C. D. SHAIN.

VAPORIZER OR CARBURETER FOR GAS ENGINES.

APPLICATION FILED FEB. 6, 1909.

963,081. Patented July 5, 1910.

2 SHEETS—SHEET 1.

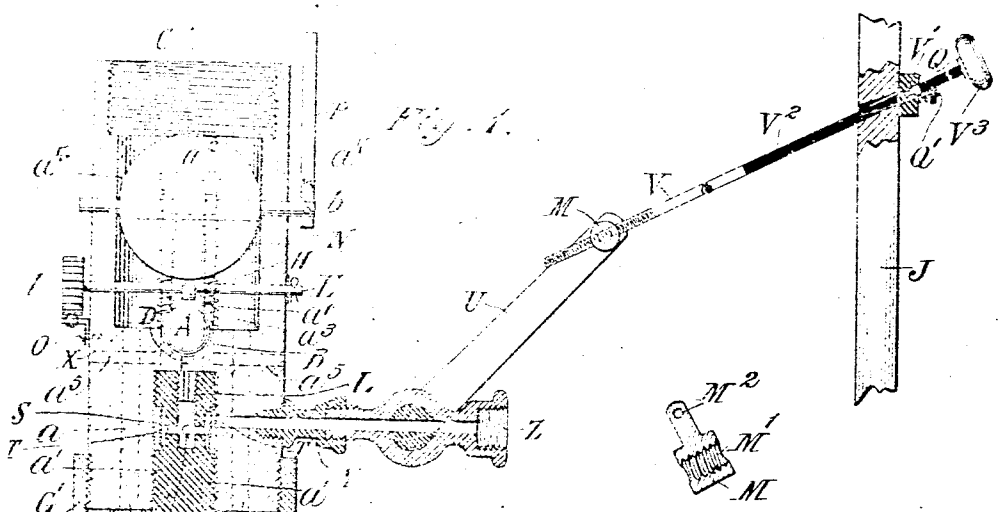


Fig. 1.

Fig. 2.

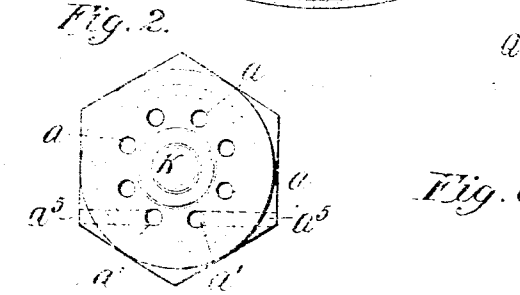


Fig. 2.

Fig. 3.

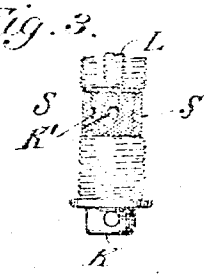
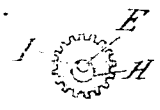


Fig. 4.



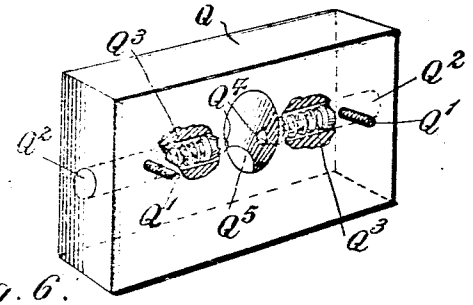


Fig. 6.

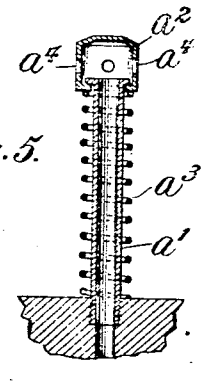


Fig. 5.

Witnesses:

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2 SHEETS—SHEET 2.

