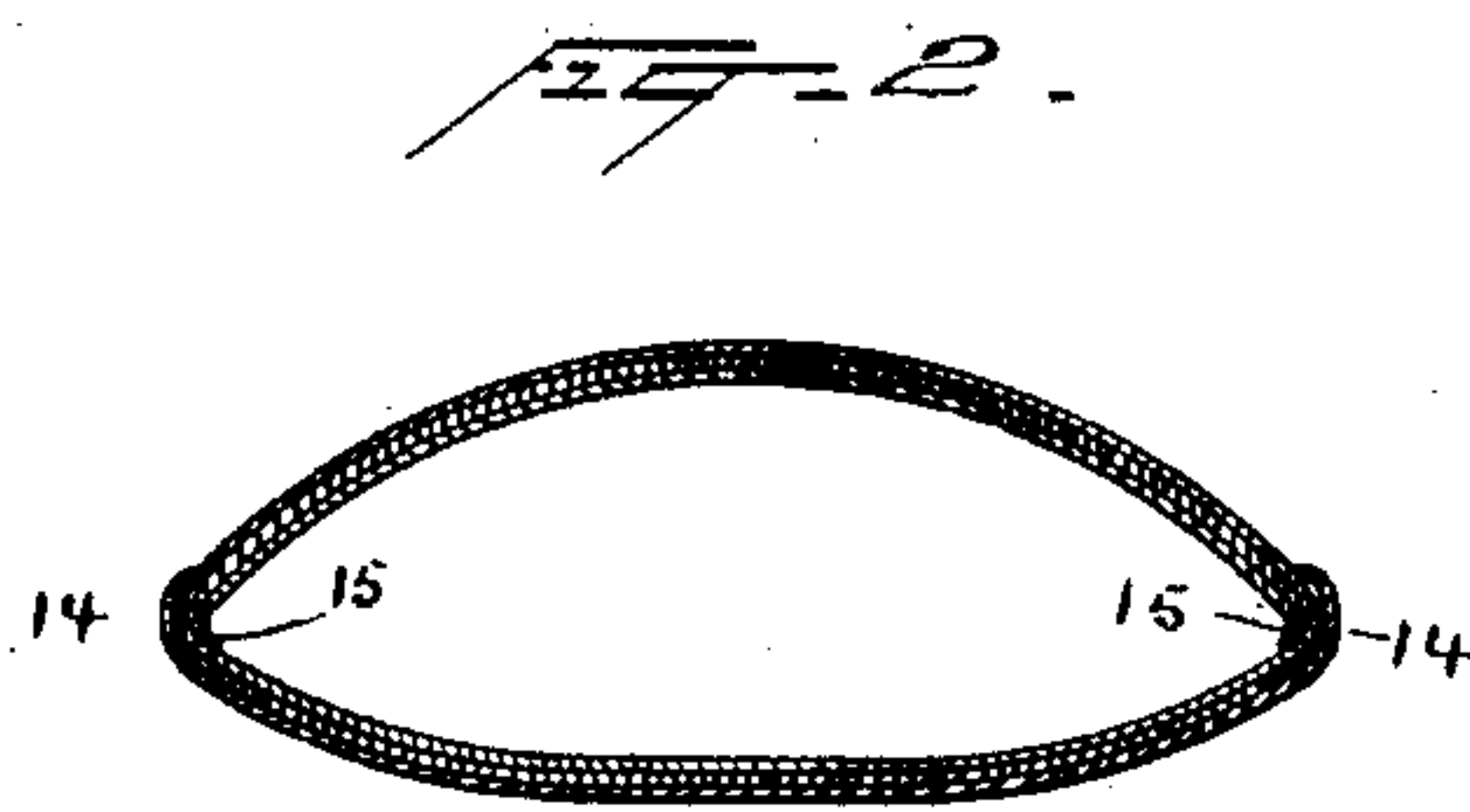
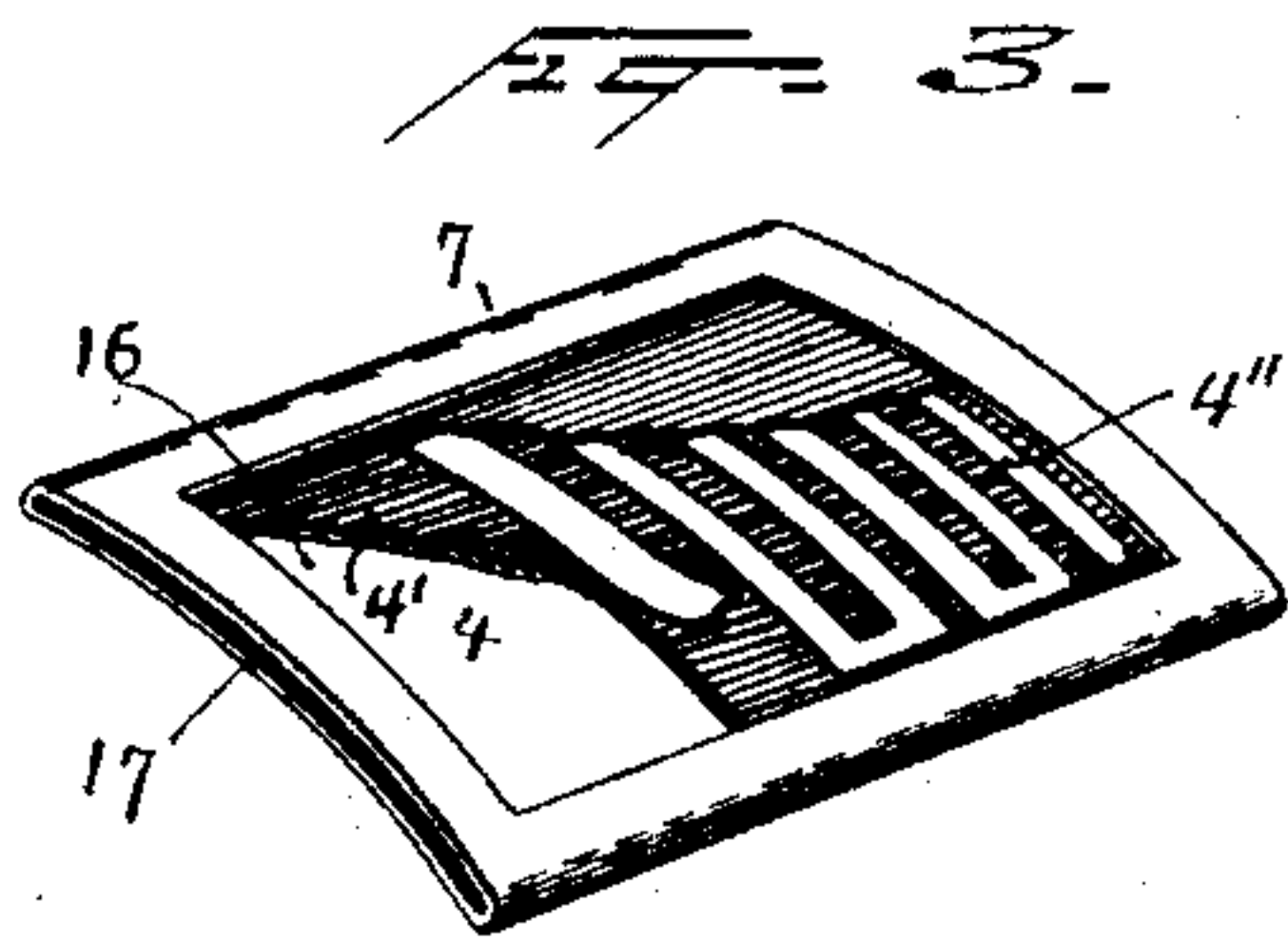
