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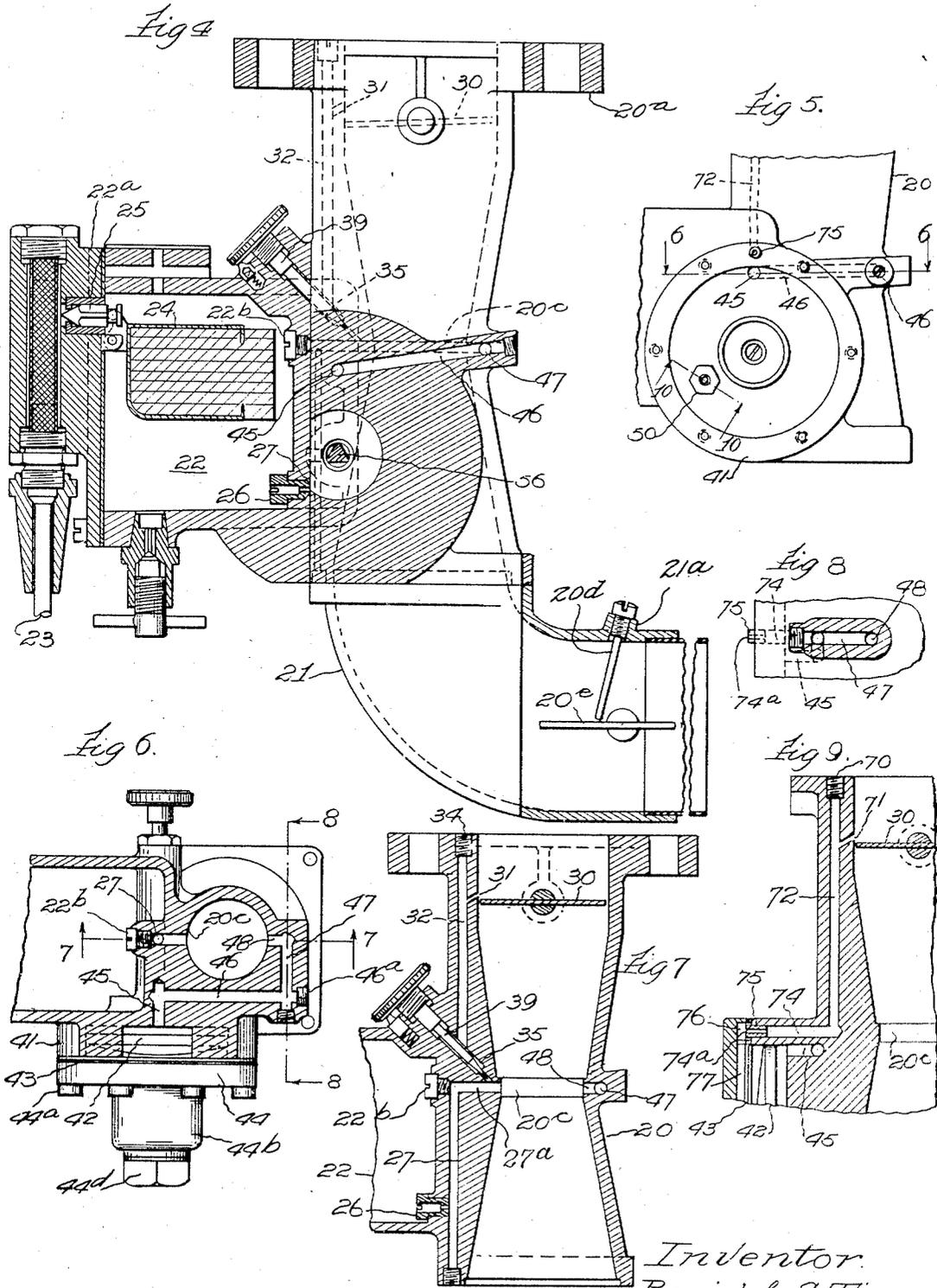
P. S. TICE

