G. M. HOLLEY.

CARBURETER.

APPLICATION FILED MAY 9, 1906.

945,167.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

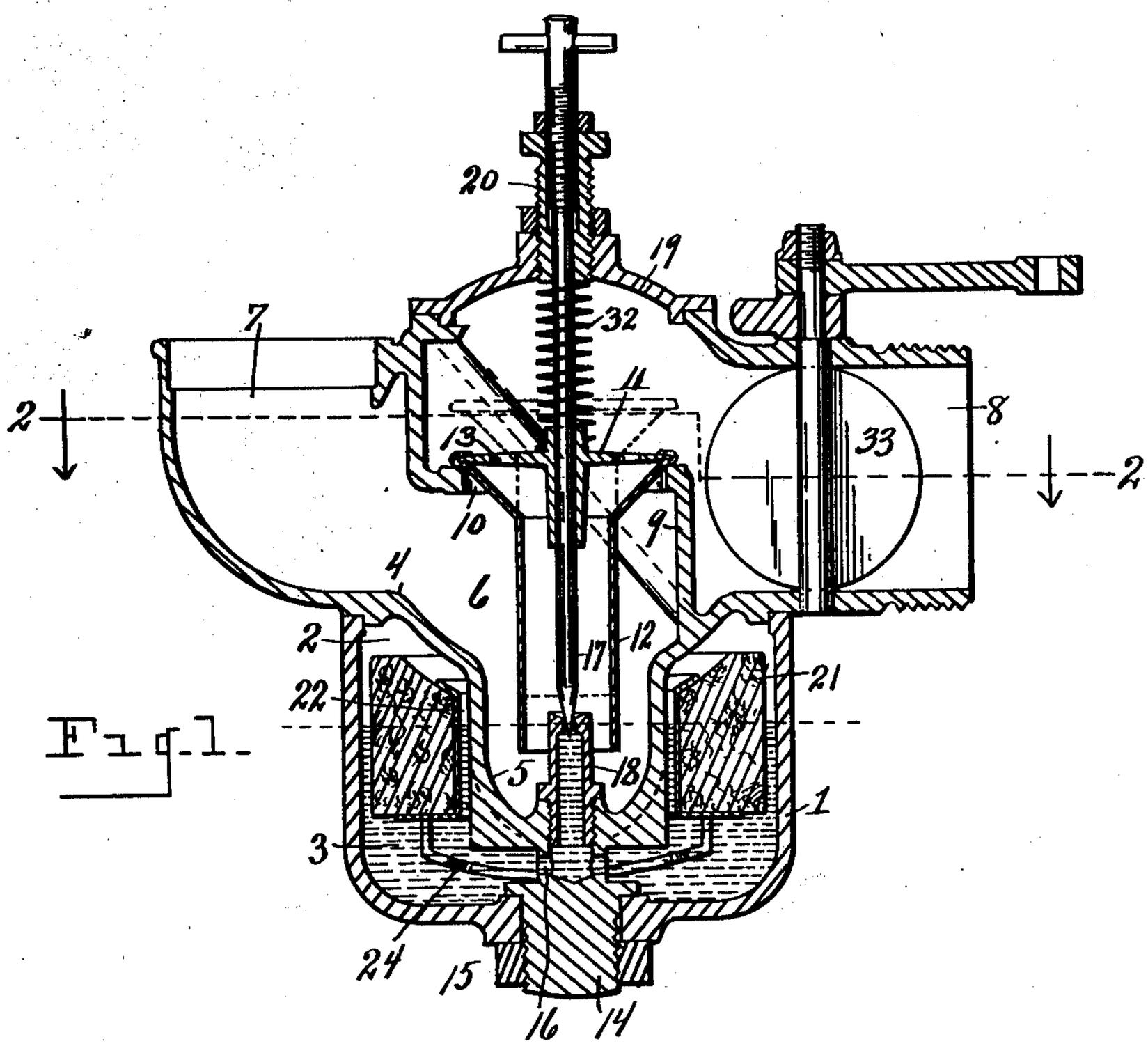
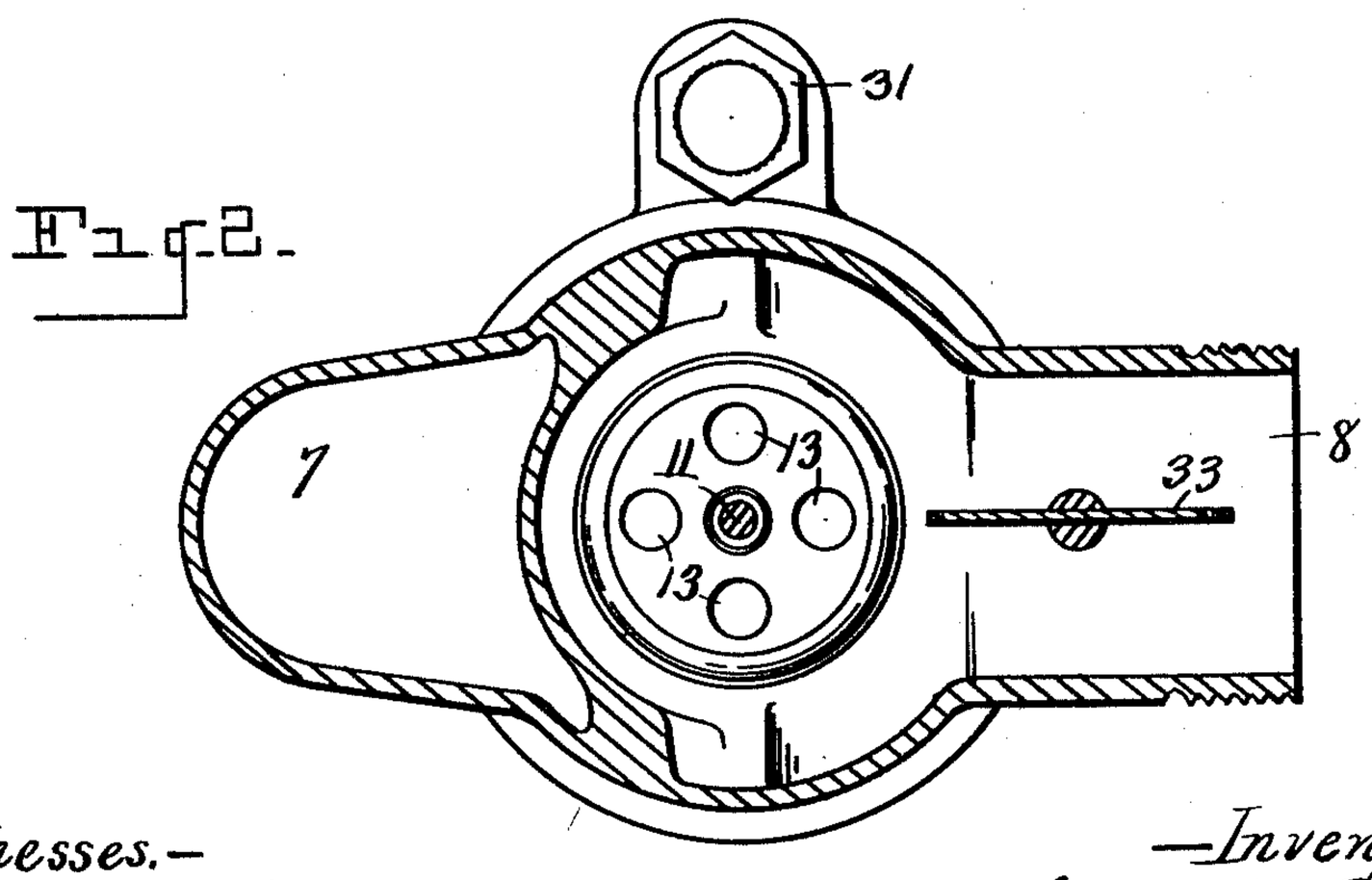


