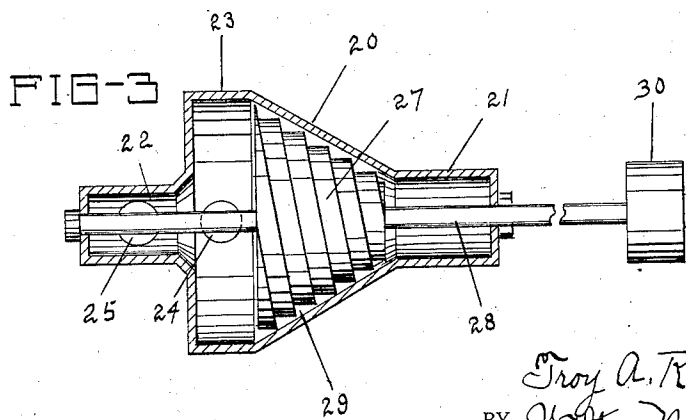
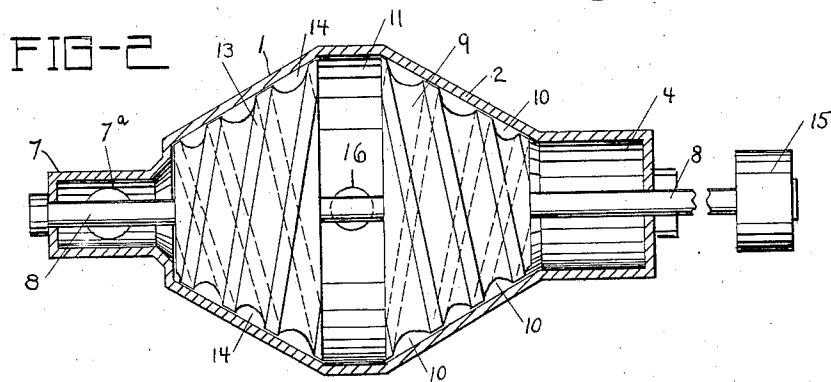
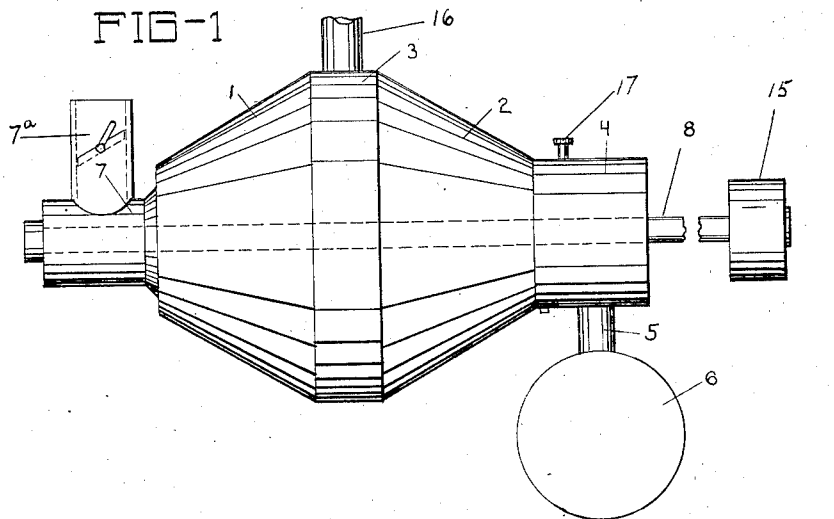


May 12, 1936.

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CARBURETOR MECHANISM
Filed Dec. 12, 1932

2,040,185



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UNITED STATES PATENT OFFICE

2,040,185

CARBURETOR MECHANISM

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Application December 12, 1932, Serial No. 646,879

11 Claims. (Cl. 261—79)

My invention has reference to a carburetor mechanism such, for example, as are used for mixing fuel and air to provide an explosive mixture for an internal combustion engine, and has for its purpose to provide an apparatus in which the movement of a quantity of hydro-carbon fuel will be greatly accelerated and a maximum efficiency of the successive charges secured. There is shown a joint or twinned apparatus in which the air introduced into the carburetor for mixture with the mixture gases passes through a similar apparatus. Both the air and mixture gases are carried into a central chamber by a whirling movement, constantly increasing, with a thorough mixing and assimilation of elements in the central chamber, with a resultant maximum of motor performance, smoothness of operation, and increased mileage for a given quantity of gasoline.

