L. ANDERSON.

CARBURETER.

APPLICATION FILED FEB. 13, 1909.

950,423.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

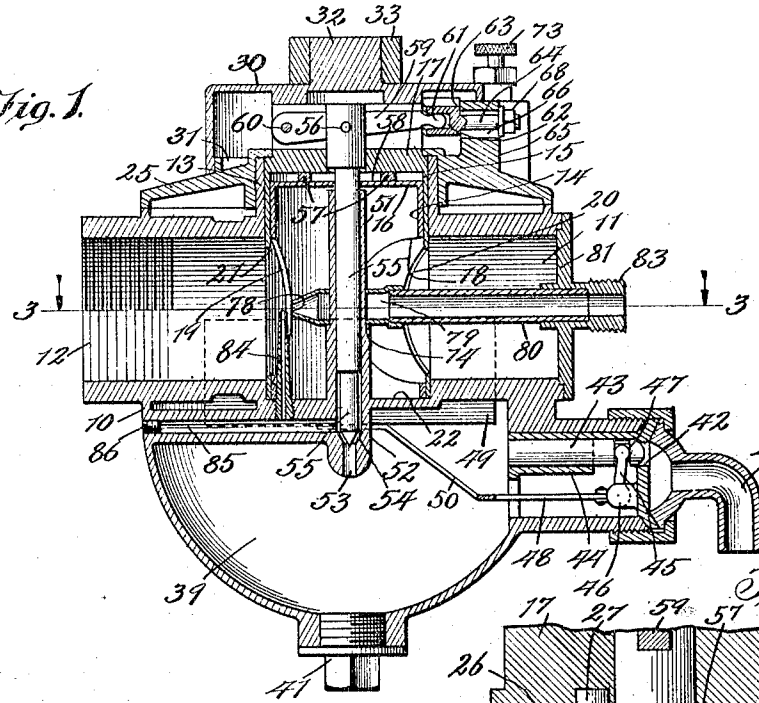


Fig. 9.

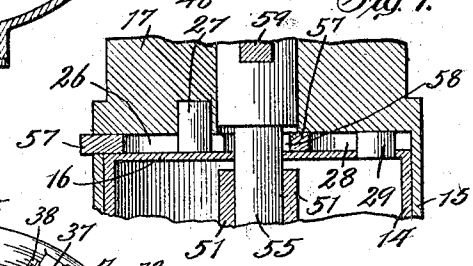


Fig. 2.

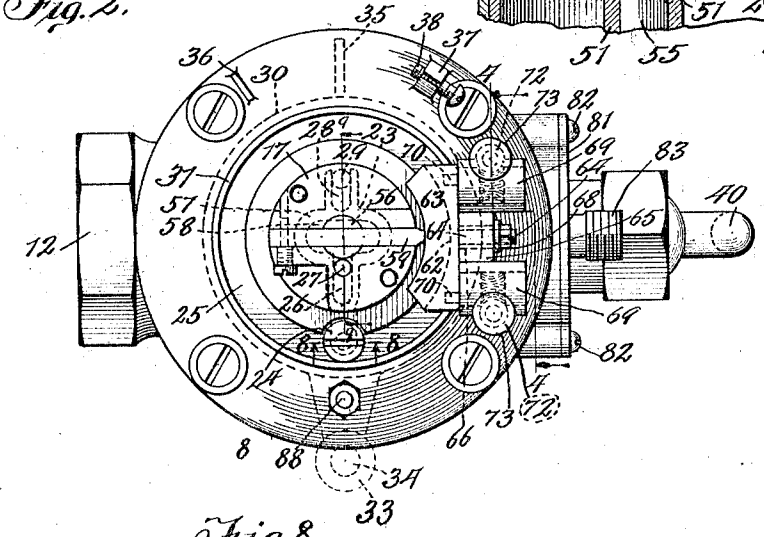
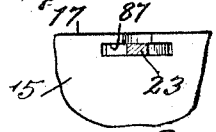


Fig. 8.



