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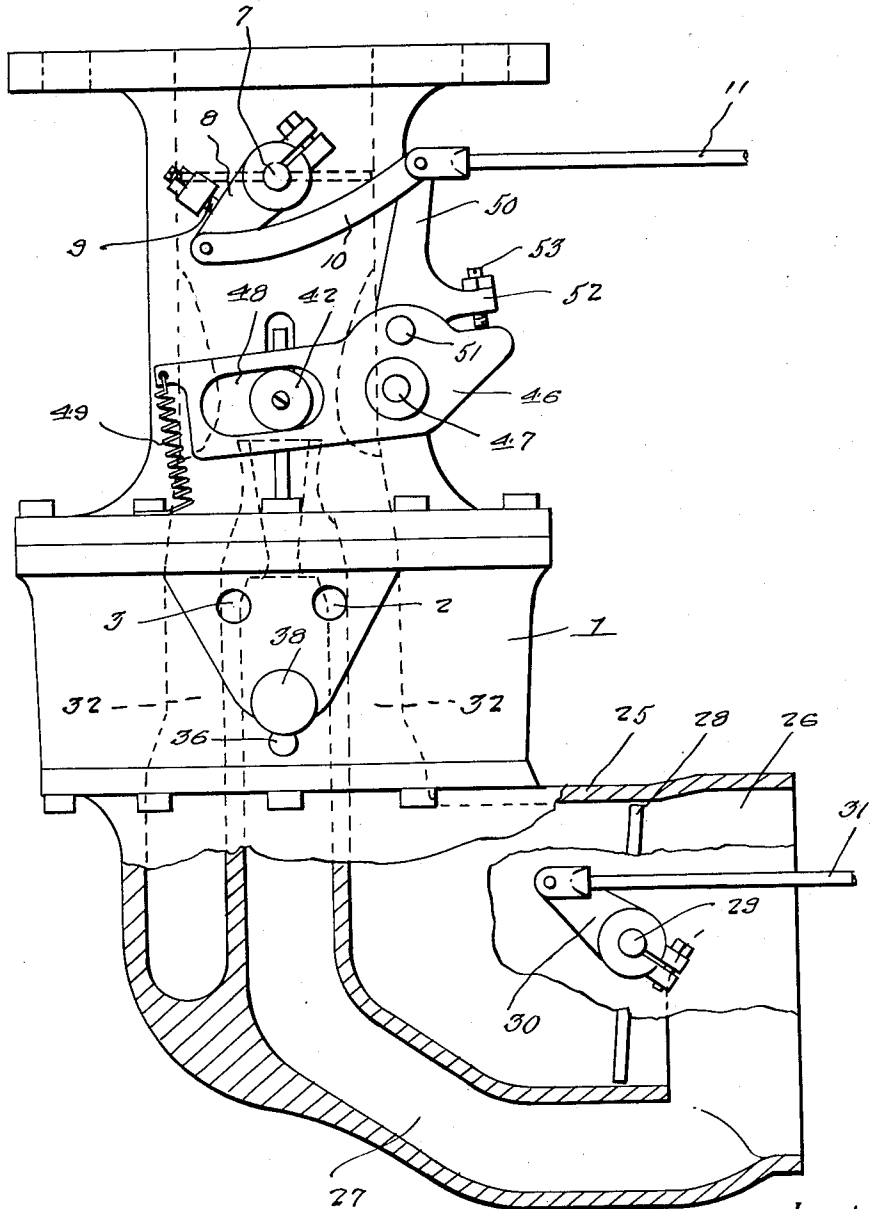
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CARBURETOR

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2 Sheets-Sheet 1

Fig. 1.



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CARBURETOR

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This invention relates to a carburetor, the general object of the invention being to provide a carburetor which is simple of construction, one which does not use a float or other fuel control means, with means for controlling the feed of gasoline and air by positive mechanical action.

Another object of the invention is to provide means whereby a perfect combustible mixture is secured at all speeds.

10 This invention also consists in certain new and other features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

15 In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

20 Figure 1 is an elevation of the improved carburetor with the lever part in section.

Fig. 2 is a vertical sectional view through the carburetor.

