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BEST AVAILABLE COPY PATENTED APR. 17, 1906.

C. STUTE.

CARBURETER.

APPLICATION FILED MAR. 25, 1905.

3 SHEETS—SHEET 1.

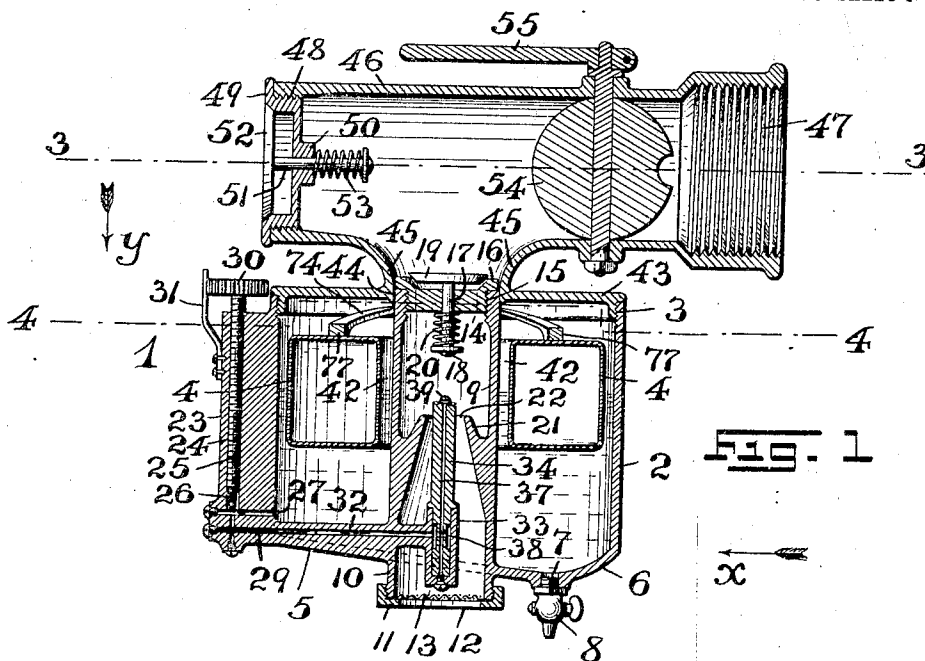
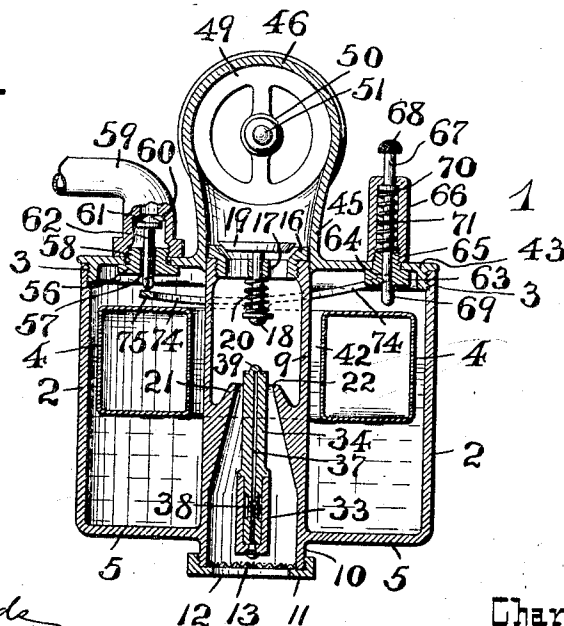


