July 21, 1953 E. G. BAREHAM ET AL 2,646,265

CARBURETOR

Filed Jan. 30, 1950 2 Sheets-Sheet 1

FIG. 1.

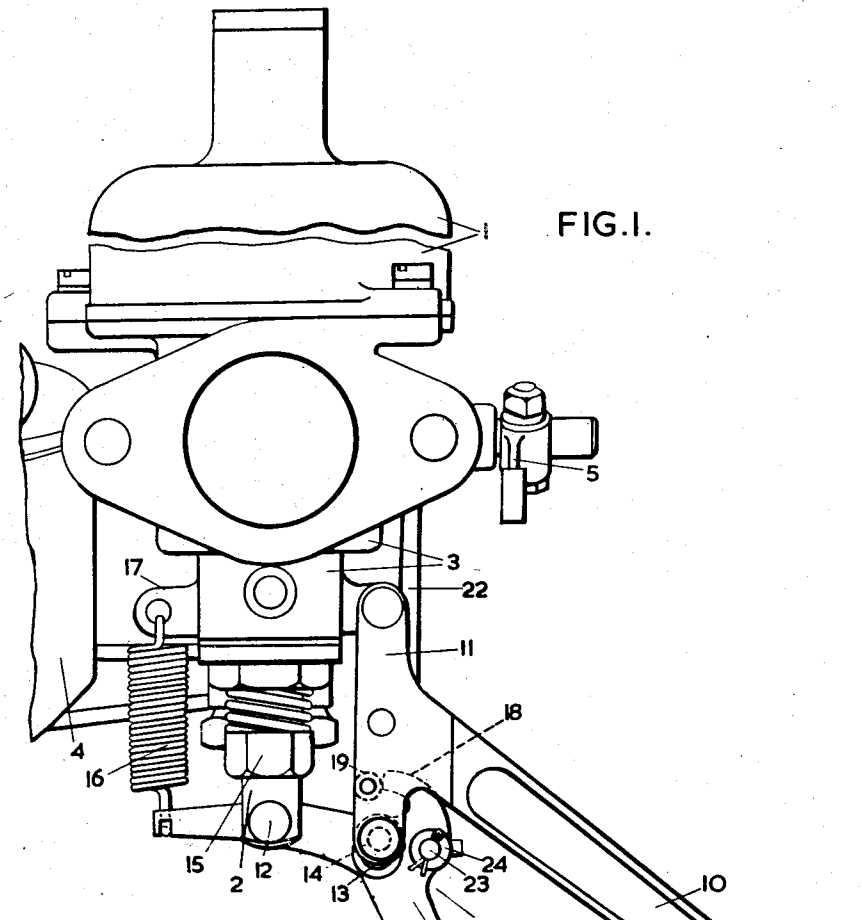
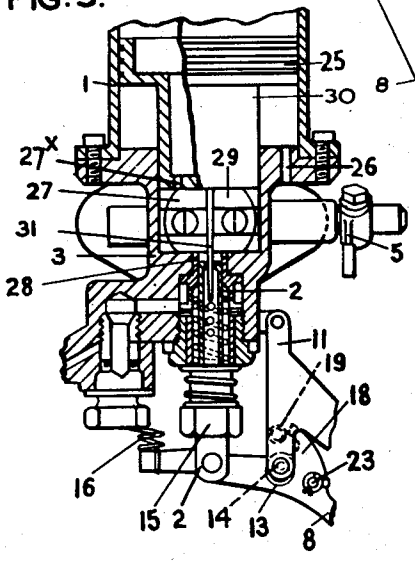


FIG. 5.



INVENTORS
ERIC G. BAREHAM
WILLIAM LAYLAND

BY Ayatt Dowell
ATTORNEY

July 21, 1953 E. G. BAREHAM ET AL 2,646,265

CARBURETOR

Filed Jan. 30, 1950 2 Sheets-Sheet 2

FIG.2.

