J. W. SWAN.

CARBURETER.

APPLICATION FILED FEB. 26, 1912.

1,126,127. Patented Jan. 26, 1915.

Fig. 1.

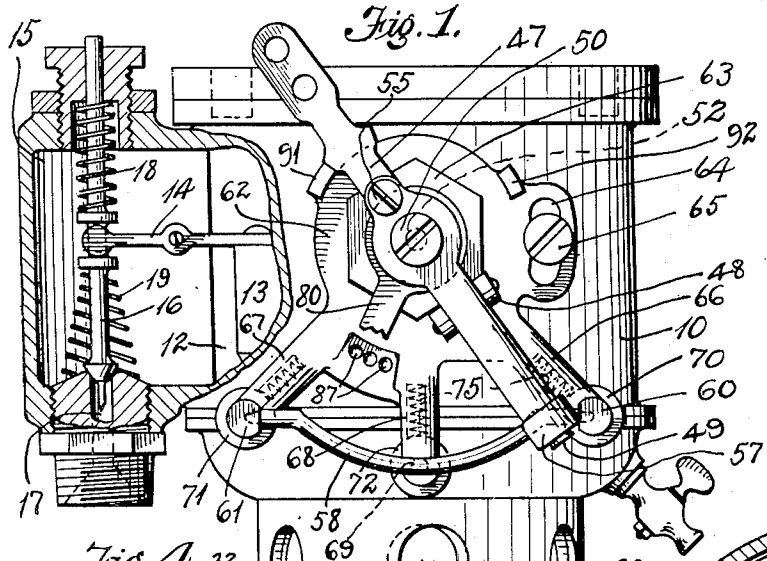


Fig. 5.

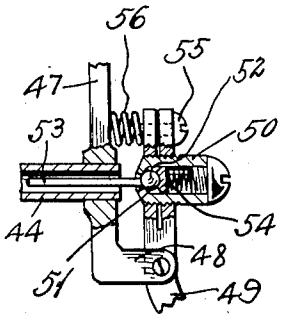


Fig. 3.

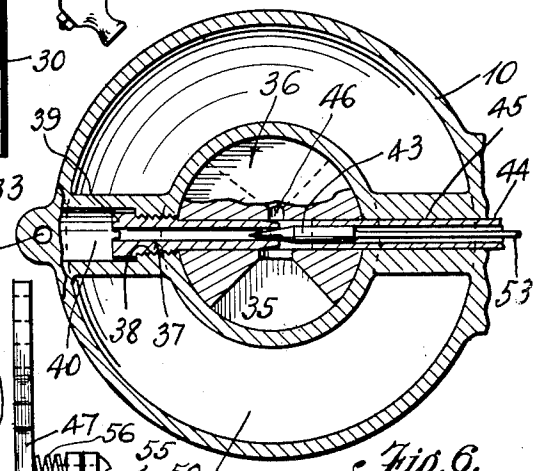


Fig. 4.

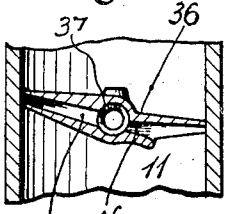


Fig. 2.

