

Aug. 18, 1925.

1,550,434

A. McC. FLUHARTY

CARBURETOR

Filed July 5, 1921

Fig. 1.

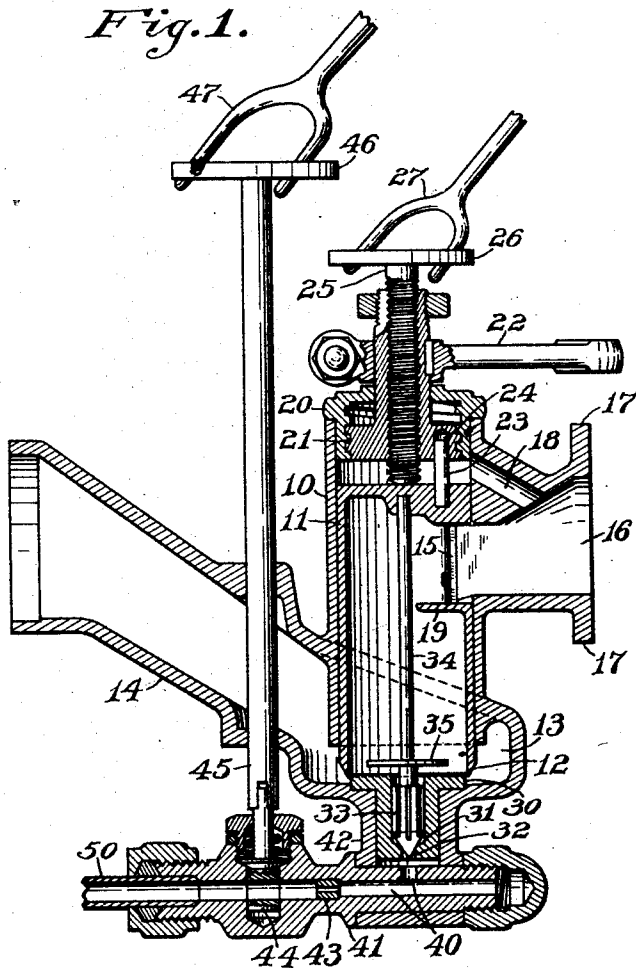
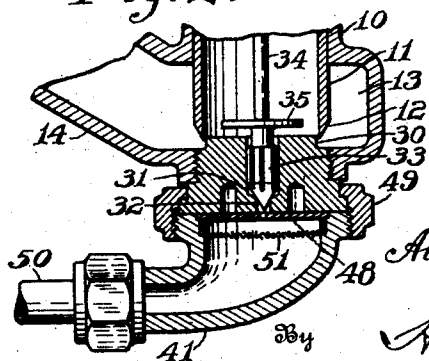


Fig. 2.



Inventor

Allan M^c C. Fluharty,

Hood & Schley

Attorneys

Patented Aug. 18, 1925.

1,550,434

UNITED STATES PATENT OFFICE.

ALLAN McC. FLUHARTY, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO LEWIS A. SNIDER
AS TRUSTEE FOR ALLAN McC. FLUHARTY, LEWIS A. SNIDER, JOHN M. ROTZ, AND
HAROLD G. RILEY.

CARBURETOR.

Application filed July 5, 1921. Serial No. 482,329.

To all whom it may concern:

Be it known that I, ALLAN McC. FLUHARTY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Carburetor, of which the following is a specification.

It is the object of my invention to improve the efficiency of a carburetor, in large measure by causing the fuel to be spread in a very thin film over a large area from the edge of which it is picked up by the passing air, and by controlling the flow of fuel and both the inlet air and the discharge of explosion mixture jointly by the throttle position and the suction of the engine.

The accompanying drawing illustrates my invention: Fig. 1 is a vertical central section through a carburetor embodying my invention; and Fig. 2 is a fragmentary section showing a variation of the lower part of the structure shown in Fig. 1.

