A. L. PAYTON.

CARBURETER.

APPLICATION FILED JAN. 19, 1916.

1,241,546. Patented Oct. 2, 1917.

Fig. 1

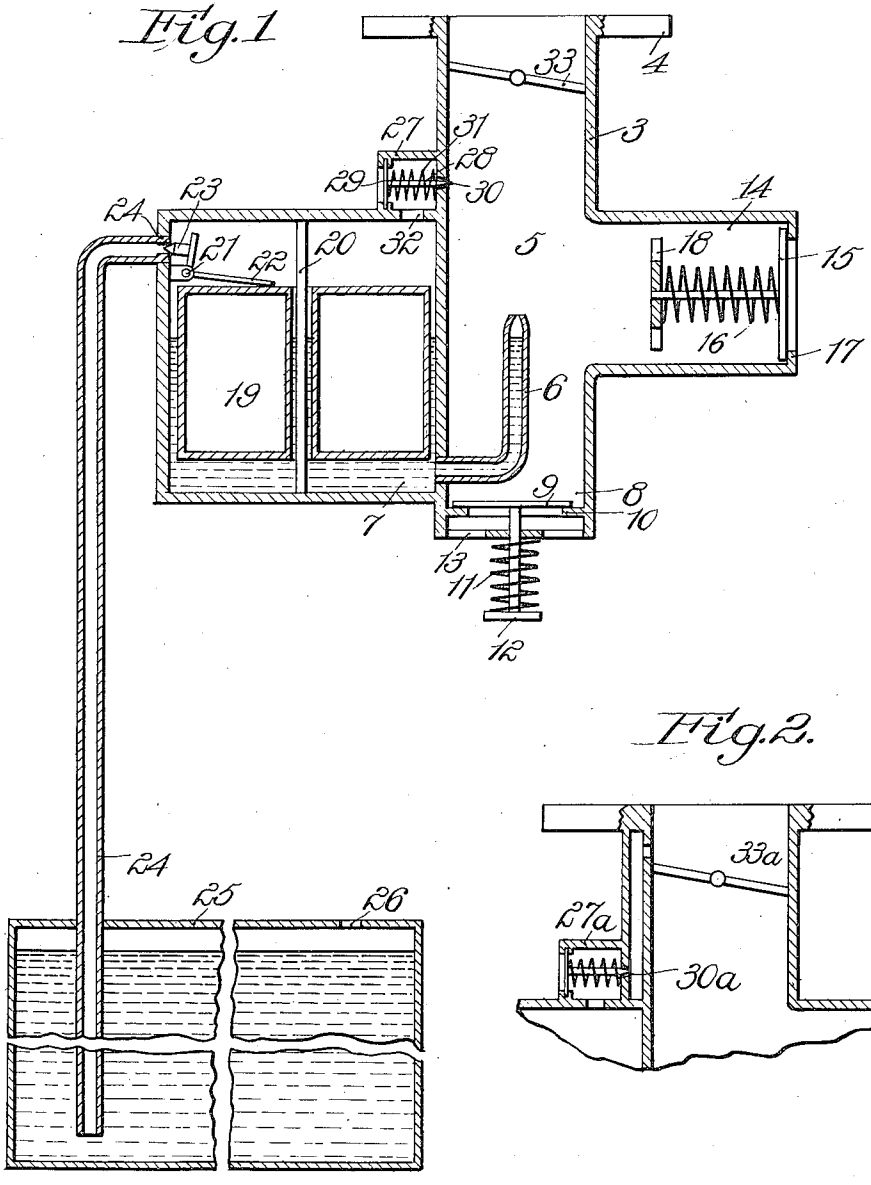


Fig. 2.

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CARBURETER.

1,241,546. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed January 19, 1916. Serial No. 72,944.

To all whom it may concern:

Be it known that I, ARTHUR L. PAYTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Carbureters, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to carbureters for internal combustion engines and has for its object the provision of simple and effective means for supplying fuel to the fuel or float chamber of the carbureter from a fuel reservoir located at a point below the float chamber of the carbureter.

