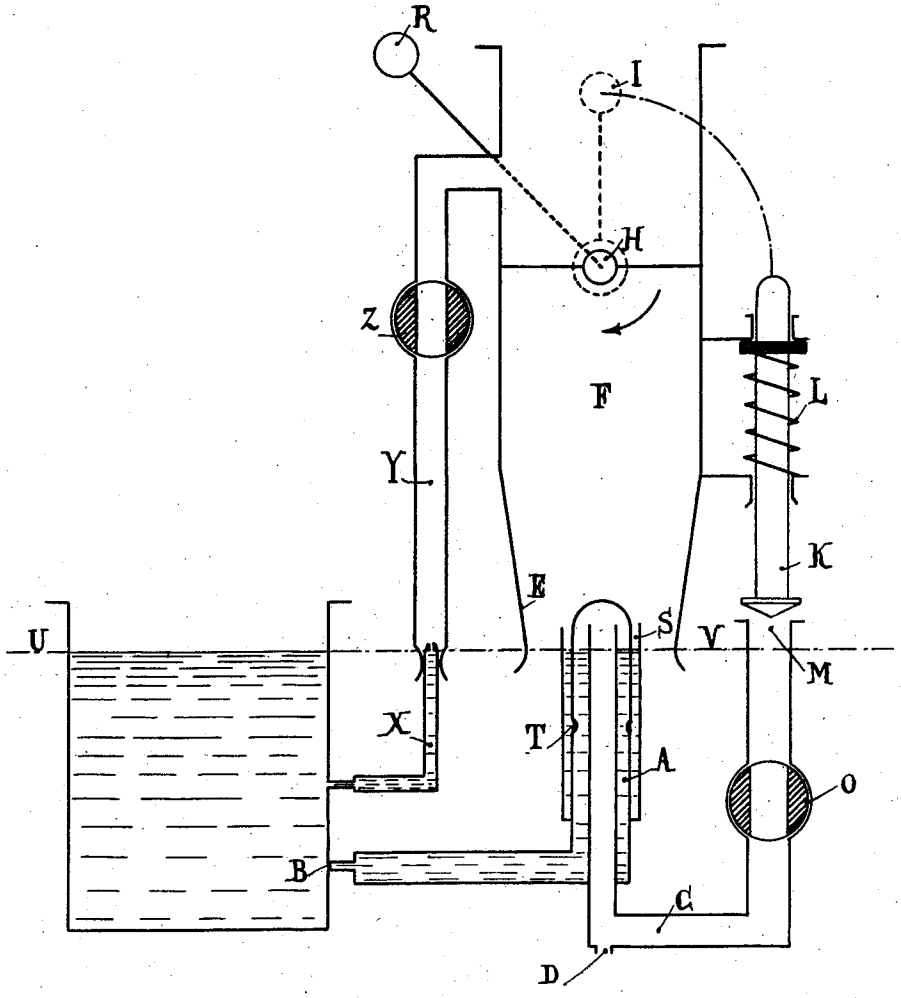
Sept. 27, 1927. 1,643,864

L. L. VIEL

CARBURETOR

Filed Feb. 17, 1922 2 Sheets-Sheet 1

fig. 1.



