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F. ASSMUS

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CARBURETOR

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Fig. 1.

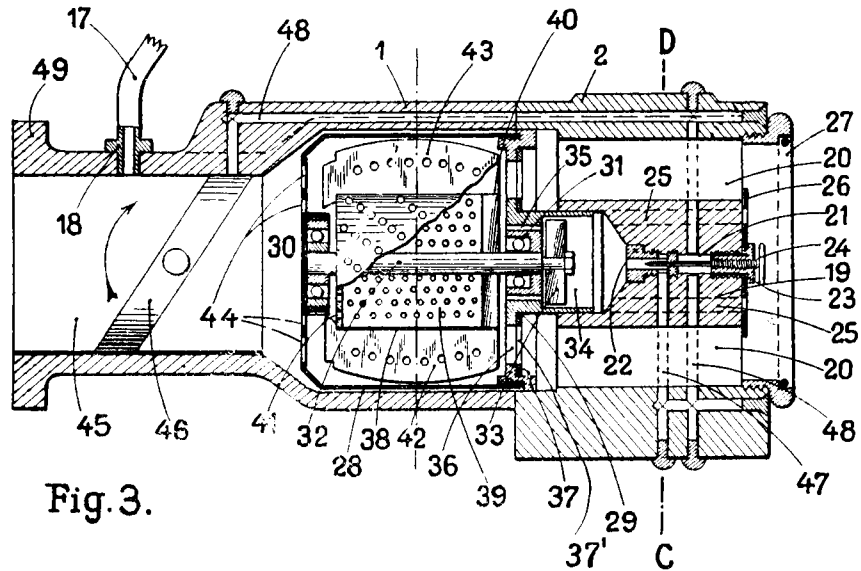


Fig. 3.

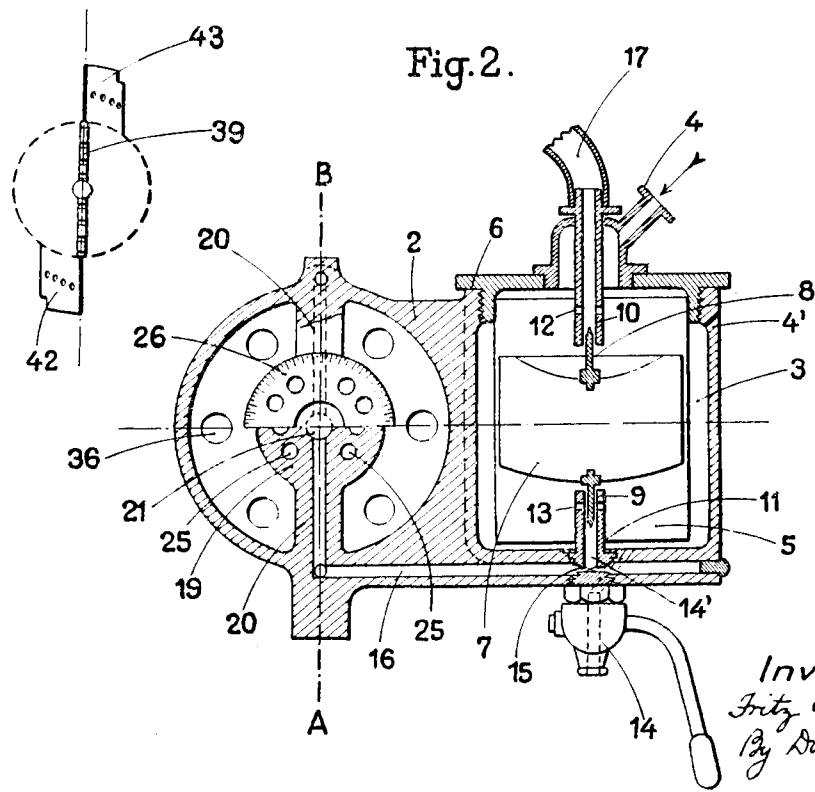


Fig. 2.

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CARBURETOR.

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To all whom it may concern:

Be it known that I, FRITZ ASSMUS, a citizen of Germany, residing at Berlin, Germany, have invented a certain new and useful Carburetor; and I do hereby 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.

My invention relates to improvements in carburetors, and the object of the improvements is to provide a carburetor which insures high economy of fuel and complete atomization or vaporization of the fuel. With this object in view my invention consists in the matters to be described hereinafter and particularly pointed out in the appended claims.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawing in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawings,

Fig. 1, is a sectional elevation taken on the line A—B of Fig. 2,

Fig. 2, is a partial section taken on the line D—C of Fig. 1, and

Fig. 3, is a sectional elevation taken on the line 3—3 of Fig. 1 and showing in detail the centrifugal drum.

