S. W. RAPP.

CARBURETER.

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938,894. Patented Nov. 2, 1909.

Fig. 4.

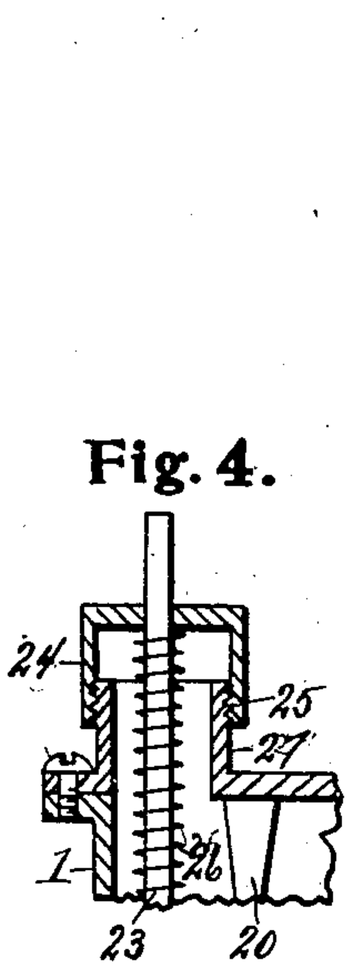
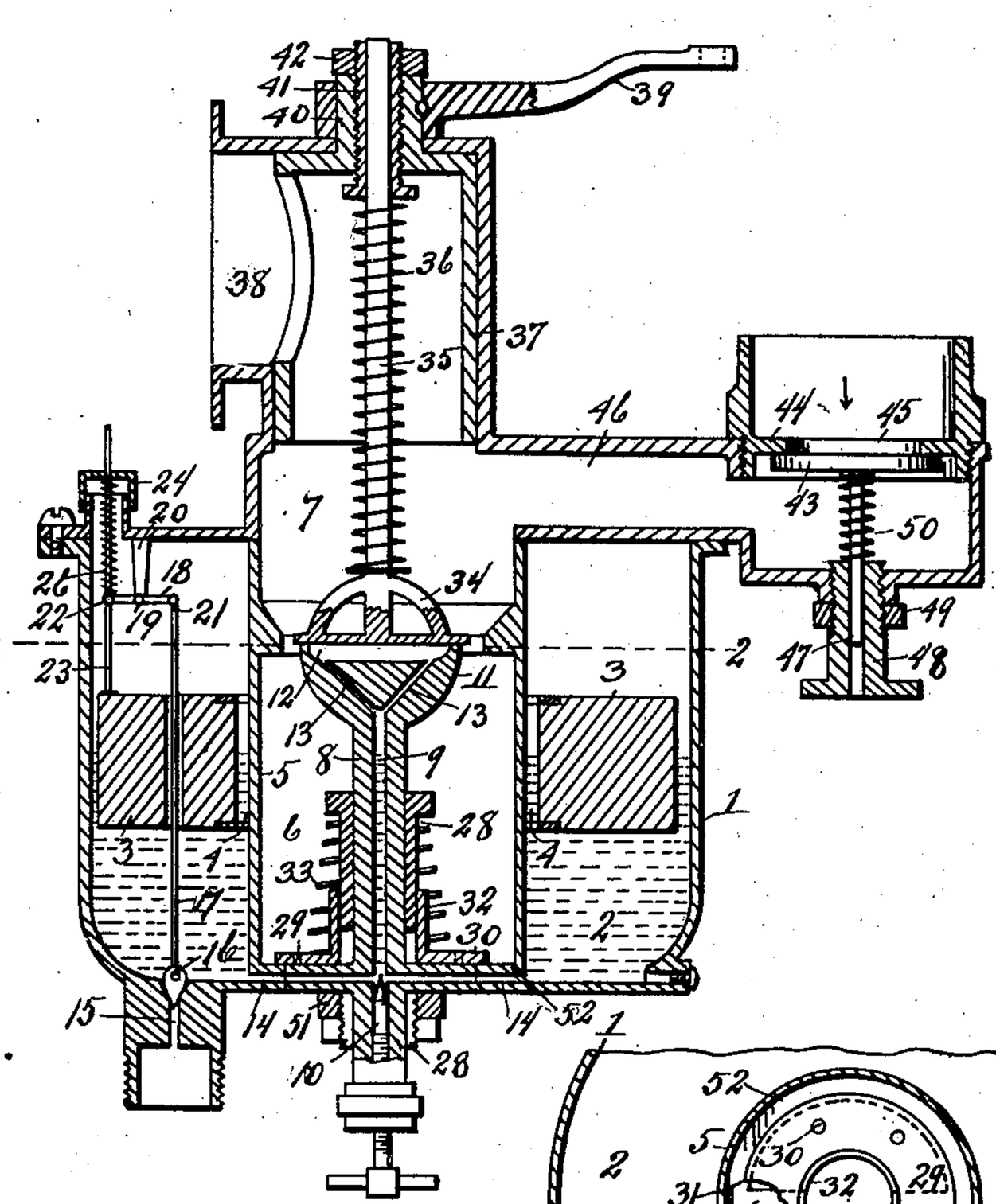


