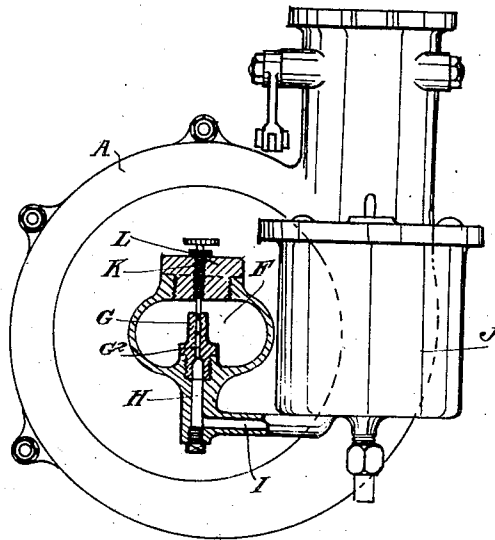
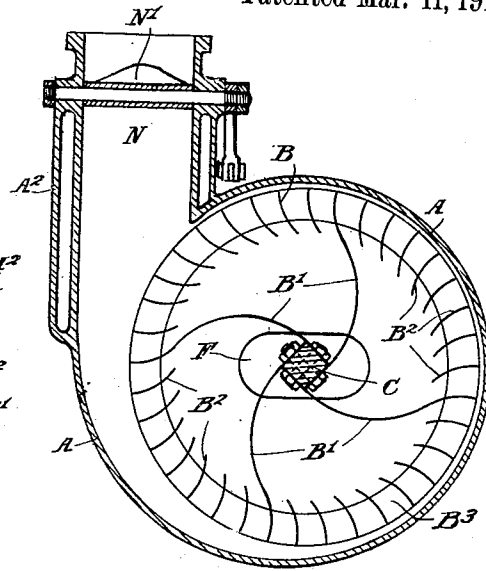
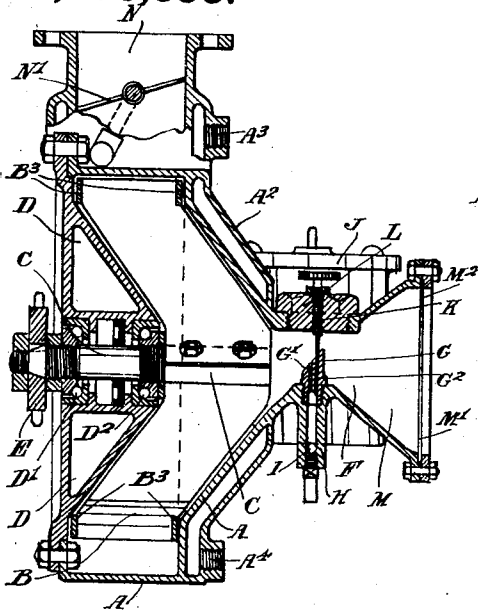


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UNITED STATES PATENT OFFICE.

JAMES DENNIS ROOTS, OF WEST KENSINGTON, LONDON, ENGLAND.

CARBURETER.

1,296,853.

Specification of Letters Patent.

Patented Mar. 11, 1919.

Application filed December 14, 1912, Serial No. 736,831. Renewed October 4, 1918. Serial No. 256,913.

To all whom it may concern:

Be it known that I, JAMES DENNIS ROOTS, a subject of the King of Great Britain, and a resident of 58 Avonmore road, West Kensington, London, W., England, have invented a Carbureter, of which the following is the specification.

This invention relates to a new or improved carbureter.

10 In carbureters as hitherto constructed when employed with internal combustion engines, particularly those of the four stroke cycle, the suction of the working piston is employed to create a vacuum in the carbureter to cause the flow of the liquid fuel through the jet. This accentuates what is in itself a bad feature of present construction inasmuch as in most engines of this type the valves are too small and throttle the inlet of mixture, while the choke tube of the carbureter provided to cause the necessary vacuum to feed the liquid fuel, causes further throttling. The existence of a vacuum at any time in the inlet pipe at 25 all is disadvantageous, tending to cause a low efficiency of the engine and a high consumption of fuel. It is one object of this invention to produce a "plenum" or slight pressure in the inlet pipe and to create 30 the required vacuum for the flow of liquid fuel by other means.

