G. P. RETTIG.

CARBURETER.

APPLICATION FILED SEPT. 7, 1910.

1,040,414.

Patented Oct. 8, 1912.

2 SHEETS—SHEET 1.

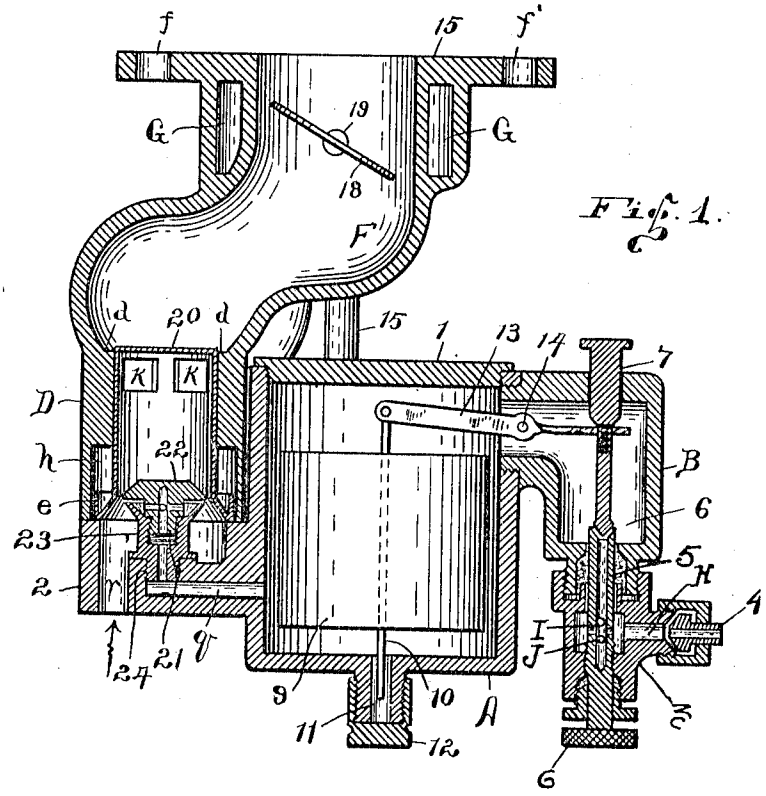

Fig. 1.

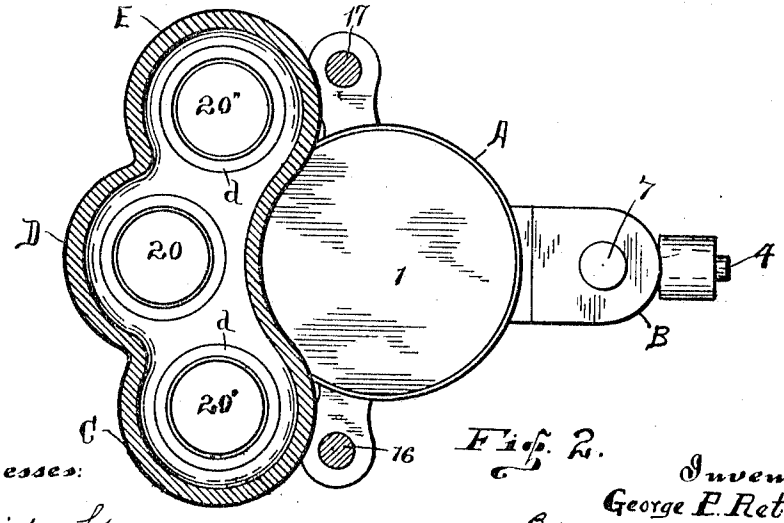

Fig. 2.

