(No Model.)

C. H. MINCHEW.

ELECTRIC HEATER.

No. 563,780. Patented July 14, 1896.

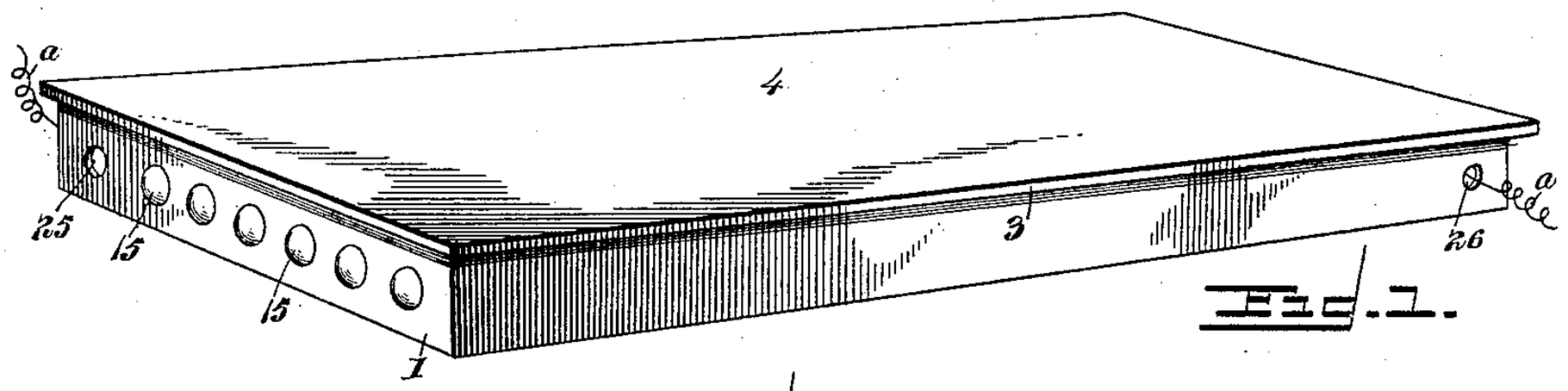

Fig. 1.

