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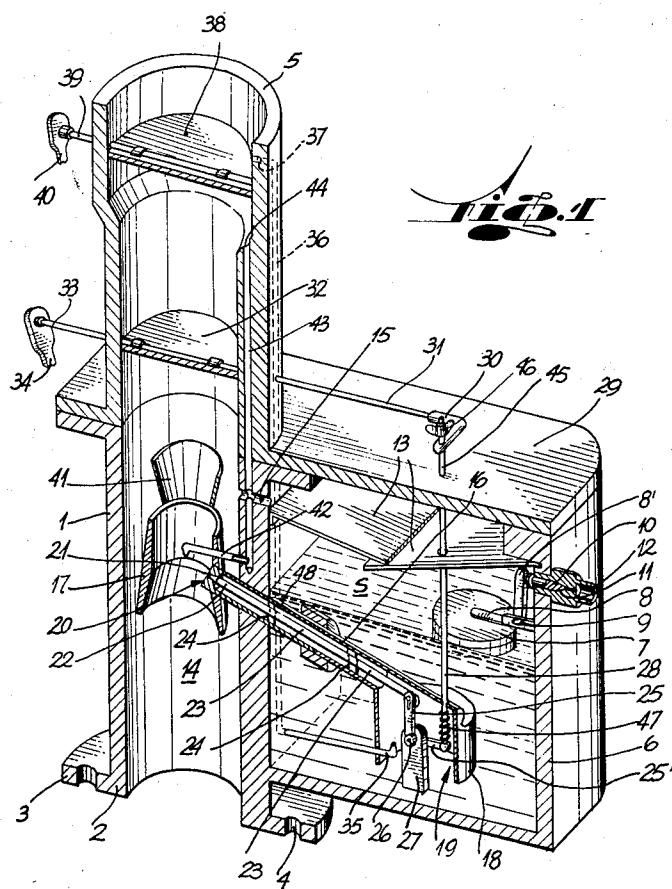
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2,849,216

CARBURETTORS

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2 Sheets-Sheet 1



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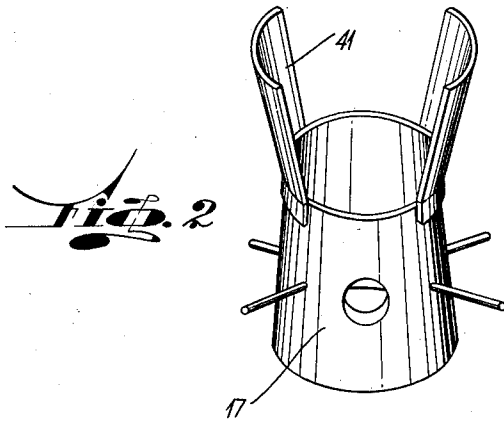
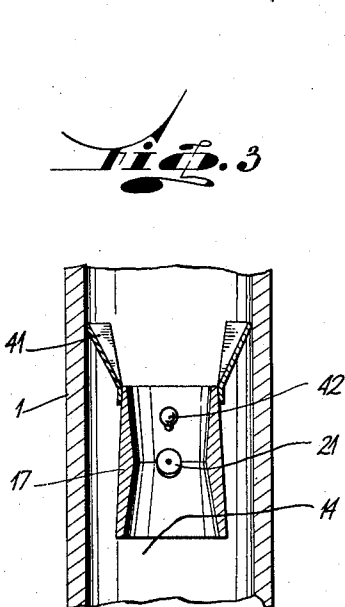
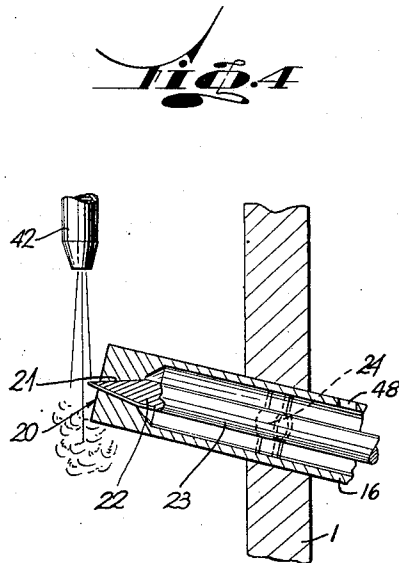
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CARBURETTORS