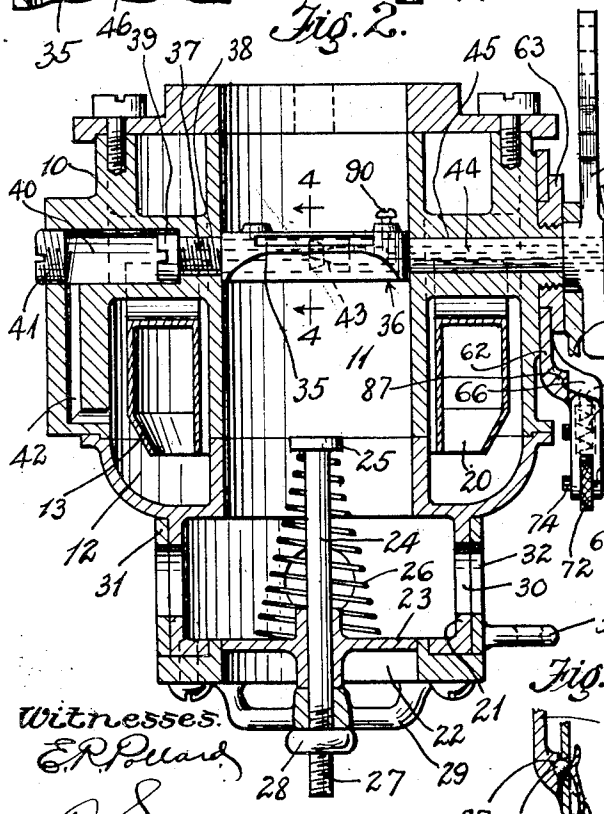


Fig. 6.

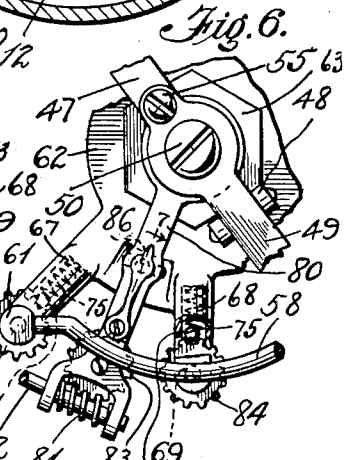


Fig. 7.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,126,127. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed February 26, 1912. Serial No. 679,820.

To all whom it may concern:

Be it known that I, JOHN W. SWAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters for explosive gas engines, and it is an object of the invention to provide a carbureter in which the gasolene feed to the mixing chamber may be admitted through the throttle valve.

It is also an object of the invention to provide a carbureter having a throttle valve adapted to deliver gasolene within the mechanism and having a lever for operating the said valve, an adjustable needle valve mechanism being carried by said lever and throttle.

It is also an object of the invention to provide a carbureter having a central mixing chamber provided with an air inlet chamber at one end, said air inlet chamber having a series of openings in its walls and an apertured slide adapted to control the inlet of air through the opening of said air chamber, the carbureter having a gasolene delivering throttle located within the central air passage of the carbureter.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of the improved carbureter, forming the subject matter of the present invention, the valve chamber containing the inlet valve mechanism controlled by the float being shown in section. Fig. 2 is a central vertical sectional view through the carbureter taken on a plane at right angles to the plane of Fig. 1. Fig. 3 is a horizontal sectional view through the valve mechanism carried by the throttle. Fig. 4 is a detail sectional view through the central passage of the carbureter and through the throttle valve mounted therein. Fig. 5 is a detail sectional view through the mechanism for moving the needle valve carried by the throttle. Fig. 6 is a fragmentary detail view in side elevation showing the mechanism for controlling the extent to which the needle valve of the throttle is operated. Fig. 7 is a fragmentary detail sectional view through the holding means for the adjusting lever shown in Fig. 6.

The details and features of the invention will now be more particularly described, reference being had to the said drawing in which 10 indicates a carbureter casing provided with a central cylindrical passage 11 forming a mixing chamber for the carbureter. Surrounding the chamber 11 is a float chamber 12 formed by the outer walls of the casing together with the walls of the passage 11 and a float 13 is mounted in said chamber and provided with a valve controlling lever 14. The lever extends into a hollow projection formed on the casing 10 as indicated at 15, in which is mounted a valve 16 adapted to control the inlet of gasolene to the carbureter through a passage 17 upon the end of which the said valve seats. Springs 18 and 19 effect the action of the said valve 16 and the action of the float is capable of readily operating the said valve. The said float 13 is preferably formed of a metallic piece of material bent into the proper form so that there are no soldered or otherwise secured edges in the upper part of the float and the lower part of the float is left open as 20, so that air will be entrapped in the upper part of the float by the gasolene and will thus maintain a proper buoyancy in said float.

