G. A. HUGHES.

ELECTRICAL HEATING DEVICE.

APPLICATION FILED DEC. 16, 1915.

1,258,904. Patented Mar. 12, 1918.

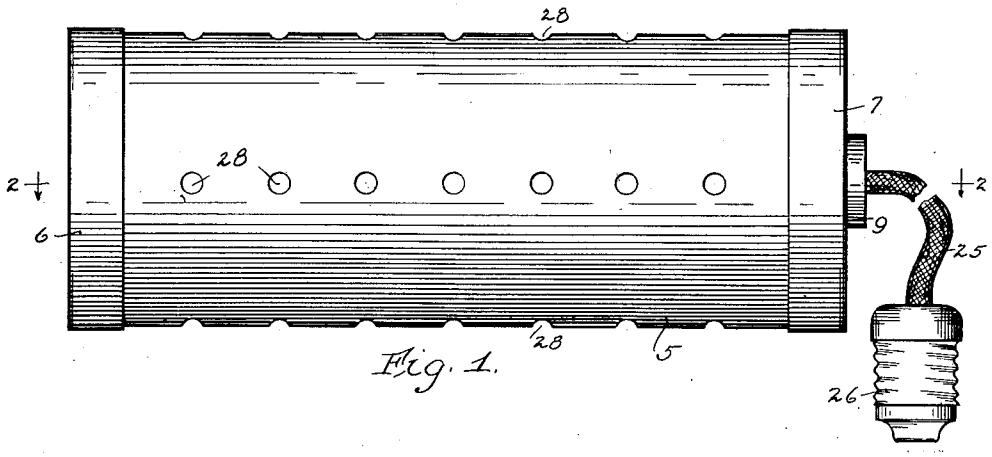


Fig. 1.

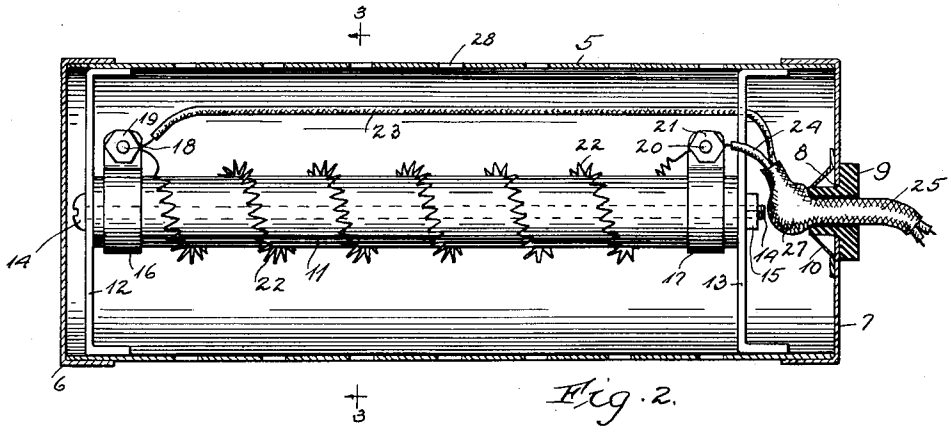


Fig. 2.

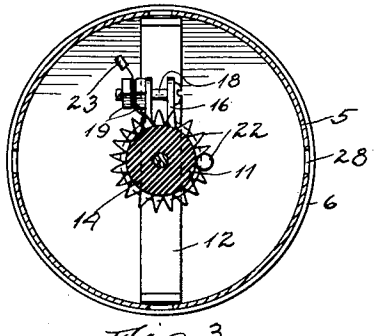


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ELECTRICAL HEATING DEVICE.

1,258,904. Specification of Letters Patent. Patented Mar. 12, 1918.

Application filed December 16, 1915. Serial No. 67,138.

To all whom it may concern:

Be it known that I, GEORGE A. HUGHES, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Heating Devices, of which the following is a specification.

My invention relates to electrical heating devices designed particularly for connection with an ordinary electric light circuit and to be inserted in the hood of explosive engine automobiles for warming the engine and radiator and particularly for preventing freezing of the water circulating through the radiator and engine.

The object of the invention is to produce a simple, light and inexpensive device for the above purposes.

