Aug. 30, 1927. 1,640,711

J. J. A. MILLER

CARBURETOR

Filed May 21, 1926

Fig. 7.

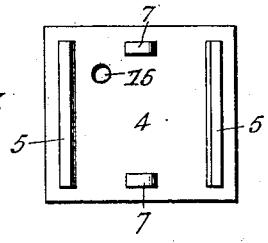


Fig. 1.

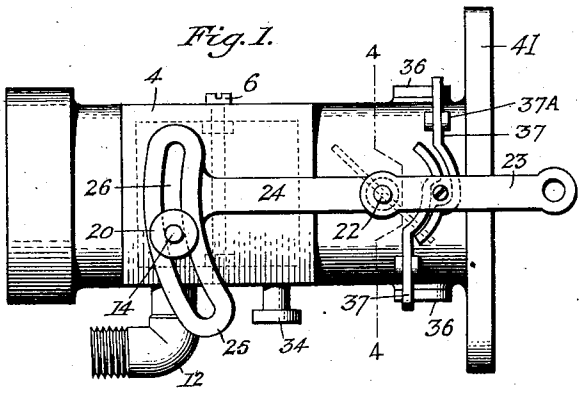


Fig. 2.

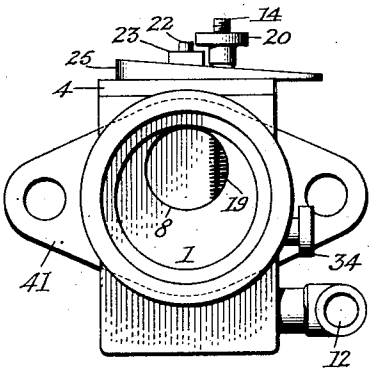


Fig. 3.

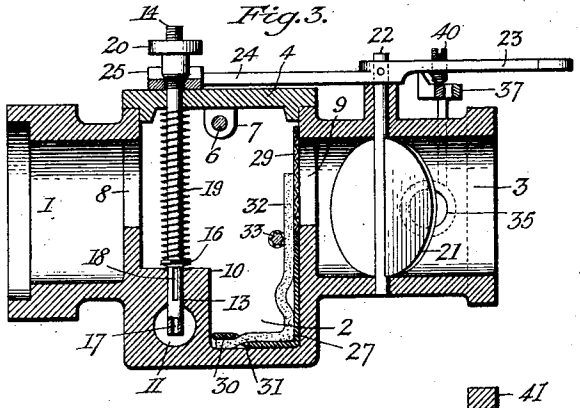


Fig. 4.

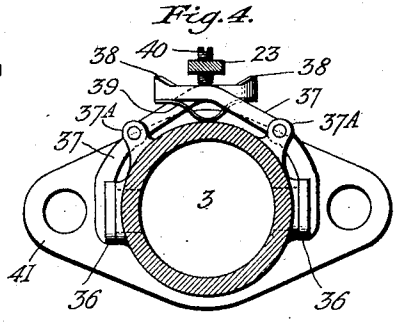


Fig. 5.

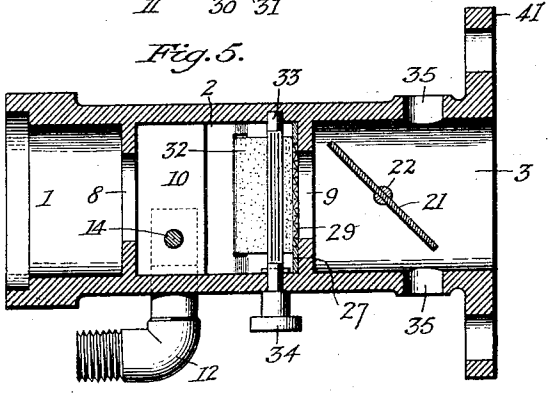
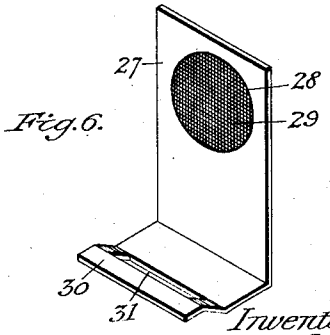


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN J. A. MILLER, OF DENVER, COLORADO.

CARBURETOR.

Application filed May 21, 1926. Serial No. 110,617.

This invention relates to improvements in carburetors.

The primary object of the invention is to provide a carburetor having a mixing chamber and a fuel inlet valve in said chamber, which is operated in conjunction with the usual throttle valve, whereby the opening or closing movement of the throttle valve effects a simultaneous opening or closing movement of the fuel inlet valve, thus automatically regulating the fuel feed with respect to the movement of the throttle valve.

Further, to provide a carburetor of this character, in which the mixing chamber is provided with a screened outlet opening, an adjustable element in the nature of a wick being arranged to extend up from the bottom of the mixing chamber and partially cover said screened opening, said wick being adapted to absorb fuel admitted to the mixing chamber and which is carried to the highest point of the wick by capillary attraction, whereby air drawn through the carburetor combines with the fuel in the wick, thus forming a vaporized mixture, the raw fuel being thus prevented from passing to the engine cylinders.

