No. 828,228. PATENTED AUG. 7, 1906

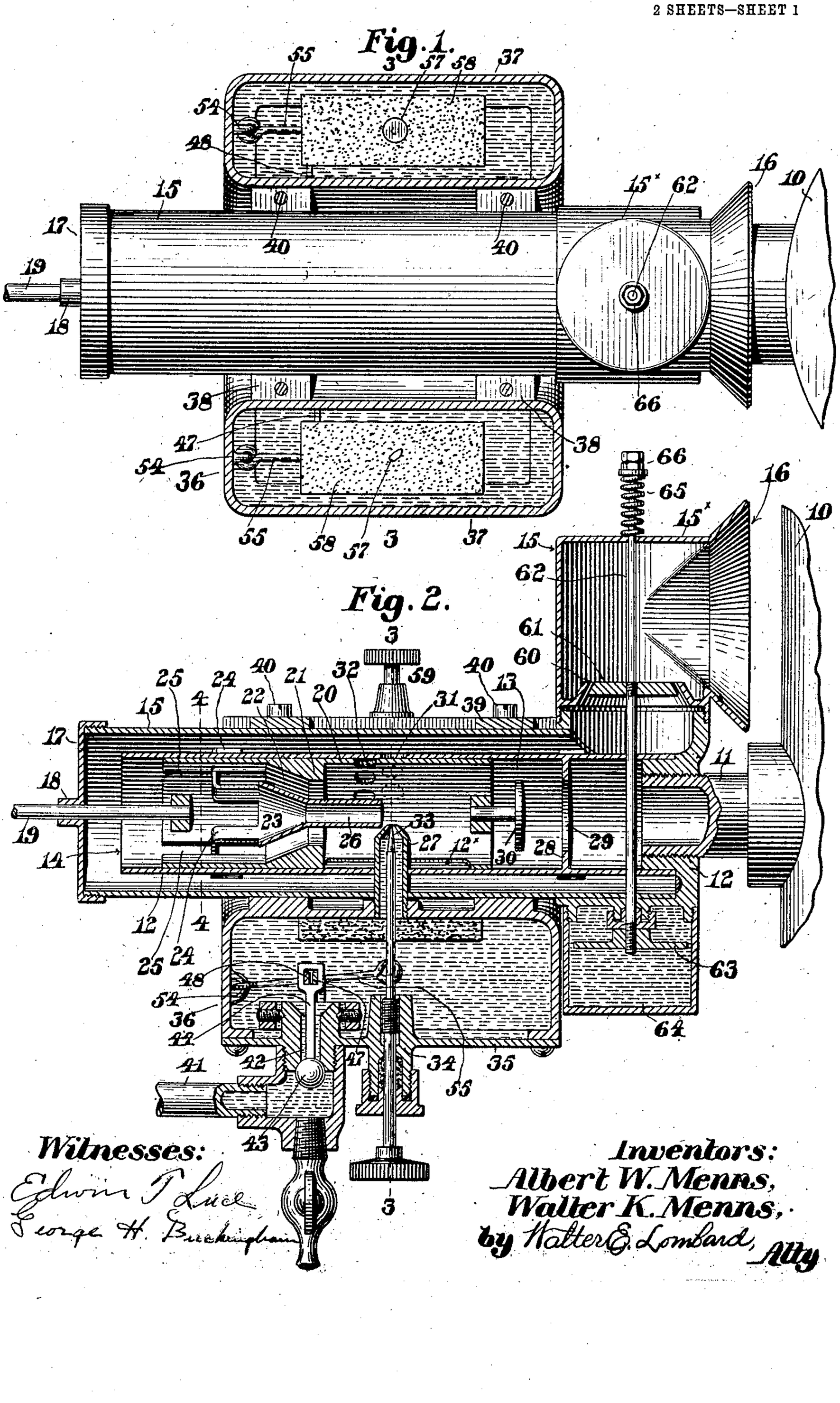
A. W. & W. K. MENNS.

CARBURETER.

APPLICATION FILED OCT. 26, 1904.

2 SHEETS—SHEET 1

Fig. 1.



