

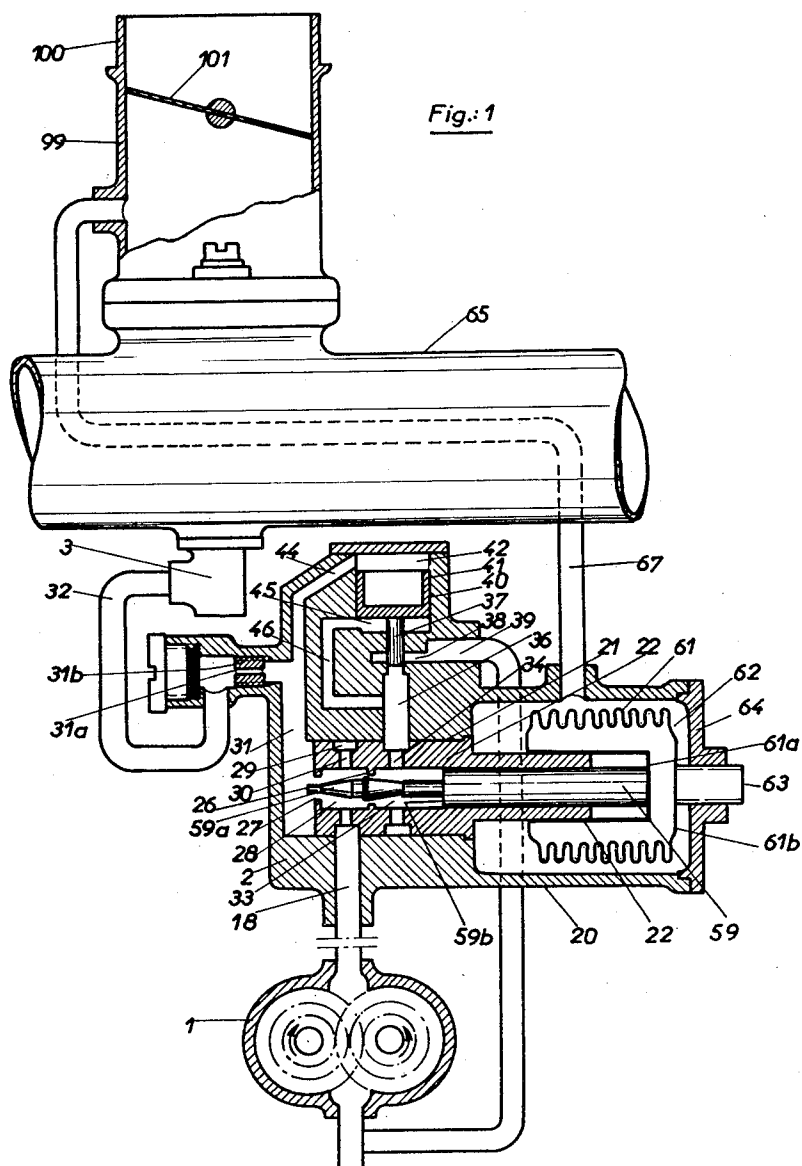
Feb. 2, 1965

J. E. L. SIMONET
TACHOMETRIC CARBURETTORS

3,168,084

Filed Feb. 20, 1963

4 Sheets-Sheet 1



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Fig. 2

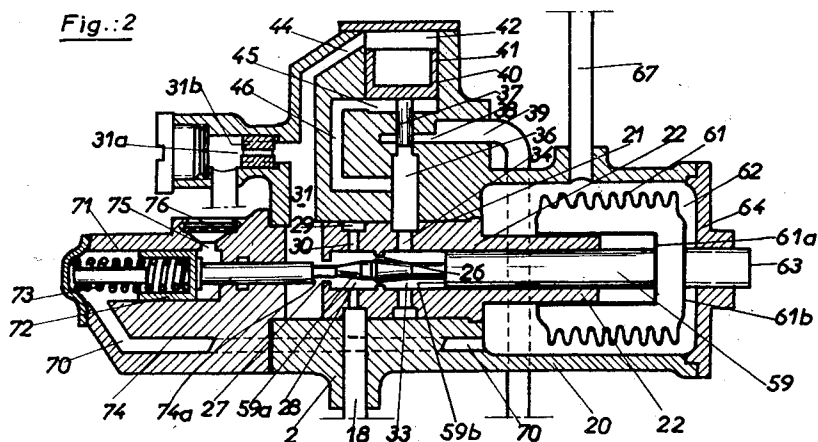
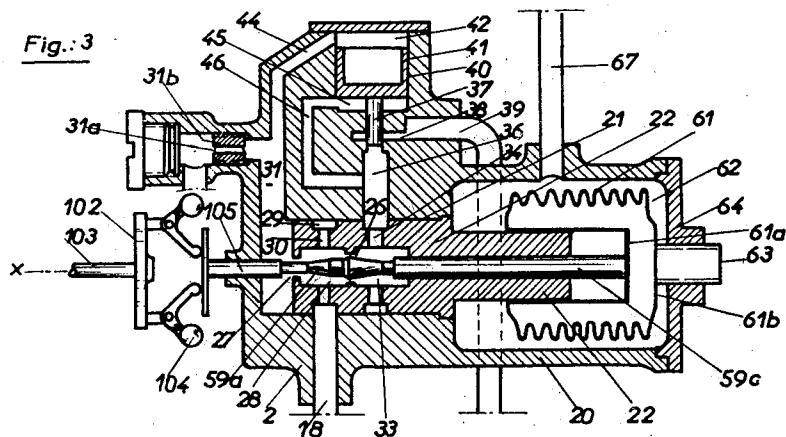


Fig. 3



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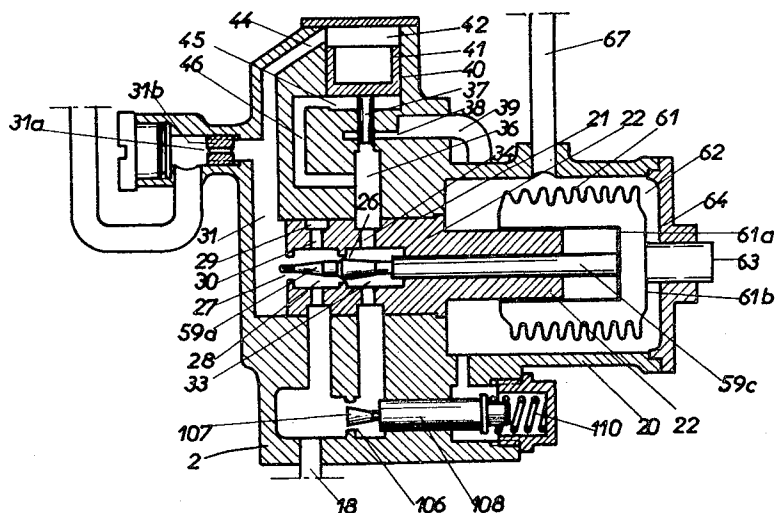
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Fig. 4



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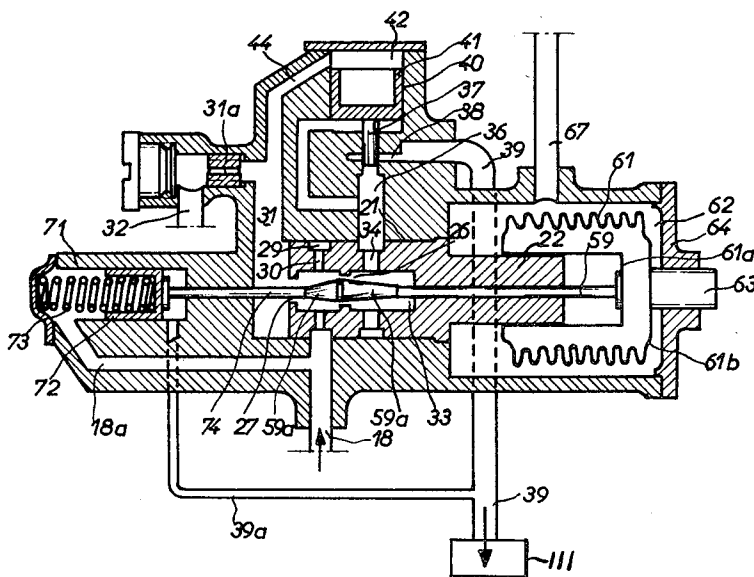


Fig. 5

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TACHOMETRIC CARBURETTORS

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888,735

12 Claims. (Cl. 123-119)

This invention relates to so-called tachometric carburetors comprising a volumetric pump which delivers a supply or flow of fuel proportional to the speed of rotation of the engine and a device dividing this flow into two parts, one of which goes to the engine while the other returns upstream of the pump.