The lower end of the casing 10 is formed with a cylindrical extension 21 affording an air chamber into and through which the air for the carbureter is introduced. The bottom of said chamber is formed with a large inlet opening 22 which is normally closed by a spring pressed valve 23, said valve moving upon a stem 24 having a head 25 upon its inner end. A spring 26 confined between said head 25 and the valve 23 normally holds the valve in closed position.

The lower end of the stem 24 is preferably screw threaded at 27 and a nut 28 applied thereto, the said stem being thus adjustably held in position in a supporting spider 29. The side walls of the said chamber 21 are provided with a series of perforations 30 at suitable intervals, adapted to provide proper air inlets for the carbureter. The openings 30 are controlled by a ring slide 31, also formed with apertures as 32 which may be brought into coincidence with the said air inlets 30, when it is desired to introduce more air to the mixing chamber than will normally enter past the valve 23. The said

ring slide 31 is provided with a projecting eye 33 with which an operating rod 34 is connected for operating the said slide.

The construction and operation of the throttle valve forms an important feature of the present invention. The said throttle valve is of such an edge contour as to be capable of snugly fitting in the passage 11 when in closed position, and the said throttle valve is also preferably made with double walls and having upon one side of its pivotal point a broad passage 35 therein. The central portion of the throttle valve 36 is transversely bored upon its axial line and hollow bearings extend into the opposite ends of said bore from the adjacent casing of the carbureter, to movably hold the said throttle in place. One of said hollow bearings is made up of a hollow member 37, having a screw threaded portion 38, engaging a screw threaded aperture formed in the casing, the outer end of said member 37 having a head portion 39 positioned in a horizontal cylindrical passage 40 in the side of the casing. The outer end of said passage 40 is normally closed by a screw plug 41 so that it may be removed for inserting or removing the said member 37. A passage 42 is also formed in the casing 10, its lower end connecting with the float chamber 12 while its upper end communicates with the cylindrical passage 40. The inner end of said tubular member 37 forms a valve seat, adapted to receive the tapered end of a needle valve 43, which enters the casing from the opposite side. The said needle valve is carried by a tubular shaft 44 having a bearing 45 in the casing 10. The inner end of said tubular shaft 45 extends well into the bore of the throttle valve but a space is left between it and the valve seat to permit of the escape of gasolene into the passage 35 of the throttle valve on one side, air also entering through an opening 46 in the hub of said throttle valve upon the other side, said air passing into the mixing chamber with the gasolene through the passage 35. The movement of the air through the opening 46 and the passage 35, is constantly carrying the gasolene through the passage 35 and into the mixing chamber above the throttle, thoroughly spreading and mixing of the materials therein.

