Aug. 13, 1946. D. J. ENRIGHT 2,405,563

CARBURETOR

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Fig. 1.

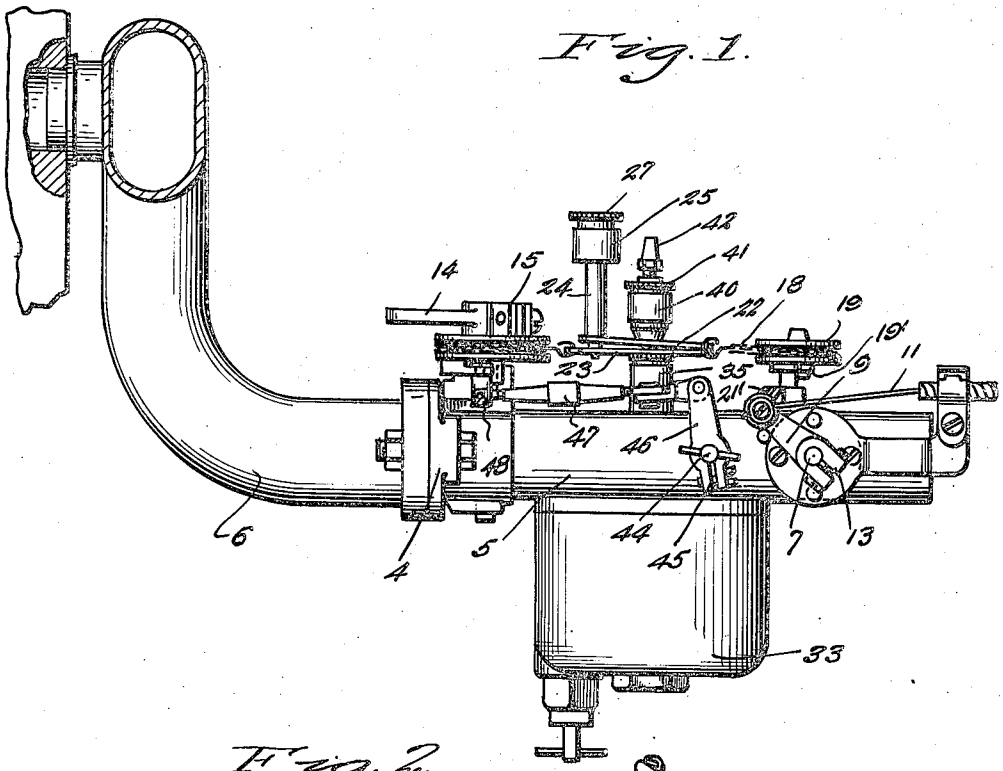


Fig. 2.

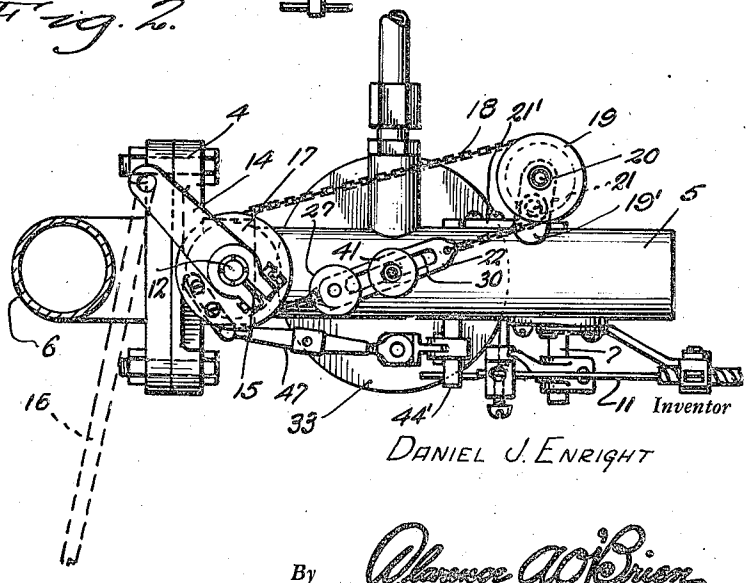
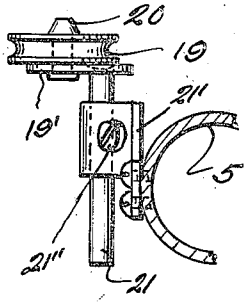


Fig. 3.



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Fig. 3.