The device comprises two calibrated fuel passages at least one of which is controlled by the inlet pressure of the engine, one of these passages delivering the useful fuel supplied to the engine while the other delivers the return fuel. A pressure balancer equalises the pressures downstream of the two passages so that the rates of flow through these passages are proportional to their cross-sections. The useful flow is then that fraction of the total flow which is equal to the ratio of the cross-section of the passage delivering the useful flow to the sum of the cross-sections of the two passages.

The member controlling the said fuel passages, which member is controlled by the inlet pressure, is designed so that the useful flow, with constant speed of rotation of the engine, varies in accordance with a certain law as a function of the inlet pressure, this law in practice being close to proportionality.

A carburettor of the above type is described in U.S. specification No. 2,803,233 of August 20, 1957, in the name of Demtchenko.

In such a carburettor, for a constant inlet pressure, the member regulating the ratio of the cross-sections of the jets maintains a fixed position and consequently the flow delivered by the carburettor is proportional to the speed of rotation of the engine.

Now it is frequently found that modern engines, in particular with full inlet, require a flow increasing more rapidly with the speed of rotation than the linear law. This law of flow required by the engine at the maximum inlet pressure is affected, among other factors, by the number of cylinders in the engine (it is well known that in this respect the behaviour of a six-cylinder engine is quite different from the behaviour of a four-cylinder engine) and the timing of the distribution which causes the inlet pressure not to be the exact reflection of the supply of the engine.

One of the objects of the invention is to adapt the flow delivered by the tachometric carburettor more precisely to the requirements of the engine at the maximum inlet pressure, whether these requirements are a flow increasing more quickly, or possibly less quickly, than the linear law, as a function of the speed of rotation.

The object of the invention is an arrangement enabling the ratio of the cross-sections of the fuel passages which is established by the control member sensitive to the inlet pressure to be corrected as a function of the speed of rotation.

In one embodiment of the invention this correction is obtained by a displacement of the said control member as a function of the speed of rotation of the engine, this displacement being effective in such manner that the ratio of the cross-section of the useful flow passage to the total cross-section of the passages varies in the desired direction and by the desired amount when the speed of rotation increases.

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In another embodiment of the invention the correction is obtained by the operation of a supplementary calibrated passage located in parallel with one or other of the main passages and controlled by a member such as a needle, the movements of which are controlled as a function of the speed of rotation, in such manner that the ratio of the cross-section of the useful flow passage to the total cross-section varies in the desired direction and by the desired amount when the speed of rotation increases.

In each of the two embodiments referred to above, which consists in displacing a movable member as a function of the speed of rotation, this displacement can be obtained either by the action of a centrifugal regulator or preferably by the action of a manometric member (plunger or similar means) subjected to a pressure varying with the speed of rotation. In the latter case the said manometric member is advantageously subjected to the pressure of the fuel downstream of the pump; in practice the actuating pressure will then be the loss of pressure in the injection duct and in the injector itself. The injector is generally of the open type, that is to say it has a constant cross-section as opposed to closed injectors in which the outlet of the injector is controlled by a valve. Under these conditions, for a given value of the fuel passages, the loss of pressure varies as the square of the speed of the engine and constitutes a measure of the latter.

It can also be arranged for the chosen physical factor, which is a function of the rotational speed of the engine, to act on the piston or other manometric member which can be provided in the carburettor in order to effect control of the delivery of fuel as a function of the back pressure at the exhaust of the engine, this piston or like member in fact being connected to the control member of the carburettor which is normally actuated by the inlet pressure of the engine and which controls the delivery of fuel by way of the two systems of orifices or calibrated passages.

