Sept. 8, 1931. G. H. SKINNER 1,822,712

CARBURETOR

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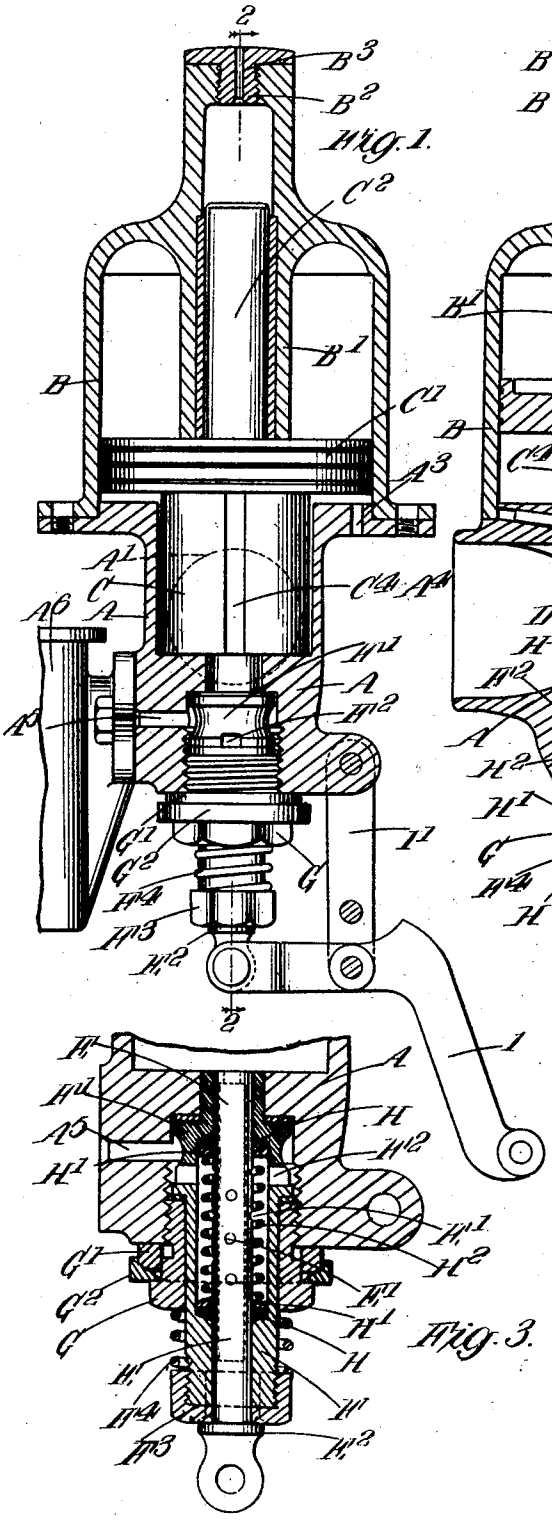


Fig. 1.

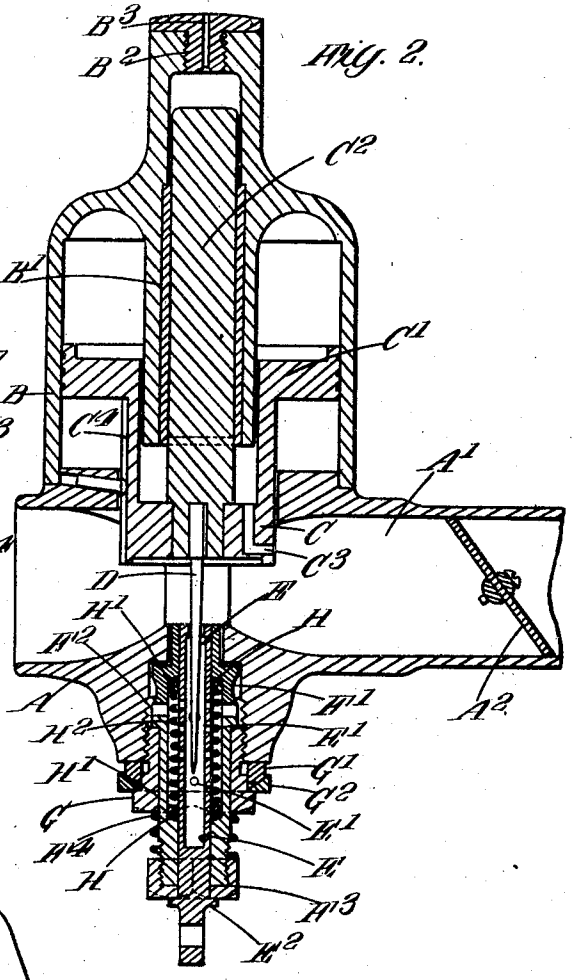


Fig. 2.

Fig. 3.