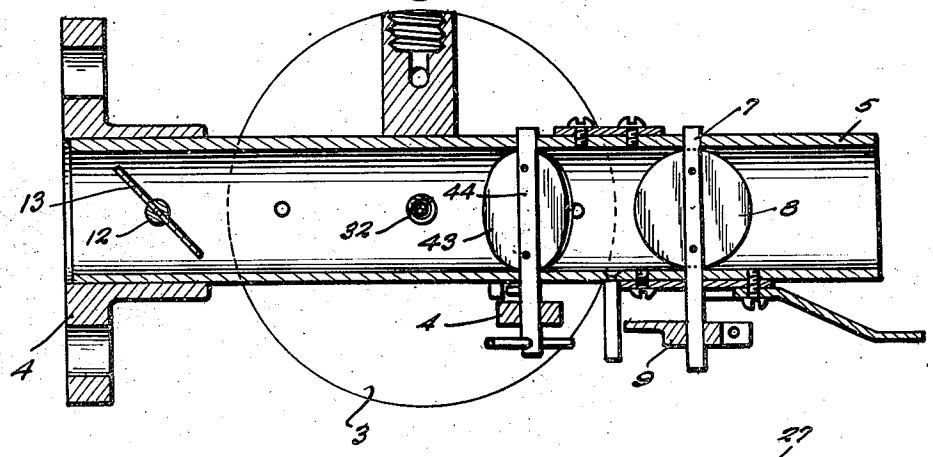


Fig. 4.

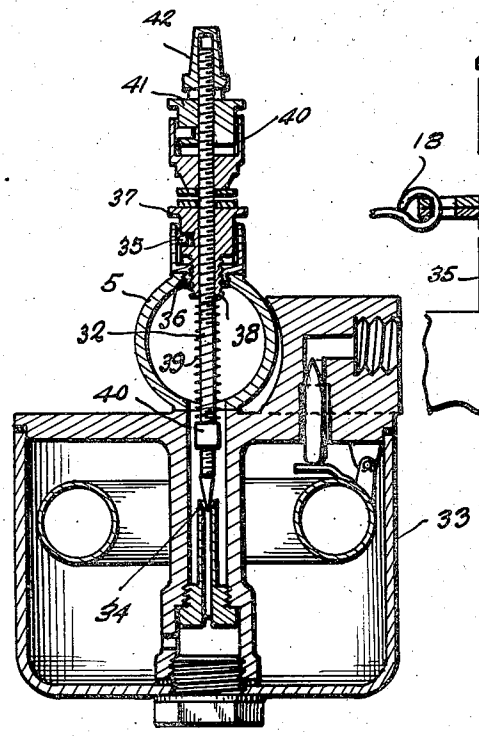


Fig. 5.

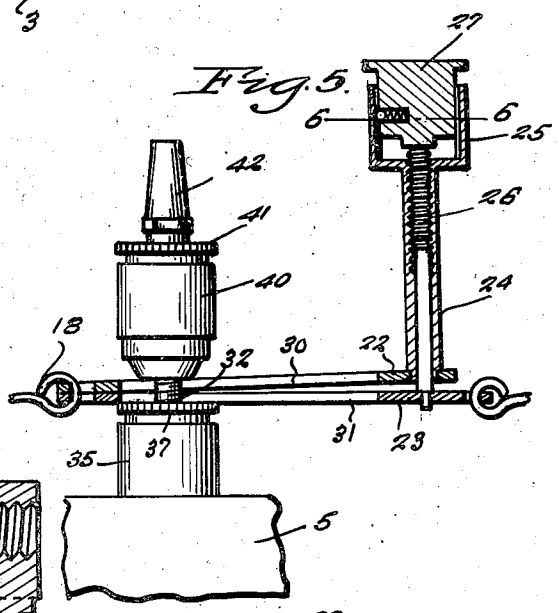
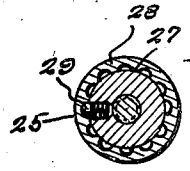


Fig. 6.



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CARBURETOR

Daniel J. Enright, Rochester, N. Y.

Application January 5, 1944, Serial No. 517,081

1 Claim. (Cl. 261—49)

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The present invention relates to new and useful improvements in carburetors and has for its primary object to provide unitary control means for the needle valve of the float chamber and the butterfly throttle valve and butterfly air intake valve to insure a proper and uniform mixture of air and fuel fed to the intake manifold of the engine.

A further important object of the invention is to eliminate the necessity of the usual Venturi in a carburetor and to provide a mechanism for furnishing a proper mixture of fuel and air through an unrestricted air tube of uniform diameter.

Another object is to provide novel means for actuating the needle valve of the carburetor and for adjusting the needle valve independently of the butterfly valve.

A still further object is to provide a carburetor of simple and practical construction which is efficient and reliable in performance, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view.

Figure 2 is a top plan view.

Figure 3 is a longitudinal sectional view through the air tube.

Figure 4 is a vertical sectional view through the needle valve and float chamber.

Figure 5 is a detail in section of the sliding cam for actuating the needle valve.

Figure 6 is a sectional view taken on a line 6—6 of Figure 5.

Figure 7 is a detail of the adjustable pulley, with parts in section.

Referring now to the drawings in detail, the numeral 5 designates an air tube which is open at one end for admitting fresh air and is provided at its other end with an attaching flange 4 for attaching to a manifold 6 of an internal combustion engine.

Near the open end of the tube is a transverse shaft 7 to which is secured a butterfly choke valve 8, one end of the shaft having a lever 9 attached thereto by a split end 10. To the other end of the lever is attached a choke wire 11 adapted for manual actuation in the usual manner.

