Dec. 22, 1925 1,566,382

A. DION

CARBURETOR

Filed April 25, 1924 2 Sheets-Sheet 1

FIG. 1.

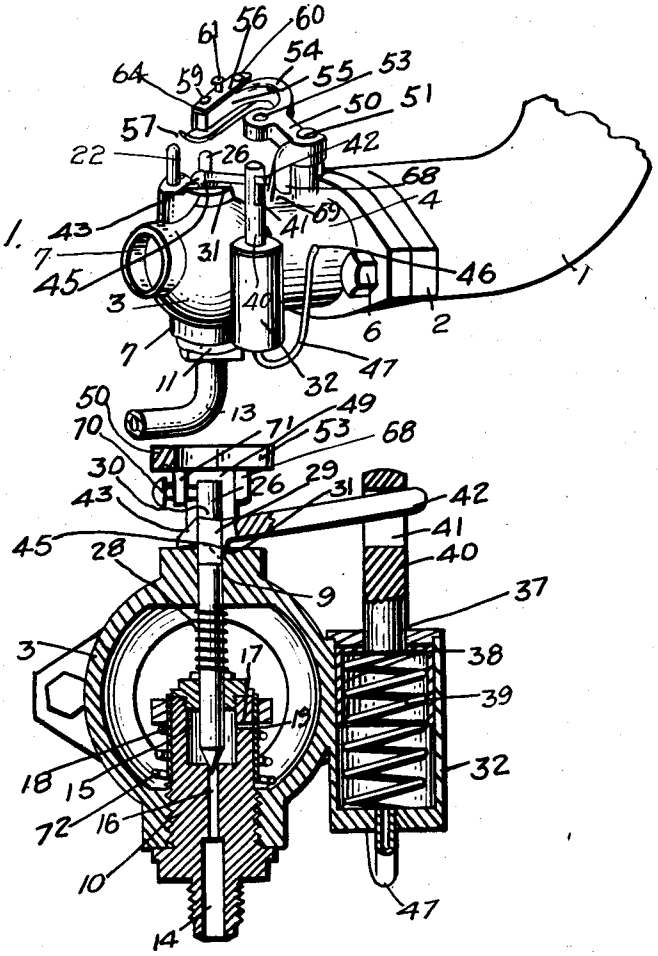



FIG. 3.

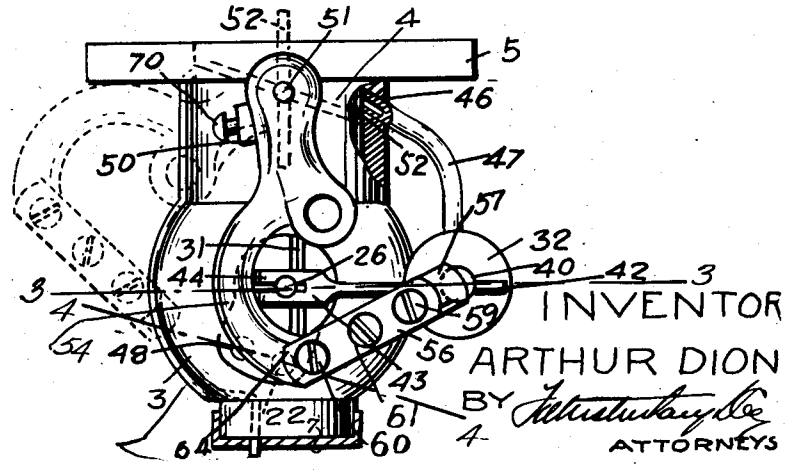



FIG. 2.