FIG. 2



WITNESSES

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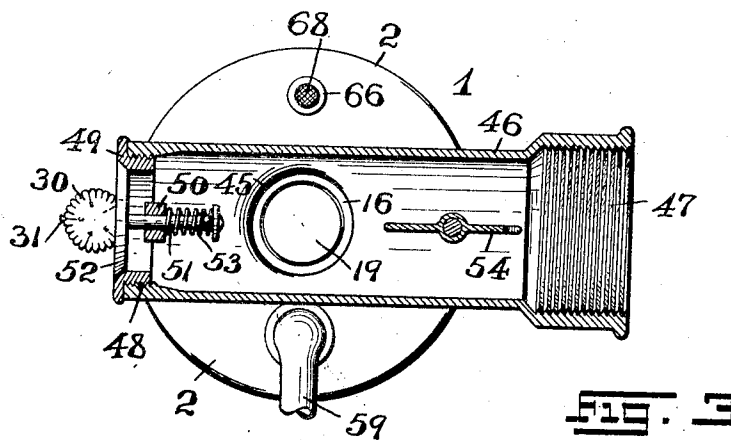
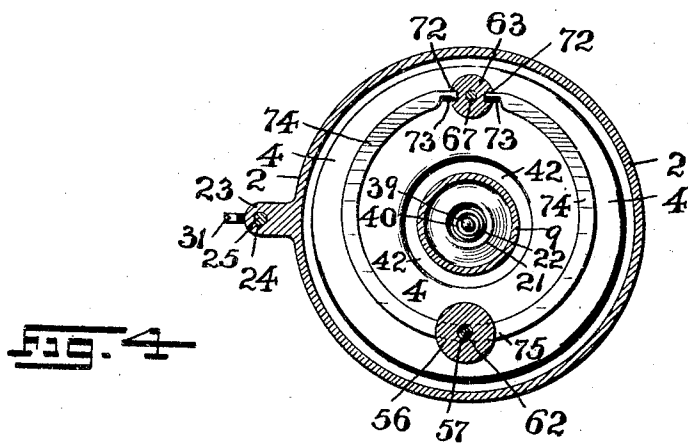
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WITNESSES

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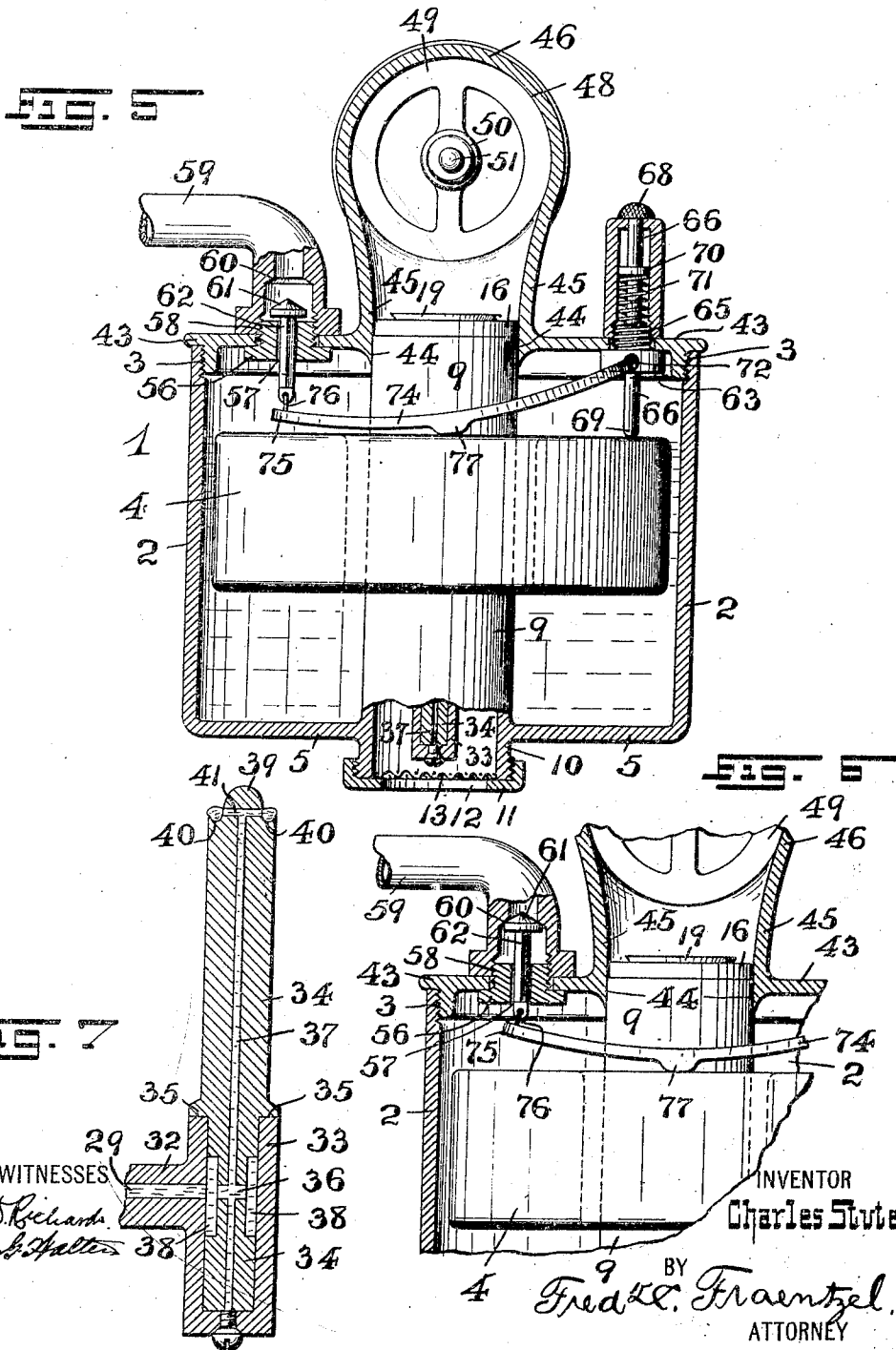
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