Witnesses:
Edwin F. Lucas
George H. Buckingham

Inventors:
Albert W. Menns,
Walter K. Menns,
by Walter E. Lombard, Atty

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2 SHEETS—SHEET 2.

Fig. 3.

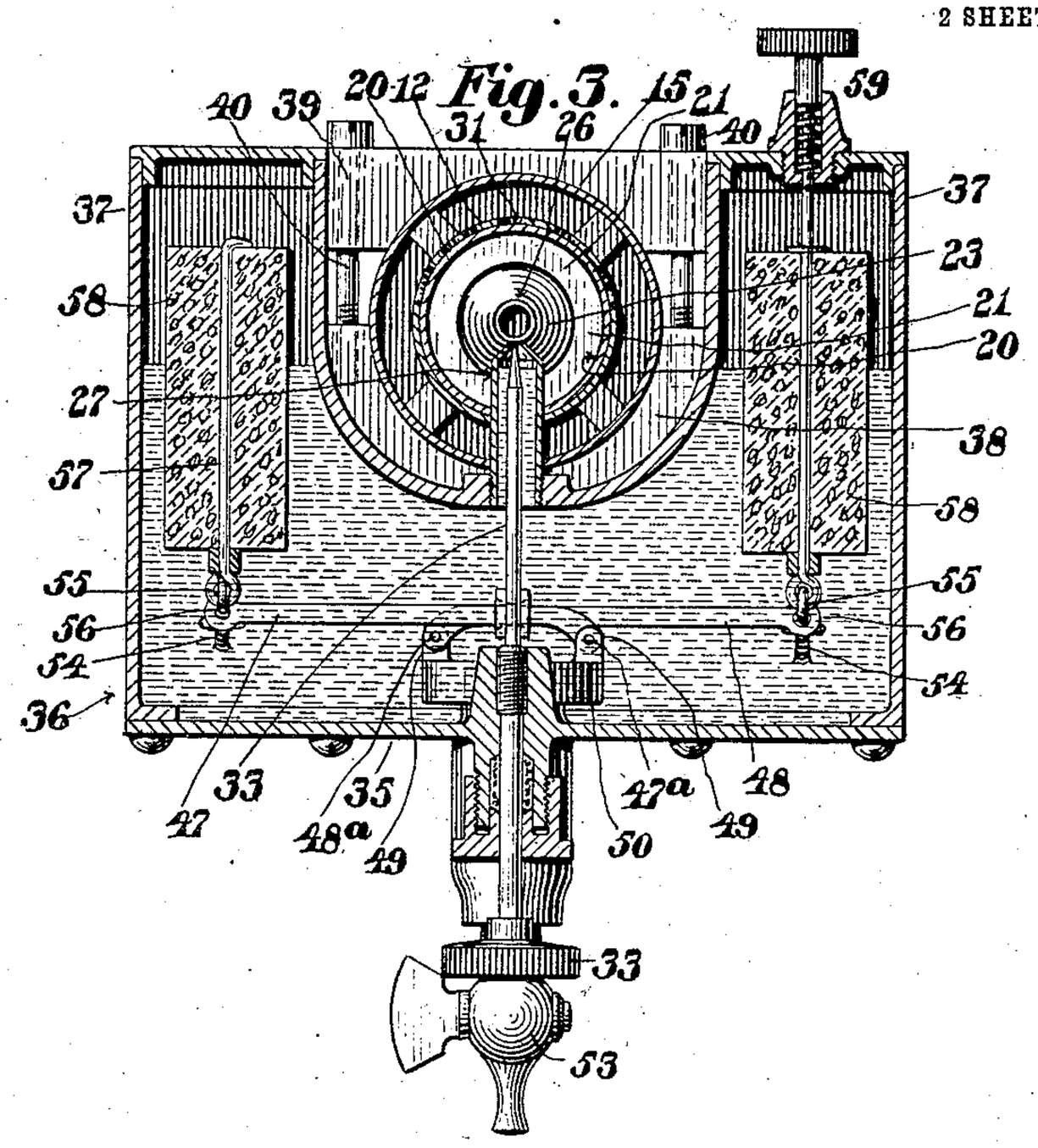


Fig. 4.

