H. V. J. JOUFFRET & J. M. RENÉE.

CARBURETER.

APPLICATION FILED AUG. 17, 1909.

1,002,699.

Patented Sept. 5, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

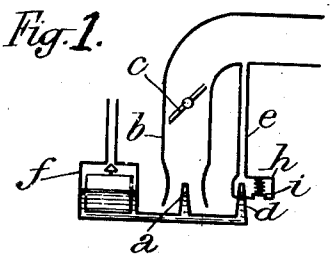
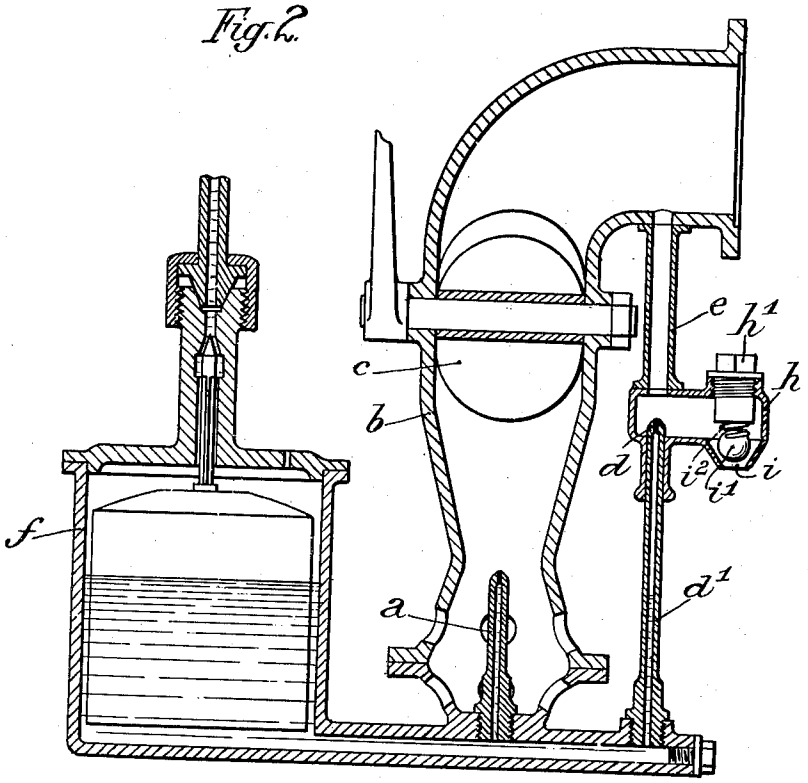


Fig. 2.



Witnesses.

