

April 28, 1931.

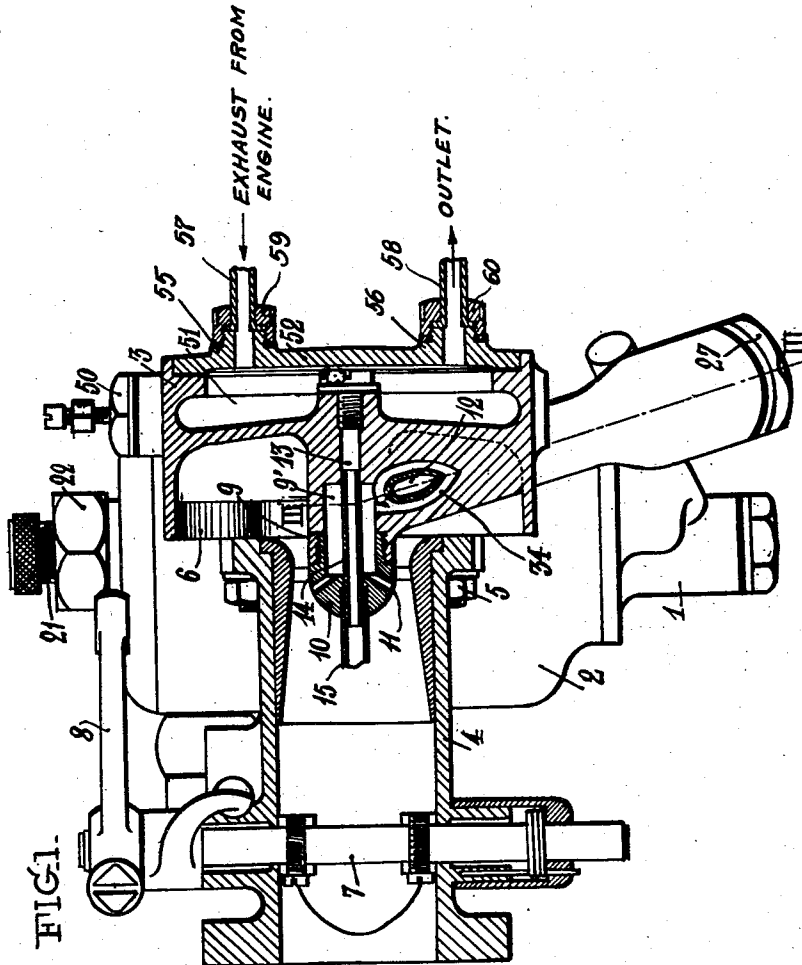
H. J. GUIRAUD

1,802,506

CARBURETOR

Filed Nov. 12, 1926

3 Sheets-Sheet 1



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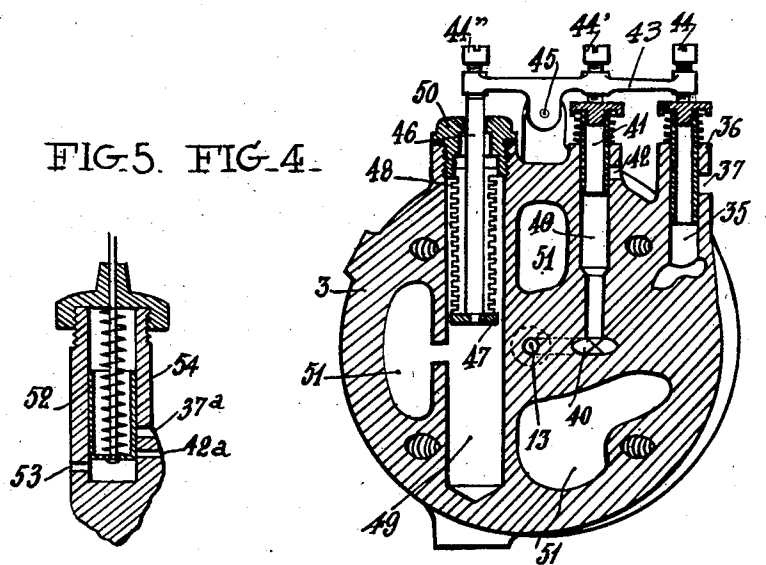
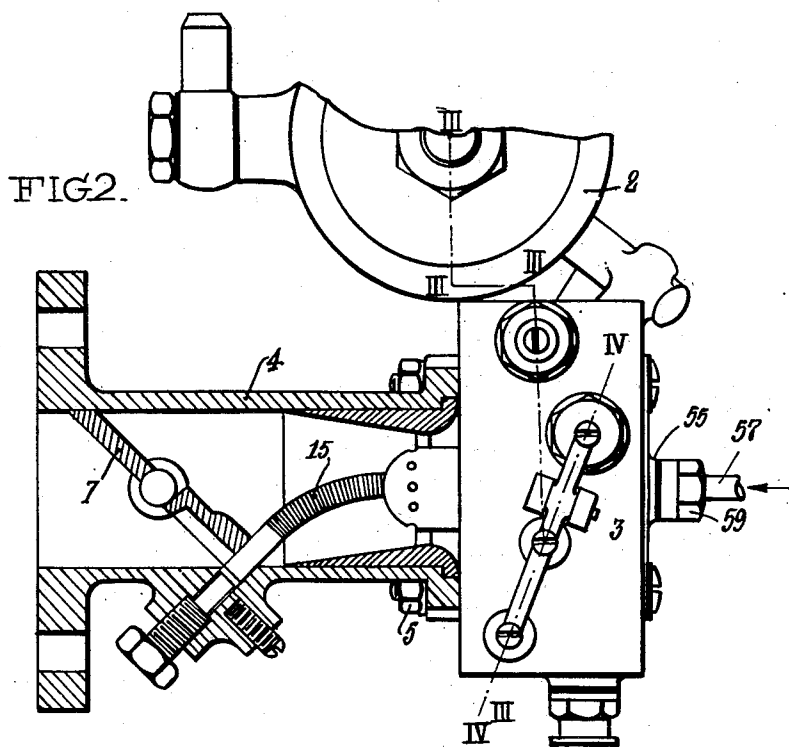