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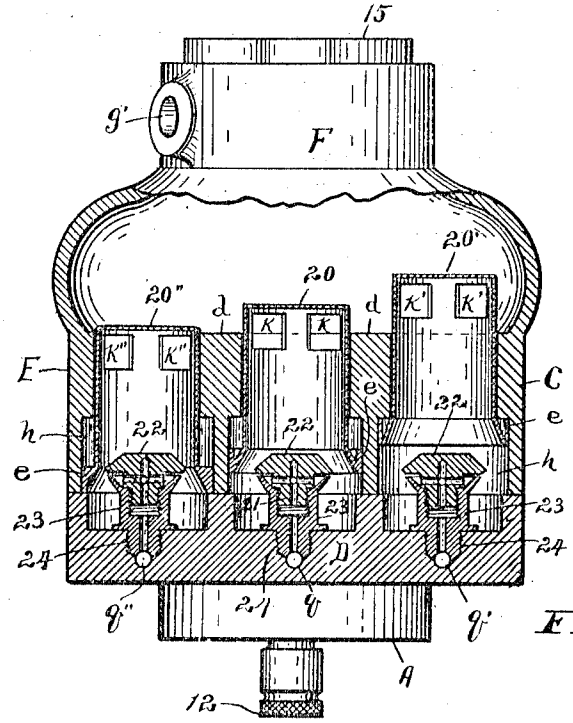

Fig. 3.

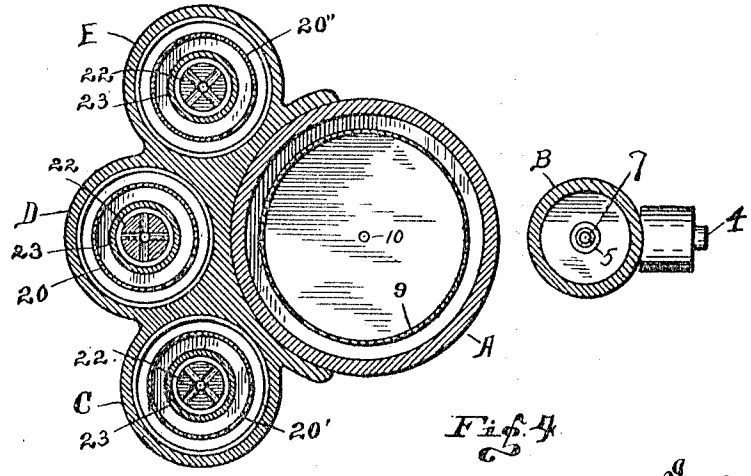

Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE P. RETTIG, OF RICHMOND, INDIANA.

CARBURETER.

1,040,414. Specification of Letters Patent. Patented Oct. 8, 1912.

Application filed September 7, 1910. Serial No. 580,921.

To all whom it may concern:

Be it known that I, GEORGE P. RETTIG, a citizen of the United States, residing in the city of Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Carbureters, of which the following is a full, clear, and accurate description and specification, being such as will enable others to make and use the same with absolute exactitude and with certainty and precision.

My present invention relates, more particularly, to a carbureter for internal combustion engines or the like, the carbureter being adapted for transforming a liquid fuel into a gaseous fuel for explosion within the engine cylinder.

The object of this invention, broadly speaking, is to provide a carbureter which will be strong and durable in construction, positive in action, adapted to a wide scope of usefulness and efficiency, and which can be manufactured and sold at a comparatively low price.

A more particular object is to provide an automatic multi-range carbureter in which the admission of fuel is automatically controlled to depend on the requirements of the engine, whereby the fuel is kept uniform, in relation to the air, for every level of the fuel and for every speed or condition of the engine.

Another object of my invention is to provide a progressive vaporizer having a plurality of transformers or vaporizers arranged to operate under different degrees of pressure or suction, thereby providing a wide range of operation, from the commencement of operation of the first vaporizer to the limit of capacity of the last vaporizer.

Other minor objects and particular advantages of my invention will be brought out in the course of the following specification, and that which is new will be correlated in the appended claim.

One manner for carrying out the objects of my invention, and that which in practice has been found to be the most desirable, is shown in the accompanying drawings, in which—

Figure 1 is a vertical central section taken through my construction. Fig. 2 is a plan view of certain of the parts, certain other parts being shown in section. Fig. 3 is a front elevation, partly in vertical section. Fig. 4 is a horizontal section.

Similar indices denote like parts throughout the several views of the two sheets of drawings.

In order that the construction and the operation of my invention may be more fully understood and that its advantages may be properly appreciated I will now take up a detailed description thereof in which I will describe the invention as briefly and as comprehensively as I may.

The body of my invention comprises the float-chamber A, same having a removable top 1, by which access may be had thereinto as indicated.

Formed integral with the wall of chamber A and extending out from one side, near the bottom thereof, is the three-fold bracket 2 which supports the three mixing chambers hereinafter referred to in detail.

