

Sept. 17, 1935.

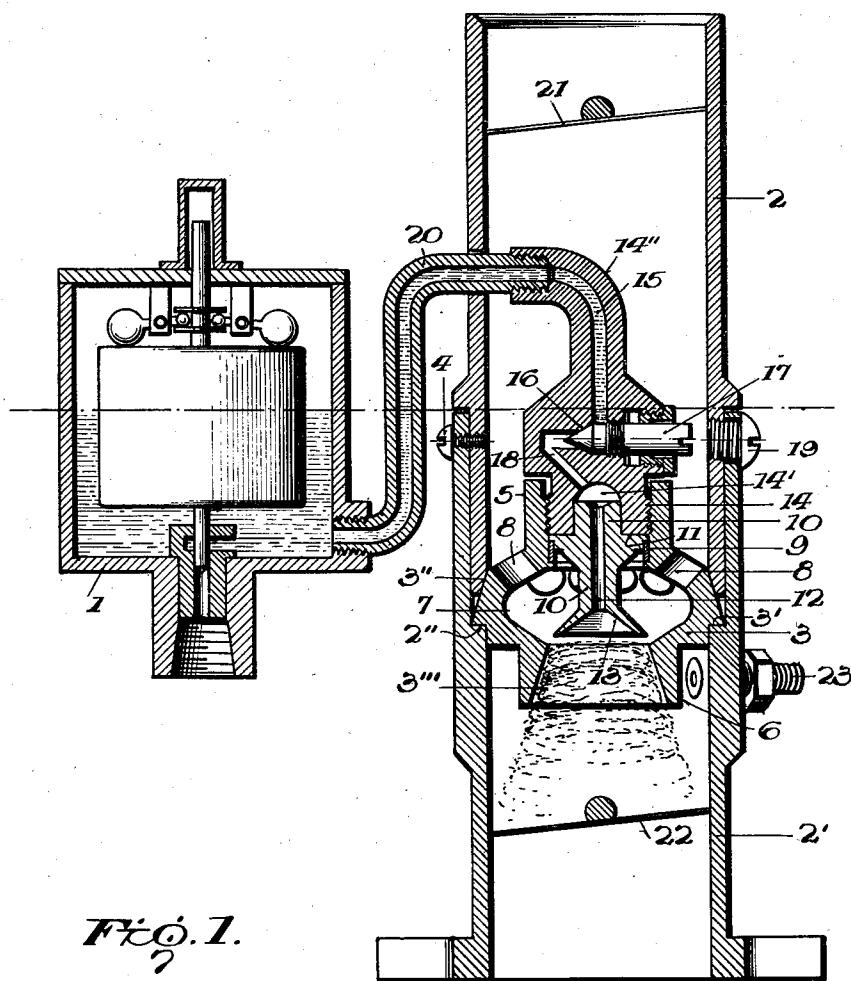
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2,014,907

CARBURETOR

Filed Oct. 22, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 2.

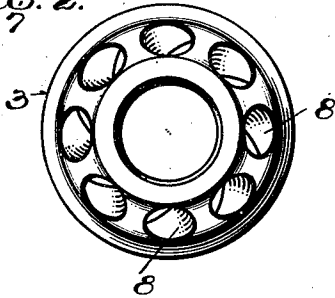


FIG. 5.



FIG. 10.

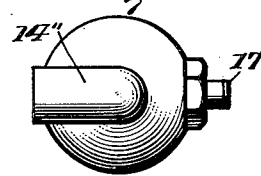


FIG. 3.

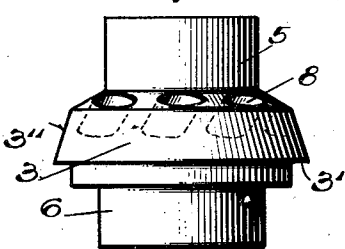


FIG. 6.

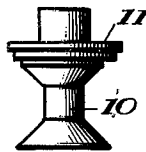


FIG. 11.

