C. J. PEMBROKE.

CARBURETER.

APPLICATION FILED JUNE 15, 1914.

1,310,432.

Patented July 22, 1919.

2 SHEETS—SHEET 1.

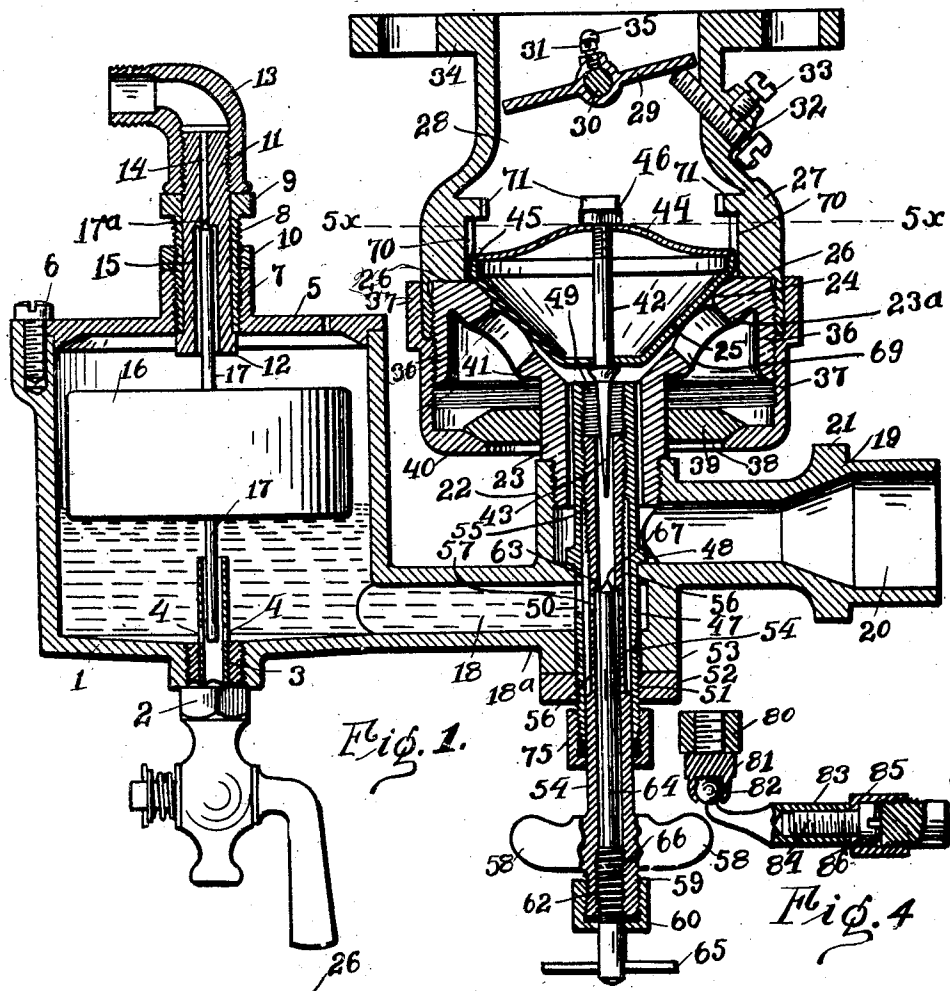


Fig. 1.

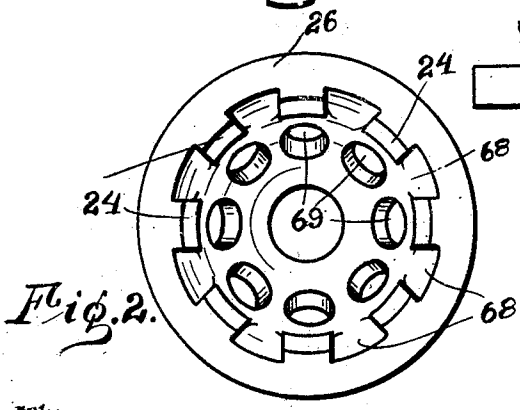


Fig. 2.