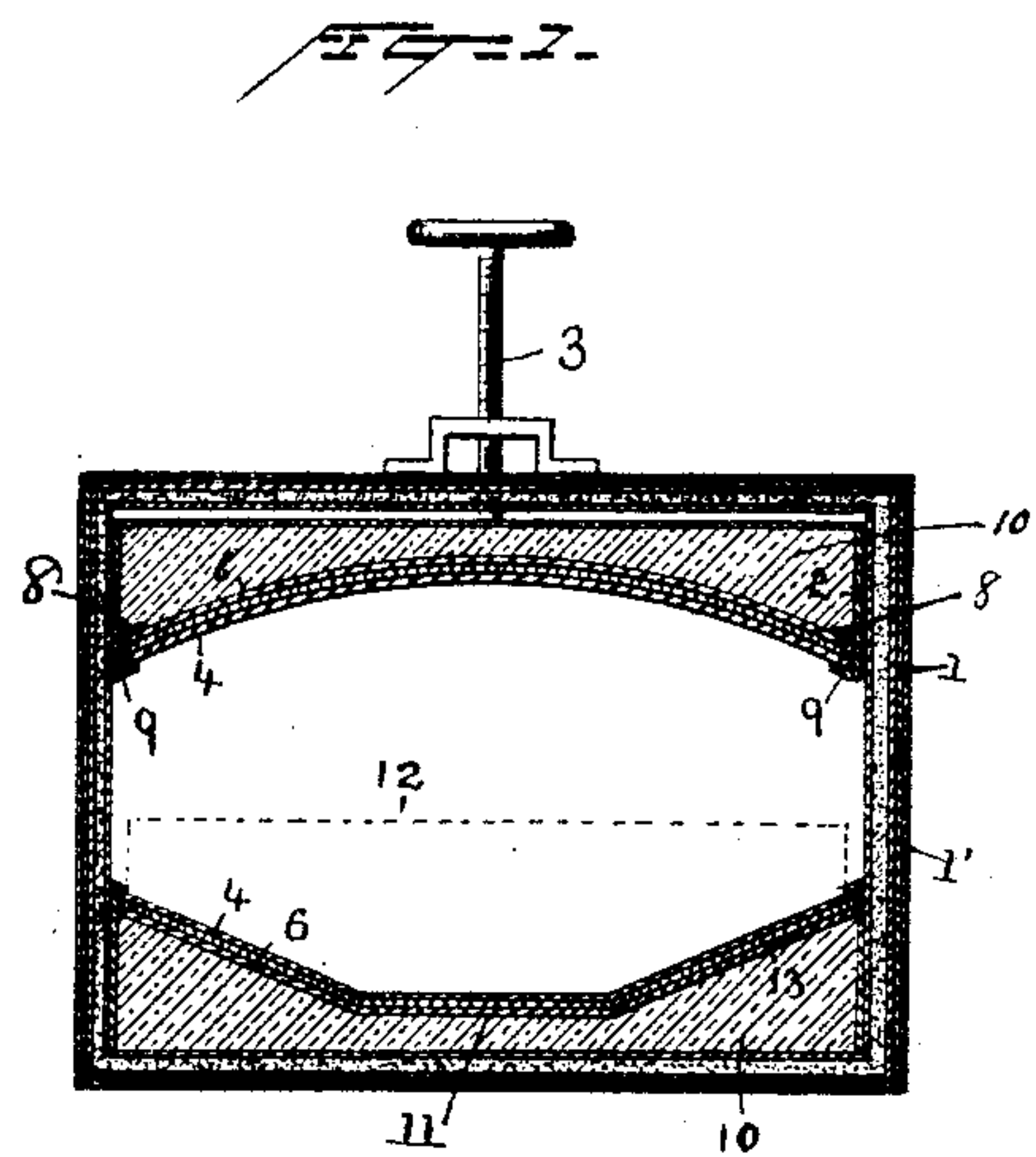


