G. W. WINTERS.

CARBURETER.

APPLICATION FILED APR. 28, 1911.

1,012,781.

Patented Dec. 26, 1911.

2 SHEETS—SHEET 1.

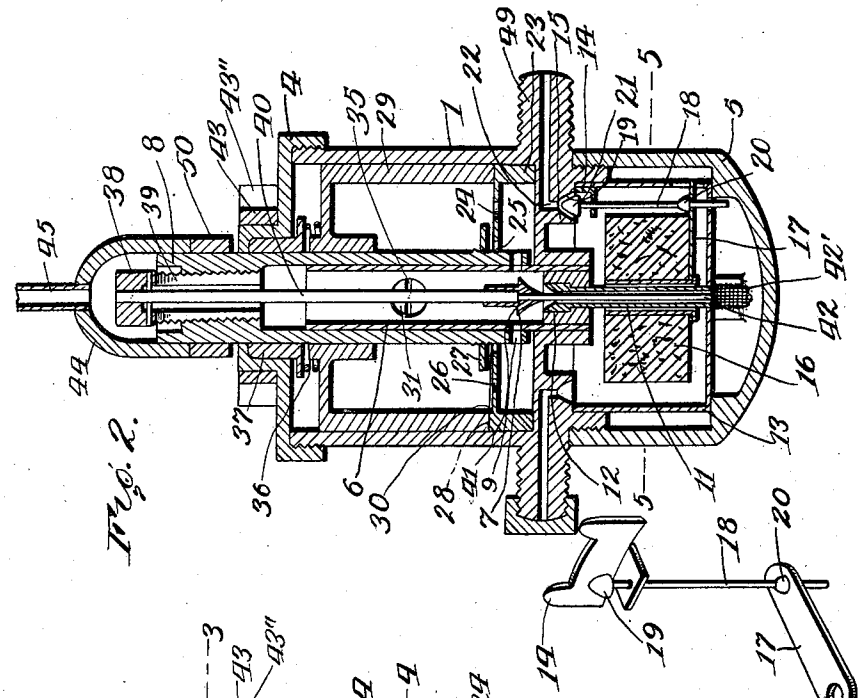

Fig. 2.

Fig. 3.

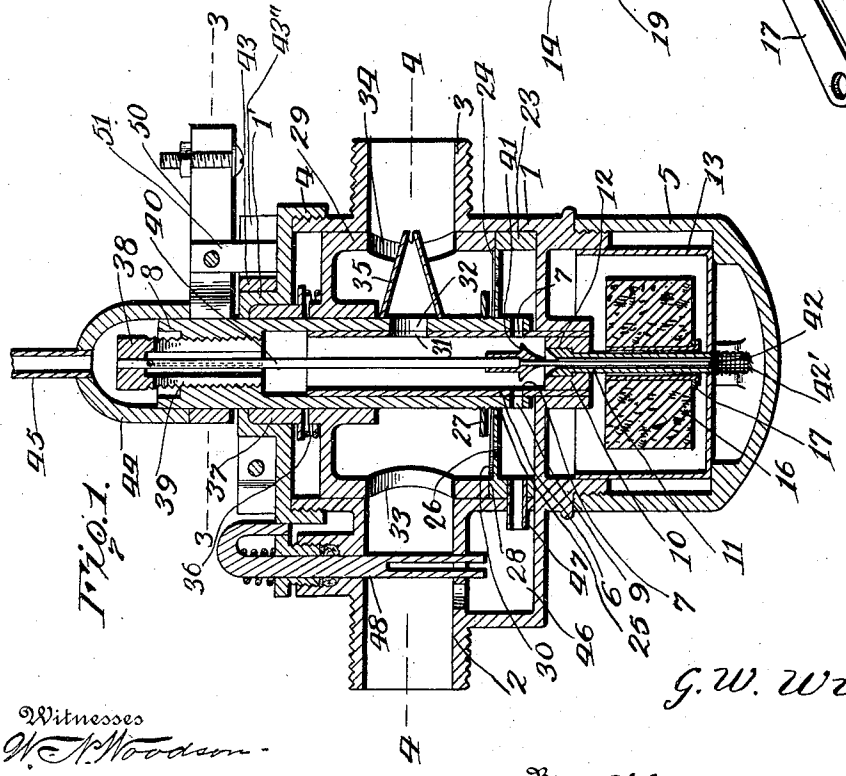

Fig. 1.

