B. N. PIERCE.

CARBURETER.

APPLICATION FILED SEPT. 19, 1907.

**973,877.** **Patented Oct. 25, 1910.**

2 SHEETS—SHEET 1.

**Fig-1-**

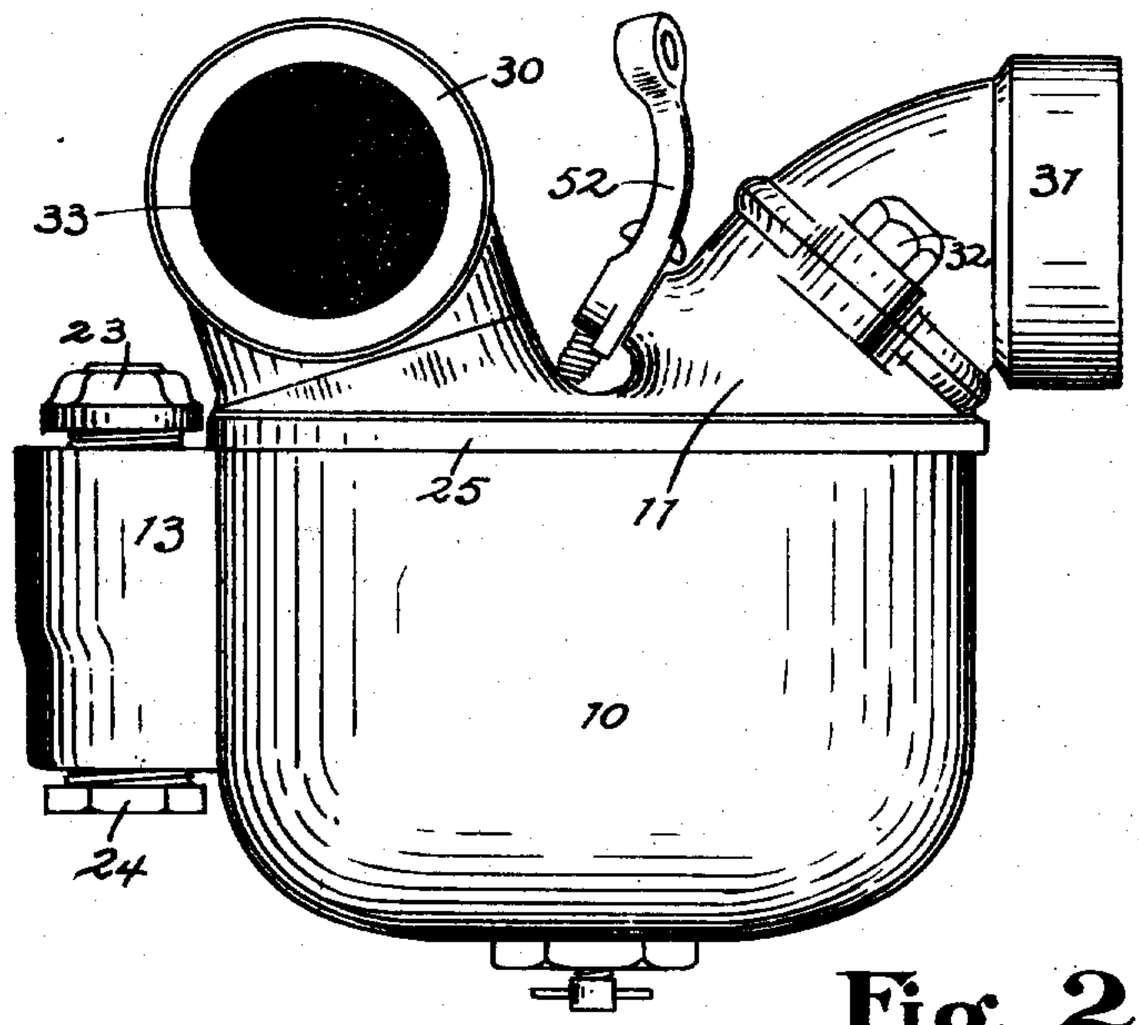