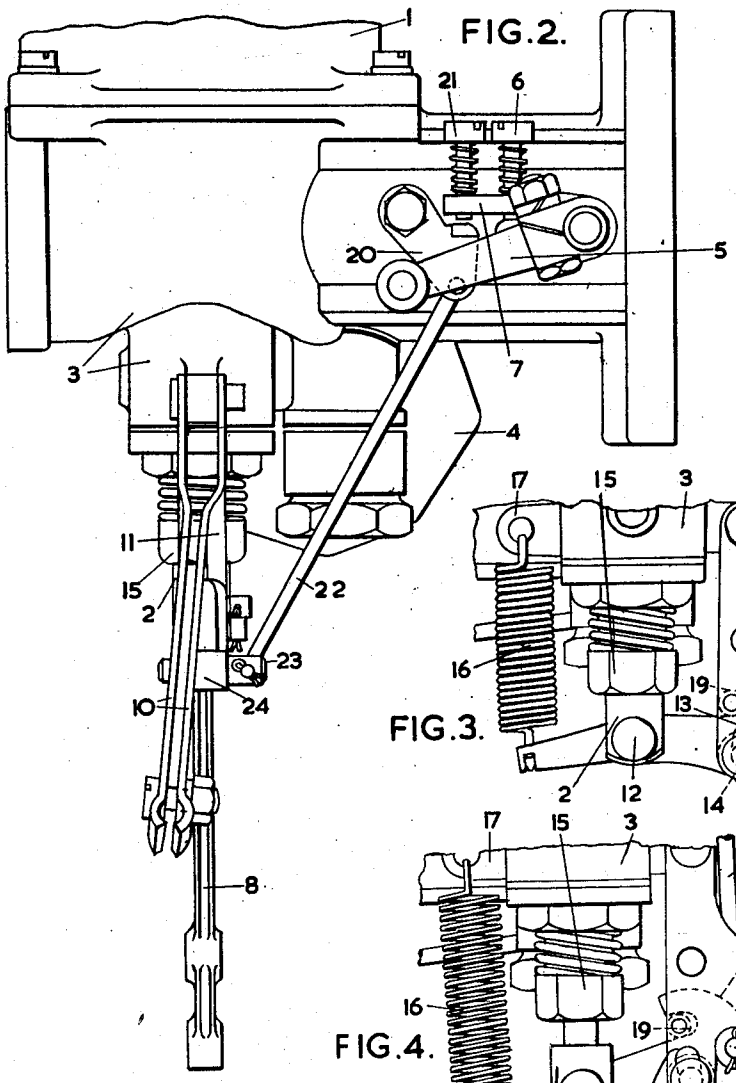


FIG.3.

FIG.4.

INVENTORS
ERIC GORDON BAREHAM
WILLIAM LAYLAND

BY A. Yates Dowell
ATTORNEY

Patented July 21, 1953 2,646,265

UNITED STATES PATENT OFFICE

2,646,265

CARBURETOR

Eric G. Bareham, Shirley, Birmingham, and William Layland, Kings Heath, Birmingham, England, assignors to The Austin Motor Company Limited, Birmingham, England

Application January 30, 1950, Serial No. 141,212
In Great Britain February 21, 1949

3 Claims. (Cl. 261—51)

1

The invention relates to carburetors of the constant suction type, that is to say that in which the choke is controlled by a piston working in a cylinder and exposed at one side to atmospheric pressure and at the other side exposed to the suction in the mixing chamber of the carburetor, the arangement being such that, as the throttle is opened the piston moves in a direction to increase the air inlet to the carburetor so that the suction in the mixing chamber remains substantially constant. Attached to the piston is a tapered needle valve entered into a jet tube, the arrangement being such that, as the piston moves in a direction to increase the air inlet to the carburetor, the needle valve moves to increase the fuel supply.

In order to provide a rich mixture to facilitate cold starting, means are provided for moving the jet tube in a direction away from the piston temporarily to increase the fuel supply. It is also desirable to provide means for opening the main throttle valve to a small extent during, and also for a short period after, starting; thus securing a faster idling speed than normal. Therefore, the means for moving the jet tube have been coupled to the throttle lever so that moving the jet tube to increase the fuel supply also increases the throttle opening to a small extent. This simple arrangement has the disadvantage that it causes an over-rich mixture when the engine is fast idling after being started up. To overcome this, means have been provided whereby the throttle is opened to a slight extent beyond normal idling position before the jet tube is moved to increase the fuel supply, and the present invention has for its object to provide simple and improved means for this purpose.

In a carburetor of the type referred to and according to the invention, the means for moving the jet tube comprises a spring-loaded actuating lever fulcrumed on the jet tube and connected by a link to a throttle-operating lever, and said actuating lever has a lost motion connection with a second fulcrum, which is fixed, and it is adapted to be engaged, at times, with a fixed supporting abutment. The arrangement is such that movement of the actuating lever in one direction takes place first about its fulcrum with the jet tube, to effect partial opening of the throttle without moving the jet tube, and then about the second fulcrum to move the jet tube and the throttle-operating lever simultaneously, so as to increase the fuel supply and throttle opening and engage the actuating lever with the supporting abutment, whilst subsequent movement of the actuating lever in the opposite direction takes place first about the second fulcrum so as to move the jet tube and throttle operating lever simultaneously, to reduce the throttle opening and fuel supply proportionately until the jet tube is restored to normal position and the actuating lever is disengaged from the supporting abutment, and then about the fulcrum on the jet tube so as to move the throttle to its normal or slow idling position.