Witnesses

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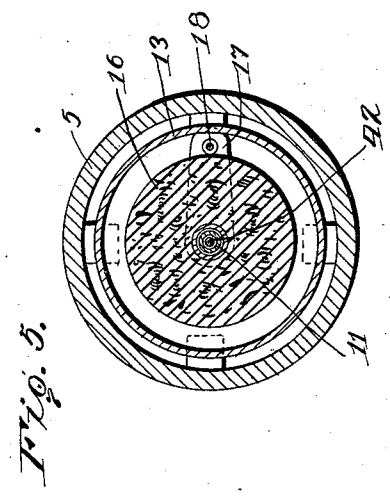

Fig. 5.

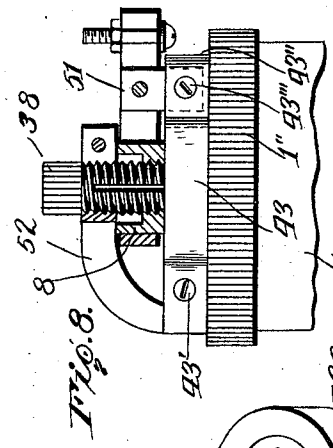

Fig. 8.

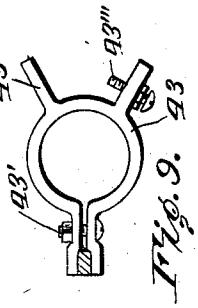

Fig. 9.

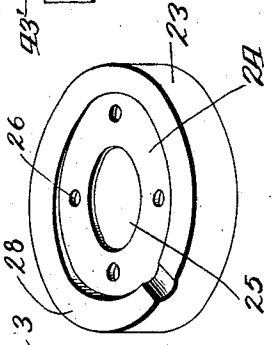

Fig. 6.

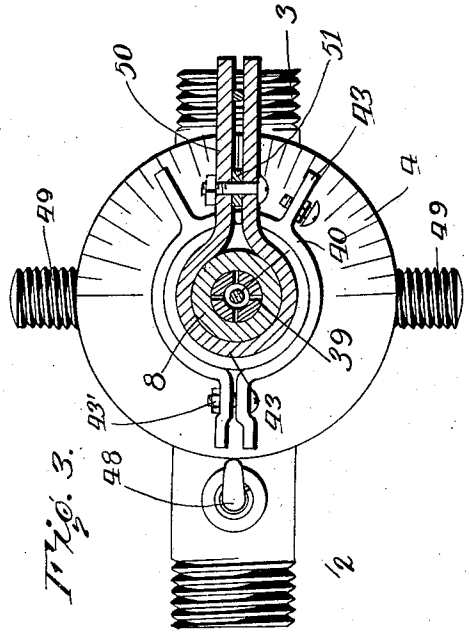

Fig. 3.

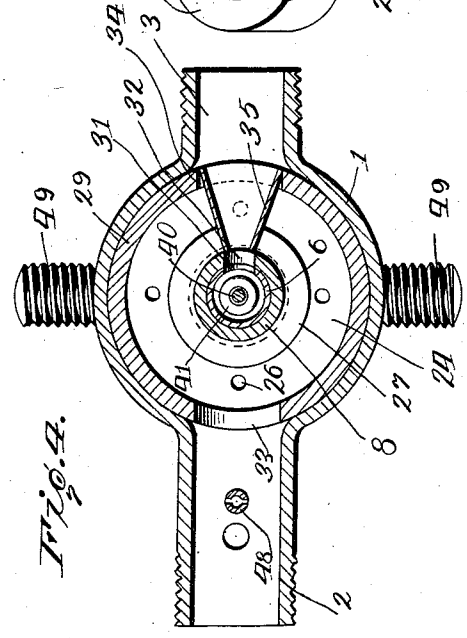

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE W. WINTERS, OF DE QUEEN, ARKANSAS.

CARBURETER.

1,012,781. Specification of Letters Patent. Patented Dec. 26, 1911.

Application filed April 28, 1911. Serial No. 623,926.

To all whom it may concern:

Be it known that I, GEORGE W. WINTERS, citizen of the United States, residing at De Queen, in the county of Sevier and State of Arkansas, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to a carbureter, and has for its object to provide a carbureter with a needle valve arranged to move with relation to its seat as the air and gas which passes through the carbureter is throttled, whereby the proportion of liquid which passes through the seat of the needle valve is automatically regulated at the time the air and gas passageway through the carbureter is regulated.

A further object of the invention is to provide within the carbureter an air and gas discharge nozzle which is flattened and above and below which are located air and gas passageways having discharge outlets disposed in the same general direction as the outlet of the nozzle so that the fluid which passes through the nozzle is enveloped in the fluid which passes through the said passageways.

