

APPLICATION FILED FEB. 9, 1914.

Patented Jan. 12, 1915.

2 SHEETS—SHEET 1.

Fig. 2.

Technical drawing of a mechanical device, likely a pump or engine component, showing a cross-section. The drawing includes various numbered parts: 1, 2, 3, 4, 11, 12, 14, 27, 31, 32, 33, 34, 38, and 39. A horizontal line 'a-a' is drawn through the center of the device.

Inventor

Witnesses
M. L. Lister
Mellie Galloway

Jas. W. Raymond
 304 R. M. Farley
 his Attorney

J. W. RAYMOND.
CARBURETER.
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1,124,949.

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2 SHEETS-SHEET 2.

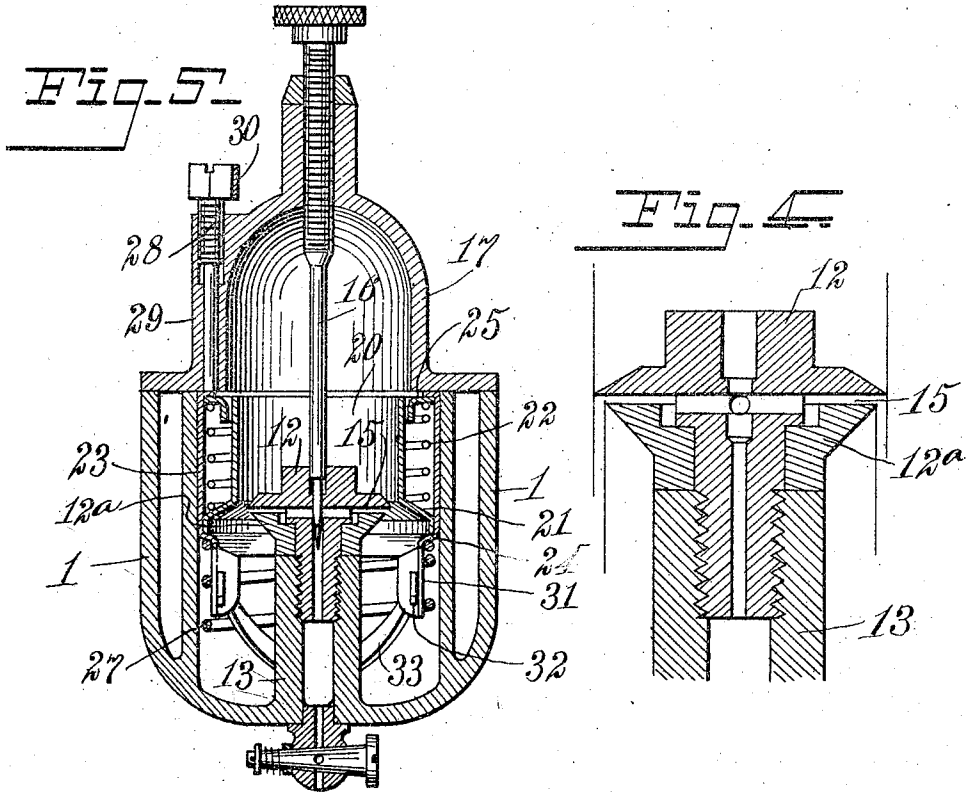
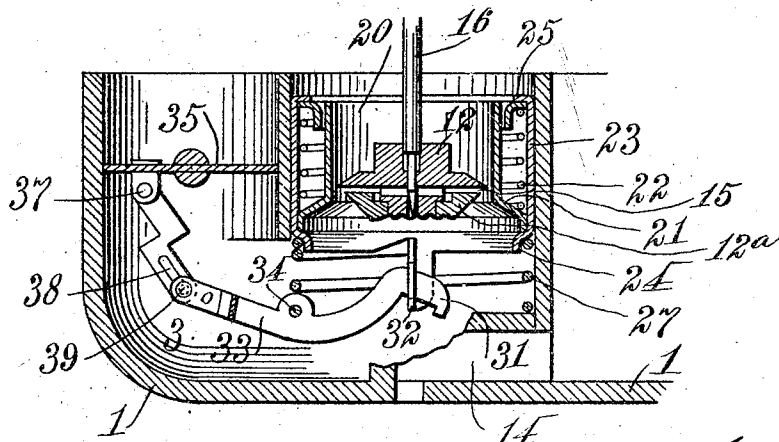


Fig. 3.