25 Figure 3 is a top plan view of the slotted ring.

In these views, the numeral 1 indicates the bowl of the carburetor which is provided with the inlet 2 and the overflow 3 which control the flow of liquid fuel into the chamber 4 of the bowl.

30 The Venturi tube is shown at 5 and is connected with the top of the bowl as shown and contains the throttle valve 6 carried by the shaft 7 to one side of which the arm 8 is connected which is provided with the adjustable stop 9, and a line 10 connects the arm with the operating rod 11. At the other end of the shaft 7 is arranged an eccentric 12 the strap 13 of which is formed with a depending rod 14. A cylinder 15 is located in the chamber 4 and is in communication 40 therewith and a piston 16 is located in the cylinder and has its rod 17 passing through the guide 18, with the upper end of the rod threaded into the coupling 19 pivoted as at 20 to the coupling 21 in which the lower end of the rod 14 is 45 threaded.

50 A projecting part 22 extends upwardly to the top of the bowl from the bottom thereof and is formed with a vertical passage 23 the upper end of which is threaded and reduced to receive the lower reduced and threaded end of the small venturi 24 which is located in the lower part of the member 5. An air housing 25 is connected to the bottom of the bowl and is formed with a large air passage 26 and a small passage 27, said small 55 passage being in communication with the lower

end of the passage 23. An air valve 28 controls the passage of air into the large passage 26 and the shaft 29 of this valve has an arm 30 connected to one end thereof, to which the operating rod 31 is connected. Air passages 32 connect the top part of the large passage 26 with the space 33' surrounding the upper end of the part 22 and the member 24, and groups of diagonally arranged passages 33 lead from the bottom of this space 33' into the chamber 4. As 60 shown in Fig. 2, the passages of each group are arranged one above the other.

A passage 35 is bored through the lower part of the bowl from one side thereof into the lower part of the passage 23 and the outer end of this 70 passage 35 is closed by a plug 36. A port 37 connects the bottom of the chamber 4 with the passage 35 and which port is controlled by a needle valve 38. A substantially L-shaped jet or nozzle 39 has its short part extending into the passage 35 with its long part extending vertically through the passage 23 with its upper end located slightly below the bore of the member 24. A sleeve valve 40 encircles a portion of the part 22 and controls the passages 33, this valve hav- 80 ing its internal walls cut away at the lower part as shown in Fig. 2.

Rods 41 have their lower ends connected with the valve 40 and said rods pass through the base of the part 5 and pass through holes formed in 85 the heads of studs 42 which pass through slots 43 vertically arranged in the part 5 and a Venturi choke 44 has threaded holes therein for receiving the threaded ends of the studs. The rods 41 are held in the holes in the heads of the studs 90 by the set screws 45.

A substantially yoke-shaped member 46 embraces the lower part of the member 5 and has its limbs pivoted thereto as shown at 47 and said limbs are provided with the elongated openings 95 48 which receive the rounded heads of the studs 42. Springs 49 connect the ends of the limbs of the member 46 with the base of the member 5, and a member 50 is pivoted to the member 46 as shown at 51 and said member 50 has its 100 upper end connected with the rod 11 and is formed with an arm 52 which carries an adjusting screw 53 which engages the outer end of the member 46.

A small diagonally arranged passage 54 passes 105 from a lower part of the bore of the member 24 through the part 22 and is in communication with a passage 55 formed below the cylinder 15 and in communication with the bottom of the cylinder and a spring-pressed check valve 56 110

controls the passage 55. The projection on the piston 16 tends to move the valve 56 to open position when the piston is in lowered position. A ring 57 is located in the lower part of the space 33' and has slits therein to form a fan-shaped spray of the fuel passing from each group of passages into said space.

The lower portions are so formed that when the choke valve 28 is open air passes through the passage 26 and said air is given a whirling action as it goes up into the space 33' and thus the air is efficiently mixed with the gas passing from the member 24 into the mixing chamber formed by the member 5 and in which is located the large venturi 44.