Another object of the invention is to provide in a carbureter two means for carbureting the air, the said means being so arranged that their mixtures are intermixed as they pass from the carbureter, whereby the resultant mixture is highly carbureted and is in condition to create prompt and positive explosions.

In the accompanying drawings:—Figure 1 is a vertical sectional view of the carbureter; Fig. 2 is a vertical sectional view of the carbureter, taken at a right angle to the view illustrated in Fig. 1; Fig. 3 is a horizontal sectional view of the carbureter, cut on the line 3—3 of Fig. 1; Fig. 4 is a horizontal sectional view of the carbureter, cut on the line 4—4 of Fig. 1; Fig. 5 is a horizontal sectional view of the carbureter, cut on the line 5—5 of Fig. 2; Fig. 6 is a perspective view of the ring and diaphragm used in the carbureter; Fig. 7 is a perspective view of the valve mechanism used in the carbureter for controlling the flow of gasolene; Fig. 8 is a side elevation of a modified form of device for adjusting the needle valve with relation to the cylinder; and Fig. 9 is a plan view of the means for limiting the adjustment of the parts.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

The carbureter consists of a body 1 which is provided at one side with an air inlet passageway 2, and at its diametrically opposite side with a mixture discharge passageway 3. The upper end of the body 1 is closed by a cap 4, and the lower end thereof is closed by a cup 5. An inner tube 6is held in stationary position within the body 1 and is centrally and vertically disposed therein. The said tube is provided in the vicinity of its lower end and at its opposite sides with ports 7. A sleeve 8 is journaled upon the tube 6 and is provided in the vicinity of its lower end with ports 9 which at times are adapted to register with the ports 7 in the tube 6. A bushing 10 is located in the lower end of the tube 6 and carries a vertically disposed tube 11 which is provided at its upper end with a valve seat 12. A chamber 13 slidably fits within the lower end of the body 1 and is held against rotation by means of spaced lugs 14 which receive shoulders 15 formed within the lower end of the body 1. The tube 11 projects down into and through the bottom of the chamber 13. A float 16 is located within the chamber 13 and is slidably mounted upon the tube 11. An arm 17 is carried by the float 16, and the stem 18 of a valve 19 passes through the end portion of the said arm 17. A stop 20 is mounted upon the valve stem 18 and at times is engaged by the arm 17 when the float 16 rises in the chamber 13, whereby the valve 19 is moved toward a seat 21 provided in the shoulder 15 and is adapted to close a port 22 provided in the body 1 and which at its upper end communicates with the interior of a nipple to be described later. A ring 23 is held against rotation in the body 1 and is provided at its upper end with a diaphragm 24 which in turn is provided with a central opening 25 which is spaced from the outer periphery of the tube 8. The diaphragm 24 is also provided with openings 26. A ring 27 is adjustably mounted upon the tube 8 and is located over the opening 25 in the diaphragm 24. The ring 23 is provided at the upper portion of its edge with a cam extension 28. A cylinder 29 is journaled in the upper portion of the body 1 and is fixed at its top to the sleeve 8. The said cylinder is provided at its lower end with a cam portion 30 which is adapted to ride

upon the cam portion 28 of the ring 23, whereby the cylinder 29 is moved slightly longitudinally as it is turned within the body 1.

At a point between the upper and lower ends of the cylinder 29, the tube 6 is provided with a port 31, and at a point between the upper and lower ends of said cylinder, the tube 8 is provided with a port 32. The ports 31 and 32 register at intervals. The cylinder 29 is provided with an inlet port 33 which is adapted at times to register with the inlet passageway 2 of the body 1, and at its diametrically opposite side the cylinder 29 is provided with an outlet passageway 34 which is adapted at times to register with the outlet passageway 3. A nozzle 35 is located over the port 32 and is provided with a flattened discharge end which projects through the outlet port 34 and which is in the form of an arc coincident with the arc of curvature of the outer periphery of the cylinder 29. A spring 36 is interposed between the top of the cylinder 29 and a packing box gland 37 located in the cap 4. The said spring 36 is under tension with a tendency to hold the cylinder 29 down against the upper edge of the ring 23. A plug 38 is adjustably screw threaded in the upper end of the sleeve 8 and is provided in its sides with slits 39 which render the portions of the said plug that are inserted in the sleeve 8 flexible or movable with relation to each other and also serve as openings through which air may pass down through the said plug. A needle valve stem 40 is fixed to the plug, and the said stem projects down into the tube 6 and carries a flared valve head 41 which is adapted to move toward and away from the seat 12 formed at the upper end of the tube 11. The head 41 is provided with a downwardly extending nose 42 which projects down into the tube 11 and prevents the same from choking up with sediment or viscous oil.

