C. L. C. MAGEE.

INTERNAL COMBUSTION ENGINE WATER HEATER.

APPLICATION FILED FEB. 1, 1917.

**1,242,711.** Patented Oct. 9, 1917

Fig. 1

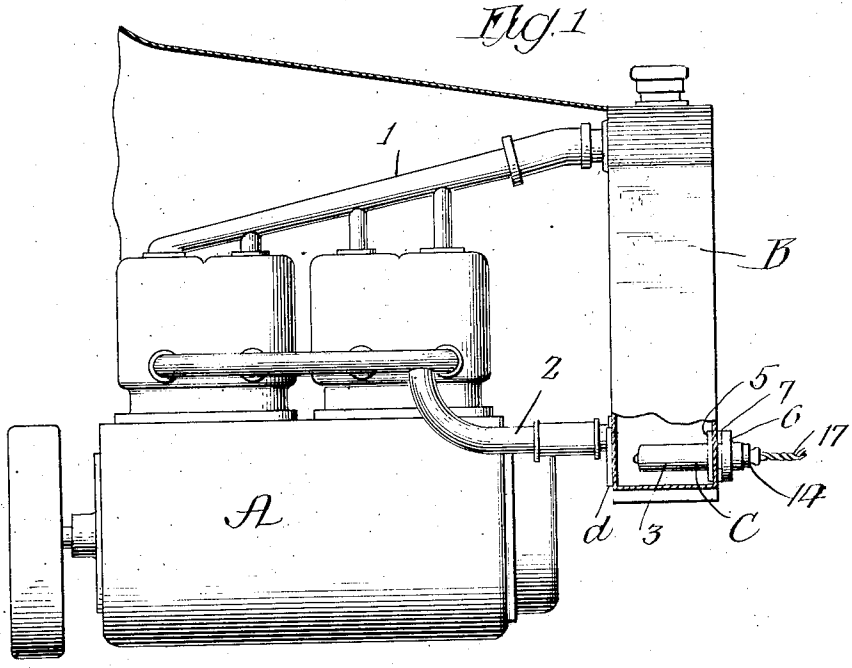



Fig. 2

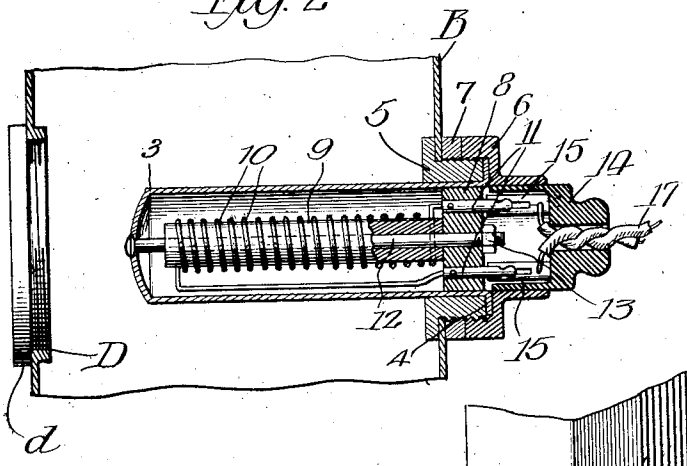
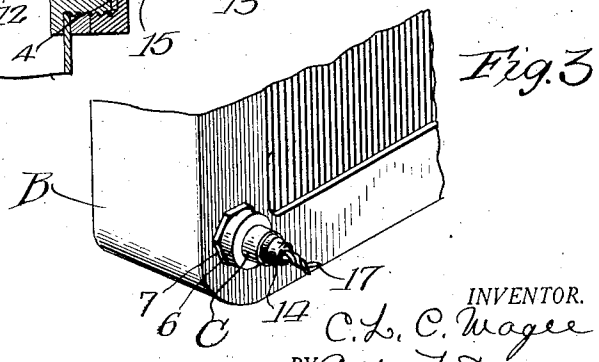



Fig. 3




WITNESS

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## INTERNAL-COMBUSTION-ENGINE WATER-HEATER.

1,242,711. Specification of Letters Patent. Patented Oct. 9, 1917.

Application filed February 1, 1917. Serial No. 145,986.

*To all whom it may concern:*

Be it known that I, CHAUNCEY L. C. MAGEE, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Internal-Combustion-Engine Water-Heaters, of which the following is a specification.

My invention relates to devices for heating the water that circulates through the water-jacket of an internal-combustion-engine, such as those used on automobiles, when the engine is not running, thereby to prevent the water from freezing in cold weather.

Generally stated, the object of my invention is to provide a novel and improved device of this kind, which can be operated by electricity with very little expense, and which can be manufactured cheaply and easily installed on an automobile.

It is also an object to provide an electric heater of this kind which will keep the water circulating in the radiator and water-jacket of the engine while the engine is not running.

It is also an object to provide certain details and features of construction and combinations tending to increase the general efficiency and desirability of an electric water-heating device of this particular character.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings:—

Figure 1 is a side elevation of a portion of an automobile, illustrating the engine and radiator and connections for circulating the water to cool the engine, and showing the same equipped with an electric heater embodying the principles of my invention.

Fig. 2 is an enlarged longitudinal section of said heating device.

