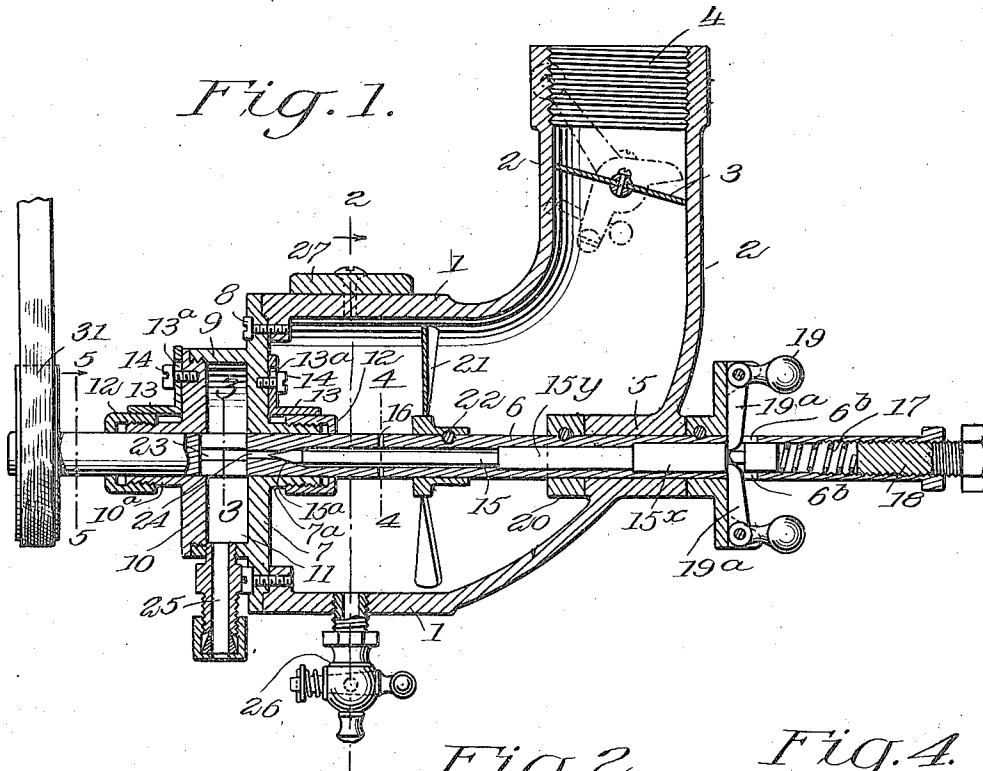
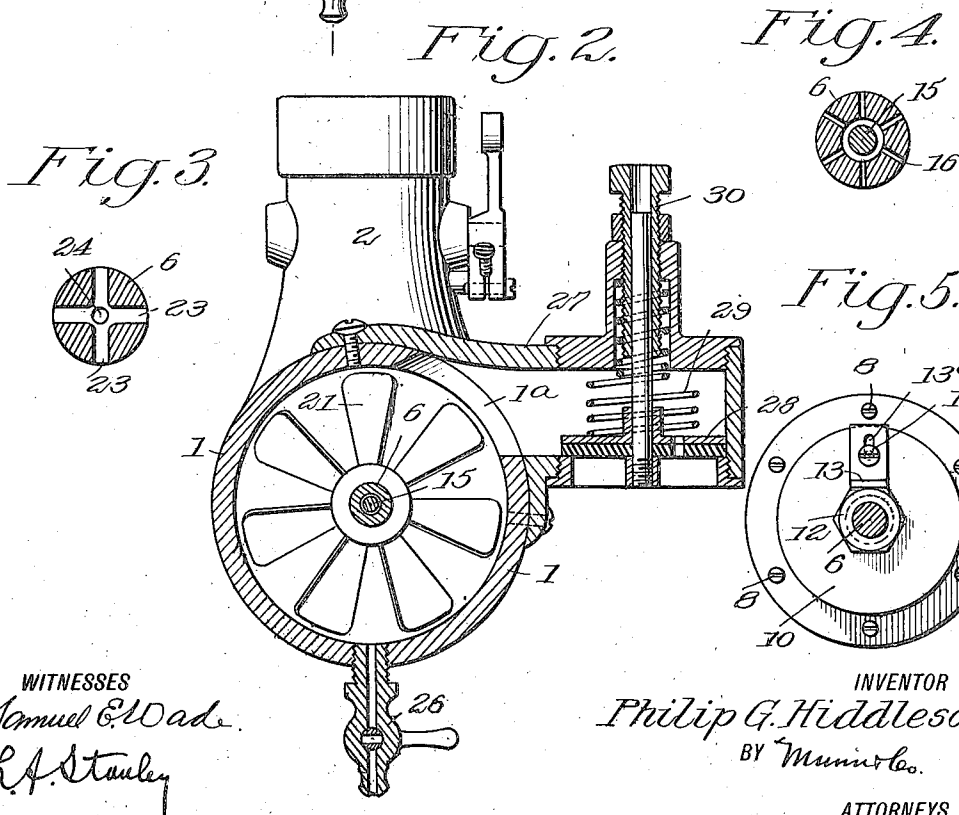


P. G. HIDDLESON.
CARBURETER.
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CARBURETER.

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To all whom it may concern:

Be it known that I, PHILIP G. HIDDLESON, a citizen of the United States, and a resident of Salem, in the county of Columbiana and State of Ohio, have made certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to improvements in carbureters, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a carbureter in which the explosive charge is so intimately mixed as to be in the best possible condition for use in internal combustion engines.