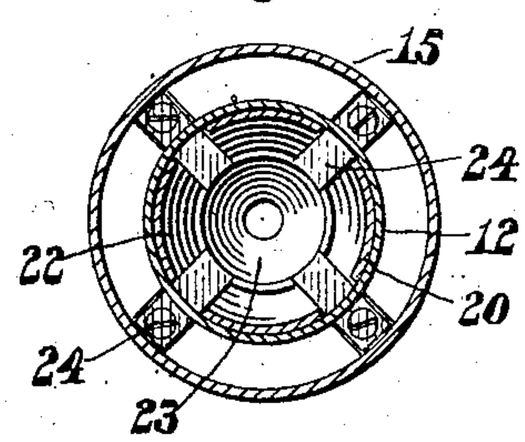
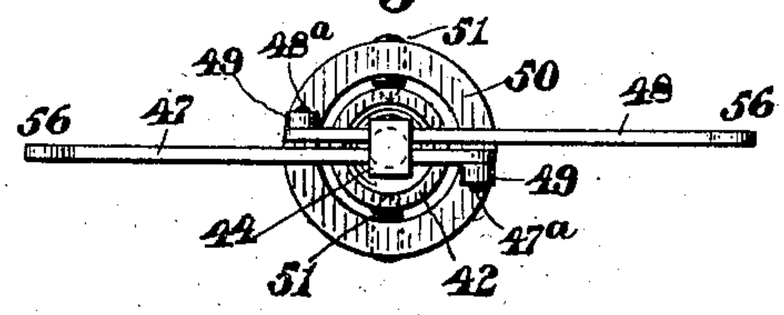


Fig. 5.



Witnesses:
Edwin T. Luce
George H. Buckingham

Inventors:
Albert W. Menns,
Walter K. Menns;
by Walter E. Lombard,
Atty.

UNITED STATES PATENT OFFICE.

ALBERT W. MENNS, OF MALDEN, AND WALTER K. MENNS, OF EVERETT, MASSACHUSETTS.

CARBURETER.

No. 828,228. Specification of Letters Patent. Patented Aug. 7, 1906.

Application filed October 26, 1904. Serial No. 230,061.

To all whom it may concern:

Be it known that we, ALBERT W. MENNS, a resident of Malden, and WALTER K. MENNS, a resident of Everett, in the county of Middlesex and State of Massachusetts, citizens of the United States of America, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to carbureters, and has for its object the production of a device which may be attached in close proximity to the engine and in which the air admitted to the carbureting-chamber passes along between the casing thereof and an exterior cylinder, the temperature thereof being increased by heat radiated from the engine.

It provides for an automatic device for regulating the inlet of air to suit the demands of the engine.

It further provides for an effective mechanism whereby the admission of air to the carbureting-chamber and the emission through the outlet of the gas generated may be effectively controlled by one lever.

It further provides for simple mechanism for controlling the level of the hydrocarbon in the hydrocarbon-inlet and maintaining it at a fixed point whatever may be the inclination of the device.

Moreover, it provides for an effective mechanism whereby the inlet to the hydrocarbon-chamber of the hydrocarbon from the main supply may be controlled as effectively when the device is inclined as when horizontal.

It consists in certain other novel features of construction and arrangement of parts, which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings, Figure 1 represents a plan of the device embodying the features of this invention, the upper portion of the hydrocarbon-reservoir being cut in section. Fig. 2 represents a sectional elevation of the same, the cutting plane being on line 2 2 on Fig. 1. Fig. 3 represents a transverse sectional elevation of the same, the cutting plane being on line 3 3 on Fig. 2. Fig. 4 represents a sectional elevation of one end of the carbureting-chamber looking toward the air-controlling nozzle and valve, the cutting plane being on line 4 4 on Fig. 2; and Fig. 5 represents a detail in plan of the mechanism for controlling the valve for the supply-inlet to the hydrocarbon-tank.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a portion of an engine which is provided with a lateral nipple 11, to which is secured the casing 12 of a carbureting-chamber 13, the opposite end of said chamber being open, as at 14. Surrounding the casing 12 is a larger cylinder 15, the end of which nearest the engine is provided with a vertical branch 15*, having a flaring mouth 16 facing the engine and adapted to catch the air and pass it along the exterior of said chamber 13 through the open end 14 thereof. The rear end of the cylinder 15 is closed, as at 17, and is provided with a bearing 18 for the stem 19 of a cylindrical member 20. The cylindrical member 20 fits the inner bore of the chamber 12 and is adapted to be moved longitudinally therein by means of the stem 19. The interior of the member 20 is provided with a partition 21, through which extends a frusto-conical bore 22, the inner perimeter of which is adapted to fit the frusto-conical air-inlet nozzle 23, secured to the cylinder 15 by legs 24, extending through openings in the casing 12, and longitudinal slits 25 in the rear end of the cylindrical member 20.