Formed through the wall of chamber A, near the top thereof, and opposite to the center of said bracket 2, is a threaded aperture in which is attached the outwardly and then downwardly extending valve-chamber B, the interior thereof being in communication with the interior of the float chamber, substantially as indicated.

Threaded onto the lower end of the valve-chamber is the angular-fitting 3 in which is threaded the vertically operable stem 5, same having a cup-like cavity in its upper end, which latter is located inside of the chamber B. Said stem 5 is operable by the knob 6. Numeral 4 denotes a nipple through which the liquid fuel may pass from the fuel supply. The fuel passing through said nipple 4 passes thence through the passage H and then through apertures I and J into the interior of stem 5 and then up into the interior of chamber B.

Numeral 7 denotes a needle stem having an enlarged upper portion which is slidable up and down through an aperture formed in the top of chamber B. The lower end of stem 7 is formed conical and it is adapted to fit in the cup-like end of the stem 5 to close the aperture therethrough. The outer end of lever 13 is located in a slot formed in the stem 7 whereby as the float 9 is moved up and down the stem 7 will be moved down and up respectively.

Numeral 9 denotes a float located inside of the float-chamber, a stem 10 being secured to and extending through the center of the float as shown. The lower end of said stem 10 extends down into the nipple 11 which

acts as a guide for the float. The lower end of said nipple 11 is adapted to be closed by a cap 12. To the upper end of stem 10 is pivoted the lever 13. The central portion of said lever 13 is pivoted at 14, all substantially as indicated in Fig. 1.

In this invention I provide three mixing-chambers which are denominated by letters C, D and E, same being integrally connected with each other, corresponding in cross-section with the top of bracket 2 on which they rest. Said three chambers extend upward and rearward where all unite in the single supply-chamber F common to all of the three chambers. Said chamber F is cylindrical in form and extending therearound at its upper edge is a flange 15 having ears with bolt apertures *f* and *f'* formed therethrough whereby the carbureter may be secured in position with the opening in the top of the supply-chamber F in connection with the fuel intake of an engine.

The three chambers C, D and E, and the chamber F, are formed integral with each other and they are secured in position, as shown, in connection with the first mentioned portion of the carbureter by means of the two bolts 16 and 17 which pass through suitable ears therefor which extend out from the sides of chamber A and from chamber F, all substantially as indicated.

Mounted across in the upper portion, or throat, of chamber F is the throttle 18 which is adapted to close the outlet of the mixing chamber. Said throttle is mounted on shaft 19 which extends through outside the chamber with means in connection therewith whereby the throttle may be operated as desired, either manually or automatically and mechanically.

Formed around the supply-chamber is a fluid or air chamber G through which warm water or air may circulate for heating the carbureter and the vaporized gas as it passes therethrough, it being evident that chamber F will be abnormally cold when the engine is in operation by reason of the vaporization of the fuel. Entrance to or from said chamber G may be had through the ports *g*—*g'*, which may be connected to other sources of supply or delivery.

I now come to a description of the most important feature of my present invention, which relates to the three mixing-chambers, which as they are alike in construction, except in one particular, a description of one will answer for all.

Numeral 20 denotes the controller which is slidable up and down in a portion of the mixing-chamber D, and controllers 20′ and 20″ are likewise mounted in chambers C and D, respectively. Said controllers are cylindrical in form, having an open lower end and a closed top or upper end, which when the controllers are down to their limit will be even with the ledge *d*. Formed around the lower edge of the controller is a hollow flange *e*, there being a channel formed around in the chamber D (and also in chambers C and E) in which said flange may operate as the controller moves up and down. Formed through the wall of the controllers are a plurality of square apertures *k* which are located near to the top of the controller, substantially as shown. Located below each of said controllers is a nozzle mechanism which I will now describe: Numeral 23 denotes a collar having a flaring upper end, the lower end of said collar is provided with a threaded stem 24 which is adapted to be screwed into the center of the bottom of chamber D, the central channel through said collar being in communication with the channel *q* which opens into the float chamber. Numeral 22 denotes the head, same having a hollow stem 21 which is threaded into the center of the upper end of collar 23. The space between the upper edge of collar 23 and the under face of the head 22 is very slight, being such as to allow liquid fuel to escape in a thin sheet or spray. Said space between the collar 23 and the head 22 may be varied, being adjustable as desired by simply turning the head causing it to raise and lower. An air inlet *r* opens from the bottom into the lower interior of chamber D and allowing the air to pass around collar 23.

