H. A. MILLER.

CARBURETER.

APPLICATION FILED NOV. 16, 1909.

995,623. Patented June 20, 1911.

Fig. 1.

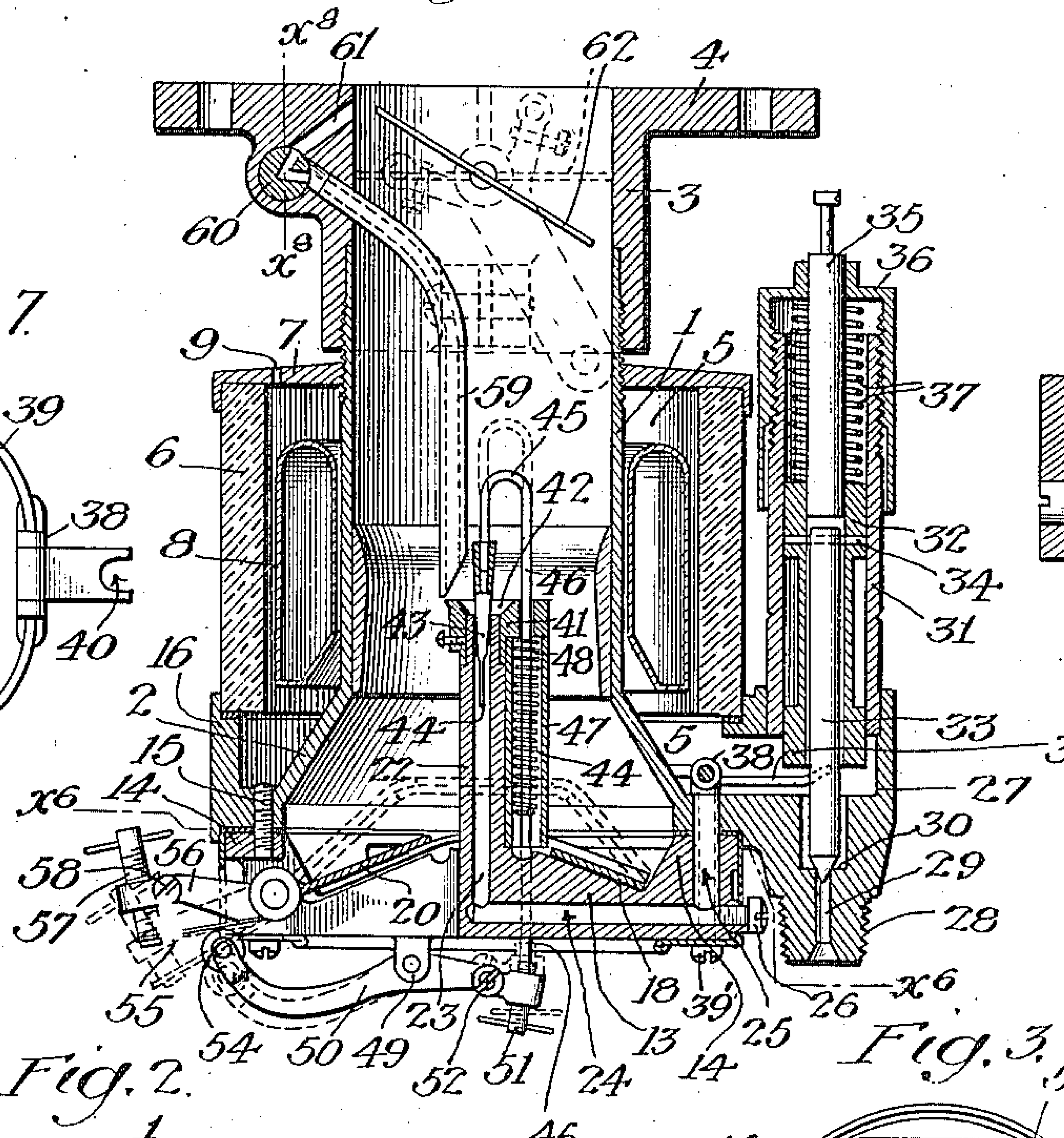


Fig. 7.