2

Thus after starting up the engine, the throttle opening and fuel supply can be reduced proportionately until the jet tube is in its normal position and the throttle is still partially open to give fast idling without an unduly rich mixture. When the engine has warmed up sufficiently under these conditions, further movement of the said actuating lever, about the fulcrum on the jet tube and permitted by the lost motion connection of the actuating lever with the second fulcrum, returns the throttle to its normal position to give ordinary running conditions.

The invention will now be more fully described with reference to the embodiment shown, by way of example, in the accompanying drawings, in which:

Fig. 1 is an elevation of the carburetor with the jet tube and throttle controls in their normal running positions.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is a fragmentary view, similar to Fig. 1, but showing the controls in the fast idling position.

Fig. 4 is a similar fragmentary view showing the controls in the starting position.

Fig. 5 is a vertical section through the carburetor to show the parts within.

Referring to the drawings and at first more especially to Figure 5, the carburetor is of the kind in which a piston **25** works in a cylinder **1**. The lower side of the piston is exposed to atmospheric pressure through a vent **26** and at its upper side is in communication with a mixing chamber **27** through a passage **27x**, into which chamber the jet **28** opens. The throttle valve **29** is actuated by a throttle lever **5**, see Figure 2. Attached to the under side of the piston **25** is a plunger **30** which controls the entry of air to the mixing chamber **27**. Depending from the plunger **30** is a tapered needle valve **31** which is entered into the upper end of a jet tube **2** to which fuel is supplied from a float chamber **4**.

Any tendency for the suction in the mixing chamber **27** to rise produces a corresponding increase of suction above the piston **25** which

causes it to lift and raise the plunger 30 allowing an increased air flow into the mixing chamber 27. Thus the suction in the mixing chamber tends to remain constant at all times. Lifting of the plunger also lifts the needle valve 31 to increase the fuel supply.

To facilitate starting from cold the jet tube 2 is arranged to slide in a bore of the carburetor casing. By lowering the tube 2 an increased fuel supply is obtained from the float chamber 4.

The parts so far described are common practice in carburetors of the constant suction type.

The means provided for moving down the jet tube 2 comprises a two-armed lever 8 one arm of which extends downwardly and the other substantially horizontally to the left, as seen in Figs. 1, 3 and 4. The lever 8 is operated by a Bowden cable 9 secured to the depending arm of said lever and connected to a mixture control knob on the instrument board of the vehicle, the sheath of the cable 9 being clamped in a downwardly extending arm 10 of a two-part bracket 11 which is fixed to the carburetor body 3. The horizontal arm of the lever 8 is pivoted at 12 to the lower end of the jet tube 2, whilst, at the junction of its two arms, said lever is formed with a short arcuate slot 13 concentric with the pivot 12 and engaged with a pivot stud 14 fixed in the bracket 11. The jet tube 2 is normally maintained up, against the abutment, by a tension coil spring 16 connecting the horizontal arm of the lever 8 to a lug 17 on the carburetor body, the upper end of the slot 13 then being engaged with the stud 14. Extending upwardly from the junction of the arms of the lever 8 is a hook 18 the nose of which is presented to the left and normally lies close to the right-hand side of the stud 19 fixed in the bracket 11. Connected to a short lever 20, which is adapted to cooperate with an adjustable abutment screw 21 on the throttle lever 7 so as to operate the latter, is a downwardly extending link 22 which is pivoted at its lower end to a short spindle 23 mounted to turn in a boss 24 on the lever 8 at a short distance to the right of the slot 13.

The effect of moving the downward arm of the lever 8 to the right, by means of the cable 9, is at first to turn said lever about the pivot 12 until the lower end of the slot 13 engages the fixed pivot stud 14. This movement has no effect on the jet tube 2 but it opens the throttle to a small extent, by pressing up the link 22, and it also brings the nose of the hook 18 above the level of the fixed stud 19, as shown in Fig. 3. Further movement of the lever 8 in the same direction takes place about the pivot stud 14, so that the jet tube 2 is drawn down, against the action of the spring 16, to increase the fuel supply through the jet and at the same time increase the throttle opening, the hook 18 during this movement becoming engaged over the stud 19 to hold up the lever 8 with the lower end of the slot 13 up against the stud 14. This movement is terminated when the boss 24 comes up against the right-hand side of the bracket 11, the parts then being in the positions shown in Fig. 4.

During the first part of the release of the downward arm of the lever 8, the latter turns about the pivot 14 under the return action of the spring 16, because the lever 8 has its hook 18 still engaged with the stud 19. The effect, therefore, is to reduce the throttle opening and to raise the jet tube 2 to reduce the fuel supply proportionately. When the lever 8 has been released from the position indicated by the centre line A to that indicated by the centre line B in Fig. 1, that is to say from the position shown in Fig. 4 to that shown in Fig. 3, the jet tube 2 has been raised to its normal running position but the throttle is still partially open to allow fast idling without an unduly rich mixture, and the hook 18 is disengaged from the stud 19 so that further release of the lever 8 allows it to turn about the pivot 12, under the action of the spring 16, allowing the throttle to close to the normal or minimum idling position determined by the adustable abutment screw 6 coming into engagement with a fixed abutment on the carburetor body 3.

