L. P. HYNES.

WEATHERPROOF ELECTRIC HEATER.

APPLICATION FILED MAY 8, 1920.

1,384,067. Patented July 12, 1921.

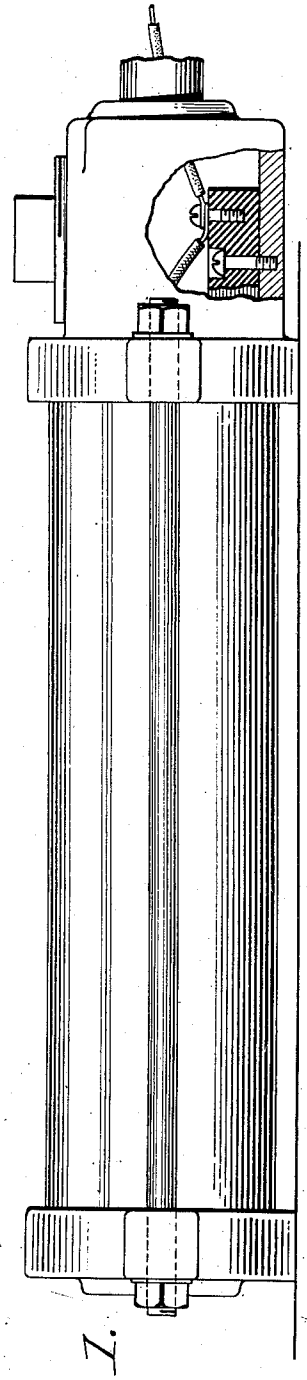

Fig. 1.

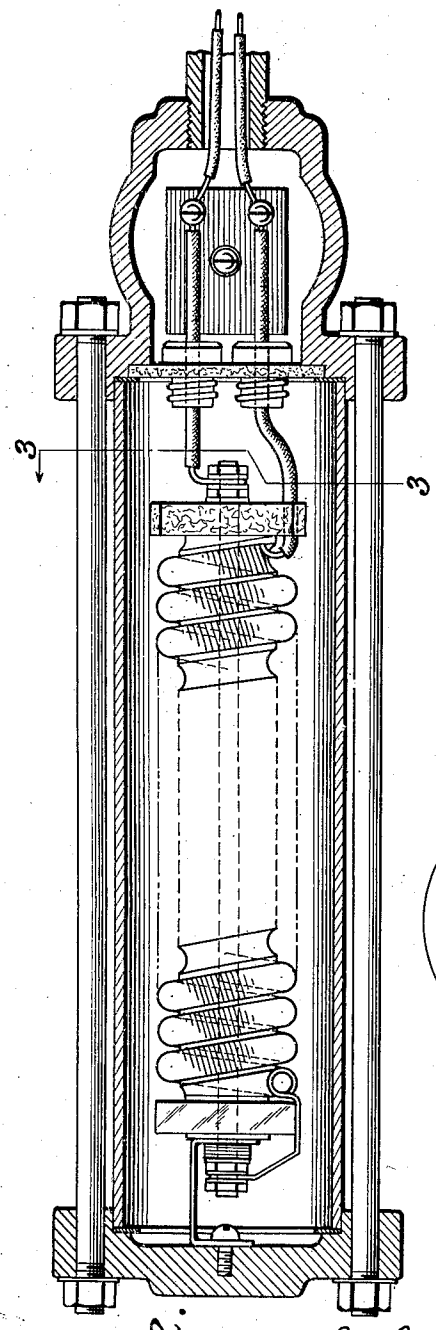

Fig. 2.

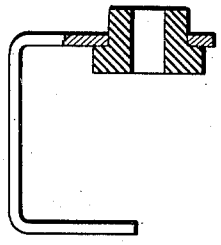

Fig. 4.