The action of the carburetor is as follows:—

The choke valve lever 31 is pulled forward closing valve 28, which forces all the air entering the carburetor to enter through the small passage 17 and small venturi 24, making a rich mixture. By manipulation and opening of the valve 28, the mixture is restored to normal operating mixture as conditions permit. Then rod 11 is pulled to open throttle valve 6 through arm 8. The manipulation of this valve is so operated that it comes back to a fixed position regulated by an adjustment screw 9 which when set properly does not allow valve 6 to be shut tight, allowing a small opening to provide enough gas mixture for idling of motor. Movement of the lever 50 which is connected to member 46 raises studs 42 which are located in the elongated slots in member 46 and thus the venturi 44 and sleeve valve 40 are raised. The action of Venturi choke 44 moving up when throttle is opened increases the air space between venturi 44 and small venturi 24. This action of increasing the air space between the two venturis in opening the throttle increases the volume of air entering mixing chamber but also cuts down the vacuum or sucking action on gas jets 33 thereby making a leaner mixture for high speed, making a feature of economy in feeding gas to the proper proportion of air, and after this upward movement takes place the sleeve valve uncovers gas jets 33, feeding gas and air in proportion, by steps, as throttle is being opened.

The adjustment screw 53 when set in proper position, acts as a timing device to insure the proper action of sleeve valve and Venturi choke and provides necessary coordination between throttle and valve mechanism. The low speed adjustment 38 is a restriction valve for low speed or idling jet 39. This may be connected to choke valve on large motors to open throttle valve 6, by means of the eccentric 12, fastened to shaft 7. The turning of this valve drives the piston down, forcing a charge of gasoline through jet 54 into small venturi 24 and thence into the mixing chamber. This feature permits more rapid acceleration.

The piston in this pump has the proper clearance between it and cylinder wall to allow gas to pass around piston at normal operation, but, upon it being actuated quickly forces gas through channel to jet 59'.

The action of this carburetor results in a great saving of gasoline through better volumetric efficiency in the action of metering the gasoline and air ratio to mixing chamber by coordination of valves and throttle in controlling the volume and velocity of the mixture. The specific construction, arrangement and operation of this carburetor maintain a proper head of gasoline

in the gas jets and this is accomplished by positive mechanical action free from atmospheric influence which is present when spring actuated parts are used.

The compact construction allows a greater range of adjustment for summer and winter driving and permits a great saving in manufacture.

The following advantages of the invention are set forth:—

The simplicity of construction embodying straight line construction and centralizing of working parts increases the efficiency of operation at acute angles. The fuel feed being devoid of pressure in the bowl of reservoir insures a positive line of level in gasoline jets. By the elimination of parts ordinarily used for fuel control at the carburetor inlet a great saving results in the cost of manufacture. The elimination of the usual needle valve and seat removes the greatest cause of carburetor trouble. There is no float of any manner used, thus overcoming any fluctuating action transmitted to fuel by vibrations or shock. A constant flow of gas being permitted to flow into the bowl constitutes an action providing a more volatile fuel, and therefore permits the use of a lower grade fuel than otherwise.

The manner of construction provides greater assurance, of it being free of individual peculiarity in quantity production. All valves in operation are positive in mechanical action, making a motor more flexible in its operation through this application of design. Atmospheric influence is reduced to a minimum by not relying on springs in metering gas to jets or in controlling air volume. The positive acting accelerating pump requires no adjustment and is converted to a high speed jet with wide open throttle. The construction of air passages permits operator to adjust carburetor to a lean or rich mixture at will from driving position. The progressive manner in feeding gas by a series of jets controlled by a sleeve valve causes a great saving of gas per mile.

The perfect timing and coordination of valves eliminates the stalling or flooding of motor upon quick deceleration at high speed of motor. The movable Venturi choke controlling the vacuum action in the mixing chamber is an entirely new phase of carburetor construction and through its application is the vital means of making a correct mixture. The automatic action all controlled by the throttle valve insures the stability of action in feeding gas and air at all speeds. Through the perfect combustible mixture secured at all speeds, excessive heating of the motor is prevented and the consumption and dilution of the oil in the crankcase is reduced.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts provided that such changes fall within the scope of the appended claims.

