

Sept. 17, 1935.

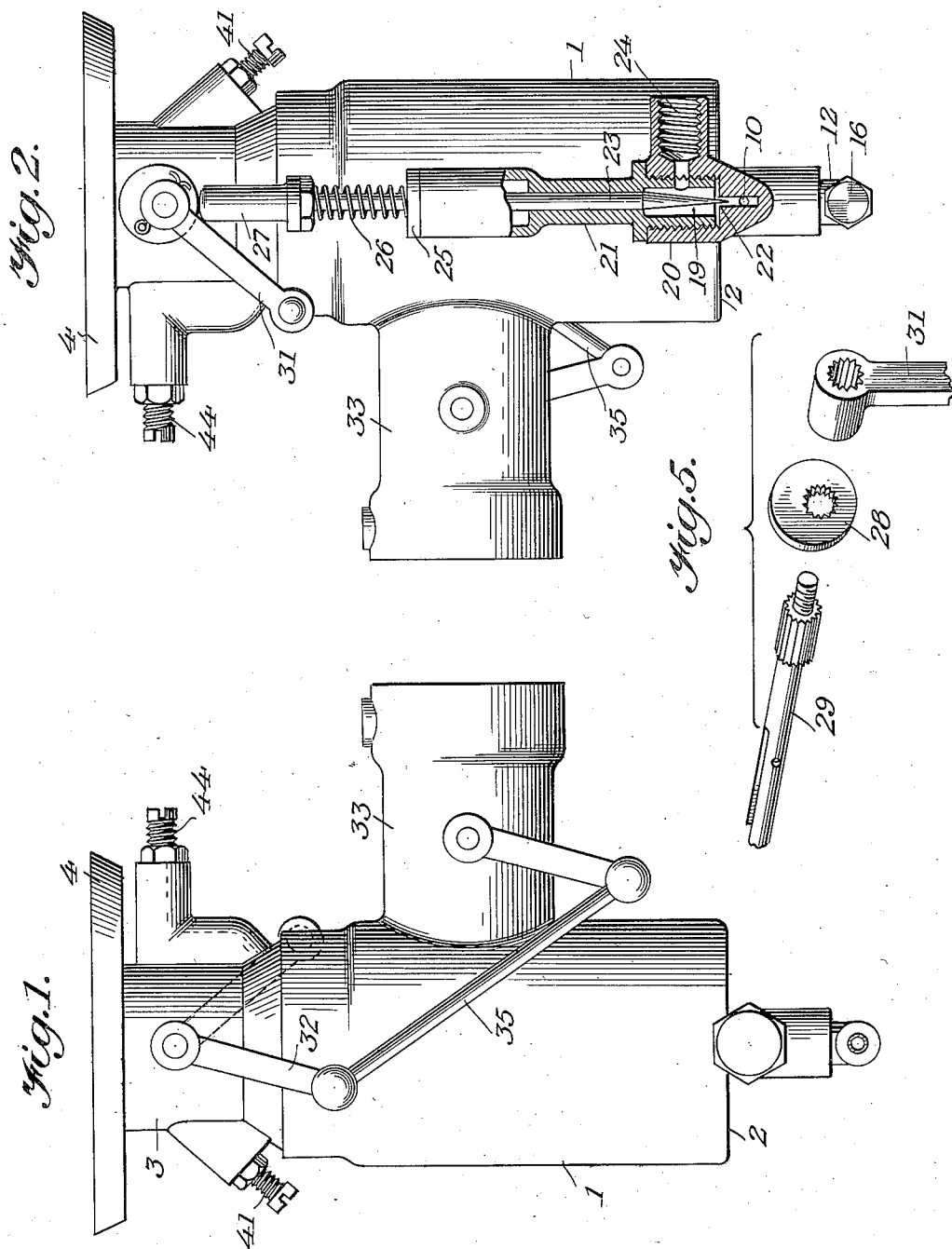
E. H. RUSTIN.

