

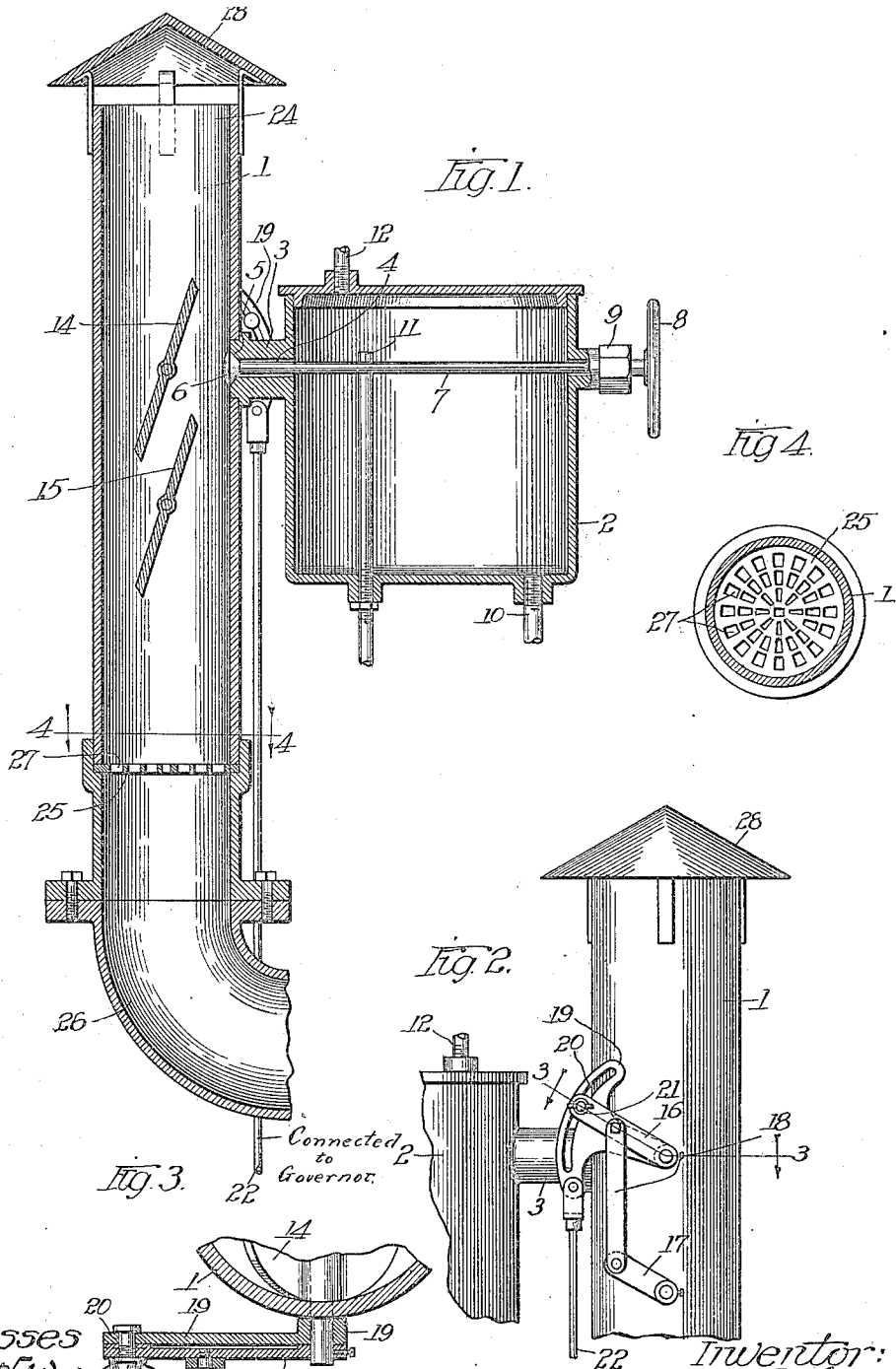
A. R. HENDRIX.

CARBURETER.

APPLICATION FILED MAY 28, 1912.

1,231,886.

Patented July 3, 1917.



Witnesses
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UNITED STATES PATENT OFFICE.

ADAM R. HENDRIX, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO W. H. BEALL,
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CARBURETER.

1,231,886.

Specification of Letters Patent.

Patented July 3, 1917.

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To all whom it may concern:

Be it known that I, ADAM R. HENDRIX, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbureters for Internal-Combustion Engines or the like, of which the following is a description.

My invention relates to that class of devices known as carbureters or mixers for finely dividing a fluid hydro-carbon and discharging the same into, and thoroughly mixing the same with, a certain volume of air to form a combustible explosive mixture.

