(No Model.)

M. W. DEWEY.

ELECTRIC HEATING APPARATUS.

No. 448,879. Patented Mar. 24, 1891.

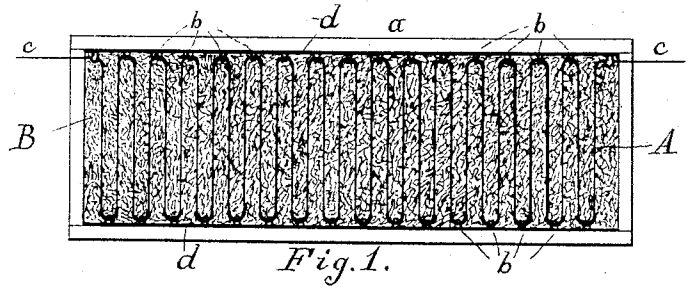


Fig. 1.

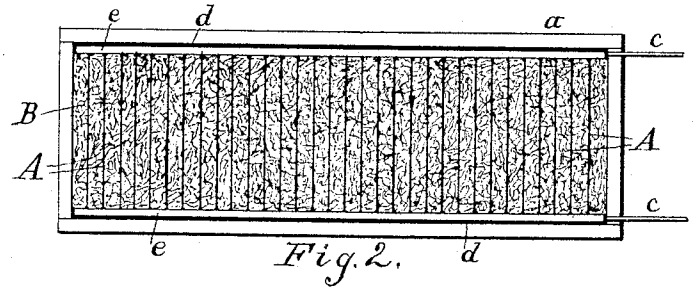


Fig. 2.

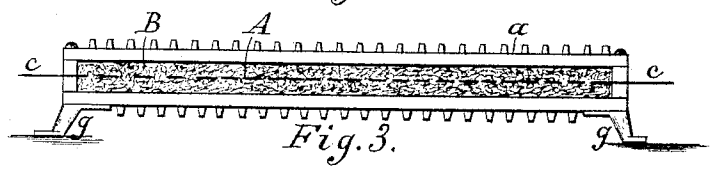


Fig. 3.

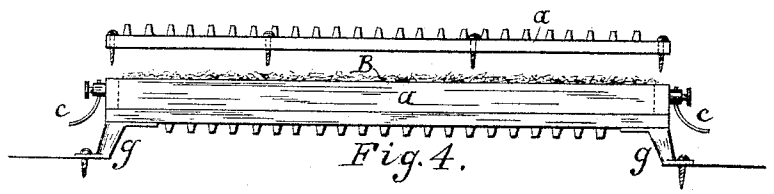


Fig. 4.

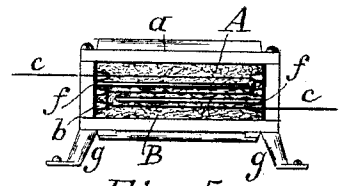


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ELECTRIC-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 448,879, dated March 24, 1891.

Application filed January 20, 1890. Serial No. 337,452. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric-Heating Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to electric-heating apparatus wherein the resistances or heat-developing electric conductors formed of platinum or other metal are of comparatively small size, raised to a high temperature by the passage therethrough of an electric current, and covered, enveloped, or surrounded by a refractory material to prevent the temperature of the conductors being raised to a point sufficiently high to melt and destroy them, and to serve to conduct the heat therefrom with sufficient rapidity to the case from which it is radiated.

The object of my invention is to provide a material with which to surround or cover the resistances or wires that will not conduct electricity, will conduct the heat slowly, but with sufficient rapidity to prevent the burning of the wire, and to provide a material of sufficient flexibility and elasticity to maintain the same in close and constant contact with the conductor during all temperatures.

It is well known that a conductor varies in size in both its cross-section and length, according to the volume of current flowing through it, and in order to conduct the heat from the conductor in any and all conditions I provide an elastic fibrous material that will maintain perfect and constant contact with said conductor at all times, and that will make it impossible for the conductor to burn out by a sudden rise of temperature.

Referring to the drawings, Figure 1 shows a plan of my electric heater with one heat-developing conductor enveloped or covered by a loose fibrous refractory material. Fig. 2 shows a plan of a heater having several heat-developing conductors connected in parallel and surrounded by the same refractory material. Fig. 3 is a side view of the heater with side of case removed, and showing ribs on top and bottom of case. Fig. 4 shows side of case with cover removed to show elasticity of the loose fibrous refractory material within, the latter having raised of its own accord above the top edge of the metallic case upon the removal of cover; and Fig. 5 is an end view of a heater with end removed to show the resistance or heat-developing conductor in several layers, one above the other, with metallic plates between the layers to aid in conducting the heat from the refractory packing material to the case of the heater.

Referring specifically to the drawings, Fig. 1 shows a resistance or heat-developing conductor A, formed of platinum, iron, or other suitable material, in a serpentine form and supported by pins or hooks *b*, of porcelain or other suitable material. The portions bent around the hooks are preferably of greater cross-section than the other portions of the wire to prevent excessive heating of the wire at these points. After the wire is suitably supported by the hooks *b*, within the metallic case *a*, the wire is covered, enveloped, or surrounded with fibrous asbestus B or other fibrous refractory material. The bed for the conductors may be formed partly of a solid slab of refractory material, as fire-brick or plaster-of-paris; but this should not come in contact with the wires, as it is not yielding or elastic. *c c* are the terminals of the heater. If the pins or hooks *b* are made of metallic material, they are insulated from the case by strips of insulation *d d*.

The same letters of reference are used for the other figures.

In Fig. 2 the heat-developing conductors are connected in parallel to metallic strips *e e* on each side of the interior of the case and insulated therefrom by strips of insulation *d d*.

The case *a* in Figs. 3, 4, and 5 is preferably ribbed on the exterior to aid in radiating the heat therefrom, but may be corrugated or roughened in any suitable manner for the same purpose.

Fig. 4 represents the cover removed from the case *a* to show the elasticity of the fibrous packing material, it having raised slightly above the top edge of the case. The cover and screws employed for fastening it to the case serve as a binding device to maintain

close, constant, and continuous contact between the fibrous refractory material and the conductor or conductors.

Fig. 5 shows the resistance or heat-developing conductor A, arranged in several planes or layers, with loose metallic plates *f* between the layers with their edges preferably in contact with the interior sides of the case *a*. The metallic plates *f* are separated and insulated from the conductor or conductors by the fibrous material which completely envelops said conductor or conductors. *g* are the feet of the heater, which raise it above the floor to increase the radiating-surface thereof.

I do not limit myself to the metallic case, as it may be made of earthenware. The source of electric current for the heater may be a battery, dynamo, or other suitable source well known, and not necessary to be herein shown and described.

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

1. In an electric-heating apparatus, a suitable metallic case, one or more resistances or heat-developing electric conductors within said case and formed in layers, metallic plates between the layers, a fibrous refractory material in contact with and enveloping or covering the conductor or conductors, and means to maintain said material in close and constant contact with the said conductor or conductors.

2. In an electric-heating apparatus, a corrugated or ribbed metallic case, one or more resistances or heat-developing electric conductors supported in said case, and a fibrous refractory material enveloping or covering the conductors and in continuous contact with the same.

In testimony whereof I have hereunto signed my name, this 18th day of January, 1890.

MARK W. DEWEY. [L. S.]

Witnesses:
C. H. DUELL,
C. L. BENDIXON.