(No Model.)

J. V. CAPEK.

ELECTRICAL HEATER.

No. 482,074. Patented Sept. 6, 1892.

Fig. 1.

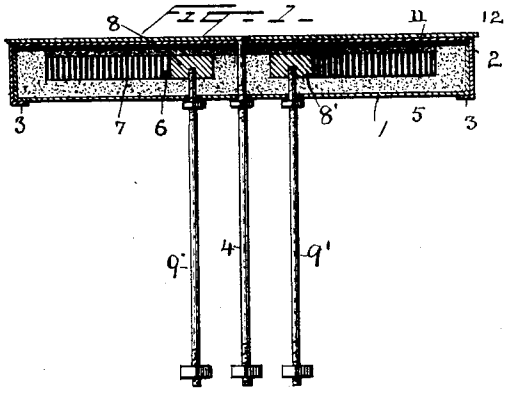


Fig. 2.

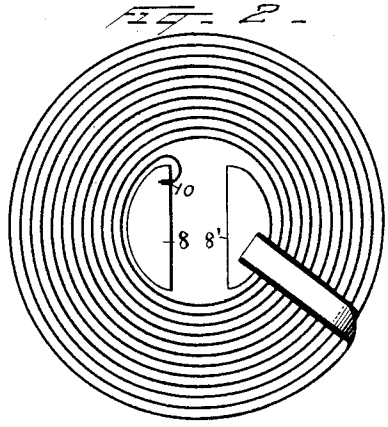


Fig. 3.

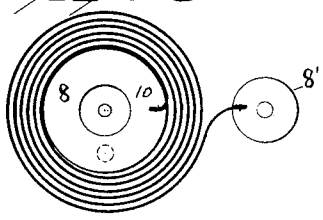


Fig. 4.

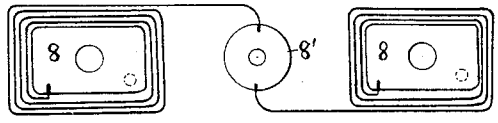


Fig. 5.

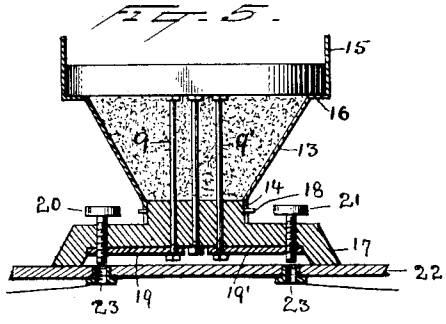


Fig. 6.

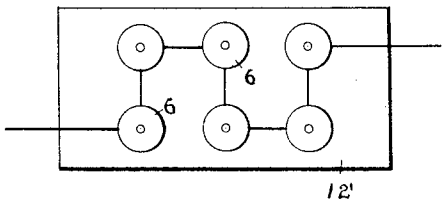
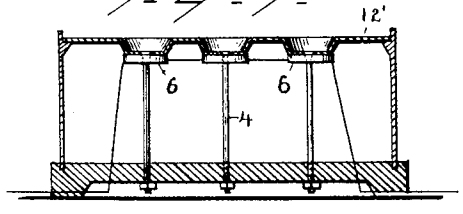


Fig. 7.



Witnesses
Norris A. Clark.
A. F. Oberlé

Inventor
J. V. Capek,
By his Attorneys
Dyer & Seely.

UNITED STATES PATENT OFFICE.

JOHN V. CAPEK, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EDWARD H. JOHNSON, OF SAME PLACE.

ELECTRICAL HEATER.

SPECIFICATION forming part of Letters Patent No. 482,074, dated September 6, 1892.

Application filed March 5, 1891. Serial No. 383,850. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. CAPEK, a citizen of the United States, residing at New York, county and State of New York, have invented a certain new and useful Improvement in Electrical Heaters, of which the following is a specification.

My invention relates to means for producing heat by means of electricity for cooking or other purposes.

My object is to provide a compact, simple, and efficient heater in which the heating conductor shall be supported in such manner as to be thoroughly protected and in which the heat shall be utilized in the best possible manner.

The invention consists in an improved holding-case for the heating-conductor, in improved means for connecting the heating-conductor to the supply-circuit, and in the several combinations and devices hereinafter described and claimed.