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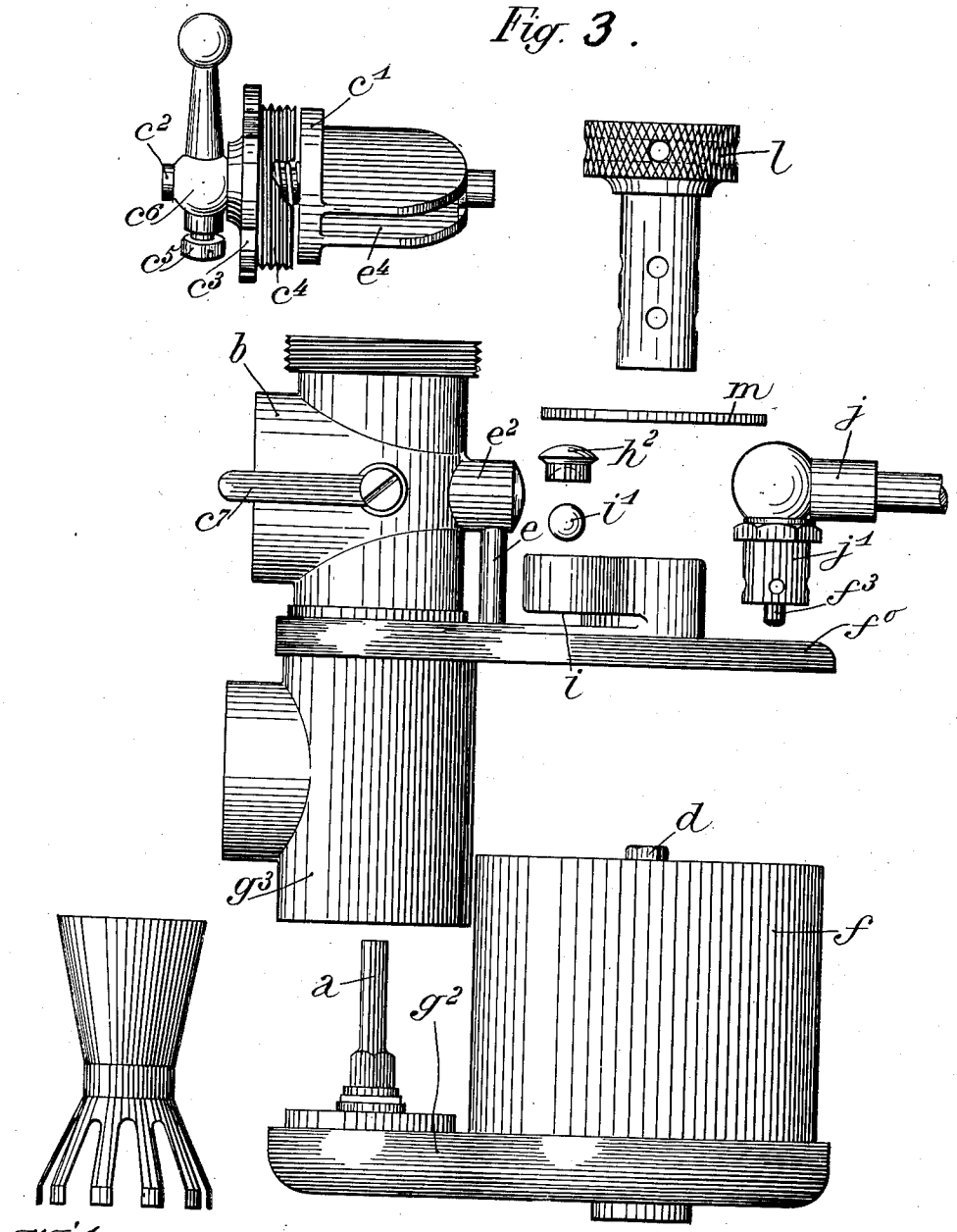
3 SHEETS—SHEET 2.

Fig. 3.



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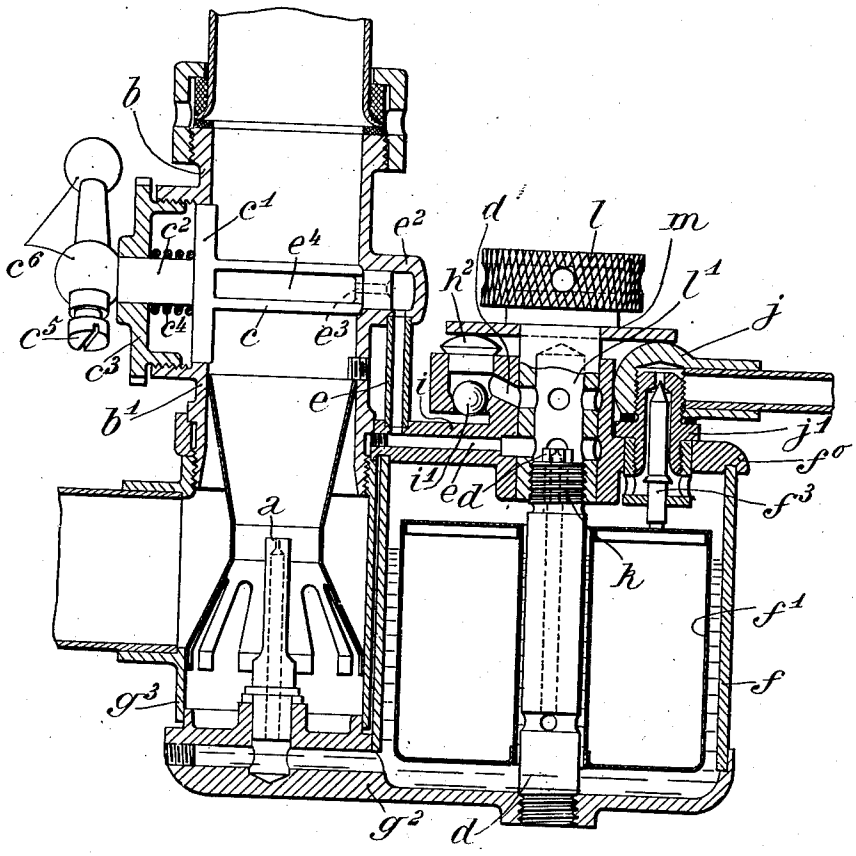
3 SHEETS—SHEET 3.