1,796,734

CARBURETOR

Filed March 20, 1925

2 Sheets-Sheet 1



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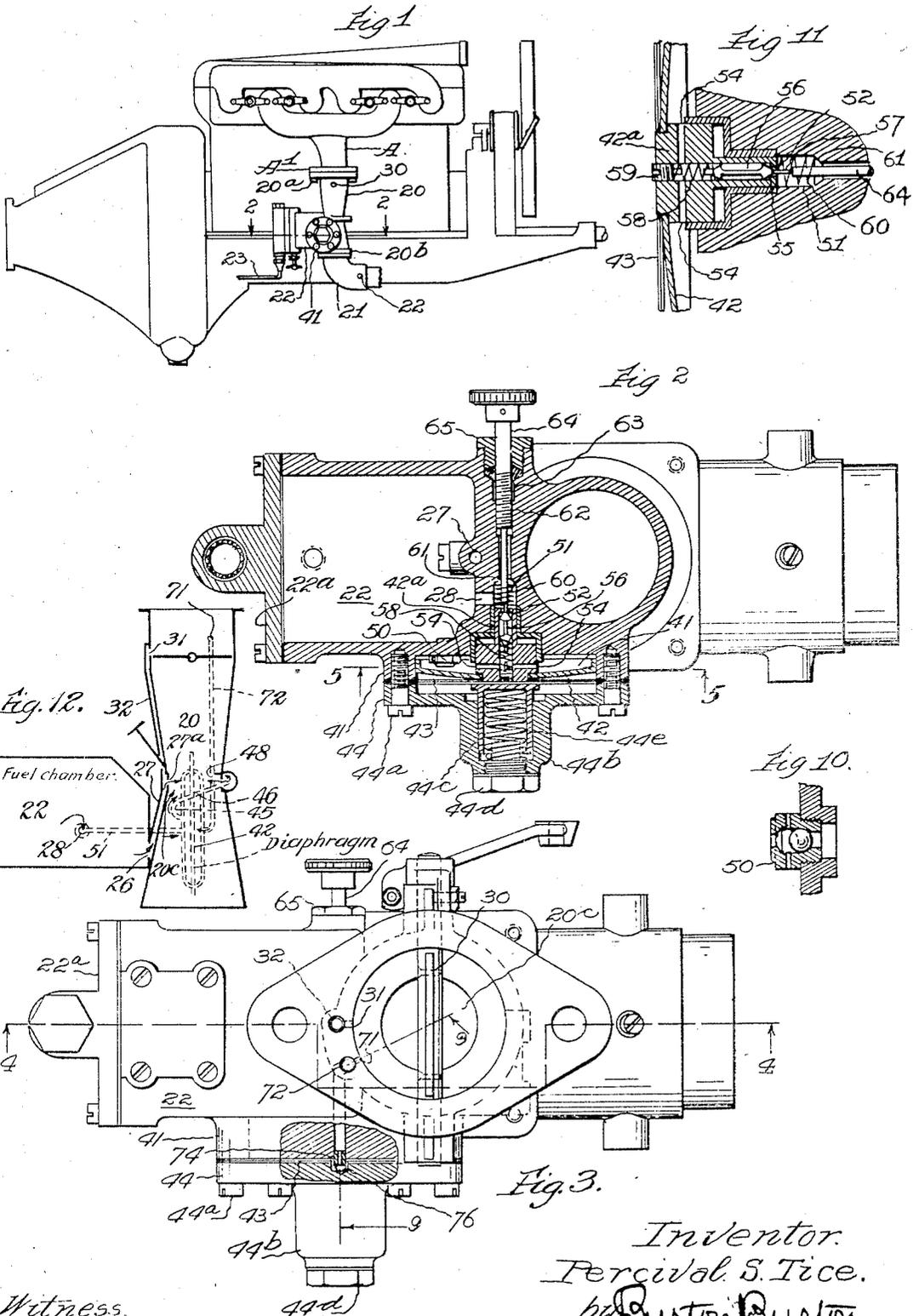
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CARBURETOR

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed March 20, 1925. Serial No. 16,897.

The purpose of this invention is to provide an improved construction in carburetor for internal combustion engine, particularly adapted for furnishing and governing the 5 furnishing of fuel mixture in quantity and varied proportions suitable for maximum economy of fuel under ordinary running conditions and maximum power develop- 10 ment under conditions calling for such maximum power and for quick acceleration upon sudden increase of throttle opening as upon starting from position of idling or other occasion for abrupt increase of speed. It consists in the elements and features of con- 15 struction shown and described as indicated in the claims.

In the drawings:

Figure 1 is a side elevation of an engine equipped with a carburetor embodying this 20 invention.

Figure 2 is a horizontal section on an enlarged scale at the line 2—2 on Figure 1.

Figure 3 is an upper end plan view of the carburetor detached from the engine.

25 Figure 4 is a section at the line 4—4 on Figure 3.

Figure 5 is a detail elevation looking in the direction of the arrow, 5 on Figure 2 with the cap or closure plate of the accelerating chambering and the movable wall of said chamber removed.