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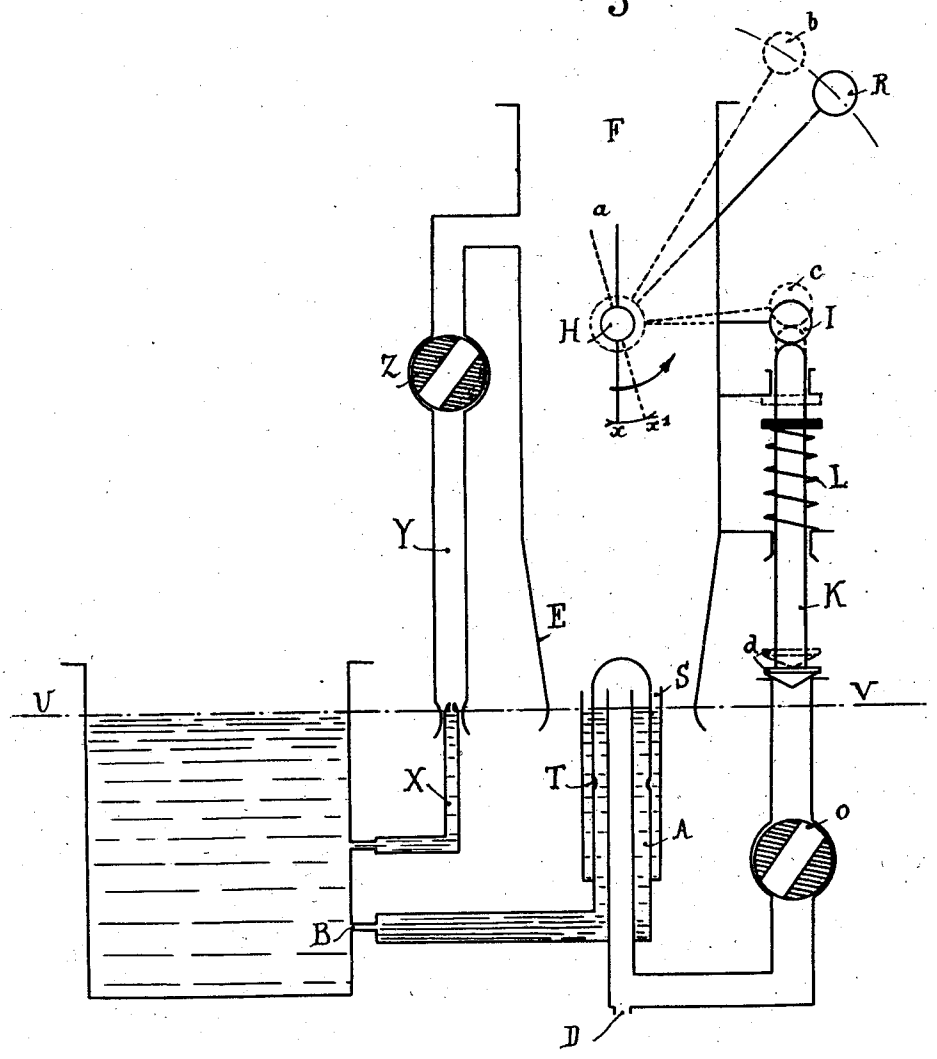
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CARBURETOR

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fig. 2.



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Patented Sept. 27, 1927.

1,643,864

UNITED STATES PATENT OFFICE.

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CARBURETOR.

Application filed February 17, 1922, Serial No. 537,202, and in France July 15, 1921.

It is generally admitted that the regulation of carburetors of internal combustion engines should be carried out in such a manner that the consumption of fuel may be as limited as possible, while permitting a satisfactory running of the vehicle.

On the other hand, it is well-known that the full power of an internal combustion engine can be obtained only with a super-carburation of the mixture to an extent of about 10 to 12% in excess of the normal carburation, and that a super-carbureted mixture likewise gives more suppleness to the engine in abrupt changes of working.

The present invention consists in improvements in carburetors of the kind in which a primary air supply is normally mixed with the fuel before this mixes with the main air supply and more especially in such carburetors as have a primary air passage traversing the spraying nozzle, the primary air supply being regulated or cut off by a valve controlled by the movement of the throttle. The improvements comprise means that enable a driver, as soon as he has opened the throttle sufficiently to admit to the induction pipe the maximum amount of carbureted mixture that can pass through the diffuser for normal feed, to furnish immediately the super-carbureted mixture, necessary in any case where it is desired to obtain either a great suppleness or the full power of an engine.

To produce super-carburation, the driver has to open the throttle to a further extent and in doing so will cause the primary air admission passage to be obturated automatically, the further opening being effected against the resistance of an elastic element which constitutes a stop to or a division between the phase of the free opening movement of the throttle for normal working and the phase of an opposed extended opening for super-carburation. It has already been proposed in carburetors to obturate the primary air passage to produce super-carburation, but this obturation has been effected concurrently with the opening movement of the throttle, in order that the variation in the feed which results should make only one phase with the variation due to the change in the opening of the throttle.

It has also been previously proposed in one type of carburetor to obturate the air admission passage at the moment when the throttle is opened to give the maximum mixture admission. But this operation has heretofore been inevitably effected at the end of the opening of the throttle, without any transition or any intimation being given that the phase of maximum flow or carbureted mixture for normal feed has been attained and the phase of super-carburation has commenced by reason of the obturating of the primary air supply, whereas in a carburetor arranged according to the present invention, owing to the resistance of the interposed elastic element, a warning is forthcoming that a transition stage has been reached.

The following description with regard to the annexed drawing, given by way of example, will clearly explain the manner in which the invention is carried out:

Figure 1 is a diagrammatic view showing a carburetor provided with the super-carbureting device, embodying the invention.

Fig. 2 is a view showing the carburetor device in operation.

In the arrangement shown in the figures a carburetor having a fuel chamber B of constant level U—V is provided with an atomizing or spray nozzle A, constructed in the usual manner with an air admission conduit or passage C producing, as is known:

1. An influx of gasoline into a diffuser E at the instant of picking up.

2. A check at the outlet of the liquid in proportion to the speed of the engine.

This check is established by the velocity of the air issuing through the calibrated holes T at the same time as the gasoline; the emulsion thus formed passes into a diffuser E after flowing through an annular channel S surrounding the nozzle.