Further, to provide a carburetor having air inlet valves which are adapted to be operated by the usual throttle valve lever, whereby, when the throttle valve is wide open, one of said valves is opened to admit additional air to the intake pipe, and when the throttle valve is closed, as in coasting, the other valve is opened, thereby admitting air to the cylinders, which serves, under compression, to retard the action of the engine, and slow down the car.

These and other objects to be hereinafter set forth are accomplished by the device illustrated in the accompanying drawings in which:—

Fig. 1 is a top view of the improved carburetor.

Fig. 2 is a view of the inlet end thereof.

Fig. 3 is a vertical longitudinal sectional view of the same.

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1.

Fig. 5 is a horizontal sectional view thereof.

Fig. 6 is a perspective view of the removable wick-supporting plate having a screened opening and

Fig. 7 is a bottom view of the cover or cap for the mixing chamber.

Referring to the accompanying drawings:

The numeral 1 designates the air inlet chamber of the improved carburetor; 2 the mixing chamber thereof, and 3 the outlet chamber. The walls of the inlet and outlet chambers are preferably cylindrical in form while the walls of the mixing chamber are flat and the bottom of this chamber extends down below the other chambers, as shown in Figures 2 and 3.

The top thereof is closed by a cap 4 having depending ribs 5 which lie within the upper end of the chamber and center the cap upon the top of the chamber, and the cap is held in place by a screw 6 which passes through holes in the side walls of the chamber and through apertured depending ears 7 on the cap. The end walls of the mixing chamber are provided with air inlet and outlet holes 8 and 9 respectively, which are preferably of less diameter than the air inlet and outlet chambers and the highest points of these holes coincide with the highest points of inlet and outlet chambers, as will appear by reference to Figures 2 and 3. The bottom of the mixing chamber is formed with a raised portion or step 10, which extends the full width of the chamber and half the length thereof and an inlet aperture 11 extends into and partially through this step from the outer side wall of the chamber, and a fuel inlet nipple or elbow 12 is screwed into the aperture 11, the nipple being adapted to be connected with a fuel supply as in the usual manner.

A hole 13 extends down through the top face of the step and intersects the hole 11, and a fuel inlet valve 14 extends down through a hole 15 in the cap 4, and through the hole 13 and into the inlet aperture 11. This valve is in the form of a rod or stem having a collar 16 which rests upon the top of the step 10 and thus limits the downward movement of the valve. The valve has an axial hole 17 which extends from its lower end to the collar 16 and a vertical slot 18 extends from the hole 17 out through the side of the valve and is entirely closed by the wall of the hole 13, when the collar 16 rests upon the top of the step, and when the valve is raised, as will be later explained, the slot 18 is gradually uncovered to admit fuel to the mixing chamber. The underside of the collar 16 is slightly convex and normally rests in corresponding concavity in the top of the step. A constant downward

pressure is exerted upon the valve by a coil spring 19 which surrounds the valve and is interposed between the collar 16 and the under side of the cap 4. The upper portion of the valve, which extends above the cap 4, is threaded to receive a thumb nut 20. Within the outlet chamber is pivotally mounted an ordinary vertically disposed throttle valve 21, having an axial stem 22 which is mounted at its lower end in a hole in the wall of the chamber, its upper end portion projects out through and beyond a hub formed on the wall of the chamber, and upon this projecting portion is rigidly secured an operating lever 23, which is adapted to be operated from the steering wheel or by a foot lever, in the usual manner. The lever 23 is formed with an integral extension or arm 24 which terminates in cam member 25 having an arcuate slot 26 whose center is the axis of the throttle valve stem. The upper face of this cam member is in the form of an inclined plane, as shown in Fig. 2. The upper portion of the fuel valve 14 passes through the arcuate slot 26 and the thumb nut 20 on the valve is adapted to be engaged by the inclined face of the cam member either to raise the valve 14, when the lever 23 is moved in one direction, or to permit the valve to descend under the pressure of the spring 19, when the lever is moved in the opposite direction, as will hereinafter more fully appear. Within the mixing chamber is placed an L-shaped metal plate 27, the horizontal portion of which rests upon the bottom of the chamber. The vertical member of this plate is formed with an aperture 28 which incloses a fine mesh wire screen 29 and the screened aperture 28 registers with the outlet aperture 9 of the mixing chamber. The aperture 28 may be of a diameter to meet the requirements of the engine as to air supply. The horizontal member of the plate 27 is bent to form an offset 30, which is on a higher plane than the remaining portion, and a slot 31 is formed through the bent portion, as clearly shown in Fig. 6. A piece of absorbent fabric 32, in the nature of a wick is passed through the slot 31, its lower end being beneath the offset 30, and this wick extends to and against the vertical member of the plate and partially covers the screened opening 28 therein. The wick can be adjusted with respect to the screened opening, by a stem 33, which is mounted at one end in one side wall of the mixing chamber, its opposite end portion passing through a hole in the opposite side wall, and is provided with a thumb button 34. The surface of the stem is serrated, as shown and bears against the wick, which is thus held between the stem and the vertical member of the plate 27, and by turning the stem the wick can be raised or lowered so as to vary the area of the uncovered portion of the screened opening. Before starting the engine, the fuel valve 14 may be lifted to flood the mixing chamber; the wick is thus saturated, and when the engine is started the air drawn through the carburetor mixes with the fuel in the wick, which fuel is continuously fed to the highest point of the wick by capillary attraction, and the fuel is thus broken up by contact of the air with the wick, and the mixture passes to the cylinders in a highly vaporized condition. The screen 29, prevents the wick from being drawn through the opening 9. With this arrangement, the usual choke valve is omitted, as the fuel valve can be raised at will to flood the mixing chamber.