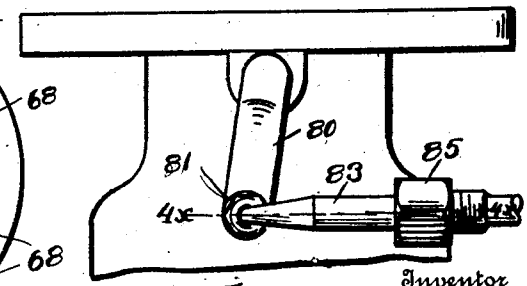


Fig. 3.

Fig. 4.

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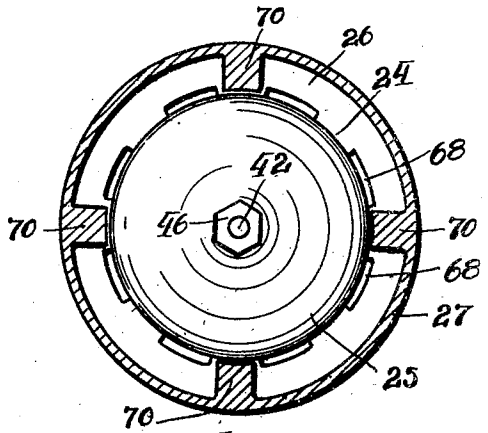


Fig. 5.

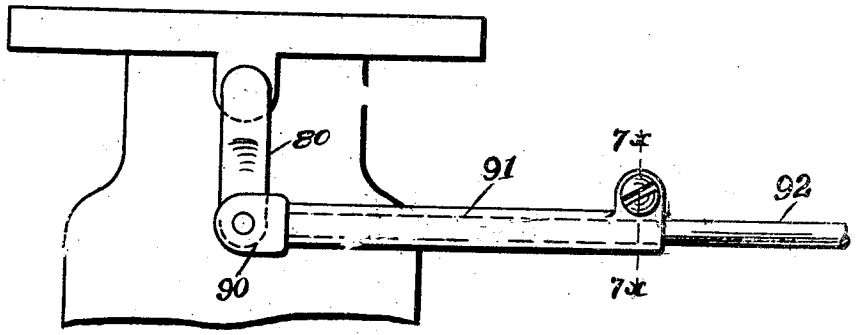


Fig. 6.

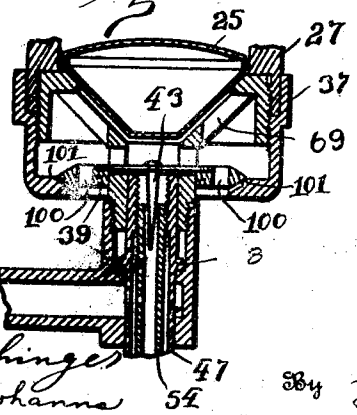


Fig. 8

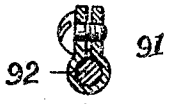


Fig. 7.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,310,432. Specification of Letters Patent. Patented July 22, 1919.

Application filed June 15, 1914. Serial No. 845,259.

To all whom it may concern:

Be it known that I, CHARLES J. PEMBROKE, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The object of this invention is to provide a new and improved form of carbureter.

This and other objects of this invention will be fully illustrated in the drawings, described in the specification and pointed out in the claims at the end thereof.

In the drawings, Figure 1 is a vertical cross section of my improved carbureter.

Fig. 2 is a top plan view of the valve seat.

Fig. 3 is a detail view of the mechanism for operating the throttle valve and

Fig. 4 is a section on the line 4ˣ—4ˣ of Fig. 3.

Fig. 5 is a horizontal section on the line 5ˣ—5ˣ of Fig. 1.

Fig. 6 is a detail view of the link for operating the throttle valve of the carbureter.

Fig. 7 is a cross section on the line 7ˣ—7ˣ of Fig. 6.

Fig. 8 shows a modified form of my carbureter in which the tapered pin is attached to the valve instead of the baffle and in which the small supply of air is admitted through or around the air valve 39.

In the accompanying drawings, like reference numerals indicate like parts.

In the drawings, 1 indicates a float chamber of the carbureter having the drip cock 2 threaded into the bottom thereof and having a guide 3 supported thereby in which guide are the openings 4, 4, through which the gasolene or water can enter the drip cock from the bottom of the float chamber. The bottom of the float chamber is shown depressed so that water or any other liquid may settle therein permitting it to be easily drained off through the drip cock. On top of the float chamber is a cover plate 5 fastened thereon by screws 6. The cover plate 5 is provided with the neck 7 which is suitably threaded to receive the sleeve 8 which sleeve is provided with the hexagon head 9. A locknut 10 surrounds this sleeve so that it can be clamped in the neck 7 at any desired height.

