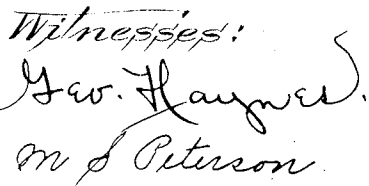


1,171,104.

Fig. 1.



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ELECTRIC HEATER.
APPLICATION FILED JAN. 30, 1911.

1,171,104.

Patented Feb. 8, 1916.
2 SHEETS—SHEET 2.

Fig. 3.

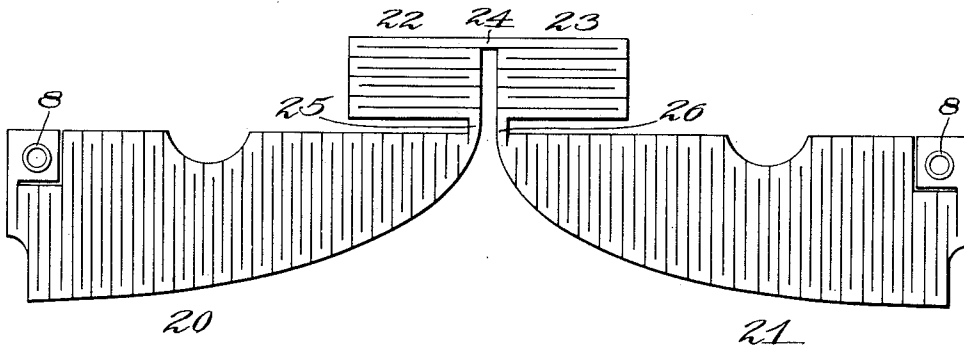
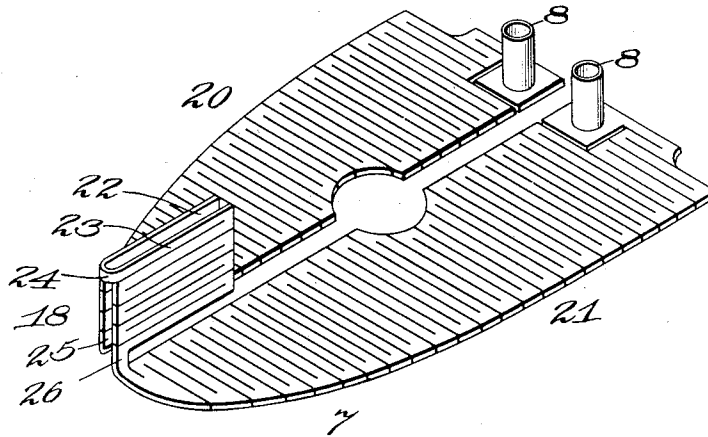


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

1,171,104.

Specification of Letters Patent.

Patented Feb. 8, 1916.

Application filed January 30, 1911. Serial No. 605,345.

To all whom it may concern:

Be it known that I, HARRY W. DENHARD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Electric Heaters, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to electric heaters.

It is particularly applicable to electrically heated flat irons, although its application is not limited to this type of heaters.

The point of a flat iron is generally subjected to a relatively greater amount of work than any other portion of the working face of the iron and consequently the point tends to cool off more rapidly than the remainder of the working face.

One of the objects of this invention is to provide an improved form of electric heater having means for maintaining the entire working face thereof at the same temperature.

Another object is to provide an electric iron in which the point of the iron is maintained at the same temperature as the remainder of the working face by the expenditure of a minimum amount of energy.

Another object is to provide an improved heating element for use with a heat storing means for maintaining the entire working face of an iron at a uniform temperature.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate an embodiment of the invention.

The view of the drawings are as follows:

Figure 1 is essentially a longitudinal sectional view of the iron. Fig. 2 is a perspective view of a portion thereof, and Figs. 3 and 4 are respectively a plan and perspective view of the heating element.

The iron comprises a hollow body portion formed in sections, 1 and 2. The section 1 forms the top and sides of the iron, while the section 2 comprises a plate forming the working surface. To the body portion is

attached a suitable handle 3. The bottom plate 2 is preferably interfitted with the section 1. The two sections are secured together by means of a screw threaded rod 4 and nut 5. The rod 4 is threaded into a boss 6 provided on the upper side of the plate 2, while the nut 5 is external to the body portion.