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CARBURETOR

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3 Sheets-Sheet 2



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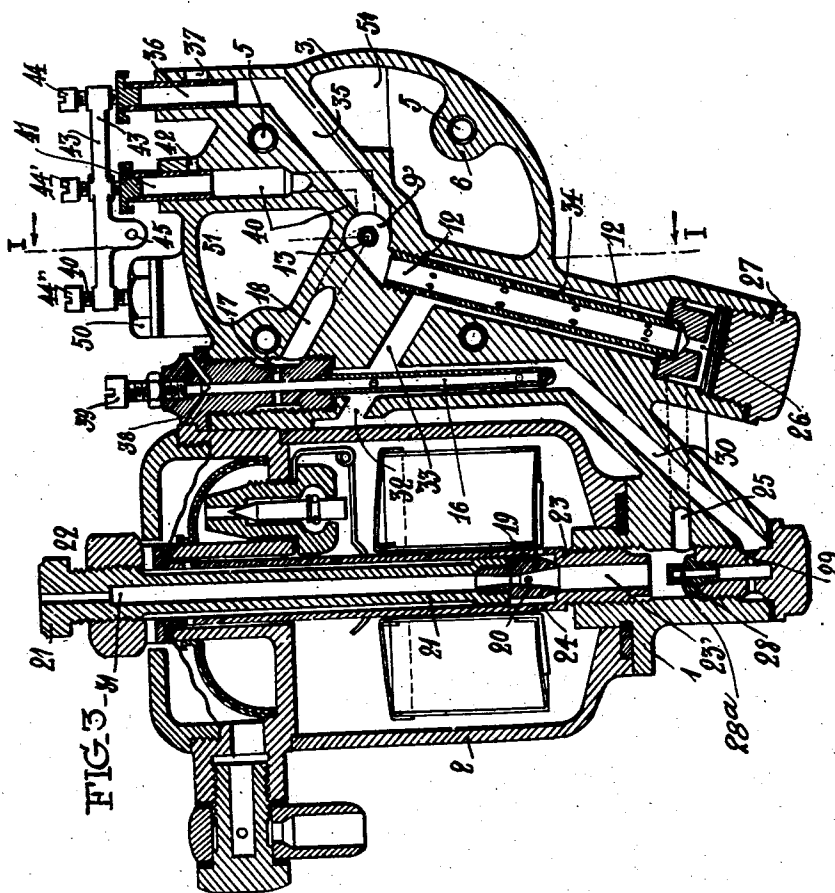
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CARBURETOR