The object of my invention is to provide a device of the kind described which can be operated under substantially any conditions of weather or temperature, suitable for use with the more non-volatile liquid hydro-carbon and with a certainty of the accurate and reliable operation of the device and the production of a uniform mixture.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described and more particularly pointed out in the claims.

In the accompanying drawings wherein like or similar reference characters indicate like or corresponding parts.

Figure 1 is a central vertical section of my device.

Fig. 2 is a detail elevation of the controlling mechanism of my device.

Fig. 3 is a fragmentary section taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a section through the mixing tube of my device taken substantially on line 4—4 of Fig. 1.

In the form shown in the drawings 1 is a tubular casing preferably of substantially uniform size its entire length with a fuel receptacle 2 rigidly secured on one side with a neck or stem 3. A port 4 extends from the interior of the receptacle 2 into the casing 1. The end 5 of the port adjacent the casing is conical, and a conical valve 6 is positioned in the casing and arranged to close the port. A stem 7 extends through the receptacle 2 with a hand wheel 8 or other convenient means upon its end for conveniently adjusting the position of the valve. A gland 9 or other suitable means is also provided to prevent the escape of fluid from the receptacle 2 adjacent the hand wheel.

In the preferred construction shown a suitable feed pipe 10 is attached to the bottom of the receptacle 2 for supplying the liquid fuel and an overflow 11 is provided so that when the height of the liquid in the receptacle reaches the point of overflow the height of the fuel will be accurately maintained as long as a sufficient amount of liquid is supplied. The overflow may of course, be connected to the main fuel supply tank or other convenient point that will permit the fluid to escape by gravity. A small vent pipe 12 is also provided in the top of the receptacle to prevent air imprisoned within the receptacle to interfere with the regular operation of the device.

The casing 1 is preferably circular in section and provided with any desired number of butterfly valves or dampers 14—15 adapted to control the flow of air through the casing. The valve 14 is positioned substantially opposite the port 4 and the valve 15 is positioned slightly nearer to the discharge end of the casing. The shafts or axis of the valves extend through the wall of the casing at one side and are each provided with a crank, or handle 16 and 17 respectively so that the position of the valves in the casing may be accurately determined and adjusted by the position of the respective cranks.

In the preferred construction a link 18 connects the cranks 16 and 17 so that a movement of one will produce a corresponding movement of the other thereby providing for the simultaneous adjustment of the valves. Any suitable means may be provided for locking the valves in position. In the form shown a yoke or segment 19 is loosely mounted upon the shaft of the valve 14 between the arm 16 and the casing 1 with a suitably formed slot 20 in its periphery. The arm 16 preferably projects beyond the link 18 as shown and is provided near its extremity with a bolt or other convenient means extending into the slot 20 so that when desired the arm may be rigidly secured to the segment in any desired position. A link or rod 22 is pivotally attached to the segment 19 and connected to the governing mechanism of the motor or if desired may be carried to any convenient point for manually controlling the position of the segment and thereby control the opening through the casing and the operation of the motor. Ob-

viously if it is not desired to provide such automatic governing mechanism or to control the operation of the motor from a distance the segment 19 may be rigidly secured to the casing 1 or if desired cast integrally therewith so that by securing the arm 16 to the segment the valves will be rigidly held until further adjusted.

The casing 1 is preferably entirely open at one end as at 24 while the opposite end is provided with a perforated plate 25 and connected beyond the plate 25 in any suitable manner as by the tube 26 to the cylinder or combustion chamber of a motor or other point where the mixture is to be consumed. The apertures 27 in the plate 25 are preferably angular as shown so that, in addition to operating as a strainer for preventing large pieces of material from being drawn into the cylinder the plate 25 also serves as a mixer for further breaking up the larger globules of the liquid and more intimately mixing them with the air. A cap or cover 28 is provided for the end 24 of the casing 1 to prevent dust and other foreign material from entering the casing and thus finding a direct passage to the engine cylinder.

In operation the desired liquid fuel is pumped or otherwise supplied through the pipe 10 to the receptacle 2 as soon as the receptacle is full, that is, as soon as the fluid begins to escape at the overflow 11 the hand wheel 8 may be operated to slightly open the valve 6 so that fluid will flow through the port with its conical part 5 into the casing 1 although under ordinary circumstances when the valve is sufficiently open for the proper operation of the device the fluid will be largely held by capillary action and will not flow to any considerable extent into the casing. When the engine is started however, the reduction in air pressure in the tube or "suction" of the engine is sufficient to draw the fluid rapidly through the conical space about the valve 6 thereby discharging the fuel into the casing in a fine spray. The larger globules are projected against one side of the butterfly valve 14 and the remainder is carried down by the air and more or less distributed over the surface of the valve 15 and plate 25 so that the air rushing through the casing 1 is brought into intimate contact with the fluid upon the valves and operates to wipe the fluid from the valves and intimately mix the same with the on rushing air. The larger globules of fluid which may be thrown from the valve 14 are caught upon the valve 15 or the plate 25 and again broken up as it passes through the plate thereby producing an extremely intimate and substantially permanent mixture. The position of the butterfly valves obviously controls the clear space through the casing and thereby the velocity of the air passing through the casing, and, since the

amount of fuel entering the casing is largely controlled by the difference in pressure or velocity of the air passing through the casing the position of the butterfly valves accurately controls the amount of fuel used in the engine and thus, within certain limits, the power developed by the engine.

