G. T. HANCHETT.

MIXER FOR GASEOUS FUEL.

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1,017,750.

Patented Feb. 20, 1912.

Fig. 1.

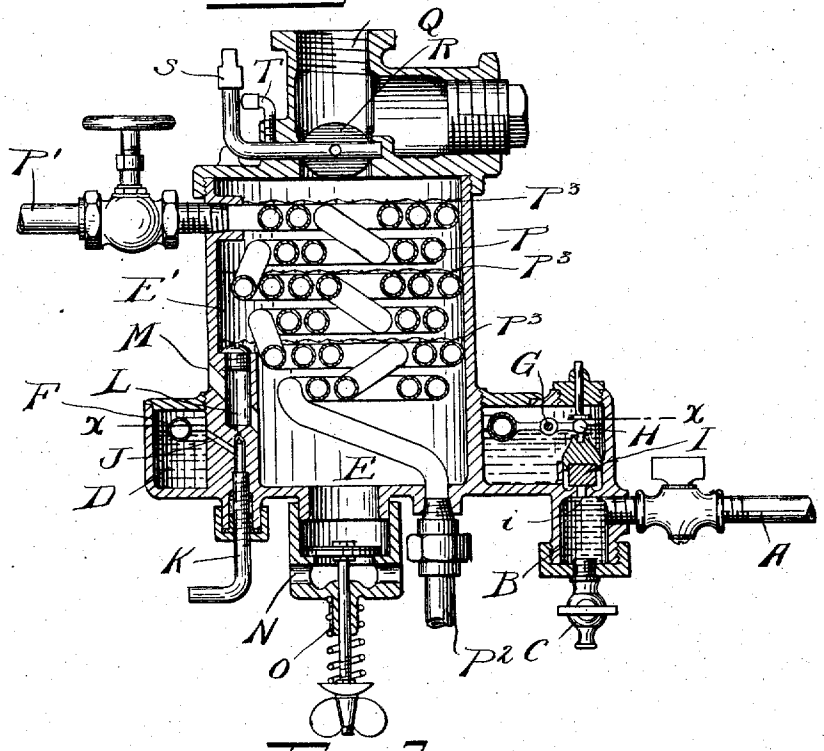
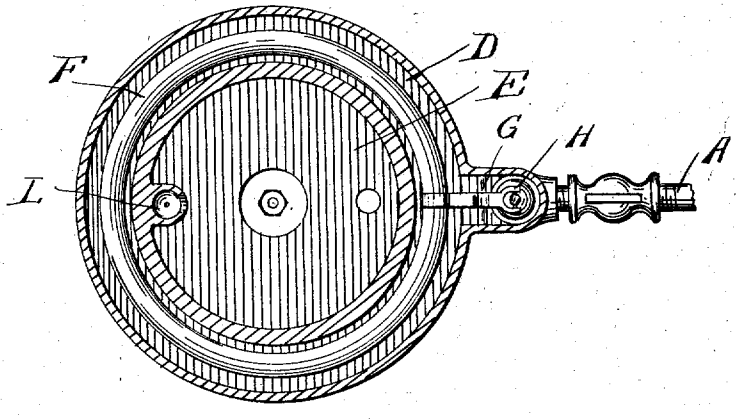


Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE T. HANCHETT, OF HACKENSACK, NEW JERSEY.

MIXER FOR GASEOUS FUEL.

1,017,750. Specification of Letters Patent. Patented Feb. 20, 1912.

Application filed July 16, 1908. Serial No. 443,748.

To all whom it may concern:

Be it known that I, GEORGE T. HANCHETT, a citizen of the United States, residing at Hackensack, Bergen county, New Jersey, have invented certain new and useful Improvements in Mixers for Gaseous Fuel, of which the following is a full, clear, and exact description.

My invention relates to improvements in carbureters for internal combustion engines, and has for its object to produce a new and improved carbureter which more thoroughly carburets, acts so that the liquid fuel will be a more perfect gas, be more perfectly mingled with air, permits the running of the engine cylinder at a lower temperature, permits the use of greater compression in the engine cylinder, and is more perfect mechanically.

The following is a description of my invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical section of the carbureter. Fig. 2 is a horizontal section of the same, with the coil removed, on the line *x*—*x* Fig. 1.

Referring more particularly to the drawings, A is the inlet pipe for the liquid fuel, such, for instance, as gasolene.

B is a chamber for collecting any water that may pass in with the fuel.

