G. J. MAYER.

CARBURETER FOR EXPLOSIVE ENGINES.

APPLICATION FILED JAN. 23, 1907.

967,407. Patented Aug. 16, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

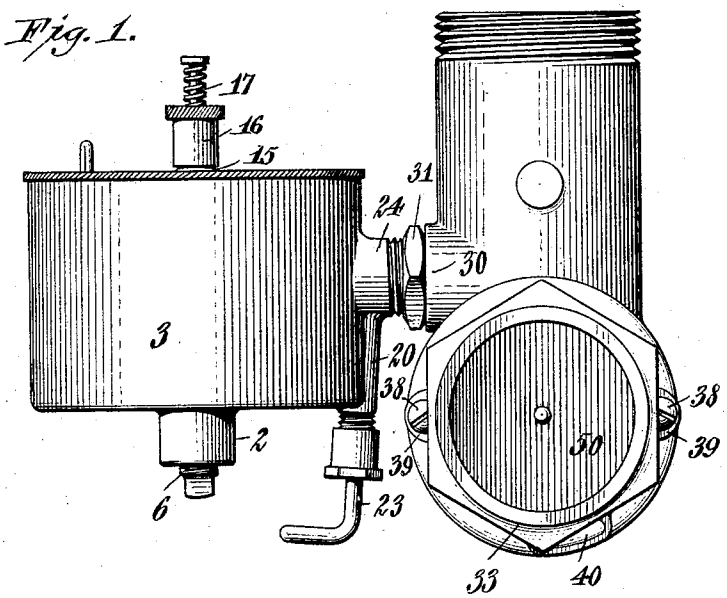
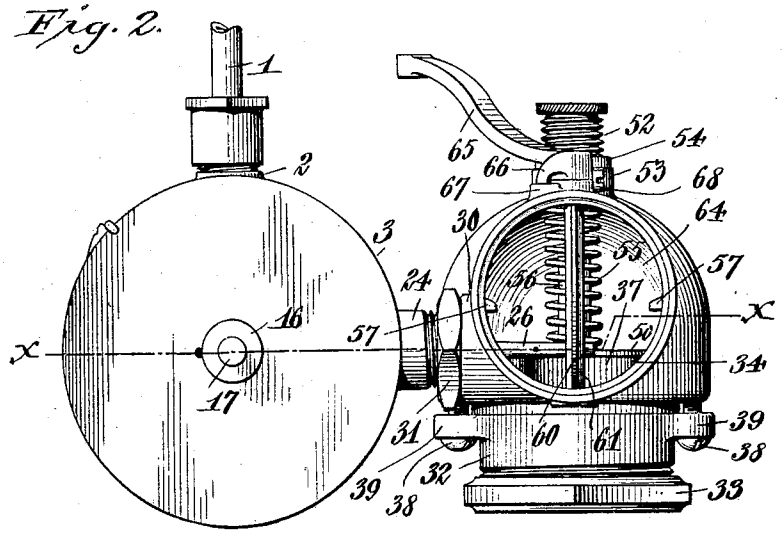



Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3.

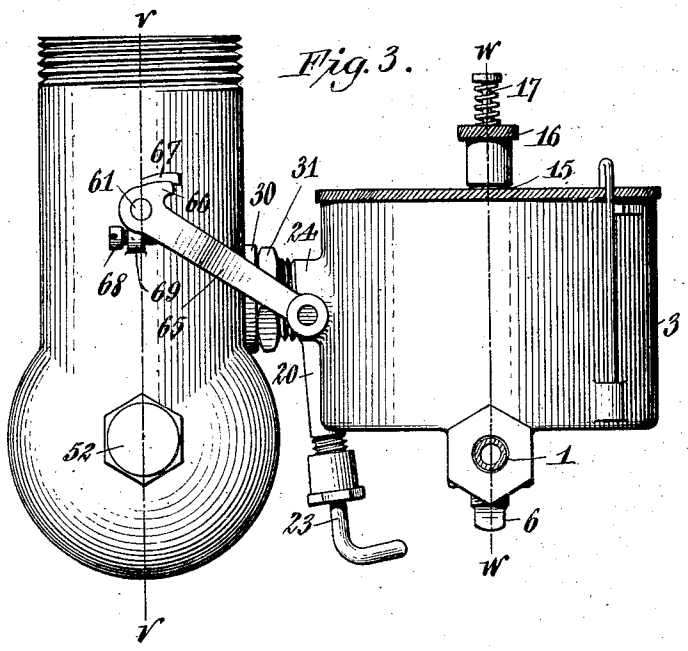



Fig. 4.