A further object of my invention is to provide a device in which the explosive charge is positively forced into the intake manifold, thereby obviating all danger of an insufficient supply of the charge due to poor suction in the cylinders or the engine for any reason whatever.

A further object of my invention is to provide a carbureter the use of which will obviate all the inconveniences and irregularities which are inherent in those carbureters of the float chamber type, such as the saturation of the float, friction of the valve mechanism controlled by the float, etc., since the present invention has no float chamber.

A further object of my invention is to provide a carbureter having a propeller disposed within the carbureting chamber driven positively through any suitable source of power.

A further object of my invention is to provide novel means of introducing fuel into the carbureting chamber; said means comprising a portion of the propeller shaft and having a needle valve whose action is regulated by a governor on the propeller shaft.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application in which—

Figure 1 is a central section through the device, Fig. 2 is a section along the line 2—2 of Fig. 1 looking in the direction of the arrow, Fig. 3 is a section along the line 3—3 of Fig. 1, Fig. 4 is a section on the line 4—4

of Fig. 1, and Fig. 5 is an end view of the propeller shaft and its associated packing gland.

In carrying out my invention I provide a main casing 1, preferably constructed of metal having a curved extension 2 which constitutes the outlet from the carbureting chamber, and which is provided with the usual throttle valve 3. The extension is threaded, as shown at 4 and may be connected with the intake manifold of the internal combustion engine, not shown.

The extension 2 is provided with an integral boss 5 which forms one of the bearings for the propeller shaft 6. The other bearing is formed in a head 7 which is secured to the walls of the body portion 1 by means of screws 8 or in any other suitable manner. The head 7 has an integral annular wall 9 on the outside thereof, this wall being threaded to receive the threaded portion of an end member 10. The space 11 between the end member 10, the head 7 and the wall 9 constitutes a fuel chamber, as will be hereinafter explained.

The end member 10 has an integral threaded extension 10^a, while the head 7 has a similar integral extension 7^a. These extensions are threaded to receive caps 12 which constitute, with their respective extensions, packing glands. In order to keep the caps from turning I provide L-shaped stop members 13 provided with slots 13^a, one of these members being secured to the head 7 and the other being secured to the end member 10 by means of screws 14. These stop members are adjusted so as to engage the plane faces of the caps 12, thereby preventing any rotation on the shaft 6.

The shaft 6, as will be observed from Fig. 1, is bored out from one end (the right end in Fig. 1) to a point just beyond the inner wall of the end member 10. Disposed within the shaft and slidable longitudinally therealong is a needle valve 15. The valve seat is formed by a beveled reduced portion 15^a. The needle valve is spaced from the interior wall of the shaft for a portion of its length to provide a fuel passage and this passage communicates by means of radially extending passages 16 (see Fig. 4) with the interior of the carbureting chamber. The needle valve has enlarged portions such as those shown at 15^x and 15^y which center the

valve. The needle valve is kept normally closed by means of a spring 17 whose end bears upon a screw plug 18.

Secured to the shaft 6 is a ball governor 19 whose hub abuts the boss 5, thereby preventing longitudinal movement of the shaft in one direction while a collar 20 secured to the shaft on the interior of the carbureting chamber prevents longitudinal movement in the other direction. The arms 19^a of the ball governor extend through openings such as those shown at 6^b in the shaft 6 into a circular groove in the needle valve for controlling the movement of the latter. On the inside of the carbureting chamber is disposed the propeller 21, the hub of the propeller being secured to the shaft by means of the pin 22 or in any other suitable manner.

As will be seen from Fig. 3, the shaft 6 is provided with radially extending passages 23 which communicate with the interior of the fuel chamber 11. These passages also communicate with the reduced bore 24 into which one end of the needle valve projects. The fuel inlet pipe 25 is shown in communication with the fuel chamber 11. The bottom of the carbureting chamber is provided with a drain cock 26.

