Sept. 4, 1928. 1,683,211

A. H. SIMMONS

ELECTRIC HEATER

Filed Sept. 25, 1925

Fig. 1.

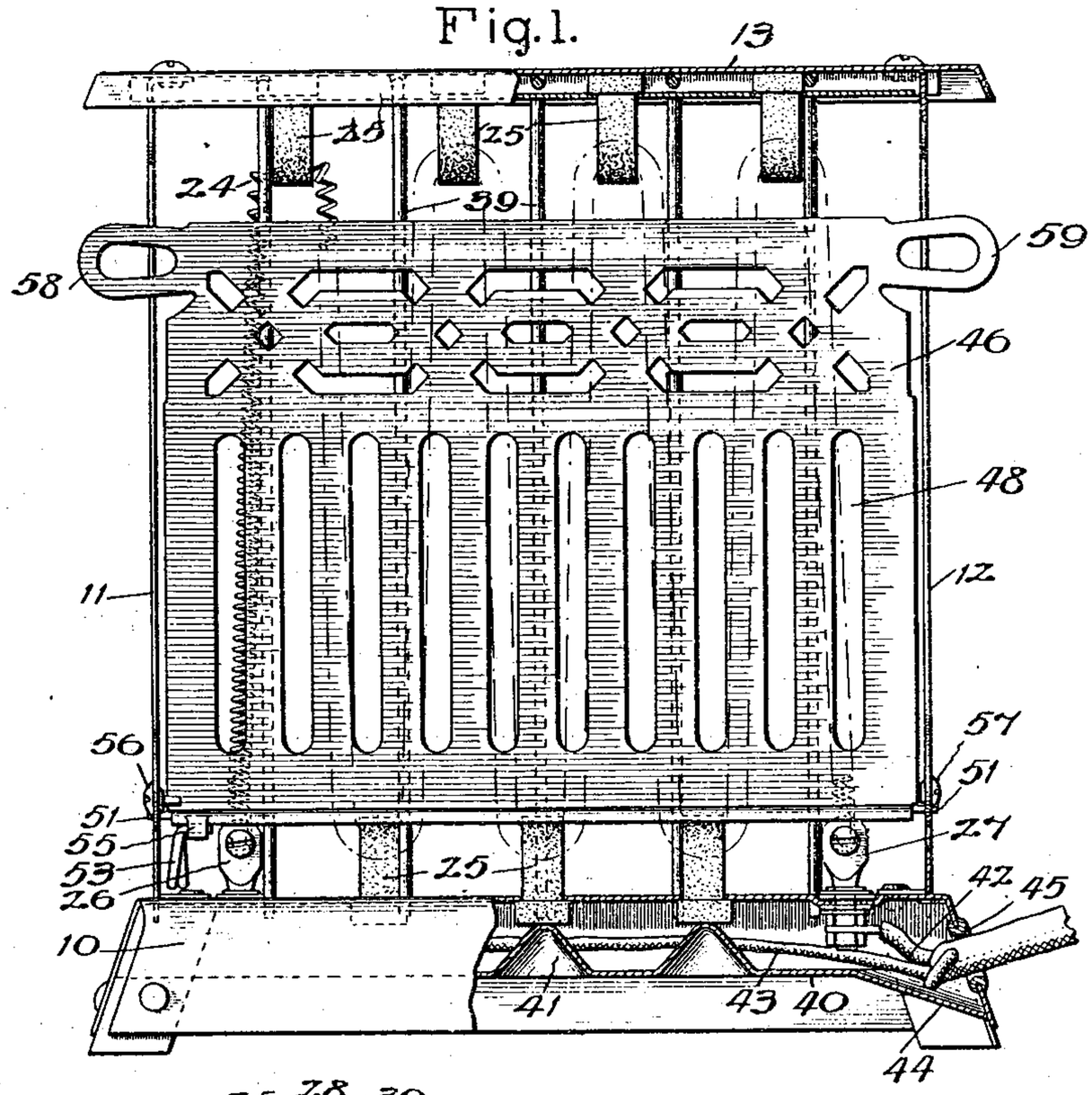


Fig. 2.

