

Sept. 21, 1943.

L. F. BLACK

2,329,693

ELECTRIC RADIATOR

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Fig. 1.

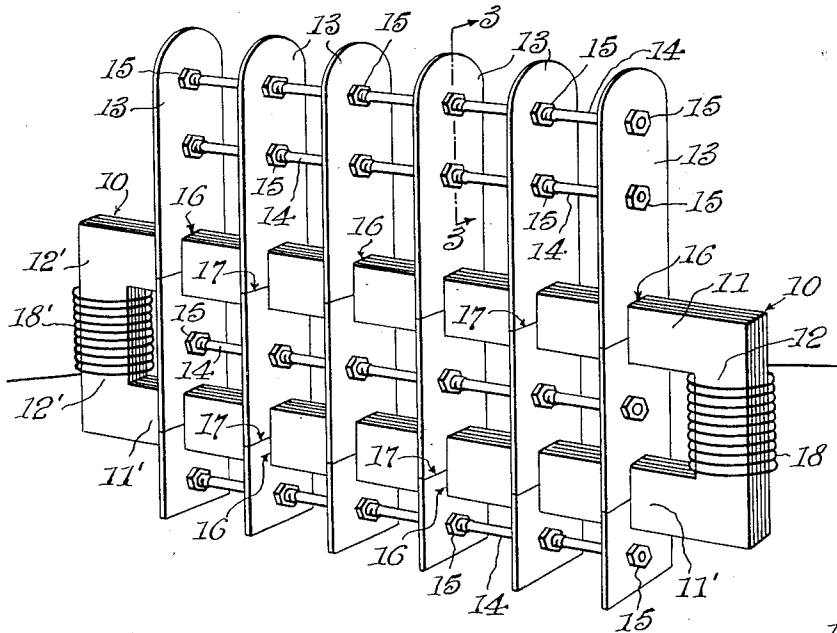


Fig. 2.

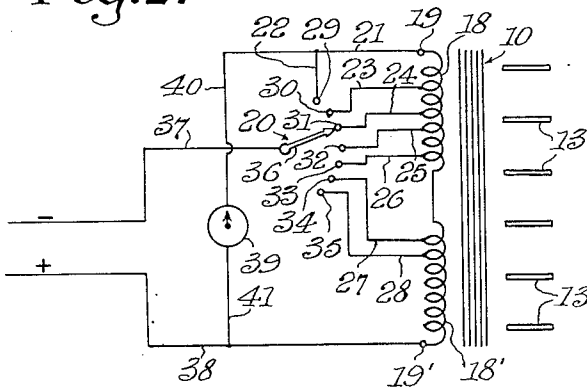
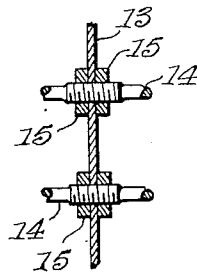


Fig. 3.

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ELECTRIC RADIATOR

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Application August 21, 1942, Serial No. 455,586

8 Claims. (Cl. 219-47)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without payment to me of any royalty thereon.

This invention relates generally to heating devices, but more particularly to an electric radiator operated on the principle of electromagnetic induction, or as a step down transformer, and comprises the novel parts and combinations of parts which will be hereinafter defined in the claims.

One object of the invention is to provide a radiating means wherein the energy of an electric current may be transformed into heat in a reliable and efficient manner.

Another object of the invention is to provide a heating apparatus which is of simple, rugged and economical construction, and one in which the parts may be easily built and assembled in a variety of sizes to accommodate it for any capacity of heating surface required.

Another object of the invention is to provide a heating device of the type described in which the electrically heated elements provide a maximum radiating surface.

Other objects and advantages of the invention will appear in the course of the following detailed description, in which reference is made to the accompanying drawing, wherein like parts are designated by similar reference characters.

Fig. 1 is a perspective view of the heating device showing the laminated core, the coils and the radiating fins;

Fig. 2 is a diagrammatic view illustrating the wiring, the regulating switch, and the current indicator associated therewith;

Fig. 3 is a sectionalized view taken on the line 3-3 of Fig. 1.

Briefly stated, the heating unit comprises a rectangular laminated core, provided with coils, which surround its lateral members, and fins which embrace its horizontal members.