2,014,986

CARBURETOR

Filed May 9, 1934

2 Sheets-Sheet 1



Eugene H. Rustin

INVENTOR

BY *Victor J. Evans & Co.*

ATTORNEYS

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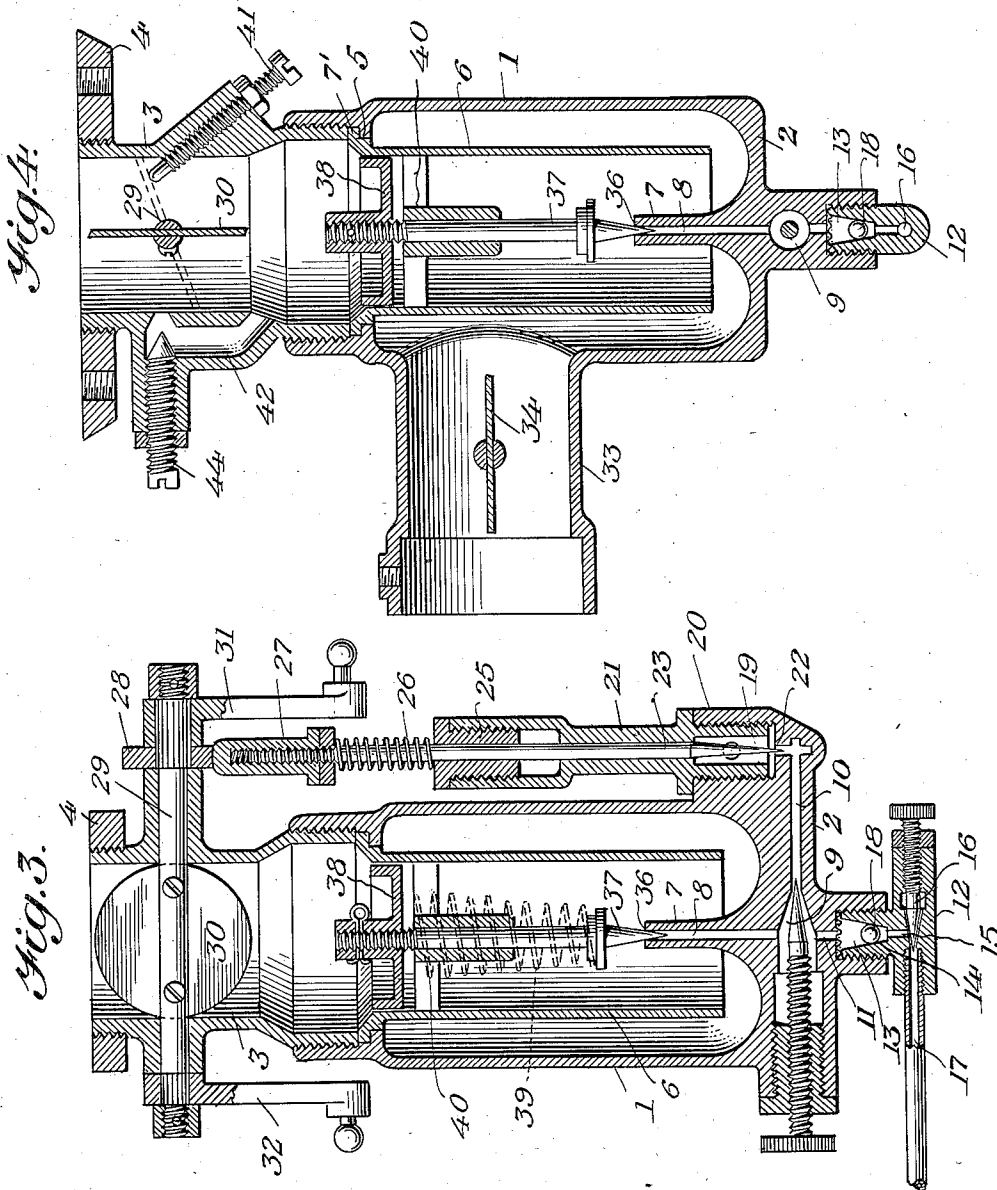
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UNITED STATES PATENT OFFICE

2,014,986

CARBURETOR

Eugene H. Rustin, Brooklyn, N. Y.