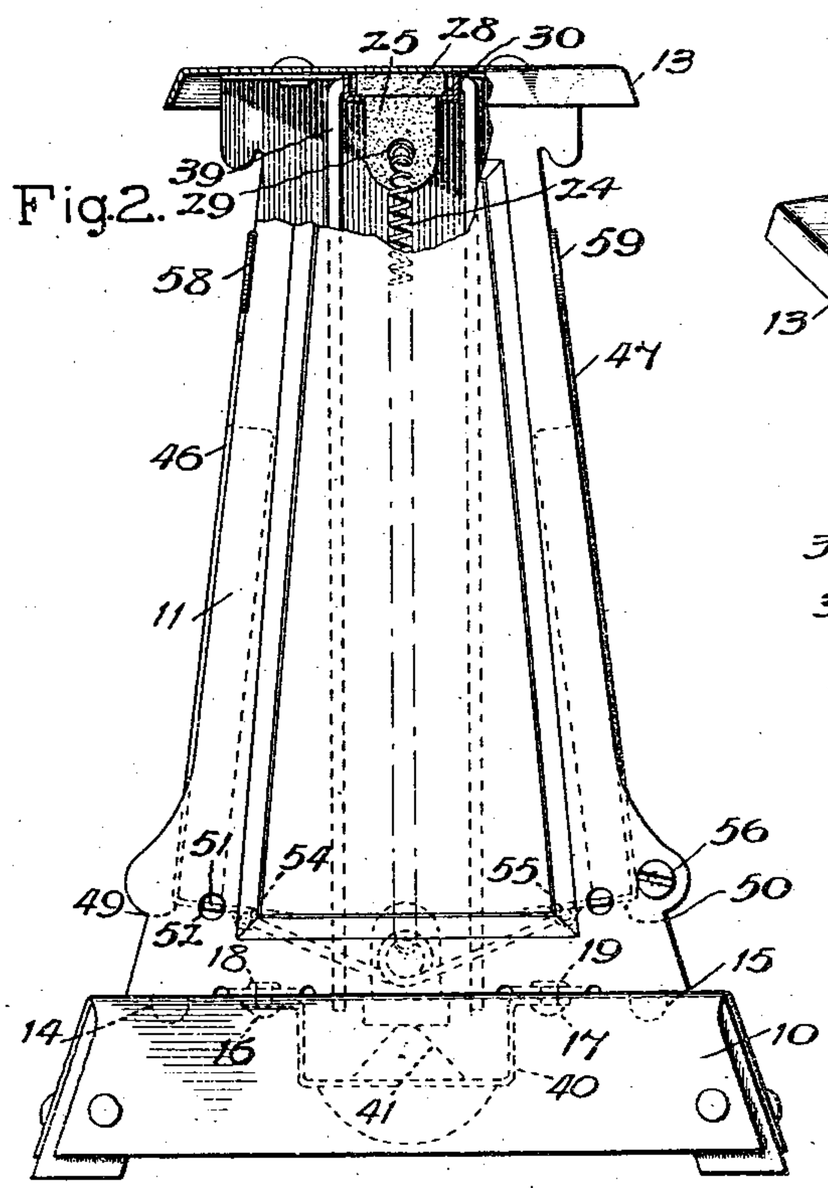
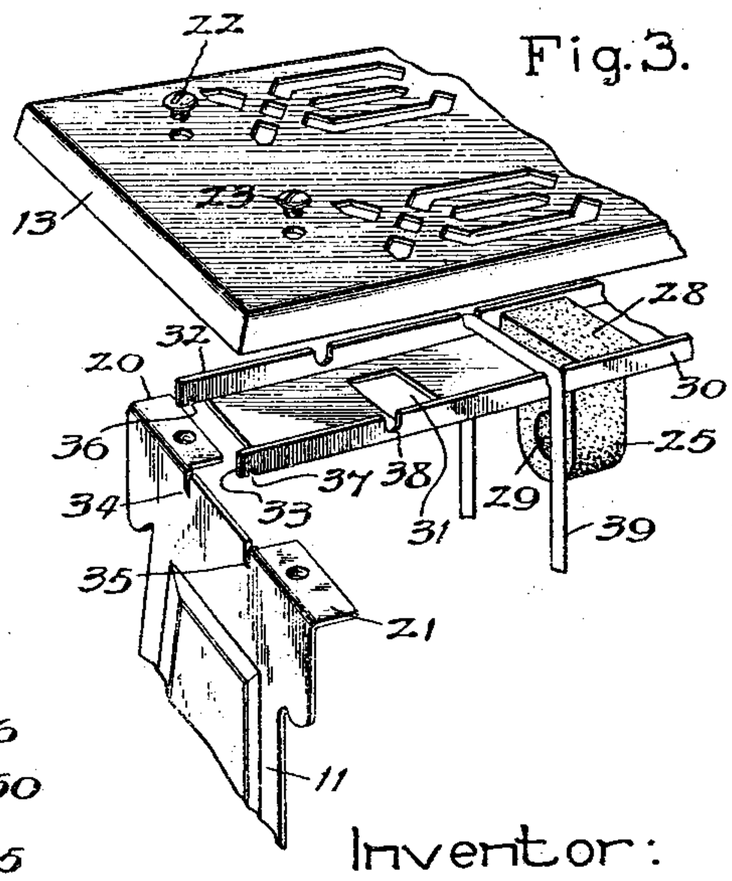