As above intimated the mechanism just described relates to chamber D but it is evident that the same construction is located in chamber C where like parts are denoted, where shown, by like characters with the addition of a single exponent; while in chamber E like parts are denoted by like characters with double exponents.

The only difference, above intimated, is that the three controllers are made of different weight. In this instance controller 20′ is the lighter of the three for the reason that no auxiliary weight is applied to this controller. Controller 20 is heavier than the former this being accomplished by adding weight in the flange *e*. And controller 20″ is made heavier than controller 20 by the addition of more weight to the flange thereof.

Operation: The operation of my invention is quite simple and is substantially as follows: It should first be understood that chamber F is to be connected to the intake of an internal combustion engine; nipple 4 is to be connected to a gasolene supply; and inlet *r* is to be connected with an air supply. Suppose for instance that the engine to which my carbureter is attached be started, and the throttle 18 be opened, or nearly so, it is evident that as the piston is on its intake stroke the pulsations which will be set up within the chamber F will each create a suction or

partial vacuum in said chamber which will, manifestly lift or tend to lift the three controllers 20′, 20 and 20″. Now as controller 20′ is the lighter of the three it will of course be the first to be lifted, in fact the other two controllers will not be lifted until the pulsations have reached a predetermined degree. As controller 20′ rises it will manifestly raise apertures *k* above the ledge *d*, and the higher said controller is raised, the wider said apertures will be opened until they are open to their limit, at which time the flange *e* will strike the top of channel *h* thereby preventing the controller from raising higher than is required. As the apertures *k* are opened it is evident that the suction of the engine will draw in air through inlet *r*, also as the controller is lifted away from the nozzle, or head 22, the gasolene will be drawn from chamber A through channel *q*, up through the collar 23, and will pass out from the nozzle in a fine sheet of spray, mixing with the incoming air in the lower part of chamber D, and the gasified air, or vapor, will be drawn up through the controller and the apertures *k* and thence into chamber F, from whence it will pass on into the engine to be utilized. Now when controller 20′ has reached its limit of delivery or nearly so, it is evident that if the suction increases that in like manner controller 20 will be raised, causing a like delivery of fuel therethrough, and thereby doubling, or nearly so, the delivery of carbureted fuel, and in like manner when both controllers 20′ and 20 have reached their limit of delivery, or nearly so, then controller 20″ will be lifted and will operate in like manner as above set forth, thereby trebling, or nearly so, the delivery of carbureted fuel to the engine.

By reason of the above described arrangement it is evident that one, two, or three controllers are brought into action at one time, depending on the requirements of the engine, thereby resulting in a saving of fuel and also resulting in a better proportioned and better grade of vaporized fuel, as no one of the controllers or nozzles will be called upon to operate beyond its capacity to properly proportion and mix the gas and air into fuel vapor.

The proper level of gasolene in chamber A is maintained by the float 9 which operates on the admission valve 7, and the height to which the gasolene may attain in chamber A may be governed by the position of stem 5, which may be controlled by the knob 6.

I desire that it be fully understood that various changes may be made in the several details of construction herein shown and described without departing from the spirit of my invention or sacrificing any of the advantages thereof.

Having now fully shown and described my invention what I claim and desire to secure by Letters Patent of the United States, is—

A carbureter comprising a casing having a liquid fuel reservoir, said casing having an extension forming a carbureted fuel supply chamber and being of arc formation located concentric to the reservoir and adapted to be connected to the intake of an engine, said arc-shaped chamber being divided into a plurality of circular carbureting chambers each having independent air inlets and connections with the fuel reservoir and supply chamber, an independently operable oil nozzle in each circular chamber, a controller in each of said chambers, each controller comprising an inverted cylinder with openings in its side walls adjacent the upper end and adapted to have vertical reciprocation, each cylinder having an enlarged lower end and means whereby each of said cylinders will be progressively operated by the suction of the engine, each being adapted to operate at a different degree of suction.

In testimony whereof I have hereunto subscribed my name to this specification in the presence of two subscribing witnesses.

GEORGE P. RETTIG.

Witnesses:
ELIZABETH M. GRACE,
JERRY SMITH.