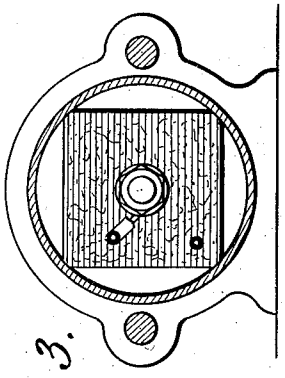

Fig. 3.

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LEE P. HYNES, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, OF ALBANY, NEW YORK, A CORPORATION OF WEST VIRGINIA.

WEATHERPROOF ELECTRIC HEATER.

1,384,067. Specification of Letters Patent. Patented July 12, 1921.

Application filed May 8, 1920. Serial No. 379,811.

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.

My invention is designed as an improvement on the electric heater shown in the patent of Boardman No. 1,294,607, February 18th, 1919.

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

Figure 1 is a side elevation of my heater,

Fig. 2 is a longitudinal section,

Fig. 3 is a transverse section on line B—B of Figs. 1 and 2,

Fig. 4 is a detail view illustrating the bracket for supporting one end of the porcelain core.

In the construction of electric heaters to be used under water or in snow or other exposed places, like the heater of the Boardman patent, it has been found difficult to maintain the electrical connection with the heating coil, due to the fact that insulation which is moisture-proof will not stand heat, while heat-resisting insulation is not moisture-proof. My improvement for overcoming this difficulty resides primarily in adding to such heater a cooling compartment or vestibule which is cut off from the coil-containing part wherein the temperature rises to 500 or 600 degrees and is also specially cooled by radiation. From this vestibule I extend through to the heater coils in the coil-chamber wires which are bare, or insulated by heat-proof material like asbestos and I extend outward from the vestibule into the atmosphere or the conduit wires which are covered with moisture-proof insulation such as rubber. By my arrangement the temperature in the vestibule is so reduced below the extreme heat in the coil-chamber that the rubber covered wires therein can be maintained without deterioration while the bare or asbestos covered wires are so disposed that they will not be affected by the moisture. I provide in the vestibule terminal posts at which the connection can be made between the incoming moisture-proof wires on the one hand and the heat-proof wires on the other hand, the latter being a permanent part of the apparatus. Further features of novel construction will be referred to hereinafter.

Turning to the drawing, 8 represents a porcelain core or support on which are spirally wound in grooves on the outer surface the heating coil 19. Through the center of the core 8 passes a metal rod 4. On the left end of the core is a porcelain disk 9 and outside of that is a U-shaped bracket 11 which is built into the heater and insulated from the central rod 4 by a composition disk 12 which secures the bracket to the disk 9, being held in place by a nut on rod 4. On the right end of the porcelain core is a square plate 10 of asbestos held against the core by a nut 27. This plate 10 serves to center the core with respect to the external casing. A metal tube 3 forms the casing which, at the left, abuts against a substantial head-plate 5 with an interposed packing gasket 7. At the right end is a similar heavy plate 5^a which is enlarged and hollowed out in a bulb shape to form the low-temperature vestibule. External bolts 6 are passed through the two heads and serve to draw them together against the opposite ends of the tubular casing 3, the packing gaskets 7 of sheet copper or asbestos and graphite composition being interposed at each end. To the head 5 at the left is secured the bracket 11 by means of a screw 20. The vestibule is shut off from the heating chamber by a wall 15 of asbestos layers through which pass two porcelain bushings 30, and through these bushings two bare or asbestos-covered wires C and D extend. In the heating-chamber wire C is secured to the right end of the central rod 4 by means of nut 28, while wire D connects with the right terminal of the heating coil. At the opposite end the central rod 4 connects with the other terminal of the coil. Within the vestibule the heat-proof wires C and D connect respectively with two binding posts 24 on an insulating plate 14 which is secured to the inside wall of the vestibule. Since the cubic capacity of the vestibule is small and its thick walls exposed on the outside to the air, water, snow or other cooling medium, the temperature therein remains

