

No. 793,424.

PATENTED JUNE 27, 1905.

L. E. CUSTER.
ELECTRIC OVEN.

APPLICATION FILED SEPT. 14, 1904.

Fig. 1.

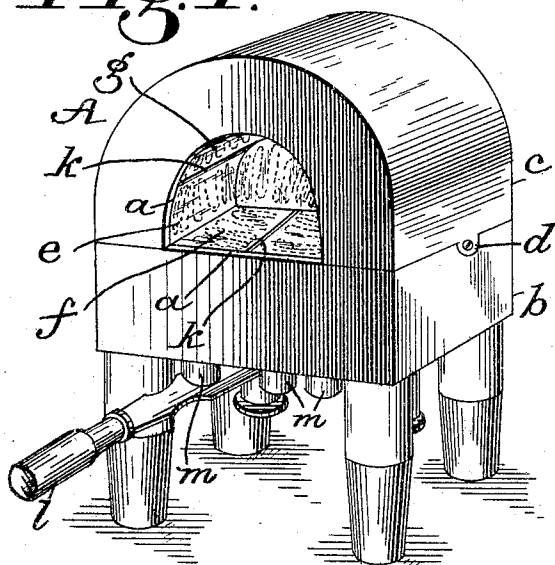


Fig. 2.

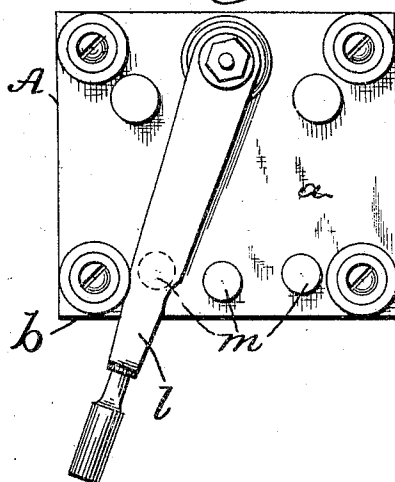


Fig. 3.

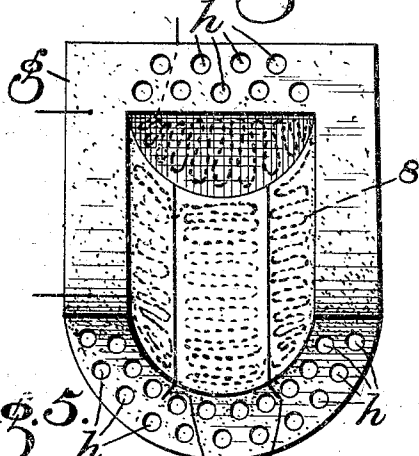


Fig. 4.

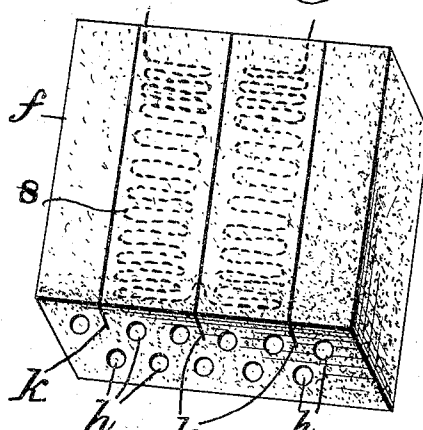


Fig. 5.

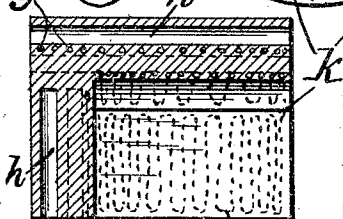


Fig. 6.

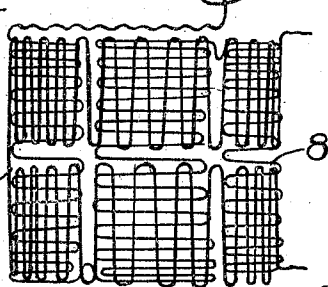
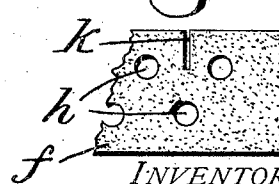


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC OVEN.