Air inlet holes 35 are formed in opposite sides of the outlet chamber 3, and these holes are normally covered by valves 36, on the ends of lever arms 37, which are pivotally mounted on pins extending through ears 37^A between which the arms lie. These arms extend up under the lever 23, and are horizontally disposed for a short distance, their ends terminating in inclined cams 38.

The arms are bent so that their outer portions are curved to lie in a common arc whose center is the axis of the valve stem 22, and blade springs 39 are soldered at one end to the under side of the lever arms, their opposite ends bearing upon the wall of the chamber 3. These springs exert an upward pressure on the arms, which causes the valves 36 to normally close the air holes 35. A screw 40 extends down through the lever 23, in such position that when the lever is turned either to the right or left, the screw travels in an arc of the same radius as the curved ends of the levers 37. When the lever 23 is moved to open the throttle valve to the limit of its movement, the end of the screw will engage the inclined cam 38 on one of the levers 37, thereby depressing the lever, the valve 36 of which opens the adjoining air hole 35, thus admitting air to the carburetor in addition to that which enters the inlet end thereof.

When the lever 23 is moved in the opposite direction to close the throttle valve, as in coasting, the end of the screw 40 will engage the inclined cam on the end of the other lever arm 37, thereby depressing the same to cause its valve to open the adjoining air hole 35, thus admitting air to the cylinders, which is compressed by the pistons, thus retarding the action of the engine, and thereby slowing down the car.

The screw 40 can be adjusted to give a greater or less valve opening movement to the arms 37, as may be found necessary.

The outlet end of the carburetor is formed with a bolt flange 41, whereby the carburetor may be secured to a corresponding flange on the end of the intake manifold of the engine.

In operation, before the engine is started, the valve 14 is lifted to flood the mixing chamber, whereby the wick 32 is saturated and the fuel feeds up to the upper portion thereof, which partially covers the screen 29 in front of the outlet hole 9. The throttle valve 21 is then opened, and the valve 14 is simultaneously opened by the engagement of the cam 25 with the nut 20 on said valve, thus admitting a regulated supply of fuel to the chamber, through the slot 18 in said valve, and as the inlet and outlet holes 8 and 9 respectively, are above the level of the slot 18, the air is drawn in a direct line through these holes, and the fuel entering through the slot 18 replenishes the supply already in the chamber, and which is continuously absorbed by the wick and mingles with the air passing through the chamber, and is thoroughly mixed therewith, and passes to the intake in a highly vaporized condition, the wick being adjusted to give the best results. By a proper adjustment of the nut 20, the valve 14 can be raised to a greater or less degree, relative to the movement of the throttle valve, thus admitting the desired amount of fuel to the mixing chamber, and the air valves 36 are opened by the screw 40, at the extreme opening and closing movements of the throttle to admit air to the outlet chamber 3, as above set forth.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with a carburetor having a mixing chamber provided with air inlet and outlet openings, of a fuel valve and means for operating the same to admit fuel to said chamber, said openings being above the level of the fuel inlet, a removable plate in said chamber having an opening and adapted to register with the outlet opening and a wire screen over the opening in said plate, a fuel absorbing wick adapted to extend partially over said screened opening, whereby air drawn through said openings mingles with the fuel in said wick to form an explosive mixture, and means for adjusting said wick with respect to the screened opening.

2. The combination with a carburetor having a mixing chamber provided with air inlet and outlet openings and a raised portion on the bottom of said chamber having a fuel inlet opening through the top thereof, said top being below the level of the inlet and outlet openings, a valve for said fuel inlet, and means for operating the same to admit fuel to the chamber; of a removable plate in said chamber having a right angled foot which rests on the bottom of the chamber, and a screened opening which registers with the outlet opening, a fuel absorbing wick adapted to extend partially over said screened opening, and means for adjusting the wick and for holding the same in contact with said plate.

In testimony whereof I affix my signature.

JOHN J. A. MILLER.