Near the other end of the tube 5 is a transverse shaft 12 to which is secured a butterfly valve 13, the shafts 7 and 12 being positioned at right angles to each other and to one end of the shaft 12 is also secured a throttle lever 14 by a split end 15. To the other end of the lever 14 is attached a throttle control rod 16.

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A pulley wheel 17 is fixed to the shaft 12 for rotation therewith and on the pulley is trained a chain or other flexible member 18, the chain also being trained over an idler pulley 19 journaled on a pin 20 at one end of an elongated plate 19', the plate being supported adjacent its other end on a vertical rod 21 which is slidably and rotatably mounted in a bracket 21' and secured in adjusted position by a set screw 21''. The bracket 21' is secured to the side of the tube 5. One end of the chain 18 is attached to one end of a pair of elongated superposed cam plates 22 and 23, while the other end of the chain is attached to the other end of the lowermost plate 23. To the remaining end of the upper plate 22 is secured a tube 24 which is internally threaded at its upper portion and has a cup 25 on its upper end. An adjusting screw 26 is threaded in the tube 24 with its lower end journaled in the plate 23 and upset to secure the screw to said last-named plate. The pulley 19 is eccentric with respect to the axis of the pin 21 in order that the pulley 19 may be adjusted laterally and vertically to properly align the pulleys in accordance with the adjustments made in the cam plates and thus reduce friction of the chain on the pulleys.

The upper end of the screw is formed with a cylindrical head 27 freely rotatable in the cup 25 and the inner walls of the cup are vertically corrugated as indicated at 28 in the valleys of which is seated a spring projected ball 29 recessed in the side of the head 27 to prevent idle rotation of the head and to secure the screw 26 in its adjusted position in the tube 24.

Accordingly, one end of the upper cam plate 22 may be raised or lowered by the manipulating of the screw 26.

The plates 22 and 23 are formed with registering longitudinal slots 30 and 31, respectively, through which is freely received the upper end of a needle valve 32 which extends vertically through a port 32' in the bottom of the tube 5 and into the float chamber 33 of conventional construction for engaging the valve seat 34 therein.

A cup 35 is formed with a hollow internally and externally threaded stem 36 which is threaded into the top of the tube 5 and within the cup is a hollow cylindrical adjusting plug 37 having an

externally threaded stem 38 threaded into the stem 36. The needle valve 32 is freely received in the plug 37 and stem 38 and a coil spring 39 is mounted on the lower portion of the needle valve between the stem 38 and a collar 40 threaded on the lower end of the valve, the adjustment of the plug 37 in the cup 35 regulating the tension of the spring 39.

The cup 35 is also internally vertically corrugated and the plug 37 is provided with a spring projected ball similar to the cup 35 and head 27 to secure the plug 37 in adjusted position.

The upper portion of the needle valve 32 is threaded for engagement by a cup 40 having its lower end overlying and bridging the slots 30 and 31 for sliding engagement by the upper cam plate 22 whereby to raise the needle valve upon movement of the plates in one direction, the spring 39 closing the valve.

A cylindrical plug 41 is threaded on the needle valve 32 into the cup 40 and is also provided with a spring projected ball for engaging the internal vertical corrugations of the cup 40 similar to the cup 25 and head 27 to secure the cup 40 in adjusted position. A locking cap 42 is threaded on the upper end of the needle valve.

Between the needle valve 32 and the choke valve 8 is a butterfly valve 43 secured on a shaft 44 journaled in the tube 5 parallel to the shaft 7 and forming an air control valve. To the outer end of the shaft 44 is secured the split end 45 of a lever 46 and to the other end thereof is pivotally attached a turnbuckle 47 connecting the lever 46 to the pulley wheel 17 by means of an eccentrically disposed pivot pin 48.

Accordingly as the throttle lever 14 is actuated by the throttle rod 16, the air valve 43, needle valve 32 and throttle valve 13 will be simultaneously opened and closed to uniformly supply a predetermined mixture of fuel and air to the intake manifold of the engine.

It is believed that the details of construction and manner of use of the device will be readily understood from the foregoing without further detailed explanation.

Having described the invention, what is claimed as new is:

A carburetor comprising an air intake tube adapted for attaching to the intake manifold of an engine, a float chamber carried by the tube and having communication therewith, a needle valve slidably mounted transversely of the tube and controlling the feeding of fuel from the float chamber into the tube, a throttle valve in the tube inwardly of the needle valve, an air control valve in the tube outwardly of the needle valve, a link connecting the throttle and air valves for simultaneous opening and closing movement, a pulley secured to the shaft of the throttle valve, an idle pulley journaled on the tube, an endless flexible member trained on said pulleys and including an elongated cam therein having a longitudinal slot receiving the needle valve, vertically spaced members adjustably carried by the needle valve and positioned respectively above and below the cam and in engagement therewith, one of said members being operable to vertically adjust the needle valve, and said cam being operable to open the needle valve, spring means for closing the needle valve, and means for adjusting the idle pulley in accordance with the adjustment of said members to center the flexible member between the flanges of the idle pulley and to take up slack in the flexible member.

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