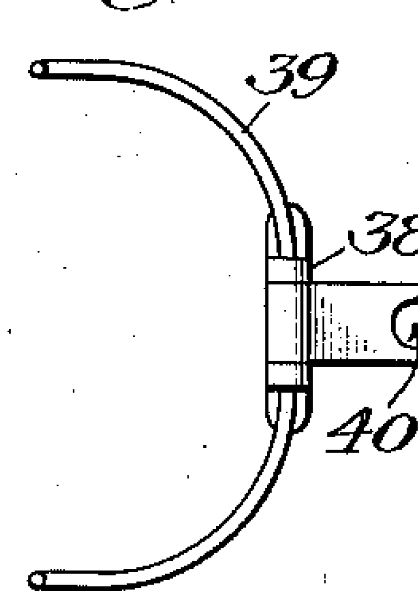


Fig. 8.

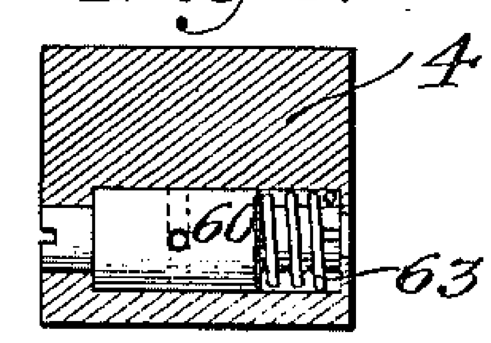


Fig. 2.

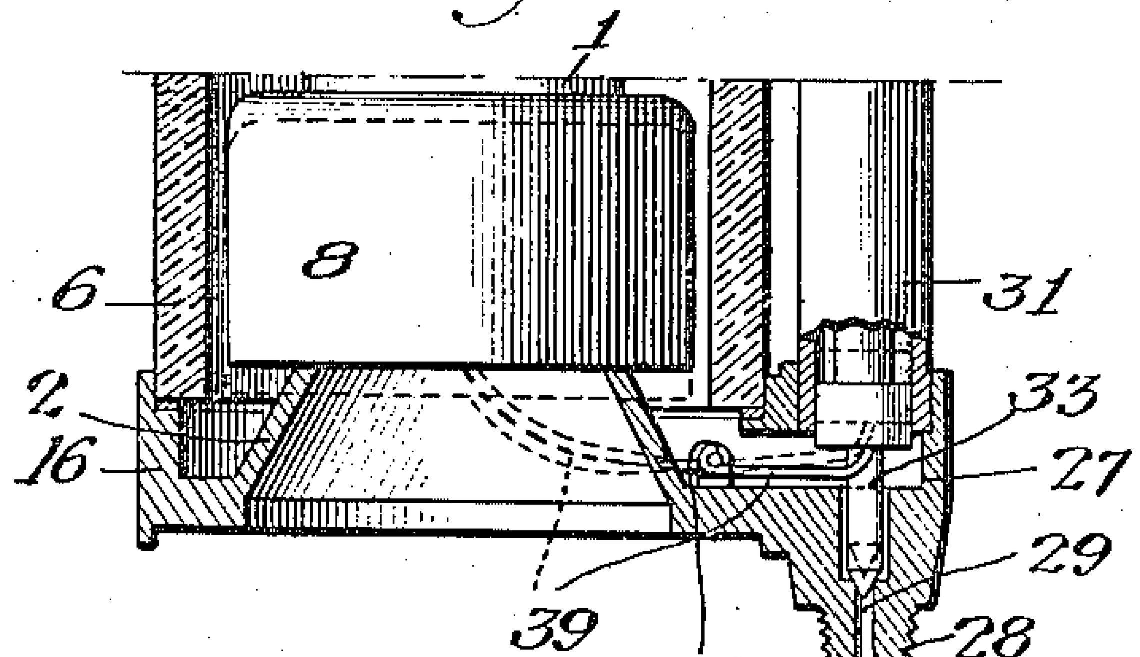


Fig. 3.

