PATENT SPECIFICATION

Application Date: April 27, 1922. No. 11,824/22. **202,689**

Complete Left: Feb. 19, 1923.

Complete Accepted: Aug. 27, 1923.

PROVISIONAL SPECIFICATION.

Improvements in Carburettors.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention to be as follows:—

The present invention relates to carburettors and has for its object to construct a simple and cheap carburettor so arranged that without adjustment it can be immediately used with any engine over a large range of size of cylinder.

The construction of the carburettor is based on the principle set out in my Patent Applications No. 9760/1922 and No. 10,697/1922, the flow of petrol from the carburettor being determined by the depression at the jet and a constant head in the float chamber, this head being as described in my Patent Application No. 9760/1922 substantially equivalent to the head required to overcome capillary and surface tension effects, while the form of the jet is such that the surface tension effects are considerable relatively to effect produced by the variations of the level of the fuel in the float chamber.

The invention consists in constructing the carburettor symmetrically relatively to the centre plane through the throttle axis so that it can be attached at either side to the engine connection.

The invention further consists in the use of a butterfly throttle valve so shaped that it can operate when inclined in either direction to the vertical according to the direction in which the air is passing through the portion of the induction pipe cast on the float chamber.

The invention further consists in constructing the baffle below the jet with small apertures both on the engine side and on the inlet side and also with small apertures in the transverse plane, these small apertures operating as outlets from the jet irrespective of the direction of flow of air in the induction pipe.

The invention further consists in a carburettor in which an inverted jet is so placed within a sleeve closed at its upper end and surrounding a sleeve projecting upwardly from the bottom of the float chamber that the suction through the jet raises the fuel within the sleeve under engine suction at starting, the space above the jet being extremely small and the passages to and through the jet being so arranged that the inertia effect is extremely small.

The invention also consists in the improved carburettor hereinafter described.

In carrying the invention into effect according to one example, a small square float chamber is provided cast in one with a portion of the induction pipe. A flanged sleeve is screwed into the bottom of the float chamber in a central position and carries a deflector of inverted conical form whose apex closely approaches the spindle of the throttle valve, which is placed immediately below the jet. The throttle valve and the portion of the induction pipe below the float chamber are made of venturi form and the edges of the throttle valve are machined on both sides meeting at an angle of about 90 degrees, so that the valve can close the induction pipe independently of the direction in which it is inclined. Small apertures are provided on both the inlet and engine side of the baffle and small apertures are also provided in the transverse plane through the axis of the throttle. The jet itself is screwed into a rod which carries at its lower end a downwardly projecting sleeve forming a thimble surrounding the upwardly projecting sleeve in the bottom of the float chamber. Passages are bored from the space within the downwardly projecting

[*Price* 1/-]

sleeve leading to the jet, so that very little free space is left above the jet. The float chamber is guided by a sleeve surrounding the downwardly projecting sleeve and may be formed of hollow celluloid or other suitable material. The lever by which the inlet of fuel to the float chamber is controlled is pivoted horizontally at one side and merely rests on the float operating a throttle valve carried on a rod passing through guides in a fitting screwed into the side of the float chamber. The jet itself is of conical outside form, the cone being of small angle and the lower extremity of the jet is formed with sharpened edges so that the meniscus formed at the bottom of the jet cannot greatly exceed the internal diameter of the jet. The narrow portion of the jet is comparatively short so that inertia effects are minimised. The float and petrol inlet are so arranged that the height of the fuel in the float chamber gives a head which substantially balances surface tension and capillary effects in the jet, so that the flow through the jet is in constant proportion to the flow of air in the induction pipe. For this purpose, I find that the diameter of the aperture of the jet should be about $^1/_{20}$ of the equivalent diameter of the choke at the throttle valve.