Inside the sleeve 8 is another sleeve 11 having a shoulder 12 on the lower end thereof which limits its upward movement. On this sleeve 11 is threaded the elbow 13 with which the sleeve 11 rotates. The parts are so dimensioned with regard to each other that the elbow 13 makes a gas tight fit with the sleeve 11 and still leaves sufficient clearance between the shoulder 12 and the sleeve 8 to permit the free rotation of the sleeve 11 and elbow 13 combined so that a free swivel action is maintained with respect to the float chamber of the carbureter.

In the sleeve 11 is provided the tubular opening 14 of small diameter at the top, and the tubular opening 15 at the bottom, of large diameter, with a shoulder between them forming a valve seat.

Inside of the float chamber of the carbureter is provided the float 16 having a stem 17 extending therethrough which stem at the bottom extends into the guide 3 forming part of the drain cock and at the top extends into the large opening 15 of the sleeve 11. The top of the stem 17 is tapered or coneshaped and forms a valve 17ª which engages with the shoulder or valve seat at the bottom of the small opening 14.

At the bottom of the float chamber is provided an extension 18ª in which is a passage way 18 extending horizontally therethrough, through which gasolene is admitted to the spray nozzle. Also integral with this part of the carbureter is the extension 19, provided with a warm air intake 20. This extension is provided with a shoulder 21 by which it may be attached to any tube or conduit through which hot air may be admitted to the carbureter. This extension of the carbureter is provided with a neck 22 having a female thread therein with which engages a neck 23, which extends down from and supports the mixing chamber 28 of the carbureter. This neck has preferably a funnel shaped portion 23ª at the top thereof, at the top of which funnel shaped portion is a flange having a series of raised inclined surfaces 24 which furnish a rest for the gravity actuated baffle 25.

These raised surfaces 24 hold the baffle 25 up from the inclined surface of the fun-

nel shaped portion, leaving a free space for the air to pass from the inlet 20 under the baffle through the recesses 68 up through the large openings between the guides 70 into the upper part of the mixing chamber. The flange at the top of the funnel shaped portion provides an annular seat 26 on which rests the carbureter head 27, which head is hollow and forms the upper part of the mixing chamber 28.

At the top of this mixing chamber is placed a throttle valve 29, mounted on the shaft 30 fastened thereto by the set screw 31, the oscillation of which valve is limited by the damper screw 32, which is held in adjusted position by the set screw 33. At the top of the carbureter head is provided a suitable flange 34 by which it may be attached to the intake manifold of the motor. A pin or screw 35 is provided which arrests the throttle valve in its opening movement and holds it when in position to give a maximum opening in the passage.

Surrounding the annular seat 26 and extending downward therefrom is the flange 36 which is suitably threaded on the outside with a male thread and which engages with a female thread formed in the shell 37 which surrounds it and forms the lower portion of the mixing chamber. This shell has a circular opening 38 in the bottom thereof through which the bulk of the air can pass into the carbureter. The air passes through the annular opening between the rim of the circular opening 38 in the shell 37 and neck 23, which extends therethrough.

No fuel other than air is admitted to or passes through the opening 38 controlled by the valve 39. Surrounding the neck 23 and normally closing the opening 38 is an annular valve 39 which has its periphery beveled to engage with a corresponding beveled surface or valve seat 40 surrounding the opening 38. The valve 39 is free to rise and fall around the sleeve 23 and make close contact with the valve seat 40 at the bottom of the shell 37. This valve 39 is normally closed or is nearly closed when the motor is running at low speed and little or no air enters the carbureter through the opening controlled thereby, but the air enters through the air intake 20 instead. This is due to the fact that at low speed there is a very low vacuum in the upper part of the mixing chamber 28. When the speed of the motor increases, the vacuum in the chamber 28 increases and the pressure of the outside air becomes more unbalanced so that it will lift the valve 39 from its seat and enter the lower part of the mixing chamber through the opening 38 controlled by this valve 39. The ratio of the area and weight of the valve 39 and the area of the passages 68 in excess of the effective area of the choke tube surrounding the spray nozzle must be such that the engine must pass a certain number of R. P. M. and make a correspondingly stronger vacuum in the mixing chamber, before the valve 39 will lift, after which the valve will lift higher as the speed of the engine increases or as the vacuum in the mixing chamber increases. A shoulder 41 surrounds the neck 23 at the top and limits the upward movement of the valve 39.