(No Model.)

J. V. CAPEK.
ELECTRICALLY HEATED OVEN.

No. 470,418.

Patented Mar. 8, 1892.



Witnesses
Morris S. Clark
Eugene Conran

Inventor
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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.

ELECTRICALLY-HEATED OVEN.

SPECIFICATION forming part of Letters Patent No. 470,418, dated March 8, 1892.

Application filed March 24, 1891. Serial No. 386,222. (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 city, in the county and State of New York, have invented a certain new and useful Improvement in Electrical Heaters, (Case J,) of which the following is a specification.

The present invention relates to an improvement in electrical heaters; and the main objects are to provide a heater that shall be so constructed as to maintain its shape and not to become warped and distorted by the effect of heat, as is the case with many of the electrical heaters now employed, which shall have their heating-plates so supported that they can expand in one direction only, and which shall economize the heat when the heater is used in an oven.

The invention consists in the several features and combinations hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a central section of an oven containing two heaters. Fig. 2 is a central section of two heaters of slightly-different shape, the inclosing oven being dispensed with; and Fig. 3 is a detached view of a heater, which may be used with or without an oven. Fig. 4 is an enlarged section of a part of the heater.

The oven has double walls with intervening heat non-conducting material. On the outside of the outer wall I place a layer 1 of asbestos, which is permeated with fire-clay and hardened by being wet with a solution of a hardening-salt, preferably sulphate of alumina. Over this coating is a layer 1' of a non-combustible or heat-resisting paint or varnish, which has the effect of reducing the radiation of heat.

At the top of the oven is an adjustable heater, constructed as follows: 2 is a box frame or holder of sheet metal or other suitable material, of such size and shape that it can be moved up and down in the oven by means of the screw 3 or by other suitable means. The lower side of the box is closed by means of a curved bottom constituting the heater proper, and formed, as shown in Fig. 4, of a lower plate 4 of thin sheet steel or brass, on which is a thin layer 4' of asbestos impregnated with fire-clay and supporting a heating-conductor

4'' in the form of wire, foil, or film. In Fig. 3 one arrangement of the heating-conductor is shown.