It will be seen that all these parts above described are symmetrical about a transverse vertical plane through the throttle valve spindle so that the direction of flow of air through the induction pipe is immaterial to the working of the apparatus. The throttle lever is mounted horizontally and can be reversed according to the direction of flow through the induction pipe. It operates the throttle valve spindle through a downwardly projecting arm which may be fitted at either end of the latter as desired.

Suitable symmetrical stops are provided to limit the movement of the throttle lever in one direction for the purpose hereinafter described.

With a carburettor as above described, in order to start the engine the throttle valve which when running is inclined in the direction which would place the jet on the inlet side is turned right over causing, in this position, considerable suction through the jet at starting. This suction raises the level of the fuel above the upwardly projecting sleeve and allows it to flow to the jet. As soon as the engine has started the throttle lever is at once thrown right over and the control is effected by opening or closing of the throttle when inclined in this position.

As explained in my Patent Applications No. 9760/1922 and No. 10,697/1922, above referred to, a carburettor constructed as above described will supply a constant mixture irrespective of the velocity of the flow of air through the induction pipe. The constant head is so arranged as to balance surface tension and capillary effects, the effect of inertia is minimised owing to the form of the passages to and through the jet and the friction effect both on the fuel and on the air is small in comparison with the other forces which determine the actual flow. The stops for the throttle lever are provided in order to obtain the suction on the jet necessary at starting the engine.

Dated the 27th day of April, 1922.

W. GRYLLS ADAMS,
87, Victoria Street, London, S.W. 1,
Chartered Patent Agent.

COMPLETE SPECIFICATION.

Improvements in Carburettors.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, 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 and has for its object to construct a simple and cheap carburettor so arranged that without adjustment it can be immediately used with any engine over a large range of size of cylinder.

The construction of the carburettor is based on the principles set out in my Patent Applications No. 9760/1922 and No. 10,697/1922, the flow of petrol from the carburettor being determined by the depression at the jet and a constant head in the float chamber, this head being as described in my Patent Application No. 9760/1922 substantially equivalent to the head required to overcome capillary and surface tension effects, while the form of the jet is such that the surface tension effects are considerable relatively to effect produced by the variations of the level of the fuel in the float chamber.

The invention consists in constructing the carburettor symmetrically relatively to the centre plane through the throttle axis so that it can be attached at either side to the engine connection and in the use of a butterfly throttle valve so shaped that it can operate when inclined in either direction to the vertical according to the direction in which the air is passing through the portion of the induction pipe cast on the float chamber.

The invention further consists in such a carburettor in which an inverted jet is so placed within a sleeve closed at its upper end and surrounding a sleeve projecting upwardly from the bottom of the float chamber that the suction through the jet raises the fuel within the sleeve under engine suction at starting, the space above the jet being extremely small and the passages to and through the jet being so arranged that the inertia effect is extremely small.

The invention also consists in the improved carburettor hereinafter described.

Referring to the accompanying drawings:—

Figure 1 is an end elevation.

Figure 2 a side elevation.

Figure 3 an inverted plan.

Figure 4 a plan of a carburettor constructed according to the invention.

Figure 5 is a central vertical section of the carburettor.

Figure 6 is a section on the line 6—6, Figure 2.

Figure 7 is a horizontal section through the carburettor.

Figure 8 shows detailed views of the jet, while,

Figure 9 is a section showing the arrangement of the apertures in the baffle member.