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3 Sheets-Sheet 3



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CARBURETOR

Application filed November 12, 1926, Serial No. 148,077, and in France October 12, 1926.

My invention has for its object improvements in carburetors and particularly in carburetors in which the spraying orifices are distinct from the diffusing elements, said spraying orifices being near the float chamber and preferably coaxial to this, and the diffusing elements being out of said chamber and eccentrically in regard of this.

One feature of my invention consists therein that both calibrated spraying orifices for normal running and for slow-speed operation are provided and communicate freely with the atmosphere so that the pressure acting upon the output of both spraying nozzles is exclusively determined by the approximately constant level of the liquid fuel column in the float chamber above the respective orifices. In this manner, the variations of the distance between the level of the liquid in the float chamber and the air supply holes to the diffusing elements which may arise when the carburetor occupies an inclined position do not produce any perturbations for the supplying of the liquid fuel.

The invention further relates to a correction device of the slow-speed and normal running emulsions; these correction devices may either be independent or conjugated and operated by a common controlling device. Both correctors may also be united so as to form a single element, such as a cylinder communicating, on one hand with the atmosphere, and on the other hand, by means of two or more orifices, with the two diffusing elements (for slow speed and for normal running), or with the respective multiple diffusing elements, a single piston covering at the appropriate moment the required orifices.

These correction devices may be automatically actuated by means of a controlling device itself controlled by the temperature and actuated directly upon said correcting devices.

The annexed drawing shows by way of exemplification a carburetor according to the invention. Fig. 1 is a section on the axis of the mixing chamber of the carburetor on line I—I (Fig. 3); Fig. 2 is a corresponding

plan view partly in section. Fig. 3 is a composite view after assembly of the sections on line III—III (Fig. 1) and that on line III—III (Fig. 2). Fig. 4 is a partial section through IV—IV (Fig. 2). Fig. 5 shows a different form of the emulsion corrector.

The support 1 of the float chamber 2 forms an integral part with the housing 3 of the emulsion system, while the mixing chamber 4 of the carburetor is fastened by means of bolts 5 to lugs 6 of the housing 3; mixing chamber 4 which is provided with a throttling element of any desired type, such as a butterfly valve 7, which is controlled by an operating lever 8.

The housing 3 of the emulsion system forms the nozzle 9 extending coaxially to the mixing chamber 4; the nozzle head 10 which is screwed upon the nozzle 9 is provided with orifices 11 for the emulsion supply at normal running. This nozzle 9 is fed by the diffusing tube 12 which extends into its chamber 9'. The slow speed nozzle comprises the central channel 13 provided within the housing 3, the central tube 14 and the flexible extension tube 15 which cooperates with the throttle disc 7 such as in the pending U. S. application Ser. No. 40,560, filed June 30, 1925; the slow speed emulsion is supplied to this nozzle by the diffusing tube 16, from where the emulsion passes through the orifices 17 into the channel 18 provided in the housing 3 and connected to the central channel 13 (Fig. 3).