Inventor
George Herbert Skinner
By
Pennie, Davis, Marvin & Edmonds
Attorneys

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UNITED STATES PATENT OFFICE

GEORGE HERBERT SKINNER, OF EALING, LONDON, ENGLAND, ASSIGNOR TO S. U. COMPANY, LIMITED, OF LONDON, ENGLAND

CARBURETOR

Application filed April 24, 1926, Serial No. 104,254, and in Great Britain April 30, 1925.

This invention relates to carburetors and has particular though not exclusive reference to carburetors of the type in which a piston valve for controlling the main air passage and carrying a needle valve for controlling the liquid fuel supply is under the influence of and is operated by engine suction.

According to one feature of the present invention the said air valve carrying the needle valve is formed in one with or is directly secured to a piston (hereinafter referred to as the suction disc) which is adapted to work in a suction chamber so that it can be operated to raise the piston valve by the engine suction. By providing a combined piston valve and suction disc, the usual spindle or rod which in carburetors of the kind hereinbefore referred to is located between the suction disc and the piston valve and also the bearing therefor are avoided. A rod may extend upwardly beyond the aforesaid suction disc so as to slidably fit in a sleeve or bearing formed on the upper part of the said suction chamber, the said sleeve or bearing having a restricted orifice for the escape of air so that a kind of dashpot action is afforded when the said rod is moved upwardly due to the combined suction disc and the piston valve being raised by the engine suction. Communication between the space above the suction disc in the suction chamber and the engine side of the main passage leading to the engine induction pipe, may be effected through a hole in the aforesaid piston valve so that the combined suction disc and piston valve can be placed under the influence of the engine suction during the running of the engine, and thereby raised to control the said main passage whilst at the same time the needle valve on the piston valve controls the fuel supply. The movement of the combined suction disc and piston valve may to some extent be controlled or regulated by the dashpot action provided by the aforesaid rod which serves as a plunger within its sleeve or bearing and the area of the restricted air orifice is chosen or selected to suit the particular engine for which the carburetor is intended; or in some cases the said restricted orifice may be adjustable.

According to a further feature of the present invention improved means are provided to ensure that a fuel tight joint is provided for an adjustable fuel jet tube or nozzle. The jet tube which is axially adjustable or slidable within a sleeve or the like is surrounded by washers of cork or other material which are adapted to be compressed around the said tube by spring means preferably acting in conjunction with bevelled surfaces, the said jet tube having holes therein through which fuel supplied to the interior of the sleeve from the float chamber passes to the jet tube orifice through which the aforesaid nozzle valve passes.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 is a sectional view of a construction of carburetor embodying the improvements according to this invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged sectional view illustrating the adjustable jet tube or nozzle with the associated parts.

A indicates the main body of the carburetor having a main air passage A′ leading to the engine induction pipe and fitted with a throttle A^2 as shown in Figure 2. B indicates a cover or cap which is secured to the main body A and constitutes the aforesaid suction chamber. C is the piston valve which is slidable in the body A to control the passage A′ and which carries the needle valve D that controls the fuel jet tube or nozzle E. The piston valve C is formed integrally with a suction disc or piston C′ which makes a sliding fit in the cover B forming the suction chamber. A guide rod or plunger C^2 extends upwardly from the lower part of the piston valve C and makes a close sliding fit in a sleeve or bearing B′ provided in the cap or cover B forming the suction chamber. The lower part of the piston valve is provided with a passage C^3 through which communication is established between the interior of the suction chamber above the suc-

tion disc C′ and the engine side of the passage A′ leading to the engine induction pipe and the space below the suction disc is open to outside air through a passage A^3 (see Figure 1). The piston valve C is maintained with its passage C^3 located in the engine side of the main passage A′ by means of a pin A^4 engaging with a slot C^4 in the said valve C. The combined piston valve and the suction disc with the needle valve can therefore be raised by engine suction to control the passage A′ and the fuel jet nozzle E according to requirements. The upper end of the sleeve B′ is provided with a screw plug B^2 which has a small opening B^3 therein that allows air to escape from the space above the plunger rod C^2 at a more or less restricted rate according to the area of the orifice. The said plunger rod working in the sleeve with the restricted orifice may serve as a dashpot to limit or control the movement of the suction disc and piston valve as this movement is to some extent regulated or determined by the size of the orifice B^3 that may be chosen to suit the particular engine to which the carburetor is applied. An adjustable orifice may be provided if desired.

