

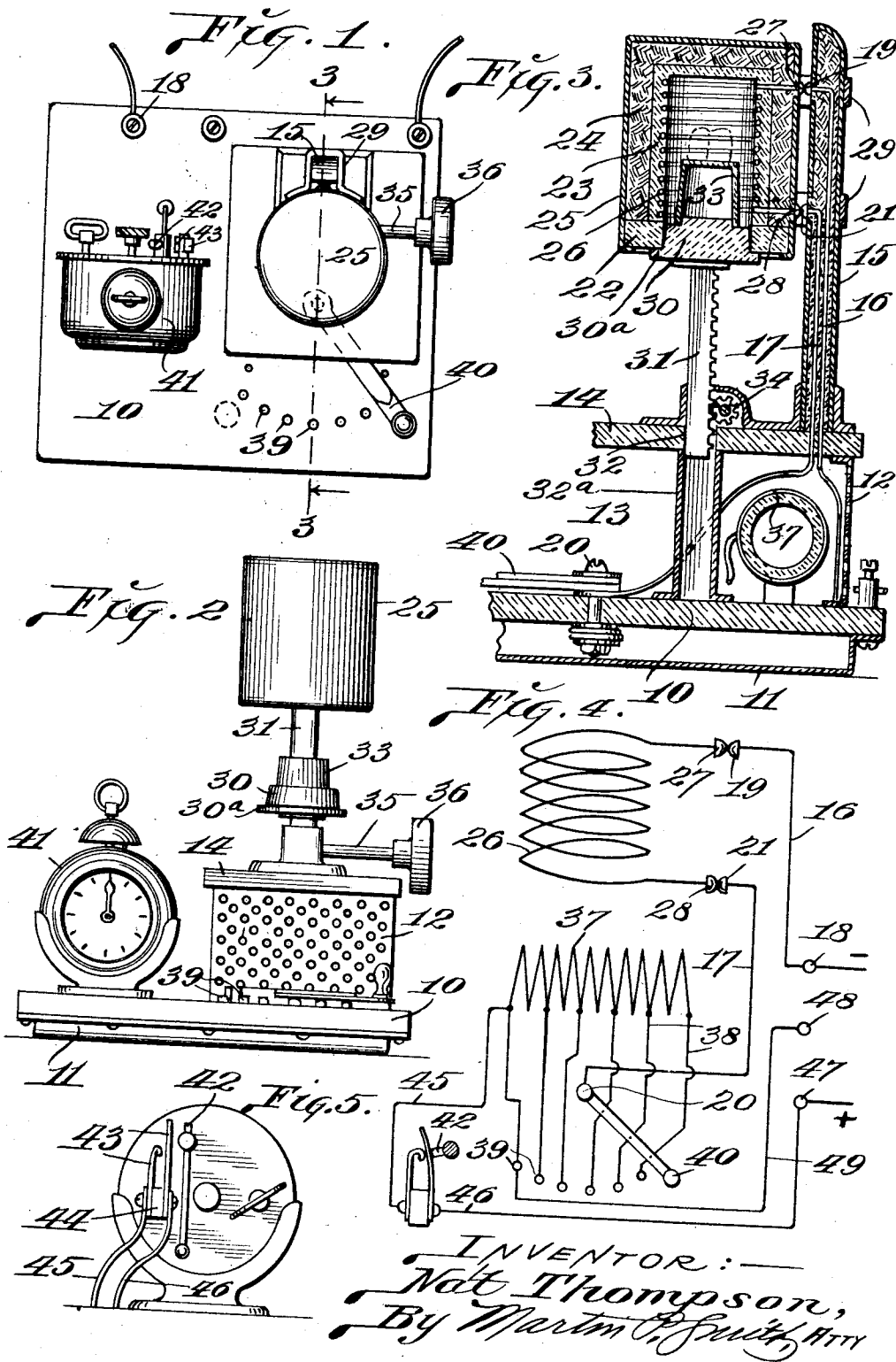
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DENTAL PORCELAIN ELECTRIC FURNACE

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DENTAL PORCELAIN ELECTRIC FURNACE

Re filing of application Serial No. 11,665, filed February 26, 1925. This application filed November 21, 1928, Serial No. 321,018. Renewed February 20, 1930.

This invention relates generally to furnaces, and more particularly to an electric furnace for fusing porcelain dental work, the principal objects of my invention being to generally improve upon and simplify the construction of the existing forms of similar electric furnace; to provide a relatively simple, practical and efficient electric dental furnace with means whereby the degree of heat within the oven or fusing chamber may be readily controlled and regulated and further, to combine with a furnace of the character referred to, a time-controlled switch that may be manually set so as to close the electric circuit to the heating element within the fusing chamber and which switch will act automatically after a predetermined interval of time, to open the circuit and thereby cut off further production of heat within said heating chamber.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully shown and described and illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of an electric furnace of my improved construction.

