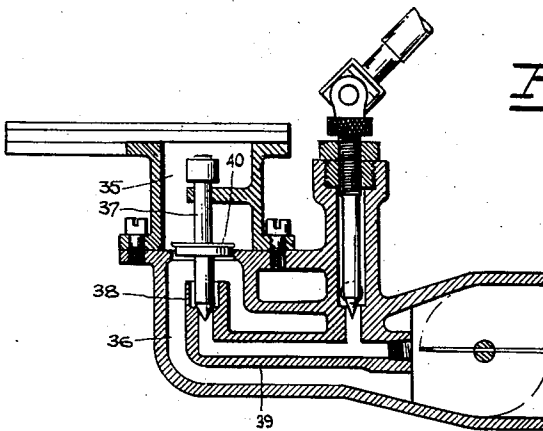


Fig. 5.

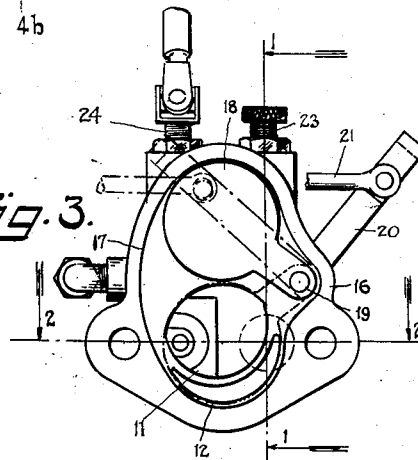


Fig. 3.

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CARBURETOR

Application filed April 17, 1926. Serial No. 102,632.

This invention relates to carburetors for internal combustion engines. This application may be regarded as an improvement upon my co-pending application, Serial Number 49,244 filed October 10, 1925, which has matured into Patent 1,778,215, granted October 14, 1930.

It is an object of the invention to provide a floatless carburetor comprising means arranged in the fuel mixture passage automatically responding to the flow through said passage and exercising control of the fuel delivery to the mixing chamber of the carburetor.

Another object of the invention is to provide dual nozzles for the discharge of liquid fuel to the mixing chamber of a carburetor, and to control the discharge from said nozzles by dual valves automatically responsive to the mixture flow through said passages, and to provide means for progressively and successively establishing said passages in communication with the engine.

A further object is to provide a floatless carburetor having dual valve controlled fuel outlets to the mixing chamber, one for operation under low speed conditions, and the other for delivering fuel to operate the engine, at relatively high speeds, and to provide for permanently setting the low speed fuel valve and for control of the high speed valve from the driver's seat.

These and various other objects the invention attains by the construction hereinafter described, and illustrated in the accompanying drawings, wherein:

Figure 1 is a view of the improved carburetor in longitudinal vertical section, taken on the line 1—1 of Figure 3.

Figure 2 is a horizontal sectional view of the same taken on the line 2—2 of Figure 3.

Figure 3 is a view of the outlet end of the carburetor.

Figure 4 is a vertical section taken on line 4—4 of Figure 1.

Figure 5 is a longitudinal vertical sectional view of an alternative construction.

In these views, the reference characters 1 and 2 designate two members bolted together as indicated at 3 to form the body of the car-

buretor. The member 1 has in one of its end portions, dual mixing chamber 4, formed by a partition 4a, the other end portion of said member forming an air inlet 4b to said mixing chambers. The inlet 4b is controlled by a suitable choke valve 5 preferably of the butterfly type, and an arm 5a which may be extended to be operable from the driver's seat of a vehicle.

The member 2 has a partition 6 therein forming two mixture passages 7 and 8 extending from end to end of said member, and separately communicating at one end of said member with the respective mixing chambers, as indicated at 9 and 10. The openings of said passages at the other end of the member 2 are indicated at 11 and 12, the opening 12 being considerably more restricted. The last mentioned end of the member 2 is formed with an outstanding flange 13 engageable by bolts 14 which secure the carburetor to an intake manifold 15. Between said manifold and the carburetor there is clamped a metal plate 16 formed with an opening 17 through which fuel mixtures are adapted to discharge to the manifold from the passages 7 and 8.

Within the opening 17 a circular shutter 18 is pivoted as indicated at 19 to control the passages 7 and 8, said opening being of sufficient size to permit travel of said shutter from the limiting position shown in full lines in Figure 3, in which said shutter clears both openings 11 and 12 to the other limiting position indicated in dash lines in said figure, in which the shutter closes both of said openings. It is to be noted that the arrangement is such that the shutter in its opening travel is adapted to first progressively uncover the opening 12 and thereupon to progressively uncover the opening 11. 20 designates a control arm suitably connected to the shutter and actuable by a control rod 21 which may be extended to the vicinity of the driver's seat.

