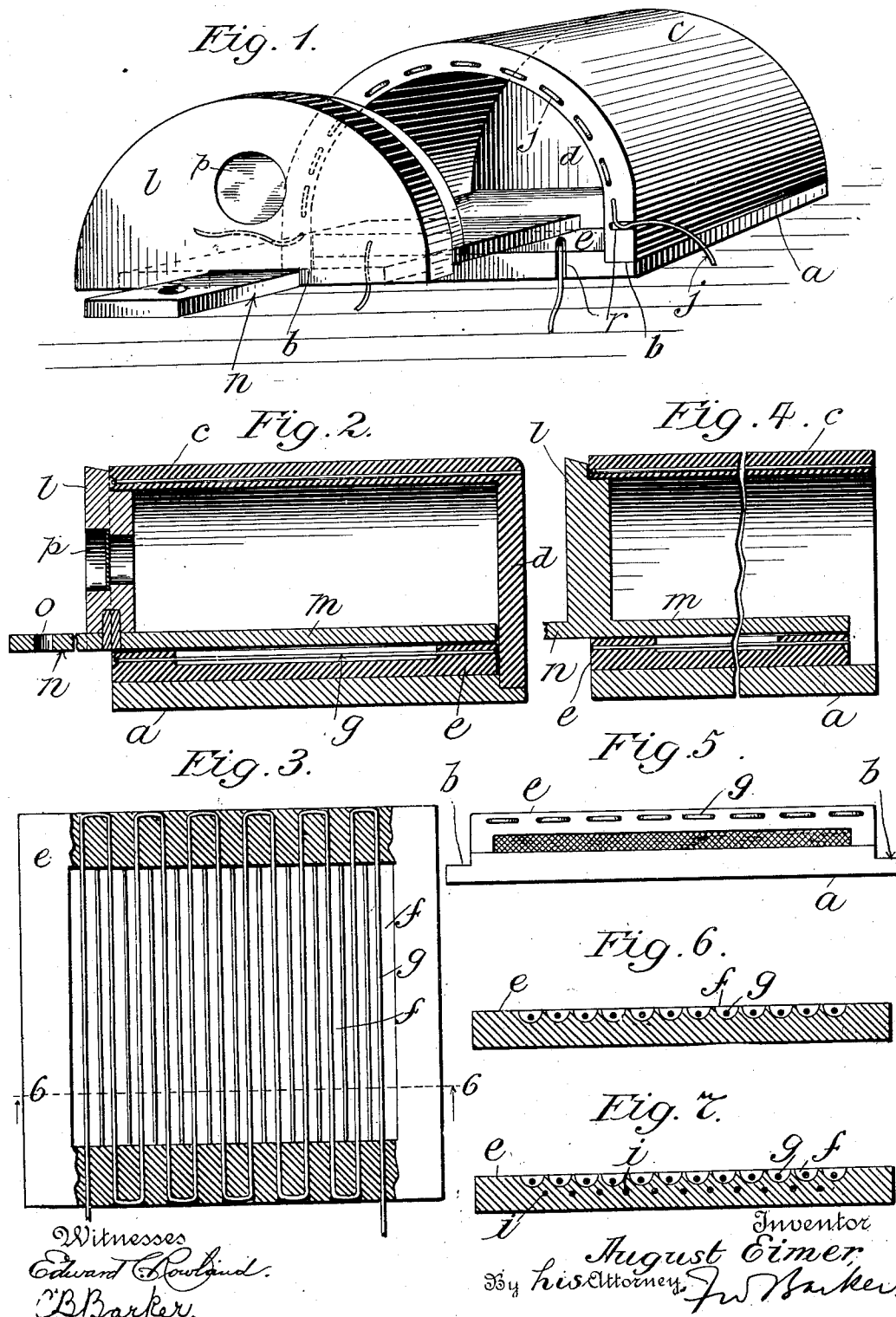


A. EIMER.
ELECTRIC FURNACE OR OVEN.

APPLICATION FILED MAY 22, 1903.

2 SHEETS—SHEET 1.

NO MODEL.