In order that those skilled in this art may fully understand the invention both from structural and functional standpoints, two desirable embodiments thereof have been illustrated in detail in the accompanying drawing, and, for simplicity, like reference numerals have been employed throughout the views to designate the same parts.

Fig. 1 is a plan view of the invention in one of its forms.

Fig. 2 is a central vertical longitudinal section thereof.

Fig. 3 is a similar view of a modified form of the invention.

As shown in Figures 1 and 2, the invention comprises a casing formed of two parts 1 and 2, each of conical form, but oppositely disposed, and connected by a central cylindrical band 3. At the outer, or smaller, end of the part 2 is an extension 4, containing a chamber communicating with the body of the casing, and connected by a pipe 5 with a float-chamber 6, by which means a quantity of liquid fuel products may be introduced into the casing 2. This may be under the control of a needle-valve or other devices not shown in the drawing. The casing 1 is also provided at its smaller end with an extension 7, into which a supply of air can be introduced from the outside by means of a pipe 7^a fitted with an appropriate control valve.

Supported rotatably in suitable bearings in the ends of the extensions 4 and 7 is a shaft 8, upon which is fixed within the casing 2 a truncated cone-shaped rotor 9, on the circumference of which is a pair of spiral or helical channels or conduits 10, opening at the smaller end into the

extension 4, and at the larger end into a central chamber 11 in the part 3 of the casing. Upon the shaft 8 being properly rotated the movement of the channels 10 and contents will be in the direction of the chamber 11. The casing 1 is similarly provided with a truncated cone-shaped rotor 13, also fixed on the shaft 8, and provided with channels or conduits 14, also spirally disposed but in a direction contrary or opposed to that of the channels 10. The channels 14 also communicate inwardly with the chamber 11, and outwardly with the extension 7. On one end of the shaft 8 is fixed a pulley 15, which may be connected to be driven from the fan-belt shaft of a motor, the gaseous fuel-mixture for which is supplied through the improved carburetor, or the pulley and its shaft may be revolved by any other appropriate means.

The rotor fits snugly in the casing 2, as illustrated, and, when the apparatus is in operation, gasoline or other fuel entering the extension 4 is drawn into the channels 10, and impelled toward the chamber 11 in form of a vortex. This movement is caused by a suction in the channels 10, the velocity of which is constantly augmented as the diameter of the cone rotor and its channels increases. This is added to or intensified by the centrifugal action on the fuel about the surface of the cone, causing a thorough disintegration of the hydro-carbon particles. At the same time the air entering the other end of the casing is subjected to a similar operation by the companion helically grooved rotor element 13, the two currents meeting each other in the central chamber 11, where they are thoroughly assimilated and vaporized. From said chamber 11 the mixture is conducted to the intake manifold of a motor through a suitable discharge pipe 16.

In the operation of the machine the suction is so strong and constant that there is a tendency to cause an excessive vacuum in the chamber 4, to avoid which a small bleed-valve 17 is fixed in the wall thereof, permitting a sufficient replacement or admission of air in said chamber, and also aiding in the initial vaporizing of the mixture.

In Fig. 3 is shown an arrangement of the carburetor in which the casing has a single cone section 20, with a gasoline intake chamber at 21. At the opposite end of the casing is a chamber extension 22, opening into an intermediate chamber 23, with a discharge opening 24, and the extension 22 has an intake pipe at 25. In the casing 20 is a truncated cone-shaped rotor 27, fixed on a shaft 28 rotatably mounted in the bearings in the

ends of the carburetor, and on the tapered surface of said rotor is arranged a pair of spiral screws 29, step fashion as illustrated. The spaces at the edges of these screws form continual parallel channels 29 of saw-tooth style, which channels extend from the intake at 21 to the chamber 23. The operation is similar to that of the cone-shaped member 9 above described, a supply of hydro-carbon or other liquid or fluid being conducted from the intake chamber 21 along the channels 29 and into the chamber 23, where it is mixed with the air coming through the air intake 22.