According to this invention the carbureter is constructed with a fan or blower as an integral part thereof, and the vacuum is 35 produced by the said fan or blower to cause the flow of liquid fuel from the jet, the said jet being placed immediately next the means causing the vacuum and advantageously also serving to atomize the liquid.

40 In order that my invention may be completely understood, reference should be made to the accompanying sheet of drawings which illustrate some examples of my invention.

45 Figure 1 is a sectional elevation in the plane of the fan spindle.

Fig. 2 is a section through the fan transversely to that shown in Fig. 1.

50 Fig. 3 is a section through the choke tube which is also the eye of the fan, the float feed and fan casing being in elevation.

Referring to Figs. 1, 2, and 3, A is the casing of the carbureting chamber of the carbureter in which is mounted the fan B. 55 The fan B is formed as a centrifugal fan having four main arms or blades B¹ B¹, and

numerous small blades B² B² arranged at the fan periphery, and secured in two rings B³ B³, which constitute the blade frame. The four main blades or arms B¹ B¹ are 60 rigidly secured at their center to the spindle C which is in part of square section, and each face of the square has bolted to it, or otherwise suitably secured thereto one inner end of each of the main blades B¹. 65 The main blades B¹ therefore constitute spokes for securing the peripheral small blades B² to the central hub or spindle C. The end coverplate D of the fan and carbureter casing A is made detachable and 70 is secured by bolts or screws to the casing A. The coverplate D is cone shaped and is formed as a hollow casting having provided at its center the ball bearings D¹ D² in which the fan spindle C is adapted to rotate. 75 On the outer end of the spindle C is secured a sprocket wheel E which is connected by a chain (not shown) to another driving sprocket wheel (not shown) mounted on either the crank shaft or the half speed 80 shaft of the engine. As it is usually desirable to run the fan by the engine at twice the crank shaft speed or rather more, the sprocket wheel on the crank shaft will therefore require to have twice (or more) 85 as many teeth as the fan sprocket. If fitted to the half speed shaft, the sprocket will require at least four times as many teeth as the fan sprocket.

The casing A is provided with the jacket 90 A² for the exhaust gases, A³ being the inlet for same, and A⁴ the outlet.

Although the fan is shown of the centrifugal type, it is possible to employ a fan of the usual type, by modifying the construction, but it would not be so effective, and the centrifugal fan is preferred. The fan shown provides an extremely convenient and effective constructional arrangement, because not only is the fan detachable 100 with the coverplate and bearing, but it provides the cone form of fan.

Although it is essential that the fan shall be power driven, it may be driven in any suitable manner as for example by skew 105 gear from the half speed shaft.

The choke tube F is also the eye of the fan, it converges to the jet or liquid fuel nozzle G, and then diverges or widens therefrom. 110

The lower vertical channel for liquid fuel H is fed by the conduit I from the float feed

chamber J which is of usual construction. The nozzle G has two jets G^1 G^2 , the upper one of which is controlled by a screw down needle valve K fitted in the center of the closing nut L. The outlet from the orifice G^2 may be therefore regulated.

It will be observed that the inner face of the nozzle G forms an inclined plane so that any liquid issuing from the jets or either of them before the fan is rotated is directed toward the fan casing. The air inlet M may be fitted with a piece of gauze or with an iris diaphragm or with other means for regulating the area of the air inlet such as two disks of thin sheet metal M^1 M^2 provided with two or three holes, more or less of which may be left open for the passage of air. N is the delivery pipe for mixture to the engine and N^1 is a throttle valve of ordinary construction mounted therein.

