W. J. STEINBRENNER.

CARBURETER.

APPLICATION FILED APR. 26, 1909.

1,016,108. Patented Jan. 30, 1912.

Fig. 1.

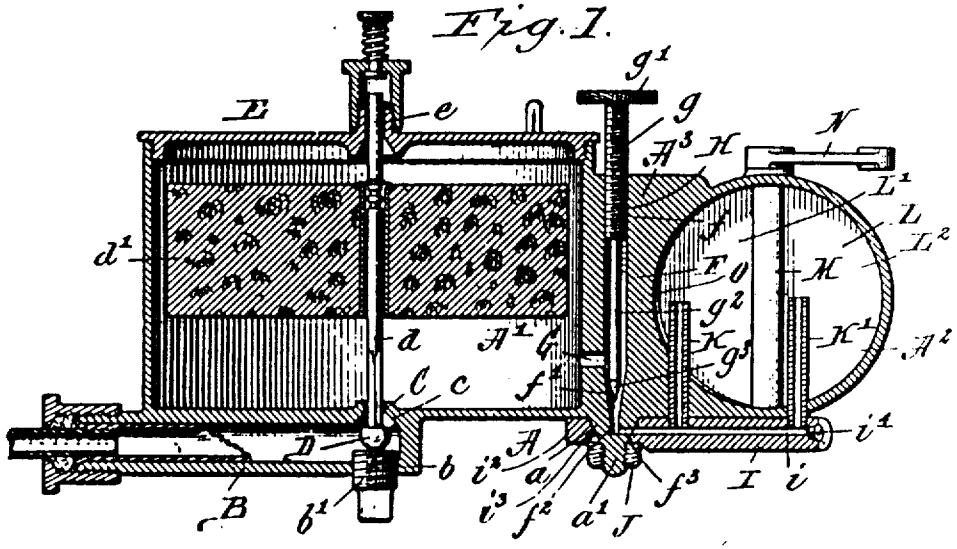


Fig. 2.

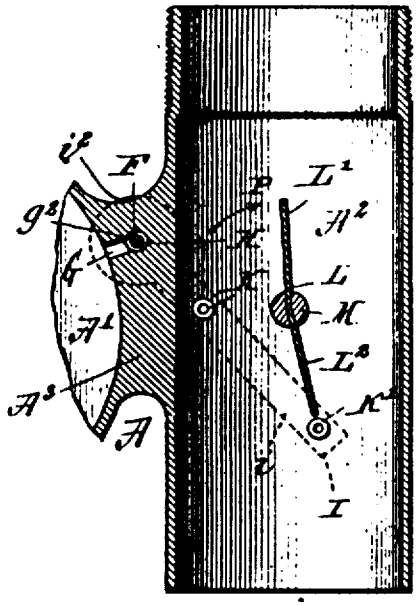


Fig 3.

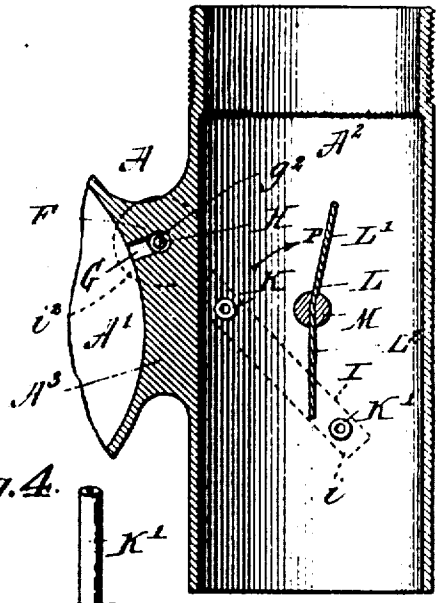
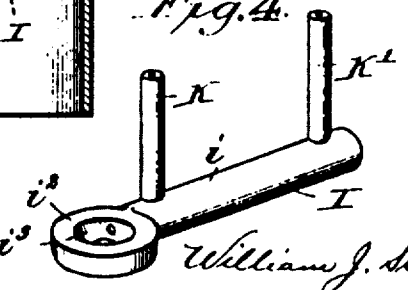


Fig. 4.



Witnesses:
Christ Rinlo Jr.
Matilda C. Slicht

William J. Steinbrenner Inventor:
By Emil Neuhard
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM J. STEINBRENNER, OF BUFFALO, NEW YORK.

CARBURETER.

1,016,108. Specification of Letters Patent. Patented Jan. 30, 1912.

Application filed April 26, 1909. Serial No. 492,298.

To all whom it may concern:

Be it known that I, WILLIAM J. STEINBRENNER, a citizen of the United States, and resident of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to improvements in carbureters and more particularly to that type of carbureters designed for use in connection with internal combustion-engines.

