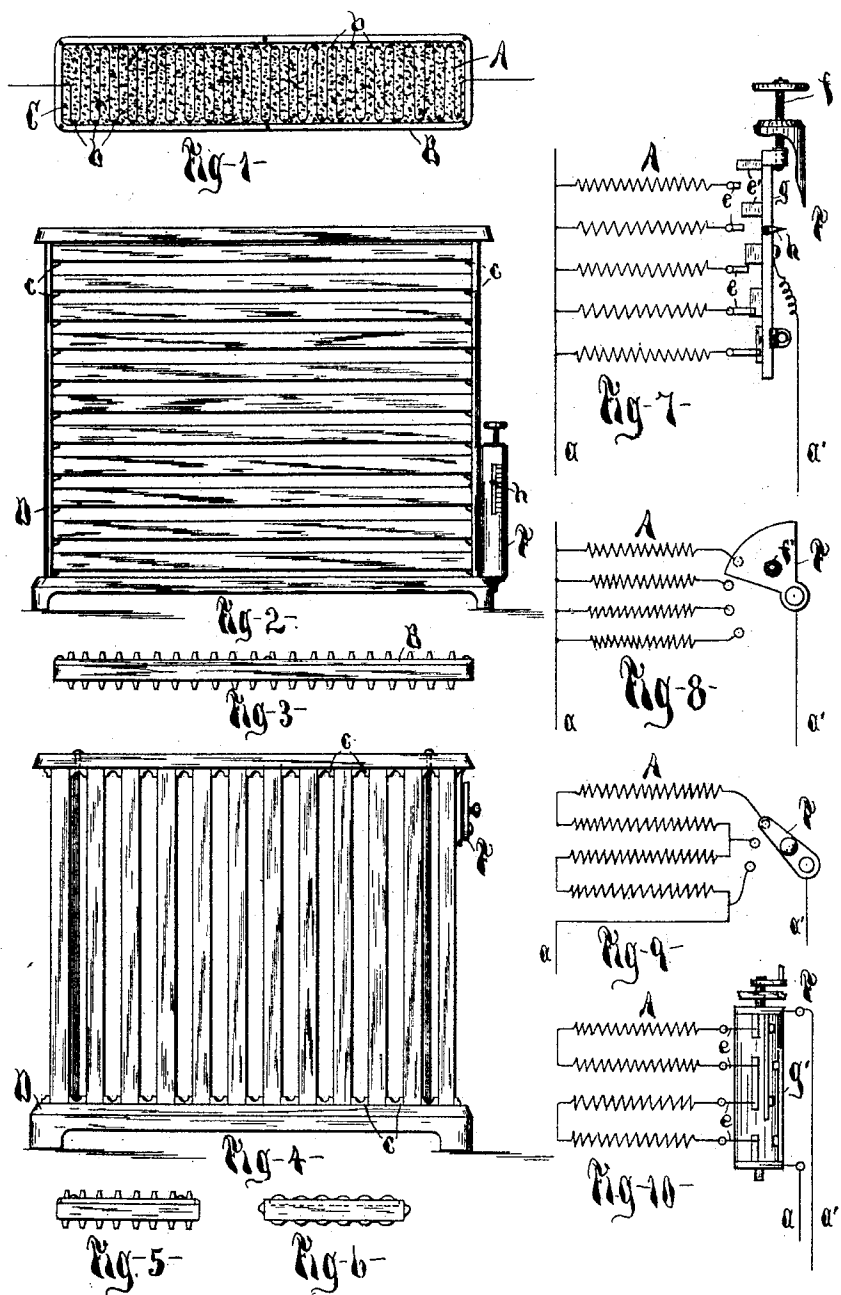


(No Model.)

M. W. DEWEY.
ELECTRIC HEATING APPARATUS.

No. 464,247.

Patented Dec. 1, 1891.



WITNESSES:

J. J. Laas,
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INVENTOR,

Mark W. Dewey,
Quell Laas & Quell,
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE DEWEY CORPORATION, OF SAME PLACE.

ELECTRIC-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 464,247, dated December 1, 1891.

Application filed March 9, 1891. Serial No. 384,259. (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, (Case No. 87,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to the production of heat by passing a current of electricity through one or more conductors of more or less resistance, and is similar to the invention set forth in my patent, dated March 24, 1891, No. 448,879.

The objects of my invention are to provide an electric heater that will produce a great amount of heat, expose a large radiating-surface, and yet not occupy much floor-space.