CHARLES STUTE, OF NEWARK, NEW JERSEY.

CARBURETER.

No. 817,941.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed March 25, 1905. Serial No. 251,927.

To all whom it may concern:

Be it known that I, CHARLES STUTE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Carbureters; and I do hereby 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 characters of reference marked thereon, which form a part of this specification.

This invention has reference generally to improvements in carbureters for gas-engines; and the present invention has for its principal objects to provide a novel and simply-constructed apparatus or device in which a perfect admixture of the gasoline with air to produce the explosive gas which is to be exploded in the cylinder of the gas-engine.

The invention has for its further object to provide in addition to the carbureting chamber or cylinder a gasoline reservoir or chamber provided with an automatically-operating means for controlling the supply of the gasoline within the said reservoir by opening and closing an inlet-valve as the level of the fluid within the reservoir becomes lowered or is raised, substantially as and for the purposes hereinafter more fully specified.

A further object of this invention is to provide a novel means or device for priming or originally filling the gasoline reservoir or chamber with the fluid, and, furthermore, this invention has for its further important object a novel arrangement of gas-inlet valve and back-fire valve connected with the gas-duct of the carbureter to prevent the burning gas or back-fire from entering the carbureting chamber or cylinder and causing an explosion of the mixed gas therein, the arrangement of the back-fire valve being such that the burning gas or back-fire will escape through the said valve into the open air.

The invention has for its further objects to provide a novel arrangement and construction of parts which will prevent overheating, and hence avoid any possibility of an explosion of the gasoline, and, furthermore, to provide a novel and separable arrangement of the various parts whereby the parts can be quickly unscrewed one from the other to get at the valves and other parts of the device for cleaning purposes or for repairs.

Other objects of this invention not at this time more particularly mentioned will be clearly evident from the following detailed description of the same.

With the various objects of my present invention in view the same consists in the novel carbureter for gas-engines hereinafter more fully set forth; and, furthermore, this invention consists in the novel arrangements and combinations of the various devices and parts as well as in the details of the construction of the same, all of which will be presently more fully described and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal vertical section of a carbureter embodying the principles of the present invention, and Fig. 2 is a transverse vertical section of the same at right angles to the plane of section represented in Fig. 1 when looking in the direction of the arrow X in said Fig. 1. Fig. 3 is a horizontal section of the carbureter, said section being taken on line 3 3 in said Fig. 1 looking in the direction of the arrow Y; and Fig. 4 is a similar section of the device, said section being taken on line 4 4 in said Fig. 1 of the drawings with the gas-inlet valve omitted. Fig. 5 is a view of the carbureter, partly in transverse vertical section and partly in elevation, said view being made on an enlarged scale and representing the parts in their relative position during the act of priming or filling the gasoline reservoir or tank with gasoline; and Fig. 6 is a detail sectional representation of certain parts of the device, showing the gasoline-inlet valve in its closed position. Fig. 7 is a detail vertical section of the spray-nozzle, the same being made on an enlarged scale to more clearly show the general arrangement and construction of the parts of the same.