Application May 9, 1934, Serial No. 724,775

1 Claim. (Cl. 261—49)

This invention relates to carburetors and has for the primary object the provision of a device of this character which may be employed either as an up-draft type carburetor or a down-draft type carburetor and has for the primary object the provision of means for simultaneously controlling the air and liquid fuel in accordance with the increased or decreased load or speed of the engine to which the carburetor is applied.

Another object of this invention is the provision of a suction actuated means for controlling the liquid fuel to the vaporizing chamber and which eliminates the float chamber and parts thereof now employed in carburetor construction.

With these and other objects in view this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a side elevation illustrating a carburetor constructed in accordance with my invention.

Figure 2 is a similar view partly in section illustrating the opposite side of the carburetor from the side shown in Figure 1.

Figure 3 is a vertical sectional view illustrating the interior construction of the carburetor.

Figure 4 is a similar view of the carburetor showing the air intake for the mixing chamber.

Figure 5 is a disrupted perspective view showing the mounting of the cam to the shaft of the throttle valve.

Referring in detail to the drawings, the numeral 1 indicates an outer shell of substantially cylindrical shape and has one end closed by an integral wall 2 while its opposite end is open and interiorly screw threaded to have threaded connection with a throttle valve housing 3. The throttle valve housing 3 is also exteriorly screw threaded and has threaded thereto a coupling plate 4 apertured to receive stud bolts or like fasteners for detachably connecting the carburetor to an intake manifold of an engine.

An internal shoulder 5 is formed on the outer shell 1 adjacent the open end of the latter and forms a seat for a mixing sleeve 6, one end of which is flanged, as shown at 7', to engage with the flange 5 while the opposite end terminates adjacent the wall 2. Rising from the wall 2 and extending into the mixing sleeve is a nipple 7 having the bore 8 communicative with a valve chamber 9 formed in the wall 2 and which is in communication with a fuel passage 10 and an air

passage 11. The air passage 11 opens into an internally screw threaded recess in which is threaded a fitting 12 having a valve chamber 13, the valve seat 14 and air passage 15 controlled by a needle type valve 16. A hot air duct 17 communicates with the air passage 15 and is controlled by the needle valve 16. A ball valve 18 operates in the chamber 13 and is adapted to admit heated air to the chamber 9 when the carburetor is under suction from the engine. Upon discontinuance of the suction in the carburetor from the engine the ball valve 18 engages the seat 14 and prevents loss of fuel from the carburetor or the fuel passage 10. The fuel passage 10 extends into a chamber 19 formed in a boss 20 integral with the outer shell. One end of a metering pin housing 21 is threaded into the chamber 19. The fuel passage where it communicates with the chamber 19 forms a seat 22 for the pointed end of a metering pin 23 which extends exteriorly of the housing 21. A fuel supply pipe nipple 24 communicates with the chamber 19 above the seat 22 so that liquid fuel may be introduced into said chamber from any suitable supply. A bushing 25 is removably secured to the housing 21 and slidably supports the metering pin 23 and also forms a seat from one end of a coil spring 26 mounted upon the metering pin. Secured to the metering pin is a cam engaging element 27 which also has one end of the coil spring bearing thereagainst. The coil spring acts to move the metering pin away from the seat 22 and the cam engaging member 27 is adjustably secured to the metering pin whereby tension of the spring may be increased and decreased. The spring 26 retains the cam engaging member 27 in contact with a cam 28 secured to a shaft 29. The latter forms part of a throttle valve 30 and is journaled in the walls of the throttle valve housing. Arms 31 and 32 are secured to the shaft 29 and the arm 31 is adapted for connection with a conventional type of throttle control mechanism.