Fig. 2.



—Witnesses.—

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2 SHEETS—SHEET 2.

Fig. 3.

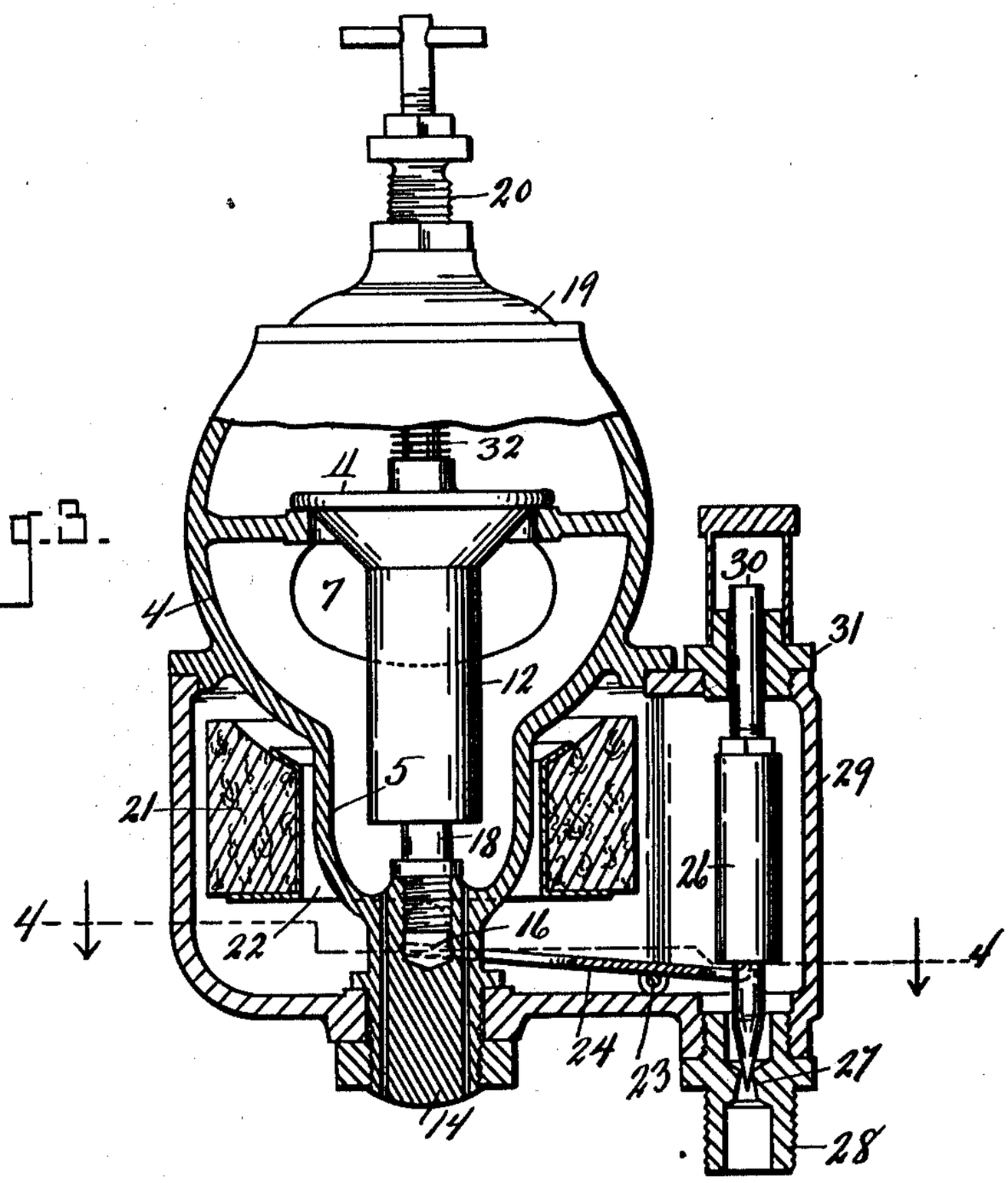
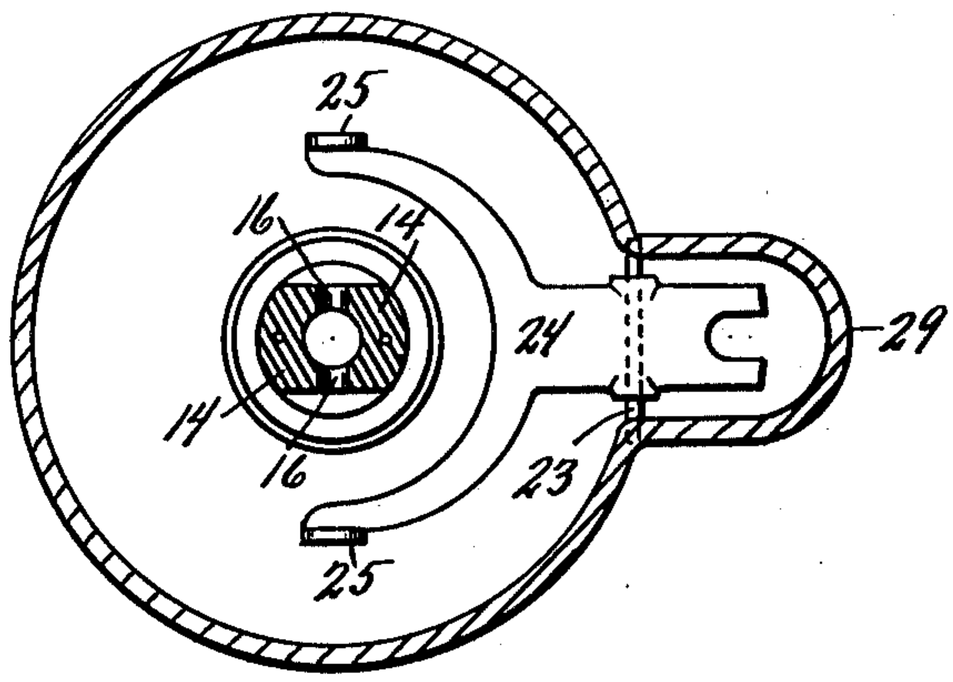