Similar characters of reference are employed in all of the said above-described views to indicate corresponding parts.

Referring now to the several figures of the drawings, the reference character 1 indicates the complete carbureter. The same consists, essentially, of a main shell or body 2, which preferably is of cylindrical configuration and is made with an open top having a screw-thread 3 upon its inner surface, substantially as shown in Figs. 1, 2, 5, and 6 of the drawings.

In the closed bottom 5 of the said shell or body 2 is a depressed part 6, having its lowest part at one side in said bottom for the collection of any sediment or water in said lowest part. An opening 7 and an outlet-cock 8 is provided at that point for draining or drawing off such sediment, water, or other matter from the interior of the shell or body 2 whenever necessary. Within the interior of said shell or body 2 and preferably integrally connected with the central portion of the bottom 5 of said shell or body 2 is an upwardly-extending hollow cylindrical body 9. The lower open portion 10 of said cylindrical body 9 projects below the outer surface of the closed bottom of the main shell or body 2, the said projecting portion being provided with a cap 11, having an opening 12 therein and which is employed for securing a screen 13 over the said lower open portion 10 of the cylindrical body 9, substantially as illustrated. In this manner a screened air intake or feed is provided. The upper and open-ended portion 14 of the said cylindrical body 9 extends, preferably, above the plane of the marginal edge which surrounds the upper opening of the main body or shell 2, the said open-ended portion 14 being provided with an internal screw-thread 15, substantially as shown. Screwed into the said open-ended portion 14 is a spider-shaped valve-seat 16, having a central bearing 17, in which is movably arranged the spindle or stem 18 of a valve-disk 19. The said disk 19 is normally closed upon the valve-seat 16 by the action of a spring 20, arranged upon the valve-stem 18 preferably as shown. Within the central portion of the said cylindrical body 9 is a nozzle-shaped member 21, having a contracted end provided with an opening 22 for the purposes to be presently more fully described. Referring now to Figs. 1 and 4 of the drawings, it will be seen that the said main shell or body 2 is made at one side with an enlarged part 23, having a screw-threaded duct 24 for the reception of a screw-threaded stem 25, which is provided with a needle-point 26, arranged to open and close a passage-way through an arrangement of ducts 27, 28, and 29. The upper end of the said stem 25 is provided with a graduated finger-piece 30, and 31 is an index secured to the side of said enlarged part 23 and extending upwardly in contact with the marginal edge of said finger-piece 30. The said duct 29 is formed in a part 32, constituting a part of the bottom of the main shell or body 2 and also forming a portion of and extending into the lower part of the cylindrical body 9. Upon its free end the said part 32 is made with a hollow member 33 at right angles to the said free end of the part 32. This said member 33 acts as a support for and is constructed to receive the lower portion of a tube or member 34, having a shoulder 35 and provided with the ducts

36 and 37 and annular receiving part 38, all in communication with the duct 29 in the part 32, whereby a complete passage for the fluid gasoline from within the said main body or shell 2 is established through the ducts 27 28 29 with the annular receiving part 38 and the ducts 36 and 37 of the tube or member 34. The upper end portion of this tube or member 34 projects through the opening 22 and slightly above the contracted end of the said nozzle-shaped member 21, the said tube or member 34 being made with a closed and rounded tip end 39, provided or formed with an annular depression 40, and a laterally-extending duct 41, which establishes a direct communication for the gasoline from the duct 37 with the said annular depression 40, as clearly illustrated in Figs. 1, 2, and 7 of the drawings and as will be fully understood from an inspection of said figures of the drawings. Movably arranged within the interior of the main body or shell 2 is a float 4, being preferably made from sheet metal and being hollow, and the said float having a central opening, as 42, whereby it is concentric with the cylindrical portion 9 and is movable upon the outer cylindrical surface of said portion 9, as will be clearly evident from an inspection of the several figures of the drawings. Suitably screwed upon the upper open portion of the said main body or shell 2, as indicated in the drawings, is a cover 43, which is made with a centrally-disposed opening 44, into which the said upper and open-ended portion 14 of the cylindrical portion 9 is snugly fitted, but is removable therefrom when the said cover 43 is unscrewed from the main body or shell 2. The said opening 44 in the cover 43 is surrounded by an upwardly-extending flange 45, and connected with the same and establishing a communication with the throat formed by said flange 45 is a laterally-extending tubular body 46, which is hollow and is open at both ends. One of said ends, as 47, has an internal screw-thread and is made to receive the end of a pipe or other suitably-constructed means for conducting the gaseous mixture into the cylinder of a gas-engine with which the carburetor is to be used. The opposite open end 48 of said tubular body 47 is also provided with an internal screw-thread into which is screwed a spider-shaped valve-seat 49, having a central bearing 50, in which is movably arranged the spindle or stem 51 of a valve-disk 52. The said valve-disk 52 is normally closed by the action of a spring 53, which is arranged upon the valve-stem 51, preferably in the manner shown. At a suitable point in the said tubular body 46, between the throat formed by the annular flange 45 and the end 47, is a throttle-disk 54, which can be set by means of a handle 55 or other actuating device. In a suitably-disposed opening in the said cover 42 is a bushing 56, having a central opening