C is a pet cock to draw off the water when necessary.

D is an annular chamber surrounding the chamber E. The chamber E is connected to a heating chamber E′. In the chamber D is an annular float F also surrounding the chamber E. This float is pivoted at G and connected to an arm H, which actuates a valve I controlling the flow of liquid fuel through the orifice *i*, so as to maintain it at a constant level. The annular float forms a rigid construction with a long lever arm insuring a powerful action on the valve I. From the chamber D the fuel flows through a passage J to a needle valve K, past whose point it flows to the chamber L. Across this chamber L, passing through both walls thereof and into the chamber E, is an air passage M. At the bottom of the chamber E is an inlet N controlled by the adjustable spring seated valve O. In the chamber E′ is a heating coil P connected at one end to the inlet pipe P′, and at the other end to the discharge pipe P^2. Hot water from the water jacket is passed through this coil and thence, if in a motor boat, discharged at any convenient point, or if in an automobile, to a radiator. The upper chamber E′ is provided with an outlet Q in which is a throttle R actuated by an arm S, and locked, if desired, by a set screw T.

The heating coil P in the chamber E′, as shown in Fig. 1, is a plurality of parallel coils each having a plurality of turns so that the coil as a whole has a plurality of turns in each of several substantially parallel planes and surrounding a common axis interspersed with wire netting P^3 P^3 P^3, secured directly thereto so as to conduct heat therefrom. The wire nettings constitute screens which provide enlarged heated surfaces for the mixed fuel and air to impinge against and also retard the passage of the air and fuel through the chamber, causing the currents to diverge so that contact is made with all the heated portions of both the coil and the screens. The coil is preferably of copper and the netting of brass, on account of their durability and heat conductivity.

In the operation of the apparatus, as the engine starts, air is drawn in through the opening M over the fuel in the ordinary manner, the fuel being atomized at the needle valve orifice. As the engine speeds up, the water becomes heated and the coil P and netting P^3 forms a heated surface upon which the fuel impinges. The tortuous passages which the air and gas must follow mixes them thoroughly. The impinging of the fuel upon the heated surfaces of the coil and netting vaporizes the fuel but does not greatly raise the temperature of the mixture. The air and gas in the chamber E are thoroughly mixed and the fuel is thoroughly vaporized so that it passes into the combustion cylinder in proper condition for immediate use. For this reason the heat of the combustion chamber is not necessary for completing the vaporizing and the combustion chamber can therefore be run much cooler. The walls of the combustion chamber have heretofore been relied upon to vaporize the fuel, but have done it unsatisfactorily because so small a part is brought into direct contact therewith. Since my fuel is not heated until after it is mixed with air, there is no danger of vaporizing before it passes the needle valve. Since the air is not heated except as it passes through the chamber E, it does not become hot, the fuel being

a better conductor of heat and the heat units given off by the coil and netting being almost entirely taken up in vaporizing the fuel. The air, therefore, does not expand as it would if heated before being mixed with the fuel, and consequently does not reduce the efficiency of the engine, as would be the case if heated air were used. As the engine speeds up, air is also drawn in through the inlets N. This air meets the air coming in through the port N, together with the fuel, at an angle, so that the two currents become thoroughly combined and mixed. As soon as the coil P becomes heated, the efficiency of the engine rises very much, and since that is the normal condition, the efficiency in normal running is very high. This is brought about by two factors, viz: the complete mixing of the two, and the vaporization of the fuel. The perfect control of the liquid fuel supply contributes incidentally to the improved action of the carbureter as a whole.

My invention permits of various modifications of the apparatus shown and described, and has various advantages such as will be evident to those skilled in the art.

What I claim is:

1. In a device of the character described, the combination of a carbureter casing having a chamber therein, a heating coil within said chamber against which mixed air and fuel may impinge, said coil having a plurality of turns in each of several substantially parallel planes and surrounding a common axis, and entrance and exit ports, said coil lying in the path between said entrance and exit ports.

2. In a device of the character described, the combination of a carbureter casing having a chamber, heating coils within said chamber, and metallic screens in direct contact with said coils and against which the mixed air and fuel impinge.

3. In a device of the character described, the combination of a carbureter casing having a heating chamber, heating coils within said chamber adapted to be supplied with water from a water jacket and against which the air and fuel impinge, and means interspersed between turns in the coil within the chamber for retarding the passage of the fuel and air therethrough.

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