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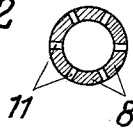
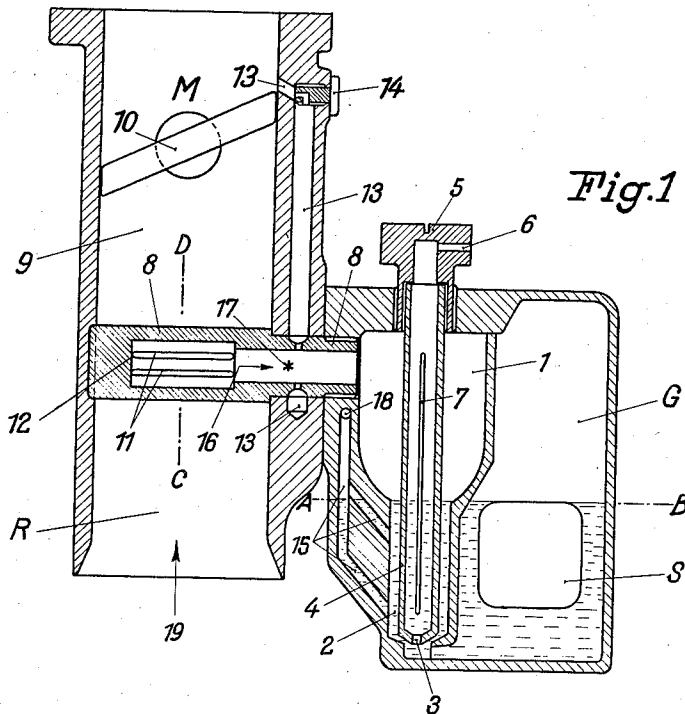
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2,075,692

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

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Fig.2



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CARBURETOR FOR INTERNAL COMBUSTION ENGINES

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1 Claim. (Cl. 261—19)

With a view to making travelling more comfortable, recourse is had in the case of carburetors for the internal combustion engines of motor vehicles to an acceleration pump the function of which is to furnish the engines, when running at a very low number of revolutions under load and when the throttle valve is suddenly and abruptly opened for the purposes of acceleration in direct gear when the vehicle is almost at a standstill, with a sufficient quantity of explosive mixture for satisfactory working. These acceleration pumps involve an extravagant waste of fuel as well as undesirably complicating the carburetor and increasing its cost.

The carburetor hereinafter described dispenses with the use of acceleration pumps with their attendant disadvantages whilst at the same time retaining their advantages.

The carburetor hereinafter described affords, moreover, the advantage of working satisfactorily with a single fuel nozzle and of furnishing the engine when the carburetor throttle is suddenly opened with only pure non-atomized fuel, so that harmful scavenging effect upon the cylinder is prevented or minimized.

Under all stages of load at a low number of revolutions the carburetor in accordance with the invention acts as a surface carburetor and, on the other hand, at a high number of revolutions as a spray carburetor.

One form of construction of the carburetor in accordance with the invention is given by way of example in the accompanying drawing, in which:—

Fig. 1 is a vertical section through the suction pipe and the carburetor,

Fig. 2 being a section along the line C—D in Fig. 1.

Contained in an ordinary float chamber G is an ordinary float S, the purpose of which is to maintain the level A—B of the fuel at a constant height. A novel feature of the present invention consists in arranging in the float chamber G, above the level A—B of the fuel a chamber I which serves as a mixture reservoir. The chamber I is provided underneath with a cylindrical extension 2 which by means of a passage 3 is placed in communication with the liquid fuel in the float chamber G. A fuel nozzle 4 designed in the form of a pipe is mounted in the extension 2. The upper end of the fuel nozzle 4 is held by a cap 5 which can be screwed in and out the float chamber G. The cap 5 is provided with a passage 6 by means of which the interior of the cap 5 is placed in communication with the outside air.

Along the tubular wall of the nozzle 4 longitudinal slots 7 are provided.

Connected with the upper part of the mixture reservoir I is a pipe 8 which crosses the intake. Positioned above pipe 8 is the usual throttle valve 10. The pipe 8 is provided with slots 11 arranged at regular intervals. These slots 11 may be substituted by perforations.

The end of the pipe 8 remote from the mixture reservoir I, is closed and acts as a deflector surface 12.

At or near the outlet of the mixture-reservoir I a passageway 13 opens into the pipe 8. This passageway 13 affords a communication between the space M above the throttle and the pipe 8 and the mixture reservoir I. An adjustable nozzle 14 regulates the delivery feed of the channel 13. In the lower portion of the float chamber C and next to the air inlet R passageways 15 are put in communication on the one hand with the extension 2 of the chamber I and on the other hand by means of a passage 18 with the outside air.

The method of operation of the carburetor is as follows:—

When the engine is at rest the float chamber G is as is usual filled with fuel up to a level indicated by the line A—B. Fuel is also present in the extension 2 of the mixture-chamber I, finding its way there by means of the fuel nozzle 4 and the lower part of the slots 7. Fuel is further present in the passage ways 15, which at 18 are in communication with the outside air.