Fig. 1.



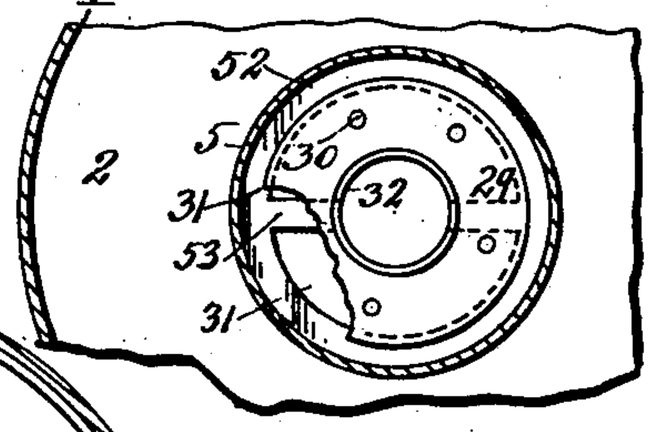


Fig. 3.

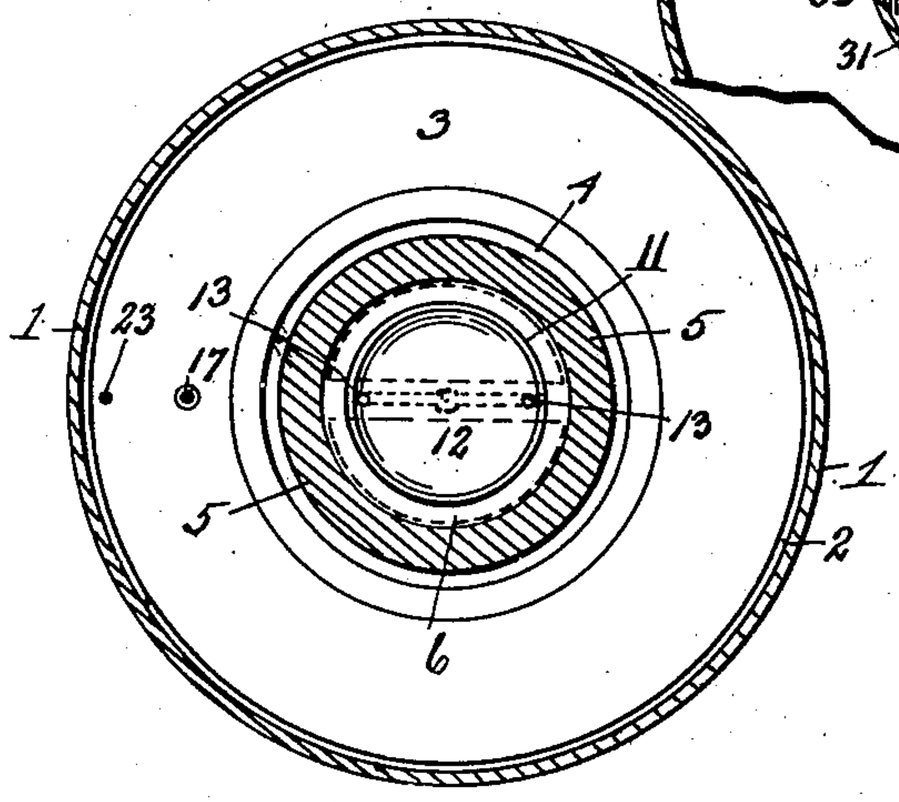


Fig. 2.