In the example of the invention illustrated, a small square float chamber *a* is provided cast in one with a portion of the induction pipe *b*. A flanged sleeve *c* is screwed into the bottom of the float chamber in a central position and carries a deflector *d* of inverted conical form whose apex closely approaches the spindle of the throttle valve *e*, which is placed immediately below the jet. The throttle valve is shaped so that it tapers towards the extremities and the portion of the induction pipe below the float chamber is narrowest at its central section, so that when the throttle is fully open a venturi effect is produced. The edges of the throttle valve are machined on both sides meeting at an angle of about 90 degrees, so that the valve can close the induction pipe independently of the direction in which it is inclined. Small apertures *f* are provided on both the inlet and engine side of the baffle and small apertures *g* are also provided in the transverse plane through the axis of the throttle. The jet *j* is screwed into a boss h^1 at the lower end of a rod *h* which carries at its lower end a downwardly projecting sleeve *k* forming a thimble surrounding the upwardly projecting sleeve *c* in the bottom of the float chamber. Passages *l* are bored in the boss at the lower end of the rod *h* from the space within the downwardly projecting sleeve leading to the jet, so that very little free space is left above the jet. The float *m* is guided by a sleeve *n* surrounding the downwardly projecting sleeve and may be formed of hollow celluloid or other suitable material. The lever *o* by which the inlet of fuel to the float chamber is controlled is pivoted horizontally at one side and merely rests on the float operating a valve *p* carried on a rod *q* passing through guides in a fitting *r* screwed into the side of the float chamber. The jet itself is of conical outside form, the cone being of small angle and the lower extremity of the jet is formed with sharpened edges so that the meniscus formed at the bottom of the jet cannot greatly exceed the internal diameter of the jet. The portion of the jet at which the internal sectional area is small is comparatively short so that inertia effects are minimised. The float and petrol inlet are so arranged that the height of the fuel in the float chamber gives a head which balances surface tension and capillary effects in the jet, so that the flow through the jet is in constant proportion to the flow of air in the induction pipe. For this purpose, I find that the diameter of the aperture of the jet should be about $^1/_{20}$ of the equivalent diameter of the choke at the throttle valve.

It will be seen that all these parts above described are symmetrical about a transverse vertical plane through the throttle valve spindle so that the direction of flow of air through the induction pipe is immaterial to the working of the apparatus. The throttle lever *s* is mounted horizontally and can be reversed according to the direction of flow through the induction pipe. It operates the throttle valve spindle through a downwardly projecting arm *t* which may be fitted at either end of the latter as desired.

Suitable symmetrical stops *u* are provided to limit the movement of the throttle lever in one direction for the purpose hereinafter described.

With a carburettor as above described,

in order to start the engine the throttle valve, which, in order that the depression acting on the jet may be that on the inlet side of the throttle, when the engine is running is inclined in the direction which would place the jet on the air inlet side, is turned right over, till its movement is limited by the stop, causing, in this position, considerable suction through the jet at starting. This suction raises the level of the fuel above the upwardly projecting sleeve and allows it to flow to the jet. As soon as the engine has started the throttle lever is at once thrown right over and the control is effected by opening or closing of the throttle when inclined in this position.

As explained in my Patent Applications No. 9760/1922 and No. 10,697/1922, above referred to, a carburettor constructed as above described will supply a constant mixture irrespective of the velocity of the flow of air through the induction pipe. The constant head is so arranged as to balance surface tension and capillary effects, the effect of inertia is minimised owing to the form of the passages to and through the jet and the friction effect both on the fuel and on the air is small in comparison with the other forces which determine the actual flow. The stops for the throttle lever are provided in order to obtain the suction on the jet necessary at starting the engine.

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 constructed symmetrically relatively to the central plane through the throttle axis so that it can be attached at either side to the engine connection, and having a butterfly throttle valve so arranged that it can operate when inclined in either direction to the vertical according to the direction in which the air is passing through the portion of the induction pipe cast on the float chamber, substantially as described.

2. A carburettor as claimed in Claim 1 in which an inverted jet is so placed within a sleeve closed at its upper end and surrounding a sleeve projecting upwardly from the bottom of the float chamber that the suction through the jet raises the fuel within the sleeve under engine suction at starting, the space above the jet being extremely small and the passages to and through the jet being so arranged that the inertia effect is extremely small, substantially as described.

3. The improved carburettor hereinbefore described and illustrated in the accompanying drawings.

Dated the 19th day of February, 1923.