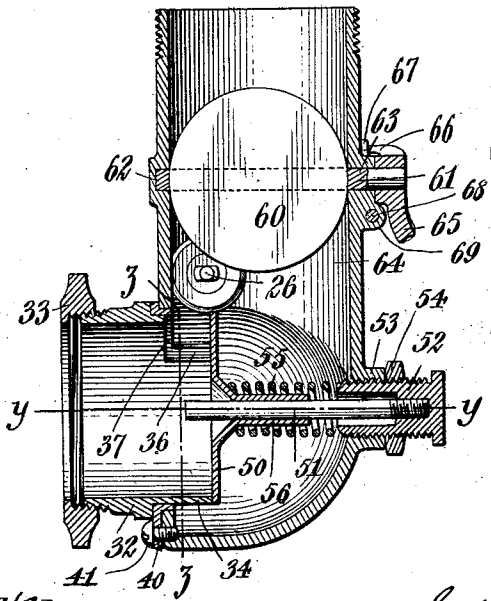
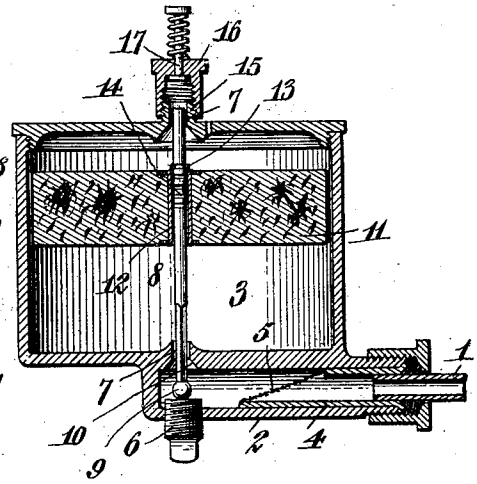



Fig. 5.

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3 SHEETS—SHEET 3.

Fig. 6.

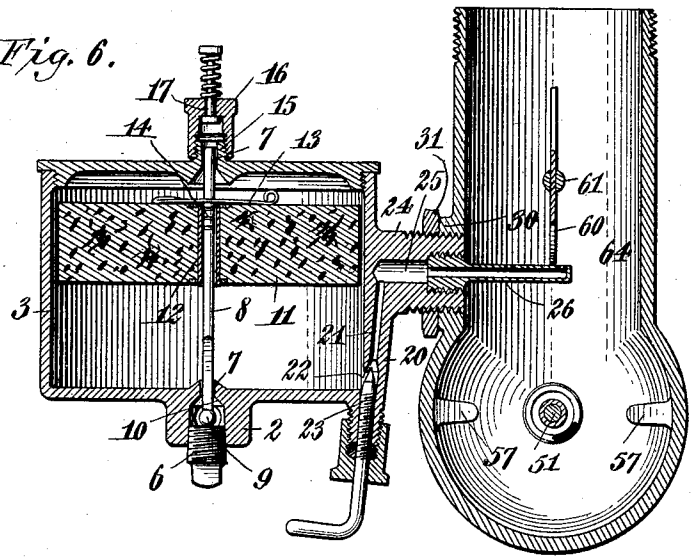



Fig. 7.

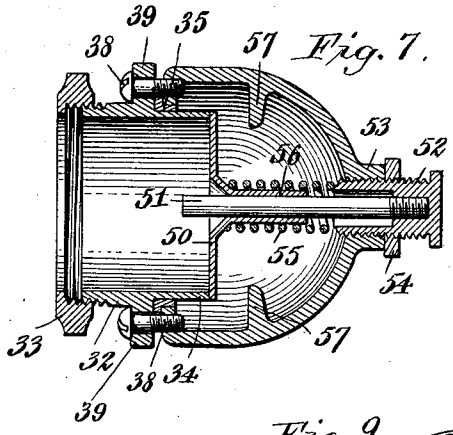



Fig. 8.