The baffle 25 carries a pin 42, which pin has a taper 43 on the bottom thereof. The pin 42 extends up through the baffle 25 and is surrounded at the top by a washer or plate 44 which rests on a flange 45 in the baffle. This plate and the pin closes the top of the baffle. A nut 46 is used for holding this plate in position. It will be seen that the baffle 25 is hollow and exposes a large area to the action of the inrushing air and its weight or its resistance to the free flow of air is comparatively little.

The baffle 25 will remain on its rests while the motor is running at low speed, there being sufficient room below the baffle and in the recesses 68 and the recesses between the guides 70 to permit the air that is drawn through the carbureter up to a certain number of R. P. M. of the engine to pass the baffle without lifting it. When the speed of the engine increases, the vacuum in the mixing chamber also increases and the air rushes in larger volume through both the intake 20 and the intake controlled by the valve 39 and lifts the baffle 25.

The air that passes through the opening 38 passes into the lower part of the mixing chamber thence through the openings 69 and under the baffle 25 and then up around the baffle into the upper part of the mixing chamber.

It will be understood that at all times during the flow of air the pressure of air in the lower part of the mixing chamber under the baffle will be higher than in the upper part of the chamber and when the difference in pressure is sufficient, the baffle will be lifted and the volume of air that flows past it will correspondingly increase. The pressure is of course highest outside of the carbureter, the pressure dropping as the air passes through the intake 20 past the baffle and into the upper part of the chamber or as it passes under the valve 39 through the openings 69 under and past the baffle 25 into the upper part of the mixing chamber, the pressure dropping rapidly in the narrow openings through which it passes and slowly in the wide openings, a low vacuum in the upper part of the mixing chamber being sufficient to draw the air through the intake 20 and a higher vacuum being necessary to lift the valve 39 and draw the air through the opening 28 and lift the baffle as well.

In this manner the passing of the air through the carbureter is regulated.

The apparatus that sprays the fuel in the carbureter and regulates the flow of the fuel, will now be described.

Extending vertically through the necks 22 and 23, is a tube 47 which tube has a flange 48 on the outside thereof. This flange rests on the bottom of the air intake opening 20 of the extension 19. The tube extends downwardly through the opening in the extension 18ª and projects below the bottom thereof. At the top this tube is provided with the female thread 49. In line with the passage way 18 and below the flange 48, this tube is provided with an opening 50 through which gasolene or other liquid fuel may be admitted from the float chamber to the interior of the tube.

This opening is placed at or near the top of the passage way 18 so as to prevent water or other heavy material that would settle to the bottom of the passage way from getting through the opening 50 into the spraying nozzle. To increase this protection the passage way 18 is made large so that a considerable quantity of heavy liquid can accumulate therein before it will pass through the opening 50 into the spraying nozzle, and this accumulation of water or other liquid can be drained off through the drip cock 2. This prevents water from getting into the spray nozzle of the carbureter where in cold weather it would freeze up and interfere with or prevent its operation.

At the bottom of this tube 47 is the male thread 51 with which engages the nut 52, the upper surface of which is ground. This nut engages with the lower surface of a boss 53 constituting a part of the extension 18ª. This nut is turned upwardly and draws the tube 47 down until the flange 48 rests against the bottom of the air intake opening 20 and holds the tube rigidly in place and at the same time closes the vertical opening in the passage way 18, through which the tube 47 extends, against possible leakage of gasolene.

Inside of the outer tube 47 is a smaller inner tube 54 having a male thread 55 at the top thereof which engages with the female thread 49 of the tube 47 by which the two tubes are held in position with relation to each other. The tube 54 has a reduced external diameter at 56 to provide an annular passage way between it and the tube 47. Near the bottom of this annular passage way, the tube 54 is provided with the openings 57 through which gasolene can flow from the tube 47 into the interior of the tube 54.