In the example illustrated the jet tube E is slidably fitted in a two part sleeve F and F′ fitted within the lower part of the main body or casing A. The lower sleeve portion F which is flanged at its upper end is held within an externally threaded nut G which is screwed into the body A and bears against a cork washer G′ through a metal ring G^2 having a bevelled surface that engages the said washer as shown in Figure 2. The said lower sleeve portion F retains the upper sleeve portion F′ in position around the upper end of the jet tube which portion F′ is provided with openings F^2 that establish communication between an opening A^5 in the main body leading from the float chamber A^6 to the interior of the lower sleeve portion F so that the fuel is supplied to the said interior of the sleeve portion F and can pass through holes E′ in the jet tube E whence it passes through the orifice controlled by the needle valve D. The jet tube makes a fairly close sliding fit in the lower end of the sleeve portion F and in the upper end of the sleeve portion F′, and its sliding movement can be limited by a flange E^2 thereon engaging with an adjustable nut or abutment F^3 screwed on the lower end of the sleeve F against a spring F^4 that bears against the nut G. In order to provide a petrol tight closure for the adjustable jet tube E, cork washers H surround the jet tube and in the example shown are maintained between bevelled surfaces on the said sleeve portions F and F′ and on rings H′ by an interposed spring H^2 which bears against the said rings H′ so that by reason of these said bevelled surfaces the cork washers are compressed tightly around the said tube E without however preventing it from being slidably moved to vary the position of its orifice in relation to the tapered needle valve D. By this construction a liquid tight closure is provided for the slidable tube E and it is not necessary to provide light tight closures between the metal surface of the jet tube E and the surrounding portions of the sleeve parts F and F′. Any suitable means may be provided for adjusting the jet tube E and in the example shown a lever I is pivoted to the end of the tube and to a link I′ pivotally mounted on the body A the lever being actuated through any appropriate connection. By adjusting the nut F^3 on the sleeve F the limit of inward movement of the jet tube can be varied owing to the flange E^2 on the jet tube E engaging this nut and by this arrangement the jet tube may be conveniently set from the exterior of the carburetor and it may be adjusted to provide a suitable supply of fuel for slow running of the engine. Instead of employing a two part sleeve F and F′ a single sleeve may be used and the body A may be suitably formed at the upper end of the jet tube to receive the cork washer H.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A carburetor comprising a body having a straight through air and mixture passage, a piston valve vertically movable across said passage, a needle valve on the lower surface of said piston valve, a fuel jet nozzle arranged in the lower part of said passage and controlled by said needle valve, a suction chamber in the upper part of said body, a flange-like portion on the top of said piston valve forming a suction disc working in said chamber, an upwardly extending plunger on said piston valve, a sleeve disposed mainly within said suction chamber and adapted to receive said plunger, and means providing a restricted egress of air from the upper part of said sleeve when said piston valve is moved upwardly, said piston valve being provided with a duct establishing communication between said suction chamber above said suction disc and the engine side of said passage, and said body being provided with a duct communicating with the atmosphere below said suction disc.

2. A carburetor comprising a body having a straight through air and mixture passage, a piston valve vertically movable across said passage, said piston valve having a recess therein, a needle valve on the lower surface of said piston valve, a fuel jet nozzle arranged in the lower part of said passage and controlled by said needle valve, a suction chamber in the upper part of said body, a flange-like portion on the top of said piston valve forming a suction disc working in said chamber, a plunger extending upwardly from the base of said piston valve into said recess, an

internal elongated bearing sleeve within said suction chamber projecting into said recess, and means providing a restricted egress of air from the upper part of said sleeve.

3. A carburetor comprising a body having a straight through air and mixture passage, a separate cover member thereon forming a suction chamber, a piston valve vertically movable across said passage, said piston valve having a duct therein, a needle valve on said piston valve, a fuel jet nozzle arranged in the lower part of said passage and controlled by said needle valve, an integral enlarged portion on the upper part of said piston valve working in said suction chamber, a plunger extending upwardly from said piston valve, an internal sleeve integral with said cover member adapted to receive said plunger, and means providing a restricted escape of air from said sleeve when said piston valve is caused to move upwardly under the influence of engine suction acting on said enlarged part through said duct.

4. A carburetor comprising a body having a straight through air and mixture passage, a separate cover member thereon forming a suction chamber, a piston valve vertically movable across said passage, said piston valve having a recess therein, a needle valve on said piston valve, a fuel jet nozzle arranged in the lower part of said passage and controlled by said needle valve, an integral enlarged portion on the upper part of said piston valve working in said suction chamber, said enlarged part surrounding said recess, a plunger extending upwardly out of said recess, an integral sleeve internally disposed in said cover member and projecting into said recess, and means at the upper end of said sleeve, providing a restricted escape of air therefrom, said piston valve being provided with a duct establishing communication between said suction chamber above said enlarged part and the engine side of the said passage, and said body being provided with a duct establishing communication between the space below said enlarged portion and the atmosphere.

GEORGE HERBERT SKINNER.

CERTIFICATE OF CORRECTION.

Patent No. 1,822,712. Granted September 8, 1931, to

GEORGE HERBERT SKINNER.

It is hereby certified that the above numbered patent was erroneously issued to "S. U. Company, Limited, of London, England", whereas said patent should have been issued to Morris Industries, Limited, of London, England, as assignee of the entire interest in said invention, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of November, A. D. 1931.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)