Witnesses:

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Inventor:

Lars Anderson

By Dawson & Hopkins

Attys

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2 SHEETS—SHEET 2.

Fig. 3.

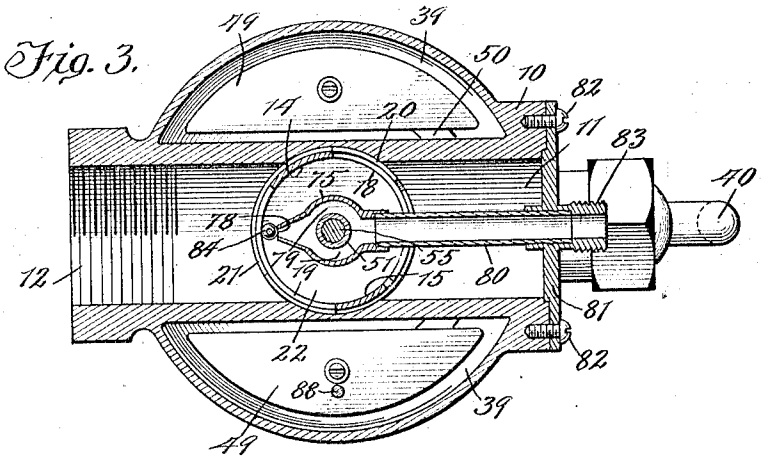


Fig. 4.

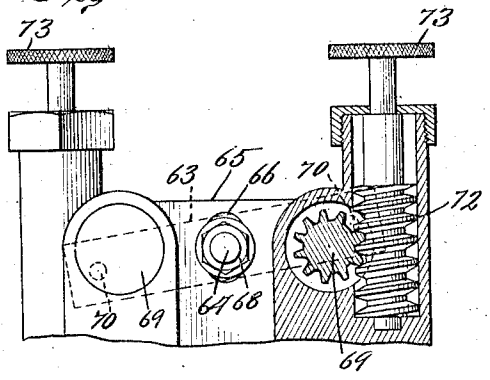


Fig. 5.

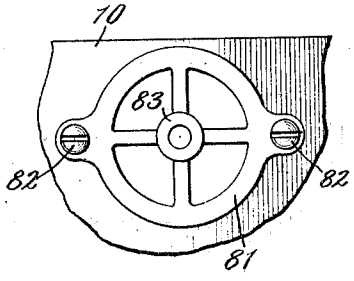


Fig. 6.

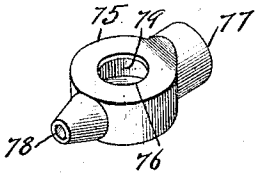
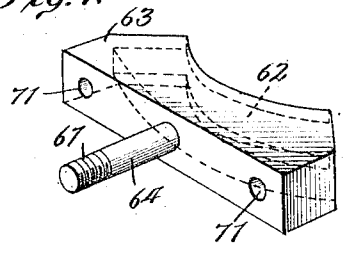


Fig. 7.



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UNITED STATES PATENT OFFICE.

LARS ANDERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO HENRY S. MORTON, OF CRANFORD, NEW JERSEY.

CARBURETER.

950,423. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed February 13, 1909. Serial No. 477,600.

To all whom it may concern:

Be it known that I, LARS ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters for volatilizing or atomizing combustible liquids, such as gasolene, alcohol, kerosene, et cetera, and it has for one of its objects to provide improved means for automatically regulating the supply of gasolene at high and low speeds to suit the requirements of the speed of the engine or other devices to which the carbureter is connected.

A further object is to provide improved means whereby the operation of the throttle will automatically and correspondingly adjust the needle supply valve.

A further object is to provide improved means for varying the adjustment of the needle valve.

A further object is to provide improved means whereby the float will control the height of liquid in the float chamber and which height may be varied by the adjustment of the float.