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2 SHEETS—SHEET 2.

Fig. 8.

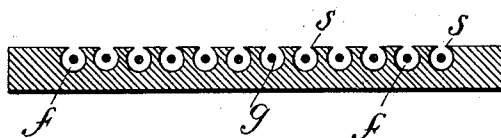
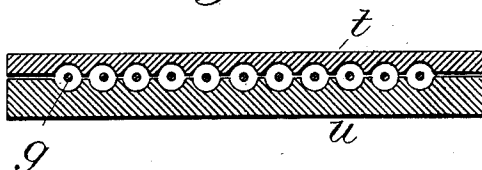


Fig. 9.



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UNITED STATES PATENT OFFICE.

AUGUST EIMER, OF NEW YORK, N. Y.

ELECTRIC FURNACE OR OVEN.

SPECIFICATION forming part of Letters Patent No. 736,509, dated August 18, 1903.

Application filed May 22, 1903. Serial No. 158,225. (No model.)

To all whom it may concern:

Be it known that I, AUGUST EIMER, a citizen of the United States of America, and a resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Electrical Furnaces or Ovens, of which the following is a specification.

This invention relates to electrical furnaces or ovens wherein small articles—such as artificial teeth, bridgework, gums, chemists' crucibles, and the like—may be baked or heated; and the main features of my said invention may be briefly summarized as follows: First, the construction of an article of the character indicated of relatively few parts in the interests of simplicity and economy; second, the provision of an integral oven closure and support for the articles to be heated, whereby both of said elements may be removed at one time; third, the provision of a removable oven-plate of refractory material having depressions containing an exposed electrical resistance-conductor and having increased heating efficiency.

The invention further includes the novel features of construction and arrangements of parts, as will be fully described hereinafter and particularly pointed out in the claims.

In the drawings accompanying this application, Figure 1 is a perspective elevation of my improved electrical furnace or oven. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a detail plan view, partly in horizontal section, of the heating-plate. Fig. 4 is a longitudinal section broken away, showing the dome or cover minus the back closure. Fig. 5 is an end view of a base-plate and a modified form of heating-plate, wherein the under side of the latter member is recessed and provided with a non-conducting packing. Fig. 6 is a cross-section taken on the line 6 6 of Fig. 3; and Figs. 7, 8, and 9 are like views showing modified forms of conductor arrangement.

As premised, one of the main features of my invention lies in the employment of as few parts as possible in producing the improved furnace or oven. To this end I provide a base-plate, as *a*, said plate being of suitable refractory material and having the recessed side edges *b b* to receive the lower ends of a

dome-like or other shaped housing or cover *c* of similar material, which latter, either with or without the back plate *d*, is produced as one integral member, or said cover and base may be produced integrally. The heating member is in the form of a plate, as *e*, of suitable refractory material of dimensions enabling it to slide within the oven upon the base-plate *a*. Said member *e* is provided upon its upper surface with a series of grooves or channels, as *f*, forming, in fact, a corrugated or serrated surface of enlarged heating area for said member. Within said grooves or channels *f* is laid a resistance-conductor *g*—as, for example, a platinum wire—to assume incandescence with the flow of a suitable electrical current.

As a means of arranging and securing the conductor *g* within the several grooves *f* I preferably cause the opposite ends of said grooves to terminate, respectively, at points anterior to the perimeter of member *e*, and I cause the substance of said member intermediate said grooves and its perimeter to be pierced horizontally, thereby permitting the threading of conductor *g* to and fro through the opposite end perforations in the manner indicated in Fig. 3, forming, as it were, a grid of heating-strands. The opposite terminals of conductor *g* may be provided with binding-posts (not shown) or may be otherwise suitably connected in an electrical circuit.

As will be clearly perceived by referring to Fig. 6, each strand of conductor *g* is partly inclosed by a groove *f*, the walls of adjacent grooves separating different sections of said conductor and said grooves, according to their depth, increasing the surface area of member *e*, thus enlarging its capacity to receive and yield heat energy obtained from the incandescence of conductor *g* and permitting direct heat radiation from said conductor to the oven interior. I may further enhance the heat production by providing in another plane of the member *e* an additional conductor, which may be connected in series with conductor *g*, or if either of said conductors are required to be used independently they may be in multiple connection with the source of current.