It will be noted that the cross-section dimension of the channels 10 is uniform throughout, and, as a result, as the diameter of the spirals increases, the charge of fuel gas is compelled to occupy a rapidly increasing space or volume, which, together with the centrifugal force applied to such charge due to the revolution of the rotor, causes an expansion of the gases, and thorough vaporizing thereof. At the same time the channel space is so restricted that there is no danger of an over-expansion, whereby their force might become dissipated.

The fuel feed operation into and through the chamber 4 is such that each succeeding charge is metered, and sufficient in quantity so that the channels 10 will be successively supplied with such charges.

The simple form of air intake shown in Fig. 3 can be used with the structure shown in Fig. 2, if desired, the cone 13 and its casing being omitted, and the air conducted directly into the chamber 11. A better result is secured, however, by subjecting both the gasoline and the air to the helical or whirling expanding action.

Various other applications and adaptations of the principle set forth herein can be made without departing from the spirit and essence of the invention as set forth in the appended claims and without the loss or sacrifice of any of the substantial benefits or advantages accruing from the employment of the invention.

What I claim, and desire to secure, is:—

1. In a carburetor, a conical casing, a conical rotor in said casing provided on its circumference with a helical channel of uniform size, a mixing chamber at the large end of said casing, means for introducing a supply of hydro-carbon fuel into the small end of said casing and channel, for gradual expansion and increase in volume in said channel, and means for introducing a current of air into said mixing chamber.

2. In a carburetor, a casing containing a pair of conical chambers with their bases in juxtaposition and with a space between said bases having a discharge outlet, a rotor in each of said chambers conforming to the conical shape thereof, and each provided with one or more spiral conduits of uniform size on its circumference arranged to perform a feed operation toward and into said space, means for introducing a supply of hydro-carbon fuel into the small end of one of said chambers, means for introducing a current of air to the other one of said chambers.

3. In a carburetor, a casing containing a pair of conical chambers with their bases in juxtaposition and with a mixing chamber between said bases, intake chambers at the ends of said casing, a shaft rotatably mounted in the ends of said casing, cone-shaped members on said shaft in said conical chambers and provided with spiral channels of uniform size on their outer walls operating as feed conduits toward said mixing chamber when said shaft is properly rotated, and means for rotating said shaft.

4. In a carburetor, the combination of means to expand fuel including a rotor having a helical channel through which the fuel passes and which is of increasing volume along the length of the axis of said rotor, means to revolve said rotor, means to admit fuel into the smaller-volume portion of said channel, means to admit air into the carburetor and to mix the air with the expanded fuel, and means to deliver the fuel mixture from the carburetor.

5. The structure contained in claim 4 in which the rotor has a plurality of said channels in parallel relation.

6. In a carburetor, the combination of a casing, a rotor fitting the interior thereof, and rotatable in, said casing, said rotor having a helical channel therein of increasing volume along the length of the axis of the rotor, means to revolve said rotor, means to admit fuel into the smaller-volume end of said channel, means to admit air into the carburetor to mix with the fuel expanded in said rotor channel, and means to discharge the mixture from the carburetor.

7. The structure presented in claim 6 in which the rotor has a plurality of said channels in parallel relation.

8. The structure presented in claim 6 in which the rotor and the interior of the casing in which the rotor fits and rotates are both conical.

9. The structure presented in claim 6 in which the rotor and the interior of the casing in which the rotor fits and rotates are conical and in which the rotor has a plurality of parallel helical channels of substantially-uniform cross-section.

10. In a carburetor, the combination of a casing, a pair of rotors fitting the interior thereof, and rotatable in said casing, each of said rotors having a helical channel therein of increasing volume along the length of the axis of the rotor, the channels of said rotors being arranged oppositely to one another, means to revolve said rotors, means to admit fuel into the smaller-volume end of the channel of one of said rotors, means to admit air into the smaller-volume end of the channel of the other rotor, whereby the expanded fuel and air mix after leaving their channels, and means to discharge the mixture from the carburetor.

11. The structure presented in claim 10 in which the rotors and interior of the casing in which the rotors revolve are conical and in which each of the rotors has a plurality of helical channels.

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