F. A. HEATH & W. O. TAYLOR.

CARBURETER.

APPLICATION FILED MAR. 3, 1911.

1,172,595.

Patented Feb. 22, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

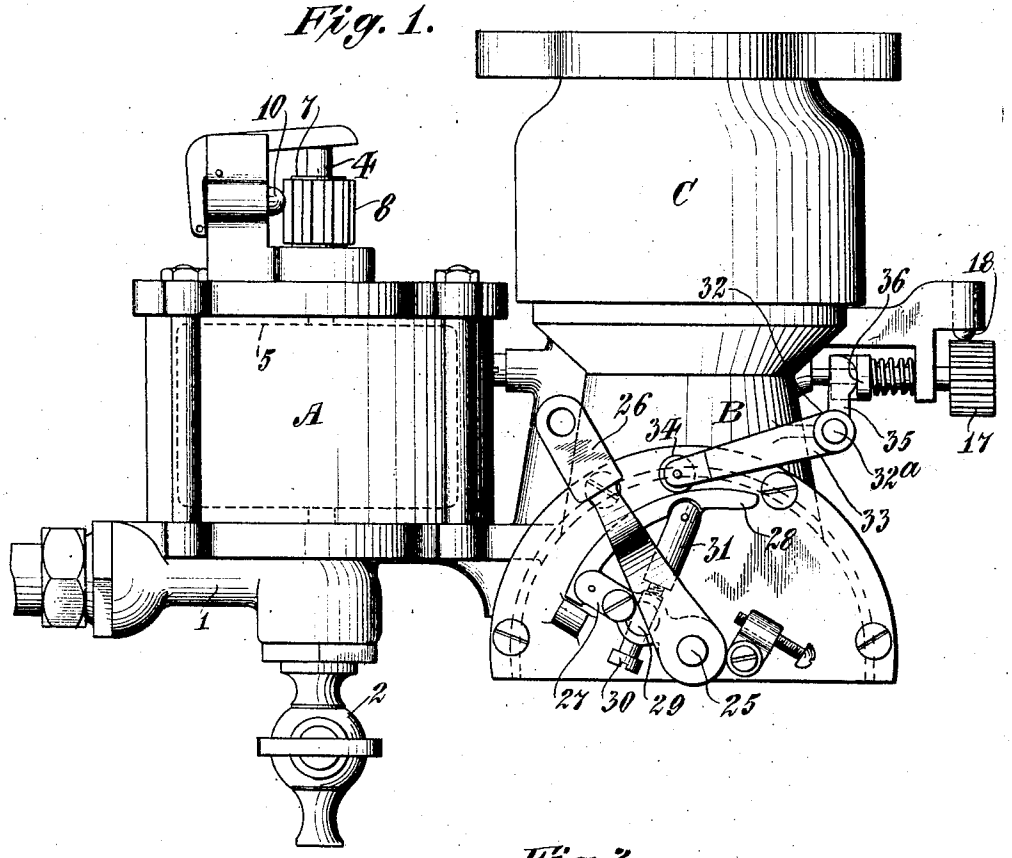
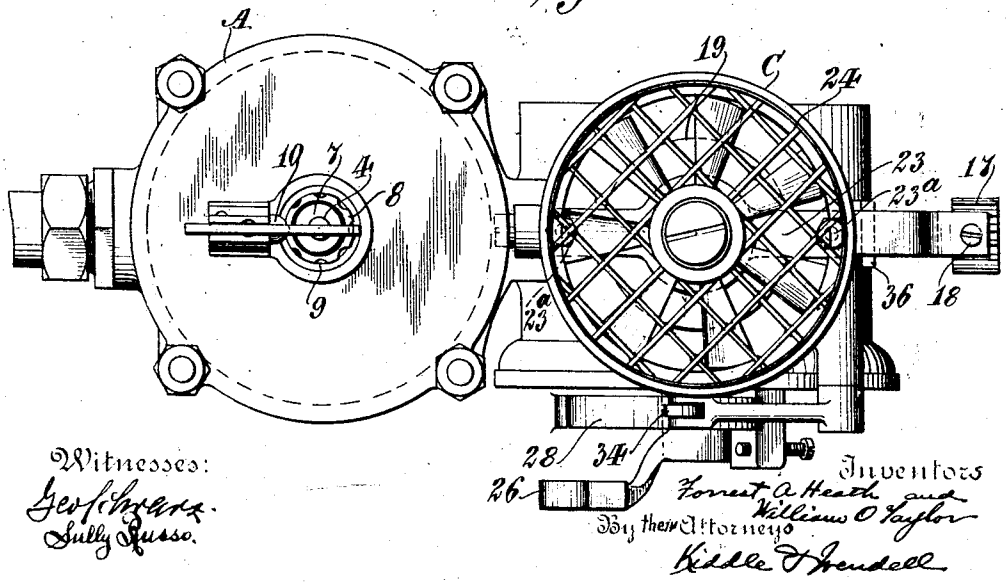


Fig. 2.



