April 20, 1926. 1,581,837

C. G. BROWNE ET AL

CARBURETOR

Filed April 30, 1924 2 Sheets-Sheet 1

Fig. 1.

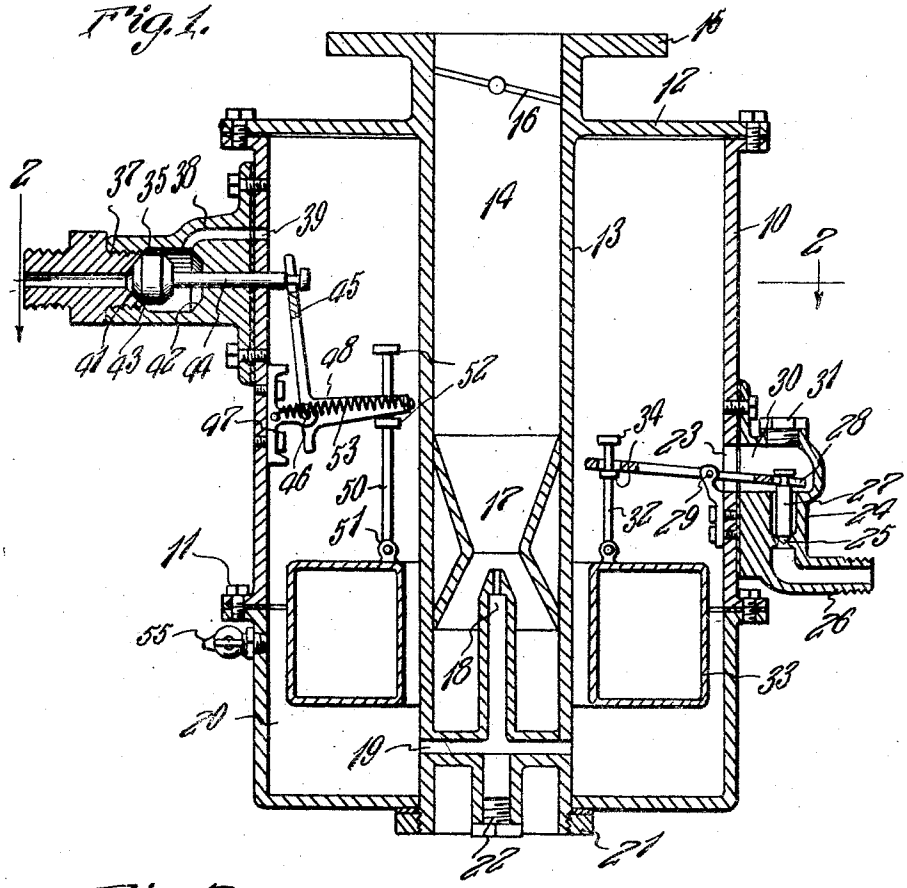
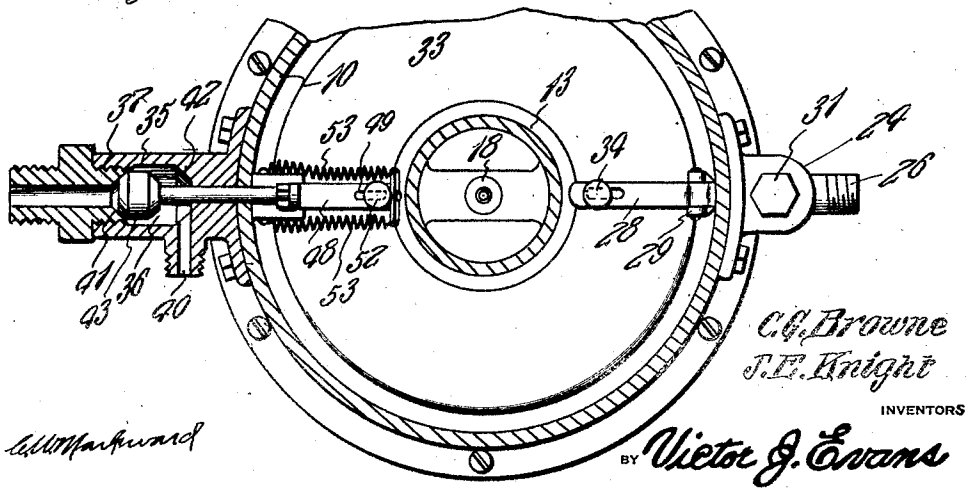


Fig. 2.