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

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My invention relates to electric heaters, more particularly to electric toasters, and has for its object the provision of a simple, reliable and inexpensive device of this character.

For a more complete understanding of my invention reference should be had to the accompanying drawing in which Fig. 1 is a side elevation view partly in section of an electric toaster embodying my invention; Fig. 2 is an end elevation view partly in section of the device shown in Fig. 1; while Fig. 3 is a fragmentary exploded view showing details of construction.

Referring to the drawing, the electric toaster embodying my invention comprises in one form a base portion 10 which is preferably stamped or otherwise formed from sheet metal. This base portion is rectangular in shape and at its ends is provided with vertical frame members 11 and 12 which are joined at the upper ends by a top member 13. The frame members 11 and 12 are secured to the base by tabs or projections 14 and 15 on each frame member, which tabs fit in apertures provided for them in the base, and also by means of bolts 16 and 17 which pass through the base and through inwardly turned right angle projections 18 and 19 on the lower ends of the frame members. At their upper ends the frame members are each provided with inwardly turned right angle projections 20 and 21 on which the top plate 13 rests and is secured by screws 22 and 23. The frame members 11 and 12 and the top member 13 are preferably stamped metal parts.

A helically wound resistance coil or heating element 24 is provided. This resistance coil extends in substantially vertical lengths between the base 10 and the top member 13, passing from top to bottom of the toaster. It is supported intermediate its length by means of a plurality of supporting members 25 made of suitable electrically insulating material, such as porcelain. Four of these supports are shown at the top of the toaster, three being provided at the bottom. The ends of the resistance conductor are secured to metallic terminal members 26 and 27 which extend through the base 10 and are secured thereto in insulated relation therewith. As shown, the turns of the heating element are spaced more closely together to give an even distribution of heat.

The supports 25 are similar in construction. They are substantially rectangular in cross section and are each provided with a head 28 and with a cross aperture 29 near the end through which the resistance conductor is threaded. The supports at the top of the toaster are secured by means of a channel shaped supporting member 30 which extends between the frame members 11 and 12 just below the top 13. The member 30 is provided with apertures 31 spaced at suitable intervals through which the insulating supports 25 are inserted from above, the apertures 31 being large enough to receive the shanks of the supports freely but not the heads. The width or distance between the upturned sides of the channel member 30 is slightly greater than the corresponding dimension of the heads of the supports 25, and the height of the sides or depth of the channel is also slightly greater than the height of the heads. Projections 32 and 33 are provided at each end of the member 30 whereby the member is secured to the sides 11 and 12. These projections are in fact extensions of the sides of the channel member 30. They fit in vertical slots 34 and 35 provided for them in each of the end members and are furthermore provided with notches 36 and 37 in their lower edges which fit over the upper edge of the end member whereby the channel member 30 is locked against endwise movement. The depth of the slots 34 and 35 is such that the upper edges of the sides of the member 30 are flush with the upper ends of the members 11 and 12, and the member 30 together with the supports 25 are further secured by means of the top 13 which is placed over it and secured by the screws 22 and 23, as previously noted.