**Fig-2-**

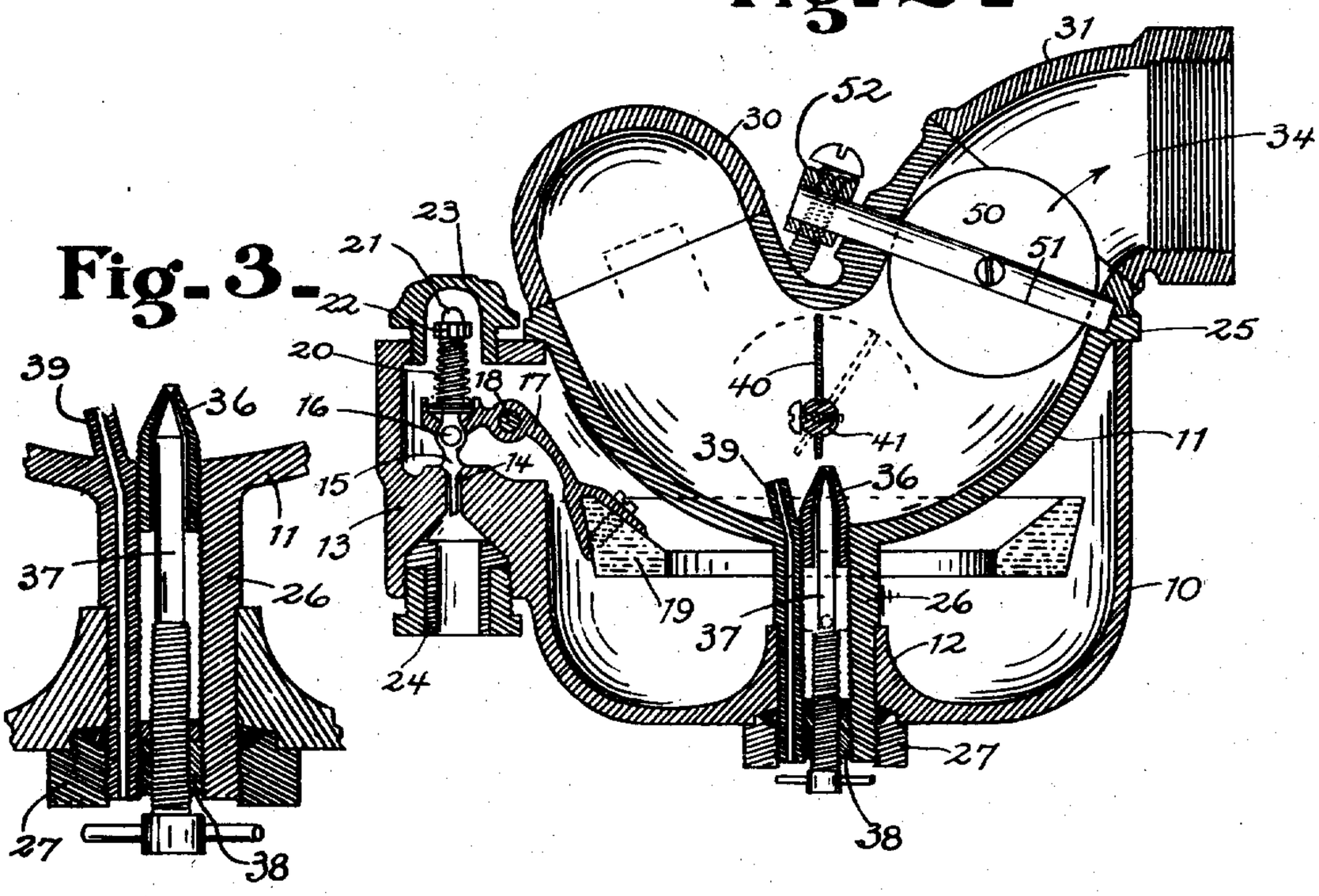


**Fig-3-**

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2 SHEETS—SHEET 2.

Fig. 4.

