May 4, 1937. W. C. DUNN 2,079,436

CARBURETOR

Filed Nov. 30, 1934 4 Sheets-Sheet 1

Fig. 1.

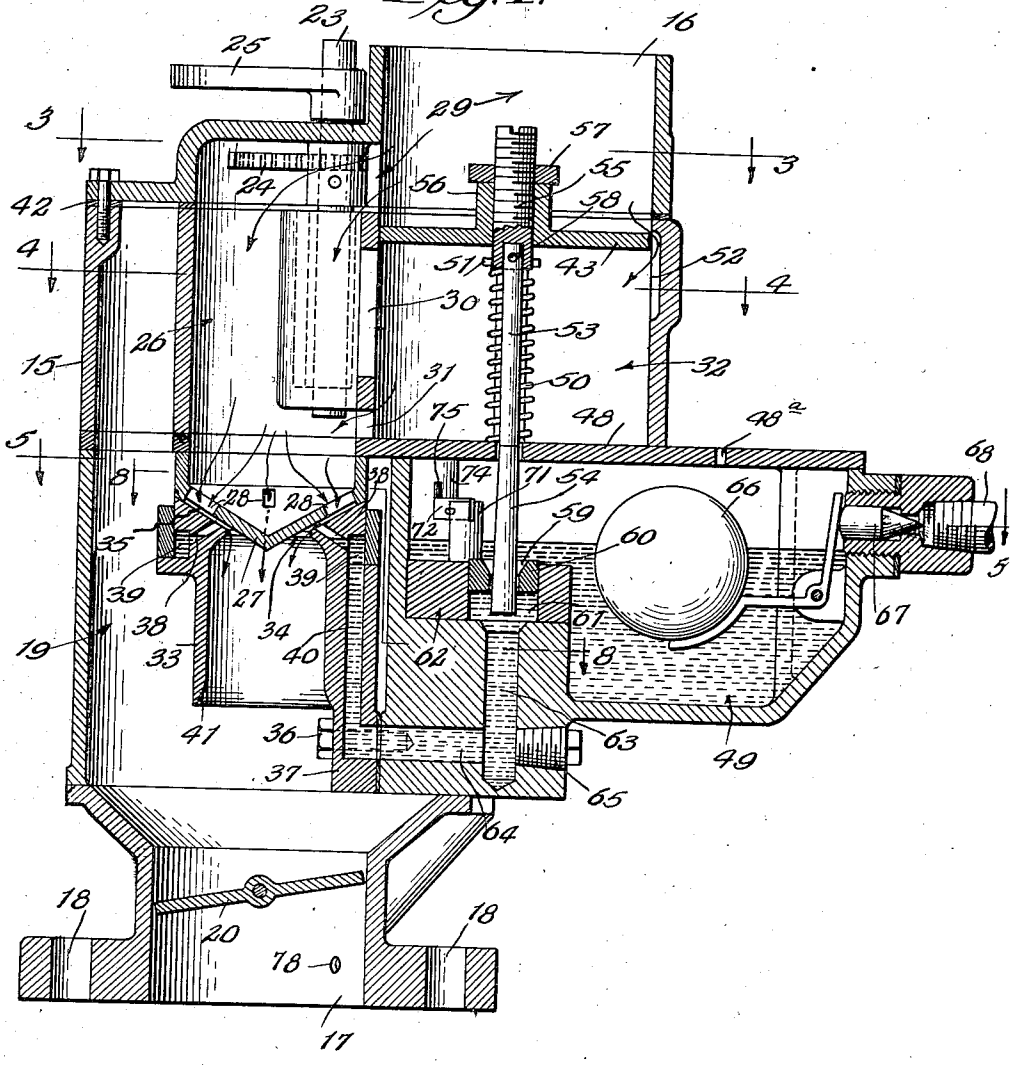
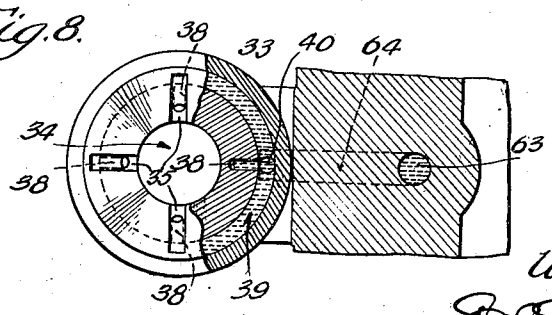


Fig. 8.



Inventor.
William C. Dunn.
By. Atty.

May 4, 1937. W. C. DUNN 2,079,436

CARBURETOR

Filed Nov. 30, 1934 4 Sheets-Sheet 2

Fig. 2.