The arrangement of the main spraying element 19 with calibrated orifices 20 is similar to that described in U. S. application Ser. No. 755,296, filed December 11, 1924; it is supported by a rod 21, the upper end of which is screwed into the head 22 of a tube 23; the lateral orifices 24 provided therein establish a direct communication between the inside of the float chamber, and the calibrated orifices 20; the latter supply to lower part 23' of the tube 23 and the main diffusing tube 12 through the channel 25, as well as the chamber 26 closed against the outside by a screw-threaded stop 27 and communicating freely with the interior of

the diffusing tube 12; the main calibrated orifices 20 feed at the same time the slow-speed calibrated orifices 28^a of the element 28 placed in series therewith while the latter
 5 supplies the diffusing tube 16 through the orifices 29 and the channel 30, all these communicating channels being formed within the part forming the diffusing system and float chamber support.

10 According to the invention the rod 21 carrying the main spraying element 19, is bored throughout by a channel 31 connecting the spraying orifices 20 with the atmosphere. It results that the pressure acting
 15 upon the output of the orifices 20 is exclusively dependent on the approximately constant height of the liquid in the float chamber above said orifices, so that this pressure remains constant under any inclination of the carburetor. Similarly, the
 20 pressure acting upon the output of the slow-speed calibrated orifices 28^a is also dependent of the height of the liquid column above these orifices, that is, this charge remains
 25 constant under all inclinations of the carburetor. All perturbations are thus avoided which, by using a solid rod 21, would occur due to the varying distance between the level of the liquid in the float chamber and
 30 the point or points of the entry of the emulsion air into the diffusing tube under the inclined positions of the carburetor.

The emulsion air for the two diffusing tubes arrives from the outside through the
 35 orifice 32 provided in the wall of the emulsion system housing (Fig. 3) and communicating with the channel 33; the latter communicates on one hand with the channel 30 around the slow-speed diffusing tube 16,
 40 and on the other hand with the channel 34 in which is lodged the main diffusing tube 12.

The main diffusing tube thus receives the liquid measured out by the spraying orifices
 45 20 and the primary air arriving through the orifices 32 and the channel 33; it supplies its emulsion to the annular chamber 9' feeding the orifices 11, but this emulsion can be corrected by a variable addition of
 50 air regulated by the corrector 36 and entering the annular chamber 9' through the channel 35; this corrector may consist of a small piston allowing to uncover more or less the orifice 37 communicating with the
 55 atmosphere. The slow-speed diffusing tube 16 receives its liquid fuel from the calibrated orifices 28^a through the channel 30, and its primary air through the orifice 32 and the channel 33; it supplies this primary emul-
 60 sion through the orifices 17 into the channel 18, but this emulsion can previously be regulated by an addition of secondary air arriving through the holes 38 into the diffusing tube, the free section of which holes being
 65 arranged to allow this previous regulation

by the needle 39. The emulsion thus regulated flows from the channel 18 into the axial channel 13 feeding the flexible tube, but it can be corrected in regard of the supplementary tertiary air arriving through
 70 the channel 40, and regulated by a corrector 41 which is likewise formed by a small piston regulating the uncovered section of the orifices 42 communicating with the atmosphere.

The two correctors 36 and 41 can be coupled by a common controlling device consisting of a lever 43 upon which are mounted the two pistons 36 and 41; the latter are adjustable upon said lever by means of
 75 screws 44, 44' . . . , the lever itself being pivoted at 45 about the casing of the apparatus. Both correctors may also be united within a single cylinder 52 (Fig. 5) communicating with the atmosphere through an
 80 orifice 53 and provided with two orifices 42^a and 37^a communicating with the slow-speed diffusing element and the main diffusing element respectively; these two correctors are regulated either by hand or by means of a
 85 controlling device operating according to the variations of temperature.