Witnesses:
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2 SHEETS—SHEET 2.

Fig. 4.

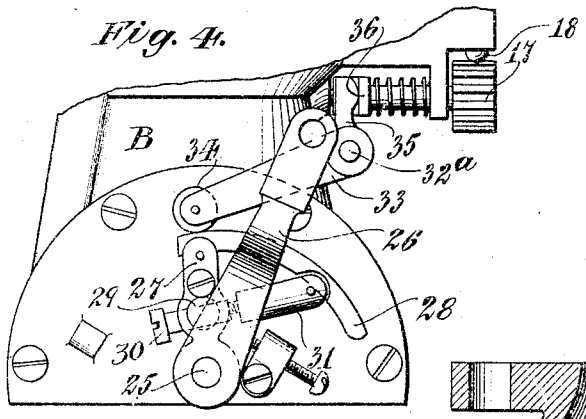


Fig. 3.

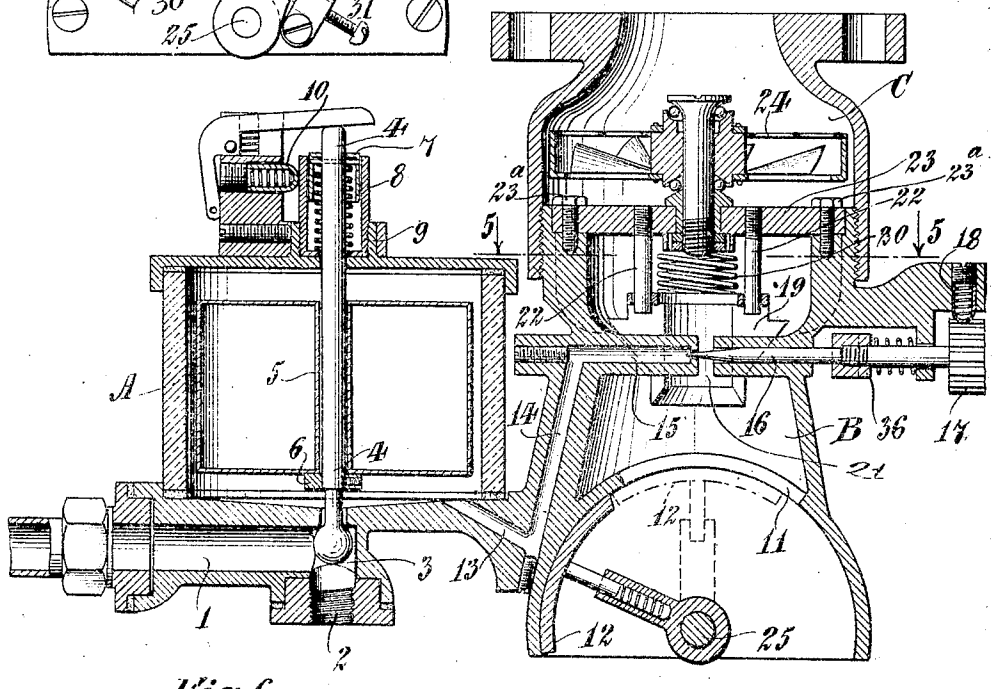


Fig. 6.

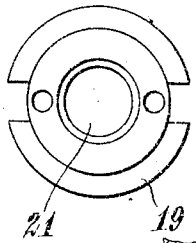


Fig. 7.

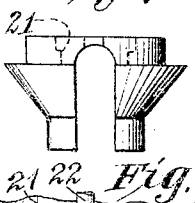


Fig. 8.