Figure 6 is a section at the line 6—6 on Figure 5.

30 Figure 7 is a section at the line 7—7 on Figure 6.

Figure 8 is a detail section at the line 8—8 on Figure 6.

Figure 9 is a section at the line 9—9 on Figure 3.

40 Figure 10 is a detail section at the line 10—10 on Figure 5.

Figure 11 is a portion of Figure 2 on an enlarged scale.

45 Figure 12 is a diagrammatic view showing the course of passages for primary and auxiliary fuel flow to the air and fuel mixture conduit and the course of a pressure communicating passage from beyond the throttle valve to the movable wall of the 50 variable capacity chamber in the auxiliary

conduit for governing the fuel flow through the latter.

To facilitate the understanding of the construction to be hereinafter described in detail, it may be noted from Figure 12 that 51 the structure embodies the combination with a fuel chamber indicated at 22, and a fuel mixture conduit indicated at 20, of familiar form as comprising a Venturi passage at which the fuel is discharged for intermix- 60 ture with the air current by way of two fuel conduits leading from the fuel chamber for said discharge at the Venturi constriction of the fuel mixture conduit, one of which affords the primary and ordinary fuel supply 65 for running the engine, the other being designed for exceptional or auxiliary supply of fuel, for acceleration when the throttle valve is opened after having been closed during a period of idling of the engine, the 70 discharge of fuel through said second conduit being effected by the admission of engine pressure from beyond the throttle to a diaphragm which forms a movable wall 75 of a variable capacity chamber which is interposed in said second conduit and becomes a part thereof, and is normally occupied with fuel, so that the access of engine pressure to the diaphragm at the side opposite the variable capacity chamber operating to 80 reduce the capacity of the chamber, expels the liquid content of the chamber for its discharge at the Venturi constriction of the fuel mixture conduit, and thus furnishes an increase in fuel supply instantly upon the 85 opening of the throttle.

The parts and passages are indicated in the diagrammatic view Figure 12 by the reference numerals which are applied to the same in the detail structural figures and in the hereinafter contained specific description, the primary fuel supply passage being indicated at 27, discharging at 27^a in the venturi indicated at 20^c, the auxiliary pas- 90 sage being indicated at 45 leading from the port, 28, in the fuel chamber by a passage indicated at 54, to the variable capacity chamber indicated as to its movable wall at 42; said secondary passage continuing from 95 said variable capacity chamber at 45 by way 100

of the duct indicated at 46, leading to its discharge, at 48, at the Venturi constriction of the fuel mixture conduit. The conduit by which engine pressure from beyond the throttle reaches the movable wall, 42, of the variable capacity chamber is indicated at 72, leading from a port of communication with the intake manifold beyond the throttle seen at 71. This diagrammatic view also shows a passage, 32, leading from connection with the passage, 27, for communication by a port, 31, with the intake manifold connection beyond the throttle, and serving for direct fuel supply from the fuel chamber to the intake manifold without passing through the fuel mixture conduit when the throttle valve is closed for idling of the engine.

The construction in detail will be described by reference to the detail figures as follows:

The engine to which a carburetor embodying this invention is shown attached in Figure 1 as seen in that figure having the intake manifold, A, to which the carburetor is attached, at the downwardly facing flange, A¹. The carburetor comprises the fuel mixture pipe, 20, flanged at the upper end as shown at 20^a, for attachment to the flange, A¹, of the intake manifold and flanged at the lower end as seen at 20^b for attachment thereto of air intake member which is shown in the form of an elbow, 21, in which there is mounted a choke valve, 20^c, checked at wide-open position by check pin, 20^d, inserted through a boss, 21^a, on the elbow, 21. Integral with the fuel mixture pipe, 20, there is formed the level governing chamber, 22, to which the liquid fuel supply pipe, 23, is connected for discharge therein at the upper part where said fuel discharge is controlled by valve, 25, connected for operation by the float, 24, in the chamber, 22, in the familiar manner. The main fuel duct from the level governing chamber, 22, leads from the lower part of that chamber by way of the metering plug, 26, and extends in the wall of the fuel mixture pipe, 20, as seen at 27 and 28, for discharge into the said fuel mixture pipe substantially at the Venturi constriction thereof, 20^e. A posterior throttle, 30, is mounted in the customary manner near the end of the fuel mixture pipe, 20. From a point just beyond the closed position of said posterior throttle, 30, a port, 31, is made leading to a pressure duct, 32, which also serves as hereinafter explained for idling fuel supply. This duct, 32, is formed in the wall of the fuel mixture pipe substantially parallel to the axis thereof being bored from the upper end where the entrance is closed by a plug, 34, to a point a little above the plane of the Venturi constriction, 20^e, where it is intersected by a duct, 35, drilled in obliquely

for intersecting also the terminal portion, 27^a, of the main fuel supply duct, the terminal portion of said oblique drill being reduced in diameter forming a valve seat for seating a needle valve, 39, whose operating handle is exposed in the angle between the fuel mixture pipe and the level governing chamber, 22, as seen in Figures 4 and 7.