The inner tube 54 is provided near the bottom thereof with the lugs 58 by which it may be conveniently turned when it is moved into threaded engagement with the tube 47. The upper end of the inner tube 54 is open so that gasolene or other fuel may flow out at that end along the tapered pin 43 and up into the mixing chamber of the carbureter. This opening and the tapered pin constitute the spray nozzle of my carbureter. The initial opening of the spray nozzle is determined by the vertical adjustment of the tube 54, partially closed by the tapered pin 43 and the subsequent opening is determined by the taper of the pin 43 which is lifted to enlarge the opening. Below these lugs is a male thread 59 with which engages a stuffing box 60. The interior of the tube 54 is provided with the female thread 62 at the bottom thereof and at a suitable distance below the top thereof, is provided the shoulder 63 above which the opening in the tube is of reduced diameter. Extending through the tube 54 is a needle valve 64 having a handle 65, having a threaded portion 66 that engages with the female thread 62 and having a tapered end 67 at the top thereof which is adapted to engage with the shoulder 63 for the purpose of limiting the opening through the tube 54 and controlling the supply of gasolene that is fed therethrough.

At the bottom of the outer tube 47 is a stuffing box 75 by which the joint between the inner and outer tubes is closed.

Between the baffle rests 24 occur the recesses 68. The funnel shaped portion 23ª is perforated with the openings 69 which openings may be of any number, size and shape, it being understood that their combined area should be equal to or greater than the opening controlled by the valve 39, it being further understood that the funnel shaped portion is a support for the carbureter and is not intended as a division wall between the upper and lower parts of the mixing chamber of the carbureter and it may even be entirely dispensed with if the mixing chamber is supported in some other way as by casting a portion of the mixing chamber integral with the float chamber.

Inside of the carbureter head 27 is provided the guides 70, preferably four in number, each having the projections or stops 71 at the top thereof. The baffle 25 is free to rise and fall between the guides 70 and is limited in its upward movement by the stops 71. It is limited in its downward movement by the rests 24.

The opening for the passage of air that is uncovered by the valve 39 is approximately equal to the clearance between the baffle 25 and the surrounding chamber and is also equal to the net opening of the discharge opening as uncovered by the throttle valve 29.

The operation of my carbureter is as follows;

Gasolene is admitted through the elbow 13 and flows into the float chamber. As the gasolene rises in this chamber, the float rises

and with it the needle valve 17a, which closes the inflow of gasolene when the desired level has been reached. The gasolene flows from the float chamber through the passage way 18 into the tube 47 and thence into the tube 54.

To regulate the flow into the tube 54, the needle valve 64 is adjusted to limit the flow of gasolene for high motor speed, which is the maximum amount that will be needed. The gasolene can accumulate in the opening above the needle valve 64, this accumulation being normally present when the motor is being operated at slow speed and being available for quick acceleration. At low speed, there is sufficient vacuum to cause the gasolene to be drawn up through the clearance between the tapered needle valve 43 and the surrounding passage way so as to mix with the air that comes into the carbureter through the opening 20. As the speed of the motor increases, and a larger quantity of mixture is drawn into the motor the vacuum in the mixing chamber 28, increases or the unbalanced pressure of the outer atmosphere over the pressure within the mixing chamber increases. This unbalanced pressure causes the air to lift the valve 39 so that a quantity of air can pass between the valve and its valve seat, the lifting of the valve being governed by the weight and area of the valve.

After the air has passed the valve 39, it then passes through the openings 69 into the clear space between the baffle 25 and its rest. If the recesses 68 which are cut between the baffle rests 24 cannot pass the air with sufficient volume to satisfy the vacuum in the mixing chamber above the baffle, the difference in pressure will cause the baffle 25 to lift from its rest and increase the area available for the passage of air. The lifting of the baffle 25 raises with it the needle valve 43 and increases the area through which gasolene is drawn and the jet of fuel will flow up through the opening regulated or governed by the valve 43 in correspondingly larger quantity, due not only to the larger area exposed thereby but to the increased unbalanced pressure of the outer air which lifts the valve 39 and acts on the fuel causing it to flow faster through the spray nozzle. The baffle 25 can be lifted to the limit of the projection or stop 71 when its upward movement will cease. These stops are provided more for the purpose of holding the baffle in place rather than regulating or limiting its upward movement. It will something happen, due to the sudden acceleration of the motor that the baffle will act violently which if continued, will cause the baffle to close the opening at the top of the mixing chamber and this is to be avoided.