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Filed April 25, 1924 2 Sheets-Sheet 2

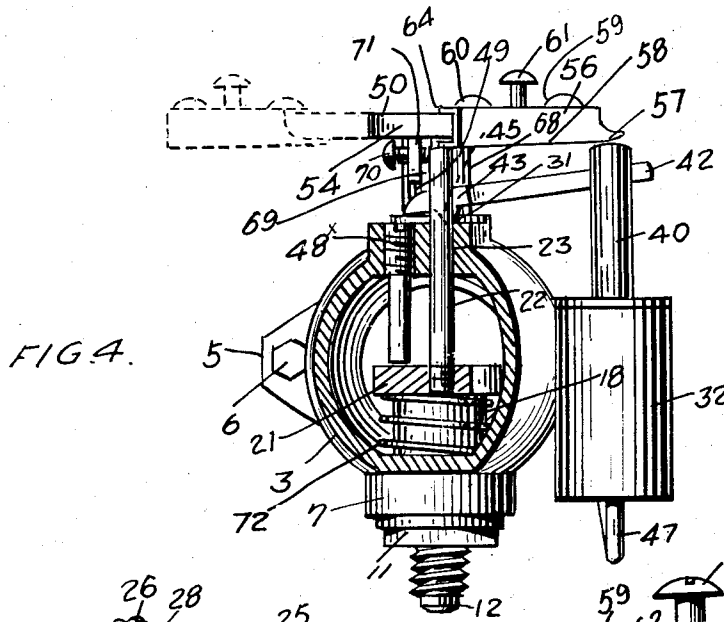



FIG. 4.

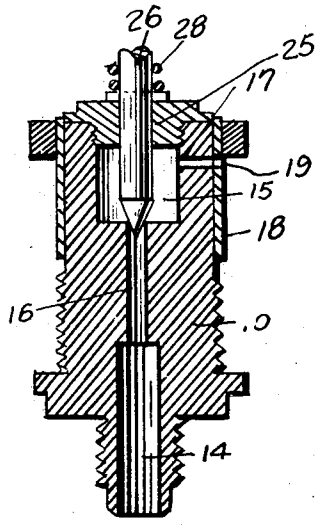



FIG. 5.

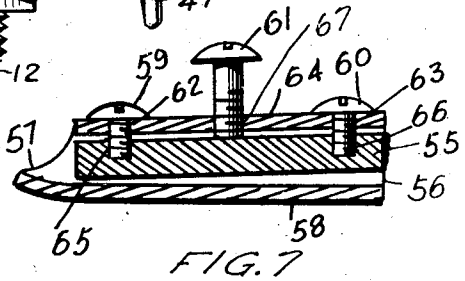



FIG. 7

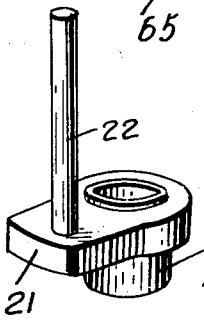



FIG. 6.

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Patented Dec. 22, 1925. 1,566,382

# UNITED STATES PATENT OFFICE.

ARTHUR DION, OF LEASIDE, ONTARIO, CANADA.

## CARBURETOR.

Application filed April 25, 1924. Serial No. 709,014.

*To all whom it may concern:*

Be it known that I, ARTHUR DION, a subject of the King of Great Britain, and a resident of the village of Leaside, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Carburetors, of which the following is the specification.

My invention relates to improvements in carburetors, and the object of the invention is to devise a carburetor in which the consumption of fuel will be greatly economized, in which the priming of the carburetor will be unnecessary, in which the detrimental results of back fire will be obviated, in which the feed of fuel from the carburetor to the engine will be automatically effected by the operation of the engine, in which there will be no fuel leakage, and in which the fuel supply may be positively controlled so as to produce the highest efficiency, and it consists essentially of the arrangement and construction of parts hereafter more particularly explained.

Fig. 1 is a perspective view of my carburetor attached to an inlet manifold.

Fig. 2 is a plan view of my carburetor showing the control lever in the low speed position, and in the high speed position in dotted lines.

Fig. 3 is a sectional view on line 3—3 Figure 2.

Fig. 4 is a sectional view on line 4—4 Figure 2.

Fig. 5 is an enlarged sectional view of my fuel inlet valve.

Fig. 6 is a perspective detail of my fuel feed control valve.

Fig. 7 is a sectional detail of the controlling cam carried by the control lever for coacting with the control valve.

In the drawings like characters of reference indicate corresponding parts in each figure.

1 indicates the neck of an inlet manifold to which my carburetor is attached.

3 is the body of my carburetor provided with a tubular neck 4 extending outward therefrom, and attached to the end of the manifold neck 1.