57 and a screw-threaded portion 58, upon which is screwed the end of a gasoline-conveying pipe 59. This pipe is provided with a valve-seat 60, and 61 indicates a valve provided with a stem 62, which extends into and through the central opening 57 in the bushing 56. This valve is operated in the manner to be presently described, and that the said valve-stem 62 will not obstruct the said central opening 57 it is made of a smaller cross-section than that of the said opening 57, being preferably of a rectangular or square cross-section, whereby passages for the flow of the gasoline through the opening 57 are provided, as will be clearly understood. Diametrically opposite the opening provided with the bushing 56 is another opening in which is a bushing 63, which is provided with a central opening 64 and a screw-threaded part 65. Screwed upon this part 65 is a tubular cap 66, having a bearing in its upper end, and movably arranged in said bearing and in the central opening 64 of the bushing 63 is a pin 67, the upper end of which may be provided with a finger-piece 68 and its lower end 69 extending normally beneath the said bushing 63, substantially as illustrated in Fig. 2 of the drawings. A spring 71 encircles the said pin 67 on that portion within the cap 66 between the upper end of the bushing 63 and a collar or nut 70 on said pin 67, the ends of the spring being connected in such a manner to the various parts that the normal tendency of the coils of the spring is to produce an upward movement of the pin 67, its collar or nut 70 limiting its upward movement, as will be clearly evident.

From an inspection of Figs. 4 and 5 it will be noticed that the bushing 63 is provided in its opposite sides with suitable receiving depressions, as 72, into which are sprung or are otherwise secured the end portions 73 of a circular and suitably-curved actuating device or cradle 74, preferably made from spring metal. This device or cradle surrounds the upper portion of the cylindrical part 9 and lies above the upper surface of the float 4, its opposite portion 75 being connected by means of a link 76 or any other suitable means with the lower end portion of the valve-stem 62, as clearly illustrated. Projections or enlargements 77 may also be arranged or formed upon the opposite and under sides of the said actuating device or cradle 74, as clearly represented in Figs. 1, 5, and 6 of the drawings. Thus it will be seen that the said actuating device or cradle 74 is suspended above the float 4, with its one portion pivotally connected with the bushing 63 and its opposite portion pivotally connected with the valve-stem 62 of the inlet-valve 61. Therefore when the gasoline-chamber of the said main body or shell 2 is full the float 4 will be near the top with its upper surface pressing against the projections or enlargements

77, as indicated in Fig. 6 of the drawings, and the result will be that the valve-stem 62 is forced upwardly, thereby seating the valve 61 upon the seat 60 in the pipe 59, as shown. The supply of the gasoline is thereby shut off and there is no danger from overfilling the body or shell 2 with the gasoline. When the carbureter is in use with the gas-engine, the gasoline as it is mixed with the air in the cylindrical part 9 is proportionately removed from the gasoline-chamber of the body or shell 2, whereby the float is correspondingly lowered. The pivotal movement of the said actuating device or cradle 74 thereupon assumes a position similar to that represented in Figs. 2 and 5, and the valve 61 in consequence is removed from the seat 60 within the inlet-pipe 59. Immediately a fresh supply of gasoline is admitted into the gasoline-chamber of the body or shell 2, whereby the level of the gasoline is again raised and the inlet-valve in the pipe 59 closed. In this manner during the consumption of the gas in the engine the gasoline-chamber of the body or shell 2 is constantly kept full by automatically opening and closing the inlet-valve in the manner just stated and maintaining thereby a uniform and constant supply of gasoline at the nozzle end of the tube 34.