If the physical factor dependent on the rotational speed of the engine is the delivery pressure of the pump this pressure can be applied to the said piston or manometric member in place of the inlet pressure.

Several constructional forms of carburettor embodying the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIGURE 1 is a diagrammatic view partly in elevation and partly in section of a first constructional form of carburettor according to the invention in which the correction sought is obtained by action on the member controlling the fuel passages, this action resulting from the pressure of the fuel which pressure is itself a function of the speed of rotation of the engine,

FIGURE 2 illustrates an embodiment of the same kind as that shown in FIGURE 1 but applied to the case where the carburettor comprises a device for correcting the back pressure at the engine exhaust,

FIGURE 3 shows a modified form of construction in which the displacement of the control member as a function of the speed is controlled by a centrifugal regulator, and

FIGURE 4 illustrates another modified constructional form comprising a supplementary calibrated orifice provided with its own control member,

FIGURE 5 shows another modification based on FIGURE 2.

The constructional form of carburettor illustrated in FIGURE 1 comprises a fuel pump 1 of the volumetric type driven by the engine (not shown), a metering device 2 for the fuel and an injector 3 opening into the inlet manifold 65 of the engine. This inlet manifold 65 re-

ceives the air from the air intake 100. The quantity of air admitted into the engine is regulated by means of a throttle 101.

That section of the pipe which is located between the inlet manifold 65 and the throttle 101 is designated by the reference 99.

The metering device 2 comprises a casing 20 provided with a cylindrical bore 21 in which there is a sleeve 22. In this sleeve 22 there are provided two calibrated orifices 26 and 27.

The fuel duct 18 which is connected to the delivery side of the pump 1 is in communication through an annular groove 29 and radial passages 30 with a chamber 28 having two different outlets for the fuel which are constituted by the calibrated orifices 26 and 27. The calibrated orifice 27 delivers the useful fuel to the injector 3 through ducts 31 and 32 between which there may be interposed a calibrated passage 31a the function of which will be explained hereinafter. The calibrated orifice 26 serves for the return of the surplus fuel to the suction side of the pump.

In the return path for the surplus fuel there is interposed a slide valve 37 which controls communication between a chamber 36 connected to the calibrated orifice 26 by radial bores 34 and an annular groove in the sleeve 22 on the one hand and a chamber 33 communicating through a pipe 39 with the suction side of the pump 1 or the fuel tank on the other hand.

The aforesaid slide valve 37 is coupled to a piston 41 movable in a cylinder 40. A chamber 42 located above this piston is in communication through a duct 44 with the duct 31 conveying the useful flow delivered through the calibrated orifice 27, while a chamber 45 located below the said piston 41 is connected by a duct 46 to the chamber 36 communicating with the calibrated orifice 26. The piston 41 is thus subjected to the opposing actions of the fuel pressures which prevail downstream of the return orifice 26 and of the useful flow orifice 27, respectively. It regulates the opening of the slide valve 37 in such manner that these pressures are substantially equal.

The flow cross-sections of the orifices 26 and 27 are adjusted by a control member sliding along its axis. This member comprises a cylindrical portion 59 guided in the sleeve 22 and a portion of varying cross-section in the form of a needle 59a the profiled surfaces of which cooperate with the calibrated orifices 26 and 27 respectively. These surfaces are designed in such manner as to obtain the desired law of variation of the flow as a function of the position of the needle 59a, through the annular cross-sections left free between the needle and the respective edges of the aforesaid orifices 26 and 27.

The cylindrical portion 59 of the control member is coupled to the movable end or back portion 61a of a manometric capsule 61 the other end 61b of which is connected to a screw 63 enabling the initial position of the said capsule, and consequently of the needle 59a, to be adjusted.

A chamber 62 in which the capsule 61 is located communicates through a pipe 67 with the section 99 of the air intake pipe 100.

The cylindrical body 59 of the control member has a face 59b disposed in the chamber 33, the said face 59b being subjected to the pressure of the fuel contained in the said chamber 33 downstream of the calibrated orifice 26. This pressure is equal, as has already been mentioned, to that of the useful fuel in the conduit 31 downstream of the calibrated orifice 27.