Secured to the walls of the carbureting chamber 1 is a valve casing 27 which is provided with an air inlet valve 28 normally pressed upon by a spring 29, the tension of the spring being regulated by a screw plug 30. The interior of the valve casing 27 communicates with the interior of the carbureting chamber 1 by means of an opening 1^a in the wall of the carbureting chamber as shown in Fig. 2.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

The shaft 6 is designed to be driven by any suitable means as by a belt 31 connected with the engine (not shown). The rotation of the shaft causes the ball governor to move the needle valve so as to open and to establish communication between the fuel chamber 11 and the interior of the carbureting chamber, the fluid passing through the passages 23 and 24, past the end of the needle valve into the space between the needle valve and the inner wall of the shaft, and out through the radially extending passages 16. The revolution of the propeller 21 causes a complete mixture of the fluid which is in an atomized condition when entering the chamber with the air which is drawn in past the valve 28. Moreover this mixture is forced out through the discharge extension 2 and into the intake manifold of the engine (not shown). As the speed of the engine increases more fuel is fed owing to the movement of the needle valve to permit more fuel to enter into the carbureting chamber, while the increased rotation of

the propeller will cause more air to enter the carbureting chamber.

With a device of this kind a sufficiency of fuel in the cylinders may always be had, since with a positive pressure behind the charge the latter instantly enters the cylinder the moment the intake valve or feed port of the engine is opened. It is a well known fact that when engines of the ordinary type, where the charge is sucked into the cylinder, are running at high speed they do not operate as efficiently as they would operate if the explosive charge had plenty of time to enter the cylinder. Since in the present device the pressure tending to force the charge into the intake manifold and thence into the cylinders increases with the speed of the engine, a carbureter constructed according to my invention will always furnish plenty of fuel even up to the maximum capacity of the engine.

I am aware that means for mechanically mixing the air and the atomized fuel consisting of rotatable propellers have been located in the intake manifolds of some engines, but generally these propellers are driven by the force of the moving gas passing through the intake manifold. While devices of this kind may secure a good mixture of the gases yet it will be obvious that one important function which is possessed by the present carbureter is absent from the devices which employ rotatable mixing elements in the intake manifold. The very presence of these devices in the intake manifold tends to retard, not to increase, the passage of the gases through the manifold. In my device the propeller is mechanically driven by an outside force. It is located in the carbureting chamber and has the double function of thoroughly mixing the gases and of actually forcing them through the intake manifold. Moreover this force is in addition to the usual suction effected by means of which the gases are drawn into the cylinders in engines provided with an ordinary carbureter of the suction type.

I claim:

1. In a carbureter, a carbureting chamber, an outlet from said carbureting chamber, means for admitting air into said carbureting chamber, a hollow shaft journaled in the walls of said carbureting chamber, means for introducing fuel into the carbureting chamber through said hollow shaft, a propeller disposed on said hollow shaft for causing an intimate mixture of the fuel and air and for forcing the mixture out of the carbureting chamber, automatic means for controlling the admission of fuel through the propeller shaft in proportion to the speed of revolution of the propeller shaft, said last named means comprising a needle valve disposed within the shaft and movable longitudinally thereof, and a centrifugal gover-

nor carried by the shaft and connected with the needle valve for operating the latter.

2. In a carbureter, a carbureting chamber, an outlet therefor, a fuel chamber, a rotatable shaft journaled in the walls of said carbureting chamber and said fuel chamber, said shaft being provided with a hollow bore, laterally extending fuel passages in said hollow shaft for establishing communication between said fuel chamber and the interior of said bore, other laterally extending passages in said hollow shaft for establishing communication between the interior of the hollow shaft and the interior of the carbureting chamber, and a propeller disposed on said shaft between the last mentioned laterally extending passages and the outlet.

3. In a carbureter, a carbureting chamber, an outlet therefor, a fuel chamber, a rotatable shaft journaled in the walls of said carbureting chamber and said fuel chamber, said shaft being provided with a hollow bore, laterally extending fuel passages in said hollow shaft for establishing communication between said fuel chamber and the interior of said bore, other laterally extending passages in said hollow shaft for establishing communication between the interior of the hollow shaft and the interior of the carbureting chamber, a propeller disposed on said shaft between the last men-

tioned laterally extending passages and the outlet, a portion of the bore in said shaft being reduced to form a valve seat, and a movable needle valve within the bore and arranged to engage the valve seat.

4. In a carbureter, a carbureting chamber, an outlet therefor, a fuel chamber, a rotatable shaft journaled in the walls of said carbureting chamber and said fuel chamber, said shaft being provided with a hollow bore, laterally extending fuel passages in said hollow shaft for establishing communication between said fuel chamber and the interior of said bore, other laterally extending passages in said hollow shaft for establishing communication between the interior of the hollow shaft and the interior of the carbureting chamber, a propeller disposed on said shaft between the last mentioned laterally extending passages and the outlet, a portion of the bore in said shaft being reduced to form a valve seat, a movable needle valve within the bore and arranged to engage the valve seat, and a centrifugal governor carried by the shaft and being operatively connected with said needle valve for moving the latter in proportion to the speed of the shaft.

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