The member 1 is formed with an upstanding integral extension 22 in which are vertically mounted two needle valves 23 and 24 controlling communication between a liquid fuel supply duct 25 and the discharge passages 26 of two nozzles 27 and 27a, which open in the direction of flow through the

mixing chambers 4 and 4a and are respectively aligned with the openings 9 and 10. The valve 23 controlling the nozzle registering with the more restricted passage 8 is adapted to be permanently adjusted to provide for a suitable fuel supply to the nozzle and the lock nut 28 maintains such adjustment. The other needle valve 24 is adjustable according to the particular conditions of operation, a control rod 29 being universally joined as indicated at 30 to the projecting upper end of said valve.

31 designates a second pair of needle valves which pass respectively through the openings 9 and 10 in the direction of flow of the mixture, and which are adapted to seat within the discharge ends of the nozzles 27 to control the fuel outlets 26. Within the chamber 2 the valve members 31 respectively carry disc closures 32 for the openings 9 and 10, said closures substantially closing said openings when said valve members are engaged with their seats in the nozzles 27. Said valve members slidably engage guide lugs 33 formed upon the member 2 in the passages 7 and 8, and coiled springs 34 mounted upon said valve members between said lugs and the discs 32 urge the tapered extremities of said valve members to their seats in the nozzles.

In the use of the described carburetor when the associate engine is not in operation, the springs 34 maintain the valve members 31 both seated in the nozzles 27 preventing any fuel discharge to the mixing chambers. Under operating conditions, the pressure drop created in the manifold 15 is communicated to the passage 8 responsive to the initial opening travel of the shutter 18, resulting in an automatic opening of the closure disc 32 which registers with the opening 10, said disc thus actuating the associated valve member 31 from its seat in the nozzle 17 to an extent proportioned to the pressure drop in the passage 8 and thus allowing a discharge of fuel to the mixing chamber proportionate to such pressure drop.

Upon a further opening actuation of the shutter 18, the opening 11 will be progressively uncovered, communicating from the intake manifold a pressure drop to the passage 7 and causing the disc 32 to withdraw from the opening 9 and to reseat the associated valve member 31 to an extent proportionate to the uncovering of the opening 11. Thus the discharge of fuel into the mixing chamber is automatically controlled by pressure conditions in the passages 7 and 8, and these conditions are regulated in common by the shutter 18.

For operating an engine at low speed as under idling conditions, the shutter 18 may be opened only sufficiently to uncover (or partly uncover) the opening 11 so that a mixture will flow to the intake manifold only through the relatively restricted passage 8.

For operating at higher speeds, or under load, the shutter 18 is shifted sufficiently to uncover, either in part or completely, the opening 11 under which condition mixture is delivered to the manifold through both passages 7 and 8.

The described automatic control of the fuel supply through regulation of pressure conditions in the passages 7 and 8 is adapted to be supplemented by the control of the needle valve 24 provided for by the control rod 29.

In that form of the invention disclosed in Figure 5 the same features of control are present, but the passages 35 which lead from the mixture chamber 36 extend upwardly and the valve members 37 are vertically arranged in said passages, their tapered lower extremities being adapted to seat within the upturned ends of the nozzles 39. This arrangement presents the advantages that the previously described springs may be eliminated, the weight of the stems 37 and of the discs 40 carried by said stems being sufficient to normally seat said valve member.

It is a desirable feature of the described carburetor that the usual float and float chamber and the annoyance and uncertainty resulting from their use are eliminated, and that the flow produced by the pressure drop in an intake manifold is utilized to automatically exercise a positive control of the fuel supply through the mixing chamber.

From the foregoing it becomes evident that the device is simple and efficient and provides means which accomplish the objects described.

While it will be apparent that the illustrated embodiment of my invention herein disclosed is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claim.

Having thus described my invention, I claim:

A carburetor having dual mixture passages, differentially restricted, means for delivering a mixture to said passages, means in each of said passages automatically regulating the flow therethrough, a flat plate secured to said carburetor having an opening through which said passages discharge, and a flat plate pivoted in said opening in back of the first mentioned plate and successively movable across said passages to open and close the same.

In witness whereof I hereunto set my hand.
ORVILLE Z. FRAZIER.