The operation of the device is as follows: the pump 1 delivers a quantity of fuel into the chamber 28 proportional to the speed of the rotation of the engine. The fuel leaves this chamber 28 divided into two streams, one of which passes through the orifice 27 towards the injector 3 while the other, passing through the orifice 26, enters the chambers 33 and 36 to arrive through the pipe 39 at the suction side of the pump. As the regulating

slide valve 37 maintains the pressures in the injecting duct 31 and return chamber 36 equal, the losses in pressure through the calibrated orifices 27 and 26 are also equal, so that the rates of flow of fuel through these two orifices are proportional to the useful cross-sections of the orifices which are controlled by the needle 59a.

As a first approximation, the flow of air drawn in by the engine is proportional to the speed of rotation of the latter and to the absolute pressure prevailing in the inlet manifold 65.

If it is desired to supply the engine with a mixture having a constant ratio of air and fuel, the flow of fuel delivered to the engine must be proportional to the speed of rotation and to the pressure prevailing in the inlet manifold 65. The proportionality of the flow of fuel to the speed of rotation is obtained by means of the volumetric pump 1 the speed of which depends on that of the engine.

The manometric capsule 61 which is subjected to the pressure prevailing in the section 99 of the air intake pipe 100 downstream of the throttle 101 displaces the needle 59a and consequently modifies the useful cross-sections of the calibrated orifices 27 and 26 when the inlet pressure varies. If the cylindrical portion 59 is reduced to a simple connecting rod between the capsule 61 and the profiled needle 59a and has a cross-section sufficiently small for the pressure exerted by the fuel on the said rod to be negligible, it is possible to give the surfaces of the needle 59a profiles designed so that the flow of fuel through the calibrated orifice 27 is proportional to the inlet pressure. Hence the flow of fuel towards the engine is solely a function of the speed of rotation of the latter and of the inlet pressure.

A constructional embodiment of such a control member satisfying this condition is described in the aforesaid U.S. specification No. 2,803,233 with reference to FIGURES 5 and 6 of that specification.

As has been stated in the preamble of the present specification, however, it is desirable for certain engines, and in particular for modern engines, to depart from a linear relation between the useful flow of fuel and the speed of rotation, at constant inlet pressure, and the invention provides a means of achieving this desideratum.

In the constructional embodiment illustrated in FIGURE 1, this correction of the law of flow as a function of the speed is such that, at high speeds, the supply to the engine increases more rapidly than that resulting from a linear relation between the flow and the speed of rotation.

Moreover, in this form of embodiment, the correction is obtained by the action of the needle 59a and the orifices 26 and 27.

The cylindrical plunger 59, 59b is given a cross-section suitable for the pressure of the fuel in the chamber 33, to which the face 59b of the said plunger is subjected, to cause a displacement of the latter and of the needle 59a, such displacement varying as a function of the said pressure. As already mentioned, this pressure, through the action of the slide valve 37 and the piston 41, is equal to the pressure of the useful fuel which has passed through the orifice 27 and travels therefrom through the duct 31 towards the injector 3. As the injector 3 has a constant cross-section, the loss in pressure of the fuel on passing through this injector varies, for a given value of the inlet pressure and of the useful section of the calibrated fuel passages, as the square of the speed of rotation of the engine, so that this loss in pressure, that is to say the pressure at 31 and 33, constitutes a measure of the speed of rotation of the engine.

The result is that the effect of the pressure of the fuel on the face 59b is a displacement of the needle 59a such that the ratio of the useful cross-section of the orifice 27 to the total cross-section of the orifices 27 and 26 increases when the speed of rotation of the engine increases, at constant inlet pressure. A suitable choice of the cross-

section of the plunger 59 enables the variation of the said ratio as a function of the variation in the speed of rotation to be adjusted at the desired value.

A supplementary calibrated passage 31a introduced upstream of the injector, between the two duct sections 31 and 32, permits precise regulation of the increase in flow when the speed of rotation increases. This increase in flow which is produced by the displacement of the needle 59a is a function both of the cross-section of the plunger 59, on which cross-section the pressure of the fuel is exerted, and of this pressure itself. The loss of pressure through the calibrated passage 31a is added to the loss of pressure through the injector and thus increases the pressure of the fuel acting on the face 59b. The calibrated orifice 31a is preferably formed in a removable part 31b so that it is easy to modify the cross-section of this passage for adaptation of the carburettor.