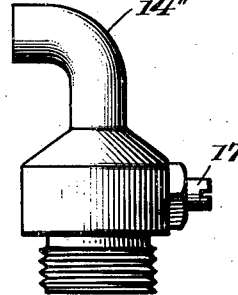


FIG. 7.

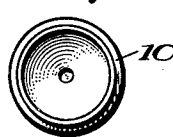


FIG. 4.

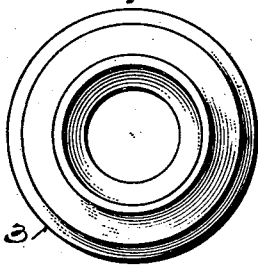


FIG. 8.

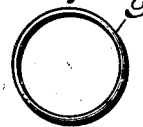


FIG. 12.

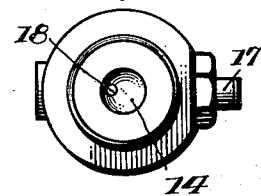


FIG. 9.

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2,014,907

CARBURETOR

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Application October 22, 1934, Serial No. 749,443

9 Claims. (Cl. 261-79)

This invention relates to carburetors for internal combustion engines and has for its object to produce a structure of this class which will control the proportions of air and hydro-carbon vapor and thoroughly mix the hydro-carbon vapor with atmospheric air and deliver the same to the motor; which will be simple in construction, not liable to get out of order and which may be made at a minimum cost.

It is generally recognized in the art that hydro-carbon fluid, such as gasoline, as ordinarily employed in internal combustion engines, is not utilized to the highest extent, since a large fraction of the hydro-carbon fluid is not burned and the amount of power obtained is much below the theoretical. This is largely due to the fact that the ideal proportions of hydro-carbon vapor and atmospheric air are not obtained, and one object of the invention is to more nearly approach the theoretical proportions between hydro-carbon vapor and atmospheric air to the end that the ultimate or theoretical results may be more nearly attained.

The inventive idea involved is capable of receiving a variety of mechanical constructions, one of which for the purpose of illustrating the invention is shown in the accompanying drawings, but it is to be expressly understood that said drawings are for the purpose of illustration only, and are not designed to define the limits of the invention, reference being had to the accompanying claims for this purpose.

In said drawings—

Fig. 1 is a central vertical section through the carburetor constituting the invention;

Fig. 2 is a top plan view;

Fig. 3 is a side elevation; and

Fig. 4 is a bottom plan view of means for imparting a whirling action to the incoming air just before it is mixed with the hydro-carbon vapors;

Fig. 5 is a top plan view; and

Fig. 6 is a side elevation of one of the elements conducting the hydro-carbon to the point where the same is mixed with the air;

Fig. 7 is a bottom plan view of Fig. 6;

Figs. 8 and 9, respectively, are a plan view and a side elevation of an adjusting ring for positioning the elements shown in Figs. 5, 6 and 7; and

Figs. 10, 11 and 12, respectively, are a top plan view, a side elevation and a bottom plan view of one of the elements connecting the gasoline feed with the float tank.

Referring to the several figures of the drawings, in which like reference numerals indicate like parts throughout the several views, 1 is a

float tank of any suitable construction, a detailed description of which is unnecessary since the specific construction of the float tank forms no part of the present invention; 2 and 2' together form the body of the carburetor proper, which is here shown as tubular in form and composed of the two sections 2 and 2', the section 2', at its upper portion, being of slightly greater diameter than at its lower portion (as seen in Fig. 1), thereby providing an internal shoulder 2''.

Referring now to Figs. 2, 3 and 4—3 is a device provided for mixing the vapors of gasoline with atmospheric air and as here shown the device is provided with an annular shoulder 3' which, when the parts are in position, as shown in Fig. 1, rests upon the shoulder 2'' of the body portion 2', heretofore referred to. This device 3 is provided with an inwardly tapering annular shoulder 3'', and when the parts are in position, said shoulder is engaged by the lower tapering end of the body portion 2 and thus held firmly in position, and when the parts are thus assembled, the body portions 2 and 2' are secured together as by screws 4, one of which is shown in Fig. 1.