Fig. 2 is a front elevational view of the furnace.

Fig. 3 is an enlarged vertical section taken on the line 3—3 of Fig. 1.

Fig. 4 is a diagrammatic view of the electrical circuits utilized in my improved furnace.

Fig. 5 is a rear elevational view of the clock that is utilized in connection with my improved furnace and which is effective in opening the circuit to the heating element, and simultaneously sounding an alarm.

Referring by numerals to the accompanying drawings which illustrate a preferred form of my invention, 10 designates a base plate of suitable insulating material such as compressed fibre, bakelite or stone, and detachably secured to the underside thereof is a shallow pan 11 that serves as a housing for the electrical conductors that are arranged on the underside of the base.

Secured on top of the rear right hand por-

tion of base 10 is a perforated wall 12 that encloses a substantially square space 13 and arranged on top of said wall 12 is a cover plate 14 of suitable insulating material.

Projecting upwardly from the rear portion of plate 14 is a hollow post or standard 15 through which passes a pair of insulated conductors 16 and 17. Conductor 16 leads from a binding post 18 on base 10 to a contact button 19 that is arranged on the upper front face of post 15.

Conductor 17 leads from a switch lever pivot bolt 20 that is seated in base 10, to a contact button 21 that is seated in the front face of post 18 a short distance below contact button 19. The oven or heating chamber of my improved furnace is substantially cylindrical in form and comprises a base ring 22, preferably formed of fire clay, an inner lining 23 of fire clay, a jacket 24 of asbestos or the like that encloses lining 23 and a metal shell 25 that encloses said ring and jacket.

Embedded in the exposed face of lining 23 is a coil 26 of platinum wire, one end thereof being connected to a contact button 27 that is arranged on the rear upper side of the shell 25 of the oven and the other end of said coil 26 being connected to a contact button 28 that is located on shell 25 a short distance below button 27.

Arranged on the rear side of the oven are horizontally disposed loops 29 that are adapted to be slipped downwardly over the upper portion of post 15, and when the oven is properly positioned on said post, buttons 27 and 28 make direct contact with buttons 19 and 21 respectively.

The work carrier of my improved furnace comprises a disk 30 of fire clay or the like that is carried by the upper end of a rack bar 31, and the latter being arranged to slide through an opening 32 in plate 14 and through a vertically arranged tube 32a that is disposed between plates 10 and 13.

Disk 30 is provided on its lower edge with a flange 30a, which, when said disk is positioned within ring 22, functions as a stop to limit the movement of said disk upwardly into the oven.

Flange 30a is also adapted to fit snugly

against ring 22 to prevent the escape of heat from the furnace chamber.

Removably positioned on the disk 30 is an inverted crucible 33 that serves as a support for the work that is to be baked or fused and said crucible being formed of fire clay, alundum or the like.

Disk 30 is adapted to pass through ring 22 at the base of the oven so that the crucible 33 that supports the work occupies the central portion of the oven chamber.

Rack bar 31 is moved vertically by means of a pinion 34, the teeth of which engage the teeth of said rack bar and said pinion being fixed on a shaft 35 that is arranged for rotation in suitable bearings on plate 14.

A disk 36 is fixed on the outer end of shaft 35 and may be engaged by the thumb and fingers when the shaft and pinion are rotated to raise or lower rack bar 31.

Arranged in the chamber within perforated wall 12 is a resistance coil 37 and connected thereto at different points are conductors 38 that lead to contact points 39, the latter being arranged in an arcuate row on base 10.

A switch lever 40 is pivoted to bolt 20 and is adapted to successively engage the contact points 39.

Suitably supported on base 10 is an alarm clock 41 of the type having means that may be set so as to sound an alarm bell at the end of a predetermined interval of time.

A rotating part of the setting means of this clock is provided with an insulated pin 42 which, when the alarm means is set, closes a switch on the clock, said switch comprising a pair of spring arms 43 that are mounted on a block of insulation 44.

A conductor 45 leads from one end of coil 37 to one of the spring arms 43 and a conductor 46 leads from the other spring arm to a binding post 47 that is seated on the rear portion of base 10.

In the use of my improved dental furnace, pinion-carrying shaft 35 is rotated to move rack bar 31 downward, thus enabling the work to be placed on crucible 33 that rests on disk 30.

Shaft 35 is now rotated to elevate the rack bar and parts carried thereby, and when flange 30a bears against the underside of ring 22, the work to be baked or fused and which is arranged on top of crucible 33 occupies a position in the center of the furnace or oven chamber (see Fig. 3).

The alarm mechanism of the clock is now set so as to sound the alarm after the lapse of a predetermined interval of time and, in so doing, pin 42 will engage and close the switch 43.