When the engine is running on low speed and the throttle is then opened the vacuum in the mixing chamber will be increased and the effect of this is to draw more air through the intake 20 and around the spray nozzle and suck more gasolene through the spray nozzle and raise the valve 39.

The vacuum in the mixing chamber below the baffle causes a simultaneous inrush of air through the opening 20 and a rush of gasolene through the spray nozzle. The air, because it is lighter, slightly precedes the flow of gasolene which follows immediately thereafter and both of these precede the flow of air past the valve 39 and past the baffle 25 from the valve 39 due to the fact that the clearance between the baffle 25 and the passages 68 is small and the flow is correspondingly restricted, and the lifting of the valve 39 is delayed until a sufficient vacuum is developed below the baffle.

Clearance in the passages 68 under the baffle 25 is preferably small being only slightly greater than the clearance in the annular opening around the spray nozzle. Because of the small passages 68 the vacuum below the mixing chamber is produced gradually and when it is sufficiently formed the outside air raises the valve 39 and rushes in through the opening 38 and through the openings 69 in sufficient volume to raise the baffle 25 and hold it up. If the clearance in the passages 68 be increased by making the rests 24 higher the valve 39 will lift and the air will pass earlier and in larger quantity and make the mixture thinner and if the clearance of the passages 68 be decreased by making the rests 24 lower the valve 39 will lift later and will delay the inrush of the air and will pass it in smaller volume and will make the mixture richer. If the rests 24 are made lower and the valve 39 and baffle 25 are made lighter the valve and baffle will lift quicker and substantially the same quantity of air and fuel will pass as before, experiments showing that the valve and baffle should be made no heavier than is necessary to make the vacuum needed to lift the fuel in the spray nozzle.

The height of the seats 24 or the clearance of the passages 68 and their relation to the weight of the valve 39 constitute one of the important features of my carbureter. It is also desirable to have the baffle 25 lighter than the valve 39. The valve 39 is made only sufficiently heavy so that the pressure which lifts it will also cause the gasolene to flow in sufficient quantity from the spray nozzle and the current of air then passing the nozzle will spread it on the under surface of the baffle, where it will be exposed to a large area in a thin film that the air may act upon and evaporate it, the quantity of gasolene emitted from the spray nozzle will gradually increase between the time of lowest motor speed and the time that valve 39 is opened. When valve 39 opens the

air rushes into the lower part of the mixing chamber and when it has formed sufficient pressure therein, it lifts the baffle sweeping off any liquid gasolene that may be clinging thereto and causing a greater flow of gasolene from the spray nozzle due to the lifting of the taper pin 43 from the spray nozzle thus increasing the area of its opening.

The high speed needle valve 64 may be dispensed with provided the proper taper is given to the pin 43 to feed the proper amount of fuel for increased speeds but as this taper if used alone, will vary for different motors, it is preferable to so taper the pin 43 that it will feed a too rich mixture and then thin out or correct this richness by the adjustment of the needle valve 64, which can be given a permanent setting according to motor that the carbureter is to be used with. Because of the arrangement of parts and the regulation of the vacuum secured thereby, a spray nozzle with a relatively large opening for the gasolene may be used without passing an excessive amount of gasolene therefrom which still gives a correct supply at all speeds.

As a vacuum is produced in the mixing chamber the pressure of the air in the float chamber forces the gasolene up through the spray nozzle into the mixing chamber and the higher the vacuum in the mixing chamber the greater will be the pressure behind the gasolene tending to force it past the needle valve.

As the gasolene flows up it strikes the bottom of the baffle and spreads out on it in an expanding film getting thinner as it goes. It is caught by the annular current of air that enters from the intake 20 and surrounds the spray nozzle and is carried up the baffle by this air current and is also exposed to the air that enters from the valve 39 evaporating and mixing with it so that complete evaporation and thorough mixing of the gasolene and air is secured. The higher the speed of the engine the higher will be the vacuum and the greater will be the pressure forcing the gasolene past the needle valve 63 from the float chamber. The valve 39 will lift and the air will come in rapidly through the opening 38 and the more will the baffle 25 be lifted and the more will the end of the spray nozzle be opened.