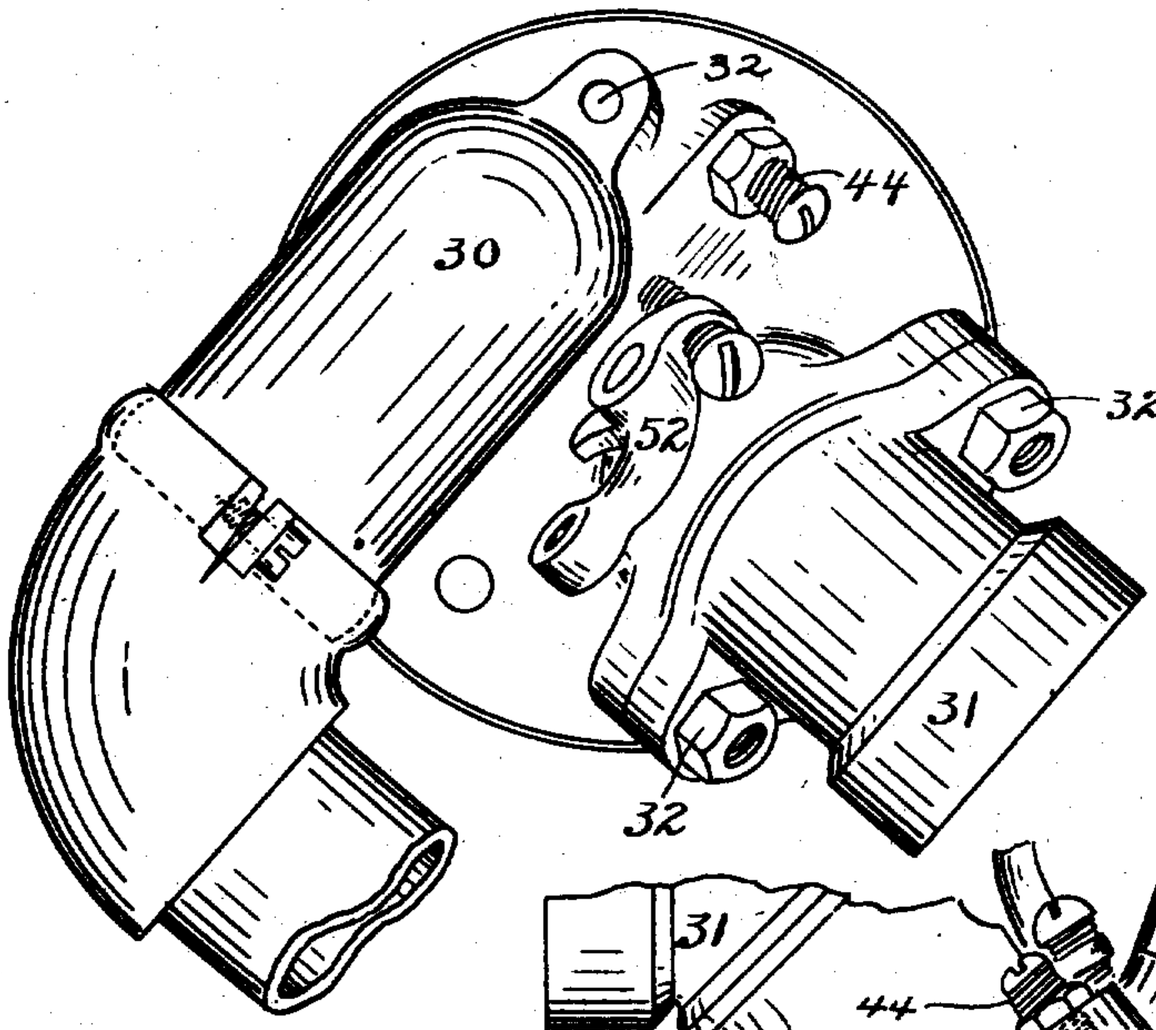



Fig. 5.