The mixing device 3 is provided with an annular, upwardly extending, internal screw threaded portion 5 and a downwardly extending portion 6, this latter portion being hollow and formed with a downwardly flaring frusto-conical portion 3'''. Said mixing device 3 is also provided with an interior chamber 7, and a series of openings or ports 8 are provided leading from the interior of the body portion 2 to the chamber 7. These ports are somewhat elongated and extend preferably at an angle of about 45° downward and inward to the chamber 7, and they also extend at an angle approximately 45° from the vertical in a circular direction around the chamber 7 to the end that the air passing through these channels into the chamber 7 will not only be directed downward but will also be directed against the walls of the chamber 7. All of these ports 8 have substantially the same angular position and substantially the same angular direction to the end that air passing through said ports into the chamber 7 will be caused to whirl around within the chamber.

The upwardly extending cylindrical portion 5 of the mixing device 3 has formed on its interior an internal annular shoulder just above the chamber 7, which shoulder serves to support a thin ring 9 (Figs. 1, 8 and 9).

Referring now to Figs. 1, 5, 6 and 7—10 indicates a part having an annular shoulder, which when the parts are assembled as shown in Fig. 1,

rests upon the ring 9, the vertical extent of this ring determining the vertical adjustment of said part 10, which part is also provided with an upwardly facing shoulder 11, a central conduit 12 and an outwardly flaring conical shaped portion 13. The element 10 is firmly held in position by a screw threaded member 14 screwed into the upwardly projecting tubular portion 5 of the mixing device 3. This member 14 telescopes over the top portion of the member 10 and, immediately above said member 10, is provided with a chamber 14' in open connection with the conduit 12 in said member 10. As here shown, the member 14 extends some considerable distance upward within the body portion 2, the extreme upper portion 14'' being extended to one side of the axis of the body 2, and this portion 14'' has formed therein a conduit 15 which at its lower portion is adjacent to a valve seat 16 controlled by a conical valve 17, and an indirect conduit 18 leads from the valve seat to the chamber 14'. The valve 17 may be adjusted in any suitable way, and as here shown there is provided an opening through the walls of the body, which opening is immediately opposite the outer end of the valve 17, and is closed by any suitable closure as a flange screw 19 extending through both the body section 2 and body section 2', and when in position serves to secure said parts together in a similar way to that of the screw 4 heretofore referred to. By removing the screw 19, the screw threaded valve 17 may be adjusted, as will be readily understood. The conduit 15 in the upwardly extending part 14'' connects with a conduit 20 which is connected to the float tank, preferably near the bottom thereof, the point of connection between said conduit 20 and the part 14'' being well above the normal level of the gasoline in the float tank.

The lower end of the conduit or channel 15 and the valve 17 may be, and preferably are, slightly below the level of the gasoline in the float tank, and when this is the case, it will be seen that the conduits 20 and 15 together constitute a siphon, the short leg of the siphon being at the level of the gasoline in the float tank exterior to the body 2, 2', and the longer leg of the siphon being within said body and terminating at the valve 17. The usual or any suitable choke valve 21 is employed and a throttle valve 22 is provided, the function of which throttle is to control the passage of mixed vapor and atmospheric air to the motor (not shown), and to control the suction of air through the carburetor. 23 indicates a connection leading from the interior of the body part 2' to the usual or any suitable automatic spark control.

Operation.—In operation the choke valve 21 is opened to any desired degree, and the throttle valve 22 is also opened when the engine is started. The result is a powerful suction within the body and an exhaust of air from the channels 15—20 which serves to elevate the gasoline and fill said channels so that the gasoline within the channel 15 is led downward to the valve 17 and is sucked past said valve into the channel 18 and through the channel 12. During the passage through said channels 12—18, the gasoline is vaporized, the vapor being led downward to the flaring part 13. At the same time there is a violent suction of air through the ports 8—8, and this air having whirling motion imparted to it within the chamber 7 is led downward between the flaring portion 13 and to the top of the frusto-conical portion 3''' of the member 3 where it mixes with the vapors being delivered downward from the channel 12. The

entire feed of the gasoline and of the air to the carburetor is controlled by the position of the throttle valve 22, and the proportions of air and gasoline are controlled by the height of the ring 9 and the adjustment of the valve 17.