As the baffle raises the taper pin 43 also raises and enlarges the annular opening at the top of the spray nozzle and permits the gasolene to flow or spurt faster from the nozzle.

In this way perfect regulation of the supply of air and gasolene at all speeds will be secured. The baffle 25 exposes a large surface to which the liquid gasolene can adhere as it is carried up by the rush of air and at low speed the under surface of the baffle is kept coated with gasolene which is not carried away from the baffle as a liquid but only as a vapor and this coating of the gasolene is in reserve ready to mix with the first rush of air through the intake 20 when the throttle opens so that at no time is the mixture starved of gasolene.

It will be understood that the tapered needle may if desired be lifted by or with the valve 39 in which case it would lift slightly earlier than if it lifted with the baffle 25 and in Fig. 8 I have shown a construction by which such a result may be secured. It will also be understood that the opening 20 may be dispensed with and a series of small openings 100 through the valve 39 may be used instead, or rests 101 may be put in the seat for the valve 39 with openings between them giving a fixed amount of initial clearance between the valve and its seat as is also shown in Fig. 8.

In Figs. 3, 4, and 6 I have shown a link or links for moving the throttle valve, the links being adjustable longitudinally so as to hold the valve in the correct initial position. As shown in Fig. 3, the throttle is mounted on a shaft 30 on the end of which is a crank 80. In Fig. 4, the end of the crank 80 is threaded to receive the stud 81 the open end of which is spun to receive the ball 82 on the end of the shank 83 which shank is internally threaded to receive the screw 84. The screw 84 has a flat head and surrounding the head is placed the flanged nut 85, which has the flange 86 on the one end thereof. This flange is perforated to receive the stem of the screw, the nut surrounding the head and extending beyond it. The nut is placed on the stem of the screw as shown in Fig. 4 and the screw is fastened in the shank 83. The nut 85 is internally threaded at its outer end to receive the threaded end of the stem 87 which engages therewith to form a link extending from the steering column to the crank of the valve in the carbureter. The head of the screw is clamped between the flange of the nut and the end of the stem. By turning the screw 84 in or out from the shank 83 any desired adjustment in the length of the link may be secured so that when the valve is brought against the end of the screw 32 in any position in which it may be set the throttle lever, on the steering column of the automobile, connected to the link, will be in the correct position.

In Fig. 6, the end of the shaft 30 of the valve is provided with a crank 80 having a flat end to which is pivotally connected the fork 90 on the end of a sleeve 91 having a clamp 93 on the other end thereof. A stem 92 engages in the sleeve and is fastened therein by the clamp. This sleeve and stem constitute a link that connects the crank of the throttle to the throttle lever on the steer-

ing column, the length of which link can be adjusted so that when the valve is brought against the end of the screw 32 in any position in which it may be set the throttle lever, on the steering column of the automobile, connected to the link, will be in the correct position.

I claim:

1. A carbureter comprising a mixing chamber having a spray nozzle therein, a movable baffle plate placed in said chamber on a fixed rest intermediate the ends thereof, said baffle plate being moved toward one end of said chamber by a heavy rush of air through said chamber and being undisturbed by a moderate flow of air, a small clearance being provided at the rest around said baffle, a larger clearance being provided around said baffle above said rests.

2. In a carbureter the combination of a mixing chamber having an air inlet and outlet, a movable baffle mounted in said chamber, a mutilated seat for said baffle on which said baffle normally rests, the mutilations in said baffle seat permitting a moderate quantity of air to pass without moving the baffle, said baffle being moved from its seat by the rush of a large quantity of air, stops for limiting the upward movement of said baffle and guides for controlling the movement of the baffle between its seat and said stops, said guides being located on the casing outside of the circumference of the baffle, said stops being located at the end of said guides.