W. GRYLLS ADAMS,
87, Victoria Street, London, S.W. 1,
Chartered Patent Agent.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1923.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

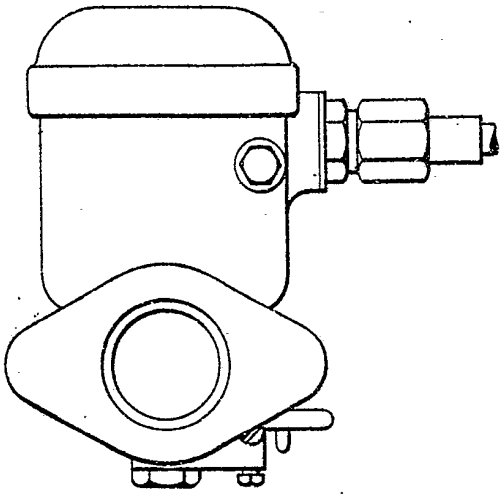


Fig. 2.

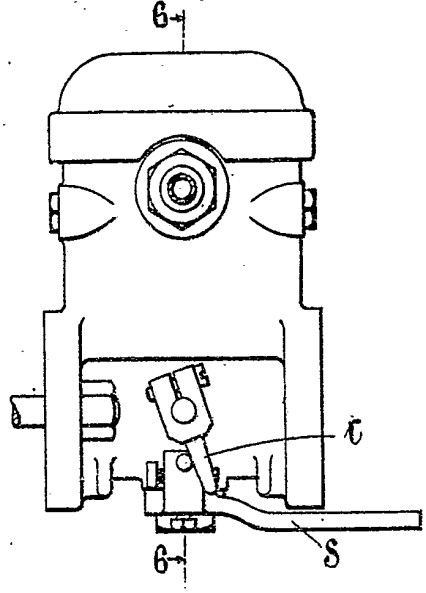


Fig. 3.

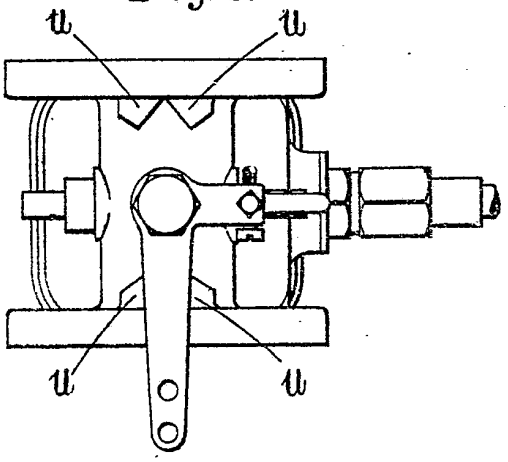


Fig. 4.

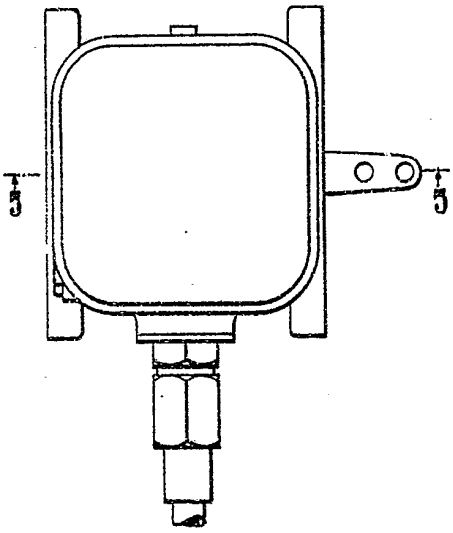


Fig. 5.

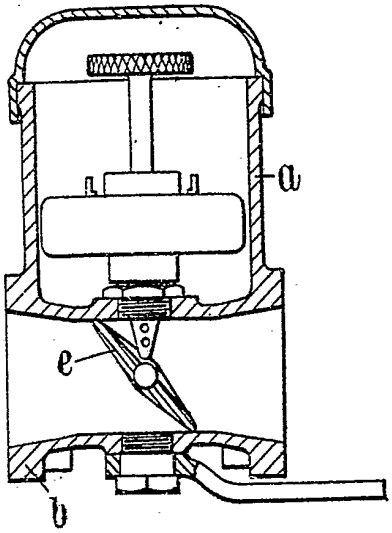


Fig. 8.