A further object is to provide an improved atomizer nozzle.

A further object is to provide an improved device of this character which will be simple, durable and compact in construction in which ready access may be had to the parts and which is effective and efficient in operation.

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 the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings, illustrating an embodiment of the invention and in which—

Figure 1 is a longitudinal sectional view of an improved device of this character constructed in accordance with the principles of this invention. Fig. 2 is a detail top plan view with the cap removed. Fig. 3 is a detail sectional view on line 3—3 of Fig. 1. Fig. 4 is an enlarged detail view partly in section on line 4—4 of Fig. 2. Fig. 5 is an enlarged detail view of the air inlet opening. Fig. 6 is a detail perspective view of the atomizer nozzle. Fig. 7 is a detail perspective view of the adjustable member for regulating the movement of the needle valve. Fig. 8 is a detail sectional view on the line 8—8 of Fig. 2. Fig. 9 is an enlarged detail sectional view on line 9—9 of Fig. 2.

Referring more particularly to the drawings and in the present exemplification of the invention the numeral 10 designates a housing having an inlet port 11 in one side and an outlet port 12 in the other side, preferably arranged directly in line with the inlet port. The housing may be of any desired size and configuration and arranged at the center thereof is a cylindrical portion 13, which has communication with the inlet and outlet ports.

Arranged within the cylindrical portion 13 is a throttle comprising two cylindrical members 14, 15, which are respectively provided with a closed end 16, 17, and these cylindrical members 14, 15, are arranged concentrically with each other with their closed extremities adjacent and spaced from each other and upon an upright axis. The cylindrical members are provided with openings 18, 19, 20, 21, which are adapted to register with each other in line with the inlet and outlet openings 11, 12. The open ends of the cylindrical members 14, 15, are adapted to rest upon the bottom 22 of the cylindrical portion 13.

Arranged in the space between the closed ends 16, 17, of the cylindrical members 14, 15, is a member designated generally by the reference numeral 23 (see Fig. 2) which is pivotally supported by one end as at 24 to a fixed portion 25 of the housing 10. This member 23 is provided with a slot 26 extending longitudinally thereof adjacent the pivot 24 into which projects a depending pin or lug 27 which is supported by the closed extremity 17 of the cylindrical member 15. The member 23 is provided with a second elongated slot 28 adjacent the free end thereof to form a bifurcated extremity into which slot projects a pin or lug 29 which is supported by and extends upwardly from the closed end 16 of the cylindrical member 14 of the throttle, so that when one of the cylindrical members of the throttle is axially rotated, the other cylindrical member will be correspondingly axially rotated to vary the sizes of the openings 18, 19, 20 and 21 in the sides thereof.

The members of the throttle may be ad-

justed by means of a cap 30, which is adapted to surround an upwardly projecting flange 31 on the top 25 of the housing, and secured to the cap in any desired or suitable manner, preferably to a projecting portion 32 thereof, is an operating handle 33, which is provided with an eye 34 in the extremity thereof by means of which it may be connected to a suitable operating rod.

The cap 30 may be provided with a laterally projecting lug or extension 35 arranged opposite to the handle 33 which is adapted to project and move between spaced stops 36, 37, on a fixed portion of the housing. One of the stops, preferably the stop 37, is provided with an adjustable member 38 for varying the movement of the projection 35 in one direction and thereby limit the axial rotation of the cylindrical members of the throttle.

The housing 10 is provided with a chamber 39 which has an inlet 40 through which latter the liquid to be vaporized enters the chamber, and the chamber may be provided with a clean-out plug in the bottom thereof.

A valve seat 42 is provided in the inlet 40, with which coöperates a sliding valve 43 mounted in a suitable support or bearing 44. A yoke 45 is provided which is journaled to a suitable support 46 for pivotal movement and the arms of the yoke are adapted to engage in a recess 47 in the valve 43 for reciprocating the latter in its bearings to seat or unseat the valve as the yoke is moved.