When the engine is set in motion a vacuum will be formed, owing to the suction effect of the pistons, in the intake at M and, while the throttle valve 10 remains closed this vacuum will be transmitted by means of the passage way 13 to the chamber forming the mixture reservoir I and, furthermore, to the pipe 8 and to the space in the upper part of the nozzle 4 which by means of the upper part of the slots 7 is in communication with the mixture reservoir. Owing to this vacuum the outside air will endeavour to flow through the channel 18 and the passage 6 into the mixture-reservoir I. Since however, some of this outside air will on its way be drawn through the fuel contained in the passage ways 15 and in the extension 2 and in the lower part of the fuel nozzle 4, it will become impregnated with fuel vapour and the air rising to the surface in a stream of bubbles carrying up vapour in suspension forms an air bubble mixture which is richly charged with fuel and which will fill up the whole of the space in the mixture-reservoir I. This

bubble mixture would endeavour to flow out through the pipe 8 into the intake 9 if the air current indicated by the arrow 16 and drawn through slots 11 in the pipe 8 were not to act as a valve and allow the bubble mixture to flow only as far as up to about the point 17. A small portion of the bubble formed mixture will be fed through the passage way 13 to the induction pipe M and consequently to the engine, the amount of the mixture for light running being regulated by the nozzle 14.

Upon the throttle valve 10 being abruptly opened the suction effect through the passage way 13 will cease, as will also the countercurrent 16 of the air. On the other hand, however, the main incoming air current indicated by the arrow 19 and flowing over the entire circumference of the pipe 8 will create an injector effect at the circumference of the pipe 8. The vacuum in the mixture-reservoir 1 will thereby be very considerably increased, and consequently a great quantity of air will suddenly flow through the passage ways 6 and 18 at a fairly high velocity which will drive the whole of the bubble formed mixture contained in the mixture-reservoir 1 with great force onto the pipe 8 and against the deflector wall 12. Any droplets of fuel which may still be present will be atomized at this deflector wall 12 owing to the rebounding effect and the explosive mixture will be hurled through the slots 11 into the pipe 9 and into the main air current. Fresh fuel from the float chamber G will at once flow through the nozzle 3-4 and will at once be mixed with the fresh air entering through the passage ways 6 and 18, whereby a bubble mixture of uniform nature will be generated continuously in the chamber 1 which will flow in an even current towards the main air current in the intake 9, M and consequently to the engine.

Since with an increasing number of revolutions of the engine the suction effect on the mixture-reservoir 1 will become greater and greater, it would be possible that in the case of the described arrangement too much fuel might, from a certain moment onwards, be drawn into the engine. This is prevented by means of the fuel nozzle 4 which is tuned down to an absolutely definite quantity.

Moreover, the fresh air current entering at a certain velocity through the opening 6 will act as a brake on the column of fuel coming from the nozzle 4. The whole system can be so tuned and adjusted that at any load and number of

revolutions the correct composition and quantity of mixture can be supplied.

The pipe 8 is so designed that at its longitudinal slots 11 intensive eddies are set up into which the bubble mixture flowing into the pipe 8 and striking against the deflector wall 12 is drawn and thereby intimately mixed with the main air current 19, whereby a not inconsiderable economy in fuel is attained.

The float chamber G together with the mixture-reservoir 1 need not necessarily be built on to the throttle valve chamber 10, R, but may be mounted at any other suitable point.

The cap 5 when designed in the form of a capnut permits the fuel nozzle 4 to be taken out very quickly without the aid of any tools. This is of special advantage for adjusting the carburetor, for example when racing, in the case of impure fuel and the like.

I claim:

In a carburetor for internal combustion engines and in combination, an intake of the draught tube having a limited longitudinal passage way in its side wall with an adjustable outlet into the draught tube, a throttle pivotally mounted in the draught tube beneath said outlet, a fuel chamber positioned near said intake and near the bottom end of said passage way and provided in its side wall with a vent communicating with the outside and with passage ways leading with two branches down beneath the fuel level into a mixture chamber, a float arrangement adapted to maintain the fuel level in the float chamber about at half of its content, a fuel mixture chamber arranged inside of the float chamber, having an enlarged portion above the fuel level and reaching with a narrower portion below said level nearly to the bottom of the fuel chamber, where it is provided with an opening, a tubular nozzle arranged inside of the mixture chamber and extended downwards near to the bottom opening of the mixture chamber, said nozzle having longitudinal slots and an opening at its bottom end and a vented head adjustably held in the top wall of the mixture chamber and a cross pipe in the draught tube beneath the throttle, this pipe being closed at one end and open at its other end discharging into the mixture chamber and provided with slots communicating with the draught tube and with holes communicating with the lower end of said limited passage way in the wall of the draught tube.

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