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(No Model.)

J. I. ASHBAUGH.

ELECTRIC HEATER.

No. 447,143. Patented Feb. 24, 1891.

Fig. 1.

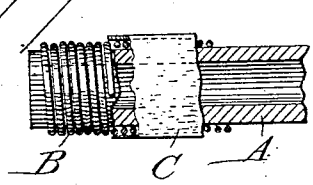


Fig. 2.

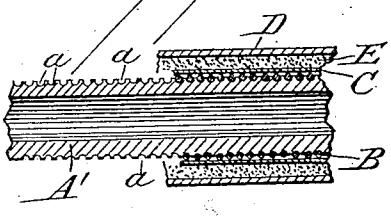


Fig. 3.

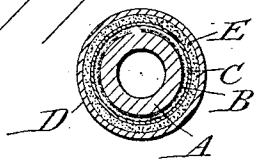


Fig. 4.

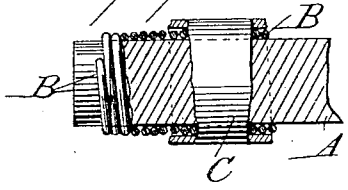
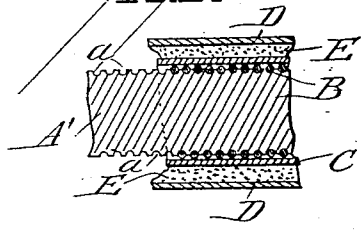


Fig. 5.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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UNITED STATES PATENT OFFICE.

JOHN I. ASHBAUGH, OF CHATTANOOGA, TENNESSEE, ASSIGNOR OF ONE-HALF TO DAVID G. CURTIS, OF SAME PLACE.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 447,143, dated February 24, 1891.

Application filed March 15, 1890. Serial No. 343,954. (No model.)

To all whom it may concern:

Be it known that I, JOHN I. ASHBAUGH, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Electric Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in electric heaters, its object being to provide a simple, useful, and efficient device for heating by means of electricity; and the invention consists in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a sectional side elevation of my improved electric heater. Fig. 2 is a similar longitudinal section of a modified form of the same. Fig. 3 is a cross-section. Fig. 4 is a detail view of the core made solid. Fig. 5 is a detail of the corrugated form of core.

Like letters of reference designate corresponding parts throughout the several figures.

A denotes a bar, rod, brick, or piece of baked or hardened fire-clay or similar substance. It is made, preferably, in a tubular or cylindrical form, since the core of which this fire-clay forms the central portion is principally intended for use in boiler-flues, although it may be used as efficiently in any other form of heating by means of electricity. The material of which this central bar, rod, or brick is composed may be fire-clay, pulverulent or solid, talc, silex, kaolin, asbestus, plumbago, or any of the mixtures or compounds of these or other similar chemicals or substances which may be adapted for use in forming a rod, bar, or brick to make a central compound or solid to serve as a base on which to build the core. This cylindrical or other suitably-shaped bar is generally compressed or baked. Its surface may be plain and smooth, as shown in Fig. 1, or it may be fluted, corrugated, or grooved, as shown in Fig. 2, at A′, the grooves being lettered *a a*. When baked or hardened in this form, it is ready to receive the surrounding wire.

B designates a coil of wire which is wrapped closely and tightly around the central fire-clay body or "core proper," as it may be termed, so as to completely surround the latter, as indicated at the left in Fig. 1. When the fire-clay has a smooth external surface, the wire will be simply wound in a tight coil around the exterior thereof; but when this fire-clay is formed with the grooves A′ then the strands of the wire coil will lie nicely within these grooves. (See Fig. 2.) After the wire has been coiled closely around the clay bar, rod, or brick which constitutes the central body or core proper said wire wrapping will in turn be covered or surrounded by some non-conducting material or substance—such as, for instance, asbestus paper, pulverulent talc, fire-clay, or a mixture or compound of suitable ingredients, designated in the drawings by the letter C. The core as thus built is now ready for insertion into the metallic tube, jacket, or envelope D, which forms a part of the heating device and which may be a flue or any external metallic incasement suitable to receive the core for heating purposes. Between the asbestus or other covering C and the surrounding metallic case D I place a suitable packing of pulverulent clay, clay-powder, or other suitable material. Of course kaolin or asbestus may be used as a packing, said packing being preferably a pulverulent packing. The packing for this annular space may be omitted, if preferred, and the core inserted closely within the metallic tube. Thus it will be seen that when the current of electricity passes through the conducting-wires it will heat the core and the surrounding metallic envelope to a high degree of heat and good results will be produced therefrom.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric heating device, the combination of the solid central bar or part of clay or its equivalent, the coil of wire closely wrapped about this solid center, through

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which coil passes the electric current, and a heat-conducting envelope surrounding the said coil, said envelope preventing the conduction of electricity.

2. In an electric heating device, the combination of the solid center of clay or other similar material, the coil of wire wrapped closely around said center, through which coil passes the electric current, an external metallic casing adapted to radiate heat and surrounding the said coil, and an intervening heat-conducting envelope between the coil and the external case, which envelope is a non-conductor of electricity.

3. In an electric heating device, the combination of the central part of clay or similar equivalent material, the coil of wire wrapped closely about said central part, through which coil passes the electric current, an envelope which is a non-conductor of electricity, such as asbestus, surrounding the wire coil, the external metallic incasement surrounding the whole device, and the annular packing between the non-conducting envelope of asbestus and the said metallic casing, substantially as described.

4. In an electric heating device, the combination of the solid center of clay or its equivalent having a fluted surface, the coil of wire wrapped closely around said solid center, with its strands entering the surface flutings, through which coil passes the electric current, the heat-conducting envelope, which is a non-conductor of electricity, surrounding the said wire coil, the external metallic casing, and the annular packing between the envelope and the casing.

5. In an electric heating device, the combination of the central part A, of clay or similar material, formed into a solid bar without any central opening, the coil of wire B, surrounding the same, the envelope of asbestus paper C, surrounding the wire coil, which envelope conducts heat but is a non-conductor of electricity, and the metallic casing D, adapted to receive and contain the aforesaid parts and radiate the heat communicated thereto in consequence of the passage of the current through the coil, all substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN I. ASHBAUGH.

Witnesses:
J. B. ALLIN,
D. G. CURTIS.