When starting the engine, the fan being positively rotated thereby, the rotation of the fan causes a suction or tends to create a vacuum in the choke tube F. The suction created causes a flow of liquid fuel from one or both of the orifices therein, and to assist this first flow the carbureter may in some cases be first flooded or filled with liquid fuel. The liquid fuel is churned up by the rotated fan producing a mixture ready for the engine. As the engine gains in speed the fan also increases in speed and the issuing liquid is directed upon the cone center of the fan causing its complete mixture and the delivery of the mixture to the engine by the delivery outlet N at a pressure. The mixture is thereby fed to the cylinders at a pressure instead of at a vacuum, each cylinder becomes more nearly filled with explosive charge and the efficiency, power, and economy of the engine are greatly increased.

What I do claim as my invention and desire to secure by Letters Patent is:—

1. A carbureter including a fan casing, a power driven centrifugal fan in the casing, the casing having a central inlet opening at one side thereof and the walls of the casing adjoining said opening diverging outwardly, an inwardly tapering air intake adjoining the said inlet opening of the casing, a fuel nozzle in the air intake tube, and means for supplying liquid fuel to the nozzle, the fan casing constituting a carbureter chamber.

2. A carbureter including a centrifugal fan, the fan being provided with a plurality of small peripheral blades, a choke tube forming the eye of the fan, a jet or nozzle in the choke tube, and a float feed device supplying liquid fuel to the nozzle, the casing of the fan constituting a carbureter chamber.

3. A carbureter including a fan casing, a power driven centrifugal fan in the casing, the casing having a central inlet opening at

one side thereof and the walls of the casing adjoining said opening diverging outwardly, an inwardly tapering air intake adjoining the said inlet opening of the casing, a fuel nozzle in the air intake tube at the juncture of said tube with the fan casing, and means for supplying liquid fuel to the nozzle, the fan casing constituting a carbureter chamber.

4. A carbureter including a fan casing constituting a carbureter chamber and having an outwardly diverging substantially cone-shaped front wall provided with a central opening, and a substantially cone-shaped rear wall spaced from and in substantial parallelism with the front wall of the casing, a fan in the casing, an inwardly tapered air intake tube connected with the central passage of the front wall of the casing and constituting the eye of the fan, a fuel passage communicating with the casing and a float feed supply.

5. A carbureter including a fan casing constituting a carbureter chamber and having an outwardly diverging substantially cone-shaped front wall provided with a central opening, and a substantially cone-shaped rear wall spaced from and in substantial parallelism with the front wall of the casing, a substantially cone-shaped fan in the casing having blades extending between the cone-shaped walls of the casing and converging toward the central opening of the front wall thereof, the blades being set at an angle, and peripheral blades located between the first mentioned blades.

6. A carbureter including a centrifugal fan casing constituting a carbureter chamber and having an outwardly diverging substantially cone-shaped front wall provided with a central opening, and a substantially cone-shaped rear wall spaced from and in substantial parallelism with the front wall, an intake tube connected with the casing at said opening, a fuel nozzle in the intake tube, a fan in the casing carried by the rear wall, said rear wall being detachably secured in place and having the bearings for the fan spindle located at its interior, the fan shaft terminating short of the central opening of the casing.

7. A carbureter including a fan casing, a power driven centrifugal fan in the casing, the casing having a central inlet opening at one side thereof and the walls of the casing adjoining said opening diverging outwardly, an air intake tube adjoining the said inlet opening of the casing, said casing also having a cone shaped part, the apex of the cone disposed opposite to the central inlet opening, a nozzle in the intake tube, and means for supplying liquid fuel to the nozzle.

8. In a carbureter including a fan casing, a power driven centrifugal fan in the casing,

the casing having a central inlet opening at the side thereof and the walls of the casing adjoining said opening diverging outwardly, an air intake tube adjoining said inlet opening of the casing, a fuel nozzle in the air intake tube, and means for supplying liquid fuel to the nozzle, the fan casing constituting a carbureter chamber.

9. A carbureter including a fan casing, a power driven fan in the casing, the casing and fan being substantially cone shaped in

form and the casing having a central inlet opening at one side at the apex thereof, an air intake adjoining the said inlet opening of the casing, a nozzle in the intake tube, and means for supplying liquid fuel to the nozzle. 15

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Witnesses:

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