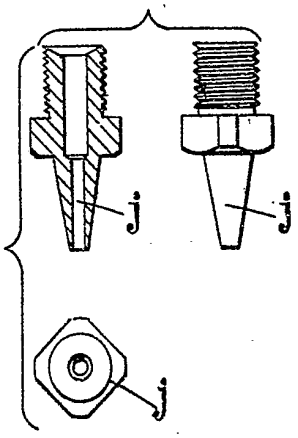


Fig. 7.

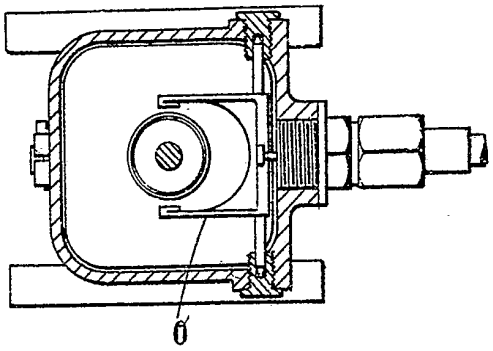
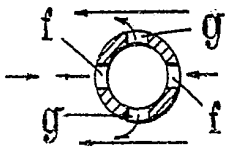


Fig. 9.



Malby&Sons, Photo-Litho.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

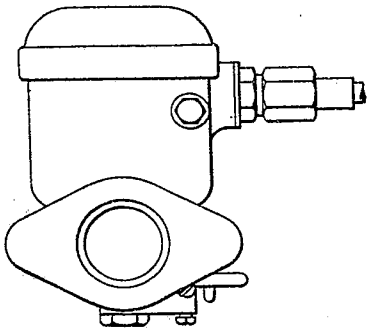


Fig. 2.

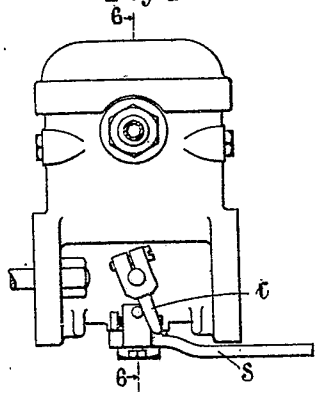


Fig. 3.

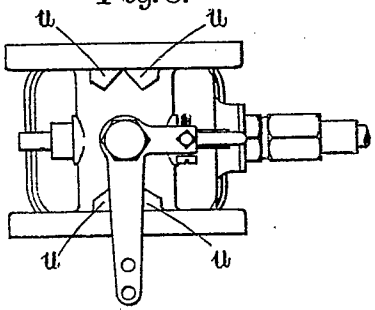


Fig. 4.

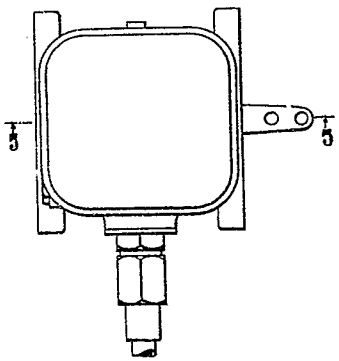


Fig. 5.

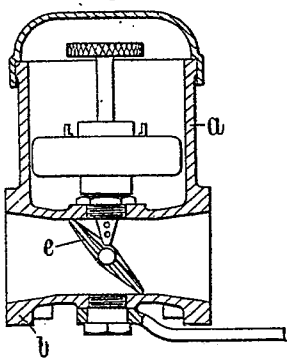


Fig. 8.