The embodiment illustrated in FIGURE 2 differs from that already described only by the presence of a device intended to take account, in the regulation of the flow of fuel, of the back pressure prevailing at the engine exhaust. This back pressure can be likened for all practical purposes to atmospheric pressure.

The chamber 62 which contains the manometric capsule 61 and which is in communication through the pipe 67 with the air intake pipe 100 moreover communicates through a duct 70 with one end of a cylinder 71 in which a piston 72 is slidably arranged. The other end of the cylinder 71 communicates through a duct 75 with the atmosphere, preferably through the medium of a filter 76 intended to prevent the passage of dust.

The piston 72 is thus subjected on one of its faces (the left-hand face in the drawing) to the inlet pressure of the engine and on its other face (the right-hand face in the drawing) to atmospheric pressure. It is moreover subjected to the action of a return spring 73. Finally, it is coupled to a rod 74 which forms an extension of the fuel regulating needle 59a at the end remote from the cylindrical portion 59 previously described.

It will, therefore, be understood that the combined actions of the manometric capsule 61 and piston 72 modify the position of the needle 59a as a function both of the inlet pressure and of the exhaust back pressure.

As in the foregoing embodiment, the correction of the flow, as a function of the speed of rotation at constant inlet and exhaust pressures, is obtained by the action of the pressure of the fuel which has passed through the calibrated orifices 26 and 27, but this time the useful cross-section on which the pressure acts is the difference between the area of the face 59b and that of the face 74a, since the pressure acts in opposition on these two areas.

The rod 74 has in general the simple function of connecting the piston 72 and the needle 59a and it is of small cross-section. The pressure exerted by the fuel on the cross-section of the rod 74 is therefore negligible or slight with respect to that exerted on the cross-section of the plunger 59. However, if it were desired to cause a reduction in the flow of fuel as a function of the speed of the engine, instead of an increase, the rod 74 would be given a considerable cross-section, while the plunger 59 would be replaced by a simple connecting rod of small cross-section.

In the modified embodiment illustrated in FIGURE 3, the correction is again obtained by the displacement of the control needle 59a but this displacement is controlled by a centrifugal regulator 102, the plate of which is rotationally driven by the engine by means of a shaft 103. Under the effect of the centrifugal force the counterweights 104 of this regulator transmit to the needle 59a, through a rod 105, a force which increases with the speed of the engine and causes a corresponding displacement of the said needle. The plunger 59 shown in FIGURES 1 and 2 is replaced by a rod 59c of small cross-section the sole function of which is to connect the capsule 61 to the needle 59a.

Finally, in the modified constructional form shown in FIGURE 4, the correction is obtained by the action of a supplementary calibrated orifice 106 supplied by the pump in parallel with the return orifice 26, already described, said return orifice communicating with the chamber 33.

The orifice 106 is controlled by a needle 107. This needle is itself actuated by a plunger 108 which is subjected on one side to the pressure of the fuel downstream of the orifice 106 and on the other side to the pressure in the chamber 62 and to that of a return spring 110.

It will be understood that if the speed of rotation of the engine increases at constant inlet pressure, the pressure of the fuel downstream of the orifice 106 also increases, for the reasons stated, so that the plunger 108 and the needle 107 are shifted towards the right in the drawing. The needle 107, the profile of which is suitably designed for this purpose, then throttles the orifice 196 and this corresponds to an increase in the ratio between the useful cross-section of the orifice 27 and the total cross-section of the calibrated passages offered to the fuel, and consequently to an increase in the useful flow supplied to the engine.

Instead of controlling an orifice in parallel with the return orifice 26, the needle 107 controlled by the plunger 108 could equally well control an orifice in parallel with the feed orifice 27 of the injector.