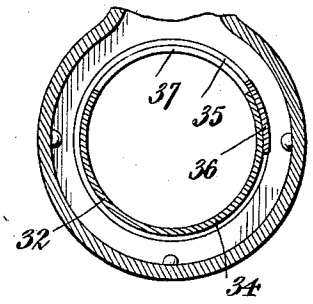
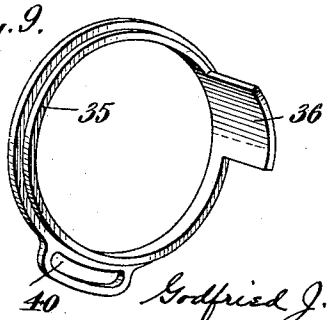



Fig. 9.

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# UNITED STATES PATENT OFFICE.

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## CARBURETER FOR EXPLOSIVE-ENGINES.

967,407. Specification of Letters Patent. **Patented Aug. 16, 1910.**

Application filed January 23, 1907. Serial No. 353,713.

*To all whom it may concern:*

Be it known that I, GODFRIED J. MAYER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Carbureters for Explosive-Engines, of which the following is a specification.

This invention relates to carbureters more especially adapted for use on certain types of automobiles which employ internal combustion engines; and the object of the same is to improve certain points in the construction so as to cheapen the cost of producing the device, adapt it more readily to the uses for which it is intended, and provide functions not heretofore contained in any single carbureter.

To this end the invention consists chiefly in a novel form and location of the strangling or reducing valve, operating in conjunction with a peculiar automatic air valve and it consists also in many other improvements in details which will appear below.

In the accompanying drawings,—Figure 1 is a front elevation of my improved carbureter. Fig. 2 is a top plan view of the same. Fig. 3 is a rear elevation. Fig. 4 is a vertical section on line *v—v*, of Fig. 3. Fig. 5 is a vertical section on line *w—w*, Fig. 3. Fig. 6 is a vertical section on the line *x—x*, Fig. 2. Fig. 7 is a horizontal section on line *y—y*, of Fig. 4. Fig. 8 is a vertical section on line *z—z*, of Fig. 4. Fig. 9 is a perspective detail of the reducing valve.

Referring to the drawings, the numeral 1 designates the inlet for oil or gasolene, here shown as directed into an inlet passage cored through a boss 2 on the reservoir 3, and within the passage around the inlet I place a sleeve 4 beveled off at its inner end to provide space for a larger strainer 5 than could be used if the inlet were cut off square. Beneath the axis of the reservoir 3 said boss 2 is tapped for the screw plug 6, and in the bottom and top of the reservoir are alined holes 7 forming guides for the stem 8 of the float valve, the head 9 of the latter resting on said plug when the valve is open or rising against the seat 10 when the valve is closed. The float 11 may well be of cork and preferably has a tube 12 through its body, and 13 is a catch on the float adapted to engage notches 14 in the stem 8 so that the float can be set thereon by hand. Surrounding the upper hole 7 is a boss 15 onto which is threaded a cap 16, and through the top of the latter passes a spring-pressed pin 17 by which the stem can be agitated in case its head 9 should stick in the seat 10.

Referring now to Figs. 1, 3, and 6, the body of the reservoir 3 is provided with another boss 20 having a passage 21 alined with the exit port 22 which is controlled by a needle-valve 23; and the reservoir is also provided with a boss 24 having a passage 25 nearly at right angles to that numbered 21 and communicating with said port 22. Boss 24 is internally threaded to receive the vaporizing nozzle 26 and exteriorly threaded for connection with the mixing chamber as described below. Thus it will be seen that the three passages and port 22 can all be drilled in a cast metal reservoir body, while the position of the opening for the plug 6 permits the formation of the lowermost hole 7, the cover of the reservoir being made separably. I consider the oblique position of the needle valve of advantage because it permits the use of a large knob or handle without interference with the adjacent chamber for the automatic valve, as seen in Fig. 6. The nozzle 26 is here shown as provided with a straight body pierced with fine openings, but any suitable nozzle could be employed. The carbureter proper, best seen in Fig. 4, is another tubular casting standing upright at one side of the reservoir, and shaped to receive the parts next to be described, being connected with said reservoir by a boss 30 screwed onto the boss 24 and held by a jam nut 31. The lower portion of this casting is nearly globular, as seen, being cut at the rear for the reception of a sleeve 32 which is connected by a coupling 33 with the air inlet. Said sleeve has a reduced extension 34 at its inner end which passes into the globular portion of the casting and forms both the seat for the automatic valve and a part of the reducing valve. The latter as best shown in Fig. 9, comprises a ring 35 and a curved plate 36 projecting therefrom and adapted to pass over or partially over a cut-away portion 37 at the top of said extension 34 and almost directly beneath the vaporizing nozzle 26; it serving to reduce the area of the opening formed by said cut-away portion. To permit the turning of the ring, the latter is mounted loosely