Fig. 8

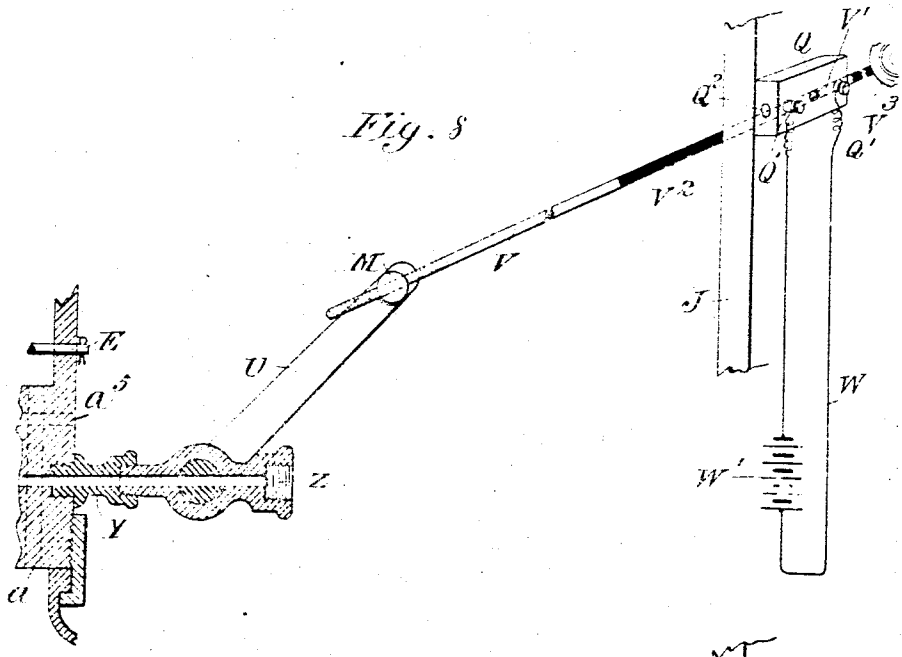
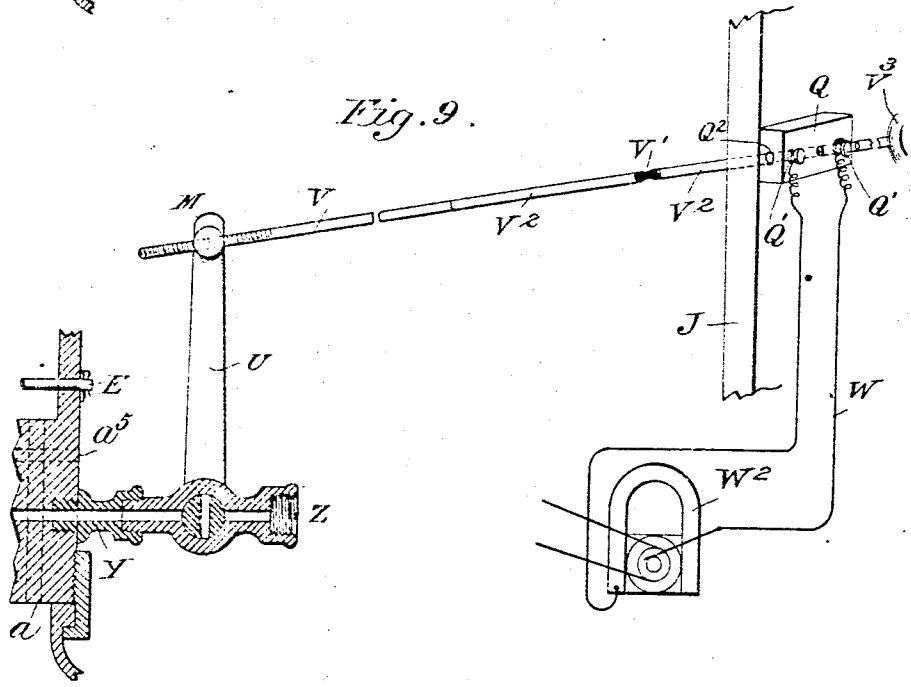


Fig. 9.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES D. SHAIN, OF ROCKAWAY PARK, NEW YORK.

VAPORIZER OR CARBURETER FOR GAS-ENGINES.

963,081. Specification of Letters Patent. Patented July 5, 1910.

Application filed February 6, 1909. Serial No. 476,539.

To all whom it may concern:

Be it known that I, CHARLES D. SHAIN, a citizen of the United States, and a resident of Rockaway Park, in the county of Queens and State of New York, have invented a certain new and useful Vaporizer or Carbureter for Gas-Engines.