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WITNESS:

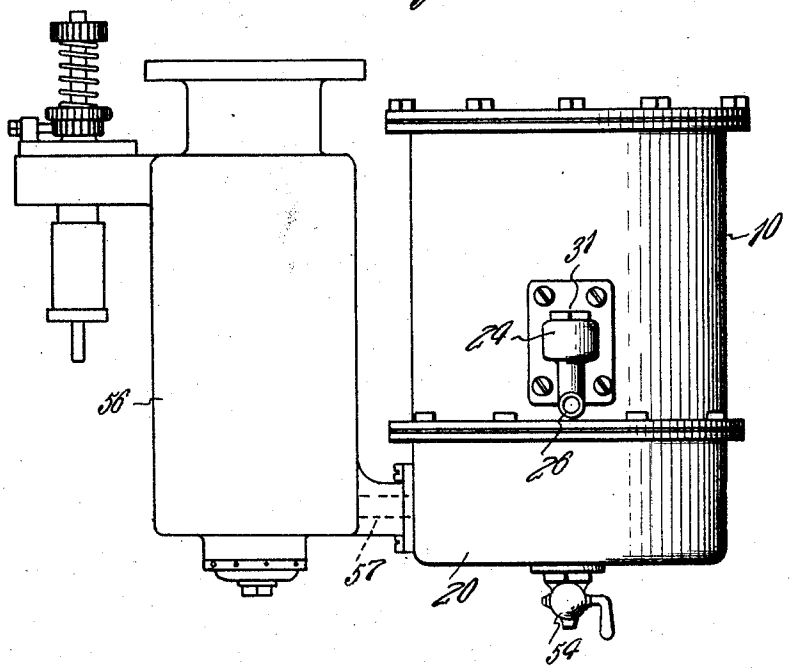
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CARBURETOR

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Fig. 2.



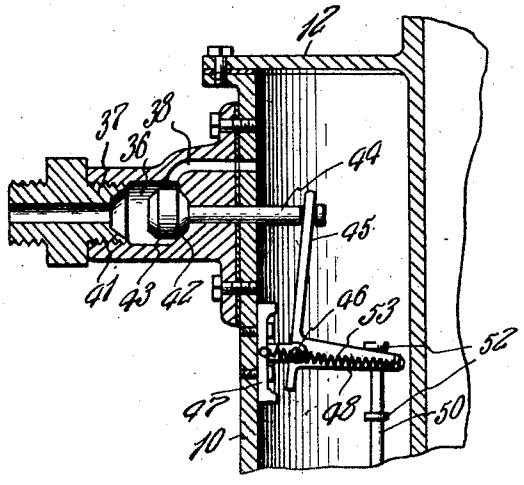


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHRISTOPHER G. BROWNE AND JAMES E. KNIGHT, OF ST. GEORGES, GRENADA, BRITISH WEST INDIES, ASSIGNORS OF ONE-HALF TO KENNETH A. McINTYRE, OF ST. JOHNS, GRENADA, BRITISH WEST INDIES.

CARBURETOR.

Application filed April 30, 1924. Serial No. 710,071.

To all whom it may concern:

Be it known that we, CHRISTOPHER G. BROWNE and JAMES E. KNIGHT, subjects of the King of Great Britain, and residing at St. Georges, Grenada, British West Indies, have invented new and useful Improvements in Carburetors, of which the following is a specification.

This invention relates to improvements in carburetors and has for an object the provision of a carburetor which under ordinary conditions will function in the usual manner, but which may be automatically converted into a vacuum feed tank or chamber, so that the invention provides a combined gravity and vacuum feed carburetor.