The objects of my invention, also, are to provide a heater having its resistance divided into sections, and so arranged that if any one of the sections becomes injured it may be repaired without cutting off the current from the entire heater or the other sections of resistance.

The object of my invention, further, is to provide the heater with an adjustable switch or current controller, so that the heat may be regulated as desired. The switch may be provided with an indicator to show the amount of current flowing through the heater or the number of sections of the resistance in circuit.

To this end my invention consists in the combination of a plurality of cases, an electric heat-developing conductor within each of said cases, and a frame to hold or support said cases.

My invention consists, also, in the combination of supply-conductors, a plurality of cases, an electric heat-developing conductor within each of said cases and connected with the supply-conductor in parallel, suitable means to hold said cases apart, and a switch to cut out of circuit one or more of the heat-developing conductors.

My invention consists, further and collectively, in the combination of a plurality of metallic corrugated or roughened cases, an elec-

tric heat-developing conductor or resistance within each of said cases and provided with a heat-retaining medium, a frame to hold or support said cases parallel with each other and separated to allow air-spaces between, a supply-circuit connected with the heat-developing conductors, and a switch or current controller mounted on the frame to control the current flowing through the resistances, or to include any number of resistances in circuit; and my invention consists, still further, in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

Referring briefly to the drawings, Figure 1 is a plan view of one of the cases containing a section of the resistance, with the top or lid removed. Fig. 2 is a side elevation of my complete heater or radiator. Fig. 3 shows a modification of one of the boxes or cases. Fig. 4 is a side elevation of another form of electric radiator. Figs. 5 and 6 are end views of cases that may be used; and Figs. 7, 8, 9, and 10 are diagram views of the resistances in connection with the supply-conductors and different forms of switches or current-controllers to be used therewith.

In the drawings, A represents the electric heat-developing conductors or resistances, preferably formed of platinum or iron wire and arranged in a serpentine or sinuous form within metallic or earthenware boxes or cases B. Said heat-developing conductor is supported by pins or hooks b, of porcelain or other suitable material, on each side of a case, and is covered or enveloped by a suitable heat-retaining medium C, such as powdered or granulated fire-clay or other refractory material, or a loose fibrous refractory material, as asbestos, described in my patent above referred to. The bed for the resistance, however, may be formed partly or wholly of a slab of slate or fire-brick, or other solid material, if desired. The cases B are preferably ribbed on their exterior surfaces to aid in radiating the heat therefrom, as shown in Figs. 3 and 5; but may be corrugated, as in Fig. 6, or roughened in any suitable manner for the same purpose. Any suitable source of electricity may be employed for the heater.

a and a' are the supply-conductors, to which the resistances A of the heaters are connected.

D is the frame or support to hold the cases B , and F is a switch or current controller mounted upon one end of the said frame to control the current flowing through the resistances or to include any number of the resistances in circuit. The frame D (shown in Figs. 2 and 4) may be of any suitable construction to hold or support the cases B side by side, parallel with each other and separated to allow air-spaces between, but is preferably square or of a rectangular shape with grooves or brackets c on two sides of its interior, in or upon which the cases B are held or supported firmly. Any suitable means may be employed to hold them in place or from being unintentionally displaced. By this arrangement, if one of the resistances A becomes injured or fused, the case containing it may be removed and the resistance repaired easily and without disturbing the other cases.

In Fig. 2 the cases B are supported in a horizontal position by the frame; but in Fig. 4 they are supported in a vertical position, which is preferred, as then there is less surface on the heater for dust to collect on.

There are many forms of switches or heat-regulating devices that may be used with my heater, several of which are shown in the drawings.

The form of switch or regulating device will depend, of course, upon the manner in which the heat-developing conductors or resistances are to be connected with the supply circuit or conductors a and a' . If said resistances are to be connected in parallel, such regulators as are shown in Figs. 7 and 8 may be employed; if in series, a regulator as shown in Fig. 9, and if the resistances are to be connected in both series and parallel, a regulator as shown in Fig. 10 can be used. As the general principles of these switches or regulators are well known it will be unnecessary to describe them minutely, and it will be sufficient to describe or point out only the differentiating features and the manner of connecting them with the heaters.

