PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in Carburettors.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to carburettors such as are employed for supplying liquid fuel to internal combustion engines. In such devices it is desirable that the mixture for slow running at light loads of the engine should be richer in fuel than that at high speeds and heavy loads.

The object of the invention is to obtain the correct mixture of fuel and air at varying speeds of the engine without the use of automatic valves or other like moving parts.

The invention consists in a carburettor having an inverted jet from which the fuel is cut off by a partition projecting above the level of the fuel when the engine is at rest, but to which the fuel is supplied by being raised above the partition by the suction of the engine on starting, the suction acting on the liquid through a restricted passage independent of the jet, so that the quantity of fuel supplied through the jet depends partly on the difference between the level of the fuel in the float chamber, and the level of the jet, and partly on the suction of the jet.

The invention further consists in the improved carburettor substantially as hereinafter described with reference to the accompanying drawings.

In the accompanying drawings, which show one means of carrying the invention into effect:—

Figure 1 is a section of the carburettor taken along the axis of the induction pipe;

Figure 2 is a section at right angles to Figure 1.

In the form of carburettor illustrated, the float chamber 1 located above an induction pipe 2 is provided with a central inverted jet 3 controlled in the well known manner by an adjustable needle valve 4. The induction pipe is fitted with a butterfly throttle valve 5 and with a choke tube 6 in the ordinary manner, the air inlet being supposed to be from the left. Liquid fuel is admitted to the carburettor by an inlet 7 and ordinary needle valve 8 under the control of a float 9 by means of which the level of the liquid fuel is maintained constant in the ordinary manner. This float, as shown, is of the type illustrated in the Specification of my co-pending Application No. 155,000 of even date herewith, but the invention is not confined to the use of a float of this particular type.

The jet 3 is continued upwards so as to form an open topped cylinder 10 the mouth of which is above the level of the fuel in the float chamber so that when the engine is at rest fuel is cut off from the jet 3.

The cover of the carburettor is formed with a chamber 11 which communicates by means of a passage 12 with the induction pipe 2 on the side of the throttle valve 5 nearer the engine. Fixed in the cover of the carburettor and communicating with the chamber 11 is a cylinder 13 dipping below the level of the fuel in the float chamber and surrounding the cylinder 10 as shown.

When the engine is started with the throttle valve 5 only partially open suction is produced in the passage 12 and

[*Price* 1/-]

chamber 11 and this is communicated through a restricted passage 14 in the chamber 11 to the cylinder 13. By this means liquid fuel is drawn up into the cylinder 13 and hence over the mouth of the cylinder 10, thus supplying fuel to the jet 3 through the valve 4.

While the engine is running a continuous supply of fuel is thus fed to the jet 3 through the joint action of gravity owing to the level of the fuel in the float chamber being above the jet and the suction of the engine.

The actual height to which the level of the fuel rises in the cylinder 13 is immaterial from the point of view of the effect of gravity on the feed, since the portion of the column of the liquid within the cylinder above the level of the fuel in the float chamber is sustained by the suction effect of the engine acting through the chamber 11. In order, however, that this suction effect shall be limited so that liquid is not actually drawn into the chamber 11 a valve 15 is provided so that when the suction in the chamber 11 exceeds a certain amount this valve lifts, thus establishing communication between the liquid levels inside and around the cylinder 13 and thereby limiting the height of the column inside the cylinder. The partial vacuum which is thus produced in the upper portion of the float chamber serves to draw in air through a small hole 16 the size of which may be adjustable by means of a valve or any other suitable device. This partial vacuum is at a maximum when the throttle is nearly shut and the engine working slowly under no-load. Therefore, at no-load of the engine, the flow of fuel through the jet is governed chiefly, on the one hand, by the height of fuel between the jet and the level of the fuel in the float chamber, and by the difference of pressure between the extremity of the jet 3 in front of the choke tube 6, and the partial vacuum created at the top of the fuel in the float chamber.

It follows that the size of the hole 16 will govern the amount of fuel supplied to the engine when working idly. If this hole is very large, the amount of fuel is due to the weight of the column of fuel between the level in the float chamber and the jet. If the size of this hole is below a certain limit, no fuel will flow through the jet, as the effect of the partial vacuum at the top of the float chamber might produce a suction higher than that due to gravity.

By properly proportioning the size of the hole 16 a correct mixture could be obtained between the amount of fuel flowing through the jet, and the amount of air sucked by the engine through the throttle 5 when the engine is working idly.

The jet 3 is formed with an annular recess 17 communicating with the atmosphere through holes 18 and with the passage through the jet by holes 19. A small amount of air is thus admitted to the stream of fuel just below the needle valve 4 serving partially to atomise the fuel and to break up the stream and avoid syphoning action.

In the throttle 5 the bottom portion is provided with a triangular slot 20 so that when the throttle is completely shut, the only amount of air entering the engine is provided through the slot 20. When the throttle is shut, fuel from the jet 3 drops simply towards the slot 20 and is pulverised when just passing on the engine side of the throttle 3. As this suction on the engine side when the throttle is nearly shut is extremely high, a perfect atomising and vaporising occurs. When the engine is stopped, the vacuum of the suction pipe 2 drops instantly, and therefore, the fuel level in the cylinder 13 drops automatically to the level in the float chamber which is below the top of the jet 3; thus, the supply of fuel is instantly cut off, and no more fuel drops through the jet 3.

In order to start the engine it is necessary to shut the throttle partially so as to enable the vacuum to be produced in the tube 2, and through the passage 12. Immediately the fuel rises in the cylinder 13, from whence by gravity it drops to the jet, as described above.

It can be seen therefore that this carburettor is self-priming, and it is not necessary to lift the needle valve 8 as is commonly done with ordinary carburettors before starting the engine.

