H. G. RENNER.

CARBURETOR.

APPLICATION FILED FEB. 4, 1919.

1,429,534. Patented Sept. 19, 1922.

Fig. 1.

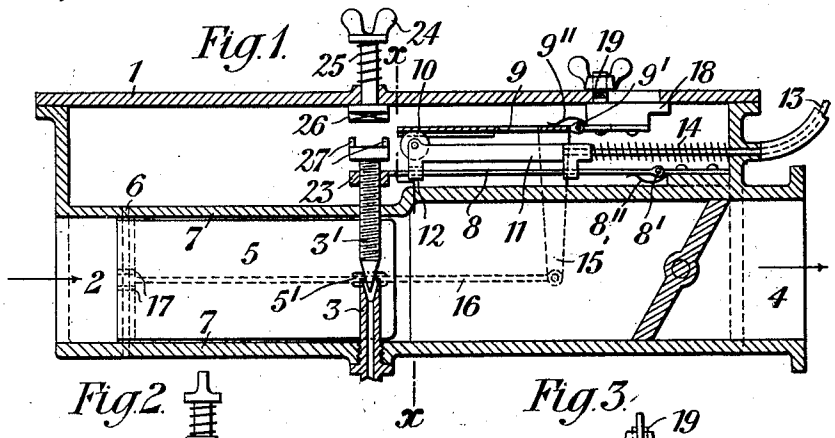


Fig. 2.

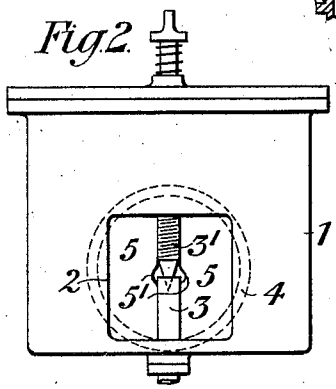


Fig. 3.

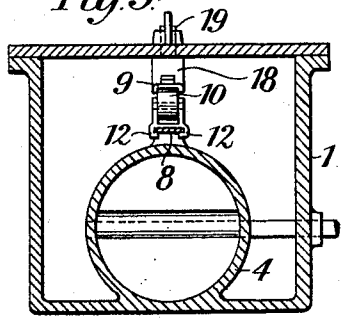
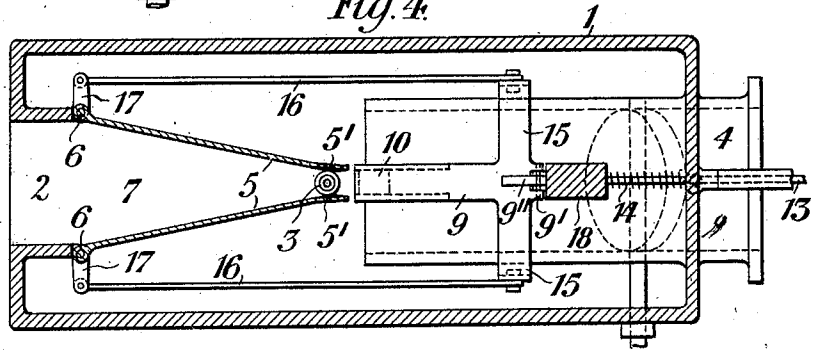


Fig. 4.



Inventor

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his Attorney

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UNITED STATES PATENT OFFICE.

HAROLD GEORGE RENNER, OF GISBORNE, NEW ZEALAND.

CARBURETOR.

Application filed February 4, 1919. Serial No. 274,889.

To all whom it may concern:

Be it known that I, HAROLD GEORGE RENNER, a subject of His Majesty the King of Great Britain, residing at Rutene Road, Gisborne, New Zealand, have invented certain new and useful Improvements in Carburetors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved carburetor, which while automatically keeping the proportions of the mixture constant at all speeds, permits these proportions to be varied at will while the carburetor is in operation.

According to my invention, I employ a choke tube of peculiar construction comprising pivoted walls whose free ends are caused by spring action to converge and close upon the jet tube, and I provide means whereby the oscillation of these walls, due to air pressure caused by engine suction, will operate a needle valve controlling the jet orifice the petrol supply being thereby automatically increased and diminished in direct proportion to the air supply.

In order to permit the proportions of the mixture to be varied while the carburetor is running, I provide means whereby the range of movement or lift imparted to the needle valve for a given range of movement of the pivoted choke tube walls, may be varied at will.

In the annexed drawings in which similar numerals refer to corresponding parts in all the figures:—

Fig. 1 is a vertical longitudinal sectional view of a carburetor in accordance with my invention.

Fig. 2 is an end elevational view looking from the left in Fig. 1.

Fig. 3 is a cross section on line x—x Fig. 1.

Fig. 4 is a horizontal sectional view of the carburetor.

Fig. 5 is a detail view of the modified form of the links 16, hereinafter referred to.