As an accessory, there is shown in the figures a slow speed nozzle X, of which a passage Y regulated by a valve Z opens into a main induction pipe F above a throttle H. Slow running may, moreover, be provided for by any other suitable known system that can be associated with the device, the object of the present invention.

It is known that in a nozzle such as A

the extent of the restriction placed on the delivery of gasoline by the air admission device C depends

1. On the section of the calibrated holes T.

2. On the quantity of air through these openings.

In the construction shown in the figures, the air penetrating into the interior of the nozzle by the passage C comes from two distinct sources; one, invariable and constant is determined by a calibrated opening D, the other is constituted by an opening M. A controlling agent, such as a valve O is provided in the passage C.

The device permits of eliminating the air feed supplied by the opening M. To this end, an obturating member, such as a needle valve K, is arranged above the opening M and a pull-off spring L keeps it normally raised. If the upper end of the needle valve K be pressed down, the latter comes to rest against the opening M, as seen in Fig. 2, and the quantity of air passing through the holes T is diminished, from which there results an additional influx of gasoline into the diffuser E and, consequently, the desired effect of super-carburation.

Normally, the atomizer nozzle, A, fed from the constant level chamber B, delivers an emulsion of normal proportions. The carburetor functions under the usual conditions between the closing position of the throttle (Fig. 1) and the position shown by the dotted lines x' in Fig. 2. The position x of the throttle corresponds to the maximum admission of the carbureted air. In fact the area of the throttled opening at this instant in the pipe or passage F is much greater than the area of the annular section allowed by the nozzle A at the restricted point of the diffuser E.

When the throttle occupies the position x' an arm I carried by the operating shaft R of the throttle H comes to rest on the head of the needle valve K, as shown by dotted lines, in Fig. 2. The spring L offering a strong resistance, the turning of the throttle is stopped at this point, which, at the same time, indicates to the driver in a satisfactory manner that the carburetor is at this instant admitting full normal mixture.

If it is desired to produce super-carburation, it will simply be necessary to overcome the resistance of the spring L so as to bring the throttle into the position indicated by the full lines, Fig. 2. The extremity of the arm I bearing on the needle valve K causes the latter to close the opening M, as seen in Fig. 2. The nozzle A will then deliver an additional quantity of gasoline. Conversely, as soon as the momentary effort is made by the engine, the throttle valve is brought into the position x', without it being necessary to proceed to any tentative measures.

It is obvious that, without departing from the limits of the invention, there may be modifications of individual parts. The obturator or valve K might be actuated by any device other than the arm I. For instance, the obturator might be actuated by another part not connected directly to the throttle, but to the accelerating pedal or lever for actuating the throttle.

I claim—

1. In combination with a carburetor having an air inlet, a mixture outlet and a throttle valve in the said outlet and a constant level chamber, a fuel nozzle having a fuel feeding orifice below the level maintained in the constant level chamber, a U-shaped air conduit having one arm opening into the interior of the said nozzle at a point above the maintained fuel level and the other arm opening into the atmosphere, an air inlet permanently open to the atmosphere in the said U-shaped conduit situated at the lower extremity of the first mentioned arm, normally opened means associated with the said second mentioned arm for closing the orifice thereof, and means operated by the said throttle valve for closing the first mentioned means when the said throttle valve is moved to wide open position, substantially as described.

2. In combination with a carburetor having an air inlet, a mixture outlet and a throttle valve in the said outlet and a constant level chamber, a fuel nozzle having a fuel feeding orifice below the level maintained in the constant level chamber, a U-shaped air conduit having one arm opening into the interior of the said nozzle at a point above the maintained fuel level and the other arm opening into the atmosphere, an air inlet permanently open to the atmosphere in the said U-shaped conduit situated at the lower extremity of the first mentioned arm, a valve for closing the orifice in the said second arm, the said valve being normally biased by a spring to the open position, and a lever on the shaft of the said throttle valve adapted to move the said spring controlled valve to closed position when the said throttle valve approaches its wide open position, substantially as described.

3. In combination with a carburetor having an air inlet, a mixture outlet and a throttle valve in the said outlet and a constant level chamber, a fuel nozzle having a fuel feeding orifice below the level maintained in the constant level chamber, a U-shaped air conduit having one arm opening into the interior of the said nozzle at a point above the maintained fuel level and the other arm opening into the atmosphere, an air inlet permanently open to the atmosphere in the said U-shaped conduit situated at the lower extremity of the said first-mentioned arm, a valve for closing the orifice

in the said second arm, the said valve being normally biased by a spring to the open position, a lever on the shaft of the said throttle valve adapted to move the said spring controlled valve to closed position when the said throttle valve approaches its wide open position and means interposed in the said second arm of the said air conduit for regulating the flow of air therethrough when the last mentioned arm is open, substantially as described.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

LOUIS LÉON VIEL.