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7 Claims. (Cl. 261-44)

The present invention relates to carburetors and one of the objects of the invention is to provide a carburetor producing a particularly homogeneous mixture of air and fuel and wherein such combustion mixture directly enters the cylinder through the admission header or manifold and wherein all surfaces obstructing the passage are avoided.

Another feature of the carburetor resides in the fact that pumps and similar auxiliary devices such as idling injector nozzles are omitted since these parts are replaced by an adjustable, that is to say remote controlled, injector.

Furthermore the carburetor proposed permits the gasoline or fuel pump to be omitted since the constant level chamber, of the carburetor, which is connected to the fuel reservoir or tank, is maintained at a sufficient vacuum so as to cause the fuel to be entrained into the float controlled chamber due to the differences in pressure.

Another feature of the carburetor resides in the fact that the Venturi device arranged on the admission header includes at least two surfaces for guiding the air towards the nozzle whereby the entrainment of the fuel leaving the injector is assured.

The invention provides evident advantages which may be easily appreciated from the following detailed description of one preferred embodiment of the invention, which has been illustrated by way of example in the accompanying drawings, wherein:

Figure 1 is a general view partially in section, showing a carburetor, according to one embodiment of the invention;

Figure 2 shows a detail of the distributor tube or Venturi and the guiding surfaces thereof for guiding the air;

Figure 3 shows in detail the fuel nozzle and the particular arrangement of the air injector nozzle; and

Figure 4 shows a detail of the injector.

Throughout the several figures, the same reference numerals have been used in order to designate equal or corresponding parts of the device.

In accordance with the drawings, 1 designates the admission tube of the carburetor the lower end 2 of which is formed with a radial flange 3 having openings 4 adapted to be connected to the admission header of an engine, whilst the upper end 5 may be provided with an air filter which has not been illustrated since any filter of conventional type may be used.

Adjacent to tube 1 there is a constant level or float chamber 6 within which a float 7 is housed which is connected to a system of levers 8, 8' pivoted to the shaft 9 whereby the float 7 controls the stopper 10 which acts as a valve in the seat 11 formed in the tube 12 connected to the fuel tank (not shown).

This float defines the level of fluid S present within the chamber 6 and above such level S there is a plurality of baffles 13 for the purpose of preventing the fluid from overflowing the same when the vehicle is moving, since the space above such sheets is in communication

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with the inner portion 14 of conduit 1, by means of a conduit or vent designated with the reference numeral 15. In order to establish a connection between the space above the baffles 13 and below the baffles 13, the free ends of said baffles 13 are obviously not in sealing contact.

Since tube 1, as already stated, is connected to the admission header, the vacuum produced therein entrains the air and the fuel vapors contained in the constant level chamber 6 and produces a certain vacuum within the latter, whereby in turn the admission of fuel supplied by the tank (not shown) is facilitated. Such fuel will pass through valve 12 under the control of the float 7.

In the same float chamber 6 there is an injector constituted generally by a tube 16, the delivery end of which discharges into a distributor cone 17 or Venturi whilst the other end portion 18 is bell shaped and open at its lower end 19 as may be seen from Figure 1.

The tube 16 may be supported by any conventional means and its free front end 20 is provided with a small nozzle 21 through which the point 22 of a needle or bar 23 passes so as to control the flow of fuel.