The outer end of the hollow shaft 44 is provided with an operating lever 47, the upper end of which is perforated and adapted to be connected with any usual or ordinary operating rod not shown. The lever 47 is also provided at its opposite end with a laterally projecting bracket 48 in which is pivoted a lever 49 adapted to control the needle valve. The inner end of the lever 49 is provided with a screw threaded opening, in which is mounted an adjustable socket member 50, having a bearing 51 formed therein and adapted to receive a ball 52 formed upon the outer end of the valve stem 53. The valve stem is preferably reduced in diameter at its outer end as shown in Figs. 3 and 5 of the drawing. A spring pressed plunger 54 is mounted in the hollow member 50. The end of the lever which carries the hollow member 50 is preferably split and provided with a screw 55 passing through the ends thereof and adapted to draw the split portions together upon the threads of the hollow member 50, to lock it in adjusted position. A spring 56 is interposed between the said split end of the lever 49 and the adjacent part of the lever 47. The outer end of the lever 49 is provided with an anti-friction roller 57. The said anti-friction roller is adapted to engage and be moved upon an adjustable rod 58. The said rod 58 is centrally bent to follow the curved path of movement of the said antifriction roller 57, and also to facilitate the adjustment of the intermediate portions thereof. The ends of said rod are supported by screws 60 and 61 which are adjustably carried by a plate 62 mounted upon the side of the casing 10, the said plate surrounding the hollow shaft 45 and the adjacent portion of the casing closing the same. A flanged nut 63 engaging a screw threaded boss upon the casing holds the said plate 62 in place. Said plate is also provided with a slotted extension 64 engaged by a set screw 65 carried by the casing 10, whereby the said plate 62 may be adjusted about the axis of the shaft 45 to set the parts carried thereby in position for the proper introduction of gasolene and air. The said plate 62 has radially extending arms, two of which 66 and 67 carry the adjusting screws 60 and 61 at their outer ends, while an intermediate one 68 carries an intermediate adjusting screw 69 which holds the central part of the bar 58 in the proper adjusted positions. The set screws 60 and 61 are adjustably carried upon the said arms 66 and 67 by means of circular nuts 70 and 71 having knurled or serrated edges, by which they may be turned for forcing the screws 60 and 61 to different positions with respect to the arms 66 and 67. A similar knurled nut 72 is applied upon the intermediate screw 69 for adjusting it. The said screw 69 however, is not provided with a head like the other screws. As there is no connection between this screw and the bar 58 such as would prevent the screw from turning, a pin 73 is provided and carried by the arm 68, said pin extending into a slot or groove 74 formed in the said screw. Springs indicated in dotted lines at 75 are usually mounted in bores extending into the said arms 66, 67, and 68, the said springs bearing upon the knurled edges of the adjusting nuts 70 and 71 and 72 so as to tend to hold them against accidental turning. It will be understood that the adjustment of the screws 60,

61 and 69 with respect to each other can be made to control the inclination or position of the rod 58, so as to tend to lift or carry outwardly the outer end of said lever 49, as the lever 47 is operated. Thus starting from the position shown in Fig. 1 and moving the upper end of the said lever 49 to the right, the antifriction roller 57 will ride inwardly upon said rod so as to lift the needle valve from its seat within the throttle, to a greater and greater extent as the said throttle is opened to a greater degree. Upon moving the lever in the opposite direction the antifriction roller 57 will ride outwardly upon the rod 58 toward the screw 60 so as to tend to close the needle valve. To prevent forcing the needle valve into too great an extent, the spring pressed bearing plunger 54 is provided which will yield after the valve is seated. The relative relations of the screws 61 and 69 will produce the desired operation of the needle valve in exact accordance with the action of the throttle and with the amount of gasolene which it is desired to introduce through the same.

It will be understood that the plate 62, with the parts thereon set for all desired movements in delivering a proper mixture of air and gasolene to the mixing chamber, may be adjusted without disturbing the said parts, upon loosening the screw 65 so that the time when the throttle begins to admit gasolene for the initial or low speed running of the engine as when starting, may be nicely adjusted.

As shown in Fig. 6 the adjusting screws for the bar 58 may be provided with means for setting them at a distance from the carbureter as for instance at a point adjacent to the seat of the chauffeur. To accomplish this purpose a bar 80 is journaled upon the hub of the lever 47 and its outer end is bifurcated and adapted to receive a worm 81 carried by a shaft 82. The said worm meshes with an actuating gear 83 journaled upon the said arm 80. In this instance also the adjusting nuts as 84 and 85 are provided with gear teeth upon their peripheries adapted to be engaged by the teeth of the actuating gear 83. When the arm 80 is swung so that the said gear 83 meshes with either of the other gears 84 or 85 and the shaft 82 is turned, the said nuts may be caused to adjust the screws which carry the said rod 58. Spring pressed balls 88 engage the edges of said gears to hold them against accidental movement. A spring pressed ball 86 is carried by the central portion of the arm 80 and adapted to engage recesses 87 formed in the adjacent plate 62 for holding the said lever 80 either in or out of operative position.

The operation of the mechanism will be readily understood from the above description, and will require only a brief outline in addition thereto. The carbureter is supplied with gasolene through the float chamber in the usual way and after starting the engine the throttle is opened more and more for speeding up the engine and admitting a greater quantity of air for the mixture delivered to the engine.