More specifically stated, the invention provides a carburetor which, when attached to the engine of an automobile or other vehicle, will feed the engine by gravity until fuel within the fuel reservoir or float chamber of the carburetor falls to a predetermined level, (as frequently occurs when ascending a grade) whereupon a vacuum will be automatically created within the carburetor and fuel therefore will be fed by the vacuum system, until fuel within the fuel chamber again reaches a normal level, when the gravity feed will be automatically restored.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claim.

In the drawings:—

Figure 1 is a sectional view through a combined gravity and vacuum feed carburetor embodying the present invention.

Figure 2 is a section taken substantially on the line 2—2 of Figure 1 with the parts in normal position.

Figure 3 is a fragmentary section illustrating the position of the vacuum feed controlling valve when the carburetor is operating as a vacuum feed carburetor.

Figure 4 is an elevation showing a modified form of the invention.

Referring to Figures 1, 2 and 3 of the drawings, the carburetor is constructed as a single unit and includes a bowl 10 which is preferably made of separate sections connected as indicated at 11 and provides a bowl which is closed at the lower end and open at the upper end, the latter being provided with a removable cover 12.

Extending centrally through the bowl is a hollow tubular member 13 the walls of which provide a mixing chamber 14. This tubular member may be formed with or attached to the cover 12 while its upper open end is provided with a flange 15 for attachment to the intake manifold of an internal combustion engine, as will be readily understood. The upper end of the mixing chamber is provided with a butterfly valve 16 which may be controlled in any suitable manner, while the lower end of the mixing chamber is provided with a restricted passage 17, axially of which extends a nozzle 18. The lower end of this nozzle is in communication with a passage 19 extending diametrically through the tubular member 13 the said passage being open at each end and communicating with the lower end of the bowl wherein is provided a fuel reservoir or float chamber 20. The lower end of the tubular member is secured within an opening provided in the bottom of the bowl 10 as shown at 21, while a removable plug 22 located at the lower extremity of the nozzle 18 provides access to this nozzle to facilitate cleaning.

The bowl is provided with a port 23 over which is secured a valve casing 24, the latter being provided with a passage which includes a valve seat 25. The outer end of this passage extends through a nipple 26 which is adapted for connection to a fuel supply pipe leading from a suitable source of supply. Operating within the valve casing 24 is a valve 27 and connected to the stem of this valve is one end of a lever 28, the latter being pivotally mounted as shown at 29 within the bowl 10. The valve connected end of the lever 28 operates within a chamber 30 provided in the valve casing 24, the said chamber being provided with an opening which is closed by a removable plug 31, whereby access may be had to the interior of the chamber.

The inner end of the lever 28 is connected to one end of a rod 32 and the opposite end of this rod is pivotally connected to a float

33. The rod 32 is provided with spaced stops 34 whereby vertical movement of the float will actuate the lever 28 and operate the valve 27.

In the operation of the invention as thus far described, fuel will be fed by gravity to the fuel reservoir or float chamber of the bowl 10 and when the fuel reaches a predetermined level in the fuel reservoir, the float will be elevated to actuate the lever 28 and move the valve 27 to a closed position. Fuel is drawn into the mixing chamber 14 and through the intake manifold into the engine cylinders in the usual manner, the operation of the float controlling the amount of fuel within the reservoir.

Should however the gravity feed fail to properly function due to ascending a grade when fuel within the reservoir will fall below a normal level, a vacuum will be created within the carburetor bowl so as to draw the fuel into the fuel reservoir by the suction of the engine.

For this purpose there is provided a casing 35 which is secured to the bowl 10 and which is provided with a chamber 36. One wall of this chamber is formed by a nipple 37 whose outer end is adapted to be connected to a fuel supply pipe (not shown) having communication with the intake manifold of an engine. The chamber 36 is in communication with the interior of the bowl 10 through a passage or port 38 which registers with a port 39 provided in the bowl. Also communicating with the chamber 36 is an air vent 40 which communicates with the interior of the bowl through the passage 38.

The chamber 36 is provided at its opposite ends with valve seats 41 and 42, the former being formed at the inner end of the nipple 37 while the latter is formed at the inner end of the chamber 36 and surrounds the inner end of the air vent 40. Operating within the chamber 36 is a valve member 43 whose opposite ends are formed to engage the seats 41 and 42 and when engaging the first mentioned seat will close the inner end of the nipple 37 so as to cut off communication with the intake manifold of the engine through this nipple and when engaged with the seat 42 to close the air intake 40.