The construction thus far described is designed to operate for furnishing fuel supply in the usual manner for the ordinary running of the engine and by way of the port, 31, and duct, 32, for idling when the posterior throttle valve is at idling position.

For the special purposes to which this invention is directed there is provided what may be referred to as an auxiliary fuel supply passage. This passage leads from the lower part of the level governing chamber, 22, by way of a metering plug, 50, seen in detail in Figure 10 leading into a chamber which will be referred to as the accelerating chamber which is formed in a boss, 41, projecting laterally with respect to the fuel mixture pipe and outwardly with respect to the engine as the carburetor is shown mounted on the intake in Figure 1. This accelerating chamber has the outer or forward side closed by a movable wall member, 42, supplemented and operated for movement by a flexible diaphragm, 43, said diaphragm being bound between the outer end of the boss, 41, and the cap member, 44, secured by screws, 44^a. The remainder of the auxiliary fuel supply passage comprises the duct, 45, 46, 47, 48, seen most clearly in Figure 6, the initial portion, 45, being drilled leading directly from the accelerating chamber and intersected by the portion, 46, drilled in from the right hand side and closed by the plug, 46^a, said portion, 46, being intersected by the portion, 47, driven in from the forward side and meeting the terminal or discharge portion, 48. This terminal portion is formed by drilling from the opposite side of the venturi in alignment with the discharge portion, 27^a, of the main fuel duct, 27, said portion, 27^a, being driven in from the left hand side of the level-governing chamber, 22, before applying the closure wall or cap, 22^a, intersecting the main portion of said duct, 27, and being closed back of that intersection by the plug, 22^b.

The cap, 44, which binds the diaphragm, 43, for completing the closure of the accelerating chamber and operating and in a sense forming part of the moving wall of said chamber has a central boss, 44^b, which accommodates a plunger, 44^c, fitted upon the outer side of the diaphragm, 43, and axially chambered to accommodate the spring, 44^e, which reacts against a screw plug, 44^d, which closes the axial bore of the boss, 44^b, whereby the spring operates for

holding the plunger thrust against the diaphragm to hold it against the piston moving wall, 42, the purpose of this construction being hereinafter explained. For admitting an auxiliary fuel supply for prompt acceleration upon opening the throttle after a period of idling a supplemental fuel passage is provided leading from the lower part of the level-governing chamber by way of a port, 28, said supplemental passage comprising passages, 51, 52, and 54—54. The passage 51, is part of a bore extending entirely through the unitary casting comprising the fuel mixture pipe and the level governing chamber, and serving other purposes hereinafter explained; the passage, 52, is formed in a piston-fitted central stem, 42^a, of the movable piston fitted wall, 42, of the accelerating chamber, said passage, 52, being connected for final discharge in the accelerating chamber, 41, by the cross ports, 54, 54, emerging from said central stem just inside the said movable wall. In the portion, 51, of this supplemental duct there is accommodated a spring, 60, reacting between a shoulder, 61, in the bore mentioned and the inner end of the stem, 42^a, of the movable wall, 42, for the purpose and with the effect of causing said movable wall and the diaphragm to be normally held at a predetermined position in the accelerating chamber in opposition to the reaction of the spring, 44^a. The portion, 52, of the supplemental duct is formed by drilling in from the outer side of the movable wall, 42, of the accelerating chamber axially with respect to the stem of that wall and counterboring from the same side to form a valve seat, 55, the counterbore being diametered to admit a valve, 56, having a slender terminal, 57, which extends through the original bore protruding into the portion, 51, of the supplemental duct when the valve is seated. This valve is triangular in cross section for the greater portion of its length forming fluid ways past it through the counterbore and leading to the cross bores, 54, and in the counterbore outwardly from said cross bores there is provided a screw plug, 59, closing the counterbore and stopping a spring, 58, which reacts for holding the valve, 56, normally seated, said spring reacting between the outer end of said valve and the screw plug, 59. The bore of which the portion, 52, of the supplemental duct forms a part is formed by drilling in from the side opposite the accelerating chamber, and is counterbored and threaded as seen at 62 and 63 for receiving a screwed in stop member, 64, and a stuffing box, 65, for preventing any leakage past said stop member. This stop member extends through the coiled spring, 60, and is designed to be adjusted by screwing it in or out to vary the

point at which it may stop the valve, 56, for certain purposes hereinafter further explained.

