W. ECKERT.

CARBURETER.

APPLICATION FILED APR. 17, 1908.

912,998. Patented Feb. 23, 1909.

Fig. 1

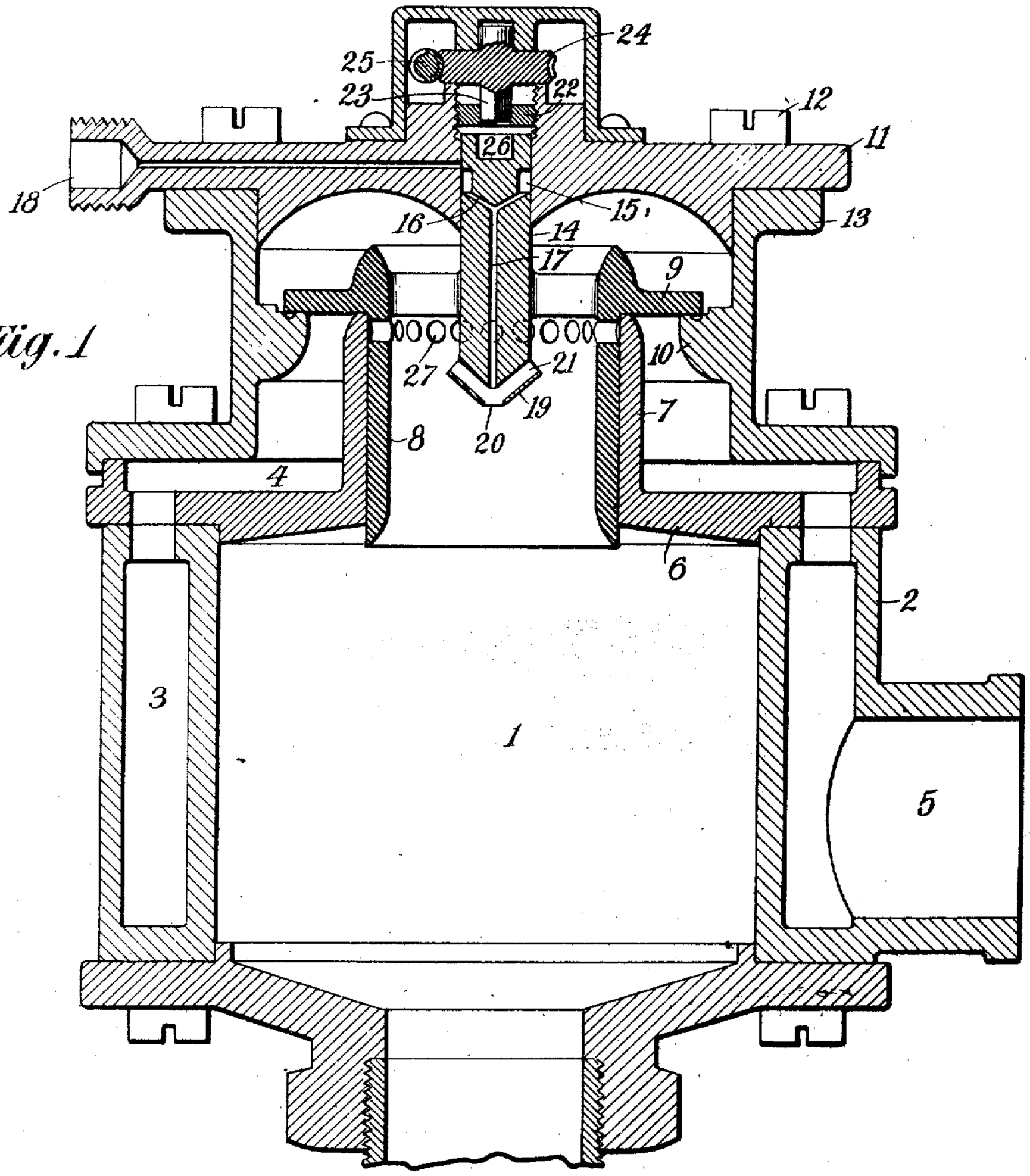
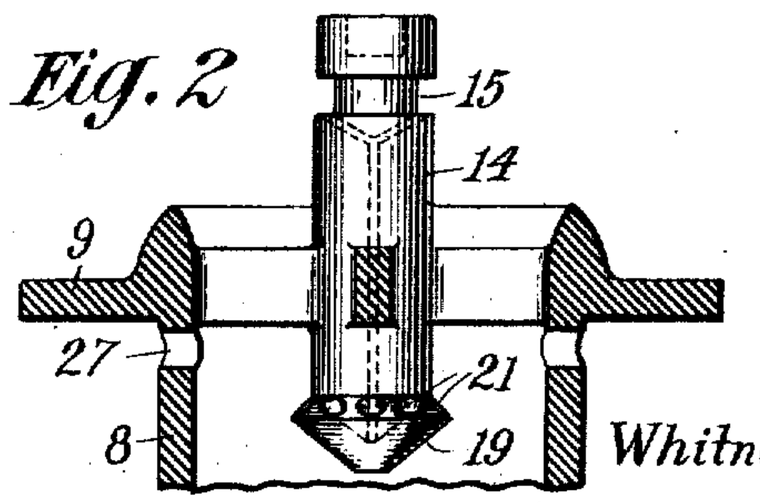