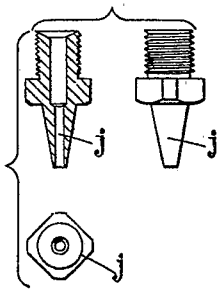


Fig. 9.

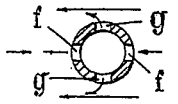
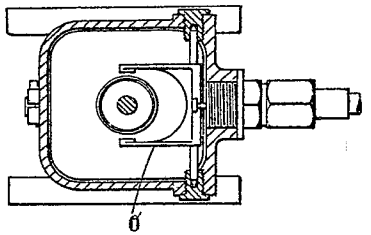
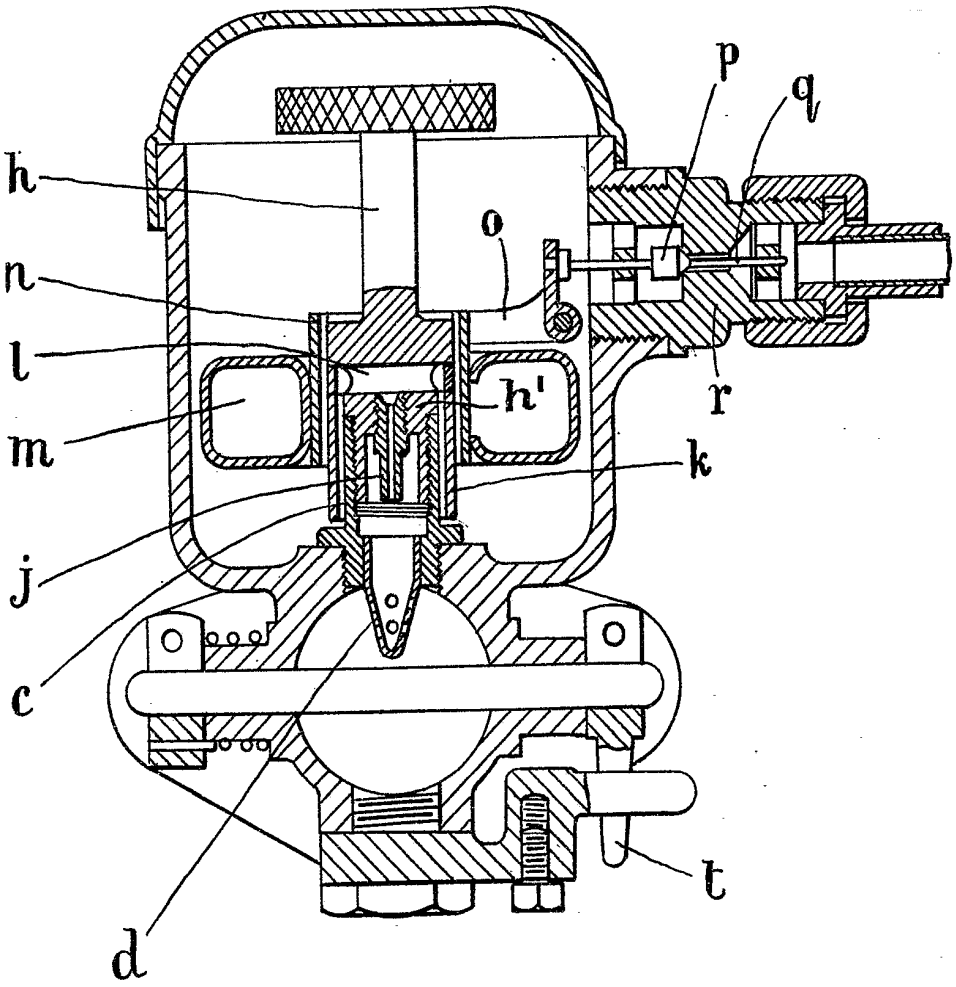


Fig. 7.



Malby & Sons, Photo-Litho.

Fig. 6.



[This Drawing is a reproduction of the Original on a reduced scale]

Malby & Sons, Photo-Litho