The valve member 43 is provided with a stem 44 which is connected with one arm 45 of a bell crank lever which is mounted for pivotal movement as shown at 46 upon a bracket 47. The other arm 48 of this bell crank lever is provided with an opening 49 through which passes the upper end of a rod 50, the lower end of this rod being connected to the float 33 as shown at 51. The rod 50 is provided with spaced stops 52, one of which is located upon each side of the arm 48 of the bell crank lever. Secured to the free end of the arm 48 are coiled springs 53 which are also connected to the bracket 47 in such manner that when the bell crank lever is rocked upon its pivot it will be snapped over the center by the action of these springs.

Assuming that the fuel in the reservoir 20 has fallen below a predetermined level, the float 33 will move downward, actuating the valve 27 so as to admit fuel from the supply tank. Should fuel fail to flow from the tank into the reservoir due to the relative positions of the tank and reservoir, a continued downward movement of the float will cause the upper stop 52 of the rod 50 to pull the arm 48 of the bell crank lever downward. This movement of the bell crank lever will move the valve inward from the seat 41 which it normally occupies so that communication between the intake manifold of the engine and the interior of the carburetor bowl will be established through the connection with the nipple 37 and the passage 38. The valve member 43 will move inward and close the air vent 40 which is normally open so that suction of the engine will create a vacuum within the bowl and will draw fuel into the fuel reservoir from the source of supply. The suction of the engine will also draw the fuel outward through the passage 38 and the nipple 37 through the feed line to the intake manifold. This operation is automatic and will continue until normal conditions resume. That is, until the relative positions of the supply tank and carburetor are such that fuel will feed into the carburetor by gravity. The fuel level within the reservoir will then raise causing the float to ascend, the lower stop 52 of the rod 50 engaging the arm 48 of the bell crank lever and moving the latter upward. The valve member 43 will then leave the seat 42 so that the interior of the carburetor bowl will be open to the atmosphere and the vacuum therein relieved, the valve member continuing to move outward until it engages the seat 41 to cut off supply of fuel to the engine through the nipple 37 and the feed line.

The bowl is preferably provided with a drain cock 54 and with a test cock 55 for determining the level of the fuel within the fuel reservoir.

If desired, the bowl 10 may be attached to the mixing chamber 56 of an ordinary carburetor, in which event communication between the fuel reservoir of the bowl 10 and the mixing chamber may be established through a passage 57. In this form of the invention the tubular member 13 previously described is dispensed with. In other respects the construction and operation are the same.

It is to be understood that when a vehicle, using my invention, is traveling upon a level it operates under the operation of a butterfly valve 16; but when ascending a grade the

butterfly valve 16 is closed and the valve 43 is then set in operation, in the manner as previously set forth.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claim.

Having described the invention what is claimed is:—

A carburetor of the character described comprising a reservoir, a hollow cylindrical mixing chamber extending vertically and centrally therein, a float member encircling the mixing chamber within the reservoir, a fuel inlet port arranged upon one side of the reservoir, a valve mounted for reciprocation within the inlet port, an arm pivoted within the reservoir and having one end connected with the upper end of the valve, a rod having its lower end pivoted to the upper side of the float and extending within the opposite end of the pivoted rod and including spaced stops upon the opposite sides thereof, an auxiliary port arranged upon the opposite side of the reservoir and having a valve arranged therein and its stem extending an appreciable distance within the reservoir, a bell crank lever pivoted to the inner side of the reservoir and having its upper free end associated with the inner end portion of the valve stem, a rod having its lower end pivoted to the upper side of the float and having its upper end received within the remaining end of the bell crank lever and including spaced stops upon the opposite sides thereof, and springs connecting the lower end of the bell crank lever and corresponding side of the reservoir whereby rocking of the bell crank lever will cause the bell crank lever to snap over its center.

In testimony whereof we affix our signatures.

CHRISTOPHER G. BROWNE.
JAMES E. KNIGHT.