between the body of the sleeve 32 and the end of the casting, these two members are connected by screws 38 passing through ears 39 on the sleeve 32 outside said ring and engaging the casting itself. A segmental slot 40 on the ring 35 may engage another screw 41 (Fig. 4) to limit the movement of this ring and hence the degree to which the reducing valve can be opened or closed, and by tightening the screw 41 the valve can be held in any position desired. I consider this form of reducing valve advantageous because the plate or shutter 36 moves transversely across the inlet opening 37, and hence there will be no tendency of the inflowing air to open or close the valve undesirably. I also consider it of advantage to locate this valve as nearly beneath the vaporizing nozzle 26 as possible; and it is my intention that the opening 37 shall never be entirely closed, thereby always permitting the inlet of some air to the carbureter. The automatic valve also works in conjunction with the extension 34 on the sleeve 32. It consists of a disk 50 mounted loosely on a rod 51 which is adjustably held within a tubular nut 52 that is screwed into a boss 53 in the rear of the carbureter casting, and held by a jam nut 54; and the disk is pressed against the inner end of the extension 34 by an expansive spring 55 coiled around this rod (or around a tubular shank 56 on the disk) between the back of the disk and the inner end of the nut 52. Within the globular portion of the casting are formed stops 57 against which the disk 50 will strike if it should move too far back on the rod 51. By adjusting the nut in the boss the tension of the spring may be adjusted, as will be clear. If the volume of inflowing air is so great that it cannot escape through the reducing valve, the automatic valve will yield against its spring as will be clear; and by adjusting the nut 52, the point at which it will yield and the degree of such yielding may be regulated. Again it will be observed that the carbureter proper may be formed of a single casting with its bosses 30 and 53 bored out and threaded and its cut-away lower end turned so as to accurately receive the ring 35, and I might here add that the journals for the throttle valve described below can also be bored in this casting. The automatic-valve may well be termed a controlling-valve since it controls the volume of air drawn into the carbureter, the extent to which it is opened being governed by the speed of the engine, or in other words,—by the engine-suction which increases as the engine runs faster.

The throttle valve is here shown as a damper 60 fixed on a central transverse rod 61 journaled at 62 in one side and at 63 through the other side of this part of the casting which constitutes the mixing chamber 64. The projecting end of the rod 61 carries a lever 65 which has a lug 66 adjacent the journal 63 adapted to strike a stop 67 on the casting when the lever is turned so as to open the throttle; and when turned to close the throttle, this lug is adapted to strike a set screw 68 which passes through an ear 69 on the casting. I consider these details of advantage, because the set screw permits the adjustment whereby the damper when closed will accurately fit the exterior of the cylindrical mixing chamber 64. I consider it also of advantage to use the circular damper in this chamber and to locate the nozzle 26 where shown because the damper can be set very low with respect to the nozzle, as seen in Fig. 4.