Fig. 4.



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CARBURETER.

1,002,699. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed August 17, 1909. Serial No. 513,305.

To all whom it may concern:

Be it known that we, HENRI VICTOR JULES JOUFFRET and JULES MAURICE RENÉE, engineers, citizens of the French Republic, residing at 18 Rue de Bruxelles, Paris, France, have invented certain new and useful Improvements in or Relating to Carbureters, of which the following is a specification.

This invention relates to carbureters, and refers particularly to that class of carbureters comprising two spraying nozzles, a principal nozzle and a secondary nozzle.

It has for its object, in the first place, to construct the secondary spraying nozzle in such a way that it only delivers the quantity of fuel absolutely necessary under all circumstances and especially when the engine is being slackened.

It has for its object, in the second place, to construct the said secondary spraying nozzle and its associated parts in such a way as to make of them a constructional unit very easily adaptable to existing carbureters.

It has for its object, in the third place, the construction of carbureters in general and especially of those with two spraying nozzles, in such a way that the unitary parts of the carbureter may be detached from one another by merely manipulating one connection.

It has for its object, finally, the construction of throttle valve of the carbureters in question with two spraying nozzles in such a way that the said throttle valve can be utilized as a means for regulating the size of the conducting passage.

Embodiments of the invention are illustrated by way of example in the accompanying drawings.

Figure 1 is a sectional diagram of one form of carbureter in accordance with the present invention. Fig. 2 is a detail vertical sectional view of a carbureter of the type shown in Fig. 1. Fig. 3 is a vertical sectional view of an alternative construction, and Fig. 4 is an elevation of the carbureter shown in Fig. 3 with certain of its parts in disassembled relation.

Fig. 1 shows in diagrammatic vertical section a carbureter in connection with which the features of the present invention are carried out. Such a carbureter comprises generally a principal spraying nozzle *a*, opening directly into the motor suction tube *b*, the latter being equipped with the usual throttle valve *c*, and a secondary nozzle *d* which opens into a tube *e*, which joins with the motor suction tube *b* in advance of the calve *c*. The tube *e* does not open directly to the outside atmosphere, but terminates at its lower end in an enlarged chamber *h* in which the nozzle *d* projects, the chamber *h* being gas tight and being equipped with a spring pressed air inlet valve *i*, which opens under an appropriate degree of suction. The spraying nozzles are supplied with hydrocarbon from a float feed chamber *f* which is connected to a pipe *g* from which the nozzles branch.

The operation of a carbureter of the above construction is as follows:—The secondary spraying nozzle is always in action although it is not in the tube *b*, and it acts always in proportion to the suction of the motor, thus rendering the action of the carbureter absolutely automatic. When slackening, the valve *c* being shut, the secondary nozzle alone is working. The entry valve *i* for the air is open to the atmosphere. When the pace is quickened and for this purpose the valve *c* is turned into the open position the suction in the chamber *h* diminishes at the same time, the entry valve *i* partly closes and the delivery from the secondary nozzle diminishes. Finally when the supply is full on, the air valve *i* closes and the secondary nozzle only delivers fuel through the suction produced above it and not through the current produced, as hitherto, through the admission of air at *i*. With this arrangement the tube *e* can be made of very small section on account of which it is not necessary to provide the spraying nozzle with a very small opening.

The present improvements consist again in giving to the secondary spraying nozzle a greater height than that of the principal spraying nozzle, thus providing in general a different or auxiliary means for allowing a larger section to be given to the said secondary nozzle as will be easily understood; in fact it is self evident that the higher the level of the secondary nozzle the more difficult it is for the air sucked in by the engine to draw up the fuel.