Fig. 4.



Witnesses.
O. B. Buenziger.
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UNITED STATES PATENT OFFICE.

GEORGE M. HOLLEY, OF DETROIT, MICHIGAN, ASSIGNOR TO HOLLEY BROTHERS CO., OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CARBURETER.

945,167. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed May 9, 1906. Serial No. 315,875.

To all whom it may concern:

Be it known that I, GEORGE M. HOLLEY, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Carbureters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to carbureters for explosive engines, and consists in the construction and arrangement of parts hereinafter fully set forth and pointed out particularly in the claims.

The object of the invention is to provide a device of the character described of comparatively simple and inexpensive construction in which the arrangement is such as to maintain the gasolene level constant at a given point, and to provide for supplying a properly mixed explosive charge to the engine under varying degrees of speed and load.

The above object is attained by the apparatus illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse section through a carbureter involving this invention. Fig. 2 is a horizontal section as on line 2—2 of Fig. 1. Fig. 3 is a vertical section through the carbureter at right angles to Fig. 1. Fig. 4 is a horizontal section as on line 4—4 of Fig. 3.

Referring to the characters of reference, 1 designates a hollow annular case which forms a reservoir 2 for the hydrocarbon or other fuel 3. Seated upon the case or reservoir is a globular body 4 (see Fig. 3) having a reduced annular portion 5 which depends centrally within the reservoir. Within the lower portion of the globular body is the carbureting chamber 6 with which communicates the air intake port 7. Crossing the interior of the body and dividing the carbureting chamber from the outlet port 8 which communicates with the engine cylinder, is an angular partition 9 through the horizontal portion of which is formed a valve opening 10. Seated in said opening is a valve 11 having depending therefrom the choke tube 12. Formed through said valve are the apertures 13.