In operation the float will be set on its stem so that the gasolene in the reservoir will be on a level with the nozzle, and as it is vaporized the float valve will automatically admit more gasolene in a manner which will be clear. After the carbureter is applied to an engine, and the latter is to be started the needle valve is adjusted and the throttle valve opened to its full extent. After the engine is started, the throttle valve is partly closed for low speed and the reducing valve adjusted to admit the proper amount of air into the carbureting chamber. Thereafter the throttle valve alone can be adjusted to increase or reduce the speed of the engine, the needle valve being left set for high speed, the reducing valve for low speed, and the tension of the spring of the automatic valve for intermediate speed. To run the engine at high or at low speed, it is merely necessary to adjust the throttle-valve, the device being otherwise automatically governed after the reducing valve is once adjusted. The gasolene issuing from the nozzle is vaporized and mixed with air, and passes upward to the cylinder of the engine in a well known manner. This flow of aeriform mixture creates a draft of fresh air through the sleeve 32, and whenever the force of this draft is augmented permanently or temporarily by any cause, the automatic valve may yield against its spring and open the inner end of the sleeve 32 in addition to that part of the cut-away portion 37 which is exposed by the shutter 36. As above stated, the point at which the spring will yield and the degree of its yielding can be very nicely adjusted. Thus the automatic valve works in conjunction with the reducing or strangling valve, for if the latter should admit too little air the former would open automatically to supply the deficiency. The automatic valve also works in conjunction with the throttle valve, for the adjustment of the latter will in a measure control the force of the draft of fresh air.

Having thus described my invention, what I claim is,—

1. In a carbureter, an upright casting having a cylindrical upper end forming the mixing chamber and a globular lower end cut off at one side, a reducing valve within said lower end adjacent such side and having its port directed upward, a reservoir, and a nozzle leading from the reservoir into the cylindrical portion of said casting and partially across the same at one side of its diameter and just above said reducing valve; combined with a throttle valve comprising a damper within said mixing chamber whose axis is at right angles to the line of said nozzle and journaled in the casting above the nozzle, as and for the purpose set forth.

2. In a carbureter, an upright casting having a globular lower end with one side cut away, a sleeve having a reduced extension entering said cut-away side and itself having a cut-away portion at the top, a ring held loosely between the sleeve and the cut-away side of the casting and having a shutter adapted to pass over the opening in said extension, and a disk normally held against the end of said extension.

3. In a carbureter, an upright casting having a globular lower end with one side cut-away, a sleeve having a reduced extension entering said cut-away side and itself having a cut-away portion at the top, a ring held loosely between the sleeve and the cut-away side of the casting and having a shutter adapted to pass over the opening in said extension, the ring being provided with a segmental slot, a screw in the casting engaging said slot, and means for normally closing the inner end of said reduced extension.

4. In a carbureter, the combination with a casing having an air-inlet and a mixture-outlet, a throttle-valve in said casing, and a nozzle; of a tubular extension surrounding the air inlet and cut away at its top beneath the nozzle, a reducing valve mounted on the extension and having a shutter adapted to regulate the size of the cut-away portion, and an automatic valve consisting of a disk and a spring pressing it normally against said extension, substantially as described.

5. In a carbureter, the combination with a casing having an air-inlet and a mixture-outlet, a throttle-valve in said casing, and a nozzle; of a tubular extension surrounding the air inlet and cut-away at its top beneath the nozzle, and a reducing valve mounted on the extension and having a shutter adapted to regulate the size of the cut-away portion, an automatic valve consisting of a disk and a spring pressing it normally against the end of the extension, and means for adjusting the tension of the spring, substantially as described.

6. In a carbureter, the combination with a casing having an air-inlet and a mixture-outlet, a throttle-valve in the casing, and a fuel-feed; of a tubular extension at the air inlet having an opening in its top, a shutter adjustable over this opening to form a reducing valve, and a spring-pressed disk against the end of the extension to form an automatic valve.

7. In a carbureter, the combination with a casing having an air-inlet and a mixture-outlet, a fuel-feed, a nozzle in said casing, and a throttle valve; of an air valve comprising a tubular extension at the air inlet having an opening in its top, a shutter adjustable over this opening to form a reducing valve, and a spring pressed disk against the end of the extension to form an automatic valve.

8. In a carbureter, an upright casing having a cylindrical upper end forming a mixing chamber and a lower end forming a valve-chamber and having an air inlet at one side of said valve-chamber, and an air-valve for said air-inlet; combined with a gasolene-reservoir having an outlet, a nozzle therein extending into and partially across the mixing chamber at one side of its diameter and directly above said air-inlet, and a throttle valve comprising a damper within said mixing-chamber whose axis is at right-angles to the line of the nozzle.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

GODFRIED J. MAYER.

Witnesses:
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ELLA C. PLUECKHAHN.