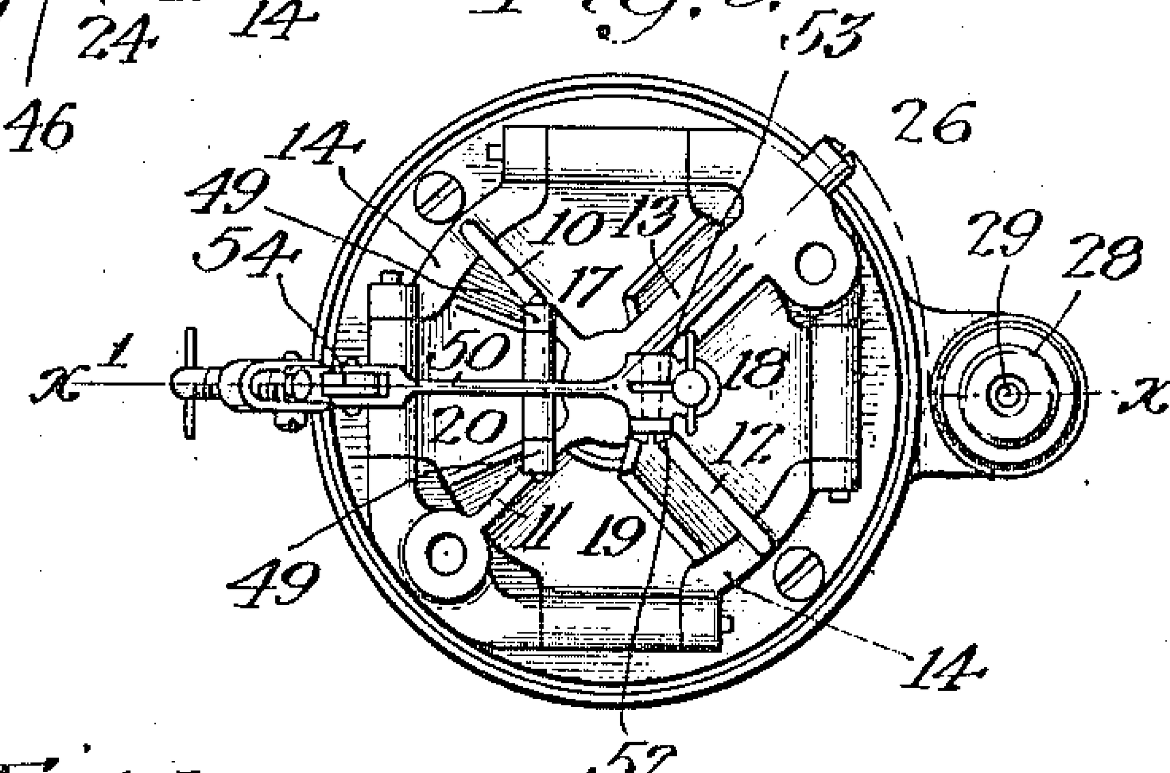


Fig. 4.

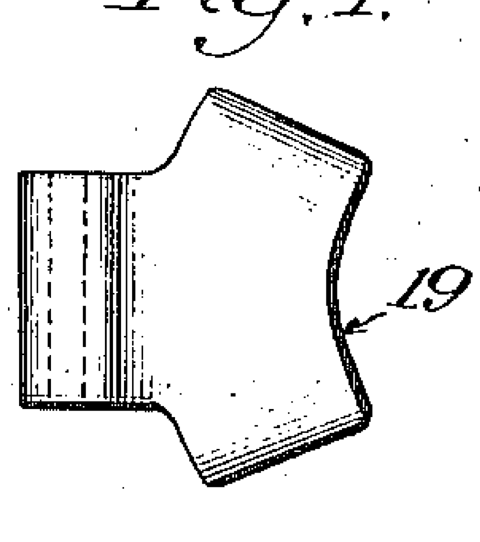


Fig. 5.