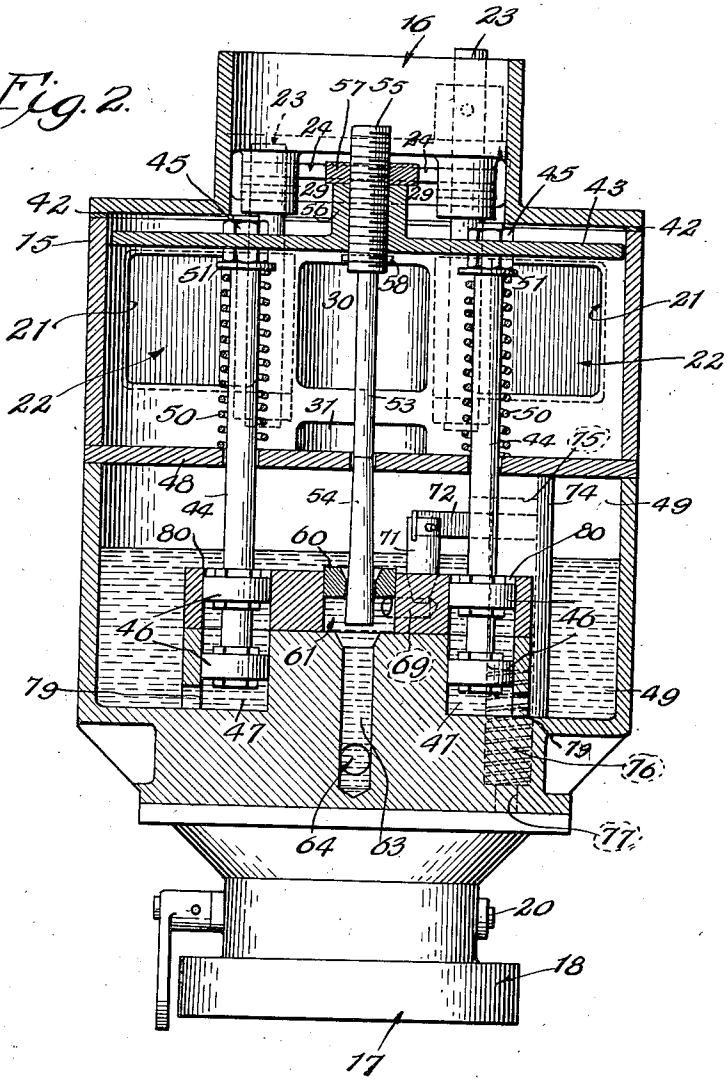
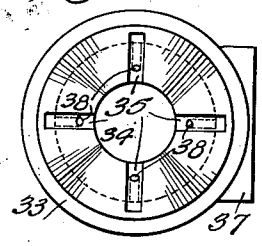


Fig. 9.



Inventor:
William C. Dunn.
By. Fitty.

May 4, 1937. W. C. DUNN 2,079,436

CARBURETOR

Filed Nov. 30, 1934 4 Sheets-Sheet 3

Fig. 3.