SPECIFICATION forming part of Letters Patent No. 793,424, dated June 27, 1905.

Application filed September 14, 1904. Serial No. 224,446.

To all whom it may concern:

Be it known that I, LEVITT E. CUSTER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Electric Ovens; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My present invention relates to special improvements in "electric ovens," but is more especially and directly intended and applicable to that class of electrical muffles or ovens employed by dentists for the fusing of porcelain for plates, crowns, bridges, and inlay-work, &c., and known to the profession as "dental-ovens" or "dental-furnaces," and is an entirely separate and distinct invention over any of the many patents previously granted to me, but more especially over Letters Patent No. 596,696—"Electric oven"—issued to me on the 4th day of January, 1889, containing as it does vastly different electrical principles and novel features of construction therefrom.

The principal objects or purposes of this invention consist in providing in combination with features already invented and patented by me of suitable, simple, and efficient means for allowing of a much greater heat being generated and retained within the furnace than heretofore, also at the same time preventing the usual cracking and checking in the heating-chamber of the clay out of which the floor and side walls and top of the dome are constructed by making them more elastic and expansible than I have heretofore, and my improvements, while apparently of not much magnitude to the ordinary observer, are valuable and of vast importance unto the art or industry to which they appertain and are clearly illustrated in the annexed drawings and set forth in the following detailed description and pointed out in the subjoined

claims in accordance with the statutes in such cases made and provided therefor.

Referring to the annexed drawings, constituting a formal part of this specification, and wherein the same letters and numerals refer to like parts wherever occurring throughout the several views, Figure 1 is a perspective view of one style of my electric oven equipped with a lever and buttons by which part of the electric heating-surfaces may be caused to act as a rheostat and provided with my improvements, and Fig. 2 is a bottom plan view of same. Fig. 3 is a perspective view in detail, on a slightly-enlarged scale, of the dome in an inverted position looking from the front at the interior of the same when removed from the metal-inclosing casing of the furnace. Fig. 4 is a perspective view in detail, on a slightly-enlarged scale, of the floor or base looking at the top as it rests when in position when removed from the metal-inclosing casing of the furnace. Fig. 5 is a vertical sectional view in detail through top of dome, showing interior of same when removed from the metal-inclosing casing of the furnace. Fig. 6 is a diagrammatical view in detail, on a slightly-enlarged scale for the purpose of illustration, of the upper and lower layers of crimped-wire conductors which are located in the dome; and Fig. 7 is a detail view, on a slightly-enlarged scale, of a broken-away portion or corner of the clay floor or base, so as to show some of my improvements more clearly.

In describing my said invention in detail and referring to the different parts in combination with my improved features of construction by means of the letters and numerals of reference as aforesaid, A refers to an electric oven or furnace, which is of one of my ordinary styles or forms of construction and having a suitable metal-inclosing casing or shell *a*, made separable in a lower section *b* and an upper section *c*, which are firmly but detachably connected at *d* in any ordinary and well-known manner, said sections when assembled together and in operative position (see Fig. 1) forming an opening at *e*, leading to the heating or interior chamber of the oven for the reception of the tray containing the

porcelain or other material to be fused or treated for dental purposes.

Adapted to rest within lower section *b* of the metal-inclosing casing is the floor or base *f*, which receives and supports the tray containing the material to be fused or treated and is formed out of suitable porous heat-retaining material, preferably fire-clay, which will properly retain the heat. (See Figs. 1 and 4.)

Adapted to rest upon floor of base *f*, by which it is supported when said sections *b* and *c* are joined together, and located within the upper section *c* of the metal-inclosing casing is the dome *g*, (see Figs. 1 and 3,) which is constructed out of same material as base *f*, preferably fire-clay.