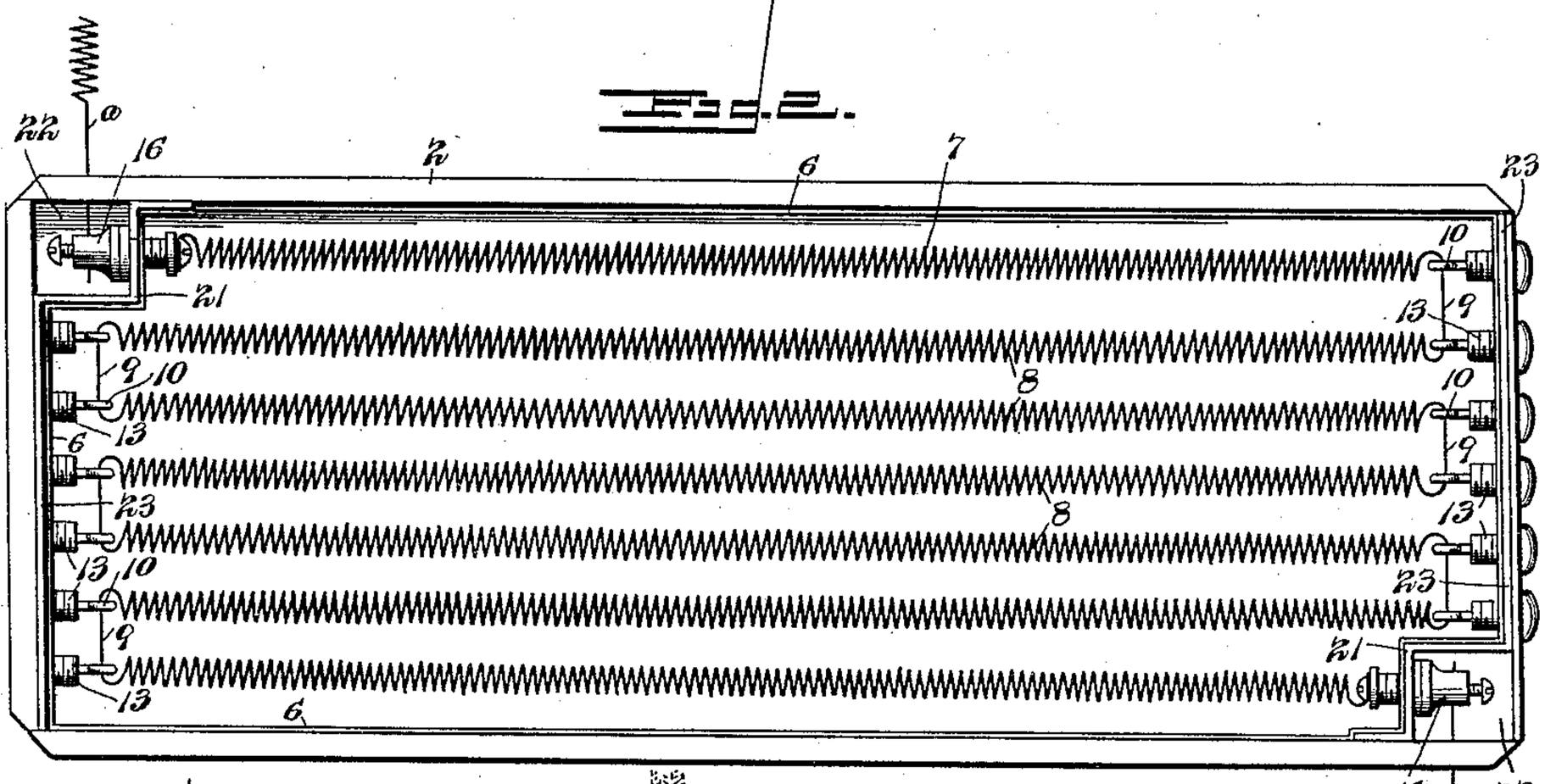

Fig. 2.

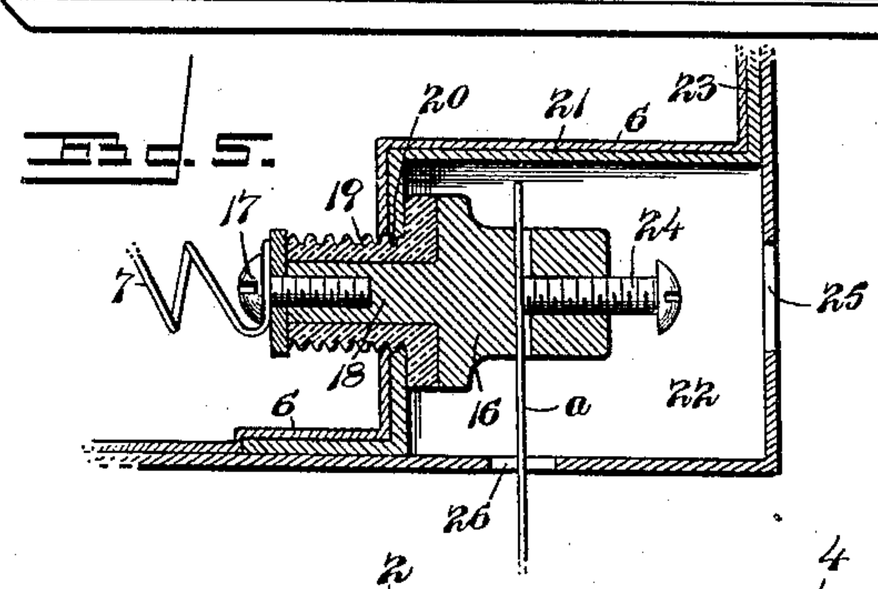

Fig. 5.

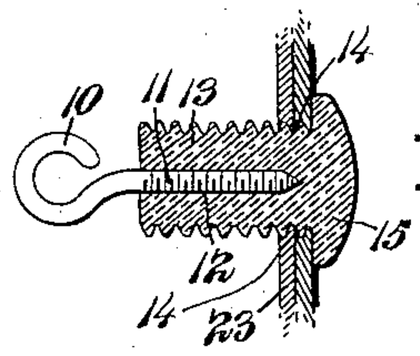

Fig. 4.