The switch F (shown fixed to the frame D in Fig. 2) is shown in Fig. 7 enlarged, with the casing or cylinder partly broken away to show the interior parts. The resistances A are of equal resistance and may be the same as the resistance of lamps if they are placed in connection with the supply-conductors. In Fig. 7 one terminal of each of the resistances A is connected to the supply-conductor a and the other terminals are arranged in a row, as indicated by e , and extend horizontally and form contact-bearings for metallic projections e' , which are secured to a longitudinally-movable bar g , which in turn has suitable bearings, so that it can be reciprocated up and down to bring one or more of the projections e' into contact with the terminals of the resistances, and thus cut out

in the resistances A . The bar g is provided with a screw f , working through the upper end of the casing, by which it may be manipulated, and is electrically connected with the supply-conductor a' . h is a pointer fixed upon the bar g and projecting through a slot in the casing to indicate, with the scale on the exterior of said casing, the number of resistances in circuit.

In Fig. 8 the resistances are shown as connected with the supply-conductor a' by means of a pivoted quadrant-shaped switch-arm having an insulated handle f' and arranged to bridge one or all of the terminals of the resistances A . The switch-arm is connected with the supply-conductor a' and is adapted to produce the same result as the switch in Fig. 7.

The switch in Fig. 9 consists of an ordinary switch-lever connected with the supply-conductor and arranged to include any number of the resistances in series.

The switch illustrated in Fig. 10 is one adapted to include the resistances A in circuit, both in series and parallel or in any other manner, and may consist of a roller or drum g' of insulating material adapted to turn in suitable bearings and having upon its peripheral surface metallic projections at suitable intervals. Upon these projections are adapted to bear contact-fingers e , forming the terminals of the resistances A . The supply-conductors a and a' are connected to the said metallic projections by means of contact-fingers, which bear upon metallic rings on both ends of the drum. By rotating the drum g' by means of a handle at one end, more or less, different rows of the said metallic projections may be brought in contact with the terminals of the resistances to vary their connection with the supply-conductors, as desired.

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

1. In an electric-heating apparatus, a plurality of loose independently-movable cases, an electric heat-developing conductor within each of said cases, and a frame to hold or support said cases.

2. In an electric-heating apparatus, a plurality of independently-movable cases, an electric heat-developing conductor within each of said cases and covered with a powdered or fibrous refractory material, and a frame to hold or support said cases.

3. In an electric-heating apparatus, a plurality of cases, an electric heat-developing conductor covered with a powdered refractory material within each of said cases, suitable means to hold said cases apart to allow air-spaces between the cases, and a switch to connect two or more of said heat-developing conductors in parallel with the supply-conductors.

4. In an electric-heating apparatus, supply-conductors, a plurality of cases, a metallic electric heat-developing conductor within each of said cases, and each of said conductors con-

ned with the supply-conductors in parallel, and suitable means to hold said cases apart to allow air-spaces between them.

5 5. In an electric-heating apparatus, supply-conductors, a plurality of cases, a metallic electric heat-developing conductor within each of said cases and each of said conductors connected with the supply-conductors in parallel, suitable means to hold said cases apart, and
10 a switch to cut out of circuit one or more of the heat-developing conductors.

15 6. In an electric-heating apparatus, supply-conductors, a plurality of metallic electric heat-developing conductors or resistances of equal resistance, and a switch to connect a plurality and all of the resistances in parallel with the supply-conductors.

20 7. In an electric-heating apparatus, supply-conductors, a plurality of metallic electric heat-developing conductors or resistances provided with a heat-retaining medium, and a switch to connect a plurality and all of the resistances in the heater in parallel with the supply-conductors.

25 8. In an electric-heating apparatus, a plurality of metallic corrugated or roughened cases, an electric heat-developing conductor or resistance within each of said cases and provided with a heat-retaining medium, a

frame to hold or support said cases parallel with each other and separated to allow air-spaces between, a supply-circuit, and a switch or current controller mounted on the frame to connect any number of the heat-developing conductors in parallel in the supply-circuit. 30 35

9. In an electric-heating apparatus having heating conductors or sections adapted to be connected in different ways with the supply-conductors, a switch for controlling said connections, and an indicator operated by the movement of the switch to indicate how the connections stand. 40

10. In an electric-heating apparatus having a plurality of heating conductors or sections adapted to be connected one or more in parallel with the supply-conductors, a switch for controlling said connections, and an indicator operated by the movement of the switch to indicate the number of sections connected in parallel. 45 50

In testimony whereof I have hereunto signed my name this 7th day of March, 1891.

MARK W. DEWEY. [L. S.]

Witnesses:

C. H. DUELL,

C. L. BENDIXON.