7 is an air inlet, the air passing through such inlet, through the body of the carburetor, and neck 4 to the manifold.

52 is a throttle valve for controlling the flow of air through the neck 4.

51 is a shaft upon which the throttle valve 52 is secured, and to which is also secured the throttle lever 50.

9 is an orifice formed in the top of the body 3.

10 is a plug extending up through the lower portion of the body 3, and through which extends the fuel inlet 14 having a reduced portion 16 leading into a fuel chamber 15 as clearly indicated, referring particularly to Figure 3.

26 is a needle valve for controlling the flow of fuel from the portion 16 of the inlet 14 to the fuel chamber 15. The valve 26 is held in its closed position by the spring 28 and is operated by mechanism actuated by piston suction of the engine, which mechanism I will now describe.

32 is a cylinder formed integral with the carburetor body and having closed ends.

47 is a tube secured at one end in the orifice 46 and extending at its opposite end through the lower end of the cylinder 32. The effect of the suction of the engine extends into the neck 4 through the tube 47 into the cylinder 32.

38 is an upwardly spring pressed piston slidable within the cylinder 32. When the suction of the engine piston takes place, such suction taking effect in the cylinder 32 as above described, draws down the piston 38.

40 is a stem extending upward from the piston 38 through the upper end of the cylinder 32, the upper end of the stem being provided with a slot 41.

42 is a lever provided with a forked inner end 43.

The needle valve 26 is reduced to form shoulders 30 with which the forked end of the lever 42 engages, such shoulders bearing downward upon the upper edges of the members forming the fork.

31 are V-shaped grooves formed in the carburetor body at each side of the orifice 9 and into which extend V-shaped projections 45 forming the fulcrum point upon which the lever swings. The outer end of the lever 42 passes through the slotted opening 41 so that when the piston 38 is drawn down by the engine suction the outer end of the lever 42 is also drawn downward and the forked end of such lever swings slightly upward so as to raise the needle valve 26 slightly off its seat formed by the upper end of the

inlet portion 16, thereby permitting the fuel to flow from the inlet into the fuel chamber 15.

I will now describe the means by which the flow of fuel from the fuel chamber into the body of the carburetor is controlled.

17 is a small orifice extending through the wall of the fuel chamber 15.

18 is a sleeve valve provided with a perforation 19 which is adapted to be carried into and out of the registering position with the orifice 17 by the vertical movement of the sleeve 18 upon the plug 10.

21 is a radial extension or lug carried by the sleeve 18 from which projects upwardly a pin 22. The pin 22 extends through an orifice 23.

48 is a screw pin which is screwed into an orifice 48× in the carburetor body, the lower end of the pin extending down into proximity to the lug 21.

72 is a spiral spring which extends around the plug 10 between the bottom of the carburetor body and the extension 21 tending to force the sleeve 18 upward and the extension into contact with the lower end of the pin 48. When in this position the perforation 19 is in align with the orifice 17 permitting the flow of fuel therethrough, such fuel being drawn outward by the engine suction into the body of the carburetor to mix with the air and pass therewith past the throttle valve 52 into the inlet manifold when such throttle is in the fully open position. In order to control the amount of fuel so fed in proportion to the extent to which the throttle valve is opened or closed.

I provide the throttle lever 50 with an extension 54 having a straight portion 55 extending when the throttle lever 50 is in the slow speed position to the right hand side of the pin 22 as will be clearly seen on referring to Figure 2.

56 is a cam shoe provided with an upwardly curved forward end 57, the body of the shoe being inclined downward as indicated at 58 from the upturned portion 57. The shoe 56 is carried by the straight portion 55 of the throttle lever extension 54 above referred to by means of set screws 59, 60 and 61, the screws 59 and 61 extending through orifices 62 and 63 formed in the upper flange 64 of the cam shoe 56, and into internally threaded orifices 65 and 66 formed in the extension 54 of the lever 50, and also by a set screw 60 extending through an orifice 67 and bearing at its lower end against the upper face of the extension 55 intermediately between the screws 59 and 61. By this means the cam shoe 56 may be adjusted vertically as has been before stated when the throttle lever is in the open position that is in the position shown by dotted lines in Figure 2 the perforation 19 is in registering alignment with the orifice 17 permitting the full flow of fuel through such orifice and perforation into the body of the carburetor to pass with the air to the engine. When the lever is swung through the dotted position towards the full line position indicated in Figure 2, the upwardly curved forward end 57 of the shoe 56 engages the upper end of the pin 22 forcing the pin vertically downward and thereby forcing the sleeve 18 in the same direction, so as to gradually carry the perforation of the sleeve 19 out of alignment with the orifice 17, and thereby gradually cut off the flow of fuel from the chamber 15 to the interior of the carburetor body.

