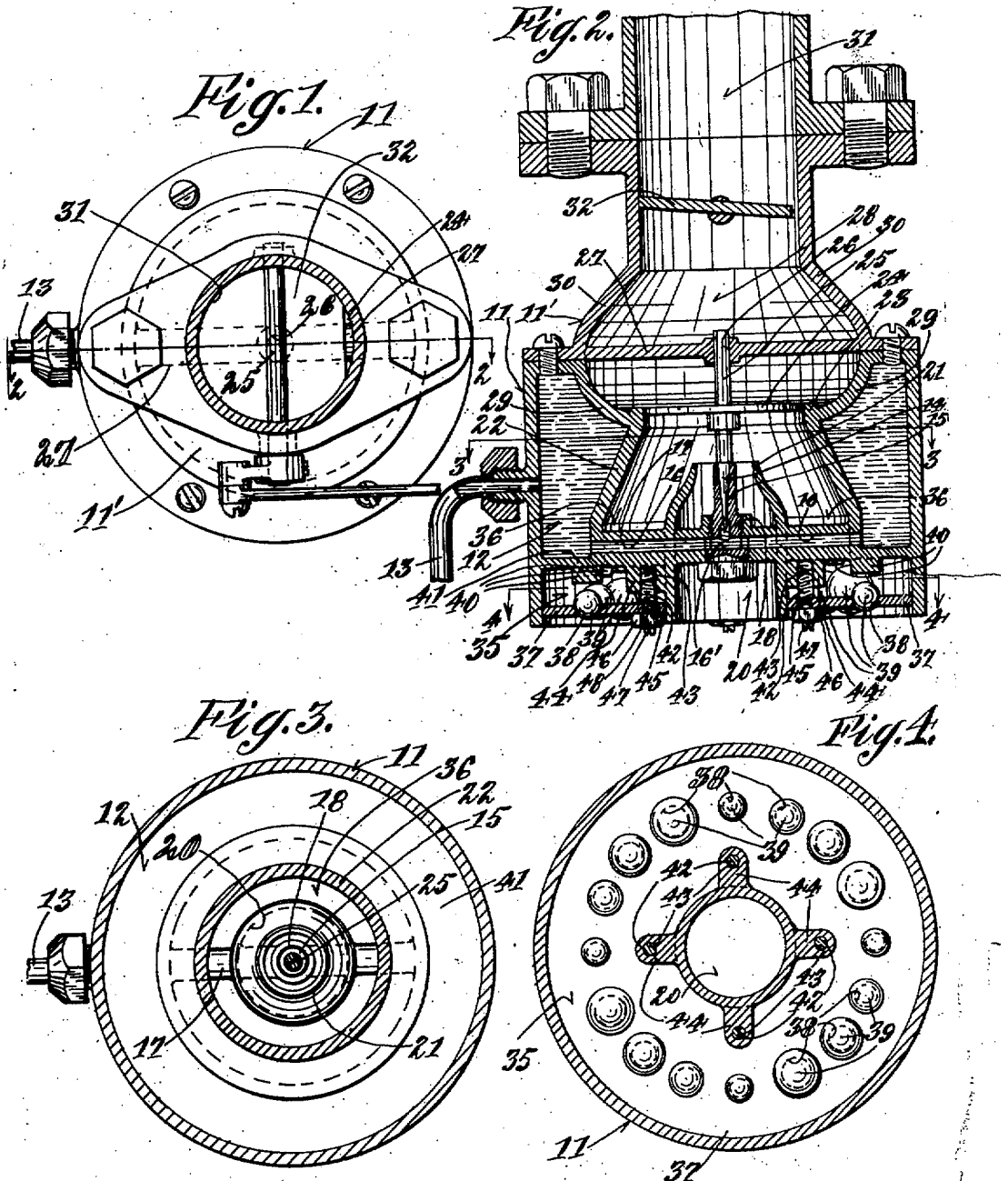


E. E. MARSH.
CARBURETER.
APPLICATION FILED JAN. 2, 1912.

1,049,887.

Patented Jan. 7, 1913.



Witnesses:
Jacob A. Hollander
Theresa Silber.

Inventor:
Elmer E. Marsh,
by D. F. Verkleb, His Attorney.

UNITED STATES PATENT OFFICE.

ELMER E. MARSH, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-THIRD TO ARTHUR C. DAVIS AND ONE-THIRD TO VICTOR GLUCHOWSKY, BOTH OF CINCINNATI, OHIO.

CARBURETER.

1,049,887.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed January 2, 1912. Serial No. 669,013.

To all whom it may concern:

Be it known that I, ELMER E. MARSH, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to carbureters, and has for its object the provision of novel means whereby the proper fuel mixture may be automatically obtained irrespective of various or changing conditions under which the internal combustion motor or automobile may be running, or by which it may be surrounded.

