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H. W. RIELLY ET AL

ELECTRICAL HEATER FOR CARBURETORS

Filed Feb. 1, 1921

Fig. 1.

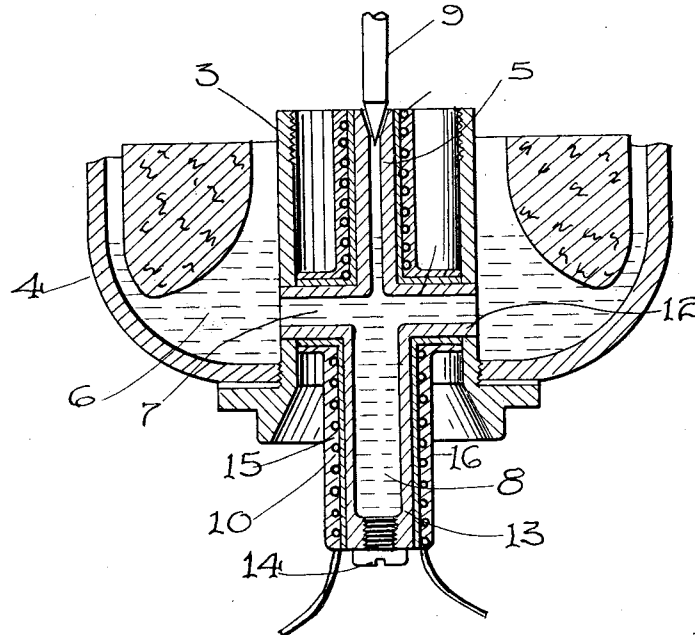
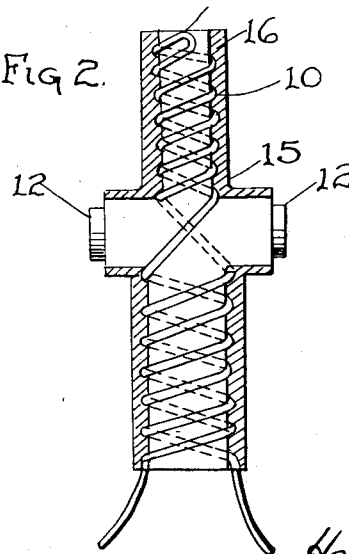


Fig 2.



Inventors:
Harvey W. Rielly
Vernon D. Hogan
By Ira Wilson Atty

UNITED STATES PATENT OFFICE.

HARVEY W. RIELLY AND VERNON D. HOGAN, OF EGAN, ILLINOIS.

ELECTRICAL HEATER FOR CARBURETORS.

Application filed February 1, 1921. Serial No. 441,539.

To all whom it may concern:

Be it known that we, HARVEY W. RIELLY and VERNON D. HOGAN, citizens of the United States, residing at Egan, in the county of Ogle and State of Illinois, have invented certain new and useful Improvements in Electrical Heaters for Carburetors, of which the following is a specification.

This invention pertaining in general to carburetors, has more particular reference to electrically heated devices for heating the fuel mixture, and to the embodiment of such a device in a carburetor in a novel manner.

We have aimed, primarily, to provide in a carburetor, a simple and economical means for heating liquid fuel, our improvements being especially adapted for kerosene, and other low grades of fuel.

It is also our object to provide a novel means which shall facilitate starting an engine regardless of weather conditions or the grade of fuel used.

Another object is to provide for electrically heating the fuel nozzle of a carburetor, and to likewise heat a reservoir or well just below the nozzle to promote more thorough carburation.

Still another object is to construct and embody a heating unit in the primary air tube of a float chamber. This is done in a particularly novel manner, insuring complete and durable insulation of the heating coil.

Other objects and attendant advantages will be appreciated as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings, in which,—

Figure 1 is a fragmentary vertical section through the float chamber of a carburetor showing a heater embodying our invention; and

Fig. 2, a view partly in section of the vaporizing unit removed from the air intake tube.

Our invention is applicable to any carburetor having a primary mixture nozzle, and is particularly suited to that type in which the nozzle is located in the primary air intake or tube. In the present application, we have shown for purpose of illustration, a conventional air intake tube 3 threadingly secured to a float chamber casing 4. The fuel nozzle 5, disposed centrally within the tube 3, is connected to the fuel chamber

6 through means of a fuel inlet conduit 7 diametrically through the tube 3. A fuel reservoir or well 8 intersects the conduit 7 directly below the nozzle passage. A suitable needle valve 9 cooperates with the nozzle for regulating the fuel supply. The upstanding nozzle 5 and the well 8 are heated by an electric coil designated generally by reference character 10. An electric current may be supplied to the coil in any suitable manner, and the coil itself or an equivalent electrical heating element may be constructed in any suitable manner for heating the nozzle and well.

In the present example, we prefer to construct the heating unit independently and to then operatively associate it with the air inlet tube. This unit is made preferably in the form of a casting, comprising horizontal arms 12, an upstanding nozzle 5 and a depending well casing 13. The horizontal and vertical passages through these parts of the casting may be suitably formed, and in the present example are drilled, a plug 14 being employed for closing the bottom of the well. The vertical and horizontal arms of the casting are next covered by a coating of suitable insulation material 15, except for the extremities of the horizontal arms 12, as shown in the drawings. The electric coil 10 is then wound about the casting in any suitable manner, the terminals emanating from the bottom of the casting. Another coating 16 of suitable refractory material such as porcelain, thoroughly insulates the coil. The heating unit now completed, is placed in a die or mold and the tube 3 is cast about the unit so that upon shrinkage of the metal, the ends of the arms 12 will be rigidly secured to the tube. This method of manufacture insures thorough insulation of the electric coil and also a rigid and leak-proof connection between the unit and the tube 3. By die-casting the tube 3 about the complete heating unit, the cost of production is also reduced.

In operation, the heat generated by the electric coil 10 raises the temperature of the fuel in the nozzle 5 and the reservoir 8, to such a degree that the fuel will be easily atomized at the needle valve. The air drawn in through the inlet tube 3 will also be heated by radiation from the heating unit, thus improving the condition for atomization of the fuel. By employing the well 8, a considerable quantity of fuel will be

heated and a circulation will be induced, in which the fuel drawn through the inlet 7 will enter the well or reservoir at the periphery thereof, and pass downwardly, 5 while the heated liquid will rise in a central current to the nozzle passage and be reheated therein to a higher temperature. A heating device of this kind not only increases the efficiency of the explosive mixture but also enables the use of low-grade 10 fuels, such as kerosene. The device also functions exceptionally well as a substitute for the so-called primers or starters designed to facilitate quick starting of an engine in cold weather. 15

It is believed that the foregoing conveys a clear understanding of our invention, and

while we have illustrated but a single working embodiment thereof, it should be understood that various changes might be made in the construction without departing from the spirit and scope of the invention as expressed in the appended claim, in which— 20

We claim:

A fuel heating unit comprising vertically 25 aligned nozzle and well portions and intermediate lateral fuel inlet portions, an electric heating coil about said vertical portions, an insulation casing cast about the coil, and a primary air tube cast on the ends of the 30 lateral inlet portions.

HARVEY W. RIELLY.
VERNON D. HOGAN.