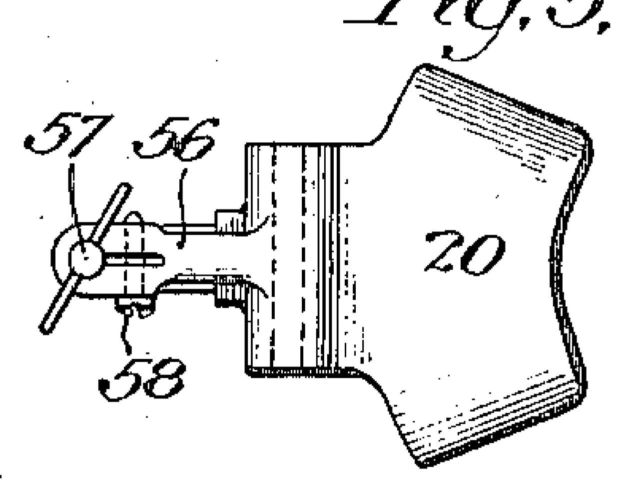
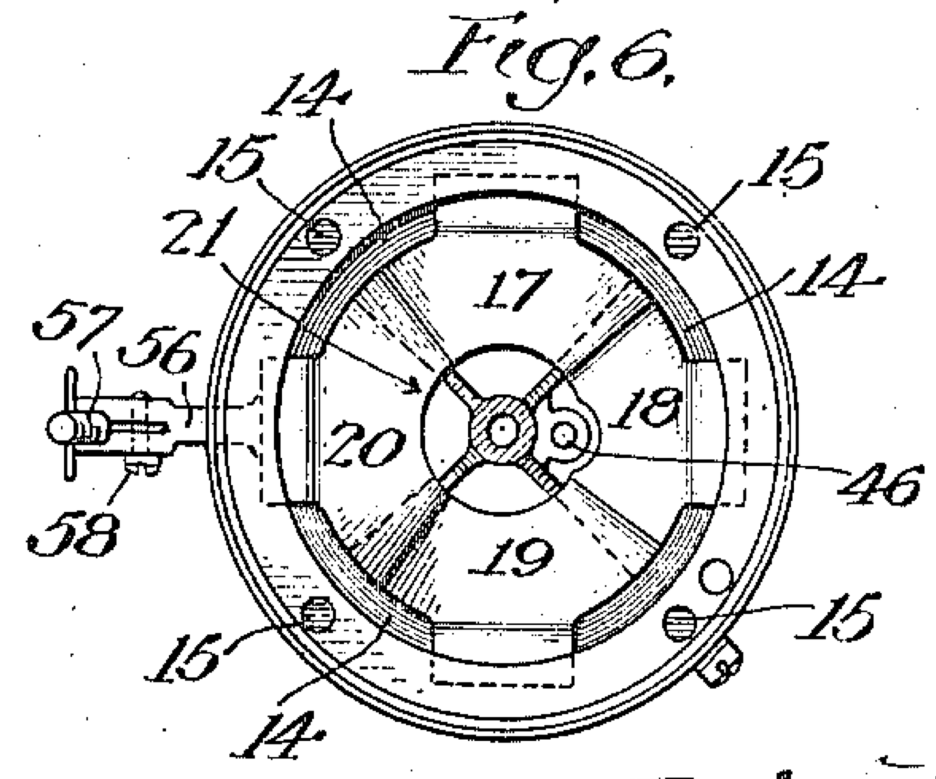


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

995,623. Specification of Letters Patent. Patented June 20, 1911.

Application filed November 16, 1909. Serial No. 528,400.

To all whom it may concern:

Be it known that I, HARRY A. MILLER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Carbureter of a type shown and described in a previous application of mine filed January 11, 1909, Serial No. 471,804, in which a series of pivoted wings are arranged around the nozzle and are lifted by the inrushing air during the suction stroke and cause the air to pass in close to the nozzle.

One of the main objects of the present invention is to cause the lifting movement of the wings to mechanically open the needle valve a distance corresponding to the lift of the wings, whereby the amount of gasolene allowed to pass through the nozzle past the needle valve is controlled directly and bears a definite ratio to the amount of air which passes through the carbureter and lifts the wings.