The invention will be readily understood from the following description and claims, and from the drawing, in which latter:

Figure 1 is a plan view of my improved device. Fig. 2 is a vertical central section of the same, taken on a line corresponding to the line 2-2 of Fig. 1. Fig. 3 is a cross-section of the same, taken on a line corresponding to the line 3-3 of Fig. 2; and, Fig. 4 is a cross-section of the same, taken on a line corresponding to the line 4-4 of Fig. 2.

11 represents the casing.

12 is the fuel reservoir, for gasoline or the like, which is in the casing, and is fed from a suitable source of fuel supply through a pipe 13 communicating with the reservoir.

14 is the fuel-valve, the valve-seat 15 of which communicates with the reservoir by means of a fuel-passage 16 in a bridge-piece 17, the valve-seat being formed on a plug 18 threaded into the bridge-piece and provided with a cross-passage 16' which forms a part of the passage between the fuel-valve and reservoir.

20 is the primary air-inlet which in the present exemplification surrounds the fuel valve-seat, the wall of the said primary air-inlet contracting as at 21 adjacent to the outlet of the valve-seat for effectually drawing the fuel through the valve-seat.

The inner wall 22 of the casing 11 is provided with a mixture valve-seat 23 arranged to receive an automatic disk-valve 24 shown on a stem 25. The lower end of this stem has the fuel-valve 14 formed thereon and its upper end is guided in a hole 26 in a cross-girt 27 in a chamber 28 in the casing, the chamber having lower spreading walls 29

and upper contracting walls 30, the chamber communicating with a passage 31 communicating with the internal combustion engine fed by the carbureter. 32 is a throttle-valve in said passage. The upper wall 30 is formed by an extension 11' of the casing 11.

The fuel-valve and its seat are quite long in the direction of axial movement of the valve for permitting appreciable movement of the valve within its fuel-supplying capacity.

35 is an auxiliary air-supply chamber which communicates with an auxiliary air-supply passage 36 between the inner wall 70 of the fuel-reservoir and the wall of the primary air-inlet. One of the walls, shown as the bottom wall 37, of the auxiliary air-supply chamber, is provided with a series of openings 38, preferably of various diameters, these openings being normally closed by obstructions 39, shown as balls, preferably of various sizes and weights, and arranged to be selectively lifted away from the walls of the openings in which the same are contained, by the suction of the engine. The movements of the balls away from the walls of the openings are limited, as by providing projections 40 of various lengths, which project toward the respective balls 35 from the opposite wall 41 of said auxiliary air-supply chamber. Provision is made for adjusting the normal distance between said balls and the said projections, as by adjusting the plate which forms the wall 37 in 90 which said openings are contained, toward and from said projections. Thus the plate is adjusted and held in place by screws 42 threaded into threaded apertures 43 in lugs 44 on the wall of the primary air-inlet, the plate being held to the screws by being received between shoulders 45 on said screws and nuts 46 received over the outer threaded ends 47 of said screws, the said screws turning loosely in the holes 48 in said plate.

In operation, during idle running of the engine and normal substantially closed throttle condition, the suction of the engine will raise the disk 24 just sufficiently to permit the fuel-valve to open very slightly, and to draw a slight supply of air through the primary air-inlet past the fuel-valve for absorbing the fuel and drawing the mixed fuel past the valve 24 into the engine. If the throttle is partially opened and the suction

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increased, the valve 24 will be raised, thereby opening the fuel-valve to greater extent and providing a larger supply of fuel, the volume of air passing through the primary air-inlet also increasing until the capacity of said primary air-inlet is reached. Upon further increase in rapidity of motion by the engine, one or more of the lighter of the balls 39 will be raised from their openings, allowing additional air to be received through the auxiliary air-intake for diluting the mixture received from the fuel-valve and primary air-inlet, and upon greater suction by the engine more or larger ones of the balls will be raised for increasing the auxiliary air-supply and providing a more rarefied mixture at the higher speeds of the engine, which is a condition much desired.

It will be further noted that the primary air-intake passage and the auxiliary air-intake passage are arranged about the fuel-valve with an inner contracting wall between said air-intake passages and an outer contracting wall surrounding said auxiliary air-intake passage. The disk-valve is located at the contracted end of said outer contracting wall and is spaced from the contracted end of said inner contracted wall. The disk-valve acts as a striker-plate for the primary mixture proceeding from the fuel-valve and primary air-intake passage for further mingling said primary mixture, which then proceeds through the outwardly bulged passage 28 in thoroughly mixed state to the throttle-passage. The disk-valve also acts as a striker-plate for the rarefied mixture when auxiliary air is received through the outer auxiliary air-intake passage, the inwardly sloping walls of which direct the auxiliary air into the path of the primary mixture, the currents of auxiliary air and primary mixture being thereby thoroughly mingled, and passing, as a rarefied mixture through the outwardly bulged passage 28, at the lower end of which the disk-valve is located. A thorough fuel-mixture is thus obtained.