The united corrector shown is preferably controlled by the temperature of a heating fluid supplied by the engine as clearly represented in Fig. 4. This controlling device
 90 comprises the lever 43 carrying at one end a rod 46, the position of which can be regulated by means of a screw 44''; this rod is mounted for free sliding movement within
 95 the closing cap 50 and is fixed by its lower end at the bottom 47 of the undulated envelope 48, the length of which automatically varies according to the variations of the temperature of the heating fluid supplied by
 100 the motor. Said fluid the temperature whereof is dependent on the motor load circulates within the chamber 49, around the envelope 48 of the thermostat, the latter adopting the same temperature. This envelope stretches out or contracts according
 105 to the varying surrounding temperature and both united correctors 41 and 36 are thus automatically controlled by the rod 46 when the temperature increases the undulated envelope 48 dilates and its bottom 47 goes
 110 down and draws along the rod 46. The lever 43 turns on the pivot 45 in a counter clockwise direction and lets up the pistons 36 and 41 in order to uncover the orifices 37 and 42,
 115 to let in additional air and consequently to make a leaner mixture. A contrary operation is actuated by a decreasing temperature.

The heating fluid is conducted from the engine by an inlet conduit 57 to the rear
 120 chamber 51. Cover 52 is provided with a nipple 55 attached by a coupling 59 to said inlet conduit 57. Rear chamber 51 is also connected through an outlet conduit 58 to the main exhaust conduit of said engine,
 125 130

conduit 58 being attached to nipple 56 on cover 52 by means of a coupling 60. Port 51' is provided between chambers 49 and 51 to permit circulation of the heating fluid within the housing of the system (see Fig. 4).

It is well understood that the dispositions and the various detail constructions of the apparatus may be widely varied without departing from the scope of the invention.

Claims:

1. In a carburetor with a diffusing tube for normal running and a diffusing tube for slow-speed running, each separately receiving fuel and air to form an emulsion, a common controlling device to actuate two separate correctors for regulating additional air separately supplied respectively to the normal running and to slow-speed running diffusing tubes, each of said correctors being formed by a piston movably mounted in a cylinder communicating with the atmosphere by at least an air inlet orifice and with the corresponding diffusing tube by another orifice, one of said orifices being covered and uncovered by said piston.

2. In a carburetor comprising a float chamber and two diffusing tubes feeding the main nozzle and the slow speed nozzle, a main calibrated spraying orifice provided in a hollow rod open to the atmosphere and mounted substantially centrally within the float chamber said main spraying orifice externally communicating directly with the float chamber and said hollow rod communicating with the main diffusing tube, and a slow-speed calibrated orifice communicating on one side with said hollow rod and on other side with the slow-speed diffusing tube.

3. In a carburetor, in combination, a main diffusing tube for normal running, a diffusing tube for slow speed running, fuel supply means for each of said diffusing tubes, air supply means for each of said diffusing tubes, a second air supply means for each of said diffusing tubes and a common controlling means for regulating the additional air separately supplied to said diffusing tubes.

4. In a carburetor, in combination, a main diffusing tube for normal running, a diffusing tube for slow-speed running, fuel supply means for each of said diffusing tubes, air supply means for each of said diffusing tubes, a second air supply means for each of said diffusing tubes, a common controlling means for regulating the additional air separately supplied to said diffusing tubes and a thermostatic control means in heat conductive relation to the motor actuating said common controlling means.

5. In a carburetor, in combination, a main diffusing tube for normal running, a diffusing tube for slow-speed running, fuel

supply means for each of said diffusing tubes, air supply means for each of said diffusing tubes, a second air supply means for each of said diffusing tubes, a common controlling means for regulating the additional air separately supplied to said diffusing tubes and thermostatic control means in heat conductive relation to the motor comprising an undulated envelope actuating a rod engaging said common controlling means.

6. In a carburetor with a float chamber, in combination, a main diffusing tube for normal running feeding a main nozzle, a diffusing tube for slow-speed running feeding a slow-speed nozzle, fuel supply means for each of said diffusing tubes, air supply means for each of said diffusing tubes, a second air supply means for each of said diffusing tubes, a common controlling means for regulating the additional air separately supplied to said diffusing tubes, a hollow rod open to the atmosphere and entirely mounted within the float chamber provided with a main calibrated spraying orifice, said main calibrated spraying orifice externally communicating directly with the float chamber and said hollow rod communicating with said main diffusing tube, and a slow-speed calibrated orifice communicating on one side with said hollow rod and on the other side with said slow-speed diffusing tube.

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