Such needle 23, according to the drawings, may be supported in guides 24 which allow the same to be moved by means of a system of bell crank levers 25, 25' pivoted to a shaft 26 on a support 27 and which, with the aid of a rod 28, passing through the upper cover 29 of chamber 6, projects upwardly to be connected to an operating lever 30 mounted on a shaft 31 on which in turn the throttle valve, screen or disc 32 is supported. Said shaft 31, at its end 33, is connected to a control rod 34 which may be connected to a pedal or accelerator control.

Below the bell 18, there is an air injector nozzle 35 which through a channel 36 is in communication with the upper portion 5 of tube 1, as indicated at the free end 37. It should be pointed out that said end 37 is located above the choker valve or screen 38 which is supported for rotary movement on shaft 39 and which by means of a control rod 40 enables the choking of the engine.

This nozzle 35 allows air to enter below the bell 18 and establishes an equilibrium so that it is possible for the fuel to leave through the nozzle 20 of the injector.

On the other hand, a slight whirl is produced below said bell 18 which is advantageous since the same allows the fuel to be introduced into the distributor cone 17 in a perfectly homogeneous condition.

It should be noted that the distributor cone 17 in its upper portion has at least one pair of guiding surfaces 41 which guide the current of aspirated air in order to entrain therein the gasified fuel leaving such distributor whereby it prevents all or a great part of the aspirated air from passing through the outer portion thereof.

An important feature includes the nozzle 42 which is arranged opposite and above nozzle 20 and which by means of a conduit 43 is in communication with the space above the throttle valve or screen 32. The reference numeral 44 designates the admission end of conduit 43.

The aspirated air drawn in through tube 43 impacts with the homogenized mixture leaving nozzle 21 and prevents the same from condensing on the inner wall of the Venturi 17. Apart from this, the air from nozzle 42 facilitates the formation of fuel clouds.

The end 45 of rod 28 which controls needle 23 may include a threaded screw 46 or any other means for adjusting the carburetor and, furthermore, said needle 23 tends to be in closed position under the action of some resilient means such as spring, 47.

In order to ensure the operation of the engine at a low rate of revolution, the tube 16 is provided with a

small opening 48 which allows a portion of the air (which is supplied by nozzle 35) to escape instead of being incorporated in the fuel through the nozzle 21.

This is evident, since if the engine rotates at a lower speed than its maximum, the admission manifold will receive a smaller quantity of fuel and if the opening 48 would not be present, the entire air supplied by nozzle 35, would be ejected with the fuel by fuel ejector nozzle 21. The amount of air which may escape through opening 48 is automatically controlled, which is obvious if it is borne in mind, that the amount of air supplied by nozzle 35 is practically constant and, that said constant amount of air is adjusted for the maximum speed of the engine, so that if the engine operates at a lower speed, the excess of air which is present in tube 16 will be withdrawn into chamber 6, due to the sub-atmospheric pressure residing therein. The amount of air which is withdrawn from opening 48 is controlled by the speed with which the fuel and air mixture passes through tube 16. Thus, nozzle 21 always ejects an ideal mixture of fuel and air.

From the above description which, as already stated, refers to one embodiment; by way of example, it can be seen that the novelty of said embodiment resides in the fact that the two fuel nozzle system for high speed and idling, in the known carburetors, is replaced by a needle injector constituted by the elements 16 and 23.

Another important feature consists in the constant level or float chamber 6 wherein through the opening 15, which is not connected to conduit 43, a certain vacuum is maintained which contributes to the easy admixture of the air to the fuel within bell 18.

Another detail which can also be seen from the above description is the balancing nozzle 35 which allows the fuel to leave through the injector which delivers the same into the Venturi 17 having guiding surfaces 41, in spite of the sub-atmospheric pressure residing in float chamber 6.

Another important detail is the fact that the throttle valve 32 is a disk controlled by the accelerator and which is located above the injector 16 and Venturi 17, whereby condensation of the fuel when contacting the disk, as happens in the prior art, is avoided.