In my improved device I dispense with the necessity of a float and float-valve for the fuel-reservoir, and with the necessity of springs, which in practice vary under different atmospheric conditions, and the reservoir may at all times be full of fuel oil.

My improved device is simple, inexpensive, and can be readily assembled, and by it the proper fuel-mixtures for various conditions under which for instance an automobile may be running, are automatically supplied.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a carbureter, the combination of a fuel-valve comprising a movable member, a primary air-intake passage about said valve

having an upper contracting end, an auxiliary air-intake passage surrounding said primary air-intake passage having an upper contracting end, and a disk-valve at said upper contracting end of said auxiliary air-intake passage and spaced upwardly from said upper contracting end of said primary air-intake passage and acting as a striker-plate for the primary mixture of fuel and primary air and for the rarefied mixture of said primary mixture and auxiliary air, and said disk-valve having connection with said movable member of said fuel-valve for operating the same, substantially as described.

2. In a carbureter, the combination of a fuel-valve comprising a movable member, a primary air-intake passage about said fuel-valve, an auxiliary air-intake passage about said primary air-intake passage, a dividing wall between said passages and a fuel-valve, an auxiliary air-intake passage said walls contracting toward their upper ends and being substantially parallel in radial section, and a disk-valve at the contracted end of said wall about said auxiliary air-intake passage and spaced from said dividing wall, said disk-valve acting as a striker-plate for the primary mixture of fuel and primary air and for the rarefied mixture of primary mixture and auxiliary air, and said disk-valve having connection with said fuel-valve for operating the same, substantially as described.

3. In a carbureter, the combination of a fuel-valve comprising a movable member, and a primary air-intake passage, an auxiliary air-intake passage and a fuel-reservoir concentrically arranged in the order named about said fuel-valve, said fuel-valve having connection across said primary air-intake passage with said fuel-reservoir, a dividing wall between said air-intake passages and a dividing wall between said auxiliary air-intake passage and said fuel-reservoir, said dividing walls contracting toward their upper ends and said second-named dividing wall extending above said first-named dividing wall, a disk-valve at the upper end of said second-named dividing wall and spaced upwardly from said first-named dividing wall and forming a striker-plate for the fuel-mixture, said disk-valve having connection with the said movable member of said fuel-valve for operating the same, and an outwardly bulged wall forming an outwardly bulged mixture passage above said disk-valve into which said disk-valve opens, substantially as described.

4. In a carbureter, the combination of a fuel-valve comprising a movable member, a primary air-intake passage about said valve having an upper contracting end, an auxiliary air-intake passage surrounding said primary air-intake passage having an upper contracting end, and a disk-valve at said upper

contracting end of said auxiliary air-intake passage and spaced upwardly from said upper contracting end of said primary air-intake passage and acting as a striker-plate for the primary mixture of fuel and primary air and for the rarefied mixture of said primary mixture and auxiliary air, said disk-valve having connection with said movable member of said fuel-valve for operating the same, and an auxiliary air-supply chamber communicating with the intake end of said auxiliary air-intake passage, said auxiliary air-supply chamber comprising a wall provided with openings, and

weight-obstructions received across said openings and arranged to be automatically moved therefrom by the suction from the engine for controlling the auxiliary air-supply through said auxiliary air-supply chamber, substantially as described. 15

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses. 20

ELMER E. MARSH.

Witnesses:

THERESA SILBER,
JACOB A. VOLLANDER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Corrections in Letters Patent No. 1,049,887.

It is hereby certified that in Letters Patent No. 1,049,887, granted January 7, 1913, upon the application of Elmer E. Marsh, of Cincinnati, Ohio, for an improvement in "Carbureters," errors appear in the printed specification requiring correction as follows: Page 2, line 86, for the words "fuel-valve, an" read *wall about said*; same page and line, after the word "passage" insert a comma; page 3, line 27, second-named witness, for "Jacob A. Vollander" read *Jacob A. Hollander*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of February, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

contracting end of said auxiliary air-intake passage and spaced upwardly from said upper contracting end of said primary air-intake passage and acting as a striker-plate for the primary mixture of fuel and primary air and for the rarefied mixture of said primary mixture and auxiliary air, said disk-valve having connection with said movable member of said fuel-valve for operating the same, and an auxiliary air-supply chamber communicating with the intake end of said auxiliary air-intake passage, said auxiliary air-supply chamber comprising a wall provided with openings, and

weight-obstructions received across said openings and arranged to be automatically moved therefrom by the suction from the engine for controlling the auxiliary air-supply through said auxiliary air-supply chamber, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

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