The inner end of the frusto-conical air-inlet nozzle 23 is provided with a tubular end 26, the front of which is in close proximity to the discharge-orifice of the hydrocarbon-inlet 27, which extends through the cylinder 15, and a longitudinal slot 12* in the member 20 into the carbureting-chamber in front of and in close proximity to the mouth of the nozzle 26 and at right angles thereto. The front end of the casing 12 is provided with a partition 28, through which is an opening 29, adapted to be closed by a valve 30, secured to the front end of the member 20. Just above and to the rear of the mouth of the nozzle 26 the member 20 is provided with a plurality of openings 31, adapted to register with openings 32 in the casing 12 immediately above the hydrocarbon-inlet 27.

The amount of hydrocarbon passing through the discharge-orifice of the hydrocarbon-inlet 27 is regulated by a needle-valve 33, mounted in a boss 34 in the under side 35

of the hydrocarbon-tank 36. The tank 36 is U-shaped in cross-section, and the sides 37 thereof extend upwardly on either side of the cylinder 15 and are clamped thereto by means of the saddle 38 and clamping-piece 39, secured thereto by screws 40.

The hydrocarbon is admitted to the tank 36 from any source of supply through the pipe 41 and the supply-inlet 42, the passage of the hydrocarbon through the inlet 42 being regulated by the ball-valve 43, secured to the depending member 44, the upper end of which is provided with an eye, through which pass in opposite directions the arms 47 and 48, pivoted, respectively, at 47^a and 48^a to ears 49, extending upwardly from a ring 50. The ring 50 is pivoted at 51 to the boss 52 of the under side of the tank 35, through which boss passes the hydrocarbon-supply inlet 42. Beneath the valve 43 the hydrocarbon-passage is provided with a petcock 53. To eyes 54 at the rear of the hydrocarbon-tank 36 are articulated rods 55, which pass through eyes 56 on the outer ends of the arms 47 48 and have articulated to the outer ends thereof rods 57, to which are secured floats 58, of cork or other suitable material. The upper end of one of the rods 57 bears against a member 59, by which the float mechanism may be operated by hand when desired. The floats 58 regulate the level of the hydrocarbon in the tank 36, so that the level is always maintained within an eighth of an inch of the discharge-orifice of the hydrocarbon-inlet 27 of the carbureting-chamber 13. By providing the two floats one on either side of the valve 43, controlling the admission of hydrocarbon-supply to the tank 36, this valve is maintained in proper position no matter what may be the inclination of the device, and by the same mechanism the level of the hydrocarbon in the inlet will always be maintained at a certain distance from the discharge-orifice thereof at whatever angle the device may be tipped. This prevents the flooding of the carbureting-chamber by a surplus amount of hydrocarbon rushing through the hydrocarbon-inlet 27, as is often the case in carbureters of ordinary construction when the carriage or the device is tipped at various angles, which is very objectionable. In the admission of air to this carbureter it is essential that it should pass in close proximity to the engine, which the flaring inlet 16 of the carbureter faces. In this manner the air in passing to the carbureting-chamber is subjected to the heat radiating from the engine and its nipple and passes into the carbureting-chamber in a sufficiently heated condition to be effective in its operation. At the start the valve 22 will be in a position at the rear of the casing 12, or at the left of Fig. 2, so that the passage between the frusto-conical bore 22 and the frusto-conical nozzle 23 will be closed, so that all admission of air to the carbureting-chamber 13 will be through the nozzle 26. The air will pass through the nozzle 26 across the discharge-orifice of the hydrocarbon-inlet 27 and will indraw the hydrocarbon into the carbureting-chamber 13. In the passage to the outlet 29 the particles of hydrocarbon will come in contact with the plate 30 and will be more thoroughly disintegrated by impact therewith, so that when the air and hydrocarbon has passed the plate 30 and through the outlet 29 into the nipple 11 of the engine the mixture will have been thoroughly accomplished. After the carbureter has been started and operated for a short time it is desired to admit more air to the carbureting-chamber and this may be accomplished by a slight movement of the rod 19, which will open up the passages between the frusto-conical bore 22 and the nozzle 23, to permit the air to pass therethrough as well as through the nozzle 26. It is obvious the size of this passage may be regulated by a greater or less movement of the member 20. Oftentimes when in full operation and under certain weather conditions it is desirable to secure a greater supply of air than can be secured through the nozzle 26 or the passages around said nozzle, and this additional supply of air is produced by a movement of the same lever (not shown) operating to secure a further movement in the same direction of the stem 19 to cause the plurality of openings 31 to register with the openings 32 in the casing 12 of the carbureting-chamber, so that the air admitted through the mouth 16 may pass directly through these openings 32 31 to the carbureting-chamber. It will be seen by this construction that a further movement of said lever and the member 20 will cause the valve 30 to coöperate with the outlet-opening 29 to close this opening to a greater or less extent, as desired. Heretofore these different operations have been produced usually by different devices operated by different levers; but in the present instance the variations in the admissions of air to the carbureting-chamber and the closing of the outlet are all provided for by the operation of the same lever (not shown) operating upon the stem 19, the various operations being secured by a continuation of a longitudinal movement of said stem 19 in the same direction.