As to the operation of the above described carburettor, it may be added, that the engine (not shown) produces, after being started, a vacuum or sub-atmospheric pressure below the throttle valve 32, which is substantially constant for all speeds of the engine. This vacuum resides both in the float chamber above level S as well as at the free front end 20 of injector 16. The fuel level S remains substantially constant, and bearing in mind the atmospheric pressure at the front end 20 and that the air ejecting nozzle 35 supplies air under atmospheric pressure into the bell 18, a constantly controlled mixture of fuel and air, which is controlled by opening 48, is led into the Venturi 17, where the actual atomization in cooperation with air ejector nozzle 42 controlled by a choker valve 38, takes place. The resulting atomized fuel mixture, of excellent quality, now directly enters the engine without, as happens in the known carburetors, the mixture having to pass any kind of throttle valve where condensation always takes place. Besides the foregoing, it has to be borne in mind that the usual butterfly type of throttle valve, as used in the known arrangements, always changes the direction of flow of the atomized mixture, which produces undesirable whirls and sometimes further condensation in the manifold. It has been noted that the carburettor according to the present invention supplies the atomized mixture to the engine at a lower temperature than the previously known arrangements, so that the size of the cooling system, such as a water cooling system, for the engine may be reduced.

It will be clear that several modifications may be introduced in the structural details described without departing from the general scope of the invention which

should be determined in accordance with the annexed claims.

We claim:

1. A carburettor for internal combustion engines of the ignition type and having accelerator means; said carburettor comprising a tube including a Venturi and having a lower end adapted to be connected to the intake manifold of an engine and an upper end adapted to be connected to an air filter, a float chamber for housing fuel which defines a fuel level and is connected to said tube, a fuel injector tube having a rear end and a front end including a fuel injector nozzle, a needle mounted in said fuel injector tube and linked to said accelerator means for controlling said fuel injector nozzle said needle being controlled by said accelerator means, a throttle valve housed in the first mentioned tube and linked to said accelerator means in order to be also controlled by said accelerator means, said front end of the fuel injector tube being arranged in said Venturi and said rear end being arranged in said float chamber, said throttle valve being disposed above said Venturi and below said upper end of the first mentioned tube whereby said Venturi is completely subjected to the suction produced by the engine, a vent in said first mentioned tube below said throttle valve connecting said first mentioned tube with said float chamber above said fuel level, said vent maintaining said float chamber under sub-atmospheric pressure when said engine is operating, said rear end of the fuel injector tube defining a bell arranged below said fuel level, first air supply means for supplying air at atmospheric pressure below said bell and capable of supplying the necessary air when said engine operates at maximum so that said fuel may leave said float chamber through said fuel ejector nozzle, and at least one opening in said fuel injector tube within said float chamber permitting the discharge of excess air in said fuel injector tube into said float chamber when said engine operates at less than maximum.

2. A carburettor as claimed in claim 1; wherein said bell has a lower end which is open, and said float chamber comprises a bottom portion, said open lower end of said bell facing said bottom portion of the float chamber.

3. A carburettor as claimed in claim 1; further comprising a choker valve arranged in said first mentioned tube between said throttle valve and said upper end of said first mentioned tube.

4. A carburettor as claimed in claim 3; further comprising second air supply means arranged above said front end of said fuel injector tube, said second air supply means having air admission means arranged in said first mentioned tube between said throttle valve and said choker valve.

5. A carburettor as claimed in claim 4; wherein said first air supply means comprises a channel arranged in said first mentioned tube and having a free end opening into the latter above said choker valve and an air injector nozzle housed in said bell and connected to said channel.

6. A carburettor as claimed in claim 1; wherein said float chamber has a plurality of sheets arranged therein above said fuel level for preventing the entry of fuel into the space above said plurality of sheets in said float chamber, said vent connecting the last mentioned space with said first mentioned tube.

7. A carburettor as claimed in claim 1; wherein said Venturi consists of a distributor cone and at least a pair of outwardly directed guiding surfaces integral with said distributor cone, said distributor cone being mounted in said first mentioned tube.

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