The object of my invention is to utilize the suction or vacuum created in the atomizing chamber of the carbureter for providing and maintaining a difference of pressure between the supply reservoir and the float chamber. The float chamber of the carbureter is arranged to communicate by means of a conduit with the fuel reservoir, the fuel reservoir being provided with a vent, so that the fuel contained therein is subjected to atmospheric pressure. When, therefore, a vacuum or reduction of pressure is created within the float chamber of the carbureter and the conduit connecting the reservoir with the float chamber is free to permit the passage of fuel, there will be, due to the difference in pressure between the fuel reservoir and the float chamber, a transportation of fuel from the reservoir into the float chamber. To provide the vacuum or reduction of pressure within the float chamber of the carbureter I provide a restricted opening communicating with the float chamber at a point above the fuel level and the atomizing chamber of the carbureter or any other portion of the carbureter, in which a vacuum or reduction of pressure is produced during the operation of the internal combustion engine with which the carbureter is associated. The float chamber carries the usual float which operates a valve for controlling the conduit leading from the fuel reservoir to the float chamber, so that whenever the fuel level has reached a certain predetermined height within the float chamber communication between the reservoir and the float chamber will be instantly discontinued.

My invention consists in the combination and arrangement of parts and instrumentalities, set forth in the following detail description and claimed in the appended claims.

My invention will be more clearly understood by referring to the accompanying drawings, in which,

Figure 1 is a diagrammatic representation of a carbureter and fuel reservoir located at a point below the float chamber of the carbureter, and

Fig. 2 is a fragmentary view illustrating a slightly modified construction.

The carbureter is illustrated at 3, provided with the usual flanges 4—4 to enable connection between the carbureter and the intake manifold of the internal combustion engine. The carbureter contains the usual atomizing chamber 5; into which extends the fuel nozzle 6 terminating at its lower end in the fuel or float chamber 7. The usual air intake of the carbureter is illustrated at 8, which is preferably controlled by a valve 9 held against its seat 10 by means of a spring 11. The spring 11 is interposed between a head 12 of the valve stem and a spider 13 supported from the carbureter casing. Communicating with the atomizing chamber and extending off at right angles thereto is an auxiliary air intake 14 also provided with a valve 15. A spring 16 normally retains the valve 15 against the seat 17, the spring 16 being interposed between the valve and the spider 18 supported from the carbureter casing.

The float chamber is provided with the usual float 19, which may, if desired, be guided by a rod 20 as illustrated, extending through the float. Pivoted at 21 within the float chamber is a bell crank lever 22 provided with a valve member 23. The lower end of this bell crank lever is arranged to rest upon the upper surface of the float so that movement up or down of the float will cause opening or closing of the valve 23. The valve 23 controls the conduit 24 extending between the float chamber and the fuel reservoir 25, as illustrated. The conduit 24 extends down into the reservoir and has its lower end disposed immediately adjacent the bottom thereof. A vent is provided at 26 so that the fuel within the reservoir is subjected to atmospheric pressure. I have illustrated the conduit 24 as emptying into the float chamber at a point above the level of the fuel, but it is to be understood that

this conduit may just as well empty into the float chamber at a point below the fuel level.

Positioned between the float chamber and the atomizing chamber is the valve mechanism 27, consisting of a plunger 28, and a diaphragm 29, the outer edge of the diaphragm being held by the casing as illustrated. The end of the plunger 28 opposite the diaphragm is pointed as illustrated and extends when in its open position partly into a passageway 30, leading to the atomizing chamber. A spring 31 may be employed to normally retain the valve in its open position. The upper wall of the float chamber is cut away as illustrated at 32, so that communication is had between the float chamber and the atomizing chamber through the apertures 30 and 32. The usual butterfly valve or throttle valve is illustrated at 33, which, of course, is under the control of the operator.

The operation of the device just described is as follows:

As the internal combustion engine is operated a vacuum or partial vacuum is produced in the atomizing chamber 5, as a result of which air is taken through the intake opening 8 and fuel is extracted from the nozzle 6. At the same time, however, the air which is contained by the float chamber above the level of the fuel is extracted through the openings 30 and 32 to the atomizing chamber to satisfy the partial vacuum. If the reduction in pressure within the float chamber becomes too great the difference in pressure between the float chamber and the atmosphere will cause the diaphragm 29 to be moved inwardly to seat the plunger 28 and close the passageway 30, thus discontinuing the communication between the atomizing chamber and the float chamber. The valve 27 is held in this position until the pressure within the float chamber is increased. It is desirable and in fact necessary that the pressure reduction within the fuel or float chamber be always equal to a predetermined amount which is sufficient to lift the fuel the required distance, that is, from the main tank to the carbureter float chamber. For this purpose it would be immaterial if the vacuum or pressure reduction exceeded a predetermined amount, but in order that the vacuum will not be so great as to prevent the proper flow of fuel through the spray nozzle into the atomizing chamber of the carbureter, it has been found important to prevent the degree of pressure reduction from exceeding a predetermined amount. Between these limits, therefore, the carbureter operates satisfactorily.