In the examples illustrated in FIGURES 1, 2 and 4, the pressure acting on the plunger of the correction device is the pressure downstream of the calibrated orifices 26 and 27. This plunger could equally well be subjected to the pressure upstream of the said orifices. The loss of pressure on passing through the calibrated orifices is relatively small in comparison with the loss of pressure on passing through the injector and the law of variation of the pressure upstream of the calibrated passages is almost the same as that of the pressure downstream of the said passages. In general, it is possible to utilise the pressure at any point whatsoever of the delivery circuit of the fuel pump for controlling the correction member.

It should be noted that at low inlet pressure engines generally require a correction of flow as a function of the speed of the engine which is different from the correction at maximum inlet pressure.

In the case where the correcting device is actuated under the effect of the pressure of the fuel, as described more particularly with reference to FIGURES 1, 2 and 4, the correction of the flow of fuel varies in relative value as the inlet pressure in the engine. In fact, on account of the action of the manometric capsule 61, the flow at constant speed is proportional to this inlet pressure p . Then again, the fuel pressure varies as the square of the flow and therefore as p^2 . The movements of the needle and finally the correction flow also vary as p^2 , so that the relative correction varies in fact as p .

In the case where the correcting device is actuated by a centrifugal regulator, the correction flow is independent of the inlet pressure and the relative correction therefore varies as:

$$\frac{1}{p}$$

Generally speaking, the law of correction required by modern engines approximates more to the first law than to the second; they require a practically zero correction for slow running (low inlet pressure), while at full load (maximum inlet pressure) they demand a considerable enrichment when the speed of rotation increases up to the maximum speed. If, however, it is advisable to obtain a law of correction intermediate between the above two laws, it is possible to combine the correction by means of a centrifugal regulator with the correction by means of a plunger subjected to the pressure of the fuel. To this end it is possible, for example in the device shown in FIGURE 3, to replace the rod 59c of small cross-section

tion by a plunger of larger cross-section, such as the plunger 59 of the device shown in FIGURE 1.

In all cases the profile of the metering needle may be determined in order to obtain the desired rates of flow on a curve chosen in advance—a so-called “utilisation curve of the engine”—and defined by the relation between the speed of rotation of the engine and the inlet pressure.

The modified embodiment of FIGURE 5 is based on that of FIGURE 2. The parts already described with reference to FIGURE 2 are identified by the same reference numerals.

The piston 72 is coupled to the rod 74 which extends from the control surfaces 59a in the opposite direction to the cylindrical rod 59 and is exposed at one of its faces (the right-hand face in the drawing) to the back pressure of the exhaust or like variable pressure by way of a conduit 39a. The conduit 39a can be connected, for example, either to the atmosphere or to the fuel reservoir as will be explained hereinafter. At its opposite face (the left-hand face) instead of being exposed to the inlet pressure as in FIGURE 2, it is exposed to the delivery pressure of the pump by way of the conduit 18a, this conduit 18a being connected to the conduit 18.

It is also subjected to the action of a restoring spring 73. It will be understood that in such an arrangement increase in the engine speed, resulting in increase in the delivery pressure of the pump, tends to produce displacement of the piston 72 towards the right in the drawing starting from the equilibrium position which existed up to then and that in consequence there will be an increase in the operative cross-section of the calibrated orifice 27 with corresponding reduction in the operative cross-section of the calibrated orifice 26 and, as a result, an increase in the delivery of fuel to the engine. On the other hand if the rotational speed of the engine is reduced the pressure on the lefthand face of the piston 72 will likewise be reduced and the piston 72 will tend to move towards the left, which will result in reduction in the operative cross-section of the orifice 27 and increase in the operative cross-section of the orifice 26 with a corresponding reduction in the delivery to the engine.

The altimetric correction will prevail since increase in the atmospheric pressure acting on the right-hand face of the piston 72 will tend to reduce the delivery of fuel to the engine and vice versa.

Such an embodiment has the advantage over those which have been described with reference to FIGURES 1 and 2 of enabling the rod 59 to have a small cross-section (equal to that of the rod 74) and thus of reducing to the minimum the losses of fuel which may occur through the guide for this rod. The losses through the guide for the piston 72 do not give rise to any difficulty and, as shown, the conduit 39a can be connected to the conduit 39 which provides the return to the fuel reservoir 111, since atmospheric pressure is usually maintained in the interior of the latter.