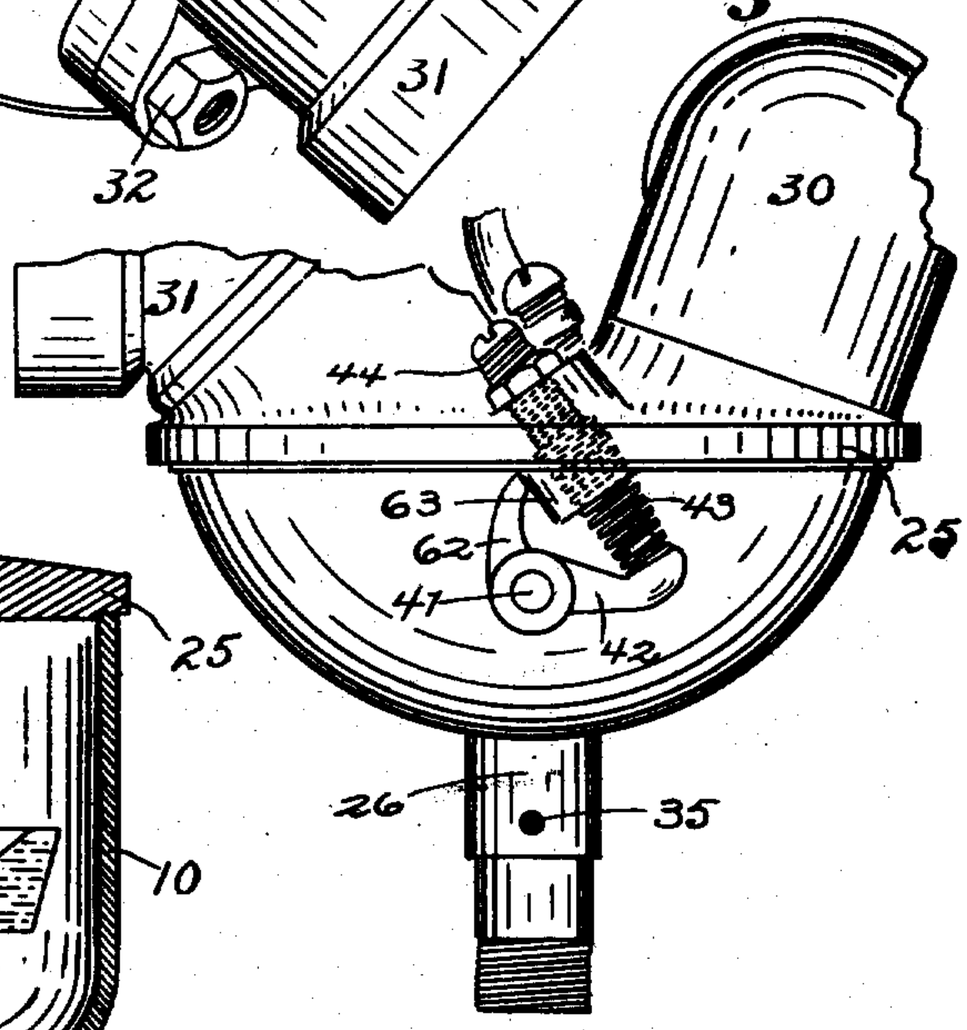
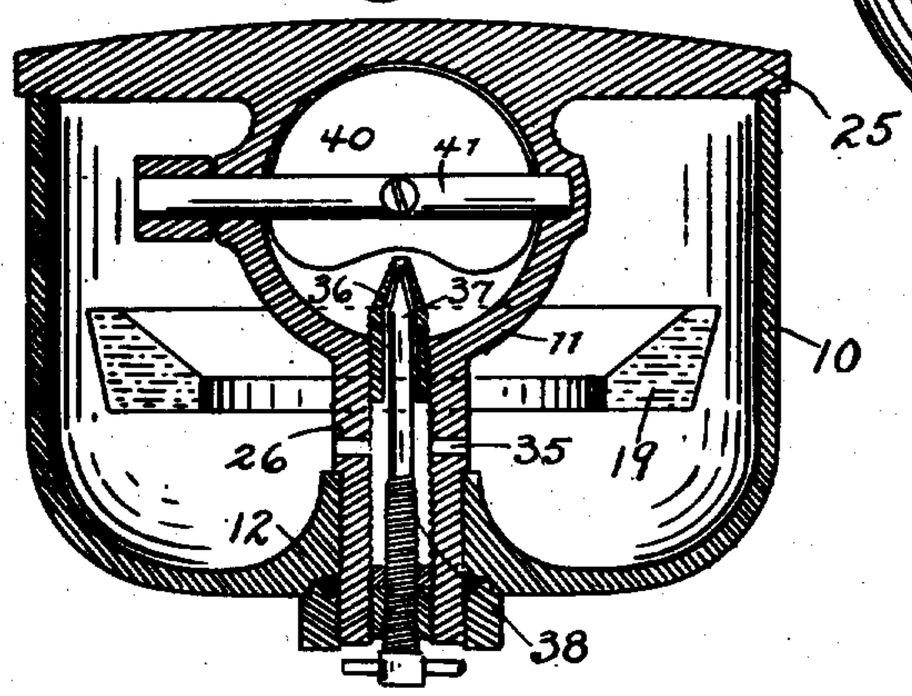



Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## CARBURETER.

973,877. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed September 19, 1907. Serial No. 393,627.

*To all whom it may concern:*

Be it known that I, BURT NEULON PIERCE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Carbureter; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The object of this invention is to improve the construction of carbureters for use in connection with gasolene engines and the like.

The chief feature of the invention consists in the provision of a wing valve within the mixing chamber, located in close proximity to the fuel inlet and extending across said mixing chamber, which valve is actuated automatically by the suction from the engine, and when thus actuated, the generation of gas will be increased in proportion to the movement of the wing valve from normal position, as such movement of the wing valve increases the passage-way and, therefore, the effect of the suction of the engine in bringing air and gasolene or other fuel into the mixing chamber. Therefore the volume of gas created by the carbureter is immediately and directly controlled within reasonable limits by the suction of the engine in accordance with its needs. When the wing valve is actuated thus by the suction of the engine, the lower part nearest the fuel inlet is moved back of the fuel inlet so that the fuel inlet will be on the suction side of the valve and thus the fuel supply in the mixing chamber be proportionately increased. Likewise the upper and larger part of the valve is swung open so as to increase the passage-way for air.

Another feature of the invention is the combination of the wing valve and the throttle valve whereby the person driving the engine can modify, change or control largely the effect of the suction of the engine upon said wing valve. The result of this combination is that the speed of the engine, from the highest speed to the very lowest speed, can be wholly controlled by these two valves. And this is true in the case of automobiles and motor boats even when the transmission gearing is at its highest.

Another feature of the invention consists in constructing the carbureter of two cylindrical parts that will keep them clamped together whereby the carbureter can be easily combined with the engine and with the gasolene supply in whatever position they may be located. It adapts the carbureter for ready use in connection with any engine.

Another feature of the invention consists in counterbalancing the irregular actions of the float upon the gasolene supply valve by a spring, whereby the action of the valve will be rendered more uniform especially when the float is shaken or tilted suddenly.

These and the other features of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Figure 1 is a side elevation of the carbureter. Fig. 2 is a central vertical section therethrough, the changed position of the wing valve being shown in dotted lines. Fig. 3 is a central vertical section through the fuel inlet to mixing chamber, the same being shown upon an enlarged scale and parts broken away. Fig. 4 is a plan view of the device. Fig. 5 is a side elevation of the upper removable portion of the device, parts being broken away. Fig. 6 is a central vertical section of the device on a line at a right angle to the section shown in Fig. 2.