much lower than that of the coil-chamber where heat is being constantly generated. The vestibule is also shut off from the coil compartment by wall 15. That enables me to bring into the vestibule rubber-covered wires such as are necessary for waterproofing but are not capable of withstanding the high heat of the coil-chamber. In the rear of the vestibule is an opening into which a conduit may be screwed tightly containing the rubber-covered wires 40 and 41. On the top of the vestibule is another opening covered by a flanged nut 18 with a watertight gasket under the flange. By this means the waterproof wires may be passed through the conduit into the vestibule and then screwed to the binding posts 24 by a screw driver inserted through the top hole aforesaid which is perpendicular to the line of the entering conduit. The heat-proof wires C and D are sufficiently removed from any metal so that even if they are bare their insulation is adequately maintained by the wall 15 through which they pass and by which they are supported and also by the insulating plate 14 carrying the binding posts to which they are connected. They are also stiff and substantial enough to preserve their shape so that there is no danger of their sagging down to touch the metal at any point. So they are independent of any insulating coating such as is required for the moisture-proof leading-in wires.

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

1. A weatherproof electric heater comprising a casing forming a coil chamber, a supplementary casing forming a low-temperature chamber suitable for moisture-proof wires, a heat insulating partition between the two chambers and a heat-proof conductor leading from the coil in the coil-chamber through said partition to a terminal in the low-temperature chamber.

2. A weatherproof electric heater comprising a casing forming a coil-chamber, a supplementary casing forming a low-temperature chamber suitable for moisture-proof wires, a heat insulating partition between the two chambers having a sealed joint with the casing, and a heat-proof conductor leading from the coil in the coil-chamber through said partition to a terminal in the low-temperature chamber.

3. A weatherproof electric heater comprising a casing forming a coil-chamber, a supplementary casing forming a low-temperature casing suitable for moisture-proof wires, a heat-insulating partition between the two chambers separated from the coil and its core and a heat-proof conductor leading through said partition from the coil in the coil-chamber to a terminal in the low-temperature chamber.

4. A weatherproof electric heater comprising a casing forming a coil-chamber, a supplementary casing forming a low-temperature casing suitable for moisture-proof wires, a heat-insulating partition between said chambers, a detached terminal block in said low-temperature chamber, and a heat-proof conductor extending through said partition to connect the coil in the coil-chamber with a terminal on said block.

5. A weatherproof electric heater comprising a casing forming a coil-chamber, a supplementary casing forming a low-temperature casing suitable for moisture-proof wires and having an end-opening for the entry of said wires, a terminal block in the low-temperature chamber, and a heat-proof conductor extending through said partition from the coil in the coil-chamber to a terminal in the low-temperature chamber.

6. A weatherproof electric heater comprising a casing forming a coil-chamber, a separate supplementary casing forming a low-temperature chamber and a heat-insulating partition between the two chambers interposed between the two casings.

7. A weatherproof electric heater comprising a tubular metal casing forming a coil-chamber, separate end-plates between which the said casing is clamped, one of said end-plates being extended to form a low-temperature casing suitable for moisture-proof wires and a heat-insulating partition between the said chambers.

8. A weatherproof electric heater comprising a casing forming a coil-chamber, a coil therein, a core for the coil provided with end-plates separated from the ends of the chamber and centered therein, a heat-insulating partition forming one end of said chamber, a supplementary casing forming a low-temperature chamber suitable for moisture-proof wires on the outer side of said partition, and a heat-proof conductor extending through the partition to connect the coil with a terminal in said low-temperature chamber.

9. A weatherproof electric heater comprising a thin metal tube forming a coil-chamber, a separate thick-walled casing forming a low-temperature chamber, a heat-insulating partition between the two chambers and means for clamping the said tube between the thick-walled casing and an opposite end-plate.

Signed at Albany, county of Albany, State of New York, this 1st day of May, 1920.

LEE P. HYNES.