Fig. 3 is a perspective of the lower corner portion of the radiator, to which the electric heater is applied, showing the outer end of said heater.

As thus illustrated, the engine A has a water-jacket of the usual character, and is connected by pipes 1 and 2 with the radiator B, which latter may be of any suitable character. Said radiator is equipped with an electric heating device C inserted in the wall thereof at or near the bottom of the radiator, so that practically the whole length of the heater is immersed in water. This heater comprises a metal shell or casing 3 having its outer end formed with a flange 4, which flange is clamped to the opening in the radiator by means of a bushing 5 and nuts 6 and 7, so that a water-tight joint is provided. A plug 8 of suitable insulating material fills the outer end of said casing and carries the core 9 for the coil or heating unit 10, which latter has its ends connected with the metal terminals 11 in said plug. A tie-rod 12 extends longitudinally of said core, passing through said plug and the inner end of the casing, and is provided at its inner end with a head which is drawn against the inner end of the casing by the nut 13 on the outer end of said rod, which nut is tightened up against said plug, and whereby the heating element is supported within the casing with space all around the coil to prevent contact thereof with the metal casing, which latter can be of aluminum or any other suitable material. Electric connection is formed by a cap 14 provided with contacts 15 to engage the terminals 11, in any suitable or well-known manner, so that the cord 16 leading to this cap will have the two electric conductors thereof suitably connected in circuit with the coil when the cap is pushed onto the outer end of the electric heater.

With this construction, a comparatively small amount of current will heat the water in the radiator, at the bottom thereof, inasmuch as the coil or heating unit is close to the casing 3 which is directly immersed in the water. The heated water will rise and maintain a circulation in the radiator and connections and the water-jacket of the engine, so that the water will not freeze in cold weather. When the engine is running, the water is sufficiently heated thereby, and at such time the electric connection can be opened by the removal of the cap 14, thereby disconnecting the electric heater from the source of current, which latter can be of any suitable character. In some cases the storage battery of the automobile can be used to furnish the current, and in other cases the current from a power station can be employed for this purpose.

While the automobile is in use, so that the

engine is heating the water, the outer end of the electric heater C can be covered or protected by a cap similar to the cap 14, except that it will not have any electric conductors leading therefrom. When the heater is to be operated, this blind cap, so called, can be removed to permit the attachment of the cap 14, in the manner previously explained.

From the foregoing, it will be seen that the invention provides in an economical and simple manner for the electric heating of the water which is employed for cooling the internal-combustion-engine of an automobile, while the engine is not running, and during cold weather, thus safeguarding the machine against freezing of the water. As stated, the water will not only be heated by the heater C, but will also be circulated through the radiator and water-jacket of the engine, so that a comparatively small amount of current will be necessary. After the engine has been running, the water will be hot, and it follows, therefore, that the electric heater C will not be compelled to raise the temperature of the water, which might require more current, but will simply supply enough heat to prevent the temperature of the water from falling below a certain point while the machine is standing in a cold place.

With the construction shown and described, an opening can be drilled or cut in the wall of the radiator, of an ordinary automobile, for the bushing 5, and for the insertion of said bushing in such opening a larger opening D can be made in the other wall of the radiator directly opposite the location of the heater, so that said bushing can be introduced into the radiator (through the opening D which is larger than the flange of said bushing) and then inserted through the opening in the front wall of the radiator to receive the nut 7 by which it is clamped in place. After the heater is installed, a plug *d* can be screwed into the opening D to close the latter.

It will be seen that the draw-bolt 12 draws the element 8 into position to close the mouth of the tube 3, which latter is closed at its inner end and engaged by the end of the bolt. The cushion 5 and nut 7 constitute means for clamping the radiator wall to permit ready withdrawal from the tube outward from the radiator, when such is necessary or desirable. There are provisions, it will be seen, for example the opening D and the plug *d*, and the nut 7 and the bushing 5, whereby not only the tube 3, but also said bushing 5, are readily removable from and insertible in the radiator. Thus the device can be applied to any radiator, by simply cutting a hole therein, and does not have to be incorporated in the structure during the manufacture of the radiator.

It will be understood, however, that the heater can be applied to the radiator or any other portion of the means for containing the water which cools the engine, and I do not limit myself to the exact construction shown and described.

What I claim as my invention is:—

1. In an automobile-radiator-electric-heating-device, a sheet-metal tube closed at its inner end and inserted through the wall of the radiator, so that the tube is immersed in the liquid at the bottom of the radiator, a heat-generating resistance inside of said tube, an element to close the outer end of said tube, a draw-bolt secured to the inner end of said tube and extending axially thereof and passing through said element, a nut on the outer end of said bolt, whereby tightening of said nut draws said element into place to seal the outer end of said tube, means on said element to establish electrical connection with said resistance, and means to engage the inner and outer surfaces of the radiator wall to clamp the tube upon said wall and permit ready withdrawal of said tube outward from the radiator.

2. The structure of claim 1, as stated, having provisions for the insertion and removal of said clamping means.

3. The structure of claim 1, as stated, in which said clamping means include a flange integral with said tube.

Signed by me at Chicago, Illinois, this 20th day of January, 1917.

CHAUNCEY L. C. MAGEE.