Secured to the yoke 45 is a member 48 which extends into the chamber 39 and secured to this member 48 are floats 49 which are preferably connected by means of a suitable connecting member 50, so that the floats will stand on each side of the cylindrical portion 13 of the housing.

As the liquid rises in the chamber 39 the floats will rise and at the same time will cause the yoke 45 to be rocked about its pivot by means of the member 48 to seat the valve 43 and thereby shut off the supply of liquid to the chamber. When the floats descend the yoke 45 will be moved in the opposite direction to unseat the valve 43 to permit the liquid to flow into the chamber.

Arranged within the cylindrical portion 13 of the housing and also extending into the throttle from the open ends thereof is a cylindrical member 51 which extends through the bottom 22, as at 52, of the cylindrical portion 13 and is provided with an opening 53 communicating with the chamber 39. The cylindrical member 51 is provided with a valve seat 54 preferably adjacent the extremity 52 and a needle valve 55 is arranged within the cylindrical member 51, which cooperates with the valve seat 54 to close the opening 53. The upper extremity 56 of the needle valve 55 preferably projects through the closed ends 16, 17 of the throttle members and extends beyond the closed end 17 and into the cap 30. The member 23 which is arranged within the space between the closed ends 16, 17, of the throttle members is provided with a laterally enlarged portion 57 (see Fig. 2) having a slot 58 therein and through which the extremity of the needle valve 55 projects, the laterally alongated slot being provided to permit the throttle members to be axially rotated when the cap is rotated.

Pivotally mounted intermediate its ends, within the cap 30, and upon the extremity 56 of the needle valve 55, is an arm or lever 59, one extremity of which latter is pivotally secured as at 60 to the cap, so that when the cap is rotated the arm or lever 59 will be bodily rotated and the needle valve 56 will be axially rotated. The other extremity 61 of the arm or lever 59 projects into an open slotted portion 62 in a member 63 which forms a track or way. This member 63 is provided with a laterally projecting stud 64 which extends from the face opposite to that in which the slot 62 is arranged, and the housing 10 is provided with an upwardly projecting portion 65 having a slot 66 through which the stud 64 passes. The slot 66 is preferably elongated vertically and the extremity of the stud 64 is provided with screw threads 67 adapted to receive a nut 68 for holding the member 63 against displacement. As the cap, and the arm or lever 59, are rotated, the extremity 61 of the latter will move within the slot 62.

In order to automatically raise and lower the needle valve 55 to unseat or seat the same with respect to the valve seat 54, the member 63 is adapted to be adjusted about the stud 64 as an axis, which stud 64 is preferably located intermediate its ends, so as to raise and lower the respective ends of the member.

Any suitable means may be provided for thus adjusting the member 63 and for this purpose there may be provided a pair of worm members 69 which are journaled in a fixed portion of the housing, preferably the upwardly projecting portion 65 thereof, and adjacent the ends of the member 63. The worm members 69 are preferably arranged horizontally and are each provided with a cap or projecting lug 70 arranged eccentrically with relation thereto and these caps or eccentric lugs 70 are adapted to project into suitable apertures or openings 71 in the respective ends of the member 63 so that by axially rotating the worm members 69, the member 63 will be moved about the stud 64 as a pivot to raise and lower the respective ends thereof and thereby incline the track or way formed by the slot 62 in the member. When the member 63 is thus adjusted it will be apparent that by imparting an axial rotation to the cap 30 and the needle valve 55, the extremity 63 of the arm or lever 59 will

be moved in the inclined slot or way 62 and the needle valve will be raised or lowered according to the direction of rotation of the cap or the movement of the extremity of the arm in the slot. By varying the angle of adjustment of the member 63, it will be apparent that the degree of adjustment of the needle valve 55 may be varied.

It will also be apparent that as the throttle members 14, 15, are adjusted to vary the supply of air, the needle valve will be simultaneously and automatically adjusted.

