March 5, 1957 T. W. GLYNN 2,784,287

ELECTRIC RESISTANCE HEATER

Filed Dec. 22, 1954

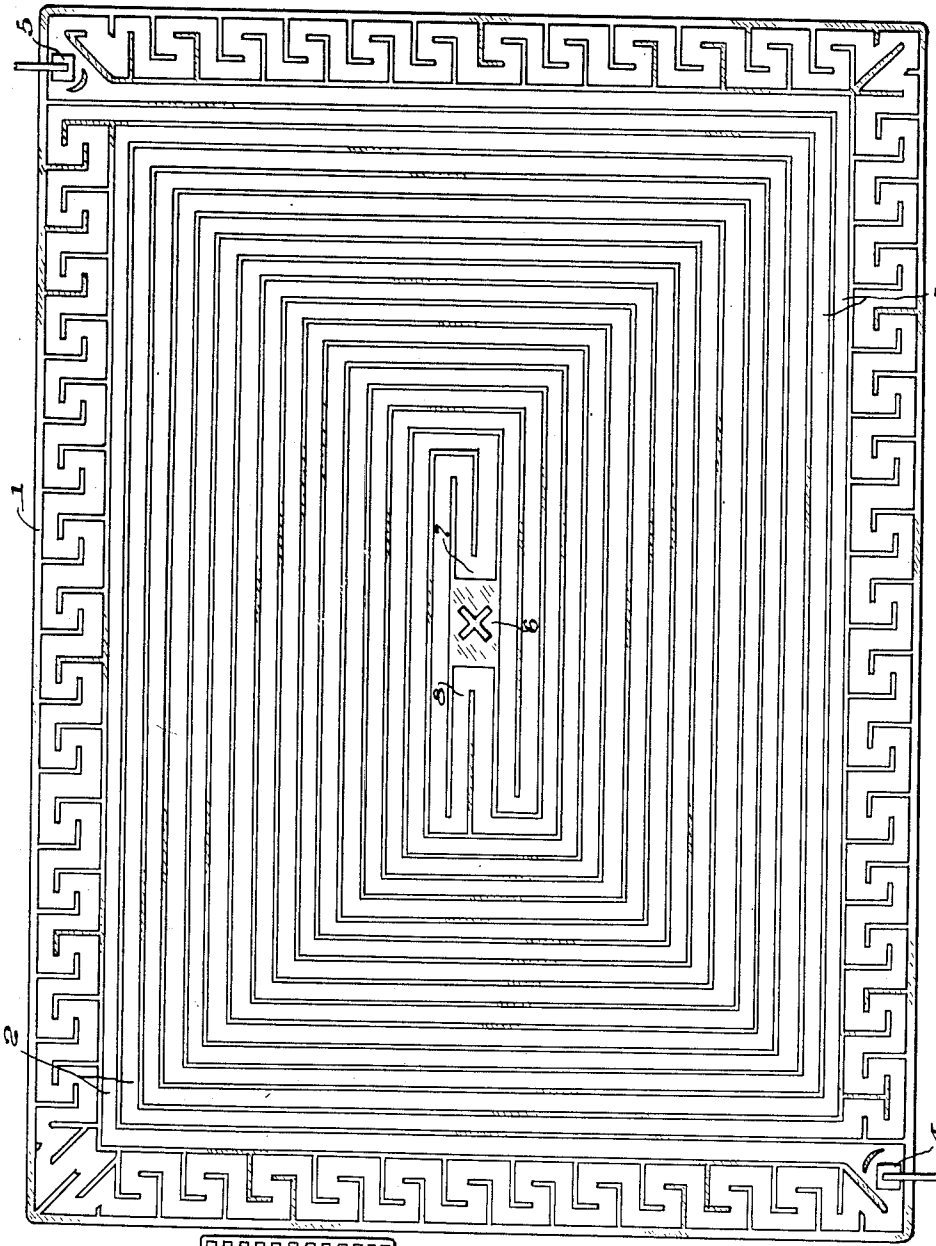

Fig. 1.

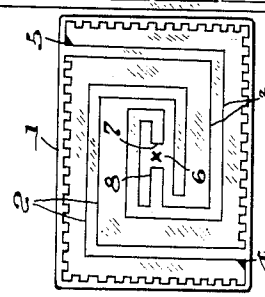

Fig. 2.

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United States Patent Office 2,784,287 Patented Mar. 5, 1957

2,784,287

ELECTRIC RESISTANCE HEATER

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Application December 22, 1954, Serial No. 477,011

5 Claims. (Cl. 219—19)

This invention relates to electric resistance heaters, and more particularly to those in which an electric heating element covers one side of a glass plate.

Such heaters are well known and extensively used for space heating and as trays for keeping food warm. The heating element is generally formed from a band or strip of suitable resistance material sprayed in a predetermined pattern on the glass. In the past the pattern has been utilitarian principally, with little thought given to its aesthetic appearance.

It is among the objects of this invention to provide an electric resistance heater of the character just referred to, which has a pleasing ornamental appearance and yet the desired wattage, and which has a space at the center of the heating element pattern for a trademark or other indicia.