Another object is to provide for manually regulating the wing operated mechanism for lifting the needle valve whereby the high speeds of the motor may be adjusted, as it is when the motor is running at high speed that suction is produced sufficiently to raise the wings and control the needle valve in the automatic manner stated.

A further object is to provide for adjusting the carbureter for low speeds. This adjustment is independent of the high speed adjustment above referred to, the low speed adjustment being secured by a center screw which directly bears against a rod which carries the needle valve and by means of which gasolene may be allowed to slowly leak past the needle valve even though the pivoted wings above referred to do not lift, the small amount of gasolene which is thus permitted to leak past the needle valve being sufficient to operate the motor at a slow speed.

A further object is to enable the carbureter to be regulated for intermediate speeds.

Other objects and advantages relate to details of construction and operation which will be brought out in the following specification.

Referring to the drawings: Figure 1 is a vertical longitudinal section through the carbureter on line x^1—x^1 Fig. 3. Fig. 2 is a sectional view, partly in elevation, of the lower part of the carbureter with the pivoted wings and mechanism controlled thereby removed. Fig. 3 is a bottom view of the carbureter on a reduced scale. Fig. 4 is a plan view of one of the wings. Fig. 5 is a plan view of the valve controlling wing. Fig. 6 is a section on a reduced scale on line x^6—x^6 Fig. 1. Fig. 7 is a plan view of the float valve lever. Fig. 8 is an enlarged section on line x^8—x^8 Fig. 1.

1 designates an air passage or mixing chamber which is cylindrical in form with a flaring lower end 2 the upper end of the mixing chamber being threaded and secured to a neck 3 having a flange 4 which affords means of attaching the carbureter to the induction pipe not shown. Surrounding the chamber 1 is a float chamber 5, the outer wall of which is shown as consisting of a cylindrical glass tube 6, the upper end of which is closed by a cap 7 screwed on the wall of the mixing chamber. Within the float chamber 5 is an annular float 8. The cap 7 is provided with a vent 9.

Secured below the flaring portion 2 of the mixing chamber is a spider comprising four arms 10, 11, 12 and 13, the outer ends of which are cast integral with a ring 14 which is secured by screws 15 to a flange 16, which is cast integral with the lower end of the flaring portion 2, the upper edge of the flange 6 being shouldered to receive the lower edge of the glass tube 6. Pivoted to the ring 14 are four wings 17, 18, 19 and 20, one edge of each of which overlaps the adjacent edge of the next wing as clearly shown in Fig. 6. When these wings are closed they form a circular central orifice 21. Projecting up through the orifice 21 is a nozzle 22 having an interior passage 23 which communicates with a horizontal passage 24 formed in the arm 13, which is made larger for that purpose, and extending up from the passage 24 through the ring 14 is a passage 25 which communicates with the space around the flaring portion 2 in the lower part of the float valve chamber 5. The passage 24 is formed by drilling through the side of the ring 14, and the end of the hole is closed by a screw 26.

Cast to the lower part of the mixing chamber 1, at one side thereof, is a float valve chamber 27 which has a lower threaded end 28 with a gasolene inlet passage 29 leading to a valve seat 30. By referring to Fig. 3 it will be noted that the threaded extension 28 is not in line with the screw 26 as might be apparent from Fig. 1. The section line $x^1—x^1$ in Fig. 3 shows the line on which the section is taken, the screw 26 being out of line with the threaded extension 28. A tubular valve guide 31 extends above the valve chamber 27, and slidable therein is a sleeve 32 which receives a float valve 33, the sleeve 32 being bored slightly longer than the valve 33 to permit the latter to loosely fit therein and enable it to take a natural close fit with the valve seat 30. The valve 33 is secured to the sleeve 32 by a pin 34, the pin tightly fitting in the sleeve 32 and loosely fitting in the valve 33 to allow the valve to accommodate itself to its seat as referred to. A rod 35 extends from the upper end of the sleeve 32 through a cap 36 which is screwed on the upper end of the guide 31, the rod 35 protruding from the cap 36 and affording a means for manually operating the float valve 33. A coil spring 37 lies between the cap 36 and sleeve 32 and serves to normally move the valve 33 toward its seat 30.