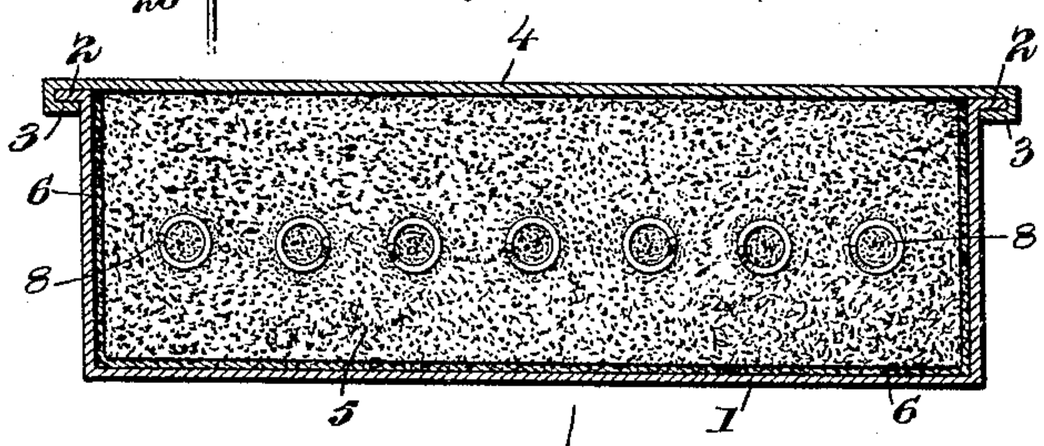

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES HENRY MINCHEW, OF TAUNTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HENRY T. MINCHEW, OF SAME PLACE.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 563,780, dated July 14, 1896.

Application filed November 19, 1895. Serial No. 569,439. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HENRY MINCHEW, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Electric Heater, of which the following is a specification.

This invention relates to electric heaters, and it has for its object to provide a simple and efficient device of this character that shall be very compact in form, so as to be especially available for use as a heater in connection with vehicles and the like.

To this end the main and primary object of the present invention is to effect certain improvements in electric heaters of that class which are so constructed that all the heat shall be radiated in an upward direction, or in other words concentrated in one direction, so that a greater degree of heat is possible from a correspondingly less quantity of electric current, thereby causing a great saving in amperage.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a perspective view of an electric heater constructed in accordance with this invention. Fig. 2 is a top plan view with the cover and interior packing removed, exposing the arrangement of the longitudinal heating-coils. Fig. 3 is a transverse sectional view of the complete heater. Fig. 4 is an enlarged detail sectional view at one end of the heater-box, showing one of the insulated hook-supports for the heating-coils. Fig. 5 is an enlarged detail sectional view at one corner of the heater-box, showing more clearly the arrangement and manner of mounting the binding-posts for the terminals of the coiled heating-wire.

Referring to the accompanying drawings, the numeral 1 designates a substantially rectangular metallic heater-box, preferably provided at its upper side edges with the outturned slide-flanges 2, embraced by the inturned flanges 3 at the opposite side edges of the removable box lid or cover 4. The box lid or cover 4 forms the main radiating-plate of the heater, and is designed to have a close-fitting connection with the box 1, in order to insure a proper confinement and radiation of the heat, and it will of course be understood that the said lid or cover may be removably fastened over the open upper side of the box by other means than those described. The metallic box 1 is adapted to be entirely filled with a loose and dry non-conducting packing 5, which is composed of kaolin, hill-sand, and soapstone combined in such proportions as will give the best heat retaining and radiating results. The non-conducting compound 5, which forms a packing filling the entire interior of the box 1, is not only a non-conductor of electricity and a radiator of heat, but possesses the important property of retaining the heat for a considerable length of time after the electric current has been cut off from the heater, thereby insuring an even distribution of heat throughout the entire interior of the box, and also renders the heater especially available for use in vehicles and the like.