In order to adjust the member 63, suitable worm screws 72 may be provided which are preferably arranged to project beyond the top of the cap, and each of the screws is provided with a knob or handle 73 by means of which they may be rotated.

The cylindrical member 51 which supports the needle valve 55 is provided with an external peripheral shoulder 74 (see Fig. 1) and an atomizer nozzle designated generally by the reference numeral 75 is provided with an aperture 76 extending therethrough intermediate the supply end 77 and the discharge end 78 of the nozzle. This nozzle 75 is preferably hollow to form a channel 79 (shown more clearly in Figs. 1 and 3) which communicates with the inlet and the discharge outlet of the nozzle. The nozzle is adapted to be sleeved upon the tubular member 51 so as to engage and rest upon the shoulder 74 to be supported thereby, with the discharge end 78 thereof directed toward the outlet opening 12 of the housing. A tubular member 80 is connected by one extremity to the inlet end 77 of the nozzle and extends through the inlet opening 11 of the housing. The free end of the member 80 is supported by a partial closure or grating 81 which is removably secured by means of suitable bolts or screws 82 to the inlet end 11 of the housing. This member 81 is preferably provided with a threaded extension 83 by means of which a suitable pipe may be connected to discharge a blast of air through the nozzle 75.

The discharge end of the nozzle 75 terminates within the inner cylindrical member 14 of the throttle, and an upright nozzle 84 is supported preferably by the bottom 22 of the cylindrical portion 13 of the housing and communicates with a passage 85 in the housing, which passage has communication with the opening 53 in the extremity 50 of the tubular member 51. This tubular member or nozzle 84 is arranged to extend transversely of the discharge end 78 of the nozzle 75 and the free extremity of the member 84 terminates adjacent the end of the nozzle so that a blast of air fluid through the nozzle will be directed across the extremity of the tubular member 84 to create a suction therein, which will draw the liquid from the chamber 39, the liquid being discharged in the form of vapor through the discharge outlet 12 of the housing.

The passage 83 preferably extends through the side of the housing and a plug 86 may be provided which forms a closure for the passage. When the passage becomes clogged, the plug 86 may be removed to permit cleaning.

The wall of the cylindrical member 15 below the closed end 17 thereof is provided with a slot 87 (see Fig. 8) to permit the free movement of the member 15 with respect to the member 23.

With this improved construction it will be apparent that the degree of movement of the needle valve 55 may be varied to any desired extent by adjusting the worm screws 72, without removing any of the parts of the mechanism. It will also be apparent that the supply of liquid may be varied at high or low speeds to suit the requirements of the speed of the engine.

In order to prime the carbureter a member 88 may be provided in the form of a rod or bar which is adapted to extend through the top 25 of the housing 10 so as to engage and rest upon one of the floats 49. This bar or member 88 is of such a length that when the floats are normally in their highest position to close the inlet opening, one extremity thereof will project beyond the top of the housing so that the operator may tap upon the extremity with his finger to vibrate the float to force a portion of the liquid through the tubular member 84.

In order that the invention might be fully understood the details of the foregoing embodiment thereof have been thus specifically described but

What is claimed as new is—

1. In a carbureter, the combination of an air induction passage, a throttle for controlling the air passage, a liquid nozzle having an outlet in said passage, a valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve cooperates means for adjusting the throttle, and means whereby the adjustment of the throttle will automatically and simultaneously adjust and rotate the said valve with respect to its seat.

2. In a carbureter, the combination of an air induction passage, a throttle for controlling the air passage, a liquid nozzle having an outlet in said passage, a valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve cooperates means for adjusting the throttle, means whereby the adjustment of the throttle will automatically and simultaneously adjust and rotate the said valve with respect to its seat, and means whereby the relative degree of movement of the valve with respect to the movement of the throttle may be varied.