Within the float valve chamber 5 is a notched lug 38 secured by a screw 39′, and pivoted to the lug 38 is a forked float valve lever 39, shown in detail in Fig. 7, the forked ends of which rest against the lower edge of the float 8, and the notched portion 40 bearing upwardly against the lower end of the sleeve 32. The level of gasolene in the float chamber 5 determines the position of the float 8 and the position of the latter through the medium of lever 39, determines the position of valve 33 so that a substantially constant gasolene level is maintained in well known manner.

At the upper end of the nozzle 22 is secured a sleeve 41 forming a cup 42 around the mouth of the nozzle. Projecting into the mouth of the nozzle 22 is a tapered needle valve 43 the lower end of which has a thin blade 44. The valve 43 is supported by a looped end 45 on a rod 46, the latter extending through a tube 47 at one side of the nozzle 22, thence down through the arm 13 at one side of the passage 24. Within the tube 47 is a spring 48 the lower end of which is secured to the rod 46 and it serves to normally depress rod 46 and close the valve 43.

The arms 10 and 11 each have a lug 49 between which is pivoted a needle valve lever 50 in the end of which is a thumb screw 51 which bears against the lower end of the rod 46. The thumb screw 51 is prevented from accidentally turning by a clamping screw 52, the lever 50 having a slot 53 extending from the screw 51, as shown in Fig. 3. The outer end of the lever 50 carries a roller 54 which bears against a flat spring 55 which is secured to the wing 20 adjacent the pintle thereof. An arm 56 extends from the wing 20 and a thumb screw 57 passes therethrough and bears against the flat spring 55. 58 is a clamping screw as shown in Fig. 6 for preventing accidental turning of the thumb screw 57. The roller 54 bears against the spring 55 and rolls thereon when the wing 20 is raised so that the rod 46 and valve 43 are lifted coincidently. By adjusting the screw 57 the spring 55 may be raised or lowered to shift the relative position of the lever 50 whereby a greater or less opening of the needle valve may be secured at each lift of the wing.

A pipe 59 extends from the upper part of the mixing chamber 1 to a point just above the cup 42, the upper end of the pipe communicating with a valve 60. A passage 61 extends from the valve 60 back to the chamber 1 at the point above the line of the throttle valve 62, when the latter is closed as indicated by dotted lines Fig. 1. Thus when the throttle valve 62 is entirely closed suction from the engine acting through passage 61 and pipe 59 will suck in air which will inspirate gasolene from the cup 42 and convey the same directly to the cylinder which enables the engine to run at far slower speed with the throttle shut. Obviously this speed of running will depend entirely upon the amount of gasolene which is allowed to leak past the needle valve 43 into the cup 42 and this adjustment is obtained by the thumb screw 51 to raise or lower the normal "closed" position of the valve 43. When the throttle valve 62 is shut no suction is produced within the mixing chamber to lift the wings 20 and thus the needle valve 43 is not at such time lifted so that the only gasolene which will be supplied to the motor is that which may be allowed to escape in small quantities past the needle valve. If desired the thumb screw 51 may be so regulated that the needle valve 43 will be entirely closed when the wings 20 are down in which event, no gasolene is permitted to flow into the cup 42 and hence there is none to be sucked through the pipe 59. Thus the adjustment of the carbureter for very low speeds is obtained by means of the screw 51.

When the throttle valve 62 is opened the suction of the engine acts to lift the wings 17, 18, 19 and 20 and the wings thus collectively assume an indented cone shape as indicated in dotted lines Fig. 1 which concentrates the inrushing air around the nozzle 22 causing it to pick up gasolene from the cup 42 and mix therewith and pass out through the upper end of the mixing chamber 1. As the wing 20 lifts it acts through its arm 56 and spring 55 to tilt arm 50 and thereby lift the rod 46 and needle valve 43. The amount of lift thus given to the needle valve being in direct proportion to the amount of lift given to the wings by the suction and thereby the amount of gasolene which is admitted through the nozzle valve is automatically proportioned to the amount of air introduced into and passed through the carbureter.