Witnesses

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CARBURETER.

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To all whom it may concern:

Be it known that I, SAMUEL WESLEY RAPP, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention has for its object an improved carbureter of superior efficiency and utility, and it consists of the combination of devices and appliances hereinafter described and claimed and illustrated in the accompanying drawings in which,

Figure 1 is a view in vertical section. Fig. 2 is a cross section on the line 2—2 Fig. 1. Fig. 3. is a detail view of one of the air valves with certain related parts in cross section, the arm 8 and sleeve 28 being omitted, and showing a part of the valve broken away. Fig. 4 is a detail view in section of certain parts.

My invention is more particularly adapted for use with automobiles or other analogous vehicles, although I do not limit myself thereto, as the carbureter is equally adapted for use with a gasolene engine for various uses.

In carrying out my invention as illustrated in the drawings submitted herewith, the numeral 1 denotes an exterior case forming a float chamber 2 therewithin, in which is located a float 3 provided with a central orifice indicated at 4.

The numeral 5 indicates an interior case or wall forming therewithin an air chamber 6. The case also is constructed to form a mixing chamber 7. Within the air chamber is a stationary standard 8 provided with a channel 9 controlled by a suitable valve 10, the upper end of the arm being formed with a head 11 having, preferably, a cup shaped recess 12 upon the upper surface thereof, the channel 9 preferably communicating through the head into said cup shaped recess through multiple channels 13 in order to distribute the hydrocarbon into said cup, or cup shaped recess. The float chamber communicates with the channel 9 of said arm or stem through channels 14, the communication of the channels 14 with the channel 9 being governed by the valve 10, preferably a needle valve. The hydrocarbon, as gasolene, is admitted into the float chamber through a channel 15 governed by a valve 16, preferably a needle valve, actuated by the float. To this end the stem 17 of the valve is shown passed through the float and is engaged at its upper end with an evener 18 fulcrumed at 19 upon a suitable bracket 20, shown depending from the upper portion of the case. The stem 17 of the valve has a jointed engagement with the evener as indicated at 21, the opposite end of the evener being jointedly connected, as indicated at 22, with a stem or rod 23 adapted to be contacted by the float at its lower end. The upper end of the rod 23 passes through a cap 24, preferably having a threaded engagement with the case as indicated at 25, Fig. 4, so that the cap may be adjusted, the upper end of the rod 23 being provided with a spring 26, the tension of which may be governed by the adjustment of the cap 24.

It will be evident that the adjustment of the cap 24 and the point at which the float may come in contact with the rod may be governed from the exterior without having to remove the cap or cover of the carbureter. This construction, it will be seen, makes the means of adjustment very accessible, and avoids all liability of the carbureter overflowing, the means of adjustment being accessible at any time whether on the road or off the road, without removing any parts of the carbureter or otherwise changing any of the mechanism.

About the lower end of the arm or standard 9 is located a sleeve 28, and about the lower end of the sleeve, and resting upon the base of the air chamber, is a valve 29, shown in detail in Fig. 3, provided with multiple openings 30 communicable through openings 31 in the base of the air chamber for the admission of air into the air chamber. The valve 29 is provided with an upwardly extended sleeve 32 surrounding the lower end of the sleeve 28, and in which the sleeve 28 is adjustable. The sleeve 28 slides upon the standard 8 and has a lower forked extremity extending over and below the part 14. A spring 33 is engaged about the sleeve 28 and the sleeve 32, its tension being exerted upon the sleeve 28 and valve 29. The air chamber is communicable with the mixing chamber about the periphery of the head 11. A valve 34 is arranged to seat upon the upper edge