In addition to the duct, 32, leading for idling supply as described from beyond the throttle, 30, there is provided a similarly situated duct, 72, leading from a port, 71, bored from inside of the fuel mixture conduit at a point a few degrees around from the port, 31, at substantially the same position in respect to the seated position of the throttle valve at said port, 31.

Said duct, 72, is shown in Figure 9 bored from the upper end of the fuel mixture pipe (the bore entrance being closed by a plug, 70) extending parallel with the axis of the fuel mixture conduit for intersecting the bore, 74, which is drilled into the end of the boss, 41, through the marginal seat on which the diaphragm, 43, is clamped, to meet the bore, 72. The passage afforded by this duct is continued in a plug, 75, screwed into the bore, 74, the continuation, 74^a, being of reduced diameter. Said plug, 75, protrudes through the clamped margin of the diaphragm, 43, and terminates in a recess, 76, bored in the marginal area of the cap, 44, which seats on the diaphragm for clamping the latter; and the duct is continued by a short radial bore, 77, leading inward from the end of the bore, 76, and opening into the cavity of the cap at the outer side of the diaphragm, 43.

By the passage comprising the parts, 71, 72, 74, 74^a, and 76, a complete communication is afforded from the engine intake beyond the throttle valve, 30, through which the pressure existing in the intake passage at that point and varying according to the operation of the engine and the degree to which the throttle valve is closed, is communicated to the outer side of the movable wall of the accelerating chamber, 41. The pressure thus communicated operates for forcing said movable wall, 42, inwardly more or less, reducing the capacity of the accelerating chamber, 41, more or less, according to the variation of said pressure.

Upon considering the construction as including the accelerating chamber and the access for pressure to its moving wall, and the provision of the spring, 44^a, operating normally for forcing the moving wall inward to reduce the capacity of the chamber, it will be understood that when the throttle valve, 30, is closed and the engine is idling causing the reduction of pressure in the engine intake passage beyond the throttle and thereby producing suction operating through the passage, 71—75, the moving wall of the accelerating chamber will be retracted outwardly against the resistance of the spring, 44^a, thereby increasing the capacity of the said chamber and this will be the normal condition during idling of the engine.

Upon opening the throttle and connecting the engine for load, the increase of pressure in the intake beyond the throttle causing diminution of suction through the passage, 71—76, causes a sudden movement of the movable wall, 42, inwardly for reducing the capacity of the accelerating chamber; and this chamber being full of liquid derived through the metering plug, 50, from the level governing chamber and this passage being restricted, and the liquid communication from the accelerating chamber onward to the point of discharge in the fuel mixture conduit at the Venturi constriction being free, this movement of the wall, 42, operates to discharge the fuel from the accelerating chamber in a jet at the discharge port, 48, enriching the fuel mixture suddenly and causing quick acceleration of the engine speed, and thereby quick starting of the vehicle; and like quick acceleration results upon abruptly increasing the opening of the throttle at any stage.

The parts and passages are dimensioned and the spring, 44^e, is normally tensioned for holding the movable wall of the accelerating chamber thrust inwardly to a point at which it will hold the valve seat, 55, withdrawn from the valve, 56, which is stopped from following up the withdrawing seat by the adjustment of the stop member, 62, as hereinafter explained; and the passages are dimensioned for causing the fuel mixture with this adjustment of the parts to be most economical, that is to yield the maximum horse power hours and the maximum vehicle mileage per gallon of fuel. When, however, it is desired to develop the maximum power of the engine regardless of economy, which in fact requires a richer mixture than that which is most economical, it is necessary in some manner to increase the richness of the mixture. This result is obtained by the structure described by reason of the fact that upon increase of pressure—reduction of suction—on the outer side of the diaphragm, 43, and movable wall, 42, the wall tends to move inwardly and retract the seat, 55, from the valve, 56,—which is stopped from following the seat by the stop member, 62,—thereby opening the supplemental auxiliary passage and admitting an increased supply of fuel.