Extending downwardly from the reduced annular portion 5 of the body is a plug 14 which passes through a central opening in the bottom of the reservoir and is threaded to receive the nut 15, whereby said parts may be secured together. Passing transversely through the plug 14 is an aperture 16. Extending downwardly into the plug from the interior of the carbureting chamber and communicating with said transverse opening is a vertical opening or passage in which is screwed a nozzle 18, the upper end of which stands centrally within the carbureting chamber and is provided with a reduced opening into which extends the lower end of the needle point valve 17. The stem of said valve 17 passes freely through a bearing in the center of valve 11 forming a guide therefor, and through the cap 19 of the body being threaded in a sleeve 20 which screws into said cap. By means of the transverse passage 16 in the plug 14 and the nozzle 18 which communicates with said passage, the hydrocarbon fuel is permitted to rise in the nozzle to the level of said fuel in the reservoir. In order to maintain the fuel level in the reservoir constant on a plane with the top of the nozzle an annular float 21 is employed which surrounds the reduced annular portion 5 of the body and is provided with a metal core or lining 22. Pivoted at 23 within the bottom of the reservoir is a bifurcated lever 24, the forked end of which straddles the plug 14 and is provided at the extremity of the forked members with the upwardly projecting lugs 25 upon which the float rests when the reservoir is empty. The opposite end of the lever 24 engages, as shown, the weighted needle point valve 26 adapted, by gravity, to normally close the valve opening 27 through the opening 28 which is screwed into the lower end of a housing or offset 29 on the side of the reservoir in which the valve 26 is located. To the plug 28 is adapted to be connected the gasolene supply pipe, not shown. The upper end of the valve 26, as shown at 30, is reduced and is supported for vertical play in a fitting 31 in the upper end of the housing 29. The weight of the float 22 is sufficient to cause the lever 24 to raise the valve 26 and permit the gasolene to fill the reservoir sufficiently to lift the float from the

end of the lever 24, when the weight of said valve will seat it and stop the inflow of gasolene. Should the level of the gasolene in the reservoir drop below the desired point, the float will again engage and actuate the lever 24 to open the valve and permit the gasolene to again enter the reservoir. By this arrangement the gasolene in the reservoir is maintained at a given level.

The tube 12 which depends from the valve 11 embraces at its lower end the upper end of the nozzle 18. Confined between the valve 11 and the sleeve 20 is a spring 32 which embraces the stem of the needle valve 17 and which normally maintains said valve on its seat. By means of said threaded sleeve which screws through the cap, any desired tension may be placed upon said spring. In the educt port 8 is a throttle valve 33 whereby the quantity of carbureted air which passes to the engine may be regulated.

In the operation of this device when the engine is running at low speed, the return stroke of the piston creates a partial vacuum in the body of the carbureter between the valve 11 and the educt port causing a strong rush of air through the apertures 13 in said valve and through the tube 12. This draft of air which is created through said tube, passing as it does, around the nozzle 18, carries with it a quantity of gasolene to form an explosive mixture that passes into the explosion chamber of the engine in a manner well understood in the art. This arrangement insures a proper charge of gasolene at the starting of the engine or when running at low speed, because of the fact that all of the air which is drawn into the carbureter must pass through the tube 12 around the upwardly projecting end of the nozzle. As the engine increases in speed, the amount of air which is permitted to pass through the apertures 13 in the valve, will not be sufficient to reduce the vacuum, consequently said valve will be lifted from its seat, as shown by dotted lines in Fig. 2, and air will be drawn around said valve as well as through the tube 12, the greater volume of air being mixed with the gasolene vapor which passes upwardly through said tube to create the explosive charge, which increase in the volume of air is necessary to balance the increased quantity of gasolene which is drawn from the nozzle by the accelerated passage of the air through the tube 12. In this manner a proper mixture is maintained at all times irrespective of the speed of the engine.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a carbureter, the combination of a body having an air induct and a mixture educt port, a partition crossing the interior of the body separating said ports, said partition having a valve opening therethrough, a valve seated in said opening and having through the top thereof a plurality of relatively small apertures, a depending tube attached to the valve to embrace said apertures, a fuel supply nozzle projecting into the lower end of said tube, and a valve for regulating the supply of fuel.