In accordance with this invention a heating element is disposed in a predetermined pattern on one side of a glass plate, on which there also is a pair of electric terminals for the element. The heating element is formed from a pair of electric conductors of substantially the same length connected in parallel between the terminals. The pattern has a border in the form of a decorative scroll which is divided into two parts of substantially the same length. Each of these parts forms a portion of a different one of the conductors. Preferably, the pattern is rectangular and the scroll border is a Grecian scroll. The conductors are arranged in such a way as to provide a blank display area at the center of the heater, where a trademark or other identifying matter may be placed.

The invention is illustrated in the accompanying drawing, in which

Fig. 1 is a view of the heating element side of my heater; and

Fig. 2 is a reduced diagrammatic view showing more clearly the relation of the two conductors to each other.

Referring to Fig. 1 of the drawing, a rectangular panel or plate 1 of tempered glass of the type generally used for an electric resistance heater or warming tray has on one side of it an electric heating element. This heating element preferably is formed in a well-known manner from a suitable resistance material, such as from aluminum or aluminum alloy, sprayed on the surface of the plate in a strip or band arranged in a predetermined pattern.

The preferred pattern is rectangular, with the main body of it formed from straight lengths of the heating element arranged in parallel relation both horizontally and vertically. The lengths decrease in length as they approach the center of the pattern, so that they appear as four groups tapered inwardly from the sides and ends of the plate. It is desirable to provide the pattern with a decorative border in the shape of a scroll, preferably a Grecian scroll. However, a scroll formed from a conductor strip of the customary width has to be so large that its does not look good. On the other hand, if a narrow conductor is used and connected in straight

series, the resistance will be too great to give the required wattage.

It is therefore a feature of this invention that the heating element is formed from two electrical conductors 2 and 3 electrically connected in parallel to cut the resistance in half. The two conductors have substantially the same length, so that both sides of the parallel circuit will be heated to the same extent. As it is difficult, if not impossible, to calculate the resistance of the scroll part of the circuit, if all of the scroll were part of one of the two conductors it would be difficult to provide a second conductor having the same resistance as the first one. This difficulty is overcome by dividing the scroll into two parts of substantially equal length. One part forms a portion of one of the conductors and the other part forms part of the other conductor. Since the two conductors are the same length, it follows that they both will have the same resistance and will balance each other when operated in parallel.

To produce a pattern having the pleasing appearance of the one shown in Fig. 1, the two parts of the border are separated at two diagonally opposite corners of the plate. The two electric terminals 4 and 5 for the heating element are located at those corners. It is convenient to place them where one end of each scroll joins the straight portion of a conductor. The straight part of each conductor between adjacent ends of the two scrolls is doubled upon itself and wound in a generally spiral manner around the center of the plate. It will be seen, especially by reference to Fig. 2, that the two spirals interlock; i. e., each conductor extends between adjacent convolutions of the other conductor, wtih the inner or doubled-over ends of the conductors terminating near the center of the pattern.

The inner end portions of the conductors are so arranged that they leave a rectangular area 6 at the center of the plate for displaying a trademark or other indicia, represented in the drawings by an X. This display space is formed by having the inner end portion of one of the conductors, such as conductor 2, extend lengthwise of the glass plate at one side of the desired open central area, and having a much shorter end portion of the other or second conductor 3 extend in the same direction but along the longitudinal axis of the plate. The inner end 7 of the second conductor terminates at a point that is spaced from the center point of the plate a distance equal to half the length of the display area. The portion of conductor 3 adjoining the inner end extends lengthwise of the plate at the same distance from the center point as the parallel inner end portion of conductor 2, and then conductor 3 extends transversely of the plate across the end of conductor 2. However, the inner part of this transverse length of conductor 3 is provided with a loop 8 that extends toward the center point of the plate but terminates the same distance from it as the end 7 of the same conductor. This produces the rectangular open area 6 at the center of the plate.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. An electric resistance heater comprising a glass plate, a heating element disposed in a predetermined pattern on one side of the plate, and a pair of electric terminals for said element, said element being formed from a pair of electrical conductors of substantially the same length connected in parallel between said terminals, said pattern having a border in the form of a decorative scroll

divided into two parts of substantially the same length, and each of said scroll parts forming a portion of a different one of said conductors, the remaining portion of each conductor being doubled on itself and extending back and forth across the area of the plate within said border.

2. An electric resistance heater comprising a glass plate, a heating element disposed in a predetermined pattern on one side of the plate, and a pair of electric terminals for said element, said element being formed from a pair of electrical conductors of substantially the same length connected in parallel between said terminals, said pattern having a border in the form of a decorative scroll divided into two parts of substantially the same length, and each of said scroll parts forming a portion of a different one of said conductors, the remaining portion of each conductor being doubled upon itself and extending in a generally spiral manner around the center of the pattern.

3. A heater according to claim 2, in which the inner end portions of the doubled conductors are arranged to leave an open display area at the center of the glass plate.

4. A heater according to claim 2, in which said pattern is rectangular and said spirals are four sided and formed from four groups of parallel conductor lengths.

5. A heater according to claim 4, in which the inner end portion of one of the conductors is provided with a pair of loops extending lengthwise of the pattern toward each other, the inner ends of the loops being spaced from opposite sides of the transverse axis of the pattern to provide an open display area at the center of the pattern.

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