of the head 11, as shown, to govern the communication of the hydrocarbon from the cup into the mixing chamber. The valve 34 is provided with a stem 35 extended through the case of the carbureter as shown, and is provided with a spring 36. Within the upper portion of the case is a throttle valve 37 to control the passage of the mixture to the engine, as through an arm 38. A throttle lever 39 is engaged with the throttle valve, said valve provided with an extension 40 with which the throttle lever has a rigid engagement. Within the tubular extension 40 of the throttle valve is a sleeve 41 having a loosely threaded engagement in the tubular end of the throttle valve, an adjusting nut 42 being engaged upon the upper end of the sleeve 41 to permit of the adjustment of the spring 36 from the exterior of the carbureter. An additional air valve 43 seats on the under side of a diaphragm 44 through which diaphragm, as through an opening 45, an additional supply of air may be admitted into the mixing chamber, as through an auxiliary air channel 46, the valve 43 being provided with a stem 47 extended into a channeled arm 48 having a threaded engagement into the case and provided with an adjusting nut or nuts indicated at 49. A spring 50 surrounds the upper portion of the stem 47, its tension being capable of adjustment by the adjustment of the channeled arm 48 in the case. The valve 34 is automatically regulated by the spring upon the stem, said spring exerting its tension upon the sleeve 41 and upon the valve 34. This construction prevents danger of back firing, or the blowing out of the charge through the carbureter.

It will readily be seen that the hydrocarbon passes from the float chamber to the cup in the head 11, the communication of the hydrocarbon into the cup being governed by the valve 10, while at the same time air enters into the air chamber and thence into the mixing chamber. When the engine is working, suction lifts the valve 34 and allows the hydrocarbon to flow into the cup or perforated head 11. When the valve 34 is lifted, there is created a suction on the air valve 29, allowing the air to pass by the head 11 into the mixing chamber, the air from the air chamber passing about the periphery of the said head into the mixing chamber. If the engine works hard and needs more air, an increased supply of air will be admitted through the valve 43, said valve being drawn off from its seat by suction. The tension of the spring 36 upon the sleeve 41 prevents the sleeve from turning with the throttle valve, while at the same time the sleeve works through its threaded engagement with the throttle to raise or lower the sleeve in the extended arm of the throttle. When the throttle is thrown wide open, the tension on the spring 36 will obviously be weakened, allowing more of the mixture to pass to the engine. When the throttle is closed, the tension will become stronger correspondingly cutting off the supply of the mixture to the engine. When the throttle is open, the sleeve 41 rises, diminishing tension on the spring 36. Two adjusting nuts 51 are shown threaded upon the lower end of the sleeve 28 to adjust the tension on the spring 33, the valve 29 being thus an adjustable air valve, the valve 29 slipping up and down on the sleeve 28, the sleeve 28 being maintained in position by the spring 33.

As already described, the tendency of the suction is to raise the valve 29 to let in more air. By the suction also upon the valve 34 it is lifted to allow the hydrocarbon to flow into the cup of the head 11. When the air valve 29 is lifted, air is allowed to pass to the mixing chamber, as already described, and if not enough air is admitted through the air chamber into the mixing chamber, the valve 43 is also opened by suction to admit more air. It will be evident that when the float actuates the valve 16, said valve may close, the float striking the rod or stem 23. As the turning of the throttle lever turns the sleeve 41, the tension of the spring 36 is readily regulated thereby. The cap 24 is sleeved upon a tubular extension of the case.

It will be evident that the tension of the spring 26 will govern the upward movement of the float. The base of the wall 5 is provided with an inwardly turned flange 52 upon which the periphery of the valve 29 seats, the channels 14 being formed in the web 53, the lower end of the wall 5 being opened on each side of the web within the inner periphery of the flange 52.

It will be seen that in applicant's construction the suction valve 34 is preferably spaced from the underlying surface of the recess 12, permitting a priming charge of hydrocarbon to constantly fill said recess in readiness for starting the work of the carbureter.