Witnesses
M. S. Litcher
Mellie Galloway

Inventor
Jno. W. Raymond
By R. J. M. Carty
his Attorney

UNITED STATES PATENT OFFICE.

JOHN W. RAYMOND, OF DAYTON, OHIO, ASSIGNOR TO THE AIR-FRICTION CARBURETER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

CARBURETER.

1,124,949.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN W. RAYMOND, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, 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 letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in carbureters of the type shown and described in my former Patent No. 1,088,181, of February 24, 1914.

The main object and purpose of the present improvements is to provide a carbureter which is capable of maintaining a maximum of efficiency under all demands; one in which the liability to become choked or clogged is reduced to a minimum if not, indeed, entirely obviated. To these ends the improvements largely center around the differential diameters of the two members of the spray nozzle, between which the annular spray outlet is formed, as will be more particularly described.

A further object of the invention is to provide means connected to the main air control valve by means of which the air supply to the spray nozzle may be reduced at predetermined times whereby a richer explosive mixture may be obtained.

Referring to the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my improved carbureter on the line *a-a* of Fig. 2; Fig. 2 is a section thereof on the line *b-b* of Fig. 1; Fig. 3 is a fractional view of the carbureter as shown in Fig. 1 with the parts in a different position; Fig. 4 is an enlarged sectional view of the spray nozzle; and Fig. 5 is a section on the line *c-c* of Fig. 1.

Throughout the specification and drawing, similar reference characters indicate corresponding parts.

Referring more particularly to the drawings, 1 represents the body or shell of the

carbureter, the same being provided with a gasoline chamber 2 and an air inlet passageway 3. The usual float 4 is located in the chamber 2 and is connected with the gasoline inlet valve 4^a by a lever 5 pivoted at 6. The valve 4^a is mounted in a chambered extension 7 of the shell 1 and seats on an apertured plug 8. The gasoline is introduced to the carbureter through a pipe 10 and enters the chamber 2 through said valve. Within the body of the carbureter there is provided an annular wall 11 forming a carbureting space which communicates with the air passage 3. A nipple 13 communicates with the chamber 2 through a lateral passage 14 and within this nozzle the apertured stem of the spray nozzle 12 is tapped. The other member of said spray nozzle, to-wit, the collar 12^a is supported on the nipple 13 around the upper portion of the said stem. Communication between the annular spray orifice 15 and the aperture of said stem is controlled by a needle-valve 16 mounted in a screw-threaded aperture in the upper portion of the carbureter casing.

In Fig. 4, it will be seen that there is a difference in the diameters of the orifice forming surface of the upper member 12 of the spray nozzle and the orifice forming surface of the lower member or collar 12^a. This structural difference is an important feature of my improvements. The advantages thereof were ascertained only after much experimentation and observation. It has been thus ascertained that the preferable difference in diameters of the two surfaces is one thirty-second ($\frac{1}{32}$) of an inch. This, however, may be varied somewhat provided the difference is in no case greater than three thirty-seconds ($\frac{3}{32}$). The greater diameter of the upper member of the spray nozzle provides a lateral horizontal obstruction to the free passage of air past the jet; in other words, produces eddies of air at the jet which have a rolling or whirling action on the circular film of gasoline thereby causing a greater evaporation of the gasoline. Furthermore, the horizontal overlapping surface of the upper member of the nozzle produces a circular film of gasoline of greater area, and the two combined, to-wit, the formation of

eddies of air and the greater area of gasoline film, produce a homogeneous mixture. Also, this construction of the jet prevents "loading" or "choking" of the carburetor and eliminates the possibility of the delivery of excessively rich mixture.