As the throttle valve swings towards the slow speed position, the extreme open position of the throttle lever is limited by means of the projections 68 depending therefrom and engaging the web 69 when the lever is in this position. When the lever is swung to the slow speed position, the movement is limited by means of the set screw 70 carried by the lug 71 and engaging the opposite side of the web 69.

Having described the principal parts involved in my invention, I will briefly described the operation of the same.

In starting, the throttle valve is in the full position shown in Figure 2. By the first suction stroke of the engine, air is drawn through the carburetor from the air inlet 7. The needle valve 26 is raised by the drawing down of the piston 38 and stem 40 swinging the operating end of the lever 42 downward so that its opposite end engages the shoulders 30 to raise the stem of the valve 36. The fuel is then drawn into the fuel chamber and through the orifice 17 and perforation 19 when in partial alignment with such orifice into the interior of the carburetor body so as to mix with the air drawn past the throttle valve into the inlet manifold. It will of course be understood that there is sufficient clearance between the throttle valve and wall of the neck 4 to permit the required amount of mixture to pass, necessary to start the engine.

When it is desired to increase the speed, the operating lever 50 is swung toward the dotted position shown in Figure 2, thereby carrying the inclined bottom of the cam shoe 56 across the top of the pin 22, so as to permit such pin and the sleeve valve 18 to which it is connected to gradually rise and carry the perforation 19 towards the fully aligned position with the orifice 17.

When it is desired to decrease the speed of the engine, the operating lever is swung in the opposite direction carrying the inclined bottom 38 of the shoe 56 against the pin 22 so as to force it and the sleeve valve 18 downward to carry the perforation 19 out of alignment with the orifice 17.

What I claim as my invention is:

1. In a carburetor, the combination with the carburetor body having a cylindrical fuel chamber located therein having a fuel inlet leading to the bottom thereof and a fuel outlet leading radially therefrom, and a throttle lever, of a sleeve valve slidably fitting the exterior of the fuel chamber and having a perforation adapted to be carried into and out of alignment with the radial orifice, a pin extending upward from the sleeve freely through the top of the carburetor body, a spring tending to force the sleeve upward, and a cam carried by the throttle lever adapted to engage the upper end of the pin to force it downward as the throttle lever is carried to the closed position.

2. In a carburetor, the combination with the carburetor body having a cylindrical fuel chamber located therein having a fuel inlet leading to the bottom thereof and a fuel outlet leading radially therefrom, and a throttle lever, of a sleeve valve slidably fitting the exterior of the fuel chamber and having a perforation adapted to be carried into and out of alignment with the radial orifice, a pin extending upward from the sleeve freely through the top of the carburetor body, a spring tending to force the sleeve upward, a cam carried by the throttle lever having an inclined bottom adapted to engage the upper end of the sleeve valve pin to force it downward when the throttle lever is swung towards the slow speed position, and means for adjusting the cam shoe vertically on its support.

3. In a carburetor, the combination with the carburetor body having a fuel inlet, a throttle valve and throttle lever, of a cylinder carried by the carburetor body, a tube extending between the carburetor at the suction side of the throttle valve and the bottom of the aforesaid cylinder, an upwardly spring pressed piston operating within the cylinder, a stem extending from the piston freely through the top of the cylinder, a spring pressed needle valve stem coacting with the fuel inlet, and a lever fulcrumed intermediately of its length upon the carburetor body and engaging the aforesaid stem at one end and the needle valve stem at the opposite end.

ARTHUR DION.