A split ring 43 is clamped upon the upper projecting portion 1′ carried by the cap 4 of the body 1. This ring is illustrated in detail in Fig. 9 and its end portions are held together by means of a clamp bolt 43′, and the ring is provided with abutment arms 43″ one of which is provided with an adjustable screw 43‴. A cap 44 is mounted upon the upper end of the sleeve 8 and the lower end of an air pipe 45 is connected to the said cap, and the upper end of said pipe leads to a point above high water level when the carbureter is used upon an automobile or similar machine designed to ford streams. A chamber 46 is formed upon the exterior of the body 1 under the nipple passageway 2 thereof, and a nipple 47 communicates at one end with the interior of the said chamber and at its other end with the space inclosed by the ring 23. The said nipple 47 holds the said ring against rotation. A butterfly valve, not shown, but whose stem is indicated at 48, is located in the passageway 2, and the carbureter may be primed by manipulating said butterfly valve in the usual manner. A screen 42′ (best seen in Figs. 1 and 2) is located under the lower end of the tube 11 and is adapted to prevent large solid bodies from entering the tube 11 with the oil. Nipples 49 are mounted at the sides of the body 1 and have the inner ends of their passageways in communication with the upper end of the passageway 22, as illustrated in Fig. 2 of the drawings. It is through one or the other of these nipples that the gasolene is admitted into the chamber 13, the gasolene flowing through the said nipple, thence through the passageway 22 into the said chamber. Two of the nipples are provided in order that the carbureter may be used at either side of a machine. The nipple which is not in use is closed by a cap, as illustrated in Fig. 2. As the gasolene accumulates in the said compartment the float 16 rises and the arm 17 operating against the stop 20 will move the stem 18 and close the valve head 19 against the seat 21 until the gasolene in the chamber 13 assumes a normal level, when the said valve head 19 will fall away from the seat 21 by gravity.

The gasolene which is admitted into the chamber 13 is drawn up through the tube 11 and when it strikes the flared valve head 41 it is deflected laterally in all directions in a thin film. The fumes of some of the gasolene will continue up through the inner tube 6 to the outlet 31 where it will mix with a column of air coming down the said tube, as hereinbefore explained. Other fumes of the gasolene will be directed out through the registering openings 7 and 9 in the tube 6 and the sleeve 8 into the space inclosed by the ring 23. Here the fumes will mix with the air just admitted into the space inclosed by the ring 23 through the nipple 47 and this mixture passes up through the opening 25 in the diaphragm 24 under the ring 27 and into the cylinder 29. From the cylinder 29 the mixture is drawn out through the outlet opening 34 at the upper and lower sides of the flattened discharge end of the nozzle 35. Thus the mixture just drawn through the nozzle comes out in a thin ribbon incased between upper and lower layers of mixture which have been drawn out through the upper and lower portions of the opening 34. Therefore the air and gasolene is thoroughly mixed in two primary mixtures, and these mixtures are finally mixed before they pass into the engine cylinder.

A handle lever 50 is fixed to the upper end

of the sleeve 8 and is provided with a finger 51 which extends down between the arms 43'' of the split ring 43. One end of the screw 43' is in the path of movement of this finger 51. Consequently when the handle lever is turned to increase or diminish the registering spaces between the openings 33 and passageway 2 and the opening 34 and passageway 3, the cylinder 29 is moved longitudinally by means of the cam surfaces 28 and 30, the former of which is carried by the ring 23 and the latter by the cylinder 29. Therefore the head 41 of the needle valve will be moved toward or away from its seat and the quantity of gasolene admitted into the lower end of the tube 6 will be regulated at the same time that the mixture and air is throttled. Also as the ring 27 will be moved toward or away from the opening 25 and the passage of the mixture through the said opening will be regulated at the same time that the final mixture is throttled. Also the openings 7 and 9 in the tube 6 and sleeve 8 will be moved out of perfect register with each other and the passage of the gasolene through the said openings is throttled. The cap 44 not only serves in part as means for conducting air to the upper end of the sleeve 8, but it also serves as means for preventing the plug 38 from being tampered with after the said plug and the valve stem 40 attached thereto have been set. By reason of the fact that the said cylinder 29 is closed at its upper end the suction of the engine through the discharge passageway 3 will have a tendency to draw the said cylinder down tight against the upper edge of the ring 23. Therefore it will be seen that by loosening the bolt 43' that the split ring 43 may be shifted in its position upon the projection 1' and secured in an adjusted position so that the path of movement of the cylinder 29 and coöperating parts may be regulated, but the swinging movement of the cylinder 29 and the connected parts is limited by the arms 42 and the screw 43''' carried by one of the said arms so that the extent of movement may be adjusted.