It will be understood that it is customary to locate the tank to supply fuel to the carbureter above the carbureter so that the fuel will feed from the tank to the carbureter by gravity pressure, or instead thereof air pressure may be applied to the fuel tank to force the fuel into the carbureter. It will be seen that since the stem 17 of the valve 16 and the rod 23 have a jointed connection with the evener 18, the valve will be closed when the evener is in horizontal position, and the end of the evener connected with the rod must be depressed and the rod lowered in order to open the valve. The

tension of the spring upon the rod 23 will so depress the end of the evener and open the valve whenever the engine consumes enough fuel from the float chamber to lower its level and cause the float to fall. In other words, the spring tension upon the rod will force the same downward with the float in proportion to the lowering of the fuel level thereby opening the valve and the inflow of fuel will continue until the level in the chamber is raised sufficiently to raise the float against the tension of said spring and again close the valve. It is evident that there are opposing pressures exerted upon the float, the spring pressure of the rod 23 and the pressure of the fuel entering the float chamber, while at the same time the weight of the float exerts a pressure against the inflowing fuel. The greater the tension of the spring the greater the resistance to the lifting of the float and the greater must be the volume of liquid displaced by the float before the liquid will raise the float and close the valve. Therefore the greater the tension of the spring the higher the level of the fuel will go in the chamber before it will exert a lifting force great enough to overcome the weight of the float and the tension of the spring. The fuel correspondingly rises in the channeled standard 8, the only exit for the fuel from the float chamber being up within said standard and it will be seen that the tension of the spring may be so adjusted that the fuel will rise high enough within said standard to form a priming charge in the recess 12. The channeled standard may evidently be of any desired height.

What I claim as my invention is:

1. A carbureter comprising a float chamber, a float therewithin, an air chamber within the float chamber, communicable with the exterior of the carbureter, a mixing chamber communicable with the air chamber, a channeled standard within the air chamber through which the mixing chamber communicates with the float chamber, valve mechanism actuated by said float to control the admission of fuel to the float chamber, a valve at the base of the air chamber to control the admission of fuel from the float chamber to the mixing chamber, a suction actuated air valve encircling said standard and movable lengthwise of said standard to control the admission of air into the air chamber, a suction actuated hydrocarbon valve at the base of the mixing chamber to further control the admission of hydrocarbon into the mixing chamber, throttle mechanism to control the exit from the mixing chamber, a spring to exert the tension upon said air valve, and means to govern the tension of said springs.

2. A carbureter comprising a float chamber, an air chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the float chamber and with the air chamber, a float actuated valve to control the admission of fuel to the float chamber, a suction actuated valve to control the admission of air into the air chamber, a suction actuated hydrocarbon valve to control the admission of hydrocarbon into the mixing chamber, throttle mechanism to control the exit from the mixing chamber, a spring exerting its tension upon the hydrocarbon valve, and means to govern the tension of said spring.

3. A carbureter comprising a float chamber, an air chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the float chamber and with the air chamber, a float actuated valve to control the admission of fuel to the float chamber, a suction actuated valve to control the admission of air into the air chamber, a suction actuated hydrocarbon valve to control the admission of hydrocarbon into the mixing chamber, throttle mechanism to control the exit from the mixing chamber, and a spring exerting its tension upon the hydrocarbon valve, said throttle mechanism comprising means to govern the tension of said spring.

4. A carbureter comprising a float chamber, an air chamber communicable with the exterior of the carbureter, a mixing chamber, a channeled arm extending through the air chamber communicable with the mixing chamber and with the float chamber, a suction actuated hydrocarbon valve to control the communication of the channeled arm into the mixing chamber, a float actuated valve to control the admission of fuel to the float chamber, a suction actuated air valve provided with a tubular stem to control the admission of air into the air chamber, a sleeve upon said arm having a reciprocatory engagement with the tubular stem of the air valve, and a spring exerting its tension upon said sleeve and upon the air valve, said sleeve provided with means to govern the tension of the spring.

5. A carbureter comprising a float chamber, an air chamber within the float chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the air chamber, a channeled standard located in the air chamber communicable with the mixing chamber and with the float chamber, a valve to control the communication of the float chamber with the mixing chamber, float actuated valve mechanism to control the admission of fuel to the float chamber, a vertically movable suction actuated hydrocarbon valve to control the communication of the channeled standard into the mixing chamber, and a suction actuated

air valve at the base of the air chamber encircling said standard to control the admission of air into the air chamber, said standard constructed with a head provided with a cup-shaped recess upon the upper end thereof into which the hydrocarbon is admitted by the action of the said hydrocarbon valve, said hydrocarbon valve seating upon the upper end of said head above the base of said recess.