The object of my invention is to provide a simple and inexpensive carbureter wherein the various speeds for which carbureters are generally arranged may be obtained by the manipulation of a single element.

It also has for its object the provision of a plurality of aspirating-nozzles having their exit ends arranged in different horizontal planes and so disposed with reference to the controlling-valve that the latter, when actuated, serves to cause an aspirating effect, first upon one nozzle and then upon another.

With these and other objects in view, the invention consists in the relative arrangement of the aspirating-nozzles and the controlling-valve; and it also consists in the construction, arrangement and combination of parts to be hereinafter described and particularly pointed out in the appended claims.

Figure 1 is a vertical section of a carbureter embodying my invention. Figs. 2 and 3 are horizontal sections through the carbureting-chamber and a portion of the gasolene feed-chamber, taken through a portion of line 2—2, Fig. 1. Fig. 4 is a detached perspective view of a nozzle-carrier with the aspirating-nozzles secured thereto.

Referring now to the drawings in detail, like letters of reference refer to like parts in the several figures.

The reference letter A designates the carbureter considered as a whole, and it consists of a gasolene feed-chamber A^1 and a carbureting-chamber A^2, herein shown as cast in one piece, but as this is merely a matter of choice, they may be otherwise constructed. The carbureting-chamber and the gasolene feed-chamber are connected by a neck A^3 having a conical boss a on its under side which terminates in a threaded stem a^1. Cast integrally with the gasolene feed-chamber on the under side thereof is an inlet-tube B having a threaded opening b at a point coincident with the axis of said feed-chamber which is closed with a screw-plug b^1. The inner end of the tube B is in communication with the interior of the gasolene feed-chamber through a passage C which is beveled, as at c, to provide a seat for a valve D arranged on the lower end of a valve-stem d passing through said passage. The upper end of the gasolene feed-chamber is closed by a cover E having a guide-opening e arranged therein in line with the passage C in the bottom of said chamber, and in said guide-opening e the valve-stem d is guided for movement. The valve at the lower end of said stem is adapted to close upwardly against the valve-seat c, so as to prevent the feeding of gasolene to said feed-chamber. As is common in gasolene controlling-devices of this kind, the valve-stem d, where it passes through the passage C, is of square formation in cross-section, as shown in Fig. 2, so that when the valve D is unseated, the gasolene can pass upward through the passage C. Secured to said valve-stem is a float d^1 which controls the opening and closing of the valve D when the level of the gasolene in the gasolene feed-chamber lowers and rises and it serves to maintain the gasolene at the required level in the gasolene chamber, irrespective of the conditions to which the device may be subjected.

The carbureting-chamber A^2 is in the form of a plain cylinder having both ends open and one end externally threaded for connection of a pipe leading to the ignition-chamber of an engine. By thus constructing the carbureting-chamber, a straight passage is provided therethrough for the passage of the air, thereby almost entirely eliminating the resistance offered to the air in compelling it to travel through curved or winding passages, as is commonly practiced. Moreover, by disposing the passage horizontally, the air enters and leaves the carbureting-chamber more freely.

In the neck connecting the gasolene feed-chamber with the carbureting-chamber is a vertical bore F threaded at its upper end, as at f, and provided at its lower end with a tapering-portion f^1 terminating in a small cylindrical portion f^2 extending down into the conical boss a, which boss has a small lateral bore f^3 extending outwardly from the lower reduced end of said vertical bore.

A passage G connects the vertical bore F

directly above its tapered portion f^1 with the interior of the gasolene feed-chamber. A needle-valve H is adjustable in the bore F and comprises an externally threaded portion g having a knurled head or button g^1 at its upper end and adapted for threaded adjustment into the threaded upper end of said bore, and a reduced lower portion g^2 terminating at its lower end in a conical or tapered portion g^3 corresponding preferably to the taper of the lower tapered portion f^1 of said bore so that it may restrict or close the flow of gasolene from the gasolene feed-chamber.

Secured to the boss a is a nozzle-carrier I which comprises a tube i having a flat cylindrical head i^2 provided with a beveled opening i^3 through which the conical boss a is adapted to pass. The bore of the tube i extends from said beveled opening to the opposite end of the tube and is threaded at said last-mentioned end to receive a screw-plug i^4, and said bore, when the carrier is applied, registers with the lateral bore f^3 in said conical boss, forming in effect a continuation of said lateral bore. Secured to the threaded stem a^1 of said boss is a nut J whereby the nozzle-carrier is forced upward on said conical boss and held in proper position. Threaded into said tube i are two aspirating-nozzles K, K¹, advisedly of different lengths, so that the upper end of the nozzle K nearest the gasolene-chamber is in a lower horizontal plane than the other nozzle K¹.