In the example shown in the drawing my improved carburetor comprises a tubular casing composed of two castings 1 and 2. The section 2 of the casing comprises a float chamber 3 equipped with a pipe 4 for supply of fuel. Within the float chamber 3 there is a vertical cylinder 5 secured to the lid 6 of the chamber and providing a guide for a float 7. The float is equipped respectively at its top and bottom with valve pins 8 and 9. The said valve pins are guided in tubular members 10 and 11 respectively communicating through transverse bores 12 and 13 with the float chamber. In alignment with the tubular member 11 a cock 14 is secured to the bottom wall of the float chamber which communicates with the chamber through a passage 14'.

Further, the tubular member 11 is provided with a transverse bore 15 opening into a passage 16 extending into the wall of the section 2.

The tubular member 10 communicates

through a pipe 17 with a tubular plug 18 fixed to the wall of the section 1 of the casing at a point beyond the butterfly 46. The section 2 is made integral with a casing 19 providing an atomizing chamber and connected with the section 2 by ribs 20. The atomizing chamber 19 is provided with an axial bore 21 having an atomizing nozzle 22 and a nut 23 for an adjustable needle 24 screwed thereto. Further the atomizing chamber is provided with longitudinal bores 25 extending through the whole length of the body of the casing 19 and adapted to be closed more or less or opened by an adjustable disk 26 formed with holes 26' corresponding in position to the bores 25. Preferably the said plate 26 is clamped in position by the nut 23.

The open end of the section 2 is closed by a sieve 27 mounted in a collar screwed in the casing.

Within the section 1 there is an atomizing casing 28 which is screwed to a head 29 having an outwardly extending tubular portion 34 fitted in the atomizing casing 19. In anti-friction bearings 30 and 31 of the said atomizing casing and the head 29 a shaft 32 is mounted, to the front end of which a small propeller 33 is secured which is disposed within the tubular portion 34.

Between the tubular portion 34 and the rear face of the head there are passages 35, and the head is provided with holes 36 adapted to be partly closed or opened by a rotary plate 37 formed with holes 37'. The valve-disk 37 is frictionally held in its adjusted position; it may be adjusted rotatively from time to time by the fingers or a suitable tool. Within the casing 28 a drum 38 is secured to shaft 32 for rotation therewith, said drum being provided with a foraminated wall. The drum is divided by a foraminated diametrical partition 39 into two chambers.

Within the centrifugal drum 38 and adjacent the inner face of the head 29, there is a propeller 40 which is likewise secured to the shaft 32. The inner end-wall of the centrifugal drum is provided with bores 41, and on its exterior it carries helical foraminated vanes 42 and 43.

The end face of the casing 28 is provided with holes 44.

Within the delivery passage 45 of the sec-

tion 1 of the casing and between the casing 28 and the tubular lug 18 there is a butterfly 46.

The passage 16 is divided into two branches 48 and 47 one for operation of the engine when running light and the other for operation under load. The branch passage 48 for light running opens into the outlet passage 45 at a point where it is closed by the butterfly 46 when the latter is completely closed.

The passage 47 for operation under load opens into the atomizer nozzle 22.

The operation of the carburetor is as follows:

The intake of the engine being connected as usual to the flange 49, a suction will be created through pipe 17. This will cause fuel to be drawn into the float-chamber through the pipe 4, and when said float-chamber is filled to a certain level the float 7 rises and closes the bores 12 of the tubular member 10 thus interrupting the sucking action through the pipe 17. Simultaneously it opens the bores 13 of the pipe 11. The float chamber 3 communicates with the atmosphere through the aperture 4'.

Now the fuel flows from the float-chamber through the passage 16 to the fuel passages 47 and 48.

By the suction of the engine air is drawn through the sieve 27, through the apertures 36 and 37 and into the atomizing casing 28, from which it flows through the apertures 44 and the passage 45 to the cylinder of the engine.

When flowing through the casing 28 the air impinges on the helical vanes 42 and 43 and imparts rotary movement to the centrifugal drum 38 and the propellers 33 and 40 connected therewith. Further air is drawn by the engine suction through the passages 25 and the bore 34, and fuel is drawn through the passage 47 and the bore or chamber 34. Within the said bore or chamber 34 the fuel is atomized in a degree corresponding to the speed of the propeller 33.

Within the tubular portion 34 the fuel is mixed with the air drawn in through the passages 25, the suction on the air being due to the action of the propellers 33 and 40. The propellers preliminarily atomize the fuel and mix it with air and then force the combustible mixture through the passages 35 and into the centrifugal drum 38, where the minute particles of fuel are struck by the partitions 39 and thereby further broken up.

After the particles of the fuel have assumed the rotary velocity of the drum they are thrown outwardly in radial direction by centrifugal action, and most of the fuel is thrown through the foraminated wall of the drum, while a part will be carried along the current of air flowing through the apertures 41. The particles leaving the drum in radial

direction will be again struck by the vanes 42 and 43, and they are finally delivered, in a more vaporized state, through the apertures 44 of the casing 28.