Fig. 2



Witnesses:
Raphael Netter
John A. Engel

Whitney Eckert, Inventor
By his Attorneys
Kerr, Page & Cooper

UNITED STATES PATENT OFFICE.

WHITNEY ECKERT, OF STAMFORD, CONNECTICUT.

CARBURETER.

No. 912,998. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed April 17, 1908. Serial No. 427,683.

To all whom it may concern:

Be it known that I, WHITNEY ECKERT, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Carbureters, of which the following is a specification, reference being had to the drawing accompanying and forming a part of the same.

My invention is an improvement in apparatus for producing explosive mixtures of hydrocarbon and air, and more particularly on those forms of carbureter shown and described in an application filed by Charles Fox, February 20th, 1906, Serial No. 301,985, and in an application of even date herewith filed by Clendenin Eckert, administrator of the estate of the said Charles Fox, deceased.

The primary objects of my improvements are to dispense entirely with the needle valves heretofore regarded as necessary in devices of this character, to do away with all springs both in and about the carbureter for actuating the valves, to provide for a more efficient and simple control and regulation of the device, and to simplify and cheapen its construction.

These objects are secured by the carbureter constructed and arranged as shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved device. Fig. 2 is a view, partly in elevation and partly in section, of a portion of the main controlling valve.

The numeral 1 indicates the mixing chamber of a carbureter which is or may be of the usual kind, but preferably cylindrical in form. Surrounding this mixing chamber is an outer casing 2, preferably of similar form, large enough in diameter and height to leave an air space or chamber around and above the mixing chamber as shown at 3, 4, for the passage of air admitted through a pipe 5. The top of the mixing chamber 1 is formed by a plate 6, having a central aperture surrounded by an upwardly extending tubular neck 7, in which is fitted a cylindrical valve member 8, capable of a reciprocating movement in said neck. At the upper end of said valve member is an outwardly extending or horizontal flange 9, adapted to seat, when the valve member is in its lowermost position, on the upper edge of the neck 7, and also on a shoulder or flange 10 on the surrounding wall of the upper portion of the casing 2. It will be seen that when the valve member 8 is in its normal position the flange 9 spans and covers the annular port formed between the neck 7 and the shoulder 10, and therefore closes the annular passage through which air is drawn into the mixing chamber through the pipe 5. The top of the outer casing 2 is closed by a casting 11, secured by screws 12 to a flange 13, and through the center of said casting a hole is bored to contain the hydrocarbon supply valve hereinafter described.

Across the upper end of the cylindrical valve member 8, extends a spider or series of radial arms, the central hub 14 of which is elongated both above and below the spider. The upper end of said hub enters the hole bored through the casting 11 and is formed or constructed to constitute a valve for controlling the admission of hydrocarbon or other liquid to the mixing chamber, by being provided with a circumferential groove 15, from which two or more ducts 16 lead to a passage 17, drilled or otherwise formed through the hub 14 and opening into the mixing chamber.

One or more passages 18 to conduct the liquid from a suitable source of supply to the valve thus constituted are formed transversely through the casting 11, the orifices of the said passages being so placed as to be alternately opened and closed by the reciprocation of the hub or stem 14. The lower end of the hub 14 terminates in a nipple 19 having a central opening 20 and a series of passages 21 running obliquely from the upper edge of the nipple to the central bore 17.

The play of the valves 8 and 14 is regulated by a nut 22 threaded to fit the upper threaded portion of the bore of the casing 11 and turned by the engagement therewith of a squared key 23, carried by a worm nut 24, turned at will by a worm screw 25. In the top of the valve 14 is a recess 26 to receive the lower end of the key 23, when the latter by its adjustment is caused to protrude through the nut 22.