3. In a carbureter the combination of a mixing chamber having an air inlet and an outlet therefor and a plurality of air sections therein of a movable member therein, atmospherically controlled and adapted to partially separate the sections both when normally at rest and after being moved and adapted when moved to adjust its position to the partial vacuum of different degrees that exist in each of the sections with a higher degree of vacuum in the section nearest the discharge orifice and a lower degree of vacuum in the section nearest the inlet orifice, rests for said member forming a mutilated seat therefor, a spray nozzle concentric with said movable member and a second movable member atmospherically operated located in and capable of controlling the main air inlet governing the degree of vacuums and the rapidity with which one can be formed with relation to the other, and means for mechanically varying the supply of fuel furnished by the spray nozzle in proportion to the flow of air, said means being operated by the air currents.

4. In a carbureter, a spraying nozzle, having an outer tube and an inner tube having a threaded engagement therewith and longitudinally adjustable therein, a chamber inclosed between said tubes and an opening through said tubes communicating with said inclosed chamber, a valve seat above the opening in the inner tube and opening downwardly, a needle valve coöperating with said seat to limit the flow of gasolene therethrough, the stem of said needle having a threaded engagement with the inner tube and extending outside of said tube to permit adjustment thereof.

5. In a carbureter, a spraying nozzle having an outer tube and an inner tube having a threaded engagement therewith and longitudinally adjustable therein, a chamber inclosed between said tubes and an opening through said tubes communicating with said inclosed chamber, a valve seat above the opening in the inner tube and opening downwardly, a needle valve coöperating with said seat to limit the flow of gasolene therethrough, the stem of said needle having a threaded engagement with the inner tube and extending outside of said tube to permit adjustment thereof, a tapered pin coöperating with the upper end of said inner tube to limit the flow of fuel therethrough, said inner tube with its needle valve being adjustable toward and away from said tapered pin to fix the minimum flow of fuel therethrough.

6. In a carbureter, a spraying nozzle having an outer tube and an inner tube having a threaded engagement therewith and longitudinally adjustable therein, a chamber inclosed between said tubes and an opening through said tubes communicating with said inclosed chamber, a valve seat above the opening in the inner tube and opening downwardly, a needle valve coöperating with said seat to limit the flow of gasolene therethrough, the stem of said needle having a threaded engagement with the inner tube and extending outside of said tube to permit adjustment thereof, a tapered pin cooperating with the upper end of said inner tube to limit the flow of fuel therethrough, said inner tube with its needle valve being adjustable toward and away from said tapered pin to fix the minimum flow of fuel therethrough, said tapered pin being raised and lowered by the air current to vary the flow of fuel above the minimum.

7. In a carbureter, the combination of a mixing chamber variably divided by a movable member within the chamber, an inlet orifice, a member normally closing said orifice, said member being exposed to the atmospheric pressure, a series of fuel controls, consisting of a movable tapered pin, carried on said first named member, said first named member being moved by the inrushing air currents to vary the air and liquid fuel openings, a seat adjustable to said pin to vary the normal opening that is enlarged by the movement of the pin.

8. In a carbureter, the combination of an

air chamber, an air valve at one end of said chamber, a movable baffle in said chamber above and separate from said air valve, the air passage being disposed so as to pass a small current of air without moving either the valve or the baffle, said valve and said baffle being both lifted by a heavy rush of air, a gasolene jet in said carbureter, means for enlarging the area of said jet upon the lifting of said valve and baffle.

9. In a carbureter, the combination of an air chamber, an air valve at one end of said chamber, a movable baffle in said chamber above and separate from said air valve, the air passage being disposed so as to pass only a small current of air without moving either the valve or the baffle, said valve and said baffle being both lifted by a heavy rush of air, a gasolene jet in said carbureter, means for enlarging the area of said jet upon the lifting of said valve and baffle, said valve and said baffle regulating the flow of air through said carbureter.

10. In a carbureter the combination of a mixing chamber having inlet and discharge openings and a spray nozzle, a baffle therefor, said baffle comprising a hollow conical shell having a sloping top draining toward the periphery, the cone shaped side being substantially as long as the radius of the top of the cone.

11. In a carbureter the combination of a casing having a small air inlet constantly open and a fuel inlet constantly open and a suction operated member controlling a large air inlet, a second suction operated member automatically controlling the flow of air through an air chamber formed in the casing whereby on high speed a different vacuum is created above the second suction operated element from that below said element, said second suction operated element having means for increasing the flow of fuel.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES J. PEMBROKE.

Witnesses:

ALICE M. JOHANNS,

EDNA K. BOOTH.