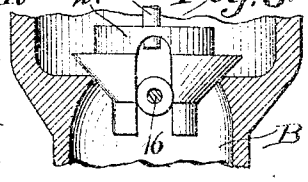
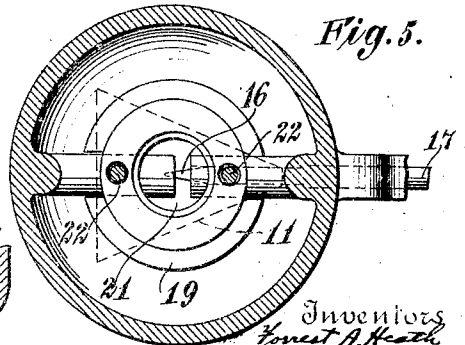


Fig. 5.



Witnesses:
Geo. H. Graves
Sully Russo

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UNITED STATES PATENT OFFICE.

FORREST A. HEATH, OF JERSEY CITY, NEW JERSEY, AND WILLIAM O. TAYLOR, OF NEW YORK, N. Y.; SAID TAYLOR ASSIGNOR TO NEW JERSEY CARBURETER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CARBURETER.

1,172,595. Specification of Letters Patent. Patented Feb. 22, 1916.

Application filed March 3, 1911. Serial No. 612,027.

To all whom it may concern:

Be it known that we, FORREST A. HEATH and WILLIAM O. TAYLOR, both citizens of the United States, and residents of the city of Jersey City, in the county of Hudson and State of New Jersey, and the city of New York, in the county of New York and State of New York, respectively, have invented new and useful Improvements in Carbureters, of which the following is a specification.

The invention relates to improvements in devices for carbureting and mixing air with hydrocarbon liquid fuels such as are utilized in the hydrocarbon engines.

The invention particularly relates to the means which regulate the amount of air passing through the carbureter and the amount of fuel which is supplied to said air.

It furthermore relates to a carbureter in which the air traveling through the carbureter passes by the delivery end of the fuel supply until the amount of air passing through the carbureter exceeds a certain amount and then the excess amount of air passes through a bypass or enlarged air passage in the carbureter without having to traverse the discharge end of the fuel supply.

The invention also relates to a carbureter having therein a rotatable mixing member for causing the mixture passing therethrough to become more homogeneous.

As showing a specific embodiment of the invention reference is made to the drawings in which,

Figure 1 shows a side view of the completed carbureter. Fig. 2 is a plan view of the same. Fig. 3 is a transverse vertical sectional view through the carbureter. Fig. 4 is a partial side view of the carbureter showing the position which the operating elements between the air valve and the fuel valve occupy when the carbureter is not being used. Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 3 looking in the direction of the arrows. Figs. 6 and 7 are detail plan views of the bypass valve. Fig. 8 is a vertical section at right angles to the section shown in Fig. 3. Fig. 8 shows the manner in which the valve seats.

The completed carbureter comprises three distinct parts, namely, the float chamber A, the atomizing chamber B and the mixing chamber C.

The float chamber A is provided with the supply duct 1 having at the extremity thereof the drain cock 2. There is an opening leading from the duct 1 to the interior of the float chamber which is controlled by the valve 3 to which is connected the vertical spindle 4. A float spindle 5 is slidable upon and relative to the valve spindle 4 and this float when the liquid in the chamber is below a certain amount rests upon the collar 6 secured to the spindle 4 to depress the valve and permit fuel to enter the chamber. There is secured to the upper end of the spindle 4 an inverted cup 7 surrounded by the cup shaped sleeve member 8 vertically adjustable in the screw socket 9. Between the cup members 7 and 8 there is a spring whose tension can be regulated by the turning of the sleeve member 8 normally held from rotation in its socket by the spring pressed pin 10.

The atomizing chamber B is provided at its lower end with the triangular air inlet opening 11 controlled by the spring pressed curved valve 12 which is of uniform width from end to end. The fuel comes to the atomizing chamber from the float chamber through the ducts 13, 14 and 15 and the area of the discharge opening is controlled by a needle valve 16 the position of which can be regulated by turning the screw threaded member 17 normally held from rotation by the spring pressed pin 18. At each side of the projections through which the duct 15 and the needle valve pass there are openings in which the bypass valve 19, shown in detail in Figs. 6 and 7, is seated and held in place therein by the spring 20 if the air suction does not exceed a certain amount. It will be observed that this valve 19 is provided with a longitudinally extending aperture 21 through which the air passing through the carbureter normally travels and into this aperture portion the discharge end of the fuel supply terminates. It will therefore be apparent that the suction of the air upon the fuel supply when the valve is seated will correspond to the amount of air drawn or passing through the carbureter. Now when the air required for any certain position of the air inlet valve exceeds a certain amount the suction will increase sufficiently to cause a lifting of the valve 19 from the seat and when this point has been reached it will be apparent that the suction of the air upon the fuel will not correspondingly increase the amount of fuel

delivered thereto. In other words some of the air is by-passed from the inlet end of the carbureter directly into the delivery side of the atomizing chamber without it all having to pass through the aperture into which the fuel supply discharges.