The hole 21 at the bottom of the carburettor is provided as a drainage of any excess of petrol which may accumulate by condensation.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A carburettor having an inverted jet from which the fuel is cut off by a partition projecting above the fuel when the engine is at rest, but to which the fuel is supplied by being raised above the partition by the suction of the engine on starting, acting on the liquid through a restricted passage independent of the jet, so that the quantity of fuel supplied

through the jet depends partly on the difference of level between the fuel in the float chamber and the level of the jet, and partly on the suction through the jet, substantially as described.

2. A carburettor as claimed in Claim 1, the partition being surrounded by a pipe with an open end below the normal level of the fuel, communicating at its upper end with a chamber to which restricted suction is applied, and arranged so that when the engine is started, the suction draws the fuel over the edge of the upwardly projecting partition, substantially as described.

3. In a carburettor as set forth in Claim 2, a valve for connecting the space above the fuel in the float chamber with the chamber in which reduction of pressure owing to the suction of the engine occurs, adapted to be automatically opened when the suction reaches a predetermined amount, substantially as and for the purposes described.

4. In a carburettor as set forth in Claims 2 or 3, an aperture whereby the space above the fuel in the float chamber is placed in communication with atmosphere in order to regulate the pressure in this space, substantially as and for the purposes described.

5. In a carburettor as set forth in Claim 1 or 2, apertures arranged just below the needle valve of the jet in order to introduce a small amount of air into the stream or liquid fuel, substantially as and for the purposes described.

6. In a carburettor as set forth in Claim 1 or 2, a small slot in the throttle valve which controls the passage of the main induction pipe in order that when the valve is in its closed position a small amount of air may be allowed to pass, substantially as described.

7. The improved carburettor substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 5th day of September, 1919.

MARKS & CLERK.

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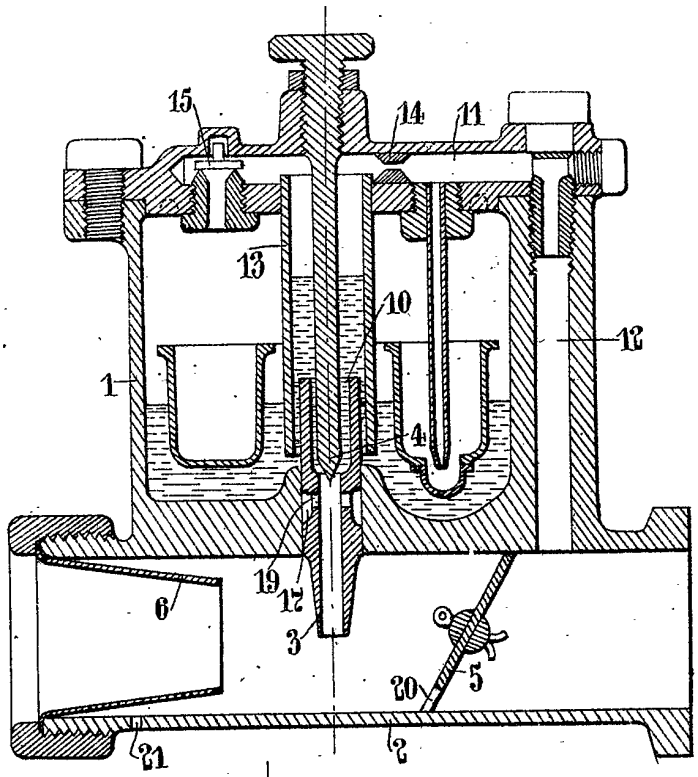

Fig. 1.

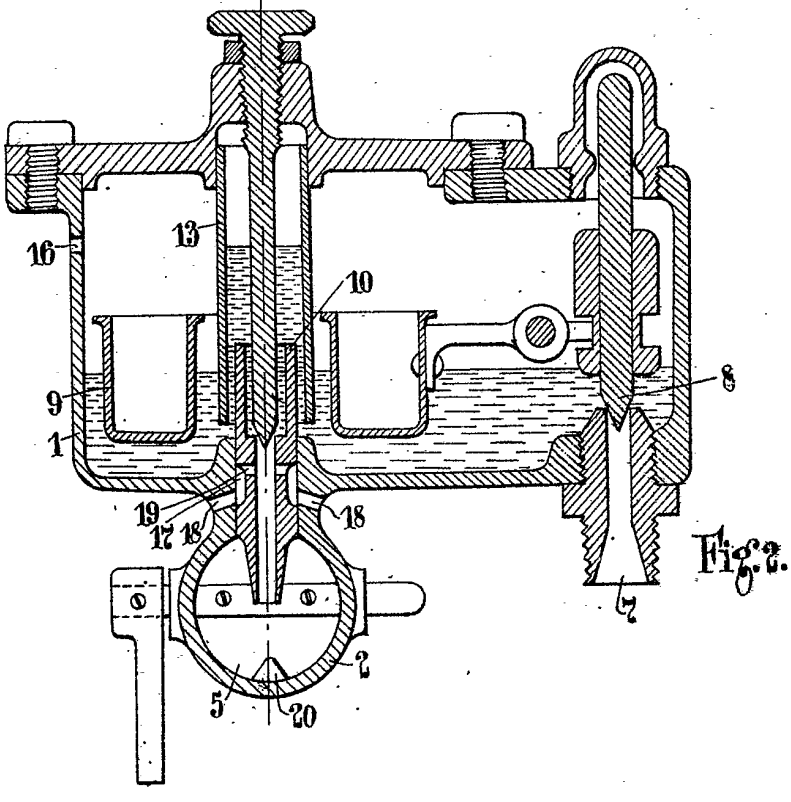

Fig. 2.

Malby&Sons, Photo-Litho.