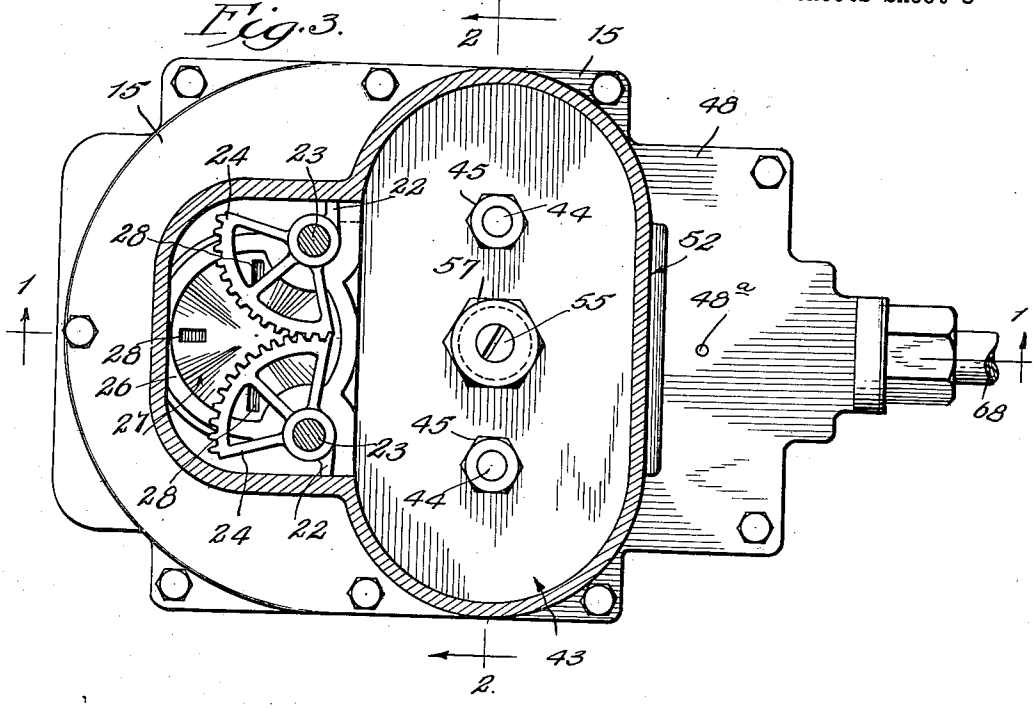
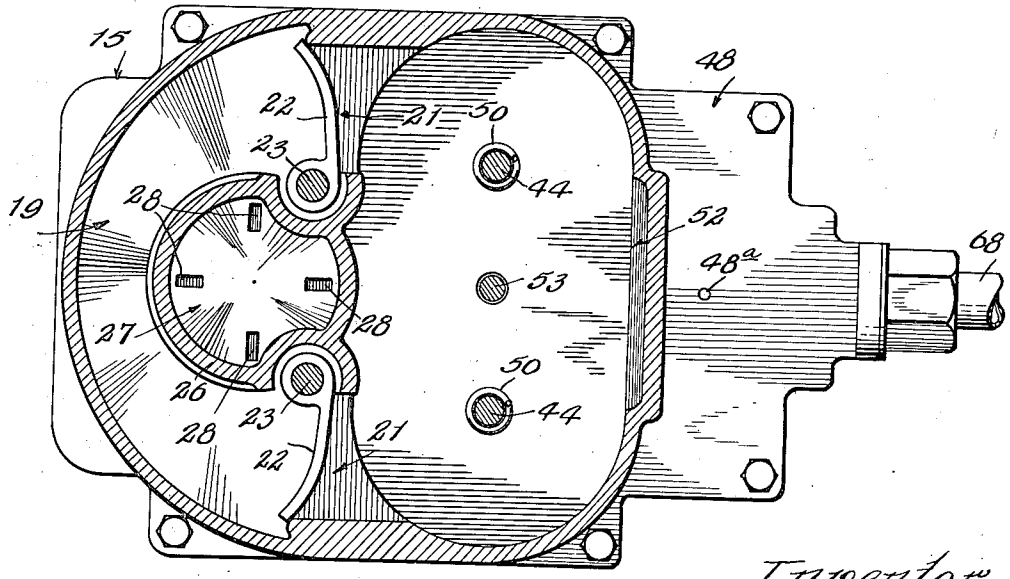


Fig. 4.



Inventor.
William C. Dunn.
By. Atty.

May 4, 1937. W. C. DUNN 2,079,436

CARBURETOR

Filed Nov. 30, 1934 4 Sheets-Sheet 4

Fig. 5.

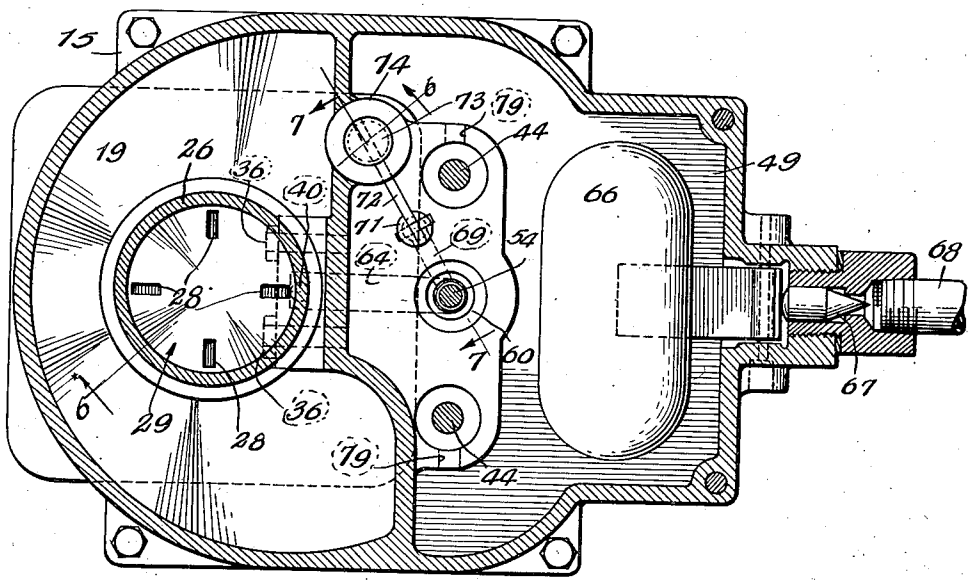


Fig. 6.