The carburetor has a main outer shell 10, cylindrical in form, in which is rotatable and vertically slidable a hollow cylindrical piston 11 closed at the top and open at the bottom; this piston is preferably provided at the bottom with an annular knife edge 12, which normally projects below the bottom of the cylindrical shell 10. The lower end of the cylindrical shell 10 projects into an annular inlet space 13, which is provided at the inner end of a lateral inlet conduit 14 through which air from the atmosphere is supplied to the space 13 and thence into the space within the hollow piston 11. The hollow piston 11 is provided near the top with a lateral outlet opening 15, which communicates with a discharge conduit 16 provided in the shell 10 and having a flange 17 by which the carburetor may be attached to the intake manifold of the associated engine. A branch conduit 18 from the conduit 16 leads into the space within the cylindrical shell 10 above the closed upper end of the piston 11, to transmit the suction of the engine to such space and thus lift the piston 11. An inwardly projecting flange 19 may be provided just below the outlet opening 15, to make the flow more nearly uniform through the hollow piston.

A sleeve 20 is fixed within the upper end of the shell 10, and is internally threaded to cooperate with a quick-pitch screw 21, upon the upwardly projecting stem of which is

fixed an arm 22 which is the throttle arm and is connected in any suitable way to the throttle lever on the dash. An eccentrically mounted pin 23 in the upper end of the piston 11 extends into a downwardly opening hole 24 in the screw 21, so that when the screw 21 is turned the piston 11 is turned correspondingly. Though the piston 11 and screw 21 thus rotate together, the piston may move vertically independently of the screw, the pin 23 moving into and partially out of the hole 24 as this occurs. The upward movement of the piston 11 is limited by a central screw 25 axially mounted in the quick-pitch screw 21; the screw 25 may be provided at the top with a flange 26 to receive a fork 27 from a suitable operating device on the dash, as this is a convenient way to operate the screw 25, though it may be operated in any other way if desired.

The air inlet conduit 14 carries a sleeve 30 at its lower end, at the bottom of the annular inlet space 13, with the upper edge of which sleeve the knife edge 12 cooperates to control the inflow of air into the lower end of the hollow piston 11. This sleeve 30 has a central upwardly opening cup 31, provided at the bottom with a fuel-inlet opening 32 through which fuel enters such cup; and the bottom of such cup constitutes a valve seat for a valve 33 which has a vertically sliding fit in the cup 31 and is fluted along the side to allow the fuel to pass by it when it is unseated. This valve 33 is seated by its own weight, augmented by the weight of the hollow piston 11, which for that purpose is provided with a central rod 34 projecting down through it to cooperate with the upper end of the valve 33 and thus to serve the double purpose of seating such valve by the weight of the hollow piston and of limiting the downward movement of such hollow piston so that the knife edge 12 may descend barely past the top of the sleeve 30, which it just clears, to provide the minimum size of air inlet. The valve 33 at its upper end is provided with a flat disk 35, which extends laterally fairly close to the inner surface of the hollow piston 11. The fuel which is discharged from the top of the cup 31 spreads out on the under surface of this disk 35, and is picked up from the edge thereof by the incoming air.

The supply of fuel to the cup 31 through the fuel inlet opening 32 may be controlled

in different ways, in addition to the effect exerted by the valve 33. In the arrangement shown in Fig. 1 such fuel-inlet opening is supplied from a fuel-supply passage 5 40 provided in a fitting 41 which is removably mounted in a transverse hole in a downward extension 42 from the inlet conduit 14, which downward extension 42 is hollow to receive the sleeve 30. The fuel 10 flow through the conduit 40 may be controlled by a calibrated plug 43, which is removable to allow a plug with a hole of different size to be substituted; and may also be controlled by a turn valve 44 operable 15 by a valve stem 45 shown as having a flange 46 at the top for receiving a fork 47 operated by any suitable device on the dash. If desired, both the calibrated plug 43 and the valve 44 may be used, or either may be 20 omitted. Instead of the arrangement shown in Fig. 1, that shown in Fig. 2 may be used, in which latter arrangement a plate 48 is removably mounted directly beneath the sleeve 30 by a suitable union connection 49 to the fuel inlet pipe 50, the plate 48 being provided with a central calibrated opening directly beneath the fuel-inlet opening 32; and a screen 51, the holes through which are 25 individually smaller than the opening through the plate 48 so that no dirt which might clog it can reach such opening, may be provided beneath the plate 48 and clamped in place by the same union connection 49. The fitting 41 or inlet pipe 50 30 may be connected to any suitable source of fuel supply, which I prefer shall be a gravity supply.