3. In a carbureter, the combination of an air induction passage, a throttle for controlling said passage, a liquid nozzle having an outlet in said passage, a longitudinally shiftable and axially rotatable valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve cooperates, means for operating the throttle, and means controlled by the movement of the throttle for longitudinally shifting and axially rotating the said valve with respect to said seat.

4. In a carbureter, the combination of an air induction passage, an axially rotatable throttle for controlling said passage, a liquid nozzle having an outlet in said passage, a longitudinally shiftable and rotatable valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve coöperates means for axially rotating the throttle and means controlled by said axial rotation for simultaneously shifting the valve longitudinally and rotating the same with respect to the valve seat.

5. In a carbureter, the combination of an air induction passage, an upright tubular throttle having apertures in the wall thereof registering with each other and communicating with the passage, a liquid nozzle having an outlet in said throttle and discharging into the said passage through one of the apertures in the throttle, an upright valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve coöperates means for axially rotating the throttle to control the air passage, and means whereby the rotation of the throttle will simultaneously adjust and rotate the said valve with respect to the valve seat.

6. In a carbureter, the combination of an air induction passage, an upright tubular throttle having registering apertures in the wall thereof communicating with the passage, a liquid nozzle having an outlet in said throttle and discharging into the said passage through one of the apertures in the throttle, an upright longitudinally shiftable valve for controlling the supply of liquid to the nozzle, means for axially rotating the throttle to control the air passage, means whereby the rotation of the throttle will longitudinally shift the valve and means for varying the longitudinal movement of the valve with respect to the throttle.

7. In a carbureter, the combination of an air induction passage, an upright throttle, said throttle comprising two telescoped tubular members, said members each having apertures in the wall thereof registering with the apertures in the other member, means for axially rotating one of the members, means whereby the axial rotation of said member will simultaneously rotate the other member to vary the size of the registering openings to control the air passage, a liquid nozzle having an outlet in said throttle and discharging into the air passage through registering apertures in the throttle members, a valve for controlling the supply of liquid to the nozzle, and means whereby the movement of the throttle members will automatically adjust said valve.

8. In a carbureter, the combination of an air induction passage, an upright throttle, said throttle comprising two telescoped tubular members, said members each having apertures in the wall thereof registering with the apertures in the other member, means for axially rotating one of the members, means whereby the axial rotation of said member will simultaneously rotate the other member to vary the size of the registering openings to control the air passage, a liquid nozzle having an outlet in said throttle and discharging into the air passage through registering apertures in the throttle members, a valve for controlling the supply of liquid to the nozzle, means whereby the movement of the throttle members will automatically adjust the said valve with respect to the throttle, and means for varying the said movement of the valve with respect to the throttle at will.

9. In a carbureter, the combination of an air induction passage, an upright throttle, said throttle comprising two telescoping tubular members each having a closed end, said ends being spaced from each other, means disposed within the space between said ends for connecting said members for movement with respect to each other, said members being provided with registering apertures in their walls communicating with the air passage, a liquid nozzle having an outlet in the throttle and discharging into the passage through registering apertures in the throttle, a valve for controlling the supply of liquid to the nozzle, means for adjusting the throttle to control the air passage, and means controlled by the movement of the throttle for adjusting the valve.

10. In a carbureter, the combination of an air induction passage, an upright throttle, said throttle comprising two telescoping tubular members each having a closed end, said ends being spaced from each other, a member pivotally mounted upon a fixed support and extending into the space between the said ends, said members being provided with a plurality of slots, each of the closed ends of the throttle members being provided with a projection extending into one of the slots whereby the movement of one of the throttle members will correspondingly move the other, said throttle members having registering apertures in their walls, a liquid nozzle having an outlet in the throttle and discharging into the air passage through registering apertures in the throttle members, a valve for controlling the

supply of liquid to the nozzle, means for adjusting one of the throttle members to control the air passage, and means controlled by the said adjustment of the throttle member for simultaneously adjusting the said valve.