2. In a carbureter, the combination of a body having an air induct port and a mixture educt port, said ports being in substantially the same horizontal plane, a partition crossing the body separating said ports, said partition having a valve opening therein, said body having a central portion depending between said ports and communicating directly with the air induct and forming a carbureting chamber, a valve seated in the opening in said partition having a restricted opening therethrough and arranged when raised to afford an air passage therearound independently of said restricted passage, a tube depending from said valve within said carbureting chamber, a gasolene supply nozzle projecting into said chamber and embraced by the lower end of said tube, a valve seated in said nozzle to control the passage of gasolene, and a spring engaging said first-mentioned valve to normally hold it to its seat.

3. In a carbureter, the combination of a globular body having an air induct port and a mixture educt port, a reduced annular portion depending centrally from said body forming within it a carbureting chamber, a reservoir secured to the body around said depending portion; a nozzle communicating with the interior of the reservoir and projecting through the bottom of said depending central portion into the carbureting chamber, a float valve in the reservoir for maintaining the gasolene at a proper level in said nozzle, a partition crossing the interior of the globular body separating the ports therein, said partition having a valve opening, a valve seated in said opening and having a restricted passage way therethrough, a tube embracing the restricted passage way in the valve and depending therefrom into the carbureting chamber, the lower end of said tube embracing the gasolene nozzle, and means for controlling the gasolene supply.

4. A carbureter comprising a globular body having an air induct port and a mixture educt port, a partition crossing the interior of said body separating said ports and having a valve opening, said globular body having a depending central portion forming a carbureting chamber, a gasolene supply nozzle projecting centrally through the bottom of said depending portion into said chamber, a valve seated in the opening in said partition having a restricted passage way therethrough, a tube embracing said restricted passage way and depending from

said valve, the lower end of said tube surrounding the gasolene nozzle, a needle point valve seated in the upper end of the gasolene nozzle and having a stem which passes centrally through said first-mentioned valve and forms a guide therefor, and a spring surrounding said stem.

5. In a device of the class described, a mixing chamber having a suitable outlet opening and provided with an air inlet opening in its bottom, in combination with an air inlet chamber beneath said mixing chamber and having in its floor a well, a reservoir surrounding said well, a valve arranged in said inlet opening and having a tubular part depending into said well, a nozzle extending from the bottom of said well into the lower end of said tubular part, and means for adjusting said nozzle.

6. In a device of the class described, a mixing chamber having a suitable outlet opening and provided with an air inlet opening in its bottom, in combination with an air inlet chamber beneath said mixing chamber and having in its floor a well, a valve arranged in said inlet opening and having a tubular vapor conducting part depending into said well, a nozzle extending into the lower end of said tubular part, a nozzle adjusting member concentric with said valve and guiding the same and an adjustable spring resisting the opening of the valve.

7. In a device of the class described, a mixing chamber having an air inlet opening in its bottom and provided with a suitable outlet, in combination with a vertically movable valve arranged in said inlet opening and having a tubular extension depending therefrom, a nozzle located in the lower end of said extension and communicating with the mixing chamber therethrough, said nozzle having a jet opening, a spring pressing upon said valve, means above said chamber for adjusting said nozzle and said spring, and a reservoir, concentric with said tube and nozzle.

8. In a device of the class described a mixing chamber having an outlet opening and provided with an air inlet opening in its bottom, a liquid nozzle beneath said opening, a vertically movable vapor tube or passage surrounding said nozzle and communicating with said chamber, an air valve whereto the upper end of said tube is joined, and a nozzle adjusting member concentric with said valve and serving as a guide for said tube.

9. A device of the class described comprising separable members together containing an air inlet chamber and a mixing chamber, in combination with a valve automatically controlling the admission of air to said mixing chamber, a vapor tube in connection with said valve, and a liquid nozzle comprising parts upon said separable members, one of said parts being adjustable and serving as a guide for said vapor tube, and means upon its respective member for holding the adjustable part in adjusted position whereby said members may be separated and assembled without disturbing the nozzle adjustment.

In testimony whereof, I sign this specification in the presence of two witnesses.

GEORGE M. HOLLEY.

Witnesses:
E. S. WHEELER,
I. G. HOWLETT.