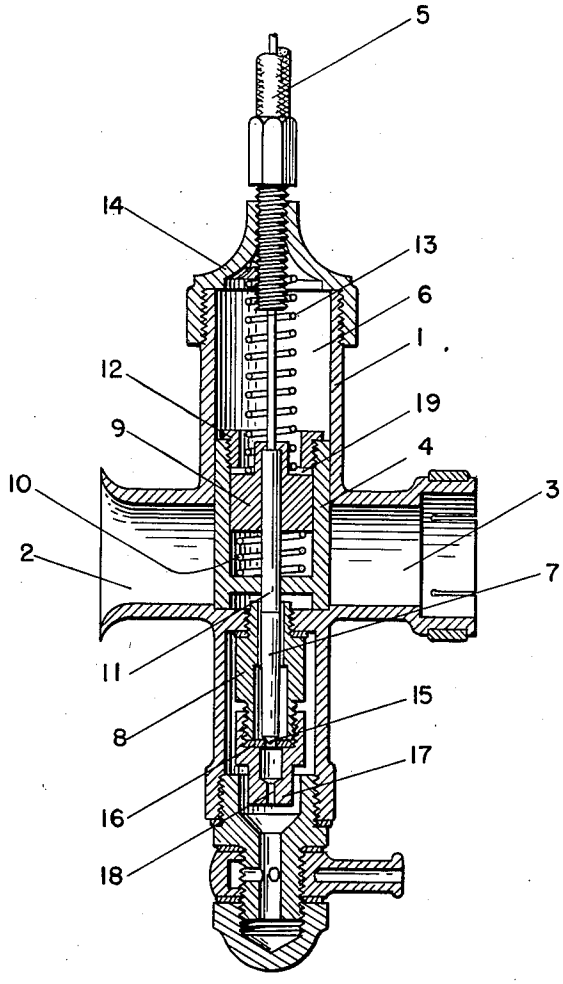
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CARBURETOR FOR INTERNAL-COMBUSTION ENGINES

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CARBURETOR FOR INTERNAL-COMBUSTION ENGINES

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1 Claim. (Cl. 261—44)

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This invention relates to carburettors for internal combustion engines and especially to those types having no associated fuel reservoir or float chamber.

It has been usual to utilise a carburettor of conventional kind, i. e. having an attached float chamber, with the types of small petrol engine in use with motor-propelled pedal cycles. The latter fall into two categories; (*a*) the machines designed and built as motor propelled pedal cycles, and (*b*) those pedal cycles having an auxiliary and detachable motorising unit fixed thereto. In both cases, and especially in the latter, the problem has been to overcome the serious disadvantages of high frequency vibration in the carburettor due mainly to the small high-speed engine. With such vibration, it is practically impossible for the fuel cut-off needle to operate effectively in the float chamber, consequently the carburettor tends to overflow and/or the engine runs with a rich mixture.

One way in which these disadvantages can be overcome is by substituting a carburettor having no float chamber, but then the problem arises as to how the fuel may be adequately supplied to the spray nozzle under running conditions, and yet be automatically cut off when not required.

The object of the present invention is to provide a carburettor of the kind having no associated fuel reservoir, wherein the aforesaid disadvantages are simply and effectively overcome.

According to the present invention we provide an improved carburettor for internal combustion engines of the kind having no associated fuel reservoir, but having a taper needle valve for regulating the flow of fuel through a metering orifice, characterised in that the needle is also adapted to co-act with a seating to shut off the fuel supply to said orifice when the throttle is fully closed, and to open said fuel supply prior to the throttle being opened.

One embodiment of the invention is illustrated by way of example in the accompanying drawing, which shows a cross-sectional view through a carburettor constructed in accordance with the present invention.

Referring to the drawing, the carburettor comprises a body portion 1 having an intake orifice 2 and an outlet or mixing chamber 3. A throttle sleeve 4, actuated through a Bowden transmission system 5, is slidably arranged within the cylindrical portion 6 of the body 1, said portion running transversely into the choke tube comprised by the intake orifice 2 and outlet or mixing chamber 3. A taper needle valve 7 adapted to travel with the said throttle sleeve 4, is arranged to co-act with a spray nozzle 8 to regulate the amount of fuel passing therethrough according to the amount of throttle opening. The taper needle 7 is secured within a slidable needle block 9, said block being disposed within the hollow centre of the throttle sleeve 4 and the needle passing through an aperture 11 in the bottom of the hollow portion. A light spring 10 is disposed between the needle block and the bottom of the hollow throttle sleeve and a screw threaded retaining collar 12 is secured in the top of the throttle sleeve in order to prevent the needle block from leaving the sleeve under the action of the said spring 10. The top of the needle block is adapted to house the nipple of the Bowden cable. A further and stronger spring 13 retained by a screwed cap 14 is adapted to co-act with the said needle block 9 in order to urge it downwards in opposition to the lighter spring 10.

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The free end of the taper needle is further tapered at 15 and adapted to engage and co-act with an annular valve seating 16, which seating is secured to the lower end of the spray nozzle by a fuel jet 17 having a metering orifice 18. It is arranged that when the throttle sleeve 4 is fully closed (as illustrated), the stronger spring 13 forces the taper needle into contact with the valve seat 16 to cut-off the supply of fuel to the spray nozzle 8. It is further arranged that in this closed position, a slight gap 19 exists between the bottom of the retaining collar 12 and the top of the needle block 9. Thus, when the Bowden control system is operated to open the throttle, it acts directly upon the needle block 9 and lifts the needle from the valve seating 16 before there is any movement of the throttle sleeve 4. In this way, fuel is allowed to enter the spray nozzle immediately prior to any admittance of air, and a weak starting mixture is avoided. Conversely, after the throttle is shut, the needle block 9 and needle 7 are urged further downwards until the end of the taper needle engages the valve seat 16 and effectively cuts off the supply of fuel.

The valve seating is preferably made of a softer material than the needle and may, for example, be made from fibre, hard rubber, or plastics material.

The size of the metering orifice 18 within the fuel jet depends upon the size of the engine with which it is to be used and various other conditions, but is, of course, of such a size that the engine is neither starved of fuel nor supplied with a rich mixture under normal throttle conditions.

A carburettor as hereinbefore described and illustrated is admirably suitable for lightweight engines of the kind described, and in these cases would probably be approximately half the size of that shown in the illustration.

A further advantage is that the carburettor functions in any position, whether the throttle sleeve is operating vertically or horizontally, or in any intermediate position. It is even possible for it to work in the invert position i. e. with the fuel jet uppermost. It will be seen that this is an added advantage over the conventional or float-chamber type where the float chamber has to be arranged in a definite position to prevent flooding.

We claim:

A carburettor for internal combustion engines having in combination a substantially vertical tubular body portion, a substantially horizontal induction chamber disposed therethrough, an air throttle sleeve arranged slidably within said body portion, a taper needle fuel valve arranged slidably within the throttle sleeve, and adapted to regulate the flow of fuel through a metered orifice, the lower tip of said needle being adapted to co-operate with a valve seating to constitute a shut-off valve for the supply of fuel to said orifice, said throttle sleeve being resiliently mounted in

relation to said needle valve, means for actuating said needle valve, an abutment associated with said needle valve, an abutment associated with said throttle sleeve, said abutments being slightly spaced from each other when said needle valve is in fuel shut-off position, and said abutments being disposed for engagement after initial movement of said needle valve from fuel shut-off position, whereby subsequent movement of said needle valve effects simultaneous movement of said throttle valve.

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