If desired the lower end of the link 22 may be pivoted to the lever 8 at a position beneath the slot 13. This leaves the initial opening of the throttle the same as above described, but it delays the further opening of the throttle valve.

Whereas the invention has been described with reference to a carburetor with a vertically disposed cylinder and piston or plunger, it may equally well be applied to carburetors in which these parts are inclined to the vertical, or even horizontal.

Having fully described our invention, what we claim and desire to secure by Letters Patent is:

1. In a carburetor of the constant suction type having a movable jet tube and a throttle operating lever, jet tube operating means comprising a spring loaded actuating lever fulcrumed on the jet tube, a link connected to the actuating lever and engaging the throttle operating lever, a second fulcrum which is fixed, a lost-motion connection between said actuating lever and said second fulcrum, a fixed supporting abutment, and means on said actuating lever adapted to engage said supporting abutment during a portion of the movement of said actuating lever, whereby movement of the actuating lever in one direction takes place first about its fulcrum on the jet tube to effect partial opening of the throttle without moving the jet tube, and then about the second fulcrum to move the jet tube and the throttle operating lever simultaneously to increase the fuel supply and throttle opening proportionately and engage said means on the actuating lever with the supporting abutment, and subsequent movement of the actuating lever in the opposite direction takes place first about the second fulcrum so as to move the jet tube and throttle operating lever simultaneously to reduce the throttle opening and fuel supply proportionately until the jet tube is restored to normal position and said means on the actuating lever is disengaged from the supporting abutment, and then about the fulcrum on the jet tube so as to move the throttle to its normal slow idling position.

2. In a carburetor of the constant suction type having a movable jet tube and a throttle operating lever, jet tube operating means comprising a spring loaded actuating lever fulcrumed on the jet tube, a link connected to the actuating lever and engaging the throttle operating lever, a fixed pivot stud constituting a second fulcrum for said actuating lever, a slot in said actuating lever engaged with said fixed pivot stud to afford a lost-motion connection, a fixed supporting abutment, and means on said actuating lever adapted to engage said supporting abutment during a portion of the movement of said actuating lever, whereby movement of the actuating lever in one direction takes place first about its fulcrum on the

jet tube to effect partial opening of the throttle without moving the jet tube, and then about the second fulcrum to move the jet tube and the throttle operating lever simultaneously to increase the fuel supply and throttle opening proportionately and engage said means on the actuating lever with the supporting abutment, and subsequent movement of the actuating lever in the opposite direction takes place first about the second fulcrum so as to move the jet tube and throttle operating lever simultaneously to reduce the throttle opening and fuel supply proportionately until the jet tube is restored to normal position and said means on the actuating lever is disengaged from the supporting abutment, and then about the fulcrum on the jet tube so as to move the throttle to its normal slow idling position.

3. In a carburetor of the constant suction type having a movable jet tube and a throttle operating lever, jet tube operating means comprising a spring loaded actuating lever fulcrumed on the jet tube, a link connected to the actuating lever and engaging the throttle operating lever, a fixed pivot stud constituting a second fulcrum for said actuating lever, a slot in said actuating lever engaged with said fixed pivot stud to afford a lost-motion connection, a fixed supporting abutment in the form of a fixed stud, a hook portion on said actuating lever adapted to engage said supporting abutment during a portion of the movement of said actuating lever, whereby movement of the actuating lever in one direction takes

place first about its fulcrum on the jet tube to effect partial opening of the throttle without moving the jet tube, and then about the second fulcrum to move the jet tube and the throttle operating lever simultaneously so as to increase the fuel supply and throttle opening proportionately and engage said means on the actuating lever with the supporting abutment, and subsequent movement of the actuating lever in the opposite direction takes place first about the second fulcrum so as to move the jet tube and throttle operating lever simultaneously to reduce the throttle opening and fuel supply proportionately until the jet tube is restored to normal position and said means on the actuating lever is disengaged from the supporting abutment, and then about the fulcrum on the jet tube so as to move the throttle to its normal or slow idling position.

ERIC G. BAREHAM.
WILLIAM LAYLAND.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
873,392	Stoker	Dec. 10, 1907
1,258,881	Donning	Mar. 12, 1918
1,307,704	Sather	June 24, 1919
1,967,708	Ericson	July 24, 1934
2,261,992	Goldi	Nov. 11, 1941
2,432,980	Abell	Dec. 23, 1947
2,464,328	Mallory	Mar. 15, 1949