My invention relates to improvements in vaporizers or carbureters in which a valve or cock at the carbureter is controlled by an adjusting rod with wheel. The adjusting rod in conjunction with a specially arranged electric switch, also establishes and disrupts the electric sparking circuit as desired; and the objects of my invention are, first, to provide an accessible means of opening the cock and at the same time establishing the electric sparking circuit: second, when closing the cock to disrupt the electric sparking circuit; third, to adjust the partial closing of the cock, thereby regulating the flow of gasolene or liquid fuel entering the carbureter without disrupting the electric sparking circuit. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:—

Figure 1, is a vertical section of the vaporizer or carbureter and shows the cock with swivel stud, adjusting rod with hand wheel and locking spring switch with binding posts; Fig. 2, is a bottom view of the carbureter: Fig. 3, is a vertical view of a partly hollow plug containing a screen and bushing; Fig. 4, is a sectional view of a shaft, cam and milled nut looking from right to left; Fig. 5, is a section of the upper part of one of the auxiliary air tubes; Fig. 6, is a perspective view of the locking spring switch, with parts cut away, so as to show its mechanism; the binding nuts of the binding posts, being left off to more clearly show the arrangement; Fig. 7, is a section of the swivel stud. Fig. 8 is a view showing the cock with swivel stud, adjusting rod, locking spring switch with binding posts connected by wires to batteries. Fig. 9 is a view showing the cock with swivel stud, adjusting rod, locking spring switch with binding posts connected by wires to a magneto.

The arrows at the bottom of Fig. 1, show air-inlets and the arrow at the top, the gas-outlet to engine.

Similar letters refer to similar parts throughout the drawing.

In Fig. 1, Z is a lever cock. The gasolene or liquid fuel enters this cock and passes through the pipe Y and flows into the chamber T. In this chamber T, is inserted a partly hollow plug K, with a screw thread, and around a part of the plug K, is placed a screen S for screening the gasolene or liquid fuel. In the top of the plug K is screwed a bushing L, (see Figs. 1 and 3). The bushing L, has a hole in the center of it, the size of which is determined by the maximum flow of gasolene or liquid fuel required for a specific size of engine. The gasolene or liquid fuel after entering the chamber T, passes through the screen S and the holes K′, into the hollow part of the plug K and from there it is sucked by the engine or forced by the pressure of the gasolene or liquid fuel behind it, through the bushing L, into the tube D, where its flow is in a measure arrested by the ball valve or sprayer A. The lift of the ball valve or sprayer A, is caused by suction from the engine and the pressure of the gasolene or liquid fuel under it and is regulated by the eccentric cam H in the center of the shaft E (Fig. 4). The shaft E and the cam H, are turned by the milled nut I, which is held in any fixed position desired, by the ball spring O.

a a are a number of air ports extending from the bottom of the vaporizer or carbureter, (see Fig. 2) up to the mixing chamber X. These ports are for the purposes of furnishing the fixed air supply while others a' a' and a^3 a^3 are used for the auxiliary air supply and a' a' are tapped and threaded where they enter the mixing chamber X and into them are inserted small tubes threaded at the bottom a' a', (see Fig. 5). These tubes, a' a', are flared and open at the top and are covered by caps a^2, with holes in them a^4, from which the auxiliary air issues. These caps are crimped at the bottom to prevent their coming off the flared tubes a' a', (see Fig. 5). Between the caps a^2 and the bottom of the mixing chamber X, are springs a^3, coiled around the tubes a', and when the butterfly valve N is open or partly open, the springs a^3, and the suction from the engine through C, raise the caps a^2 on the open end tubes a', so that air can be sucked through the holes a^4 and when the butterfly valve N, is closed or partly closed, it pushes down the caps a^2, on the open end tubes a', so that a less volume or no air can be sucked through the holes a^4 in the caps a^2. The butterfly

valve N, is operated by the shaft *b* and the lever P (Fig. 1). The gasolene or liquid fuel after being mixed with air in the mixing chamber X, passes out of the vaporizer or carbureter at C.

The bottom of the vaporizer or carbureter is threaded at R, to receive a union with bent pipe connection G G', which may be connected to heated air and both the fixed air ports *a* and the auxiliary air tubes *a'*, thus be supplied with heated air; or the openings leading to the auxiliary air tubes *a'* may be plugged at the bottom of the vaporizer or carbureter and tubes run through the side of the vaporizer or carbureter a^5 a^5 Fig. 1, connecting with the tubes *a'* and the vaporizer or carbureter thus be supplied with cold auxiliary air, while the ports *a*, are supplied with heated air; or vice versa.