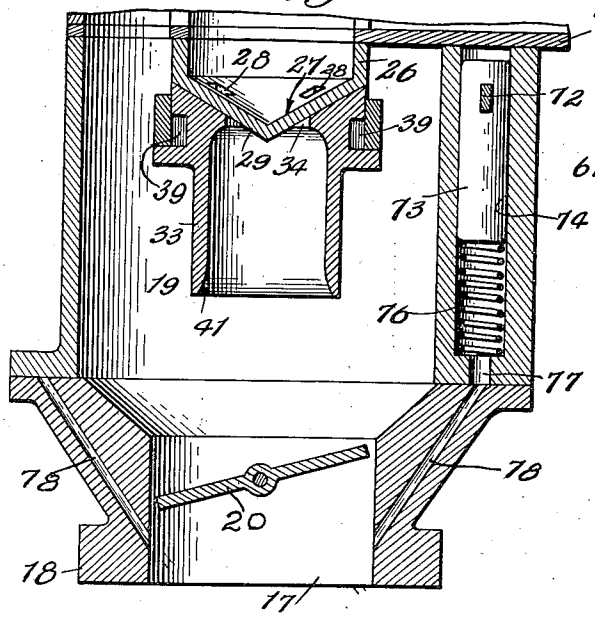
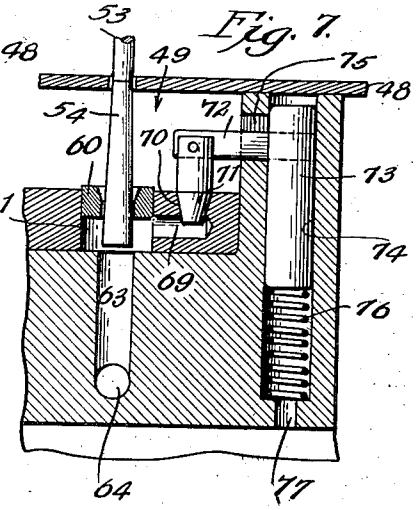


Fig. 7.



Inventor.
William C. Dunn.
By. Atty

Patented May 4, 1937 2,079,436

UNITED STATES PATENT OFFICE

2,079,436

CARBURETOR

William C. Dunn, Chicago, Ill.

Application November 30, 1934, Serial No. 755,346

17 Claims. (Cl. 261—69)

This invention relates to improvements in carburetors for internal combustion engines, and has for one of its objects to provide improved means for creating and maintaining the most desirable mixture proportion for the varying demands of the engine to which the device is connected.

A further object of the invention is to provide in a device of this character improved means whereby the air which flows across the fuel jets will be circulated in what might be termed a down draft, and whereby a high velocity of the air currents will be obtained across the jets when starting the motor under any condition, resulting in a complete vaporization of the fuel at the jet openings, the fuel being raised by aspiration and directed into the mixing chamber, at the same time the fuel will not drip down into the intake manifold.

A further object is to provide improved means for automatically delivering to the engine a uniform and lean mixture over the complete range of speed when the throttle valve is only partially open, and an improved means whereby the fuel mixture will be automatically and readily changed to meet conditions when the throttle valve is wide open or nearly so.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a vertical sectional view of a device of this character constructed in accordance with the principles of this invention, and as taken on line 1—1, Figure 3.

Figure 2 is a vertical sectional view as taken on line 2—2, Figure 3.

Figure 3 is a horizontal sectional view taken on line 3—3, Figure 1.

Figure 4 is a horizontal sectional view taken on line 4—4, Figure 1.

Figure 5 is an irregular, horizontal sectional view taken on line 5—5, Figure 1.

Figure 6 is a vertical sectional view, with parts omitted, as taken on line 6—6, Figure 5.

Figure 7 is a detail sectional view taken on line 7—7, Figure 5.

Figure 8 is an irregular, horizontal sectional view taken on line 8—8, Figure 1.

Figure 9 is a top plan view of the upper end of the throat tube.

Referring more particularly to the drawings, the numeral 15 designates a casing of any desired size and configuration, and is provided with an air inlet opening 16 and a discharge outlet 17. The casing is adapted to be supported above the intake manifold and may be secured in position in the usual manner by means of fastening devices passing through suitable openings 18 in the base of the casing.