In Fig. 7 I have shown a plate *e*, having its surface provided with the grooves *f*, contain-

ing the conductor *g*, and I have also shown said plate as provided with a series of horizontal perforations containing a conductor *i*, which latter is threaded to and fro through some 5 or all of said perforations and has opposite terminals capable of making electrical connections either in multiple or in series with the conductor *g*. With the additional or auxiliary conductor *i* embedded within the plate 10 *e* it is evident that the degree of heat obtainable from said plate can be intensified.

The interior surface of the dome or cover *c* may be recessed or corrugated in a similar manner to member *e* and provided with a corresponding resistance-conductor, or said dome 15 may be pierced longitudinally, as seen in the drawings, whereby the conductor, as *j*, as threaded within the perforations indicated is thus embedded in the material of which 20 the dome is composed. The opposite terminals of conductor *j* may connect with binding-posts (not shown) conveniently located or may be otherwise suitably included in an electrical circuit. The rear closure-plate *d* 25 may, as seen in Fig. 2, be produced integrally with the dome, or said plate may be a separable member, or, as seen in Fig. 4, said rear plate may be eliminated altogether or when used may, if desired, be provided with a resistance-conductor. 30

The forward closure of the furnace or oven consists of a plate *l*, of refractory material and of like contour to the arch of the dome or otherwise, to fit about and close the oven- 35 opening. Extending from said closure *l* is a shelf or support *m* for the articles to be heated, which support is either formed integrally with said closure (see Fig. 4) or is connected thereto, as by fitting, at its narrowed portion 40 within a recess in the base of said closure. (See Fig. 2.) When the support *m* is formed separately and fitted to the closure, as indicated in Fig. 2, it has a rearward extension, as *n*, which is provided with an engaging 45 means, as an aperture *o*, within which latter the bent or hooked end of a tool may be inserted for the purpose of removing the closure *l* and withdrawing the support *m*. Also when the closure *l* and support *m* are produced as 50 one integral member then the rearward extension *n*, as shown in Fig. 4, may likewise be produced integrally therewith. The support *m* is located and arranged with relation to the closure *l* and when inserted within the 55 oven is in such relation to the heating member *e* as to lie superposed upon and over the latter.

The closure *l* or the forward end of the dome may be provided with grooves, as *r*, for the 60 passage or reception of the conductor-terminals, although, as is evident, such arrangement is by no means arbitrary and may be modified to suit requirements, or binding-posts for said terminals may be suitably provided. 65

I provide a peep-hole, as *p*, in the closure *l*, and instead of fitting same with a remov-

able plug, as is the present method, I preferably fit therein a disk of fused quartz or other transparent substance permitting a visual 70 indication of the interior heated condition of the oven without removing the closure.

As seen in Fig. 5, the plate *e* is recessed at its under side, leaving a clearance intermediate said plate and the base-plate *a* to retard 75 the absorption of heat by the latter member, and also in the furtherance of said end I may insert a packing of non-conducting material, as asbestos, within said recess.

In the operation of my invention I fit the 80 aforesaid parts together, placing the dome upon the base-plate, laying the articles to be heated upon the support *m*, and moving the closure *l* to cover the entrance to the oven with the support *m* entered therein. The 85 current is then switched on either to the conductor or conductors in plate *e* alone or also to the conductor in the dome, and during the operation of the furnace the color of the firing can be discerned through the peep-hole 90 *p*. If desired to test the articles being heated, it is only necessary to draw away the closure *l* by the extension *n*, by which act the support *m* is brought outside the oven in full view. The dome-like interior contour of the 95 cover serves to concentrate the heat received thereby directly upon the articles held by support *m*.

