

June 19, 1923.

1,458,940

L. P. HYNES

WEATHERPROOF ELECTRIC HEATER

Filed Oct. 18, 1921

Fig. 1.

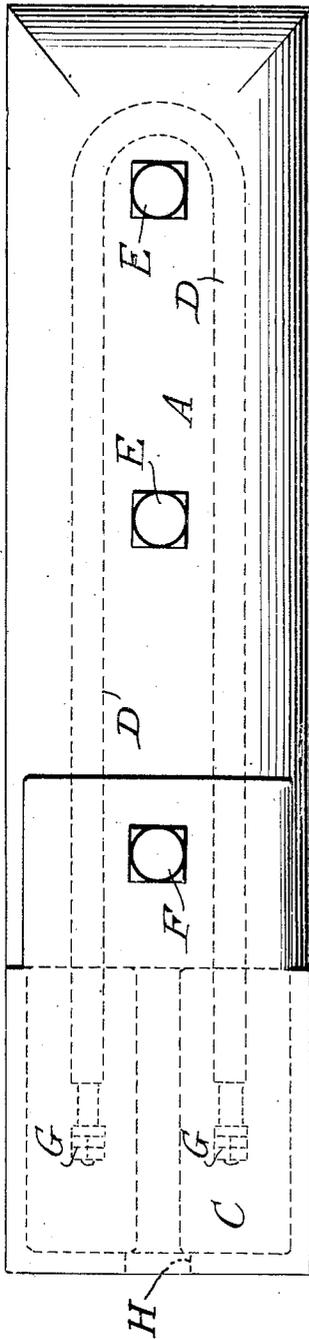


Fig. 2.

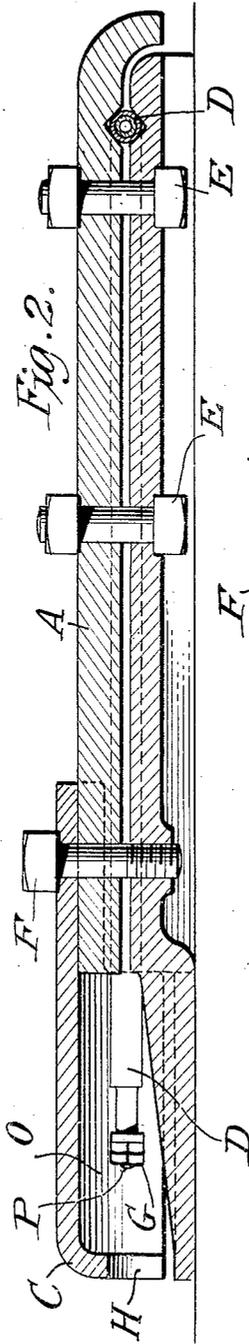


Fig. 3.

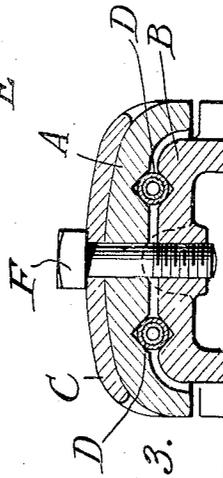
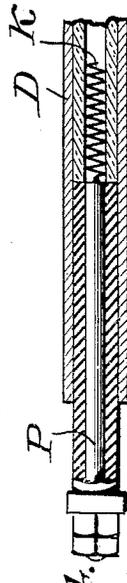


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## WEATHERPROOF ELECTRIC HEATER.

Application filed October 18, 1921. Serial No. 508,543.

*To all whom it may concern:*

Be it known that I, LEE P. HYNES, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Weatherproof Electric Heaters, the following being a full, clear, and exact disclosure of the one form of my invention which I at present deem preferable.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawing forming a part thereof, wherein—

Fig. 1 is a plan of my new heater,

Fig. 2 is a longitudinal and

Fig. 3 a transverse section thereof, and

Fig. 4 a section of the terminal device.

My invention relates to an electric heater of the weatherproof type which is used for out-door work, such, for instance, as the thawing of railway switch points or is embedded in masses of earth and is hence without any protection from snow and rain except such as may be contained in its own structure. The principal feature of my device is an enclosing mass of cast iron or other metal which serves for the storage and distribution of the heat, but takes no part in the insulation of the heating coil, or in its immediate protection, being applied outside of a metallic tube in which the heating coil and its insulation are contained and separable therefrom. The said mass does, however, act also as a mechanical protector for the said tube, and is in heat-conducting contact therewith so that it draws the heat therefrom which it stores, distributes and radiates.