It will be seen therefore that in the construction described the chamber called the accelerating chamber having a wall which is movable for expanding and reducing the capacity of the chamber serves, by means of this movable wall, two quite distinct, but not inconsistent, functions; first, by quick contraction of the chamber to expel fuel for accelerating the engine action; and second, by the movement for contracting or expanding the chamber, and regardless of the change of capacity of the chamber, to increase or diminish the flow capacity of one

of the passages through which the fuel is delivered to the fuel mixture pipe. And it will be observed that the stage in the operation of the engine at which this last mentioned function for exceptionally enriching the fuel mixture is performed, will be determined by the adjustment of the stop, 62, determining at what stage in the chamber-reducing movement of the movable wall, 42, the valve, 56, will be stopped from following the withdrawing movement of the seat, 55, while the seat continues to withdraw, opening the port for allowing more fuel to pass.

I claim:—

1. In a carburetor and the like, in combination with an air and fuel mixture conduit adapted to be connected for discharge at the engine intake and having a flow-accelerating constriction; a level-governing chamber constituting an immediate source of liquid fuel; two conduits leading from said fuel chamber for discharge in the fuel mixture conduit proximate to said constriction, the first of said conduits having a fixed flow-restricting obstruction intermediate the fuel chamber and the discharge, and having relatively free fuel flow capacity between said obstruction and said discharge, the second conduit comprising a valve device consisting of a port and a valve thereat for controlling the flow capacity of said second conduit; means for operating the valve device consisting of a movable partition wall of a chamber, the portion of said chamber at one side of said partition wall being comprised in the course of said second conduit, and a fluid pressure duct connecting said chamber at the other side of said partition wall with a region of variable pressure in the path of flow of the fuel mixture to the engine beyond the flow accelerating constriction.

2. In the construction defined in claim 1 foregoing, the second mentioned conduit having no communication intermediate its connection with the fuel chamber and its discharge in the fuel mixture conduit with the pressure duct or with the portion of said partitioned chamber with which said pressure duct communicates.

3. In a carburetor and the like in combination with an air and fuel mixture conduit to be connected for discharge at the engine intake and having a flow accelerating constriction for promoting aspiration and mixture of the air and fuel; a level-governing chamber constituting an immediate source of liquid fuel, two conduits leading from said fuel chamber for discharge in the fuel mixture conduit proximate to the transverse plane of said constriction, the first of said conduits having a fixed flow-restricting obstruction at a point in its course intermediate the fuel chamber and its discharge in the fuel mixture con-

duit, a chamber having a movable partition wall whereby its partitioned portions are rendered expansible and reducible in capacity, the portion of said chamber at one side of said partition wall being comprised in the second of said two conduits; a fluid pressure duct connecting the other side of said partitioned chamber with a region of variable pressure in the path of flow of the fuel mixture to the engine beyond said flow-accelerating constriction, and a valve device consisting of a port and valve thereat for controlling the flow capacity of said second conduit, the movable element of said valve device being connected for operation by said movable partition wall.

4. In a fuel mixture forming and delivering device for internal combustion engines, in combination with a fuel source and a conduit in which an air and fuel mixture is formed leading for discharge at the engine intake, a throttle valve in said conduit subsequent to the point therein at which the fuel mixture is formed controlling flow toward the engine through said conduit, a fuel passage from the fuel source leading for discharge in the air and fuel mixture conduit; a valve which controls flow through said fuel passage; an expansible and contractible chamber having a movable wall by reason of which the chamber is contractible and expansible; pressure connection to said chamber from a point in the engine intake passage beyond the throttle valve; operative connections from said movable wall for controlling the opening and closing of said fuel passage controlling valve, and means adjustable at will for determining the stage of movement of the movable wall at which it begins to cause the opening of the valve.

5. In a fuel mixture forming and supplying device for internal combustion engines, in combination with a fuel source, an air and fuel mixture conduit leading for discharge of fuel mixture at the engine intake; a throttle valve controlling the freedom of inflow through said conduit to the engine intake, a fuel passage from the fuel source leading for discharge in the air and fuel mixture conduit; a chamber having a movable wall by means of whose movement it is expansible and contractible, said chamber being located and connected for forming a part of said fuel passage intermediate the fuel source and the discharge of said passage in the fuel mixture conduit, means located in the fuel passage at a point anterior to the connection of said expansible and contractible chamber therewith for retarding the fuel flow through said fuel passage anterior to said chamber; a pressure conduit leading from a point in the engine intake beyond the throttle valve, and means by which pressure communicated through said pressure conduit is operative

upon the movable wall of the expansible and contractible chamber for causing the contraction of said chamber upon increase of said pressure and its expansion upon decrease of said pressure, the movable wall of the expansible and contractible chamber containing part of the fuel passage, a valve for controlling said fuel passage and the movable wall having a port and seat thereat for said valve, the valve being carried by said movable wall member, and having a terminal projecting through and protruding from the port of its said seat, and an adjustable stop member for stopping the valve by encounter with the protruding terminal thereof in the movement of the movable wall; whereby the opening of the valve is caused by its movement being arrested while the movement of its seat continues, and the amount of movement of the movable wall which may occur before causing the valve to be opened is determined by the adjustment of said stop.

