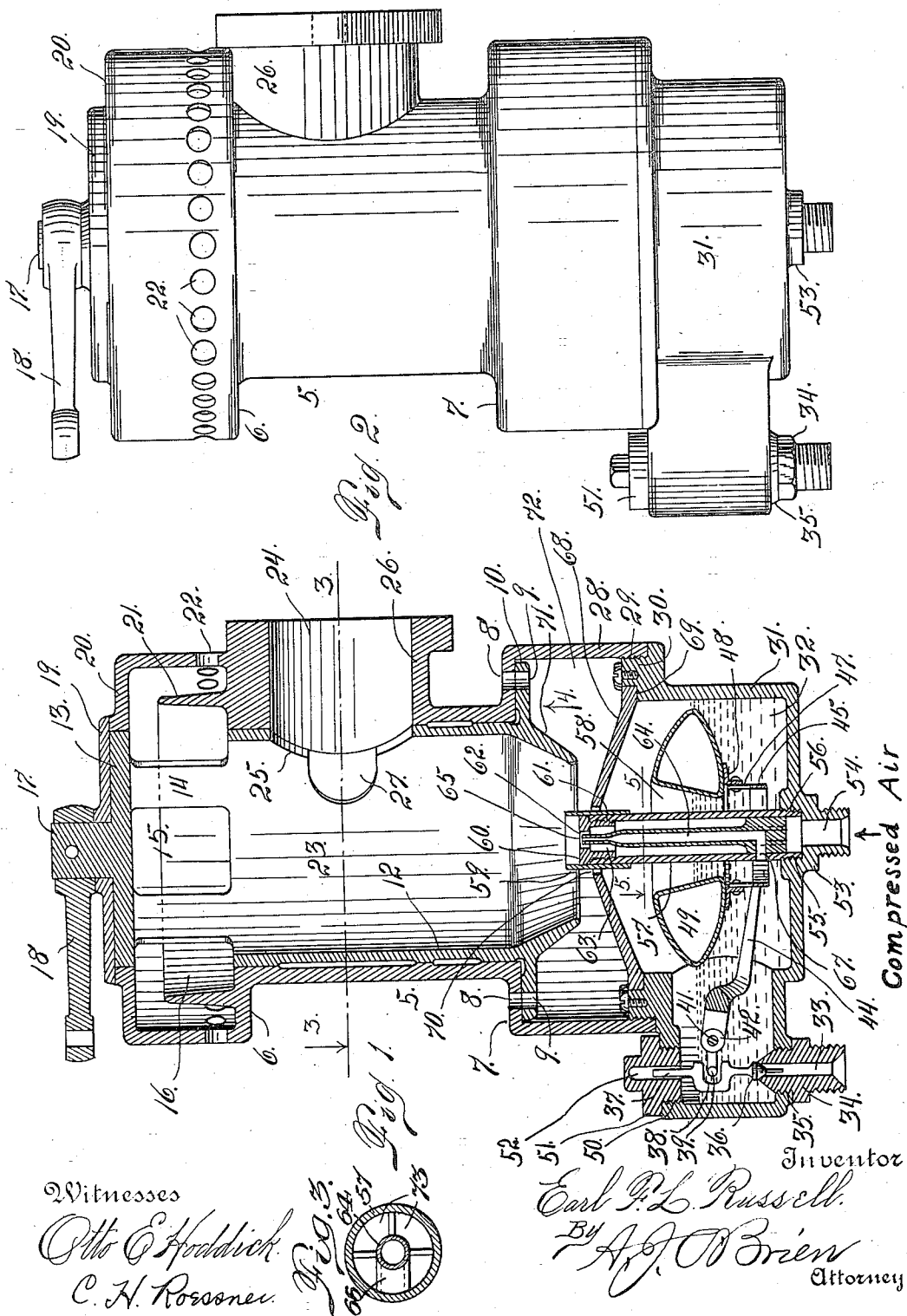


E. F. L. RUSSELL.
CARBURETER.
APPLICATION FILED JUNE 23, 1911.

Patented Feb. 2, 1915.