When thus constructed the operation of the device is as follows: Let it be assumed that the carbureter is used in connection with an internal combustion engine or the like; that the air which enters at 5 is drawn through the mixing chamber and into the engine by the suction produced by the movement of the engine pistons, and that the air before entering the device is heated, either by the exhaust from the engine or otherwise. When the engine, having been started in the usual way, is running normally, a partial vacuum is created at a given instant within the mixing chamber 1 and the space above the valve 8 by the movement of a piston. The pressure of air in the annular chamber 3, therefore, lifts the valve 8 against the force of gravity and raises its flange from its seat. The lifting of the valve 8, raises the hub or valve 14, bringing the groove 15 therein into register with the port or orifice of the passage 18 for hydrocarbon and this establishes direct communication between the supply of hydrocarbon and the mixing chamber through the bore of valve 14. The hydrocarbon or other liquid is thereupon drawn by suction down through the said bore to the discharge orifice of the same. The upward movement of the valve 8 also carries a series of perforations 27, formed in the cylindrical body of said valve immediately beneath the flange 9, above the edge of the neck 7, and through the parts thus opened a charge of air is admitted which converges centrally downward with a tendency to develop a vortex about and upon the nipple at the lower extremity of valve 14. At the same time, the major part of the charge of air admitted to the mixing chamber to supply the partial vacuum by which the valve 8 is raised enters through the annular port opened by the flange 9 and being deflected by the arched or curved upper surface of the chamber is caused to take the same course downward through the valve 8 and around the central hub 12 and the nipple at the end thereof. A part of the two commingled currents of air thus established passes through the passages in the nipple and taking up the hydrocarbon issuing from the lower end of the passage 17 atomizes and discharges it through the orifice 20 into the mixing chamber 1. It will be understood, although the interior arrangement of the chamber is not illustrated in detail, that baffle plates such as are shown and described in the applications hereinbefore referred to should be used in such chamber.

By means of this greatly simplified construction I secure an extreme delicacy of control of the operation of the carbureter and provide for a positive locking of such control at any stage. I have furthermore found that with the construction shown, shocks to any working part of the controlling devices by hammering of the valve stem at high speed, the creation of a vacuum, accumulation of oil or back pressure of any kind above the valve are entirely avoided.

Having now described my invention what I claim is:

1. In a carbureter, the combination with a mixing chamber having an air inlet formed through an upwardly extending neck, an outer casing providing a port around said neck, a cylindrical valve member working in said neck and having a flange covering the said port, a hub or stem carried by the said valve member and having a passage through itself connecting a groove in its side with the interior of the mixing chamber and an oil supply communicating with the chamber in which said hub works, whereby said oil supply will be brought into direct communication with the mixing chamber by the reciprocation of the air valve, as set forth.

2. In a carbureter as herein described, the combination with the valve 8 controlling ports for the admission of air, of an oil supply controlled by the hub or stem 14 carried by the air valve, and a nipple at the lower extremity of said hub, provided with perforations to direct the air admitted through the ports toward the orifice of a central passage in the hub from which the oil is discharged into the mixing chamber.

3. The combination of the cylindrical valve member 8, having a flange 9 covering the port for the admission of air, and the row of perforations 27, opened by the lifting of said valve member, the central hub or stem 14, working in a chamber above the air valve and constituting a valve for controlling the admission of hydrocarbon to the mixing chamber, and the nipple provided with converging air passages at the lower extremity of the said valve 14, as set forth.

4. In a carbureter as herein described, the combination with a mixing chamber having an air inlet formed through an upwardly extending neck, an outer casing containing an annular port around the neck and having its walls rounded to deflect the entering charges of air centrally downwards through the neck, a cylindrical valve member working in said neck and having a flange covering the annular port, an oil supply valve operated by the movements of the cylindrical air valve and having a hollow stem projecting centrally into the said air valve and adapted to discharge the oil through the orifice at its lower end into the converging current of air, whereby the discharged oil will be atomized, as set forth.

5. The combined air and oil control valve for carbureters, as herein described, composed of a hollow cylindrical member 8, a

flange 9, a hub or stem 14, supported by radial arms on the cylindrical member, the said stem containing a longitudinal duct for conveying charges of oil from an oil supply chamber and a nipple at its lower end with air passages therein converging to the discharge orifice of the duct, whereby the charges of oil issuing from the duct may be atomized, as set forth.

WHITNEY ECKERT.

Witnesses:
S. S. DUNHAM,
M. LAWSON DYER.