6. In a carburetor in combination with an air and fuel mixture conduit adapted to be connected for discharge at the engine intake and having a flow accelerating constriction, a fuel chamber constituting an immediate source of liquid fuel, a conduit leading from the fuel chamber and discharging in the fuel mixture conduit for forming the fuel mixture for operating the engine; a second conduit leading from the fuel chamber and terminating for discharge in the fuel mixture conduit, said second conduit having in its course a variable capacity chamber with a movable wall member by whose movement the change in the capacity of the chamber is effected, a portion of said second conduit being formed in said movable wall member; a valve device comprising a valve and having port at which the valve seats for controlling the flow through said second conduit, said device comprised in a portion of said second conduit which is formed in the movable wall member, the valve being seated at the side of the port at which the liquid emerges, and a stop positioned for encounter of the valve in the chamber-capacity-reducing movement of the movable wall of the variable capacity chamber.

7. In the construction defined in claim 6, the stop being adjustable in the direction of movement of the movable chamber wall for limiting the approach of the valve to its seat variably according to the variation in the wall movement.

8. A fuel supplying apparatus for internal combustion engines comprising in combination with a main conduit leading for discharge of fuel mixture to the engine intake, a fuel chamber constituting the immediate source of fuel for the fuel mixture; a primary fuel flow conduit leading from said chamber and discharging in said main

conduit; a throttle valve in the main conduit subsequent to the discharge of the primary fuel flow conduit therein, a secondary chamber connected for deriving fuel from the fuel chamber and also connected for discharging fuel in said main conduit antecedent to the throttle valve, said secondary chamber having a wall member movable for enlarging and reducing the chamber for indrawing and discharge of fuel to and from said secondary fuel chamber comprising spring means for giving the movable wall chamber-reducing movement, and a duct communicating sub-atmospheric pressure derived from the main conduit beyond the closed throttle in opposition to said spring means for giving said moving wall the fuel-indrawing movement.

9. A fuel supplying apparatus for internal combustion engines comprising in combination with a main conduit leading for discharge of fuel mixture to the engine intake, a fuel chamber constituting the immediate source of fuel for the fuel mixture; a primary fuel flow conduit leading from said chamber and discharging in the main conduit; a throttle valve in the main conduit subsequent to the discharge of the primary fuel flow conduit therein, a secondary chamber connected for deriving fuel from the fuel chamber and also connected for discharging fuel in the main conduit antecedent to the throttle valve, said secondary chamber having a wall member movable for enlarging and reducing the chamber for indrawing and discharge of fuel; a fluid pressure chamber having a wall member movable for enlarging and reducing the chamber capacity with a duct leading therefrom to a point in said main conduit beyond the throttle valve for communicating to said fluid pressure chamber the pressure changes occurring in the main conduit due to varying opening and closing of the throttle valve, and thereby causing chamber-capacity-changing movement of the movable wall of the fluid pressure chamber, the movable wall members of the secondary fuel chamber and the fluid pressure chamber being operatively connected for movement enlarging either chamber concurrently with reducing the other.

10. In the construction defined in claim 9, said moving wall members being arranged to be moved in a direction for reducing the air chamber and enlarging the fuel chamber by the reduction of pressure in the main conduit due to the closing of the throttle, and spring means for actuating said wall members in the opposite direction.

11. In a carburetor and the like for an internal combustion engine, in combination with an air and fuel mixture conduit adapted to be connected for discharge at the engine intake, a throttle valve in

said conduit; a level governing chamber constituting an immediate source of liquid fuel, and a principal fuel supply passage leading therefrom for discharge in the fuel mixture conduit anterior to the throttle valve, said principal passage having a flow restricting means anterior to its discharge in the fuel mixture conduit; a secondary fuel passage deriving supply from the level-governing chamber and discharging in the fuel mixture conduit and intermediately by-passing the flow restricting means of the principal fuel passage; and means for impelling fuel through said additional fuel passage for such discharge, consisting in a pressure-operated device connected for deriving pressure from the intake passage beyond the throttle.