In case the carbureter is used in conjunction with very large engines an arm 52, as illustrated in Fig. 8, is employed. This arm is fixed to the plug 38 and has an end portion which lies between the extremities of the split ring 43, but the said arm may move vertically between the said extremities. By this arrangement a very fine and accurate rise and fall of the needle 41 may be accomplished.

This carbureter is so constructed that a hundred horsepower carbureter can be used on a one horsepower engine with the same adjustment of the plug 38, which is largely due to the perfect control that the numerous throttling points have over the mixture. For instance, when the mixture is being throttled in its movement through the discharge nozzle 35 it is also being throttled through the opening 34 of the cylinder 29. At the same time it is being throttled at the openings 31 and 32, and also at the openings 7 and 9. As this is being done the opening 25 in the diaphragm 24 is closed wholly or in part by the plate 27. Also the inlet of air is throttled at the opening 33 and passageway 2, which makes seven points at which the elements are throttled. There are two sets of air openings that remain constant, the openings 26 in the diaphragm 24 and the slots in the upper end of the plug 38. Also the dimensions of the passageway through the nipple 47 and chamber 46 do not vary. The nipple 47 is smaller in transverse sectional area than the chamber 46, and the combined ports 7 and 9 are of greater transverse area when wide open than that of the nipple 47. Consequently when the ports 7 and 9 are wide open and the nipple 47 being of less area, the gasolene is drawn into the air space under the diaphragm 24 and within the ring 23 and is threshed into a perfect mixture. The gasolene passes into the air space within the ring 23 through the lower portions of the ports 7 and 9 and the mixture comes back into the tube 6 through the upper portions of the said ports and at the same time some of the mixture goes up into the cylinder 29 through the openings 26 and 25. The passageway through the nipple 47 being smaller than the transverse sectional area of the chamber 46, no gasolene ever goes into the said chamber. When the ports 7 and 9 are nearly closed and their combined transverse sectional area is less than that through the nipple 47, no gasolene goes out through these ports into the space under the diaphragm 24. Therefore it will be seen that by providing these numerous throttlings a synchronic effect and perfect control of the mixture is attained in a simple and easy manner. This control ranges from a mere leak to wide open position of the parts, and to accomplish this it is not necessary to use toggle joints or other mechanisms calculated to be affected by sand, water or other foreign substances.

Having thus described my invention, what is claimed as new is:

1. A carbureter comprising a body having an air inlet passageway and a mixture outlet passageway, a cylinder journaled within the body and having an air inlet and a mixture outlet, a tube fixed with relation to the body, a sleeve fixed with relation to the cylinder and snugly receiving the tube, said tube and sleeve having at points between the upper and lower ends

of the cylinder openings adapted to register, a nozzle surrounding the opening upon the sleeve and having a flattened discharge end passing through the mixture outlet in the cylinder and having its extremity in an arc coincident with the arc of curvature of the outer periphery of the cylinder and means for introducing air and oil into the tube.

2. A carbureter comprising a body having an air inlet passageway and a mixture outlet passageway and an oil inlet, a cylinder journaled within the body and having an air inlet and a mixture outlet, a tube fixed with relation to the body, a sleeve fixed with relation to the cylinder and snugly receiving the tube, said tube and sleeve having at points between the upper and lower ends of the cylinder openings adapted to register, the said tube and sleeve also having in the vicinity of their lower ends openings adapted to register, and an oil controlling valve fixed with relation to the sleeve and located in the tube and having a flared head located opposite the lower openings in the said tube and sleeve.

3. A carbureter comprising a body having an air inlet passageway and a mixture outlet passageway, a diaphragm located in the body and provided with a central opening, said body having an oil inlet below the said diaphragm, a tube fixed with relation to the body, a sleeve snugly receiving the tube and passing through the opening in the diaphragm but spaced from the edges of the same, said tube and sleeve having in their sides openings adapted to register, means for moving the sleeve as it is turned upon the tube, and a ring carried by the sleeve and located above the opening in the diaphragm.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. WINTERS. [L. S.]

Witnesses:
W. D. GARRISON,
WILLIAM DUNHAM.