Within the casing is arranged a mixing chamber 19 which has communication with the outlet 17 and a throttle valve 20 controls the outlet.

The mixing chamber also has communication with the inlet 16 by means of passages or openings 21, which latter are controlled by valves 22 of any suitable construction, preferably wing valves mounted upon upright pivots 23 journaled in suitable bearings.

Any suitable means may be provided to cause the valves 22 to be opened and closed simultaneously, but a simple and efficient means preferably embodies toothed segments 24 secured to the valves, the teeth of which mesh and the valves are preferably operated by operating mechanism connected to an arm 25 on one of the valves and which operating mechanism is also connected with the choke operating mechanism arranged in any convenient position for the operator. Usually the choke mechanism is provided with some form of spring return means and serves as a means for normally moving the valves in one direction, that is so that in the present instance the valves 22 will be normally open.

Arranged within the casing is an upright tubular passage 26 which is closed at its ends, and which is provided with a bottom wall of an inverted conical formation 27, the bottom being provided with outlet passages 28, any number of which may be provided.

The passage 26 has communication with the inlet opening 16 to the casing by means of a passage 29 and also has communication by means of openings or passages 30—31 with a valve chamber 32, for a purpose to be described.

Arranged beneath and in alinement with the passage 26, but out of communication therewith, except through the openings 28 in the bottom 27 thereof, is a throat tube 33 of any desired configuration and diameter and of any suitable length. The tube is provided with an opening 34 at the top thereof, the wall of the opening tapering from the periphery of the tube towards the diametric center of the opening to form a tapering or inclined surface of a substantial area about the opening. The apex of the conical bottom 27 of the passage 26 projects into the opening in the end of the throat tube and abuts the surface of the surrounding or top wall of the throat tube.

Within the top wall of the throat tube are arranged a plurality of channels 35 which have communication at one end with the opening in the throat tube, but these channels terminate short of the periphery of the tube so that they

will be closed at their outer end, the lower face of the bottom 27 of the passage 26 forming a closure for the tops of the channels. The openings 28 in the bottom 27 of the passage 26 have communication respectively with the channels 35 so that air currents discharged from the passage 26 through the openings 28, will flow into the throat tube 27 through the channels 35.

This throat tube may be supported in any suitable manner such as by means of fastening screws 36 passing through a portion 37 of the supporting structure.

Within the wall of the top of the throat tube are upwardly inclined passages 38, any number of which may be provided according to the number of channels 35, and the outlet ends of these passages 38, which are the upper ends thereof discharge into the respective channels 35 and are disposed out of direct alinement with the openings 28 in the bottom of the passage 26, so that when air currents are directed through the openings 26 into the channels 35, they will flow at high velocity across the outlet ends of the openings 38, and raise the fuel by aspiration into the channels 35 where it will be contacted by the air currents and will be atomized into the throat tube 33 through the opening 34.

The passages 38 have communication with a channel 39, and which channel has communication with a passage 40 through which fuel is supplied to the channel and thence to the fuel jets 38.

The external diameter of the throat tube 33 is considerably less than the chamber 19, and if desired the lower extremity of the throat tube may be flared on its inner surface as at 41, the lower extremity of the throat tube being disposed in alinement with the discharge outlet 17 of the casing and for a considerable distance above the throttle valve 20.

The casing 15 is preferably formed in sections with suitable packing 42 between the sections.

Within the valve chamber 32 is arranged a valve 43, which may be supported in any desired or suitable manner and is of any suitable configuration to conform to the contour of the chamber 32. This valve may be supported preferably by means of upright rods or members 44, one end of each of which is secured as at 45 to the valve and to the other end of which rods or uprights may be secured pistons 46 which operate respectively in dash pots 47, for a purpose to be set forth.

The rods 44 pass through and are guided by means of a top or closure member 48, for a fuel tank 49, and encompassing each of the rods is a coiled spring 50, one end of each of which rests upon the top or closure 48 and the other end of each of which bears against a washer or collar 51 encompassing the respective rods and abutting a nut or shoulder which forms a part of the fastening means for the rod with the valve 43. The tendency of the springs 50 is to raise the valve 43 so as to cut off communication between the passage 16 and the openings 30 and 31, which latter communicate with the passage 26. A bypass 52 is provided in the wall of the chamber 32 so as to establish communication between the inlet 16 and the chamber 32 when the valve 43 is shifted so as to permit such communication. When the valve is moved to the position shown in Figure 1, under the effects of suction, in a manner to be set forth, a portion of the air currents entering the inlet 16 will flow through the bypass 52 around the valve 43 and will be directed into the passage 26 through the opening 31 or through the opening 30. When the valve 43 is moved a sufficient distance to establish communication between the inlet 16 and the opening 30 air currents will also flow in that direction and into the passage 26.