The portion 17 of the carburetor provides a passage with an outlet 18 communicating with the usual manifold (not shown). The said outlet is controlled by a well known type of throttle-valve 19. A shiftable sleeve 20 surrounds the spray nozzle and provides an air passage. The lower end 21 of said sleeve is of conical form to increase the air space on the interior of said sleeve, at that point. The said sleeve controls the supply of air to the spray nozzle and is vertically movable, being subject to elevation by the suction due to the air passing the spray nozzle. The operation is such that the volume of air is proportional to the demands of the engine. The movement of said sleeve 20 is controlled by gravity, or preferably by a spring 22 which encircles the upper part thereof. The said spring and sleeve are inclosed by an outer sleeve or cylinder 23 to be again referred to. Its normal position is shown in Figs. 1 and 5. In order to reduce the supply of air and to thus produce a mixture of greater richness when such becomes desirable, for example, to insure a ready starting of the engine, the sleeve 20 may be lowered to reduce the volume of air supply. See Fig. 3. The said sleeve 20 is vertically movable, independently of or with the outer cylinder 23 which supports it. The said outer cylinder 23 is provided with a lower contracted flange 24 upon which the sleeve 20 rests and with an upper flange 25 which forms a guide for the upper end of said sleeve 20. The said cylinder 23 is vertically movable in the annular wall 11 and is held in an upper position by a spring 27. The upper position of said cylinder 23 controls the normal position of the sleeve 20 and is adjusted by a screw 28 which engages the upper flange 25 of said cylinder. The screw 28 is mounted in a boss 29 extending from the upper portion 17 of the casing and is provided with a locking spring 30. See Fig. 5.

Extending from the flange 24 of the cylinder 23 are apertured ears 31 which receive the ends 32 of a bifurcated lever 33. The lever 33 is pivoted at 34 and is connected to a valve 35 mounted in the air-passageway 3. The connection consists of a link 36 pivoted at 37 to the valve, said link being provided with a slot 38 which receives a suitable pin 39 on one end of the lever 33. The slot 38 permits the cylinder 23 and valve sleeve 20 to be adjusted by the screw 28 without disturbing the valve 35. The valve 35 is actuated by a lever 39^a and its normal position is that shown in Fig. 1.

The said valve is held in a normal position by a spring 40 and a stop 41 which is a well known expedient. See Fig. 1. The spring 40 also acts to return the valve to a normal position. The lever 39^a is provided with any suitable connection (not shown) which extends within easy reach of the operator. When the lever 39^a is moved to close the valve 35, the supply of air passing through the passage 3 is materially reduced. The flow of air is also reduced around the spray nozzle, the sleeve 20 being depressed by the valve 35 through the agency of the lever 33, thereby insuring a richer mixture. It is to be understood that the valve 33 is only actuated during the starting operation of the engine when the manifold is cold and is capable of condensing some of the fuel out of the mixture.

Having described my invention, I claim,

1. In a carburetor, the combination with the carburetor casing providing a fuel chamber, of a spray nozzle consisting of upper and lower annular members providing between them an annular spray orifice, the orifice forming surface of the lower member being of smaller circumference than the orifice forming surface of the upper member, substantially as shown and described.

2. In a carburetor, the combination with a casing providing a fuel chamber, of a spray nozzle consisting of upper and lower annular members providing between them an annular spray orifice, the upper member having an apertured stem providing a valve-controlled passage from the fuel chamber to said spray orifice, the diameter of the said orifice forming surface of the upper member being not less than one thirty-second of an inch greater than that of the orifice forming surface of the lower member, substantially as specified.

3. In a carburetor, the combination with a casing forming a gasoline chamber and an air-passageway, a spray nozzle mounted between said chamber and passage, a main air-control valve mounted in said air-passageway, a sleeve surrounding said spray nozzle and constituting an air controller, a slidable cylinder supporting said sleeve, a lever connected to said cylinder, and a lever connected to said main air-control valve, said last named lever having a slot and pin connection with the first named lever whereby the said cylinder is adapted to be actuated from said main valve and adjusted relatively to the spray nozzle when the main air valve is open.

4. In a carburetor, the combination with a casing providing a fuel chamber and an air passage, a spray nozzle mounted in said air passage, a sleeve inclosing said spray nozzle, a cylinder inclosing said sleeve, and a main air-control valve, of a lever engaging

opposite sides of the cylinder, and a lever
engaging the main air-control valve, said
levers being loosely connected to each other,
whereby the lever engaging said cylinder
5 may have some movement independent to
the lever engaging the air valve.

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

JOHN W. RAYMOND.

Witnesses:

EDWARD A. FLAHERTY,
MELLIE GALLOWAY.