Rheostat arm 40 is now shifted so as to make contact with one of the contact points 39 whereupon current from line conductor 65 that is connected to binding post 47 will flow

through conductor 46, closed switch 43, conductor 45 to resistance coil 37, thence through the conductor 38 that is connected to the contact point with which arm 40 is in engagement, thence through arm 40, conductor 17, contacts 21 and 28, thence through heating coil 26 and thence through contacts 27 and 19 and conductor 16 to binding post 18 and the line conductor that is connected thereto.

Thus coil 26 becomes highly heated and, as a result the furnace or oven chamber and the work therein is heated to a high degree and such heat prevails until the end of the time required for properly baking or fusing the work, whereupon the clock releases the part that carries pin or stud 42 and, as the same moves away from the switch, the arms thereof spring apart so as to open the circuit to the heating coil within the furnace.

Simultaneously with the opening of the circuit just described, the bell on the clock is sounded, thereby giving an audible signal and alarm that the baking or fusing operation has been completed.

To remove the work from the furnace, it is only necessary to actuate shaft 35 so as to lower the rack bar 31 until disk 30 and the work carrying crucible have been withdrawn from the chamber.

Rheostat arm 40 may be adjusted on contact points 39 so as to vary the degree of resistance offered by coil 37, thereby regulating the degree of heat produced within the furnace chamber.

In the event that the clock becomes inoperative or the user of the furnace desires to use same without the time interval and alarm, the line conductor that is connected to binding post 47 is connected to a third binding post 48, and from the latter the current passes through a conductor 49 that leads to the contact member 39 that is located at the end of the arcuate row.

Thus it will be seen that I have provided a dental furnace that is relatively simple in structure, capable of being easily and cheaply produced, and which is very effective in performing its intended functions.

The porcelain or other work to be baked or fused may be readily positioned within the furnace or removed therefrom, the degree of heat produced within the furnace chamber may be accurately regulated and a simple and efficient time controlled switch is provided for cutting off the current to the heating coil at the termination of a predetermined elapsed time interval.

It will be understood that minor changes in the size, form and construction of the various parts of my improved dental furnace may be made and substituted for those herein shown and described without departing from the spirit of the invention, the scope of which is set forth in the appended claims. This appli-

cation is a refiling of my abandoned application No. 11,665, filed February 26, 1925.

I claim as my invention:

1. In an electric dental furnace, a standard, electric conductors extending upwardly through said standard, contacts at the upper ends of said conductors and arranged externally of said standard, an oven removably positioned on said standard, which oven is provided with a heating chamber that is open at its lower end, a heating coil within said oven around the chamber therein, contacts on the ends of said coil, which contacts are adapted to engage the contacts on the standard and a vertically movable work carrier arranged beneath the heating chamber and adapted when moved upward to plug the open lower end thereof.

2. In an electric dental furnace, a standard, electric conductors extending upwardly through said standard, contacts at the upper ends of said conductors and arranged externally of said standard, an oven removably positioned on said standard, which oven is provided with a heating chamber that is open at its lower end, a heating coil within said oven around the chamber therein, contacts on the ends of said coil, which contacts are adapted to engage the contacts on the standard, a work carrier arranged for vertical movement beneath the heating chamber and adapted when elevated to plug the lower end of said chamber and a manually operable rack and pinion for raising and lowering said work carrier.

3. In an electric furnace, a base, a standard, an oven supported by said standard, said oven comprising an enclosed heating chamber open at its lower end, electrical heat radiating means for said chamber, and a vertically movable work carrier adapted to enter said chamber through said open lower end and having a base portion adapted to plug said open lower end of said chamber.

4. In an electric furnace, a base, a standard, an oven supported by said standard and comprising an enclosed heating chamber open at its lower end, electrical heat radiating means for said chamber, a vertically movable work carrier adapted to enter said chamber through said open lower end and adapted to constitute a tight closure for said open lower end of said chamber, and means on said carrier for supporting work substantially centrally of said chamber when said carrier is in operative position.

5. In an electric furnace, a base, a standard, an oven supported by said standard and comprising an enclosed heating chamber open at its lower end, electrical heat radiating means within said oven for said chamber, an electrical conductor extending upwardly through said standard and having a portion extending outwardly of said standard, said radiating means having a portion extending

outwardly of said oven, said portions being adapted to have separable contact with each other and a vertically movable work carrier adapted to enter said chamber through the open end thereof and to constitute a closure therefor.

6. In an electric furnace, a base, a standard, an oven supported by said standard and comprising an enclosed heating chamber open at its lower end, electrical heat radiating means within said oven for said chamber, an electrical conductor extending upwardly through said standard and having a portion extending outwardly of said standard, said radiating means having a portion extending outwardly of said oven, said portions being adapted to have separable contact with each other, a vertically movable work carrier adapted to enter said chamber through the open end thereof and to constitute a closure therefor, and means on said carrier for supporting work substantially centrally of said chamber when said carrier is in operative position.

In testimony whereof I affix my signature.
NAT THOMPSON.

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