In order that the valve 19 may be properly maintained in place in the atomizing chamber pins 22 have been provided upon which the valve can slide. These pins are carried by the transverse bar 23 which supports the rotary mixing member 24 and this bar is detachably secured in place by the bolts 23ª.

The spring pressed air inlet controlling valve 12 previously referred to is carried on a shaft 25 having connected thereto the operating arm 26. This shaft also carries an arm 27 which has pivoted thereupon at its free end the curved cam 28. There is also carried by the arm 27 a swiveled member 29 having a threaded member 30 passing therethrough and held from longitudinal movement therein. A nut 31 with which the screw threaded member 30 engages is pivotally secured to the cam 28 in a manner to effect the changing of the radial position of a portion of the cam relative to the axis of the shaft 25. The carbureter also has a rocker member 32 comprising a shaft 32ª parallel with the shaft 25; an arm 33 secured to one end of shaft 32ª, having a roller 34 at the free end thereof in engagement with the cam 28 and a forked arm 35 secured at the other end of said shaft, which straddles a nut member 36 on the needle valve 16.

It will thus be apparent that by swinging the lever 26 from the closed position of the carbureter shown in Fig. 4, to the position shown in Fig. 1, that the air valve 12 will be moved from the dotted position shown in Fig. 3 to the full line position and that the needle valve will be drawn from closed position to open position due to the fact that the radius of curvature of the cam 28 increases going away from the supporting arm 27.

The means which operatively connect the air inlet valve and the fuel supply needle valve comprise a movable member namely the cam 28, the free swinging end of which can be adjusted to different radial positions relative to the axis of the shaft 25 and the construction of the operating parts in this connecting mechanism is such that in one position of the movable member a fixed ratio between the openings of the fuel and air supply may be maintained and in another position of the movable member other varying ratios may be maintained between the air and fuel supply openings. In fact this movable member can in one position maintain a constant ratio between the areas of the openings during the movement of the air inlet valve from closed to open position in another position of the movable member the ratio of the fuel area to the air area may be variably increased with the opening of the air valve while in another position of the movable member the ratio of the fuel opening to the air opening may be variably diminished as the air valve moves to open position.

It will be observed that the air valve is in reality a throttle valve located at the opening of the atomizing chamber and that the engine suction will produce more or less of a vacuum in the atomizing chamber which will to a material extent lower the boiling or vaporizing point of the liquid fuel and this will permit a lower grade of gasolene or whatever the fuel may be to be used in the carbureter than if the air valve were not so located.

I claim as my invention:

1. In a carbureting device having an atomizing chamber and a mixing chamber the combination of a spring pressed valve in the atomizing chamber, a bar detachably secured to the walls of the carbureting device, a valve spring between the valve and bar, and a mixing member carried by the bar.

2. In a carbureter a bar supporting at one side thereof downwardly extending air valve guiding members, a hollow air valve member slidable thereupon, fuel delivering means terminating within the opening of the valve and a rotatable mixing device having its axis of rotation in alinement with the axis of the opening in the hollow valve member.

3. A carbureter having an upright casing with a main air controlled valve at the lower portion thereof, a fuel supply leading to the interior of said casing and terminating above the main valve opening, a hollow air valve within which said fuel supply terminates, a transversely extending bar detachably secured in the upper part of said casing, depending members secured thereto for guiding said hollow air valve, an upright stud carried by said bar and located between said depending guiding members, and a mixing member mounted on said stud in the path of the gaseous mixture which passes upwardly past said bar.

This specification signed and witnessed the 23d day of February, A. D. 1911, in the city of New York, State of New York.

FORREST A. HEATH.

Signed in the presence of—
EDWIN A. PACKARD,
G. MCGRANN.

This specification signed and witnessed the 15th day of February, A. D. 1911, in the city of New York in the State of New York

WILLIAM O. TAYLOR.

Signed in the presence of—
EDWIN A. PACKARD,
G. MCGRANN.