The improvements which have just been described can obviously be applied either separately or in combination in any suitable way, for example as shown at Fig. 2,

where the different parts are indicated by the same letters of reference as have been previously used. Here the secondary nozzle d is located at the end of a long conducting pipe d^1 and within the chamber which has the air inlet. This air inlet may, for instance, comprise a ball valve i^1 which works with relation to a seat i and has associated therewith a regulating screw h^1 and an intermediate controlling spring i^2. In the arrangement shown in the said Fig. 2, the secondary spraying nozzle d, its conducting pipe d^1, its gas-tight chamber h, the associated parts and the tube e leading to the outlet connection of the carbureter form a unit which can be applied to any existing kind of carbureter and which consequently enables these latter to be made entirely automatic. The features of the invention which have just been described may, however, be carried out in other ways, for instance, most advantageously in the way indicated in Figs. 3 and 4.

The construction shown in Figs. 3 and 4 involves more particularly details of structure and arrangement concerning the throttle valve and the secondary nozzle. The secondary nozzle d is coaxial with the float feed oil supply chamber and is connected by a duct e to a chamber e^2 which is formed as an extension at one side of the tube b and which receives one of the end trunnions of the throttle valve c. This valve embodies two connected plates which are disposed in spaced relation and in parallel planes whereby an intervening chamber e^4 is afforded. Said chamber communicates with the chamber e^2 aforesaid through a passage e^3 in the trunnion which is fitted in said chamber e^2. The throttle valve is adjustable in the direction of its axis in order that the efficient size of the passage by which the secondary nozzle communicates with the suction tube when the throttle is in position to shut off or substantially shut off the communication of said tube and the primary nozzle, may be regulated as desired. It will be apparent that as the throttle valve is moved in the direction of its axis away from the extension e^2 a crescent shaped opening is produced between the edge face of said valve and the adjacent surface of the tube b. The size of this crescent shaped opening of course depends upon the particular position of the valve with respect to the extension e^2. Obviously when the throttle valve is in an extreme right hand position as shown in Fig. 3, there can be no crescent shaped opening. But this opening is produced and gradually increases as the throttle valve is moved to the left. If it be assumed that the valve has been adjusted to the left so as to produce the crescent shaped opening aforesaid and in addition that the valve is in the plane of its closed position, a vacuum is produced in the chamber e^4 the degree of which is greater as the construction of the crescent shaped opening is less. It will be understood that this position of the valve is selected for a low running of the motor, and it is apparent that with the throttle valve in the plane of its closed position the influence of the vacuum in the chamber e^4 produces the drawing up of fuel from the secondary nozzle, while the slight vacuum under the throttle valve provides for a proper admission of air but is insufficient to provide for the passage of fuel from the primary nozzle. However, when the throttle valve is turned from the plane of its closed position, as when the pace is to be increased, the vacuum in the chamber e^4 acts with gradually diminishing effect upon the secondary nozzle until finally, when the valve is in the plane of its fully opened position, the vacuum in the chamber e^4 becomes merely a fractional part of the vacuum in the tube b and ceases to have any effect on the action of the secondary nozzle. It will thus be apparent that the action of the primary and secondary nozzles is regulated by the position of the throttle valve in any particular plane and that the action of the secondary nozzle gradually diminishes as the valve is turned from the plane of its closed to the plane of an open position, ceasing when the valve is fully opened, while on the other hand the action of the primary nozzle during the same interval progresses from zero to maximum.

To effect the regulation of the throttle c the latter is provided at one end thereof with a disk-shaped plate c^1 which is set in an extension of the tube b, the extension forming the second bearing of the throttle. The throttle thus mounted is movable in the direction of its longitudinal axis and is provided with an axial stem c^2 projecting outwardly from the plate c^1 and passing into a screw plug c^3 which closes the extension and between which and the aforesaid plate an expansive coil spring c^4 is fitted. An actuating key c^6 is attached to the stem c^2 as by a screw c^5. The arrangement is advantageously completed by a locking device which preferably consists of a leaf spring c^7 fixed on the outside of the carbureter and arranged to engage in notches formed on the periphery of the plug c^3. The regulation is effected by turning the plug c^3 after having freed it from the leaf spring. Since this plug bears against the handle c^6, its movement outwardly or inwardly when turned, results in a corresponding axial movement of the throttle c, the spring c^4 moving therewith.