In Fig. 1, the cock Z, with the lever U, is in a fully open position at 45°. In the end *b*, the lever U is a swivel stud M, (Figs. 1 and 7), the small part of which passes through a hole in the lever U and is held in place by a pin through M^2, permitting the swivel stud M to turn readily. In the head of the swivel stud M, is a threaded hole M', into which screws the threaded end of the adjusting rod V (Figs. 1 and 7). The adjusting rod V passes through a support J, which in case of an automobile is generally the dash-board. The adjusting rod V then passes through a hole Q^5 of an insulated block Q (Figs. 1 and 6), which is attached to the support J. Into this block Q are inserted in each side, metal pieces Q^2 Q^2 which hold the binding posts Q' Q' with nuts and also hold in position the contact springs Q^3 Q^3 which are coiled around the conical pointed contacts Q^4 Q^4. The points of these contacts project for a short distance into the large hole Q^5 in the insulated block Q. Where dry cells W' Fig. 8 or storage batteries are used as a source of electrical energy for sparking purposes Figs. 1 and 8 the binding posts Q' Q' are connected by wires W to the electrical circuit Fig. 8 (preferably the ground side). The adjusting rod V is insulated for a portion of its length V^2 (Fig. 1). It also has a grooved metal contact V' which is placed over the insulation V^2. It is obvious that, with a rod V of the proper length, when the grooved metal contact V' is in contact with or between the contact points Q^4 Q^4, the cock Z, which opens at 45°, will be open and the gasolene or liquid fuel will flow into the carbureter and the electric sparking circuit will be established. It is also obvious that when the grooved metal contact V' of the adjusting rod V, is pushed out of contact with the contact points Q^4 Q^4, far enough to close the cock Z, the flow of gasolene or liquid fuel will be cut off and the insulated portion V^2 of the adjusting rod V, will be between the contacts Q^4 Q^4 and the electric sparking circuit will be disrupted.

When the cock Z is opened by the adjusting rod V, being pulled into the position of contact between its grooved metal contact V' and the contacts Q^4 Q^4, the points of these contacts fit into the grooved portion of V' and the springs Q^3 Q^3 around the contacts Q^4 Q^4, will press their points against the grooved metal contact V' of the adjusting rod V, thereby holding it in such a position, that by turning the hand wheel V^3, the thread on the end of the adjusting rod V, will engage with the thread in the swivel stud M in the lever U of the cock Z and partly close the cock Z, thus regulating the flow of the gasolene entering the carbureter, while maintaining the electric sparking circuit without interruption.

Some forms of magnetos W^2 Fig. 9, used as a source of energy for electric sparking, require that the switch to stop them, shall short circuit the armature current of the magneto Fig. 9. Where such magnetos are used, the wires W from the binding posts Q' Q' are cut into the magneto circuit Fig. 9. In such cases the adjusting rod V, instead of having a grooved metal contact V', would require this part to be an insulated groove and the insulated part V^2 of the adjusting rod V, would be made of metal, so that when the cock Z was open, this insulated groove would be between the contact points Q^4 Q^4 and the magneto would continue in operation, and when the cock Z was closed Fig. 9 by pushing the adjusting rod V out of the insulated groove, the metal part of the adjusting rod V, would make a contact with the contact points Q^4, Q^4, thus short circuiting the armature current and stopping the magneto. It is therefore obvious that the adjusting rod V can be constructed for either batteries or magnetos used as a source of energy for electric sparking of gas engines.

This vaporizer or carbureter can be made in several ways; but I prefer to carry out this feature of my invention as shown in the drawings.

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

In a vaporizer or carbureter a gasolene or liquid fuel supply valve or cock with lever having in its end a swivel stud with a threaded hole in one end, an adjusting rod of electrical conducting material with an insulated portion, one end of the adjusting rod provided with a thread which screws into the swivel stud, the other end of the adjusting rod having a hand wheel; an insulated block with a hole through it attached to a support, through which the adjusting rod passes, the insulated block provided with two spring contacts bearing against the adjusting rod; the insulated

block having binding posts in contact with the springs of the spring contacts, with wires connected to the electrical sparking source of a gas engine, arranged so that by sliding the adjusting rod back through the hole in the insulated block, the supply valve or cock can be opened and the electrical sparking circuit of the gas engine established; and by sliding the adjusting rod forward through the hole in the insulated block, the supply valve or cock can be closed and the electrical sparking circuit of the gas engine disrupted; and by turning the adjusting rod when the supply valve or cock is in the open position, the partial closing of the supply valve or cock can be regulated and the electrical sparking circuit of the gas engine maintained without interruption, all substantially as set forth.

Witness my hand this fifth day of February, 1909, at the city of New York, in the county and State of New York.

CHAS. D. SHAIN.

Witnesses:
EMMA BECHTEL,
CHAS. X. SHAIN, Jr.