In operation, when the engine is at rest the valve 33 is closed by its own weight and 40 that of the piston 11, and the supply of fuel to the cup 31 is cut off. When the engine is started, a certain suction is created in the intake manifold thereof, which suction is transmitted through the conduits 16 and 18 to the space within the hollow piston 11 and the upper part of the shell 10. This 45 suction and the resultant air flow into the hollow piston 11 beneath the knife edge 12 lift the piston 11 and the valve 33 to a greater or lesser extent, the lift being limited by the setting of the screw 25. The fuel from the source now enters the cup 31 through the fuel inlet passage 32, the 50 rate of flow being determined by the size of the hole in the valve 44, the calibrated plug 43, or the plate 48, or a plurality of these, and by the suction of the engine; and this fuel passes upward through the cup 31 and is discharged against the under face 55 of the disk 35, and spreads out on such under face and is picked up from the edge thereof by the incoming air beneath the knife edge 12. The mixture of air and fuel 60 passes up through the hollow piston 11, and escapes through the outlet opening 15

and conduit 16 into the intake manifold and thence to the engine. The flow of this mixture through the hollow piston 11 is equalized to a greater or lesser extent by the inwardly projecting flange 19 beneath the opening 15. The speed of the engine is controlled by manipulating the throttle arm 22, thus rotating the screw 21 and correspondingly varying the effective size of the outlet opening 15; and at the same time 70 varying the position of the screw 25 (which is carried by the screw 21 and moves with it) and thus varying the upper limit of the movement of the hollow piston 11 and so controlling the rate at which fuel and air 80 may enter such hollow piston.

I claim as my invention:

1. In a carburetor, the combination of a shell having an air-inlet opening and a mixture-discharge outlet, a piston mounted in 85 said shell to control both said inlet and said outlet, means for rotating said piston to control said outlet, said piston being mounted so that it is moved longitudinally by suction in said shell to control said inlet, and an abutment for limiting the suction-producing 90 movement of said piston, said abutment being mounted so that it is varied in position by the operation of the piston-rotating means, said shell being also provided with a 95 fuel-inlet opening.

2. In a carburetor, the combination of a shell having an air-inlet opening and a mixture-discharge outlet, a piston mounted in 100 said shell to control both said inlet and said outlet, means for rotating said piston to control said outlet, said piston being mounted so that it is moved longitudinally by suction in said shell to control said inlet, and an 105 abutment for limiting the suction-producing movement of said piston, said shell being also provided with a fuel-inlet opening.

3. In a carburetor, the combination of a shell having an air-inlet opening and a mixture-discharge outlet, a piston mounted in 110 said shell to control both said inlet and said outlet, means for rotating said piston to control said outlet, said piston being mounted so that it is moved longitudinally by suction in said shell to control said inlet, an abutment 115 for limiting the suction-producing movement of said piston, said abutment being mounted so that it is varied in position by the operation of the piston-rotating means, said shell being also provided with a 120 fuel-inlet opening, and a valve controlling said fuel-inlet opening and operated by suction, said valve being limited in its movement in accordance with the longitudinal 125 position of said piston.

4. In a carburetor, the combination of a shell having an air-inlet opening and a mixture-discharge outlet, a piston mounted in 130 said shell to control both said inlet and said outlet, means for rotating said piston to

control said outlet, said piston being mounted so that it is moved longitudinally by suction in said shell to control said inlet, an abutment for limiting the suction-producing movement of said piston, said shell
5 being also provided with a fuel-inlet opening, and a valve controlling said fuel-inlet opening and operated by suction, said valve

being limited in its movement in accordance with the longitudinal position of said piston. 10

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 2nd day of July, A. D. one thousand nine hundred and twenty-one.

ALLAN McC. FLUHARTY.