A device embodying the features of my invention is illustrated on the accompanying drawings, in which drawings—

Figure 1 is a side elevational view,

Fig. 2 is a sectional view on plane 2—2, Fig. 1, and

Fig. 3 is a sectional view on plane 3—3, Fig. 1.

The device comprises an electrical heating element and an inclosing and protecting housing therefor adapted to permit free circulation of heated air from the element to the exterior. The housing shown consists of a body 5 of sheet metal with the caps or ends 6 and 7 having detachable slip or friction fit with the body. The housing may be cylindrical as shown or of any other desired shape. One cap has the central opening 8 for receiving an insulating bushing 9 which is held in place by a spring clip 10 engaging its inner end.

The heating element comprises a core 11 of suitable insulating material, transversely extending U-shaped spacer members 12 and 13 being clamped to the core ends by means of a bolt 14 passing centrally through the spacers and the core and receiving a nut 15. These spacers have substantially the length of the internal diameter of the housing body 5 so as to space the heating element axially within the housing. Terminal clips 16 and 17 are secured to the ends of the core, these clips being preferably in the form of metallic straps having their ends drawn together by bolts and nuts 18, 19 and 20, 21, respectively. Wound spirally around the core is the heating conductor 22 in the form of a coil of insulating wire, the ends of the conductor being secured to the terminals by the bolts 19 and 21 respectively. These bolts also secure to the terminals 16 and 17 the ends 23 and 24 of the current supply conductor in the form of a cord 25 which passes to the exterior through the bushing 9 and terminates in a plug 26 adapted to fit the ordinary electric light socket. The cord ends are first drawn through the bushing and housing and are connected to the heating element terminals whereupon the heating element is slipped into the housing and the cap 6 is then applied to close the housing. To prevent strain on the cord ends connecting with the terminals a knot 27 is placed in the cord adjacent the heating element and this knot takes up any pull on the cord outside of the housing. When the device is to be used in an automobile it is placed under the hood in the best position for heating the engine and radiator and the plug is secured to a socket and the current turned on. In order that air may freely circulate through the device to be heated the housing has openings 28. The heating conductor and the terminals being adequately insulated from the housing and all strain being removed from the supply conductor ends by means of the knot, the connections cannot loosen and there is no chance for short circuiting and the user of the device will not be in danger of receiving shocks. The heating conductor is electrically dimensioned to give maximum heat with minimum amount of current without danger of over-heating and burning up. If inspection or repairs are necessary the heating element can be quickly withdrawn from the housing by the removal of either end cap. The device is very durable and owing to the simplicity of construction and arrangement can be inexpensively manufactured.

If greater heat is desired a number of cores can be provided and heating conductors placed thereon and interconnected. Other changes and modifications may also be possible which would still come within the scope of the invention. I claim as follows:

1. In a heating device of the class described, the combination of a core, terminals clamped to said core adjacent the ends thereof, a heating conductor wound spirally on

said core and having its ends connected to said terminals, cross supporting members secured to the ends of said core, a shell removably slipped over but not secured to the ends of said cross supporting members to protect and to be spaced away from the core and conductor thereon, detachable end caps telescopically fitting the shell ends, one of said caps having an opening, and an electrical supply conductor extending through said opening and connecting with said terminal.

2. In a heating device of the class described, the combination of a core, terminals clamped to said core adjacent the ends thereof, a heating conductor wound on said core with its ends connected to said terminals, supporting plates, a bolt passing axially through said core and centrally through said plates to secure said plates to the ends of said core, a perforated shell removably slipped over but not secured to the ends of said plates to be spaced thereby away from said core and conductor, detachable closure caps for the ends of said shell, one of said caps having an opening, and a current supply cord extending through said openings and having its conductors connected with said terminals.

3. In a heating device of the class described, the combination of a core, terminals secured to said core, a heating conductor surrounding said core and connected at its ends with said terminals, spacer plates secured to the ends of said core, a cap having an opening, a current supply cord extending through said opening and having its conductors connected with said terminals, a perforated shell removably slipped over but not secured to the ends of said spacer plates and receiving said cap at its one end, and a detachable closure cap for the other end of said shell.

In witness whereof I hereunto subscribe my name this 13th day of December, A. D., 1915.

GEORGE A. HUGHES.