1,127,286.



UNITED STATES PATENT OFFICE.

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CARBURETER.

1,127,286.

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To all whom it may concern:

Be it known that I, EARL F. L. RUSSELL, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Carbureters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in carbureters for use in connection with explosive engines, and, while especially adapted for use in connection with these engines where employed in connection with automobiles, it is evident that the carbureter is equally valuable wherever engines or motors of this character are employed.

My object is to obtain a more intimate mixture of the gasoline and the air, whereby a better explosive mixture is formed than where the old forms of carbureters are employed.

An important feature of my improved construction consists in introducing the gasoline mixture mingled with air under pressure, and, at the same time, subjecting the gasoline to an atomizing operation by the introduction of the air under pressure, the atomizing apparatus being suitably connected with the receiver of an air compressor, which may be mounted on the automobile or suitably located where the engine is of the stationary form. Provision is made for automatically feeding the liquid gasoline to the atomizing device simultaneously with the introduction of the air under pressure. Above the atomizer is a relatively large chamber into which the explosive mixture is delivered, this chamber being in communication with the engine, whereby it may be supplied to the cylinders under pressure supplemented by suction resulting from the action of the cylinder pistons.

In the usual form of construction, the explosive mixture is acted on by the suction within the cylinders only, while in my improved form of construction, this suction is supplemented by the pressure of the air within the mixing chamber.

Provision is made for introducing air to the carbureter other than that delivered to the atomizing nozzle from the receiver of the air compressor. This auxiliary air may be regulated, as circumstances may require, by the adjustment of an inner cylinder, which is provided with a flange equipped with elongated openings arranged to register with perforations formed in an adjacent flange of the outer casing. By imparting a partial rotary movement to the inner cylinder, the admission of the auxiliary air may be partly or entirely cut off, as may be desired.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a central vertical section, taken through my improved carbureter. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section of the atomizing nozzle, taken on the line 5—5 of Fig. 1.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate an outer casing which is offset at the top and bottom, as shown at 6 and 7, the offset portion 7 being provided with perforations 8 arranged to register with elongated openings 9 formed in an adjacent flange 10 of an inner cylinder 12, which is connected with a top plate 13 by means of webs 14, separated by spaces 15 forming a communication between the inner cylinder and an outer chamber 16 formed between the upper portion of the inner cylinder and the outer casing. The top plate 13 of the inner cylinder is provided with a wrist pin 17 to which is secured a crank 18, which is employed for manually adjusting the inner cylinder for the purpose of regulating the supply of air through the openings 8 and 9. The outer casing is closed above the top plate 13 of the inner cylinder by a plate 19, which rests upon an interiorly-projecting flange 20 of the said casing. The offset portion 6 of the outer casing is provided interiorly with an upwardly-projecting member 21 which is interposed between the chamber of the inner cylinder and perforations 22 formed in the upper portion of the outer casing. These perforations 22 are for the admission of an additional supply of air, if the same shall

be found necessary. It must be understood that the perforations 22 are not vital to the invention, as the apparatus may be employed with or without these perforations, as may be found desirable. By interposing the wall 21 between the chamber of the inner cylinder and the perforations 22, the air is compelled to pass upwardly over the member 21 and then downwardly into the chamber 23 of the inner cylinder, thus compelling the air so introduced to become intimately mixed with the gasoline mixture before passing to the engine through the outlet opening 24. When the inner cylinder 12 is adjusted, as illustrated in Fig. 1, of the drawing, an opening 25 formed in the said cylinder just registers with the opening 24 formed in a neck 26 of the outer casing. When, however, the cylinder 12 is rotatably adjusted for the purpose of regulating the supply of air through the openings 8 and 9, the relatively large opening 24 is partially cut off, but the inner cylinder is provided with an auxiliary slot or opening 27 to compensate to a certain extent for the cut-off resulting from such rotary action. It is intended, by virtue of this construction and arrangement, to regulate the outlet opening to the engine to harmonize with the regulation of the air inlet openings 8 and 9.