The outer shell 1 intermediate its ends is formed integrally with a tubular air intake housing 33 and communicates with the atmosphere and with the interior of the shell above the lower end of the mixing sleeve 6. An air control valve 34 is mounted in the air intake 33 for controlling the passage of air into the outer shell and the shaft of the valve 34 is connected to the arm 32 by linkage 35 whereby the throttle valve and the air control valve are caused to move in unison.

The end of the nipple 7 forms a seat 36 for a needle valve 37 secured to a piston-like element

38 operating in the mixing sleeve 6. The suction from the engine acts to unseat the valve 37 and when this suction is interrupted the valve closes by gravitation when the carburetor is employed as the up-draft type. However, when the carburetor is employed as a down-draft type, a spring 39 is employed on the valve 37 for seating the latter. The spring bears against a spider 40 integral with the mixing sleeve 6. The spider also forms a guide for the needle valve 37.

A seating of the throttle valve is controlled by a set bolt 41 threaded to the Venturi housing and by adjusting the set bolt 41 the seating of the throttle valve may be varied for the purpose of admitting sufficient fuel to the engine when operating at idling speed to prevent stopping or stalling of the engine when idling.

A bypass 42 is formed in the housing 3 for the purpose of admitting fuel by the throttle valve when the latter is in closed position for the purpose of supplying fuel to the engine at idling speed and the bypass is controlled by a needle valve 44 threaded to the housing 3.

In operation, the cam 28 when the throttle valve 30 is in closed position leaves the metering pin 23 slightly disengaged from the seat 22 so that a small amount of liquid fuel may pass into the mixing sleeve 6 sufficient to maintain the engine operating at idling speed. As the throttle valve is moved towards an open position the cam 28 permits the metering pin to move away from the seat 22 by the action of the spring 26 increasing the supply of liquid fuel to the mixing sleeve 6, also the air control valve 34 moves towards an open position admitting air to the interior of the outer shell which air travels downwardly to enter the lower end of the mixing sleeve and then passed by the discharge end of the nipple 7 to become mixed with the liquid fuel escaping therefrom. The air and liquid fuel becomes thoroughly mixed during its passage through the throttle valve housing and when passing from the latter into the intake manifold of the engine will be in a highly combustible state to assure maximum power with a minimum consumption of fuel.

As before stated, the suction from the engine acting upon the piston-like element 38 unseats the needle valve 37 so that the liquid fuel may readily pass through the mixing chamber 6 before mixing with the air received from the air tube 33. Heated air also enters with the liquid fuel to the mixing chamber from the air duct 17.

The carburetor of the character described will efficiently mix air and liquid fuel and will render the starting of an engine comparatively easy in cold weather and also will permit the operation of the engine with a minimum consumption of fuel with the development of maximum power.

Having described the invention, I claim:

A carburetor comprising an outer shell, an air intake neck formed on said shell intermediate the ends of the latter, a mixing sleeve removably mounted in said shell and extending beyond the air neck, a throttle valve housing removably secured to the outer shell and retaining said mixing sleeve in the outer shell, a jet carried by the outer shell and extending into one end of the mixing sleeve, said shell having a fuel passage, a metering pin housing carried by and arranged exteriorly of the outer shell and connected to the fuel passage, a metering pin slidable in said housing for controlling the fuel passage, spring means normally acting to urge the metering pin in a direction to open the fuel passage, a throttle valve carried by the throttle valve housing, a cam connected with the throttle valve for engagement with the metering pin for urging the latter in a direction to close the fuel passage, an air control valve in the air neck, linkage between the throttle valve and the air control valve, a manually actuated valve for controlling fuel through the fuel passage and located between the jet and the metering pin, means for admitting heated air to the fuel passage for mixing with fuel prior to said fuel entering the jet, a self-seating needle valve for closing the jet and operating in the sleeve, and a piston-like member secured to said needle valve for unseating the latter by the suction in the sleeve.

EUGENE H. RUSTIN.