1 is a suitable casing, 2 the choke tube, 3 the jet tube and 4 the induction pipe to engine. The choke tube is constituted by two spaced walls 5 pivoted at 6 and movable between two flat surfaces or walls 7 of the casing. The free ends of the walls 5 are caused to converge and close upon the jet tube 3 and its needle valve 3′ by spring action. The said valve is carried by the free end of an arm 8, called the needle valve arm, which is pivoted at 8′ and which by the action of the spring 8″ tends constantly to lift the valve, and to prevent lost motion thereof, as illustrated in Figure 1. This lifting tendency is however resisted by a second arm 9, called the control arm, which is pivoted at 9′, and which by the action of the spring 9″ bears on an adjustable member located between the arms and consisting of a roller 10 carried by a member 11 slidably connected with the needle valve arm 8 by the clips or slides 12. The said member 11 is adjustable longitudinally of the arms 8 and 9 from outside the casing 1 by a Bowden wire 13, and is returned by the spring 14.

Arms 15 extend laterally from the control arm 9, and have arms 15′ extending downwardly therefrom, which have their ends pivotally connected by light rods 16 with the arms 17 extending from the pivoted ends of the walls of the choke tube, so that when the converging ends of these walls are moved apart, owing to the air pressure thereon caused by engine suction, the control arm 9 is thereby swung away from the roller 10 of the distance piece, and the needle valve arm 8 by its spring action follows this movement, raising the needle valve. The petrol supply is thus automatically increased and diminished in direct proportion to the air supply. The spring of the control arm must be the master spring.

Regulation of the proportions of the mixture while the carburetor is working is effected by longitudinally adjusting the point of contact between the control arm 9 and roller 10. Since the pivots 8′, 9′ of the arms 8, 9, are not both in a plane perpendicular to the arms when in their normal parallel position, it follows that when these arms are caused to swing on their pivots from the normal position by the movement of the walls 5, they will no longer be in parallelism, but will converge slightly, consequently on shifting the distance roller 10 longitudinally of the arms by the Bowden

wire 13, the range of upward movement of the needle valve arm 8 will be varied, movement of said roller to the right, for example, reducing the lift of the arm 8 and needle valve 3′, for a given lift of the arm 9.

Small grooves or passageways 5′ may be provided in the pivoted choke tube walls where they close upon the jet to pass air for running when the needle valve is in idling position. The flaps 5 would then be closed on the jet tube and needle valve, and there would be no automatic movement of the control arm 9.

The needle valve 3′ screws up and down within a collar 23 on the needle valve arm 8, and may be adjusted therein from outside the casting by the key 24 which may be pressed down against the spring 25 to cause a rib 26 on the end of the key to engage between upwardly extending projections 27 on the head of the needle valve.

In operation the parts of the invention function in the following manner: Assuming that an engine being supplied with fuel from the present carburetor and that the same is running at a low speed; the velocity of the air passing through the chamber will be low, due to the partly closed position of the butterfly valve. The position of the walls 5 under such a condition will be partly opened or separated and the needle valve 3′ held in a slightly raised position. To automatically and simultaneously increase or reduce the velocity of the air and incoming flow of fuel, the butterfly valve may be operated to provide a greater or less opening to the engine. The result of such an operation, if the valve is opened, will be to cause the walls 5 to separate to a greater extent with a consequent increase in the volume of air permitted to pass through the chamber. Simultaneously with the movement of the walls 5 there will be a lifting movement of the needle valve 3′ through the operation of the links 16 and arms 15 to raise the arms 8 and 9. The proportion of air and fuel is controlled by movement of the Bowden wire 13 to change the relative position of the roller 10 with respect to the arms 8 and 9.

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

1. In a carburetor of the character described, a casing having a choke tube therein comprising a pair of suction operated walls, a jet tube projecting into the choke tube and on which said walls are adapted to converge, a needle valve controlling the outlet of said jet tube, suction operated flaps in the choke tube adapted to converge, means for communicating the movements of said walls to the needle valve, said means including a pivoted control arm mechanically connected to the walls, a needle valve arm carrying the needle valve and arranged substantially parallel to the control arm, an adjustable member movable between said arms, and yieldable means acting on the needle valve arm to prevent lost motion thereof.

2. In a carburetor of the character described, a casing having a choke tube therein comprising a pair of suction operated walls, a jet tube projecting into the choke tube, a needle valve controlling the outlet of said jet tube, said walls being adapted to converge on said jet tube and having grooves or passages in the portions thereof which converge on the jet tube, means for communicating the movements of said walls to the needle valve, said means including a pivoted control arm mechanically connected to the walls, a needle valve arm carrying the needle valve and arranged substantially parallel to the control arm, means for setting the control arm at any desired angle to the needle valve arm, and yieldable means acting on the needle valve arm to prevent lost motion thereof.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

HAROLD GEORGE RENNER.

Witnesses:

A. E. ALEXANDER,

C. W. ROWEDDER.