The arrangement of the end portion or tip of the tube 34 is such that the gasoline will form in beads in the depression 40, as shown in Fig. 7, and when a suction is produced at the end 47 of the tubular member 46 by the piston of the engine the valve-disk 19 is raised from its seat and the valve-disk 52 all the more tightly closed upon its seat. The air from the opening 12 thereupon rushes through the opening 22 of the nozzle-shaped part 21 past the beads of gasoline upon the groove 40, carrying said beads away to be replaced by others and producing a perfect mixture of the gasoline and air.

In priming or starting it becomes necessary to have a good supply of gasoline until the engine is running, in which case the priming-pin 67 is depressed by the operator to the position indicated in Fig. 5 of the drawings, thus depressing the float 4 below the level of the gasoline in the body or shell 2 and keeping the valve 61 in its opened relation. As soon as the engine is running freely the pressure is taken from the priming-pin 67, which is returned to its normal initial position, and the remaining devices and parts of the carbureter will take care of themselves. From an inspection of Fig. 1 it will be seen that during the back pressure or back-firing at the time of an explosion of the gas the valve-disk 19 is closed down upon its seat and the valve-disk 52 is forced from its seat, with the result that the back-fire will escape from the tubular member 46 into the air. Consequently there can be no danger of an explosion of the mixed air and gasoline in the cylindrical part

9 nor any possibility of the gasoline taking fire in the gasoline-chamber of the body or shell 2 and there can be no possible danger from an explosion of the gasoline in said body or shell 2.

From the foregoing description of my present invention it will be clearly seen that I have devised a simple and efficiently-operating carbureter for gas-engines and a device is the result which is absolutely safe.

I claim—

1. A carbureter comprising a main body having its upper portion made open and provided with a screw-thread, a cover screwed down over said open portion, said cover being formed with a centrally-disposed opening, a cylindrical body within said main body having its upper end portion arranged in the opening of said cover and the lower and open end portion of said cylindrical body extending below the closed bottom of said main body, a screen in said lower and open end portion of said cylindrical body, an upwardly-extending flange on said cover, said flange surrounding the opening in said cover, and a laterally-extending tubular body upon and connected with said flange, said laterally-extending body and cover being both removably arranged upon the said main body, a centrally-guided inlet-valve in the upper and open end of said cylindrical body, a means of attachment at one end of said laterally-extending body, and a relief-valve at the other end of said laterally-extending body, said valves being arranged so that the back-fire will close said inlet-valve and will open said relief-valve, substantially as and for the purposes set forth.

2. A carbureter comprising a main body having its upper portion made open and provided with a screw-thread, a cover screwed down over said open portion, said cover being formed with a centrally-disposed opening, a cylindrical body within said main body, having its upper end portion arranged in the opening of said cover and the lower and open end portion of said cylindrical body extending below the closed bottom of said main body, a screen in said lower and open end portion of said cylindrical body, an upwardly-extending flange on said cover, said flange surrounding the opening in said cover, and a laterally-extending tubular body upon and connected with said flange, said laterally-extending body and cover being removably arranged upon the said main body, a centrally-guided inlet-valve in the upper and open end of said cylindrical body, a means of attachment at one end of said laterally-extending body, and a relief-valve at the other end of said laterally-extending body, said valves being arranged so that the back-fire will close said inlet-valve and will open said relief-valve, a cone-shaped air-nozzle in said cylindrical body, a gasoline-conveying duct

leading and extending into the lower portion of said cylindrical body, a hollow receiving member connected at right angles with the free end of said conveying-duct, and a tube extending vertically from said receiving member and having its upper end portion projecting through and slightly above the opening of said cone-shaped nozzle, said vertical tube having a closed tip provided with a laterally-extending duct and an outer annular bead-forming groove, substantially as and for the purposes set forth.