It has been demonstrated that when an intense heat is generated or when the oven has been in constant use for any great length of time there is a tendency of the clay composing the base and dome and which forms the floor and sides and top of the oven and constitutes the interior or heating-chamber thereof to crack, split, and crumble, thus affecting the same. These defects, however, I remedy by what is a very important feature of this invention, and they consist in forming both base *f* and dome *g* with large perforations or cylindrical depressions *h*. (See Figs. 3, 4, 5, and 7.) I also further provide both said base and dome with grooves, recesses, or cuts *k* of a suitable depth, as clearly shown in the drawings in Figs. 3, 4, and 7. By means of perforations *h* and grooves *k* the clay is made sufficiently elastic to allow or permit of the contraction and expansion of the floor and dome as caused by the action of the heat, thereby avoiding the objectionable cracking of the clay, and at the same time the perforations assist in utilizing the heat as generated by acting as heat-retaining chambers.

In Figs. 3, 4, and 5 I have shown in dotted lines the course or position of the crimped-wire conductors 8, which are embedded only to a slight depth in the clay, forming the base and dome, and in Fig. 6—as the best and clearest manner in which to illustrate my method of wiring—I have shown a diagrammatic view of the upper layer of resistance-wire 9 and lower layer of wire 8 of the inner electrical conductors, which I prefer should be of the best platinum or platino-iridium wire, as this grade of wire lasts longer and gives more perfect results. Said wire conductors are first formed into loops or crimps and then embedded in the clay while being molded in strips or rows, so that said loops will be brought as close together as possible without coming in actual contact at the more remote or distant parts from the center of the oven and where there is the least amount or degree of heat, while the wires nearest to or directly opposite the center of the oven, and where the heat would naturally be the greatest or more in-

tense, the loops or crimps are arranged in a more open position or farthest apart from each other and are also arranged closer together at opening or mouth than at back part of muffle, thereby compensating for the loss of heat at the mouth. By this system of wiring it will be obvious that the heat will be more evenly distributed throughout the entire oven, and as the clay of course is porous the material in the oven will be more effectively fused or treated, said conductors being electrically connected and provided with a lever *l* and set of contact-buttons *m*, so as to act as a rheostat in the usual well-known manner and not necessary to be here referred to in detail.

I do not wish to be understood as herein laying or attempting to lay claim, broadly, to all the features of construction as herein shown and described, as they have mostly been covered by claims in my previous patents; but my claims will here be based on certain combinations; therefore

What I claim is—

1. In an electric oven having an outer inclosing casing or shell; an interior heating-chamber having its floor and walls formed out of porous material, and provided with perforations or cylindrical depressions; and grooves or recesses; substantially as described.

2. An electric oven or furnace having a heating-chamber, the floor and walls of which are provided with perforations or cylindrical depressions, and grooves or cuts; electrical conductors suitably arranged as desired so as to generate a uniform heat throughout the heating-chamber; all substantially as and for the purposes set forth.

3. The combination in an electric oven or furnace; of an inclosing casing; a heating-chamber; of the floor and walls to said heating-chamber constructed out of porous material provided with perforations or cylindrical depressions, and grooves or elongated recesses; of crimped or looped wire conductors, arranged so as to evenly distribute the heat, and embedded within the floor and walls of said heating-chamber; said oven provided with a rheostat means; all substantially as and for the purpose described.

4. The combination in an electric oven, of an outer sectional casing or shell; a base adapted to rest within one of the sections of said casing, and formed of porous heat-retaining material and provided with means for allowing of contraction and expansion; a dome adapted to rest within one of the sections of said casing, and formed of porous heat-retaining material, and provided with means for permitting of contraction and expansion; of one or more electrical conductors formed in crimps or loops at varied distances apart so as to increase or decrease the current of heat as desired, and arranged within the base and dome of said oven; substantially as set forth.

5. In an electric oven or furnace, the com-

5 bination with an outer separable sectional casing or shell; an interior chamber formed in said oven; a base adapted to form a floor to said interior chamber and constructed out of
10 clay, and provided with means for making it elastic; a dome adapted to form the sides and top to said interior chamber, and constructed out of clay, and provided with means for making it elastic; of electrical conductors constructed out of high-grade wire, crimped or

looped and arranged close and far apart so as to evenly distribute the heat, and embedded within said base and said dome; all substantially as and for the purposes described.

In testimony whereof I have affixed my signature in presence of two witnesses.

LEVITT E. CUSTER.

Witnesses:

ELEANOR ZUG,
HEBER SWERER.