As seen in Figs. 8 and 9, I have illustrated two other means of applying resistance-con- 100 ductors to the plate *e* and which means are equally applicable in fitting resistance-conductors to the other refractory members of the furnace. For instance, in Fig. 8 I show the grooves *g*, within which conductor *f* is 105 sunk, as provided with the overhanging edges *s* to better retain said conductor within said grooves when expanded by heat. Also in Fig. 9 I show a heating-plate as formed of two opposed members *t* and *u*, provided with 110 corresponding grooves upon their meeting sides, whereby when said members are fitted together they may receive or inclose or embed between them a resistance-conductor, as *g*.

Having now described my invention, I declare that what I claim, and desire to secure by Letters Patent, is— 115

1. An electrical furnace or oven composed of a permanent base-plate forming a bottom, an integral housing fitting removably there- 120 about, a forward removable closure therefor, and a removable conductor heating member.

2. An electrical furnace or oven composed of a permanent base-plate forming a bottom, a dome-like housing, fitting removably there- 125 over, a forward removable closure, and a removable conductor heating member.

3. An electrical furnace or oven composed of a permanent base-plate forming a bottom, a dome-like, rearwardly-closed housing, fitting removably thereover, a forward remov- 130 able closure, and a removable conductor heating member.

4. The combination with an electrical fur-

nace or oven of a combined closure and shelf therefor comprising a cover member having an inwardly-extending support for the articles to be heated.

5 5. The combination with an electrical furnace or oven of a combined closure and shelf therefor comprising a cover member having an inwardly-extending support for the articles to be heated, and a rearward extension.
10

6. The combination with an electrical furnace or oven, of a combined closure and shelf therefor comprising a cover member having an integral, inwardly-extending support for the articles to be heated.
15

7. The combination with an electrical furnace or oven, of a combined closure and shelf therefor comprising a cover member having an integral, inwardly-extending support for the articles to be heated, and having an integral rearward extension.
20

8. In an electrical furnace or oven, a removable heating member composed of a plate of refractory material having a resistance-conductor disposed in an open recess in its surface, and non-closing means preventing dislodgment of said conductor when expanded.
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9. In an electrical furnace or oven, a removable heating member composed of a plate of refractory material bearing a series of parallel depressions, to enlarge its surface area, a resistance-conductor located in said depressions, and non-closing means preventing dislodgment of said conductor when expanded by heat.
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35

10. In an electrical furnace or oven, a removable heating member composed of a plate of refractory material, a series of parallel, partially-overhung, open grooves sunk in the surface thereof, the ends of said plate, between its perimeter and the respective opposite ends of said grooves being provided with horizontal perforations, and a resistance-conductor threaded through said perforations, and lying within said grooves, said conductor being thus capable of radiating heat outwardly from said grooves.
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11. In an electrical furnace or oven, a removable heating member composed of a plate of refractory material having an open recess in its heating-surface, and a resistance-conductor disposed in said recess, the material bounding the recess at opposite sides extending partially over the opening thereof; together with an auxiliary resistance-conductor embedded in said member.
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55

12. In an electrical furnace or oven, composed of a base-plate forming a bottom, and an integral housing fitting removably thereabout, a heating member having a series of depressions in its heating-surface, and a resistance-conductor located in said depressions; the reverse surface of said member being recessed, and containing a packing of non-conducting material.
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13. In an electrical furnace or oven, composed of a base-plate forming a bottom, and an integral housing fitting removably thereabout, a base-plate, a removable heating member composed of a plate of refractory material, having a series of parallel grooves in its heating-surface, a resistance-conductor disposed in said grooves, and a layer of non-conducting material interposed between said base-plate and the reverse surface of said heating member.
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75

14. In an electrical furnace or oven, a wall thereof having an observation-opening, and a transparent covering of fused quartz for said opening.
80

15. In an electrical furnace or oven, composed of a base-plate forming a bottom, and an integral housing fitting removably thereabout, a heating member composed of a pair of superposed plates of refractory material bearing aligned depressions in their respective, opposed surfaces, and a resistance-conductor inclosed between said depressions.
85

Signed at New York this 11th day of May, 1903.

AUGUST EIMER.

Witnesses:

F. W. BARKER,
JACOB B. TOCH.