The lower offset cylindrical portion 28 of the outer casing is interiorly threaded at its lower extremity, as shown at 29, whereby it is connected with the exteriorly threaded upper part 30 of a receptacle 31 for gasoline 32, which is admitted through a passage 33 formed in a nozzle 34 fitted into an opening 35 formed in the lower part of the said receptacle. The passage 33 is controlled by a valve 36 provided with a stem 37, in which is formed a recess 38 into which projects the T-shaped extremity 39 of a lever 40, which is fulcrumed at 41, the fulcrum pin having its extremities fast in the walls of the receptacle 31 and passing through a hub 42 of the lever. The long arm of this lever is bifurcated forming arms 44 which extend to the opposite sides of a ring 45, the ring being provided with pivot pins, which pass through openings formed in the extremities of the lever arms 44, whereby the lever is pivotally connected with the said ring. This ring is equipped with upwardly-projecting lugs 47, whose upper extremities are riveted to angled brackets 48 secured to the bottom of a float 49 mounted in the gasoline receptacle and arranged to act upon the lever, whereby the latter is caused to open and close the valve 36, according as the gasoline falls and rises in the said receptacle. Directly above the opening 35, into which the inlet nozzle 34 is screwed, is located a threaded opening 50 into which is screwed a plug 51 having an opening 52 adapted to receive the upper ex-

trermity of the valve stem 37, whereby the valve is accurately guided during its rise and fall in response to the action of the lever 40.

The bottom of the receptacle 31 is provided with a depending nipple 53 in which is formed an air inlet opening 54. This nipple may be connected in any suitable manner with a source of compressed air, not shown. Above the passage 54, the bottom of the receptacle 31 is reinforced and counterbored to form a threaded socket 55 into which is screwed the lower exteriorly-threaded extremity 56 of a tube 57 forming a part of an atomizer. This tube passes upwardly through a central opening 58 formed in the float 49, its upper extremity being equipped with a sleeve 59, which is vertically slidable thereon and into which is brazed a disk 60 having a depending threaded part 61 screwed into the top of the tube 57, the said disk being provided with a central opening 62, the disk being counterbored below said opening to form a somewhat larger opening 63 for the passage of air around a relatively small inner tube 64 passing centrally through the air tube 57, its upper extremity being contracted as shown at 65, whereby a space is left around the upper portion of the inner tube for the escape of air which enters the tube 57 from the inlet passage 54, the lower part of the inner tube 64 being formed spider-shaped and fitted into the lower part of the tube 57, one of the spider arms 66,—see Fig. 3,—being formed relatively large and perforated, as shown at 67, to form a passage for the gasoline 32, the opening 67 through the said spider arm being in communication with the gasoline in the receptacle 31. The upper part of the receptacle 31 is provided with a top plate 68, which is slightly cone-shaped, its outer edge resting upon a shoulder 69 formed on the upper part of the wall of the gasoline receptacle. The central part of this top plate 68 is provided with an opening 70 through which the sleeve 59 passes. The opening 70 is made slightly larger than the sleeve 59. With this exception, the gasoline receptacle is closed at the top. The lower extremity of the inner cylinder 12 is contracted and terminates in a cone-shaped part 71, which surrounds the upper extremity of the sleeve 59. The opening, however, in the lower depending cone shaped part 71 of the inner cylinder, is relatively large, leaving ample space for the passage of air from the chamber 72, formed by the lower part of the outer casing, upwardly into the chamber 23 from which the explosive mixture passes to the engine through the registering openings 24 and 25, as heretofore explained. By virtue of this depending cone-shaped cylinder extremity 71, the air entering through the openings 8

and 9 is compelled to pass downwardly into the chamber 72, and thence upwardly around the upper extremity of the sleeve 59, through which the gasolene vapor passes. By virtue of this construction and arrangement, the air so entering is brought into intimate contact with the gasolene mixture produced by the passage of air up through the tube 57 and around the inner tube 64 with which the liquid gasolene is in communication. By adjusting the disk 60 within the upper threaded extremity of the outer tube 57, the sleeve 59 may be raised or lowered, whereby its upper extremity may be caused to project more or less above the upper extremity of the inner gasolene tube 64 of the atomizing apparatus.