11. In a carbureter, the combination of an air induction passage, an upright throttle, said throttle comprising two telescoping tubular members each having a closed end, said ends being spaced from each other, a member pivotally mounted upon a fixed support and extending into the space between the said ends, said member being provided with a plurality of slots, each of the closed ends of the throttle members being provided with a projection extending into one of the slots whereby the movement of one of the throttle members will correspondingly move the other, said throttle members having registering apertures in their walls, a liquid nozzle having an outlet in the throttle and discharging into the air passage through registering apertures in the throttle members, a valve for controlling the supply of liquid to the nozzle, means for adjusting one of the throttle members to control the air passage, means controlled by the said adjustment of the throttle member for simultaneously adjusting the said valve, with respect to the throttle, and means for varying the movement of said valve at will.

12. In a carbureter, the combination of an air induction passage, a throttle for controlling said passage, a liquid nozzle having an outlet in said passage, a longitudinally movable and axially rotatable valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve coöperates, an arm connected to and extending laterally beyond the valve, a cam engaged by the arm, and means for adjusting the throttle to control the air passage and to move the arm over the cam for automatically shifting and rotating said valve with respect to the valve seat.

13. In a carbureter, the combination of an air induction passage, a throttle for controlling said passage, a liquid nozzle having an outlet in said passage, a longitudinally movable and axially rotatable valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve coöperates, an arm connected to and extending laterally beyond the valve, a cam engaged by the arm, means for adjusting the throttle to control the air passage and to move the arm over the cam for automatically shifting and rotating said valve with respect to the valve seat, and means for adjusting the cam to vary the degree of longitudinal movement of the valve.

14. In a carbureter, the combination of an air induction passage, a throttle for controlling the passage, a liquid nozzle discharging into the passage, a longitudinally movable valve for controlling the supply of liquid to the nozzle, an arm extending laterally from the valve, a cam, comprising a pivotally mounted guide way in which the end of the arm is movable, means for adjusting the throttle and for moving the arm in the way to adjust the valve, and means for moving the way about its pivot to vary the angle of inclination thereof.

15. In a carbureter, the combination of an air induction passage, a throttle for controlling the passage, a liquid nozzle discharging into the passage, a longitudinally movable valve for controlling the supply of liquid to the nozzle, an arm extending laterally from the valve, a cam comprising a pivotally mounted guide way in which the end of the arm is movable, means for adjusting the throttle and for moving the arm in the way to adjust the valve, a worm member operatively related to the cam for adjusting the same to vary the angle of inclination of the way, and a worm screw for adjusting said worm member.

16. In a carbureter, the combination of an air induction passage, a throttle for controlling the passage, a liquid nozzle discharging into the passage, a longitudinally movable valve for controlling the supply of liquid to the nozzle, an arm extending laterally from the valve, a cam comprising a pivotally mounted guide way in which the end of the arm is movable, means for adjusting the throttle and for moving the arm in the way to adjust the valve, a worm member provided with a crank engaging the cam, and a worm screw for operating the said worm member to adjust the cam to vary the angle of inclination of the said guide way.

17. In a carbureter, the combination of an air induction passage, an upright and axially rotatable throttle for controlling the passage, a liquid nozzle discharging into the passage, an upright and longitudinally shiftable valve for controlling the supply of liquid to the nozzle, an arm pivotally connected intermediate its ends to the valve and extending transversely thereof, one end of the arm being pivoted to the throttle, a cam comprising a guide way mounted on a fixed support and into which guide way the other end of the arm projects and is movable, said guide way being inclined to the horizontal, and means for adjusting the throttle to control the passage and for moving the end of the arm in the guide way to shift the said valve.