Connected to the valve 43 and also moving through the top or closure 48 of the tank or reservoir 49, is the stem 53 of a metering valve 54. This stem is connected to an adjustable screw 55 which is threaded through a bearing 56 carried by the valve 43 by telescoping into one end of the screw, and is securely fastened thereto by a fastening pin 58, so that when the screw 55 is adjusted longitudinally by rotating the same the stem 53 and metering valve 54 will be correspondingly adjusted. The metering valve and the bearing 56 are preferably located intermediate the rods 44. A nut or collar 57 is threaded upon the screw 55 and serves as a means for maintaining the screw and metering valve in their adjusted positions.

The reservoir or tank 49 has communication with the fuel supply passage 40 through an opening 59 which is shaped to form a seat for the metering valve 50, which latter is preferably of a construction to taper from its free extremity upwardly. The valve seat or opening 59 may be provided in a member 60 that may be removably seated within an opening 61 in a member 62 and the opening 61 forms a chamber having a reduced outlet in the bottom thereof which communicates with a passage 63, the latter in turn communicating with a passage 64 that has communication with the passage 40. A clean out plug 65 may be provided for closing the passage 64, if desired.

Thus it will be seen that the fuel will flow from the tank 49 through the valve opening 59, passage 63, passage 64, passage 40 to the channel 39 and thence to the fuel jets.

Therefore, by adjusting the metering valve 54 with respect to its seat or opening 59, the amount of fuel flowing to the fuel jets 38 may be controlled. This control is effected automatically by suction of the engine, somewhat in the following manner.

Within the tank or reservoir 49 is a float 66 which controls a valve 67 and which valve in turn controls the supply through the inlet pipe 68.

The fuel jets 38 are so disposed that their outlet ends which communicate with the channels 35 are disposed above the normal fuel level so that when the air currents flowing with high velocity past the fuel jet outlets, the fuel will be raised or lifted by aspiration into contact with the air currents.

When the load on the engine increases, such for instance as heavy loads, it is desirable to increase the fuel supply to the jet outlets. During the ordinary running, the suction created by the engine is manifested upon the valve 43 through the throat tube 33, channels 35, outlet openings 28 from the passage 26, and through the openings 31—30 to the under side of the valve.

Therefore, the amount of fuel supplied to the jet outlets will be controlled by the metering valve 54.

On heavy loads or when the throttle is wide open or nearly so, a larger supply of fuel is necessary, and therefore means are provided to furnish the extra supply. This may be accomplished by means of an additional passage 69 (see particularly Figure 7) which has communi-

cation with the chamber 61 and has an inlet 70 forming a valve seat. This valve seat is preferably conical for the reception of a conical valve 71. The valve 71 is mounted for automatic opening and closing movements in any suitable manner, such as by means of an arm 72 secured to the valve. The other end of the arm is connected to a plunger 73 which moves in a chamber 74, the arm 72 passing through a slot or opening 75 through the wall of the chamber 74 to form a guide therefor. The upper end of the chamber 74 is closed preferably by the top or closure 48 of the tank or reservoir 49, and beneath the plunger 73 is arranged a coiled spring 76 which tends normally to raise the plunger 73 to unseat the valve 71, thereby allowing an additional supply of fuel to flow into the chamber 61.

The chamber 74 below the plunger 73 has communication by means of a passage 77 with a passage 78 in the wall of the casing and this passage 78 leads to the suction side of the throttle valve 20.

Under ordinary running conditions, sufficient suction will be manifested upon the plunger 73 to hold the valve 71 closed but, when the throttle 20 is wide open, not sufficient suction will be manifested upon the plunger 73 to overcome the stress of the spring 76, and therefore the spring 76 will exert its stress on the plunger 73 to unseat the valve 71 and maintain the passage 70 open.

It is thought that the operation will be clearly understood from the foregoing, but briefly stated it is as follows.

In starting the engine the valves 22 will be closed to operate as a choke. The suction from the engine will then be manifested through the throat tube 33, channels 35, openings 28, passage 26, openings 31—30 against the under side of the valve 43, and suction will also be manifested through the opening 29 to the inlet passage 16.

Until the valve 43 is unseated or the passage 52 or the opening 30, opened, the air currents will flow through the inlet 16 through the opening 29 into the passage 26, thence through the outlets 28, thence through the channels 35, across the fuel jet openings 38 and into the throat tube 33.