From the foregoing description, the use and operation of my improved carbureter will be readily understood. The gasolene receptacle 31 is supplied with liquid gasolene 32 through the nozzle 34, whose passage is valve-controlled, as heretofore explained. This nozzle is connected with a suitable source of gasolene supply, not shown. When the gasolene is low in the receptacle, the float 49 will occupy a relatively low position and its action on the lever 40 will cause the short T-shaped arm 39 of the latter, by virtue of its action on the recessed stem 38 of the valve, to raise the valve and open the passage 33 for the free entrance of the liquid gasolene. When, however, the gasolene has risen to a suitable height within the tank 31, as indicated in Fig. 1 of the drawing, the float will be lifted sufficiently to cause the lever to close the said valve and cut off the supply. As air under pressure is introduced through the passage 54 in the bottom of the receptacle 31, the said air passes upwardly through the spaces 73 between the arms of the spider-shaped lower extremity of the inner tube 64. This air passes upwardly within the tube 57 and around the inner tube 64 through which the gasolene enters freely from the tank 31. As the air under pressure passes upwardly through the tube 64, it escapes at the upper extremity of the said tube through the openings in the disk 60. This air escapes with great force through the central opening 62 of the said disk and in immediate contact with the upper reduced extremity of the inner tube 64, thus producing the necessary suction or partial vacuum to draw the gasolene through the said tube and atomize it, thereby forming an intimate admixture between the gasolene and the air, this mixture being complete when it escapes into the chamber 23 of the inner cylinder. At the same time, air is drawn into the chamber in the lower part of the outer casing through the openings 8 and 9, and passes upwardly through the depending cone-shaped lower extremity of the inner cylinder, thus furnishing, if necessary, air in addition to that introduced under pressure through the tube 57 of the atomizing apparatus. If desired, as heretofore explained, the passage of air through the openings 8 and 9, may be wholly or partially cut off.

Having thus described my invention, what I claim is:

1. A carbureter comprising a mixing chamber located in its upper portion, a receptacle constituting the lower portion of the device adapted to contain a suitable liquid, which, when atomized and mixed with air, will form an explosive compound, an atomizer passing through the liquid receptacle, its upper extremity being in communication with the mixing chamber, a vertically slidable sleeve mounted thereon, and means for supplying air and gasolene to the atomizer by separate passages, substantially as described.
2. A carbureter comprising an outer casing and an inner cylinder, the casing and cylinder being provided with registering openings and the cylinder being rotatably adjustable within the casing for the purpose of regulating the supply of air through the said openings, the inner cylinder having its lower portion contracted and projecting downwardly below the said openings, and means for delivering an explosive mixture into the lower depending portion of the inner cylinder, the said mixture being delivered under air pressure, substantially as described.
3. A carbureter comprising an outer casing and inner cylinder, the casing and cylinder having registering openings and the cylinder being rotatably adjustable for the purpose of regulating the supply of air to said openings, the lower portion of the cylinder projecting below said openings, the lower part of the casing being equipped with a receptacle for holding a suitable liquid as gasolene, an atomizing apparatus passing upwardly through the said receptacle and communicating with the lower extremity of the said cylinder, means for supplying air to the atomizer under pressure, and means for supplying liquid to the atomizer from the said receptacle, the air and liquid being introduced through separate passages, and suitable means for regulating the supply of liquid to the said receptacle, substantially as described.

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

EARL F. L. RUSSELL.

Witnesses:

F. E. BOWEN,
JNO. G. POWELL.