In turning the throttle to admit more air the lever 49 is operated for opening the needle valve and delivering a corresponding additional quantity of gasolene. The gasolene is carried through the passage 35 of the throttle valve by the air with which it becomes thoroughly mixed and into the engine. The position of the throttle valve upon the shaft 44 is controlled by means of a set screw 90. Stops 91 and 92 are provided on the plate 62 to limit the movement of the said lever 47. When additional air is required above that which normally passes through the inlet 22, the plate 31 is adjusted for opening the apertures 30.

What I claim is:

1. A carbureter having a central air passage therethrough, a throttle valve mounted therein having a hollow hub portion with passages extending therethrough, so as to distribute gasolene from the said throttle, a hollow trunnion entering the throttle from one side and adapted to deliver gasolene thereto, a hollow shank entering the throttle from the other side and adapted to turn the same, a needle valve mounted in said hollow shaft and adapted to seat in the end of said hollow trunnion, and a lever mechanism controlling the hollow shaft and carrying valve controlling means adapted to operate according to the position of the throttle, for delivering suitable quantities of gasolene through the said throttle.

2. A carbureter having an air passage extending therethrough, a flattened hollow throttle tiltingly mounted within said air passage, and having a gasolene outlet arranged centrally thereof, and communicating with a source of gasolene, a hollow shaft for adjusting the said throttle, a lever connected with the shaft for turning it, a needle valve mounted in the hollow shaft, a lever carried by the throttle lever and having a movable engagement with the stem of the needle valve, and means mounted upon the casing for operating said needle valve lever to permit of an increased discharge of gasolene as the throttle is opened.

3. A carbureter having a central air passage, a hollow tilting throttle mounted therein having gasolene discharge passages, means for delivering gasolene to said throttle, a lever for turning the throttle, a needle valve carried by the throttle, a lever carried by the throttle lever, a spring interposed between said levers tending normally to unseat the needle valve, an adjustable bearing carried by the needle valve lever for seating or unseating the same, an adjustable bar engag-

ing the outer end of said lever, and means for adjusting the said bar at various points for controlling the movement of said needle valve in accordance with the movement of the throttle.

4. A carbureter having an air passage, a mixing chamber extending therethrough, a throttle valve mounted therein, a needle valve carried by the throttle valve and controlling the discharge of gasolene into said mixing chamber, a lever for operating the throttle valve, a spring actuated lever carried by the throttle, said lever having an antifriction roller at its outer end, a curved bar engaging said anti-friction roller, a series of set-screws supporting said bar at various points, adjusting nuts engaging said screws for varying the position and inclination of said bar, and an adjusting mechanism for turning said nuts in adjusting the said bar.

5. A carbureter comprising a casing having an air passage therethrough, a throttle mounted transversely of said passage, a needle valve carried by the said throttle and adapted to control the discharge of gasolene at the throttle, a lever controlling said needle valve, an adjustable bar engaging the outer end of said lever, adjusting screws controlling the position of said bar, an adjustable plate carrying said screws, means for adjusting the said plate with respect to the casing of the carbureter, arms projecting from said plate and carrying said adjusting screws, nuts engaging said screws and carried by said arms, and springs mounted upon said arms, and engaging the peripheries of said nuts tending to prevent their accidental movement.

6. A carbureter, comprising an air passage, a mixing chamber extending therethrough, a tilting throttle valve mounted therein, a needle valve carried by the throttle valve and controlling the discharge of volatile fluids in said mixing chamber, a lever for operating the throttle valve, a spring actuated lever carried by the throttle valve for operating the needle valve, a bar carried in the path and engaging said spring actuated lever, a pair of set screws pivotally and adjustably supporting said bar, and an intermediate screw bearing against said bar to adjustably alter the path traveled by said spring actuated lever.

In witness that I claim the foregoing I have hereunto subscribed my name this 20th day of February, 1912.

JOHN W. SWAN.

Witnesses:
E. STAELLMAN,
EARLE R. POLLARD.