This device consists essentially of two parts, a bowl 10 for the gasolene and float, and a shell 11 forming the mixing chamber and carrying the adjacent parts. These two are separable and removable and one turns upon the other to any desired position. Thus the bowl 10 is substantially in the shape of a cup with a rim symmetrically and cylindrically formed and with a thickened portion 12 centrally located in the bottom thereof with a central vertical opening therethrough. To one side of said body 10, positioned somewhat like the handle of a cup, a casing 13 is provided with a vertical gasolene inlet port 14 that is closed by a valve 15, somewhat like a needle valve, that is mounted with a pivot 16 on the short end of a lever 17 that is fulcrumed on a pin 18, the long end of said lever being secured to an annular float 19 in the gasolene bowl 10. The short end of the lever 17 is held down normally and controlled by a spring 20 on an extension 21 from the valve 15, the tension of said spring 20 being regulated by a nut 22 on said extension 21. A cap 23 closes an opening through which said extension 21 projects so that the latter is rendered accessible by the

removal of the cap 23. The gasolene supply is brought to the device through the nipple 24. Thus it is observed that the irregularities in the movements of the float 19 are controlled, steadied, and largely overcome by the action of the spring 20 on the short end of the lever 17, said spring tending to hold the valve 15 in its normal position.

The shell 11 is semispherical on its underside and provided with a cylindrical peripheral flange 25 that fits snugly upon the top of the bowl 10. Centrally from the lower end of said bowl there is a downward tubular extension 26 that passes through the opening in the enlargement 12 in the bottom of the bowl, and said extension 26 is threaded on its outer end for a nut 27 whereby said two parts 10 and 11 may be drawn and held tightly together after adjustment. The shell 11 which forms the mixing chamber has additional parts or members 30 and 31 secured by bolts 32, said parts being turned somewhat L-shaped and attached at an angle to said shell so that the position of said added members may be altered to assist in the easy mounting or attachment of the carbureter. The member 30 has the air inlet 33 and the member 31 has a gas outlet 34 that leads to the engine.

From the foregoing it is observed that the device is readily adjustable with reference to the position of the permanent parts of a gas engine, such as the engine fuel supply, etc. Thus, the bowl 10 may be turned to any convenient position for attachment to the fuel supply and then the shell 11 turned on said bowl 10 to any desired position to accommodate its connection with the engine, and when thus adjusted, the nut 27 will tighten and hold said parts in place. Likewise the air inlet can be turned toward the engine so as to get warm air.

The tubular extension 26 from the lower end of the shell 11 is provided with a pair of oppositely located ports 35 for the admission of gasolene from the bowl 10. A tapering fuel inlet nozzle 36 is screwed into the upper end of the tubular extension 26 so as to project up into the mixing chamber in the shell 10. The port therethrough is closed by a needle valve 37 that at its lower end is screw-threaded to fit and screw through an internally threaded nut 38. There is also a waste tube 39 extending down through the extension 26 and parallel with the valve stem 37, the upper end of said waste tube 39 extending above the bottom of the shell 11 to a point slightly below the upper end of the nozzle so as to form a puddle chamber about the fuel inlet in which there will be fluid standing up almost to the upper end of the nozzle. This is a matter of considerable importance in the effective operation of the device that leaves in it a priming charge.

Within the mixing chamber of the shell 11 and immediately over the fuel inlet, a wing valve 40 is mounted on a transversely extending shaft 41, see Fig. 6, which has bearings in the shell and one end extends outside the shell and carries an arm 42 against which a spring 43 acts. Said spring is mounted on the end of arm 42 and its tension is adjustable by a screw 44 that extends through a projection outside the shell 11, whereby the normal vertical position of the wing valve 40 is maintained; and its movement is limited by the stop 62 engaging the projection 63 on the outside of the shell.

The upper part of the wing valve is of considerably greater area than the lower part, as appears in Figs. 2 and 6, so that under the influence of the suction of the engine the upper part of the valve will be drawn toward the gas outlet, that is into the dotted line position shown in Fig. 2, the extent of oscillation, however, of said valve depending upon the forcefulness of the suction of the engine. When thus drawn by suction into an inclined position, it turns the lower part of the valve backward away from the fuel inlet so the fuel inlet will be on the suction side of said valve and give the suction of the engine greater power by way of drawing in fuel through said inlet. At the same time the air passageway about said valve is considerably enlarged when it is in its inclined position. Therefore, the gas-creating power of this carbureter is immediately and directly controlled and regulated by the suction of the engine, the greater that suction, the greater will be the amount of gas generated so that the gas creation will bear a uniform relation with the demand for gas and thus render the carbureter peculiarly automatic.