12. In a carburetor and the like for an internal combustion engine in combination with an air and fuel conduit adapted to be connected for discharge at the engine intake; a throttle valve in said conduit; a level governing chamber constituting an immediate source of liquid fuel and a principal fuel supply passage leading therefrom for discharge in the fuel mixture conduit anterior to the throttle valve, and flow restricting means in said passage anterior to its discharge; a secondary fuel passage leading from the fuel source for discharge in the fuel mixture conduit anterior to the throttle valve and intermediately by-passing the flow restricting means of the principal fuel passage, said secondary passage comprising intermediate the fuel source and the discharge of said passage in the fuel mixture conduit a variable capacity chamber; flow restricting means in the secondary conduit anterior to said variable capacity chamber; the capacity-varying means of said intermediate chamber being a movable wall thereof and a pressure chamber at the opposite side of said wall; a pressure duct leading from a point in the fuel mixture conduit beyond the throttle valve to said pressure chamber; whereby increase of pressure in the engine intake passage beyond the throttle valve tends to reduce said intermediate chamber and impel fuel therefrom through said secondary passage for discharge in the fuel mixture conduit, and a check valve in said secondary passage intermediate said chamber and the discharge of said passage in the fuel mixture conduit, said valve opening in the direction for such discharge and seating in the opposite direction to prevent reverse flow through said secondary passage upon reduction of said pressure.

13. In a carburetor and the like for an internal combustion engine in combination with an air and fuel mixture conduit adapted to be connected for discharge at the engine intake, a throttle valve in said con-

5 duit; a level-governing chamber constituting an immediate source of liquid fuel, said conduit having a flow-accelerating constriction anterior to the throttle valve; a principal fuel supply passage leading from the fuel source for discharging in the fuel mixture conduit proximate to said constriction; flow restricting means in said fuel supply passage anterior to its discharge in the fuel mixture conduit, said passage having relatively free
 10 flow capacity between said flow restricting means and said discharge; a secondary fuel passage leading from the fuel source for discharge in the fuel mixture conduit proximate to said constriction and by-passing the flow restricting means of the principal fuel passage; the secondary fuel passage comprising intermediate the fuel source and the discharge of said passage in the fuel mixture conduit a variable capacity chamber and a flow restricting obstruction intermediate the fuel source and said chamber, the means for varying the capacity of said chamber being a movable
 15 wall thereof, a pressure chamber opposite said wall and a pressure duct leading from a point in the fuel mixture conduit beyond the throttle valve to said chamber; whereby increase of pressure in the engine intake passage beyond the throttle valve tends to reduce said intermediate chamber and impel fuel therefrom through said secondary passage for discharge into the fuel mixture conduit, and a check valve in said secondary
 20 passage intermediate said chamber and the discharge of said passage opening in the direction for such discharge and seating in the opposite direction.

14. A fuel mixture forming and delivering device for an internal combustion engine adapted to be connected for delivering fuel mixture at the engine intake comprising a fuel mixture conduit; a throttle valve therein; a fuel source constructed for maintaining the fuel at a governed level; a passage for leading liquid fuel from the fuel source to a point of discharge in the fuel mixture conduit anterior to the throttle; a duct extending from a point in the fuel mixture conduit beyond the throttle valve to a point of communication with said fuel passage immediately preceding the discharge of the latter into the fuel mixture conduit, said last mentioned duct being reduced to form a jet at its discharge; whereby said duct serves upon increase of the throttle opening after closure to idling position as a gas pressure duct for delivering an aspirating jet into the fuel passage substantially at its discharge into the fuel mixture conduit, the fuel passage mentioned being a principal fuel passage, a secondary fuel passage leading from the fuel source for discharge into the fuel mixture conduit and comprising
 25 the terminal discharge portion of the first

mentioned fuel passage; a variable capacity chamber interposed in and constituting part of said secondary passage and positioned mainly below the governed level of the fuel source, whereby it is normally occupied by the liquid fuel; means for momentarily reducing the capacity of said variable capacity chamber for causing discharge of liquid therefrom, the communication between said chamber and the fuel source being relatively restricted in comparison with the communication through the fuel passage between said chamber and the discharge of said passage into the fuel mixture conduit; whereby the reduction of capacity of said chamber drives fuel onward for discharge into the fuel mixture conduit subject to the aspirating jet delivered through the pressure passage for aspirating the fuel at its said discharge.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 17th day of March, 1925.

PERCIVAL S. TICE.