Once the device is set in operation it will be observed that the longer leg of the siphon, composed of the conduits 15 and 20, terminates at the valve 17 and remains filled with gasoline, and the adjustment of the feed valve 17 is such as to prevent the feed of the gasoline past such valve except under the action of suction when the throttle valve 22 is open, and thus a finely adjusted feed of gasoline vapor at the point 13 is secured. But this point 13 is the place where the vapor is mixed with air descending from the whirl chamber 7, and the amount of air delivered from the whirl chamber is determined by the elevation of the part 10, which in turn is determined by the vertical extent of the ring 9. It will thus be seen that means are provided for thoroughly vaporizing the gasoline before it reaches the air current and nicely proportioning and thoroughly mixing the air and gasoline vapors before they pass to the motor. Moreover, the feed both of air and gasoline is under the control of the throttle valve 22.

Having thus described the invention what is claimed is:

1. In a carburetor, the combination of a float chamber, a carburetor body, a stationary siphon leading from said chamber into said body, a valve controlling the discharge end of said siphon within said body, means subjecting the discharge from said valve to suction whereby feed of hydrocarbon fluid is effected, a conduit within which hydrocarbon is vaporized and means mixing air with the hydrocarbon vapor.

2. In a carburetor, the combination of a float chamber, a carburetor body, a stationary siphon leading from said chamber into said body, means controlling the discharge end of said siphon within said body, means subjecting the discharge end of said siphon to suction, whereby feed of hydrocarbon fluid is effected, and means mixing air with the hydrocarbon vapor.

3. In a carburetor, the combination of a float chamber, a carburetor body, a stationary siphon leading from said chamber into said body, means controlling the discharge end of said siphon within said body, means subjecting the discharge end of said siphon to suction, whereby feed of hydrocarbon fluid is effected, a conduit within which hydrocarbon is vaporized and adjustable means mixing air with the hydrocarbon vapor.

4. In a carburetor, the combination of a float chamber, a carburetor body, a stationary siphon leading from said chamber into said body, means controlling the discharge end of said siphon within said body, means subjecting the discharge end of said siphon to suction, whereby feed of hydrocarbon fluid is effected, a vaporizing passage leading from the discharge end of said siphon, and means mixing air with the hydrocarbon vapor.

5. In a carburetor, the combination of a float chamber, a carburetor body through which a current of air passes to the motor, means imparting a whirling movement to said current of air, means delivering gasoline within said body from said float chamber, means vaporizing the gasoline before it reaches the whirling air current and means delivering the vapor to said current.

6. In a carburetor, the combination of a float chamber, a carburetor body, means delivering gasoline from said chamber into said body, means creating a whirling movement to a current of air

passing through said body to the motor, a conduit leading from said gasoline delivery means and within which the gasoline is vaporized, and means delivering the vapor to said air current.

5 7. In a carburetor, the combination of a float chamber, a carburetor body through which air is drawn by the motor, a whirl chamber through which the air passes, means delivering gasoline from said float chamber to said body at a point
10 between said float chamber and said whirl chamber, and a vaporizing conduit leading from said gasoline delivery means to the outlet of said whirl chamber.

15 8. In a carburetor, the combination of a float chamber, a carburetor body, a siphon delivering gasoline from said chamber to said body, means between the siphon and the motor and imparting

a whirling movement to air passing through said body to the motor, means controlling the delivery of gasoline from the siphon and a vaporizing conduit leading from said controlling means to said whirl-imparting means.

5 9. In a carburetor, the combination of a float chamber, a carburetor body, an air-whirling chamber centrally supported within said body and having a central discharge opening, a siphon leading from said float chamber, means controlling the delivery end of said siphon within said
10 body, and a chamber within which gasoline delivered from said siphon is vaporized, said channel delivering the vapor into the discharge opening of said air-whirling chamber.
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