At the same time and when the suction is manifested upon the bottom of the valve 43, the valve will be opened, allowing air to flow through the by-pass 52 into the chamber 32 and thence through the opening 31 and openings 30 into the passage or chamber 26 to be discharged through the openings 28, into the channels 35 and across the fuel jet openings. This will give a rich mixture for starting.

When the engine is running and the choke valves 22 are opened, air currents will flow from the inlet 16, through the openings 21 controlled by the valves 22, around the outside of the passage 26 and around the outside of the choke tube 33. At the same time air will also be flowing from the inlet 16 through the passage 52 into the valve chamber 32, thence through the opening 31, through the outlets 28, through the channels 35, and into the throat tube 33.

The air currents will be commingled in the mixing chamber and will be controlled on their passage to the engine manifold by the throttle 20.

The movement of the valve 43 controls the meter valve 54 and therefore the supply of fuel to the fuel jet openings, and the supplemental valve 71 which is controlled by engine suction in one direction and by a spring in the other, will be automatic in operation.

With this improved construction it will be manifest that there will be provided what might be termed a down draft across the fuel jet openings and there will be a complete atomization of the fuel at the jet openings. At the same time the fuel will be raised by aspiration and all objection to the fuel gas dripping down into the intake manifold will be obviated. This will be accomplished by reason of the fact that the air currents entering the throat tube 33 will lift the gas as it vaporizes it.

The movement of the valve 43 under the effect of engine suction or by the springs 50 and consequently the metering valve 54, will be dampened in its action by means of the pistons 46 connected to the rods 44 operating in the dash pot construction. The cylinder or piston chambers of the dash pot are arranged within the fuel tank 49 and are provided with openings 79 in the wall thereof, through which the fuel flows back and forth by the rising and falling movement of the pistons. Where superposed pistons 46 are employed, the upper end 80 of the dash pot construction may be open, so as to permit the entrance and discharge of the liquid fuel during the operation of the upper piston.

Obviously, by adjusting the screw 55 the amount of fuel permitted to pass the metering valve 54 on the operation of the valve 43 may be controlled or varied.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper portion of which tube the jet openings are disposed, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air currents around and outside of said throat tube to commingle with the atomized fuel discharging from and through said tube, means for controlling at will the last said means, and means for controlling the supply of fuel to said nozzle.

2. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper end of which tube the jet openings are disposed, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air currents around and outside of said throat tube to commingle with the atomized fuel discharging from and through said tube, means for controlling at will the last said means, and means controlled by engine suction for controlling the supply of fuel to said nozzle.

3. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper end of which tube the jet openings are disposed, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air currents around and outside of said throat tube to commingle with the atomized

fuel discharging from and through said tube, means for controlling at will the last said means, a metering valve for metering the supply of fuel to said nozzle, and means whereby said metering valve will be controlled in its operation by engine suction.

4. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper end of which tube the jet openings are located, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air curents around and outside of said throat tube to commingle with the atomized fuel discharging from and through said tube, means for controlling at will the last said means, means for automatically controlling the supply of fuel to said nozzle, and means with which a portion of the last recited means co-operates for varying the supply of down draft air currents across the fuel jet openings.

5. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper end of which tube the jet openings are located, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air currents around and outside of said throat tube to commingle with the atomized fuel discharging from and through said tube, means for controlling at will the last said means, means for controlling the supply of fuel to said nozzle, and means for augmenting the supply of fuel to said fuel jet openings.

6. In a carburetor, a fuel nozzle provided with upwardly discharging fuel jet openings, an open throat tube depending below the jet openings and in the upper end of which tube the jet openings are located, means for directing a down draft of air currents across said jet openings for atomizing the fuel into the throat tube, means for directing air currents around and outside of said throat tube to commingle with the atomized fuel discharging from and through said tube, means for controlling at will the last said means, means for controlling the supply of fuel to said nozzle, and means influenced by engine suction for augmenting the supply of fuel to said fuel jet openings.

7. In a carburetor, a mixing chamber, an open ended upright throat tube in said chamber, there being upwardly discharging fuel jet openings leading through a portion of the wall of the top of said tube, a downwardly discharging air passage having a downwardly tapering bottom projecting into the open upper end of said tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent surface of the tube to form passages into which fuel is atomized from the jet openings, there being openings in the said bottom of the passage out of direct alinement with the fuel jet outlet openings and discharging into the said channels, means controllable at will for causing air currents to be directed into the mixing chamber and around said downwardly discharging air passage and the said throat tube, and means for automatically controlling the supply of fuel to said fuel jet openings.