In the accompanying drawings, which illustrate the invention, Figure 1 is a central section of the heater detached from the base on which it is mounted when in use. Fig. 2 is a diagram illustrating the circuit of the heater in the preferred form. Fig. 3 is a diagram indicating a second arrangement of the heating-conductor. Fig. 4 is a diagram illustrating still another arrangement of the heating-conductor. Fig. 5 is a view of the heater in place on its support, said support being in section; and Figs. 6 and 7 illustrate a multiple heater.

A single heater will first be described. I take a thin metal box, preferably of sheet-steel spun into form, said box consisting of a bottom section 1 and a cover 2, which is preferably of such size that it may be placed over the bottom section and bent around under the bottom, as indicated at 3. In the center of the cover and in the center of the bottom I form screw-holes for the reception of the long screw 4. Holes are also provided in the bottom on each side of the central hole for conducting screws hereinafter described.

Before placing the cover on the box the heater is placed therein in the following manner: A layer 5 of asbestus or similar heat-resisting material is placed in the box. On said layer is placed the heating-coil 6, which consists of a volute of the heating-conductor, preferably German silver, the coils of the conductor being separated by insulating material, as indicated by the heavy lines 7 in Fig. 1 and as fully described by me heretofore. At the center of the heater are placed two metal terminals 8 8′, equal in thickness to the width of the heating-conductor, and to these terminals the long rods or screws 9 9′ are connected. Terminal 8 is provided with a slit 10, and into said slit one end of the heating-conductor is inserted and fastened. The terminals 8 8′ being as thick as the width of the ribbon-conductor, good contact is made therewith, and the edges of the ribbon will not project beyond the terminals. These terminals also are readily connected to the exterior circuit in the manner indicated. The conductor is then wound into a volute, as indicated in Fig. 2, and the outer end carried across the upper surface of the volute, but insulated therefrom, and is connected to 8′. Over the heating-coil is placed a second layer 11 of asbestus. This sheet, as well as the asbestus under and around the heating-coil, is soaked with a solution of alumina, preferably sulphate of alumina, and then dried, thereby being hardened. Over the latter sheet of asbestus is placed a mixture composed of graphite and a metallic oxide, as alumina, digested with sulphate of alumina or some other heat-conducting material. To increase the strength of the cover, and at the same time to provide a good heating-platform, a copper or other metal plate 12 is supported directly on the cover and in close metallic contact therewith. This cover and plate are then placed over the box and firmly pressed thereon, whereby close contact is made between the cover and the composition. The central screw 4 is then put in place, thereby locking the cover and box together and the plate on the cover. Instead of this central screw other screws, rivets, or similar devices may be used. By pressing the cover on as described the composition in the top of the box becomes forced between the box and the cover at the edge and forms a tight joint, so that moisture will be ex-

cluded. The head of screw 4 may be soldered to form a water-tight joint where it passes through the cover.

In making small heaters the conductor forming the heating medium will nearly fill the box; but a small space should be left around the edge for asbestus or similar material in order to conserve the heat. In making large heaters there will be a larger space around the conductor for asbestus. In making such large heaters, instead of using the heating-conductor arranged as in Fig. 2, I may use two heaters, arranged side by side, as indicated in Fig. 4, in which the terminals 8 are substantially rectangular and the heating-conductor is wound in a rectangular spiral, the outer end of each conductor being connected to a common terminal 8′. With this arrangement the two heating-conductors may be connected either in series or in quantity.

In Figs. 6 and 7 several heaters 6 are supported on one heating-plate 12′, which has several depressions, in which separate articles may be cooked, one box-heater being placed under each depression.

The wires connecting the several heaters may be of cheaper material than that used in the heating-coil.

Another arrangement of a single heating-conductor is shown in Fig. 3, in which the central terminal 8 is in the form of a ring having a central opening of sufficient size to allow the screw 4 to pass therethrough without contact. The other terminal 8′ is placed at one side of the volute conductor.