Having fully described our invention, we claim.

1. In a carbureter, in combination, a motor suction tube in open communication with the atmosphere, a primary nozzle which projects directly into the motor suction tube, a secondary nozzle, a gas tight chamber associated only with the secondary nozzle, a connection between the gas tight chamber and the suction tube to put the former and the secondary nozzle in communication with the latter, an automatic air admission device associated only with the gas tight chamber, the latter having such relation to the secondary nozzle that the entering air passes over and around said secondary nozzle, and a throttle valve arranged in the motor suction tube between the points of communication therewith of the primary nozzle and the connection from the gas tight chamber.

2. In a carbureter, in combination, a motor suction tube in open communication with the atmosphere, a primary nozzle which projects directly into the motor suction tube, a secondary nozzle which has its discharge end at a higher point than the discharge end of the primary nozzle, a gas tight chamber associated only with the secondary nozzle, a connection between the gas inlet chamber and the suction tube to put the former and the secondary nozzle in communication with the latter, an automatic air admission device associated only with the gas tight chamber, the latter having such relation to the secondary nozzle that the entering air passes over and around said secondary nozzle, and a throttle valve arranged in the motor suction tube between the points of communication therewith of the primary nozzle and the connection from the gas tight chamber.

3. In a carbureter, in combination, a motor suction tube, a primary nozzle in communication therewith, a secondary nozzle, a gas tight chamber associated only with the secondary nozzle, the secondary nozzle and the gas tight chamber being in communication with the suction tube, a single automatic air admission device associated with the gas tight chamber, and a float feed mechanism including a float and liquid fuel chamber from which the nozzles are supplied, the secondary nozzle having its fuel receiving end arranged coaxially with and above the float and liquid fuel chamber.

4. In a carbureter, in combination, a motor suction tube; a float chamber, a primary nozzle projecting into the suction tube and a connecting pipe between the float chamber and the primary nozzle, the primary nozzle, the float chamber and the connecting pipe being assembled as a unit; a float chamber cover, a gas-tight chamber communicating with the suction tube, and an automatic air-admission device for the gas-tight chamber; a secondary nozzle arranged co-axially with the float chamber and in communication with the same, the gas-tight chamber and the motor suction tube; the said motor suction tube, float chamber cover, gas-tight chamber, and air-admission device being assembled as a unit; the secondary nozzle being included as a part of one of said units; and a connection for holding the units assembled with relation to one another.

5. In a carbureter, in combination, a float chamber, a primary nozzle, a connection between the same and the float chamber, and a secondary nozzle fitted co-axially in the float chamber, the said nozzles, float chamber and connection being assembled as a unit; a motor suction tube into which the primary nozzle projects, a float chamber cover, a gas-tight chamber associated with the cover, and an automatic air-admission device for the gas-tight chamber; the said tube, cover, gas-tight chamber and air-admission device being assembled as a unit; and a connection for holding the units assembled with relation to one another and consisting of a plug passed through the cover and threaded upon the secondary nozzle, the plug having a central passage in communication with the secondary nozzle and the gas-tight chamber and also in communication with the motor suction tube.

6. In a carbureter, in combination, a motor suction tube, a primary nozzle communicating therewith, extensions at opposite sides of the tube and above the primary nozzle, a secondary nozzle communicating with one of the extensions, a throttle valve disposed in the suction tube above the primary nozzle and consisting of spaced parallel plates and end journals connecting the plates and fitted in the extensions, one of the journals having a duct communicating with the space between the plates and also with the extension with which the secondary nozzle communicates and means for moving the throttle valve in the direction of its longitudinal axis without interference with the turning movement thereof whereby an opening in communication with the space between the plates intervenes between adjacent faces of the throttle valve and suction tube.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRI VICTOR JULES JOUFFRET.
JULES MAURICE RENÉE.

Witnesses:
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