Resting upon the upper face of the bottom plate 2, but separated therefrom by a layer of suitable insulating material is the electrical heating element or unit 7, which may assume various different forms. The specific structure of the element illustrated will be hereinafter described. At its rear end the heating element is provided with terminal lugs 8 having extensions 9 projecting through the top of section 1 and suitably insulated therefrom. The extensions 9 project into a receptacle 10 carried at the rear of the iron, which receptacle electrically connects the heating element with the supply wires.

Superimposed upon the heating element, but separated therefrom by one or more layers of suitable insulating material, is an iron plate 11 of substantially the same shape and size as the bottom plate of the iron. The plate 11 is provided at its rear end with hollow bosses 12 through which the terminals of the heating element are adapted to project, said terminals being properly insulated from said bosses. The plate 11 has a two-fold function, first, it gives the iron the requisite weight, second, being a heat absorbing body and being in close proximity to the plate 2, it acts as a heat reservoir, tending to maintain the working face of the iron at a uniform temperature.

For a purpose hereinafter set forth, the plate 11 is provided with an enlargement adjacent to the point of the iron and said plate is preferably formed in two longitudinal sections *a* and *b*. The two sections *a* and *b* are preferably secured at their rear ends to the plate 2 by screws 14, said screws being so located as not to contact with the heating element 7. The two sections of the plate 11 are recessed to clear the rod 4 and

they are provided with lugs 15 adjacent said rod. Loosely mounted on the rod 4 is a clamping member 16 engaging the lugs 15 on the sections *a* and *b* to hold said sections in a fixed relation. Threaded onto the rod 4 is a nut 17 adapted to be turned against the member 16 to firmly hold said member in engagement with the lugs on the plate 11 and by this means clamp the plate 11 and heating element against the bottom plate 2 of the iron.

If it be assumed that all portions of the plate 11 be heated to a uniform temperature, it will be apparent that owing to the provision of the enlargement 13 on the plate 11 a much greater volume of heat will be stored in the nose of the iron than in the remainder thereof. It will also be apparent that owing to the uniformity of temperature of all parts of the plate 11, all parts of the working face of the iron will naturally have a uniform temperature. On the other hand, the increased volume of heat stored in the nose of the iron will compensate for the increased expenditure of heat at the point of the iron, thereby tending to maintain the point at an even temperature with the rest of the working face.

In order to insure uniform temperature of all parts of the plate 11, it is necessary to supply the enlarged portion of said plate with a greater volume of heat than the portion of less cross sectional area. To meet this condition, I have provided the heating element 7 with a portion 18 particularly designed to give the increased volume of heat at the point desired. The portion 18 of the heating element is adapted to be received between the two sections of the plate 11, the enlarged portions of the two sections being slightly recessed to form a pocket therefor. Here it should be noted that the portion 18 of the heating element must be of such design as to supply the requisite amount of heat to the enlargement 13 and yet at the same time it must be so disposed and its heating capacity must be so limited as not to disturb the uniformity of the temperature of the working face of the iron.

In practice it would be possible to produce a heating element which would accomplish the required results in various different ways and of various different materials. I prefer, however, to construct the element in the manner illustrated in the drawing, because of the simplicity thereof and cheapness of construction. This element may be produced by stamping or punching the same from a single sheet of conducting material having the proper degree of conductivity. It may be punched at a single operation, the preferred shape and character of the punching being illustrated in Fig. 3. This punching comprises two like sections 20 and 21, which

when arranged side by side as illustrated in Fig. 4 produce a heating element of substantially the same shape and size as the working face of the iron. Each of these sections is provided with a plurality of transversely extending slots, alternate slots extending from opposite sides thereof. This gives each section the character of a reflexed bar or strip, thereby providing a tortuous conducting path for the current traversing the same. In addition to the sections 20 and 21, the element comprises two rectangular sections 22 and 23, slotted in the same manner as the sections 20 and 21. The sections 22 and 23 are entirely separate except for a narrow connecting strip 24 at the top thereof. They are also entirely separate from the sections 20 and 21, except for narrow connecting strips 25 and 26 at the bottom thereof, which connect the same to the points of the sections 20 and 21 respectively. With this arrangement, it will be obvious that a continuous and tortuous conducting path is provided throughout the entire area of the element, thereby giving a maximum heating surface in a minimum space. When the element has been punched as illustrated in Fig. 3, it may be readily bent into the form shown in Fig. 4, whereby the sections 20 and 21 will form the heating portion for the working face of the iron and the portions 22 and 23 the heating portion for the enlargement 13.