Referring to the drawing A and B are two flat castings of iron or suitable metal, the upper one fitting down over the lower one and surrounding it with its depending flange. The top of casting A is rounded to shed off water produced by melting snow coming from any other source, and bolts E and F are passed vertically through the two castings to secure them together. On the top surface of B and the under surface of A is a groove of V-shape in cross section, the two grooves registering to form an approximately square channel which follows an elongated horse-shoe route extending up on one side and down on the other side of

the casting as appears in dotted lines on Fig. 1. The two parallel branches of the channel are connected at one end by a semicircular section of the channel and at the other end terminate in a chamber O formed by cutting off a short length of casting A and covering the space thus provided by means of a cap casting C. The casting C is secured by the bolt F and has depending sides and end which enclose the chamber O aforesaid. In the aforesaid horseshoe groove is laid a correspondingly bent tube D of metal which contains an insulating lining and inside of said lining is the heating coil K, as shown in Fig. 4. The ends of tube D project into chamber O and from each one extends a heavily insulated conducting rod P which at its inner end connects with coil K and at its outer end is screw-threaded to receive binding nuts G. The external conductors pass into chamber O through an opening H and are connected respectively to the rods P and thence to the opposite terminals of the heating coils. The projecting ends of rods P and tubes D afford opportunity for wrapping the connections with tape and waterproofing material.

It is not necessary that the castings A and B should fit tightly to make a watertight joint such as has been required in prior heaters of the waterproof type. I thus avoid the use of gaskets, packing and cement which are needed with such joints and are not wholly reliable for their purpose. In my present construction the metal tube D affords all the needed protection of the coil and its insulation from snow and water, while the outside castings afford mechanical protection for the tube and the coil therein at the same time that they store up and distribute the heat, being of sufficient heat absorbing and dissipating capacity to avoid overheating of the coil. It may be noted that the V-shape of the aforesaid groove affords an effective grip of the castings on tube D without distorting it and insures an efficient heat conducting connection between the tube and the casting. In addition the use of the tube allows the employment of a thin wall of insulation that causes no material obstruction to the outflow of heat from the coil at all points of its length. The cap casting C is readily removable, even when the apparatus is otherwise embedded in the ground or in ice, and connection thus made

with the terminals G. After that the cap may be replaced. My present device is thus easily accessible for practical use, besides being a rugged, waterproof and essentially indestructible instrument.

What I claim as new and desire to secure by Letters Patent is:

1. A waterproof electric heater comprising a heating conductor, an enclosing and insulating waterproof tube therefor and an external metallic mass applied to the outside of said tube.

2. A waterproof electric heater comprising a heating conductor, an enclosing and insulating waterproof tube therefor, and an external metallic mass applied to and enclosing the said tube.

3. A waterproof electric heater comprising a heating conductor, an enclosing and insulated waterproof tube therefor of metal, and an external metallic mass applied to said tube and in heat-conducting contact therewith.

4. A waterproof electric heater comprising a heating conductor, an enclosing and insulating waterproof tube therefor and an external metallic mass applied to said tube and provided with a groove in which said tube is contained.

5. A waterproof electric heater comprising a heating conductor, a metallic waterproof tube enclosing said conductor, an external mass applied to the outside of said tube, and a cap applied to said mass and enclosing a connecting chamber for the terminals of the said heating conductor.

6. A waterproof electric heater comprising a heating conductor, a metallic tube en-

closing said conductor and insulated therefrom, and an external metallic mass formed in separable parts and applied to the outside of said tube.

7. A waterproof electric heater comprising a heating conductor, a metallic tube enclosing said conductor and insulated therefrom, coil terminals projecting from said tube and an external metallic mass applied to said tube on the outside and enclosing said terminals.

8. A waterproof electric heater comprising an external metallic mass of substantial volume for storing and distributing heat, and an encased and insulated heating conductor waterproofed independently of said metallic mass.

9. An electric heater comprising a coiled-wire conductor, an insulating tube enclosing said conductor, a metal tube enclosing said insulating tube, and an external heat-absorbent mass in heat-transmitting contact with said metal tube.

10. An electric heater comprising a coiled-wire conductor, an insulating tube enclosing said conductor, a metal tube enclosing said insulating tube, and an external metallic mass in heat-transmitting contact with said metal tube.

11. An electric heater comprising a coiled-wire conductor, an insulating tube enclosing said conductor, a metal tube enclosing said insulating tube, and an external removable mass of metal in heat-transmitting contact with said metal tube.

Signed at Albany, county of Albany, State of New York, this 14th day of October, 1921.

LEE P. HYNES.