While in the foregoing specification I have shown and described a very desirable form of my invention, it is obvious that various parts may be considerably modified without departing from the spirit of my invention, I do not therefore wish to limit myself to the exact form or construction shown.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the kind described, a tubular casing provided with a fluid inlet port, at one side, a valve stem positioned in said port, and a valve for controlling said port said valve being mounted upon said stem and positioned within said casing outside the port, in combination with a movable valve plate opposite said port, whereby fluid entering said casing will be sprayed upon said plate, and means projecting through the casing for adjusting said plate in opposite directions.

2. In a device of the kind described, a tubular casing provided with a fluid inlet port at one side, a transverse plate provided with an angular opening positioned at one end of said casing, a valve stem positioned in said port, and a valve for controlling said port said valve being mounted upon said stem outside of said port in combination with a movable valve plate positioned within said casing, whereby fluid entering said casing will be sprayed upon said plate, means for adjusting said movable plate and means for holding the plate in adjusted positions.

3. In a device of the kind described, a tubular casing provided with an oil inlet port at one side, a valve stem positioned in said port, and a valve for controlling said port said valve being mounted upon said stem, in combination with a plurality of adjustable valve plates arranged within said casing one of which is arranged directly opposite said port, whereby fluid entering said casing will be sprayed upon said plate.

4. In a device of the kind described, a tubular casing open at one end and provided with a fluid inlet port at one side, a valve stem positioned in said port and a valve for controlling said port said valve being mounted upon said stem and positioned within said casing outside and beyond the end of the port, in combination with a movable valve positioned within the casing opposite said port, whereby fluid entering said casing will be sprayed upon said valve.

5. In a device of the kind described, a tubular casing provided with a fluid inlet port at one side, and a cup connected to said

port, a valve stem positioned in said port and extending through said cup, and a valve for controlling said port said valve being mounted upon said stem and positioned within said casing, in combination with a movable valve plate positioned within the casing opposite said port, whereby fluid entering said casing will be sprayed upon said plate.

6. In a device of the kind described, a tubular casing provided with a fluid inlet port at one side, a transverse plate provided with angular openings positioned at one end of said casing, a valve stem positioned in said port, and a valve for controlling said port said valve being positioned within said casing beyond said port, in combination with a plurality of movable valve plates positioned within the casing forming therebetween a vacuum chamber, one of said valves being arranged opposite said port, whereby fluid entering said casing will be sprayed upon said plate.

7. In a device of the kind described, a tubular casing open at one end provided with a fluid inlet port at one side, a valve stem positioned in said port, and a valve for controlling said port, said valve being mounted upon said stem, in combination with a plurality of separated valve disks positioned within the casing one of which disks is arranged directly opposite said port, whereby fluid entering said casing will be sprayed upon said disk.

8. In a device of the kind described, a tubular casing open at one end and provided with a fluid inlet port at one side, a cup adapted to contain a fluid connected to said port, and a transverse plate provided with an angular opening positioned at one end of said casing, a valve stem positioned in said port and extending through said

cup, and a valve for controlling said port, said valve being mounted upon said stem, in combination with a plurality of adjustable plates positioned within the casing one of which is arranged directly opposite said port, whereby fluid entering said casing will be sprayed upon said plate, and means for holding said plates in adjusted positions.

9. In a device of the kind described, a tubular casing open at one end and provided with a fluid inlet port at one side, a valve stem positioned in said port, and a valve for controlling said port said valve being mounted upon said stem, in combination with a plurality of adjustable valves positioned within the casing, said valves being separated from one another to form therebetween a chamber one of said valves being positioned opposite said port, whereby fluid entering said casing will be sprayed upon said valve.

10. In a device of the kind described, a tubular casing provided with an oil inlet port at one side, a valve stem positioned in said port, and a valve for controlling said port said valve being mounted upon said stem, in combination with a plurality of adjustable valve plates arranged within said casing one of which is arranged directly opposite said port, whereby fluid entering said casing will be sprayed upon said plate, and a foraminous member positioned in the path of the mixture formed in said casing to finally mix the same.

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

ADAM R. HENDRIX.

Witnesses:

BURTON U. HILLS,
BLANCHE CHALMERS.

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