The heater, made up as already set forth, is placed in a suitable stand consisting of a short metal case 13 of sheet brass or steel. This I have shown cone-shaped in Fig. 5, having cylindrical extensions 14 15 at the base and at the top, respectively, and having near the top a ledge 16, on which the box inclosing the heater rests. 15 preferably extends a short distance above the top of the heater and constitutes means for holding cooking utensils in place thereon. The shell is placed on a base 17, of insulating material, and is kept from turning by pins or screws 18, extending from the neck of the base into slots in the shell, as shown. In the bottom of the base is a groove, in which are placed two metal plates 19 19′, 19 being connected to terminal 8 by means of a screw or rod 9, and 19′ being connected to terminal 8′ by a screw or rod 9′. While it is preferable to have both 9 and 9′ out of metallic connection with the inclosing box of the heater, it is sufficient for practical purposes to have one of them only insulated. These two screws, as well as screw 4, pass through holes in the base, the two former passing, also, through holes in plates 19 19′, and are held in place by suitable nuts. It will be seen that screw 4 not only secures the two parts of the box together, but secures the box upon the base or stand. I find this better than to rely on the screws 9 9′ for holding the box on the base, although in some cases they might be sufficient. Near the outer end of the two plates 19 19′ are screw-holes for reception of the screws 20 21, which are thus connected to the heating-conductor.

In the top of the table 22, or in any other convenient support, are two screw-threaded sleeves 23, which are connected to the supply-circuit. When it is desired to connect the heating-conductor to the circuit, the base is placed over these screw-terminals, and 20 21 are screwed into the same, thereby completing the circuit, and at the same time holding the heater firmly in position.

Within the space beneath the heater is placed asbestus or other non-conductor of heat.

Having thus described my invention, what I claim is—

1. An electrical heater consisting of an insulated heating-conductor and an inclosing sheet-metal box, the lower edge of the cover being bent under the box, thereby holding it in place and forming a tight joint, substantially as described.

2. An electrical heater consisting of an insulated heating-conductor and an inclosing box or case having a cover, a metal plate on the box-cover, and a screw or similar device passing through the plate, cover, and box and connecting said three parts together, substantially as described.

3. The combination of a heater, a box inclosing the same, a heating-platform for electrical heaters, consisting of a sheet-metal box, cover, and a copper plate in direct contact therewith and connected thereto, substantially as described.

4. The combination, with a heating-conductor and inclosing box, of a cover therefor and a composition containing graphite and a metallic oxide between the conductor and the cover, substantially as described.

5. The combination, in an electrical heater, of a heating-conductor, enlarged terminals therefor, an inclosing case, and conductors, in the form of screws or bolts, extending from the terminals to the outside of the case, substantially as described.

6. The combination, in an electrical heater, of a heating-conductor in the form of a volute coil, with a space at the center, and enlarged terminals therefor in said space, substantially as described.

7. The combination, in an electrical heater, of a heating-conductor in the form of a volute insulated ribbon, terminal plates or blocks having a thickness substantially equal to the width of the heating-conductor, and means for connecting the conductor thereto, substantially as described.

8. The combination, in an electrical heater, of an insulated heating-conductor in the form of an insulated ribbon, layers of asbestus treated with sulphate of alumina, below and above said heating-conductor, and an inclosing case, substantially as described.

9. The combination, in an electrical heater, of the base, the shell supported thereon, the heating-conductor, an inclosing box therefor supported by the shell, and the screw or rod connecting said parts together, substantially as described.

10. The combination, in an electrical heater, of the base, the metal terminals supported on said base, the shell also supported on the base, the heater supported on the shell, and the screws or conductors extending from the heating-conductor to said terminals, substantially as described.

11. The combination, in an electrical heater, of the base, the metal terminals supported on said base, the shell also supported on the base, the heater supported on the shell, and the screws or conductors extending from the heating-conductor to said terminals, and means for connecting the terminals to the supply-circuit, substantially as described.

12. The combination, with an electrical heater, of screws or similar devices passing through the base thereof and in electrical contact with the terminals of the heater and sockets in a table or similar support connected to the supply-circuit, whereby by inserting the screws the circuit may be closed through the heater and at the same time the heater be held in place, substantially as described.

13. The combination of a shell or body forming a stand, a heater comprising a heating-conductor inclosed in a metal case supported thereon, and a mass of asbestus or similar material in the space within the shell below the heater, substantially as described.

14. The combination, in an electrical heater, of a heating-plate having depressions and a heater mounted on the under side of the plate below each depression, each of said heaters being complete in itself and adapted to concentrate heat at the point of the plate where it is secured, substantially as described.

This specification signed and witnessed this 2d day of March, 1891.

JOHN V. CAPEK.

Witnesses:

CHARLES M. CATLIN,

J. A. YOUNG.