4 is the heating-plate, which is preferably of metal covered with insulation, and supports on one side a zigzag strip of German silver or other high-resistance conductor. Over the conductor in Fig. 4 is a thicker insulating plate or layer 5, and over this a metal or stiff insulating-plate 6.

When the heater is used in the oven, the last or upper plate may be omitted. The lower plate 4 is bent round at the edges, as indicated at 8, to embrace the edges of the upper plate to hold the parts together. The plates and heater, when straight, are somewhat larger than the area of the box 2. Hence to put them in place it is necessary to bend them, so that they assume a curved form, as indicated in the drawings. When thus arranged, they are held in position by the turned-in edges or by lugs 9 on the box 2. In the space above the curved plates is a mass 10 of asbestos or other poor conductor of heat. This arrangement allows the heating-plate to expand upward evenly without causing any distortion of said plate, and all holding screws or rivets, which add to the mass of metal to be heated and which are otherwise objectionable, are dispensed with.

The lower heater is constructed in practically the same manner as the upper one. Instead, however, of having a plain curved or spherical form, it is arranged with a flat portion 11 at the center, so that the pan therein, as indicated at 12, may be of such shape as to stand firmly on an ordinary table when out of the oven. If desired, the parts 13 may be curved instead of straight.

In Fig. 2 the lower heater has inwardly-extending edges 14 so formed that the corresponding edges 15 of the upper heater will be held thereby. The bent edges form a holding device for the second heater corresponding to the parts marked 9 in Fig. 1, as well as to secure the plates of the first heater together. The upper heater forms a cover and in some cases a cover not a heater might be substituted. The lower heater forms a holder for the upper one and corresponds exactly to the holder 2. With this arrangement any-

thing to be baked or heated would be placed in the space inclosed by the two heaters. The upper heater would be put in place by being slid in from one end.

5 In Fig. 3 is shown a heater especially adapted for use in heating rooms and in other places where diffused heat is desired. This consists of a holder composed of a frame 7, open at 16, slightly curved and having a slot 17, into which
10 the plate supporting the heating-conductor is slipped. The frame 7 has grooves along the two sides formed by the folding of the material of which the frame is made. These grooves are the same in design and construction
15 as those formed by the edges 14.

Ovens are, as a rule, approximately square, while objects to be cooked ordinarily have a rounded outline, so that the part directly below the center of the top or heating-plate of
20 the oven is much nearer to said plate than the parts facing the upper corners of the oven, and a large portion of the heat of the upper part of the oven is wasted. This is true, also, to a less extent of the lower part of the oven.
25 By curving or bending the heater, as I have above described, this objection is overcome. It also gives me a smaller heating-space in an oven of certain receiving capacity. Since the heating-plates are supported around the
30 edge and are bent into such shape that they can readily expand and contract without becoming distorted, very thin plates can be used whereby a high heat can be quickly and economically produced.

35 What I claim is—

1. The combination of a holder, an electrical heater having a heating or supporting plate, and an insulated heating-conductor, said plate fitting into the holder and said
40 holder being constructed with inwardly-extending edges to hold the same without separate securing devices, substantially as described.

2. The combination of a holder having in-

ward extensions at the edges, a heater held
45 thereby, consisting of plates, one of which is the heating-plate, and an interposed heating-conductor, substantially as described.

3. The combination, with a holder having means for supporting a curved or bent electrical heater, of said heater, which comprises
50 a plate supporting a heating-conductor, said conductor being insulated from the plate and holder, substantially as described.

4. The combination, with an oven, of two
55 separate electrical heaters therein on or adjacent to opposite sides, each heater comprising a holder, a thin heating-plate held in concave form in said holder, the concave sides of the two heating-plates facing each other, and
60 a heating-coil for each heating-plate, substantially as described.

5. An electrical heater having a heating-conductor mounted on but insulated from a heating-plate, and a plate over but insulated
65 from the heating-conductor, the edges of one of said plates being bent to form a holding device, substantially as described.

6. An electrical heater having a heating-conductor mounted on but insulated from a
70 heating-plate, and a plate over but insulated from the heating-conductor, the edges of one of said plates being bent to form a holding device, and a second heater held thereby, substantially as described.
75

7. An electrical heater having a heating-conductor mounted on but insulated from a heating-plate, and a plate over but insulated
80 from the heating-conductor, the edges of one of said plates being bent to form a holding device, and a cover held thereby, substantially as described.

This specification signed and witnessed this 19th day of March, 1891.

JOHN V. CAPEK.

Witnesses:

CHARLES M. CATLIN,
J. A. YOUNG.