18. In a carbureter, the combination of an air induction passage, an upright and axially rotatable throttle for controlling the passage, a liquid nozzle discharging into the passage, an upright and longitudinally shiftable valve for controlling the supply of liquid to the nozzle, an arm pivotally connected intermediate its ends to the valve and

extending transversely thereof, one end of the arm being pivoted to the throttle, a cam comprising a guide way adjustably mounted on a fixed support and into which guide way the other end of the arm projects and is movable, means for adjusting the throttle and for moving the end of the arm in the guide way, and means for adjusting the cam for varying the angle of inclination of the guide way.

19. In a carbureter, the combination of an air induction passage, an upright and axially rotatable throttle for controlling the passage, a liquid nozzle discharging into the passage, an upright and longitudinally shiftable valve for controlling the supply of liquid to the nozzle, an arm pivotally connected intermediate its ends to the valve and extending transversely thereof, one end of the arm being pivoted to the throttle, a cam comprising a guide way pivotally mounted intermediate its ends on a fixed support and into which guide way the other end of the arm projects and is movable, a worm member having connection to the cam on each side of its pivot for moving the same about its pivot, and a worm screw having engagement with each of said worm members.

20. In a carbureter, the combination of a liquid chamber having an inlet, a reciprocating valve controlling the inlet, a float, a connection between the float and the valve for adjusting the latter, an air induction passage, a throttle controlling said passage, a liquid nozzle having communication with the chamber and discharging into the passage, a valve for controlling the supply of liquid to the nozzle, a valve seat with which the valve coöperates means for adjusting the throttle and means whereby the adjustment of the throttle will correspondingly and automatically adjust and axially rotate said valve with respect to the valve seat.

21. In a carbureter, the combination of a liquid chamber, an air induction passage, an upright cylindrical tubular throttle having registering openings in its wall for controlling the passage, a liquid nozzle having an outlet in the throttle and discharging into the air passage through the throttle, an upright tubular valve casing having communication with the chamber and the nozzle, a valve in the casing for controlling the supply of liquid to the nozzle, said valve extending through the throttle, a blast nozzle removably supported by and surrounding the valve casing and discharging across the liquid nozzle, said blast nozzle having a source of supply, and means for adjusting the throttle and for simultaneously and automatically adjusting the valve.

22. In a carbureter, the combination of a liquid chamber, an air induction passage, an upright cylindrical tubular throttle having registering openings in its wall for controlling the passage, a liquid nozzle having an outlet in the throttle and discharging into the air passage through the throttle, an upright tubular valve casing having communication with the chamber and the nozzle, a valve in the casing for controlling the supply of liquid to the nozzle, said valve extending through the throttle, said casing having a peripheral shoulder, a hollow blast nozzle sleeved upon the casing and resting upon the shoulder and discharging across the liquid nozzle, a supply pipe located in the air passage, one end of the pipe being connected to the nozzle, means for supporting the other end of the pipe, and means for adjusting the throttle and for simultaneously and automatically adjusting the valve.

23. In a carbureter, the combination of an air induction passage, a throttle for controlling the passage, a liquid nozzle discharging into the passage, a longitudinally movable valve for controlling the supply of liquid to the nozzle, an arm, a cam with which the arm coöperates, one of the last two elements being operatively connected to the valve, means for moving one of said elements with respect to the other to adjust the valve, and means for adjusting one of the said elements with respect to the other to vary the adjustment of the valve.

24. In a carbureter, the combination of an air induction passage, a throttle controlling said passage, said throttle comprising two telescoped tubular members, each of said members being provided with apertures in their walls, the apertures in one member being adapted to register with the apertures in the other member and to communicate with the air induction passage, means for axially rotating one of the members, means whereby the rotation of one throttle member will adjust the other throttle member to cause the apertures to close toward and open from the center of said passage, a liquid nozzle having an outlet in the passage, a valve for controlling the outlet, and means whereby the adjustment of the throttle will automatically adjust the valve.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 9th day of February A. D. 1909.

LARS ANDERSON.

Witnesses:
J. H. JOCHUM, Jr.,
M. W. CANTWELL.