To insure the concentration of the heat, so that the same will be radiated only in an upward direction through the metallic lid or cover 4, the bottom and inner sides and ends of the box 1 are lined with an asbestos or other suitable non-conducting lining 6, which positively insures the result noted, and thereby causes a great saving in amperage, because by preventing the loss of heat by radiation through the bottom, sides, and ends of the box a large quantity of heat can be produced at the expense of a small quantity of electric current.

The heat is imparted to the non-conducting packing 5 through the medium of a bare heating-wire 7, arranged inside of the heater-box and provided with a series of parallel longitudinal heating-coils 8, extending from end to end of the box and embedded within the packing 5, midway of the top and bottom of the box, as clearly illustrated in Fig. 3 of the drawings. At the ends of the heater-box the heating-wire 7 is looped, as at 9, over a pair of supporting-hooks 10, which are arranged in a transverse series at both ends of the box 1, to provide means for holding the heating-coils as close to

the end of the box as possible, while at the same time providing means for positively maintaining the same in a proper position between the top and bottom of the box. The supporting-hooks 10 are provided with threaded shanks 11, fitted in the threaded sockets 12 of the exteriorly-threaded insulator-buttons 13, adjusted in the insulator-opening 14, formed in the ends of the box 1, midway of the top and bottom thereof, and at their outer ends the insulator-buttons 13 are provided with the flanged heads 15, which bear against the outer sides of the ends of the box, to limit the inward projection of the buttons 13 and hold the same properly in place.

It will be noted that by reason of the manner of mounting the buttons 13 and hooks 10 a proper adjustment can be readily effected for maintaining the coils 8 properly stretched within the box.

The opposite terminals of the heating-wire 7 are respectively connected to the inner ends of diagonally opposite binding-posts 16. A headed screw 17 preferably connects the terminals of the wire 7 to the inner ends or shanks 18 of said binding-posts, and said shanks 18 of the binding-posts 16 are fitted in the insulator-sleeves 19, arranged in openings 20, formed in one side of the angled housing-plates 21, fitted in diagonally opposite corners of the box 1, to form corner-pockets 22, within which the said binding-posts are located. The angled housing-plates 21 may be conveniently formed at one end of transverse inner end reinforcing plates 23, fitted within the box against the ends thereof in which the insulator-buttons 15 are fitted to provide for strengthening or reinforcing the box at these points. By reason of forming the corner-pockets 22 the binding-posts 16 are completely isolated within directly opposite corners of the box and are entirely out of the way, so as not to project outside of the box and thereby be liable to become broken off or injured.

The diagonally-opposite-housed binding-posts 16 are provided with the ordinary binding-screws 24, which are conveniently loosened or tightened by means of a screw-driver or other suitable tool introduced through the tool-openings 25, formed in the ends of the box 1, directly opposite the heads of the screws 24, and the feed-wires *a*, which are fastened to the binding-posts in the usual way by the screws 24, are conveniently introduced through the wire-openings 26, formed in the sides of the box 1 near its corners, so as to communicate with the pockets 22, directly opposite the ordinary wire-openings in the binding-posts.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described electric heater will be readily apparent to those skilled in the art without further description, and it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an electric heater, a rectangular metallic box provided in its ends with a series of openings, a non-conducting compound entirely filling the interior of the box, a series of flanged insulator-buttons removably fitted in the openings in the ends of the box, supporting-hooks having their shanks removably and adjustably fitted in the inner ends of said buttons, and a heating-wire looped at the ends of the box over a pair of said supporting-hooks and provided with a series of parallel longitudinal heating-coils embedded in the non-conducting packing, substantially as set forth.

2. In an electric heater, the heater-box provided at opposite ends with inner end plates bent at one end to form angled housing portions at inner corners of the box, said angled housing portions of the inner end plates inclosing at opposite corners of the box corner-pockets, binding-posts arranged in said corner-pockets, and having their shanks fitted in and insulated from one side of the said angled housing portions of the inner end plates, and a coiled heating-wire embedded in suitable packing within the box and having its terminals connected respectively to the opposite binding-posts, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES HENRY MINCHEW.

Witnesses:
AUGUST MILLER,
FREDERICK S. HALL.