The vertical branch 15* at the front of the cylinder 15 is provided with a frusto-conical opening 60, closed by a diaphragm-valve 61, secured to a stem 62, passing through the casing 12 and having adjustably secured to its lower end a diaphragm 63. The diaphragm 63 is of a somewhat less diameter than the interior bore of the dash-pot 64, filled with oil and in which said diaphragm is adapted for vertical reciprocation, thereby increasing or decreasing the opening 60 by

means of the vertical movement of the valve 61, moving with said stem 62. The normal position of said valve is as shown in the drawings, and this position is maintained by means of the spring 65, interposed between the upper end of the vertical branch 15* and the adjustable nuts 66, secured upon the upper end of the stem 62. In the normal position of the valve 61 there is sufficient space between the outer perimeter thereof and the inner perimeter of the frusto-conical opening 60 to permit a sufficient quantity of air to pass into the carbureting-chamber to start the engine; but as the speed of the engine increases, and, as a consequence, needs a greater amount of fuel and necessarily more air, the increased speed of the engine will cause an inrush of air through the bell-mouth 16 and force the valve or diaphragm 61 downwardly to increase the area of the air-passage through the air-inlet opening 60. This movement of the valve 61 will cause the diaphragm 63 to be moved downwardly, the oil beneath said diaphragm passing around the edges of the same to a position above the opening, the area of the passage around the diaphragm in the dash-pot 64 being regulated so as to prevent too quick a movement of the valve 61. As soon as the inrush of air through the bell-mouth 16 has decreased, owing to the slackening of the speed of the engine, the spring 65 will move the valve back into its normal position. This device readily provides for automatically regulating the amount of air supplied to the carbureting-chamber to meet the demands of the engine under different speeds and conditions. This makes a very simple construction of a carbureter, which is very effective in its operation.

It is believed that with the foregoing description a thorough understanding of the operation of the invention will be understood without further description.

Having thus described our invention, we claim—

1. In a carbureter, the combination with a carbureting-chamber having a plurality of openings in the wall thereof and provided with a hydrocarbon-inlet and an air-inlet nozzle having its mouth at one side of the mouth of said hydrocarbon-inlet and adapted to eject a stream of air from the mouth of said nozzle across the mouth of said hydrocarbon-inlet, of a valve surrounding said nozzle having therein a plurality of openings adapted to register with the openings in the walls of said chamber and regulate the admission of air thereto, and means for moving said valve.

2. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet thereto, of an air-inlet nozzle adapted to eject therefrom an air-jet across the mouth of said inlet, and a valve surrounding said nozzle adapted in its movement to open a passage around said nozzle for the admission of an additional supply of air to said chamber.

3. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet thereto, of an air-inlet nozzle adapted to eject therefrom an air-jet across the mouth of said inlet, and a valve surrounding said nozzle adapted in its movement to admit an additional supply of air to said chamber through an annular opening around said nozzle, the area of which may be varied by the movement of said valve.

4. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof adapted to eject therefrom an air stream across the mouth of said hydrocarbon-inlet, a valve member surrounding said nozzle adapted in its movement to admit an additional supply of air to said chamber, an outlet-valve secured thereto, and means for moving said valve.

5. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof adapted to eject therefrom an air-stream across the mouth of said hydrocarbon-inlet, a valve surrounding said air-inlet nozzle adapted in its movement to admit an additional supply of air to said chamber, a partition across said chamber provided with an outlet-opening, and means secured to said valve for closing said opening.

6. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof adapted to eject therefrom an air-stream across the mouth of said hydrocarbon-inlet, and mechanism surrounding said air-inlet nozzle for decreasing or increasing the supply of air and controlling the outlet of gas by the continuation of the same movement.

7. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof, a hydrocarbon-chamber, an inlet thereto, a device for controlling the supply through said inlet, and floats for operating said device.

8. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof, a hydrocarbon-chamber, an inlet thereto, a valve in said inlet, and two floats articulated to said valve for controlling the supply through said inlet.

9. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-

inlet, of an air-inlet nozzle in axial line with said chamber at the inlet end thereof, a hydrocarbon-chamber, an inlet thereto, a ring pivoted to said inlet, ears extending upwardly from said ring, arms pivoted to said ears and extending across the ring in opposite directions, floats secured to the free ends of said arms, and a valve depending from said arms midway of said ears.

10. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet and an air-inlet nozzle in axial line with said chamber at the inlet end thereof, of a hydrocarbon-chamber, an inlet thereto, a ring pivoted to said inlet, ears extending upwardly from said ring, rods pivoted to eyes within said hydrocarbon-chamber, floats secured to the free end of said rods, and arms articulated to said pivoted rods.

11. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle adapted to eject therefrom an air-stream across the mouth of said hydrocarbon-inlet, a valve surrounding said nozzle adapted in its movement to admit an additional supply of air to said chamber, an outlet in axial line therewith, and means secured to said valve for closing said outlet-opening.

12. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet, of an air-inlet nozzle adapted to eject therefrom an air-stream across the mouth of said hydrocarbon-inlet, an air-valve adapted for movement longitudinally of said nozzle to regulate the admission of an additional supply of air around said nozzle, an outlet in axial line with said nozzle, and means secured to said valve adapted in the movement of said valve to close said outlet.

13. In a carbureter, the combination with a carbureting-chamber having a hydrocarbon-inlet and an air-inlet, of a hydrocarbon-chamber partially surrounding said carbureting-chamber, a supply-inlet to said hydrocarbon-chamber, and floats universally connected with the valve in said supply-inlet to regulate the admission of hydrocarbon at any inclination.

14. In a carbureter, the combination of a carbureting-chamber, an air-inlet nozzle in axial line with said carbureting-chamber, a hydrocarbon-inlet at right angles therewith, an air-inlet passage to said nozzle, an automatic valve for controlling the amount of air through said passage, an oil-chamber, and a piston therein for regulating the movement of said valve.

15. In a carbureter, the combination of a carbureting-chamber, an air-inlet nozzle in axial line with said carbureting-chamber, a hydrocarbon-inlet at right angles therewith, an air-inlet passage to said nozzle, an automatic valve for controlling the amount of air through said passage, a stem therefor, a piston secured to the opposite end thereof, and an oil-chamber in which said piston is adapted to reciprocate.

Signed by us at Boston, Massachusetts, this 25th day of October, 1904.

ALBERT W. MENNS.
WALTER K. MENNS.

Witnesses:
WALTER E. LOMBARD,
EDWIN T. LUCE.