It will be observed that the preliminary atomization of the fuel and the mixing of the atomized fuel with the air coming in through passage 25 will be greatly promoted by the suction-fan 33. This fan, by the rapid rotation it receives from the windmill drum, churns the air and the fuel together before it is forced through the passages 35 into the inner propeller 40. The inner propeller serves not only to assist the propeller 33 in discharging the mixture through the passages 35, but also insures its delivery into the interior of the foraminated cylinder 39 for final atomization.

If now the motor is running at low speed, for example when running light, the suction will not be sufficient to draw a current of air through the carburetor sufficient for rotating the centrifugal drum. In this case fuel is directly supplied through the by-passage 48 and into the outlet 45.

While in describing the invention reference has been made to a particular example embodying the same I wish it to be understood that my invention is not limited to the construction shown in the drawings, and that various changes may be made in the general arrangement of the apparatus and the construction of its parts without departing from the invention as defined in the appended claims.

I claim:

1. A carburetor comprising a main casing having a passage for air and atomized fuel, means within the inlet-end of said casing for preliminarily atomizing the fuel, a removable non-rotatable cylindrical casing or shell positioned in the casing to receive the air and fuel into its outer end and to discharge it from its forward end into the main passage, and means for finally atomizing the fuel mixed with air embodying a drum rotatively mounted upon and within said shell and having vanes positioned to cause the drum to rotate through the medium of the incoming air passing through said shell, said drum being perforated and positioned to receive in one end the mixed air and fuel as it comes from said preliminary atomizing means.

2. In a carburetor, a main casing, means embodying a suction-fan within the inlet-end of said main casing for preliminarily atomizing the fuel, and means within said main casing for finally atomizing the fuel, this latter means embodying an air-propelled rotary atomizing device driven by the incoming air, said suction-fan being connected to said rotary atomizing device and operated thereby for maintaining suction through the preliminary atomizing means.

3. A carburetor comprising a passage for air and atomized fuel, atomizing means located at the intake-end of said passage, a rotary drum mounted within said passage at a point behind the atomizing means with its outer end in position to receive the mixture of air and fuel from said atomizing means, said drum having a multiplicity of peripheral perforations and an interior foraminated partition extending longitudinally of the drum, for the purpose set forth.

4. A carburetor comprising a passage for air and fuel, an atomizing device located within the intake-end of the passage, a drum journaled to rotate within the passage behind said atomizing means and having its outer end open in a position to receive the mixed air and fuel from said atomizing means, said drum being provided with a multiplicity of peripheral perforations, an interior foraminated diaphragm extending longitudinally of the drum, and a plurality of spirally-arranged vanes on its exterior, for the purpose set forth.

5. A carburetor, comprising a passage for air and atomized fuel, atomizing means, a power driven rotary drum within said passage mounted to receive the fuel from said atomizing means and to discharge the same by centrifugal action, and a propeller connected with said drum and arranged for driving the air and atomized fuel into said drum.

6. A carburetor comprising a tubular casing, a preliminary atomizing means located within the intake-end of said casing and embodying a chamber for receiving the fuel and air and inwardly-extending passages for delivering the mixture of air and fuel in an inward direction, a rotary drum having its outer end provided with a propeller or fan positioned to act as a suction device for withdrawing the mixture of air and fuel from the discharge-ends of said passages and delivering the same within the drum, said drum having a multiplicity of perforations to further comminute the fuel.

7. In a carburetor, a tubular casing, a cylinder 28 removably mounted in said casing, this

cylinder being provided at its outer end with a head having air-passages and also passages for mixed air and fuel, the inner end of the cylinder being provided with openings for the final discharge of the mixture, a preliminary atomizing means for delivering a mixture of air and fuel to said fuel-passages, a perforated drum journaled within said cylinder and having its axis in line with the ingoing air, the outer end of said cylinder being positioned to receive the mixture of air and fuel from the preliminary atomizing means, said cylinder being provided with spiral vanes on its exterior positioned to be struck by the air coming in through said air-passages of said head.

8. A carburetor, comprising a tubular casing adapted to be connected with the intake manifold of an internal combustion engine, a block within said casing having a chamber and a fuel nozzle opening into said chamber, a rotary drum within said tubular casing and opening into the tubular casing and into said chamber, and formed with vanes adapted to be struck by the current of air flowing through said tubular casing for being rotated thereby, and a propeller connected with said drum and disposed within said chamber for drawing air and fuel from said chamber into said rotary drum.

9. A carburetor, comprising a tubular casing adapted to be connected with the intake manifold of an internal combustion engine, a block within said casing having a chamber and a fuel nozzle opening into said chamber and an air supply to said chamber, said chamber being provided with inwardly-directed discharge-passages for the fuel mixture, a rotary drum within said tubular casing and opening into the tubular casing and into said chamber and formed with vanes adapted to be struck by the current of air flowing through said tubular casing for being rotated thereby, and two propellers actuated by said drum, one propeller being located within said chamber and the other at a point beyond the discharge-passages from said chamber.

FRITZ ASSMUS.