Referring to Fig. 1, the core which is indicated by the numeral 10 is formed with longitudinal members 11 and 11' and vertical members 12 and 12'.

On the longitudinal members of the laminated core, and at right angles thereto, are fitted a multiplicity of parallelly arranged fins 13 which are formed of narrow strips of stainless steel, or other non-magnetic metal, copper plated or covered with copper foil.

The fins are conductively united and braced by the bus bars 14 which are threaded for the reception of nuts 15. These nuts are tightened

against the sides of the fins to retain them in equally spaced parallel position and thus form a rigid construction as shown in Fig. 1.

The fins are provided with rectangular openings 16 which fit the longitudinal members 11 and 11' of the laminated core. At these openings the fins have slits 17 which extend to an edge thereof to provide for attachment to the core, which can be accomplished by bending aside the portion of the fins adjacent the slit to allow passage of the longitudinal members into the rectangular openings after which the bent portions may be moved back to their original position.

Another method for assembling the device would be to form the core in two parts so that the longitudinal members could be threaded through the rectangular openings and the core then united with bolts or by any other suitable means.

The end members of the core are wrapped with coils 18 and 18' which are connected in series to terminals 19 and 19' and hence through a rotary switch 20 to a source of power as indicated diagrammatically in Fig. 2.

The terminal 19 and turns on the coil are connected through conductors 21, 22, 23, 24, 25, 26, 27 and 28 to the arcuate arranged terminals 29, 30, 31, 32, 33, 34 and 35 of the rotary switch, and the selector blade 36 of the rotary switch and the terminal 19' of the coils are connected to the source of power through leads 37 and 38.

The device operates as a step-down transformer, each fin, acting as a short-circuited secondary, and therefore the amount of heat produced in the secondaries depends on the amount of electricity allowed to flow in the primary. This is controlled by the multipoint switch as shown in the electrical connections on the diagram shown in Fig. 2.

A meter 39 may be bridged across the terminals 19 and 19' by conductors 40 and 21 and conductors 41 and 38.

It is obvious that the formation of the core and of the fins and their method of assembly admit of considerable variations and that other structural modifications may be made within the spirit and scope of the invention as defined by the appended claims. The invention, therefore, is not limited to the specific construction and arrangements shown in the accompanying drawing.

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

1. An electric heater comprising a core, coils surrounding said core and a plurality of non-magnetic copper covered radiating elements arranged on said core, and adapted to be inductively heated by said coil.

2. An electric heater comprising an open core, primary coils surrounding said core, and a plurality of fins composed of narrow elongated strips of copper covered non-magnetic material attached to said core and adapted to be inductively heated by said coils.

3. An electric heater comprising an open core, primary coils surrounding said core connected through control means to a source of power, and a plurality of fins composed of narrow strips of non-magnetic copper coated material attached to said core and adapted to be inductively heated by said coils.

4. An electric heater comprising a rectangular laminated core provided with a centrally located opening, series connected primary coils surrounding the ends of said core, and parallelly arranged copper coated radiating elements affixed to the central portion of said core, and adapted to be inductively heated by said coils.

5. An electric heater comprising a laminated core provided with a centrally located opening, a series of connected primary coils surrounding the ends of said core, and parallelly arranged

copper coated non-magnetic radiating elements affixed at right angles to the central portion of said core, and adapted to be inductively heated by said coils.

6. An electric heater comprising a laminated core provided with a centrally located opening, series connected primary coils surrounding the end portions of said core, and a plurality of parallelly arranged copper plated stainless steel radiating fins affixed to the central portion of said core and adapted to be inductively heated by said coils.

7. An electric heater comprising a rectangular laminated open core, series connected primary coils surrounding the end portions of said core, and a plurality of parallelly arranged stainless steel radiating fins, covered with copper foil, affixed to the central portion of said core and adapted to be inductively heated by said coils.

8. An electric heater comprising a rectangular laminated open core, series connected primary coils surrounding the end portions of said core, a plurality of parallelly arranged copper plated stainless steel radiating fins affixed to the central portion of said core, and spacing members attached to said fins to retain the same in equally spaced relation and thereby effect a uniform radiation of heat.

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