3. A carbureter, comprising a main body or shell adapted to contain a supply of gasoline, a removable cover on said main body or shell an inlet-valve connected with said cover, a float in said body or shell for automatically controlling said inlet-valve, a cylinder within said body or shell in which the gasoline is mixed with air, a laterally-extending and hollow member connected with said removable cover into which the gas is drawn for conveyance to the cylinder of a gas-engine, said member being open at its opposite ends, one of said ends being provided with a means of connection for attachment to the gas-engine, a means of communication between said cylinder and hollow member provided with an inlet-valve, and a centrally-guided outlet-valve in the other open end of said hollow member, said valves being arranged so that the back-fire will close said inlet-valve and will open said outlet-valve, substantially as and for the purposes set forth.

4. A carbureter, comprising a main body or shell adapted to contain a supply of gasoline, a removable cover on said main body or shell an inlet-valve connected with said cover, a float in said body or shell for automatically controlling said inlet-valve, a cylinder within said body or shell in which the gasoline is mixed with air, a laterally-extending and hollow member connected with said removable cover into which the gas is drawn for conveyance to the cylinder of a gas-engine, said member being open at its opposite ends, one of said ends being provided with a means of connection for attachment to the gas-engine, a means of communication between said cylinder and hollow member provided with an inlet-valve, and a centrally-guided outlet-valve in the other open end of said hollow member, said valves being arranged so that the back-fire will close said inlet-valve and will open said outlet-valve, and a throttle in said hollow member, substantially as and for the purposes set forth.

5. A carbureter, comprising a main body or shell adapted to contain a supply of gasoline, a removable cover on said main body or shell an inlet-valve connected with said cover, a float in said body or shell for automatically controlling said inlet-valve, a cylinder within said body or shell, said cylinder having an open bottom, and a cone-shaped air-nozzle, a

gasolene-conveying tube in the lower portion of said cylinder, a portion of said tube projecting through and slightly above the said air-nozzle for producing a mixture of air and gasolene in the upper part of said cylinder, and means for conveying gasolene from the main body or shell into said tube, a laterally-extending and hollow member into which the gas is drawn for conveyance to the cylinder of a gas-engine, said member being open at its opposite ends, one of said ends being provided with a means of connection for attachment to the gas-engine, a means of communication between said cylinder and hollow member provided with an inlet-valve, and a centrally-guided outlet-valve in the other open end of said hollow member, said valves being arranged so that the back-fire will close said inlet-valve and will open said outlet-valve, substantially as and for the purposes set forth.

6. A carbureter, comprising a main body or shell adapted to contain a supply of gasolene, a removable cover on said main body or shell an inlet-valve connected with said cover, a float in said body or shell for automatically controlling said inlet-valve, a cylinder within said body or shell, said cylinder having an open bottom, and a cone-shaped air-nozzle, a gasolene-conveying tube in the lower portion of said cylinder, a portion of said tube projecting through and slightly above the said air-nozzle for producing a mixture of air and gasolene in the upper part of said cylinder, and means for conveying gasolene from the main body or shell into said tube, a laterally-extending and hollow member connected

with said removable cover into which the gas is drawn for conveyance to the cylinder of a gas-engine, said member being open at its opposite ends, one of said ends being provided with a means of connection for attachment to the gas-engine, a means of communication between said cylinder and hollow member provided with an inlet-valve, and a centrally-guided outlet-valve in the other open end of said hollow member, said valves being arranged so that the back-fire will close said inlet-valve and will open said outlet-valve, and a throttle in said hollow member, substantially as and for the purposes set forth.

7. In a carbureter, the combination, with an open-bottomed cylinder, and a cone-shaped air-nozzle in said cylinder, of a gasolene-conveying duct leading and extending into the lower portion of said cylinder, a hollow receiving member connected at right angles with the free end of said conveying-duct, and a tube extending vertically from said receiving member and having its upper end portion projecting through and slightly above the opening of said cone-shaped nozzle, said vertical tube having a closed tip provided with a laterally-extending duct and an outer annular bead-forming groove, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 23d day of March, 1905.

CHARLES STUTE.

Witnesses:

FREDK. C. FRAENTZEL,
GEO. D. RICHARDS.