Notches 38 are provided at suitable intervals in each side of the channel member 30 to receive guard wires 39. As indicated in Fig. 3 the notches 38 are arranged in pairs, the notches of each pair being directly opposite each other, and the guard wires are substantially in the shape of an inverted U the cross connecting portion between the vertical lengths lying in a pair of notches 38. In other words, the guard wires on

opposite sides of the heating conductor 24 are arranged in pairs which are integral and joined together at the top by a transverse section which lies in a pair of notches. These transverse sections are secured in the notches by the top member 13, which is placed over the member 30. At their lower ends the guard wires pass through suitably spaced apertures in the base 10 whereby they are secured. As shown, five guard wires 39 arranged substantially vertically are provided on each side of the resistance conductor although any suitable number may be used.

At the bottom of the toaster the insulating supports 25 are slipped through spaced apertures provided for them in the base 10, the supports being inserted from below so as to be secured by their heads which engage the lower surface of the base. The supports are further loosely secured to the base by means of a channel shaped member 40 which is secured to the lower side of the base. As shown the member 40 has its sides bent outward at right angles to form flanges which rest against the lower side of the base and through which the bolts 18 and 19 pass to secure the member in place. At intervals along the length of the member 40 just below each support 25 is a protuberance or extruded portion 41 which extends upward far enough to engage the lower ends of the supports and thus secure them. These protuberances 41 may be formed as one large extruded portion which is long enough to engage all three of the insulators 25 on the base. The channel member 40 has the further function of acting as a guard for the electrical conductors 42 and 43 which are laid in it and connected to the terminals 26 and 27. As shown the member 40 is struck downward at one end as indicated by the reference numeral 44 to provide space for an outlet 45 or guard through the end of the base for the conductors 42 and 43.

Pivotally mounted on opposite sides of the heating element are slice holders 46 and 47. Since the two slice holders are identical in construction it will be understood that the description applies to both. The slice holders are stamped sheet metal plates and are provided with suitable apertures 48 for the purpose of ornamentation. They are pivotally mounted between the members 11 and 12 at their lower ends a short distance above the base. As shown the slice holders are provided with inwardly turned right angle projections 49 and 50 at their lower ends on which the slice of bread rests. A projection 51 is provided on each end of these extensions 49 and 50, i. e., on each side of the slice holder. These projections extend through apertures 52 in the members 11 and 12 whereby the slice holders are pivotally mounted. As shown the pivot axes of the slice holders are slight distances from the bends in the slice holders which connect the bottom portions 49 and 50.

The slice holders are biased toward the heating element 24 by means of a single spring 53 situated just below the slice holders at one end of the toaster, the spring having its ends connected to the slice holders respectively. As shown the spring has a central coiled portion from which two arms extend outward in opposite directions at an angle with each other. It is arranged to exert a force tending to open it out, i. e., bring the end portions into alignment. Pivotal connections are provided between the ends of the springs and the slice holders. As shown, the spring is bent at right angles at each end, these right angle portions being inserted in apertures 54 and 55 on the slice holders provided by striking downward a loop of the metal of the slice holder. It will be observed that the points of connection between the ends of the springs and the slice holders are near the inner ends of the portions 49 and 50 and nearer the heating element than the pivot axes of the slice holders. No support for the spring is provided other than that afforded by its connection at each end with the slice holders.

When the slice holders are in toasting position, as shown in the drawing, it will be observed that the force applied by the spring to each slice holder is along a line passing below the pivot axes of the slice holder whereby the slice holder is secured in this position. When one or the other of the slice holders or both is tilted outward away from the heating element for the purpose of replacing or reversing the slice, the point of connection with the spring is moved upward so that the force applied is eventually directed along a line above the pivot axis of the slice holder, and consequently the slice holder is secured by the spring in this position also. The action of the spring is therefore to bias either one or both of the slice holders in either of its two positions. Stops 56 and 57 are provided on the frames 11 and 12 to limit the movement of the slice holders in an outward direction while the movement of the slice holders in the opposite direction toward the heating element is limited by means of lateral projections 58 and 59, constituting operating handles, on each slice holder which rests against the frame members 11 and 12. The handles 58 and 59 may be conveniently utilized to move the slice holder from one position to the other.