While the wing valve 40 is directly and solely controlled by the suction of the engine and in that sense is the same as automatic, still the effect of the suction of the engine upon said valve is controlled largely by the throttle valve 50, which is on the shaft 51, and is actuated by the throttle lever 52. In other words, when the throttle valve is open, it is obvious that the effect of the suction of the engine upon the wing valve 40 may be increased. This wing valve construction cooperating as explained with the throttle valve, renders it possible to control and regulate the speed of the engine with the throttle valve from one extreme of speed to the other. When used in connection with an automobile, while the automobile power transmission mechanism is in a high gear, the generation of gas with this carbureter can be so reduced and minimized that the automobile will move at the slowest possible speed. In other words, without changing the gear on the automobile, its speed can be regulated from the slowest possible movement to the greatest speed with ease and ab-

solute regularity, by operating the throttle and thus controlling the effect of the suction of the engine upon this wing valve. This renders the carbureter peculiarly valuable in use with automobiles and motor boats, for it enables them to be driven at an extremely slow speed without stopping the engine or changing the gear, and this constitutes the chief feature of the invention.

What I claim as my invention and desire to secure by Letters Patent is:

1. A carbureter including a shell forming a gas chamber with an air inlet opening substantially at one side and a gas outlet opening substantially at the other side, a fuel inlet between said air inlet and gas outlet openings, and a spring-controlled rocking valve mounted over said fuel inlet in position to substantially close said chamber, the major portion of said valve lying on the side of the fulcrum thereof opposite said fuel inlet, whereby the suction of the engine will automatically turn the larger portion of said valve above the fulcrum thereof toward the gas outlet and the smaller portion behind the fuel inlet end and thus increase the effect of the suction upon the fuel inlet.

2. A carbureter including a shell forming a gas chamber with an air inlet opening substantially at one side and a gas outlet opening substantially at the other side, a fuel inlet between said air inlet and gas outlet openings, and a spring-controlled rocking valve mounted over said fuel inlet in position to substantially close said chamber, the major portion of said valve lying on the side of the fulcrum thereof opposite said fuel inlet, whereby the suction of the engine will automatically turn the larger portion of said valve above the fulcrum thereof toward the gas outlet and the smaller portion behind the fuel inlet and thus increase the effect of the suction upon the fuel inlet, and a throttle valve between the gas outlet and said rocking valve for modifying the effect of the suction of the engine upon said rocking valve.

3. A carbureter including a shell forming a gas chamber with an air inlet opening substantially at one side and a gas outlet opening substantially at the other side, a fuel inlet nozzle projecting upwardly through the bottom of said shell and between said air inlet and gas outlet opening, a shaft mounted in said shell and extending transversely through said gas chamber and over said fuel inlet nozzle, a wing valve secured to said shaft so as to be normally vertical over the fuel inlet and with the part thereof below the fulcrum being partially cut away so that it will be smaller than the part of said valve above the fulcrum thereof, a spring acting on said shaft tending to prevent the movement of the upper part of said valve toward the gas outlet, and a stop for limiting the return movement of said valve and holding the same substantially vertical over said fuel inlet nozzle, whereby the valve can be actuated by the suction of the engine and then said fuel inlet nozzle will be on the suction side of the valve, substantially as set forth.

4. A carbureter including a gasolene bowl with a cylindrical open top and with a central opening through the bottom thereof, a shell for forming the gas-creating chamber adapted to fit upon and extend down into said bowl and with a tubular extension therefrom through the opening in the bottom of said bowl, which extension is threaded on its outer end, a nut on the outer end of said extension whereby said parts may be adjusted and held in relative positions, a fuel inlet passage way from the bowl through said extension into the chamber within said shell, a valve in said extension and operable from the outside for closing said fuel inlet port, and a waste tube leading from the chamber within said shell, said waste tube extending above the bottom of the shell to a point slightly lower than the upper end of the nozzle.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

BURT NEULON PIERCE.

Witnesses:
OLIVE BREEDEN,
N. ALLEMONG.