(No Model.)

F. B. PERKINS & C. S. JONES.

ELECTRIC HEATER.

No. 483,940. Patented Oct. 4, 1892.

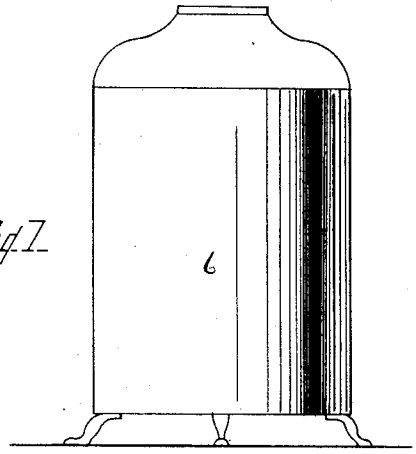

Fig 1.

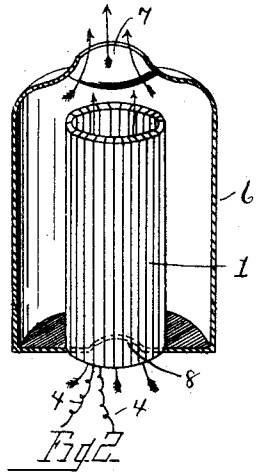

Fig 2.

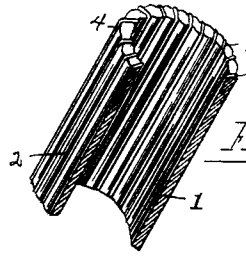

Fig 3.

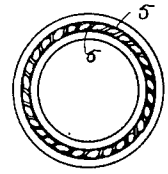

Fig 4.

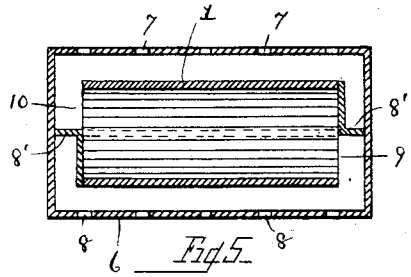

Fig 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

FRED B. PERKINS AND CHARLES S. JONES, OF TOLEDO, OHIO, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE TOLEDO ELECTRIC HEATING COMPANY, OF SAME PLACE.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 483,940, dated October 4, 1892.

Application filed April 1, 1892. Serial No. 427,379. (No model.)

To all whom it may concern:

Be it known that we, FRED B. PERKINS and CHARLES S. JONES, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Electric Heaters; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

Our invention relates to an electric heater, and has especial relation to that character of heaters intended for use in heating houses, offices, cars, &c.

The object of the invention is to obtain a maximum and regular amount of heat from a dynamic current of electricity by providing for a diffusion of heated air from an interiorly-heated air-conduit and a radiation of heat from the exterior of the conduit by winding the conducting-wires upon a cylinder of fire-clay, terra-cotta, or other analogous non-conducting incombustible heat-radiating material, the conducting-wires being wound longitudinally of the cylinder in order to pass the same from the outer to the inner side of the cylinder to insure resistance to the current upon the outer and inner sides of the cylinder, whereby a current of air may pass through the cylinder and be heated and at the same time a radiation of heat be insured from the exterior thereof.

A further object is to provide a cylinder having longitudinal depressions to receive the wires, so that they shall be embedded in the shell of the cylinder, and also of plastering an insulating-coating over the wires, so that should a wire be fused it will still keep its original position and conductivity.

A further object is to form a casing for the cylinder that shall allow of placing it within the heater in horizontal relation, if desired.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is an elevation of a complete heater. Fig. 2 is a like view with one-half of the shell or casing removed to disclose the cylinder and conducting-wires. Fig. 3 is a section of the cylinder shown in perspective. Fig. 4 is a top plan view of the cylinder showing the position of the wires and the insulating material in place. Fig. 5 is a longitudinal vertical section of a modification, showing the heater in a horizontal position.

1 designates the cylinder, formed of a plastic material, such as fire-clay, terra-cotta, tile-clay, or analogous material.

Our experiments have been made with ordinary drain-tile which subserve the purpose admirably. We however prefer to form the cylinders with longitudinal grooves 2 and radial grooves 3 across the end, in order that the conducting-wires 4 may be wound back and forth across the side and over the end of the side, as shown in Figs. 2 and 4, and lie within the recesses or grooves and be insulated from dampness or possibility of rust by a plastering of the same material of which the cylinder is composed upon the outer and inner sides, as shown at 5, the wire as thus embedded being held firmly in place, and also to maintain the conductivity of the wire in case of fusion of the same by holding the wire in position, and thereby causing the electric current to pass through the metal of the wire, although fused. Cylinder 1 is incased in a shell or casing 6, formed with coincident openings 7 and 8, formed at the top and bottom, respectively, the openings being of approximately the diameter of the cylinder, so that the bore of the cylinder and opening coincide when the cylinder is placed within shell or casing 6.

In the construction shown in Fig. 5 the casing 6 and cylinder 1 are arranged horizontally, the shell or casing being perforated at 7 and 8 to allow an ingress of air and egress of the caloric current, and in order to induce a draft of air through the interior of the cylinder there is arranged a transverse diaphragm 8′, extending from the outer side of the cylinder to the shell or casing, whereby the air entering through the bottom perforation impinges against the cylinder and enters the same at 9

and passes out at 10 to find egress through the perforations in the upper part of the casing and at the same time the heat radiated from the exterior of the cylinder heats the shell and finds an egress through the perforations. It will be seen that the resistance being on both sides of the cylinder we have an increased heat radiation and that by the insulation by means of a plastic covering there is afforded a heat-retaining mass that continues the radiation of heat should the current vary or be intermittently cut off. It will also be apparent that by reason of the conducting-wires within the cylinder a greater volume of air can be heated and to a higher degree than were the conducting-wires only upon the outside of the cylinder.

In the construction of the heater the inexpensive character of the cylinders reduces the cost of the heaters to a minimum.

What we claim is—

1. In an electric heater, the combination, with an outer casing having apertures in the top and bottom of the same, of an insulating-cylinder which fits over the bottom aperture, and the conducting-wire wound longitudinally upon the cylinder, extending over the inner and outer faces of the same.

2. In an electric heater, a cylinder formed with longitudinal grooves upon each side and conducting-wires wound longitudinally upon the cylinder and lying in the grooves and insulated by means of a plastic material compacted upon the wire and adhering to the cylinder.

3. In an electric heater, an open cylinder composed of insulating material and formed with grooves upon the inner and outer surfaces and the conducting-wire wound longitudinally upon the cylinder and arranged in the grooves and extending over the inner and outer surfaces of said cylinder, whereby air-currents are heated upon the interior and exterior of the cylinder.

In testimony that we claim the foregoing as our own we hereby affix our signatures in presence of two witnesses.

FRED B. PERKINS.
CHARLES S. JONES.

Witnesses:
WILLIAM WEBSTER,
CARROLL J. WEBSTER.