By means of the restricting valves 9 and 15 the pressure reduction within the carbureter chamber is maintained always as great as the pressure reduction necessary for lifting the gasolene from the supply tank to the float chamber. I have found that a one pound pressure reduction in the float chamber is sufficient to raise the fuel for a distance of about 30″, which is sufficient for most purposes where the carbureter is used in connection with automobiles. When, therefore, it is desired to operate the system on a one pound pressure reduction the valve 27 is arranged so that it will close the passageway 30 when a one pound pressure reduction is obtained within the float chamber.

Attention is directed to the fact that inasmuch as the conduit 24 empties into the float chamber at a point above the fuel in the latter, at no time, regardless of the position of valve 23 can the supply of fuel in the float chamber return to the reservoir 25.

Fig. 2 illustrates a slightly modified construction wherein the passageway 30 instead of extending into the atomizing chamber immediately adjacent the nozzle 6 extends upwardly and communicates with that portion of the carbureter which is disposed posterior to the throttle valve 33ª. In this construction when the throttle valve is closed or nearly so the pressure reduction within the float chamber will occur before fuel is extracted from the float chamber or air is admitted through the intake opening 8 or the auxiliary opening 14.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A carbureter provided with a fuel chamber, an atomizing chamber and an opening affording communication between the atomizing chamber and fuel chamber, located above the normal fuel level within the fuel chamber, and a valve adapted to close said opening when a certain predetermined reduction of pressure has been produced in the fuel chamber.

2. A carbureter provided with a fuel chamber, an atomizing chamber and an opening affording communication between the atomizing chamber and fuel chamber, located above the normal fuel level within the fuel chamber, and an atmospherically operated valve adapted to close said opening when a certain predetermined reduction of pressure has been produced in the fuel chamber.

3. A carbureter provided with a fuel chamber, an atomizing chamber, and an opening affording communication between the atomizing chamber and the fuel chamber located above the normal fuel level within the fuel chamber, a valve adapted to close said opening when a certain predetermined reduction of pressure has been produced in the fuel chamber, a float in said fuel chamber, a supply reservoir located below the normal level of the fuel within the fuel chamber, a conduit connecting the supply reservoir and

fuel chamber, and a valve operated by the float for controlling the passage of fuel through the conduit into the fuel chamber.

4. A carbureter provided with a fuel chamber, an atomizing chamber, and an opening affording communication between the atomizing chamber and fuel chamber, located above the normal fuel level within the fuel chamber, an atmospherically operated valve adapted to close said opening when a certain predetermined reduction of pressure has been produced in the fuel chamber, a float in said fuel chamber, a supply reservoir located below the normal level of the fuel within the fuel chamber, a conduit connecting the supply reservoir and fuel chamber and a valve operated by the float for controlling the passage of fuel through the conduit into the fuel chamber.

5. A carbureter provided with a suction chamber, a float chamber, a spray nozzle in the suction chamber, a diaphragm valve controlling an opening between the suction chamber and the upper part of the float chamber, the diaphragm controlling said valve having atmospheric pressure upon one of its faces and the pressure within the float chamber upon the other of its faces, said valve being so arranged as to close when a predetermined depression in pressure exists in the float chamber, whereby fuel may be sucked into the float chamber from a source at a lower level than the level of the gasolene in the float chamber.

6. A carbureter provided with a suction chamber, a float chamber, a spray nozzle in the suction chamber, a diaphragm valve controlling an opening between the suction chamber and the upper part of the float chamber, the diaphragm controlling said valve having atmospheric pressure upon one of its faces and the pressure within the float chamber upon the other of its faces, said valve being so arranged as to close when a predetermined depression in pressure exists in the float chamber, whereby fuel may be sucked into the float chamber from a source at a lower level than the level of the gasolene in the float chamber, an automatic valve mechanism anterior to said suction chamber to maintain a rarefied atmosphere in the suction chamber during the normal operation of the carbureter.

In witness whereof, I hereunto subscribe my name this 17th day of January, A. D. 1916.

ARTHUR L. PAYTON.

Witnesses:
MARY A. COOK,
KATHLEEN W. HUTTON.