By adjusting the side screw 57 the lever 50 may be caused to operate a greater or less distance and thereby correspondingly lift the needle valve 43. As the wing 20 must lift to admit air when the motor is running at high speeds it is obvious that the high speed adjustment is obtained by the screw 57. The ratio of adjustment of the needle valve to the lifting movement of the wings which determines the intermediate speeds may be varied to suit requirements by substituting needle valves 43 of different taper. The valve 60 may be turned to regulate the amount of suction in pipe 59 and amount of gasolene which is allowed to pass therethrough. As shown in Fig. 8 the valve 60 is held against accidental turning by the compression spring 63.

What I claim is:—

1. In a carbureter, a nozzle, a valve for controlling the flow of fuel through the nozzle, an air passage around the nozzle, an automatically variable air inlet controlling means for said air passage comprising a plurality of pivoted segmental wings, and means operated by said inlet controlling means to produce a variable ratio of relative movement between the valve, and said air inlet controlling means.

2. In a carbureter, a nozzle, a tapered valve extending downward into the discharge end of the nozzle in a direction opposed to the discharge of fuel, means outside the nozzle for supporting the valve, an air passage around the nozzle, an automatically variable air inlet controlling means for said air passage comprising a plurality of pivoted segmental wings, and means operated by said inlet controlling means to impart a corresponding definite movement to the valve, and means for regulating the ratio of movement between said last two elements.

3. In a carbureter, a nozzle, an air passage around the nozzle, a plurality of overlapping wings pivoted to swing and vary the air inlet to the air passage, a valve for controlling the passage of fuel through the nozzle, a lever pivoted below said wings and operatively connected with said valve, and means on one of said wings bearing against the lever to tilt the same and lift the valve when the wings lift.

4. In a carbureter, a nozzle, an air passage around the nozzle, a plurality of overlapping wings pivoted to swing and vary the air inlet to the air passage, a valve for controlling the passage of fuel through the nozzle, a lever pivoted below said wings and operatively connected with said valve, a flat spring on one of said wings, a screw in said wing engaging the end of the spring to adjust the same, and a roller on said lever bearing against the spring.

5. In a carbureter, a nozzle, an air passage around the nozzle, a plurality of overlapping wings pivoted to swing and vary the air inlet to the air passage, a valve for controlling the passage of fuel through the nozzle, a rod extending along the nozzle and connected to the valve, a lever pivoted below said wings, a screw in said lever bearing against said rod, and means on one of said wings bearing against said lever to tilt the same and lift the rod and valve when the wings lift.

6. In a carbureter, a nozzle for gasolene, an air passage around the same, a valve for closing the air passage above the nozzle, and means for concentrating suction on a small area at the mouth of the nozzle for lifting gasolene with a slight amount of air from the nozzle and conducting the same past said valve when the latter is closed.

7. In a carbureter, a nozzle and needle valve, an air passage around the nozzle, a throttle valve for closing the passage above the nozzle, a pipe independent of the nozzle and needle valve extending past the throttle valve and connecting with the passage above and below the valve, the lower end of said pipe being close to the mouth of the nozzle, and a valve for controlling the passage of gasolene and air through said pipe.

8. In a carbureter, a nozzle, an air passage around the nozzle, a throttle valve for closing the passage above the nozzle, and a pipe extending past the throttle valve and connecting with the passage above and below the valve, the lower end of said pipe being close to the mouth of the nozzle, and a cup on the mouth of the nozzle for holding a small amount of gasolene.

9. In a carbureter, a nozzle, an air passage around the nozzle, a throttle valve for closing the passage above the nozzle, and a pipe extending past the throttle valve and connecting with the passage above and below the valve, the lower end of said pipe being close to the mouth of the nozzle, and a valve in said pipe operable outside the air chamber.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 2d day of October 1909.

HARRY A. MILLER.

In presence of—
G. T. HACKLEY,
FRANK L. A. GRAHAM.