6. A carbureter comprising a float chamber, an air chamber within the float chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the air chamber, a channeled standard located in the air chamber communicable with the mixing chamber and with the float chamber, a valve to control the communication of the float chamber with the mixing chamber, float actuated valve mechanism to control the admission of fuel to the float chamber, a vertically movable suction actuated hydrocarbon valve to control the communication of the channeled standard into the mixing chamber, and a suction actuated air valve at the base of the air chamber encircling said standard to control the admission of air into the air chamber, said standard constructed with a head provided with a cup shaped recess upon the upper end thereof into which the hydrocarbon is admitted by the action of the said hydrocarbon valve, said hydrocarbon valve seating upon the upper end of said head above the base of said recess, throttle mechanism to control the exit from the mixing chamber, an auxiliary air channel leading into the mixing chamber, and an additional suction actuated air valve to admit an increased supply of air through said auxiliary air channel into the mixing chamber.

7. A carbureter comprising a float chamber, an air chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the air chamber, a channeled standard located in the air chamber communicable with the mixing chamber and with the float chamber, float actuated valve mechanism to control the admission of fuel to the float chamber, a suction actuated hydrocarbon valve to control the communication of the channeled standard into the mixing chamber, and a suction actuated air valve encircling said standard and movable lengthwise of said standard to control the admission of air into the air chamber, said standard constructed with a cup shaped recess upon the upper end thereof into which the hydrocarbon is admitted, said hydrocarbon valve seating upon the upper edge of said standard and spaced from the base of said recess, said channeled standard provided with plural channels into said recess.

8. A carbureter comprising an inclosing case, a float chamber within said case to receive the fuel, an air chamber within the float chamber communicable with the atmosphere, means to control the communication of the air chamber with the atmosphere, a mixing chamber communicable with the air chamber and with the float chamber, means at the base of the air chamber to control the communication of the mixing chamber with the float chamber, a suction actuated hydrocarbon valve to further control the admission of fuel into the mixing chamber, throttle mechanism to control the exit from the mixing chamber, a float actuated valve to control the admission of fuel to the float chamber provided with a valve stem, an evener pivoted intermediate its ends and adapted to be turned on its pivot by the movement of the float and connected at one end with the stem of the float actuated valve to actuate said valve, a rod connected with the opposite end of the evener extending through the case of the float chamber, a spring upon said rod, and an adjustable cap upon said case to govern the tension of said spring.

9. A carbureter comprising a float chamber, a float within said chamber, an air chamber within the float chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the air chamber, a channeled standard within the air chamber through which the mixing chamber communicates with the float chamber, a cupped head on the upper end of said standard formed with a plurality of channels leading from the channel in the standard into the bottom of the cup near its periphery, a valve actuated by said float to control the admission of fuel to the float chamber, a spring to exert a pressure upon said float, means for adjusting the tension of said spring, an adjustable sleeve upon said standard, a suction actuated air valve to control the admission of air into the air chamber, a spring between said air valve and sleeve, a suction actuated hydrocarbon valve seated upon the cupped upper end of the standard to further control the admission of hydrocarbon into the mixing chamber, and throttle mechanism to control exit from the mixing chamber.

10. A carbureter comprising a float chamber, an air chamber communicable with the exterior of the carbureter, a mixing chamber communicable with the float chamber and with the air chamber, a float actuated valve to control the admission of fuel to the float chamber, a valve at the base of the air chamber to control the admission of fuel from the float chamber to the mixing chamber, a suction actuated valve to control the admission of air into the air chamber, a suction actuated valve at the base of the mixing

chamber to further control the admission of hydrocarbon into the mixing chamber, throttle mechanism to control the exit from the mixing chamber, an evener connected at one end with the stem of the float actuated valve, a rod connected with the opposite end of the evener extending through the case of the float chamber, a cap having a threaded engagement with the case to adjust said rod, and a spring upon said rod the tension of said spring being adjusted by said cap.

In testimony whereof I have signed this specification in presence of two witnesses.

SAMUEL W. RAPP.

Witnesses:
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G. E. MCGRANN.