E. GOBBI.

CARBURETER.

APPLICATION FILED JULY 24, 1911.

**1,061,835.** Patented May 13, 1913.

*Fig. 1*

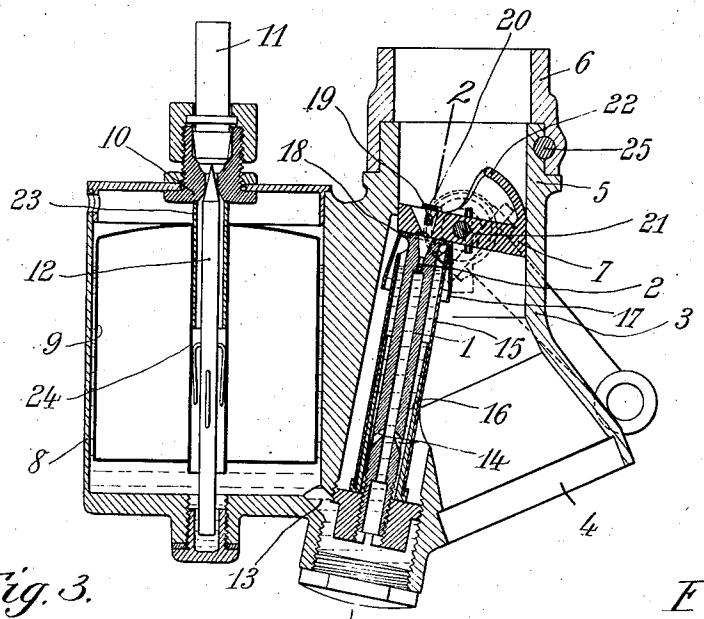



*Fig. 3.*

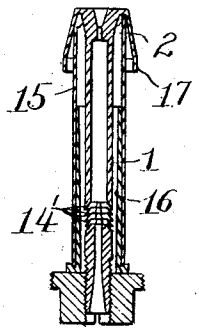



*Fig. 2*

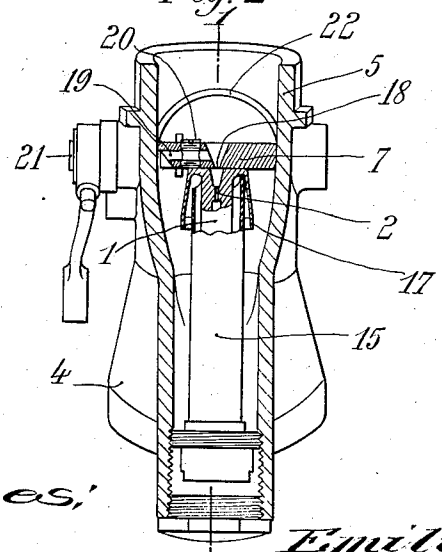
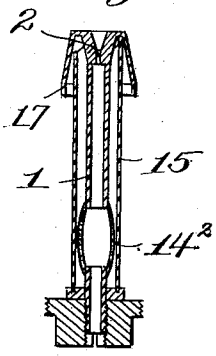



*Fig. 4.*

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## CARBURETER.

1,061,835. Specification of Letters Patent. Patented May 13, 1913.

Application filed July 24, 1911. Serial No. 640,298.

*To all whom it may concern:*

Be it known that I, EMILIO GOBBI, a subject of the King of Italy, residing at Asnières, Seine, France, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters, and its primary object, namely, to provide an extremely sensitive and responsive arrangement which will correctly proportion the mixture with the engine running both at high and low speed, is served by a number of novel features of construction.

According to the invention, the bore of the nozzle, which in spray carbureters, is used for conducting liquid hydro-carbon to the spraying orifice, communicates with an aperture provided in the wall of the nozzle and arranged below the level of the liquid in the constant level chamber, whereby, during the normal running of the engine, a draft of air is induced into the nozzle, the intensity of which is proportionate to the suction exerted, and which is effective to insure the proper proportioning of the hydro-carbon constituent of the explosive mixture.

A further feature of the invention is the provision of a throttling device that may be closed directly against the nozzle and to completely cut off the motor suction tube and the main air supply inlet, this throttling device having a small orifice which, when the device is in closed position, communicates with the nozzle and having an auxiliary air inlet passage. Ordinarily, with a throttle of the usual construction, in closed position there is always a communication between the main air inlet and the motor suction tube and between the latter and the nozzle; in other words, there is never a complete cut off. The objection to this arrangement is that when the engine is running at excessively low speed and the throttle is closed, it is impossible to secure a proper proportion of the air and hydro-carbon constituents of the explosive mixture, and there will be an excess of air. This objection is eliminated by the throttling device of the present invention, by means of which a comparatively strong suction action is transmitted to the nozzle by which the hydro-carbon is conducted, and at the same time a suitable and not excessive supply of air is induced. When the novel throttling device is used with multiple-nozzle carbureters, it is to be closed at least against one of the nozzles.

The invention will be understood from the accompanying drawings, wherein:

Figure 1 is a longitudinal section on the line 1—1 of Fig. 2, of one form of carbureter constructed in accordance with this invention; Fig. 2 is a cross-section on the line 2—2 of Fig. 1; Fig. 3 is an axial section of a modified form of nozzle; and Fig. 4 is a similar view of a further modification.

Referring to Fig. 1, the nozzle 1, which is provided with a spraying orifice 2, is disposed within a substantially tubular casing 3 having an air inlet 4. This casing is also provided with a collar 5 which is connected to the suction pipe 6 of the engine, and with a throttling device 7. At one side of the casing, there is disposed a constant-level fuel tank 8 equipped with a float 9 and with an externally-threaded nipple 10 which serves to connect the tank and the supply pipe 11 for the liquid hydro-carbon. Said tank is also furnished with a needle valve 12 and communicates with the nozzle 1 by way of a conduit 13, the valve just referred to being carried by the float.