The carbureting-chamber is provided with two openings at points on opposite sides of its vertical center, through which openings the aspirating-nozzles extend. The nozzle K¹ terminates at the horizontal center of the chamber and the nozzle K at a point slightly below the center. The passage G connecting the gasolene feed-chamber with the bore F, the lower end of the bore F with its lateral extension f^3 and the bore of the tube i, serve as a passage for feeding the gasolene from said feed-chamber to the aspirating-nozzles. A controlling-valve L is provided which is in the form of a butterfly valve or disk passing through a stem M, journaled for rotation in the top and bottom of the carbureting-chamber and extending up through the top of said chamber for connection thereto of a manipulating-lever N which may be operated in any convenient manner from a distant point. Said valve has two semi-circular wing-members L¹, L² arranged at a slight angle to each other so that when the wing-member L² is directly at a right-angle to the axis of the carbureting-chamber and closes the space between the stem M and the wall of the chamber at the right of said stem, the wing-member L¹ leaves a slight space between its edge and the wall of the chamber on the opposite side, as clearly shown in Figs. 2 and 3. The aspirating-nozzles are peculiarly situated with reference to the stem of the valve and for this purpose the nozzle-carrier is arranged diagonally, as shown in dotted lines in Figs. 2 and 3, the nozzle K being close to the inner wall of the carbureting-chamber and approximately in line transversely with the stem of the valve so that when the valve is in closed position, said nozzle is in close proximity to the edge of the wing-member L¹. The nozzle K¹ is located between the vertical center of the carbureting-chamber and its outer wall and a distance from the stem of the valve M so that the edge of the wing-member L² will just clear it, when the valve is being swung into full open position. The purpose of making the aspirating-nozzles of different lengths is to compel the air drawn or passing over the upper ends of the nozzles to have an aspirating effect upon the nozzle K before it acts upon the gasolene in the nozzle K¹, but after the velocity of the air currents increase by reason of the controlling-valve being opened, the aspirating effect will be upon both nozzles.

By arranging the nozzles relatively to each other and to the valve, as shown, the proper proportion of gasolene to air will always be maintained, irrespective of the speed of the engine and the velocity of the air currents. When the controlling-valve is in the position shown in Fig. 2, it is set for low speed. The edge of the valve to the right of its stem is then in contact with the wall of the carbureting-chamber while the opposite edge is separated from the wall of the chamber by a slight space O, see Figs. 2 and 3. The air at such times passes over the nozzle K, carries with it a proportionate amount of gasolene in spray form, takes a slight angular course, and passes through the space O between the butterfly valve and the wall of the carbureter. When in this position, the air passing through the carbureting-chamber does not act upon the nozzle K¹, owing to the distance of said nozzle from said space. The gradual opening of the valve in the direction shown by the arrow P in Figs. 2 and 3 causes an increase in velocity of the air and a proportionate increase of gasolene from the nozzle K, owing to the space between the wing-member L¹ and the wall of the carbureting-chamber being increased, and during this opening movement of the valve the wing-member L² is moved toward the nozzle K¹ and acts as a shield for said nozzle until the space between the edge of said last-mentioned wing-member and the wall of the chamber is of a certain area. The nozzle K is therefore relied upon to supply gasolene to the air currents during the initial opening movement of said valve and also during such times as the valve may be held

in any position within range of such movement. When the valve is opened to a greater degree, the velocity of the air-currents increase and act upon the nozzle K^1, and have a slight aspirating effect upon the same also, which effect is increased as the wing-member L^2 approaches said nozzle and permits the air to pass between the spaces on opposite sides of the valve.

When the valve approaches the position shown in Fig. 4, the air currents have a full aspirating effect upon the nozzle K and approach almost full effect on the nozzle K^1, and in this position the valve is arranged for high speed. Highest speed is obtained when the valve is in the position shown in Fig. 5 at which time the air currents have full effect on both nozzles. It is apparent, therefore, that the speed of the engine may be governed to a nicety by the mere manipulation of the controlling-valve and that the greater the valve is opened the higher the speed at which the engine may be run.

Having thus described my invention, what I claim is,—

1. In a carbureter, the combination with a gasolene feed-chamber and means for maintaining the gasolene therein at a constant level, of a carbureting-chamber formed integrally with said gasolene feed-chamber and connected thereto by a neck having a vertical bore and a conical boss at its lower end in which said bore terminates with a lateral extension, said neck having also a passage connecting said bore with the interior of said gasolene feed-chamber, a nozzle-carrier provided with a nozzle extending up into the carbureting-chamber and having a beveled opening through which said conical boss extends and a passage connecting said nozzle with the lateral extension of said vertical bore, means for holding said nozzle-carrier on said conical boss, and means for regulating the flow of gasolene to said nozzle.

2. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber connected with said gasolene feed-chamber by a neck having a conical-boss at its lower end and a threaded stem on said boss, said neck having also a vertical bore terminating in a right-angled extension opening at the side of said boss and connected with said gasolene feed-chamber by a passage at a point above said right-angled extension, a nozzle-carrier having a head at one end provided with a beveled opening into which said boss fits, a nut threaded onto the threaded stem of said boss to hold said nozzle-carrier on the latter, aspirating-nozzles secured to said nozzle-carrier and extending into said carbureting-chamber, said nozzles being connected with the right-angled extension of said bore through a passage in said carrier, and a needle-valve in said bore for restricting or closing the flow of gasolene to said nozzles.

3. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber connected with said gasolene feed-chamber and having a vertical bore in its wall between said chambers, said bore being connected with said gasolene feed-chamber by a passage, a removable nozzle-carrier having a gasolene passage in connection with said bore, aspirating-nozzles extending up into said carbureting-chamber and secured to said nozzle-carrier, a valve in said carbureting-chamber to control the aspirating effect of the air on said nozzles, and means to regulate the flow of gasolene to said nozzles.

4. A carbureting-chamber comprising a casing having an air inlet and a mixture outlet, a butterfly valve having wing-members on opposite sides of its pivotal point with one of said members at a slight angle to the other, and aspirating-nozzles in operative relation to said valve.

5. A carbureting-chamber comprising a cylindrical casing, a disk-valve pivoted centrally in said casing and having one-half thereof at a slight angle to the other half to provide a slight opening between the edge of said valve and the wall of said casing when said valve is in closed position, and two aspirating-nozzles arranged in a diagonal plane so that when said valve is in closed position one of said nozzles is adjacent the valve at one side of its center and when said valve is open the other nozzle is adjacent said valve at the other side of its center.

6. A carbureting-chamber comprising a casing having a butterfly valve pivoted centrally so that it may stand transversely or longitudinally within said casing, an aspirating-nozzle at one side of the longitudinal center of said casing and approximately in line transversely with the pivot of said valve, and a second aspirating-nozzle arranged at the other side of the longitudinal center of said casing and a distance from the pivot of said valve to permit the edge of the same to clear in passing it.

7. A carbureting-chamber provided with a butterfly-valve and two aspirating nozzles on opposite sides of a line passing through the pivot of said valve, one of said nozzles being nearer said pivot than the other so that the air passing through said chamber will not act upon one of said nozzles during the initial opening movement of said valves.

8. A carbureting-chamber comprising a cylindrical casing, a disk-valve pivoted centrally in said casing, and two aspirating-nozzles situated on opposite sides of the longitudinal center of said casing and so positioned relatively to the wing-members of

said valve that one of said wing-members moves away from one of said nozzles while the other wing-member moves toward the other nozzle.

9. A carbureting-chamber comprising a casing, two aspirating-nozzles extending up into said casing with the upper ends in different horizontal planes, and a controlling valve in said casing having a central pivot so disposed relatively to said nozzles that upon opening said valve an aspirating effect is produced first upon the nozzle having its upper end in the lower horizontal plane.

10. A carbureting-chamber comprising a cylindrical casing, a disk-valve pivoted centrally in said casing, and two aspirating-nozzles situated at opposite sides of the longitudinal center of said casing and so positioned relatively to the pivot of said valve that one nozzle is closer to the edge of said valve when open than the other.

11. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber having an inlet at one end and an outlet at its other end, a pair of aspirating nozzles in said carbureting-chamber in connection with said gasolene feed-chamber, and a butterfly-valve in said carbureting-chamber, said aspirating-nozzles being arranged obliquely to the course of the air so that the wing-member on one side of said valve will swing toward and from one of said nozzles and the wing-member on the other side will swing past the other nozzle.

12. A carbureting chamber having an inlet at one end and an outlet at its other end, a pair of aspirating nozzles in said chamber, and a valve also in said chamber, said aspirating nozzles being arranged obliquely to the course of the air passing through said chamber.

13. A carbureting chamber having an inlet at one end and an outlet at its other end, a pair of aspirating-nozzles in said chamber arranged out of longitudinal alinement and at right-angles to the course of the air passing through said chamber, and a valve in said chamber.

14. A carbureting chamber having an inlet at one end and an outlet at its other end, a pair of aspirating-nozzles in said chamber, and a butterfly valve also in said chamber, said aspirating nozzles being arranged out of longitudinal alinement and one of said nozzles being closer to the pivot of said valve than the other.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

WILLIAM J. STEINBRENNER.

Witnesses:
ELLA C. PLUECKHAHN,
MATILDA C. STICHT.