Having thus described my invention, what I claim as new is:—

1. A carburetor of the class described comprising a floatless bowl, having a fuel inlet and an outlet, a tubular part connected to the top of the bowl, a throttle valve in the upper portion of said part, a Venturi member supported for vertical movement in said part below the valve, an air conduit in communication with the lower end of said part, said bowl having a group of passages therein connecting the lower end of said tubular

part with the fuel space of the bowl, said passages being superimposed, a valve controlling said group of passages and progressively uncovering the passages as the valve moves upwardly, and means for raising said valve and the Venturi member as the throttle is opened.

2. A carburetor of the class described comprising a bowl, means for feeding liquid fuel thereto, a tubular part connected to the top of the bowl, a throttle valve in the upper portion of said part, a Venturi member supported for vertical movement in said part below the valve, an air conduit in communication with the lower end of said part, said bowl having a group of passages therein connecting the lower end of said tubular part with the fuel space of the bowl, said passages being superimposed, a valve controlling said group of passages and progressively uncovering the passages as the valve moves upwardly, adjustable means for raising said Venturi member as the throttle is opened, adjustable means for connecting the valve to the Venturi member whereby said valve will be raised with the Venturi member, a pump communicating with the bowl, a conduit connecting the pump with the lower part of the mixing chamber formed by the tubular member, and means whereby the pump will force liquid fuel through the passage upon quick acceleration of the throttle.

3. A carburetor of the class described comprising a bowl, means for feeding liquid fuel thereto, a tubular part connected with the top of the bowl, a throttle valve in the upper portion of said part, a Venturi member supported for vertical movement in said part below the valve, an air conduit in communication with the lower end of said part, said bowl having a group of passages therein connecting the lower end of said tubular part with the fuel space of the bowl, said passages being superimposed, a valve controlling said group of passages and progressively uncovering the passages as the valve moves upwardly, means for raising said valve and the Venturi member as the throttle is opened, a pump communicating with the bowl and a conduit connecting the pump with the lower part of the mixing chamber formed by the tubular member, means whereby the pump will force liquid fuel through the passage upon quick acceleration of the throttle, a small Venturi member in the lower part of the mixing chamber into which the conduit from the pump discharges, a jet in communication with the fuel chamber of the bowl and discharging into said small Venturi member, a valve for controlling the flow of fuel from the said cham-

ber into said jet, a small air conduit communicating with the small Venturi member and a choke valve for controlling the first-mentioned air supply.

4. A carburetor of the class described comprising a bowl forming a liquid chamber, and having inlet and overflow passages therein, a projection extending from the bottom of the bowl to the top thereof and which is surrounded by the chamber of the bowl, said projection having a centrally arranged passage therein and an annular space in its upper portion, groups of diagonally arranged passages connecting the bottom of the space with the liquid chamber, the passage of each group being superimposed, means for shaping the fuel passing through each group of passages into fan-shape, a small Venturi member connected to the upper part of the central portion of the projection and in communication with the passage therein, a jet in said passage having its upper end discharging into the Venturi member, a conduit connecting the jet with the liquid chamber, a valve controlling said conduit, a pump cylinder in the bowl and in communication with the liquid chamber thereof, a small jet opening out into the Venturi member a passage connecting the small jet with the lower end of the pump member, a piston in the pump cylinder, a piston rod connected therewith, an air housing connected with the bottom of the bowl and containing a main air passage and a small air passage, the latter being in communication with the vertical passage of the projection in the bowl, a choke valve for controlling the flow of air into the main passage, conduits connecting the main passage with the annular space in the top part of the projection of the bowl, a tubular member connected with the top of the bowl and forming a mixing chamber, the lower part of which surrounds the Venturi member and is in communication with the annular space, a sleeve valve for controlling the groups of passages and progressively uncovering the passages as the valve moves upwardly, a large Venturi member supported for vertical movement in the mixing chamber, a throttle valve in the upper part of the mixing chamber, means for actuating the valve, and means for simultaneously raising the large Venturi member and the sleeve valve as the throttle valve is opened, and means for causing the piston of the pump to force fuel through the passage and small jet of the small Venturi member when the throttle valve is quickly opened.

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