8. In a carburetor, a mixing chamber, an open ended upright throat tube in said chamber, there being upwardly discharging fuel jet openings leading through a portion of the wall of the top of said tube, a downwardly discharging air passage having a downwardly tapering bottom projecting into the open upper end of said tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent surface of the tube to form passages into which fuel is atomized from the jet openings, there being openings in the said bottom of the passage out of direct alinement with the fuel jet outlet openings and discharging into the said channels, means controllable at will for causing air currents to be directed into the mixing chamber and around said downwardly discharging air passage and the said throat tube, and means controlled by engine suction for automatically controlling the supply of fuel to said fuel jet openings.

9. In a carburetor, a mixing chamber, an open ended upright throat tube in said chamber, there being upwardly discharging fuel jet openings leading through a portion of the wall of the top of said tube, a downwardly discharging air passage having a downwardly tapering bottom projecting into the open upper end of said tube, there being downwardly inclined channels between the bottom of said passage and the adjacent surface of the tube to form passages into which fuel is atomized from the jet openings, there being openings in the said bottom of the passage out of direct alinement with the fuel jet outlet openings and discharging into the said channels, means controllable at will for causing air currents to be directed into the mixing chamber and around said downwardly discharging air passage and the said throat tube, and means for automatically controlling the supply of fuel to said fuel jet openings, a portion of the last recited means also functioning to cause the flow of air currents through the said downwardly discharging passage to be varied.

10. In a carburetor, a mixing chamber, an open ended upright throat tube in said chamber, there being upwardly discharging fuel jet openings leading through a portion of the wall of the top of said tube, a downwardly discharging air passage having a downwardly tapering bottom projecting into the open upper end of said tube, there being downwardly inclined channels between the bottom of said passage and the adjacent surface of the tube to form passages into which fuel is atomized from the jet openings, there being openings in the said bottom of the passage out of direct alinement with the fuel jet outlet openings and discharging into the said channels, means controllable at will for causing air currents to be directed into the mixing chamber and around said downwardly discharging air passage and the said throat tube, means for automatically controlling the supply of fuel to said fuel jet openings, and means controlled in its action by engine suction for augmenting the supply of fuel to said fuel jet openings.

11. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within the chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent surface of the tube to form fuel passages communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the last said channels, there being upwardly

opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said channels, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, and means for controlling at will the air currents around said air passage.

12. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within one chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent surface of the tube to form fuel passages therebetween communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the said channels, there being upwardly opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said channels, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, means for controlling at will the air currents around said air passage, and means for augmenting the supply of air to said air passage.

13. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within the chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of the said air passage and the adjacent wall of the tube to form fuel passages communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the said channels, there being upwardly opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said air passage, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, means for controlling at will the air currents around said air passage, and means controlled by engine suction for augmenting the supply of air to said air passage.

14. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within the chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent wall of the tube to form fuel passages communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the said channels, there being upwardly opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said air passage, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, means for controlling at will the air currents around said air passage, and means for automatically controlling the supply of fuel to said fuel jets.

15. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within the chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent face of said tube to form fuel passages communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the said channels, there being upwardly opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said air passage, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, means for controlling at will the air currents around said air passage, means for augmenting the supply of air to said air passage, and means co-operating with the last recited means for metering fuel to said fuel jets.

16. In a carburetor, a mixing chamber provided with a discharge outlet, an upright open ended throat tube within the chamber, a downwardly discharging air passage having a downwardly tapering bottom, said bottom projecting into the upper open end of said throat tube, there being downwardly inclined channels between the bottom of said air passage and the adjacent wall of the tube to form fuel passages communicating with the interior of the throat tube, there being openings in the said bottom of the air passage communicating with the said channels, there being upwardly opening fuel jet openings discharging into the said channels, the fuel openings being out of direct alinement with the openings in the bottom of said air passage, means whereby air will be supplied to said air passage, means for directing air around said air passage and also around said throat tube and into the mixing chamber, means for controlling at will the air currents around said air passage, means for augmenting the supply of air to said air passage, means co-operating with the last recited means for metering fuel to said fuel jets, and additional means controlled by engine suction for augmenting the supply of fuel to said fuel jets.

17. In a carburetor, a mixing chamber, a fuel nozzle, means for atomizing fuel from the nozzle into the mixing chamber, means embodying a metering valve for supplying fuel to the nozzle, means for automatically actuating the metering valve, means for dampening the action of the metering valve, means for augmenting the supply of fuel to the nozzle, the last recited means embodying a fuel supply passage, a valve for controlling the last said passage, a plunger, a connection between said plunger and said valve, means for moving said plunger in one direction, and means whereby the plunger will be moved in the opposite direction and against the stress of the last said means by engine suction, whereby the said valve will be automatically opened and closed.

WILLIAM C. DUNN.