The nozzle 1 is apertured for the purpose of inducing a draft of air therethrough when the hydro-carbon is drawn through the orifice 2 with sufficient speed. In Fig. 1, such apertures are shown at 14 and open upwardly and inwardly into the bore of the nozzle; but in place of the said apertures the nozzle may be provided with a series of spaced conical flanges 14′, (Fig. 3), which form a multiple injector, or with a foraminous section $14^2$, (Fig. 4).

By adopting the arrangement described, a mixture will be obtained during the suction of the engine, (except when the engine works at an excessively slow speed and the suction force is correspondingly low,) which will serve to effectively regulate the quantity of hydro-carbon drawn in at each suction stroke of the engine. A loss of the hydro-carbon occurs when the engine is standing still, (obviously no loss takes place when the engine is working, because the hydro-carbon, instead of escaping through

the aperture, causes suction by aspiration), which loss can be easily remedied by utilizing, for instance, a tube 15 which surrounds the nozzle and extends to a point above the normal level of the hydro-carbon in tank 8, the tube being preferably provided with a tapered lining 16 whose greatest thickness is at its lower end. In conjunction with said tube there is provided a conical flange 17 which is located at the top of the nozzle and is designed to concentrate and direct into the tube a fairly large portion of the air that, during the suction stroke of the engine, is drawn through the air inlet 4, such portion being, of course, dependent on the dimensions of the flange, as well as on the velocity of the air entering said inlet. Under these conditions, there will be obtained, on the stoppage of the engine, a reserve of hydro-carbon in the said tube. At the first suction strokes of the engine, the hydro-carbon thus placed in reserve will be drawn through the hole or holes 14, and during the normal working of the engine the desired suction of air for producing the explosive mixture will be effected.

The throttling device 7 is in the form of a plate, and is arranged in the casing 3, above the nozzle 1, its arrangement being of such nature that in its closed position it bears directly against said nozzle. The throttling device is provided with an upwardly widened orifice 18 which alines with the spraying orifice 2, and communicates with an air conduit 19, which, in turn, opens to the bottom face of the throttling device and in which a regulating valve 20 may be fitted. When the throttling plate 7 is in its closed position it completely cuts off the motor suction tube 6 and the main air inlet 4. Its orifice 18 alines with the spraying orifice 2, so that a strong suction action is transmitted to the latter, and an adequate supply of liquid hydro-carbon is secured when the engine is running at low speed. At the same time, a proportionate amount of air is drawn in through the passage 19. Thus, for a given range of low speed, a proper mixture of air and hydro-carbon is obtained.

As shown in Figs. 1 and 2, the throttling plate is in the form of a disk having a diametrically arranged pin 21, the projecting ends of which serve as trunnions. The nozzle 1 is arranged eccentrically of the casing 3, and the air inlet 4 is arranged laterally of the casing 3. The plate 7 is provided on its upper side with an arcuate flange 22, the radius of which is taken from the pin 21 as a center. This flange 22 is located on that side of the plate 7 which is in line with the inlet 4, and will contact with the adjacent side of the casing 3 in any position of said plate. Consequently, the air drawn in through the inlet 4 will be prevented from passing between the throttle and the adjacent side of the casing, but on the other hand, will be positively directed immediately over the nozzle so as to intimately mingle with the fluid discharging at the orifice 2.

The nipple 10, which connects the fuel tank to the inlet conduit 11 for the hydro-carbon, and the needle valve 12 are preferably arranged so that the hydro-carbon passes into the tank from the top, in which case said nipple is provided with a depending tubular extension 23 and the float 9 is provided with a corresponding tube 24, whereby the hydro-carbon, when it enters the tank, cannot spread over the surface of the float to interfere with the proper working thereof.

For connecting either the carbureter as a whole to the suction pipe, 6, as in the construction shown in Fig. 1, or for connecting any or all of the constituent parts of the carbureter together, a tangential key 25 is used, so as to facilitate the disassemblage and subsequent assemblage of the parts, as will be readily understood.

I claim as my invention:

1. In a carbureter, the combination with a casing adapted for connection to the suction pipe of an engine and provided with an air inlet; of a nozzle disposed within the casing; a tube inclosing said nozzle and spaced therefrom; a conical flange provided upon the upper end of said nozzle and extending past the upper end of said tube, for directing air into the space between the tube and the nozzle; and means for supplying fuel to the nozzle, said nozzle having an aperture through which the air is drawn thereinto from said space simultaneously with the fuel, to mix directly with the latter, by the suction created in said casing.

2. In a carbureter, the combination with a casing adapted for connection to the suction pipe of an engine and provided with an air inlet; of a nozzle disposed within the casing and provided with a spraying orifice; means for supplying fuel to said nozzle; and a throttle located in said casing and comprising a pivotally-mounted disk provided with an orifice and with a conduit opening at one end into the latter and at the other end through the bottom face of the disk, the orifice in said disk registering directly with the first-named orifice when the throttle is closed.

3. In a carbureter, the combination with a casing adapted for connection to the suction pipe of an engine and provided with an air inlet; of a nozzle disposed within the casing; a tube inclosing said nozzle and spaced therefrom; a conical flange provided upon the upper end of said nozzle and extending past the upper end of said tube for directing air into the space between the tube and the nozzle; and means for supplying fuel to the

nozzle, said nozzle having upwardly and inwardly directed apertures below the fuel level through which the air is drawn thereinto from said space simultaneously with the fuel, to mix directly with the latter, by the suction created in said casing.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EMILIO GOBBI.

Witnesses:
H. C. Coxe,
Paul Blum.