It will thus be seen that a simple, efficient heater has been provided in which the heating surface is maintained at a substantially uniform temperature even though the heat demand on certain portions of the working face is unequal. The heating unit which is employed distributes the heat so that it is used efficiently to maintain the working surface of the heater at a uniform temperature. The heating unit is simple in construction and may be formed from a single piece of sheet metal. The entire heater may be inexpensively manufactured and easily assembled. The structure is not only inexpensive but it is durable and efficient.

It should be understood that the structure shown is for the purpose of illustration only and that other structures may be devised which embody the invention and which are included within the spirit and scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination, an electrical heater having heat storing means associated therewith and having a specially heated portion of increased storing capacity adjacent the portion of said heater dissipating the maximum amount of heat.

2. In an electrical heater, a heat transmitting member, a heat storing member as-

sociated therewith having a portion of increased storing capacity adjacent the portion of said transmitting member subjected to the greatest heat dissipating demand and electrical means for supplying heat to both of said members and an augmented quantity to said portion of increased storing capacity.

3. A heater having an electric heating element for heating the working face thereof to a substantially uniform temperature and heat storing means heated by said element and having a specially heated portion of increased storing capacity contiguous to the portion of the heater dissipating the maximum amount of heat.

4. In an electrically heated device, in combination, an electrical heating element for heating the working face of the device to a substantially uniform temperature, and heat-storing means heated by said element and having an increased storing capacity contiguous to the portion of the heated device dissipating the most heat, said element having a portion for specially heating said heat-storing means at the point of its increased storing capacity.

5. In an electrically heated iron, in combination, a heat storing member within the iron having a portion of increased storing capacity adjacent to the point of the iron and a heating element having a portion disposed between the working face of the iron and the portion of said member having an increased storing capacity.

6. In an electrically heated iron, in combination, a heat storing member within the iron having a portion of increased storing capacity adjacent to the point of the iron and a heating element having a portion for heating the point of the working face of the iron and another portion for heating said portion of said heat storing member.

7. In an electrically heated iron, in combination, an electrical heating element for heating the working face of the iron to a substantially uniform temperature, a heat storing plate adjacent to the working face and supplied with heat from said element, said heat storing plate having an enlargement adjacent to the point of the iron and said element having a portion for imparting an increased amount of heat to said enlargement.

8. In an electrically heated iron, in combination, a flat heating element arranged parallel to and in close proximity with the working face of the iron, a heat storing member superimposed upon said heating element, said member having an enlarged portion of increased heat storing capacity adjacent to the point of the iron and said heating element having a perpendicularly disposed portion for heating the enlarged portion of said member substantially

independently of the working face of the iron.

9. In an electrically heated iron, in combination, a heat storing member contiguous to the working face of the iron and having an enlarged portion of increased storing capacity adjacent to the point of the iron and an electrical heating element interposed between the working face of the iron and said member, said element providing a conducting path through the enlarged portion of the heat storing member, whereby said portion is heated substantially independently of the working face of the iron and the remainder of said member.

10. A heating element for electric irons, comprising a single piece of sheet metal, the main portion of said element comprising two sections connected at one end by two perpendicularly disposed sections, said element being slotted throughout its entire length to provide a zigzag path, beginning and terminating at the separated extremities of the sections of the main portion.

11. A portable heat generating and transmitting device, comprising in combination, a heat transmitting member having a portion subject to an increased heat demand, a heat storing member associated therewith and having a portion of increased storing capacity adjacent said portion of said first mentioned member, and heating means for maintaining said heat transmitting member at a substantially uniform temperature and for imparting an increased amount of heat to the portion of said storing member having an increased capacity.

12. A portable electric heating device comprising, in combination, a heat transmitting member having a portion subjectable to an increased heat demand, a heat reservoir member associated therewith and having a portion of increased storing capacity adjacent said portion of said first mentioned member, and an electrical resistance element between said members having a portion for maintaining said heat transmitting member at a substantially uniform temperature and having a portion for imparting supplemental heat to the increased capacity portion of said reservoir member substantially independently of the remainder of said member and of said transmitting member.

13. A portable heat generating and transmitting device, comprising in combination, heat-transmitting and storing means having portions of its working surface subject in use to varying heat demands and having other portions of different heat-storing capacities to compensate for said variations in the heat demands, and heating means for uniformly imparting heat to the working face of said means and for imparting heat

to the remainder of said means proportional
to the heat storing capacity thereof whereby
the working face of said means is main-
tained at a substantially uniform tempera-
5 ture during use.

In witness whereof, I have hereunto sub-

scribed my name in the presence of two wit-
nesses.

HARRY W. DENHARD.

Witnesses:

ALFRED HALVERSON,
M. R. FENNS.