What is claimed is:

1. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated passage means, duct means for supplying one of said streams to the engine, duct means for returning the other stream to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated passage means, control means for modifying the relative useful cross-sections of said calibrated passage means, and means responsive to both the inlet pressure of the engine and the engine speed for actuating said control means.

2. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated orifices and supplying one of said

streams to the engine and returning the other to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated orifices, a control member actuated by the inlet pressure of the engine for modifying the relative useful cross-sections of said calibrated orifices in such manner that the flow supplied to the engine varies in accordance with a predetermined law as a function of the inlet pressure, means providing a supplementary calibrated orifice supplied with fuel by the pump in parallel with one of said two calibrated orifices, and a movable member, the movements of which are controlled as a function of the speed of rotation of the engine, to control said supplementary calibrated orifice in such manner as to adjust the flow supplied to the engine at constant inlet pressure.

3. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated orifices and supplying one of said streams to the engine and returning the other to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated orifices, a control member actuated by the inlet pressure of the engine for modifying the relative useful cross-sections of said calibrated orifices in such manner that the flow supplied to the engine varies in accordance with a predetermined law as a function of the inlet pressure, means providing a supplementary calibrated orifice supplied with fuel by the pump in parallel with one of said two calibrated orifices, a movable member, the movements of which are controlled as a function of the speed of rotation of the engine, to control said supplementary calibrated orifice in such manner as to adjust the flow supplied to the engine at constant inlet pressure, and a manometric member connected to said movable member and acted on by said pressure.

4. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated orifices and supplying one of said streams to the engine and returning the other to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated orifices, a control member actuated by the inlet pressure of the engine for modifying the relative useful cross-sections of said calibrated orifices in such manner that the flow supplied to the engine varies in accordance with a predetermined law as a function of the inlet pressure, and a correcting device responsive to the pressure of the fuel downstream of the pump in such manner as to adjust, as a function of said pressure, the flow supplied to the engine at constant inlet pressure.

5. A tachometric carburettor according to claim 4, comprising a manometric member connected to said control member and acted on by said inlet pressure.

6. A tachometric carburettor according to claim 5, comprising a plunger connected to said control member and having a face subjected to the pressure of the fuel, said plunger constituting at the same time a connecting member between said control member and said manometric member.

7. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated orifices and supplying one of said streams to the engine and returning the other to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated orifices, a control member actuated by the inlet pressure of the engine for modifying the relative useful cross-sections of said calibrated orifices in such manner that the flow supplied to the engine varies in accordance with a predetermined

law as a function of the inlet pressure, a centrifugal device rotationally driven by the engine, and a correcting device responsive to said centrifugal device in such manner as to adjust the flow supplied to the engine at constant inlet pressure.

8. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated passage means, duct means for supplying one of said streams to the engine, duct means for returning the other stream to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated passage means, control means for modifying the relative useful cross-sections of said calibrated passage means, a piston like member responsive to atmospheric pressure and connected to said control means, means responsive to the inlet pressure of the engine for actuating said control means, and means responsive to the engine speed for actuating said member.

9. A device according to claim 8, comprising means for subjecting the said piston like member to the opposing actions of, on the one hand, a pressure which is a function of atmospheric pressure and, on the other hand, the fuel pressure at the delivery of the pump.

10. A device according to claim 9, wherein the first named pressure is led by pipe means into the fuel reservoir of the engine.

11. A tachometric carburettor according to claim 1,

comprising means providing a calibrated orifice in the fuel duct supplying the engine.

12. A tachometric carburettor for internal combustion engines comprising in combination means for dividing a flow of fuel delivered by a volumetric pump driven at a speed proportional to that of the engine into two streams through two calibrated passage means, duct means for supplying one of said streams to the engine, duct means for returning the other stream to the suction side of the pump, means for equalising the pressures of the fuel downstream of said calibrated passage means, a control member for modifying the relative useful cross-section of said calibrated passage means, means responsive to the inlet pressure of the engine, operatively connected to said control member, and means responsive to the engine speed, operatively connected to said control member.

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