While I have described my invention as embodied in concrete form and as operating in a specific manner in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications

thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. An electric toaster comprising a base member, upright frame members secured to said base member, a supporting member secured above said base member, said base and supporting members being provided with apertures, headed insulators made of heat refractory electrically insulating material inserted in the apertures in said supporting and base members from above and below respectively, top and bottom members cooperating with the heads of said insulators for securing them in place on said base and supporting members, and a resistance conductor supported by said insulators passing back and forth between said base and top members.

2. An electric toaster comprising a base member provided with apertures, vertical frame members secured to said base member, a top member joining said frame members, a supporting member underneath said top member provided with apertures, headed insulators made of heat refractory electrically insulating material inserted in the apertures in said base and supporting members, a resistance conductor carried by said insulators, terminals for said resistance conductors mounted on said base, electrical connections underneath said base leading to said terminals, and a member attached to the lower side of said base in engagement with the heads of the insulators carried by said base and forming a guard for said electrical connections.

3. An electric toaster comprising a base member provided with apertures, vertical frame members secured to said base member, a top member joining said frame members, a supporting member below said top member extending between said frame members and interlocking with said frame members so as to be secured in place by said top member, insulators carried by said supporting member, said insulators being provided with heads secured between said supporting member and said top, insulators secured to said base member, a resistance conductor supported by said insulators, and slice holders mounted on said frame members on opposite sides of said resistance conductor.

4. An electric toaster comprising a base, upright frame members secured to said base, a channel shaped supporting member joining the tops of said frame members, said supporting member being provided with apertures and with a series of oppositely disposed notches in its sides, headed insulators inserted in said apertures, the heads of said insulators lying in said channel supporting member, upright guard wires having their upper ends joined by crosswise sections lying in said notches, a top member secured to said upright members so as to secure said insulators and guard wires in place on said channel member, insulators secured to said base, and a resistance conductor supported by said insulators.

5. An electric toaster comprising a base provided with apertures, upright frame members secured to said base, a channel shaped supporting member provided with a plurality of apertures, extensions on the ends of said member provided with notches interlocking with said frame members, said frame members being provided with notches to receive said extensions, insulators provided with heads inserted in said apertures, the heads of said insulators lying between the sides of said channel member, a series of oppositely arranged notches in the sides of said channel member, vertical guard wires having their upper ends connected by cross members lying in oppositely arranged pairs of said notches, a top member secured to said frame members whereby said supporting member, said insulators, and said guard wires are secured, headed insulators inserted in the apertures in said base, a resistance conductor supported by said insulators between said guard wires, and slice holders pivotally mounted on said frame member adjacent the sides of said resistance conductor.

6. A toaster comprising a heating element, a pair of slice holders pivoted on opposite sides of said heating element, a compression spring, and connections between the ends of said spring and said slice holders whereby said spring is supported at its ends solely by said slice holders, said connections being at such points with relation to the pivots of said slice holders that said slice holders are secured by said spring in either one of two positions.

7. A toaster comprising a heating element, a pair of slice holders pivoted on opposite sides of said heating element and movable on their pivots from a position adjacent said heating element to a position removed from said heating element, and a compression spring carried by said slice holders having its ends connected to said slice holders at points spaced from the pivots of said slice holders and arranged to exert a force toward said pivots so as to tend to secure said slice holders in either of their two positions.

8. A toaster comprising a heating element, a pair of slice holders pivoted on opposite sides of said heating element movable on their pivots away from said heating element, and a compression spring having its ends attached to said slice holders so as to be supported solely at its ends on said slice holders in such manner that the force applied by said spring is directed on one side of the piv-

ots of said slice holders when said slice holders are in positions adjacent said heating element and on the other side of said pivots when said slice holders are swung to positions remote from said heating element.

9. A toaster comprising a base member, a pair of vertical frame members, a top member joining said frame members, a heating element disposed between said frame members, a pair of slice holders pivotally secured at their lower ends between said frame members on opposite sides of said heating element, so as to be movable on their pivots from positions adjacent said heating element to positions remote from said heating element, the lower ends of said slice holders being extended inward toward said heating element, and a compression spring having its ends attached to the lower ends of said slice holders so as to be carried by said slice holders and arranged to apply a force tending to hold said slice holders in either of their two positions.

In witness whereof I have hereunto set my hand this 21st day of September 1925.

ALBERT H. SIMMONS.