(No Model.) 2 Sheets—Sheet 1.

C. H. TALMAGE.

ELECTRIC HEATER.

No. 442,649. Patented Dec. 16, 1890.

Fig. I.

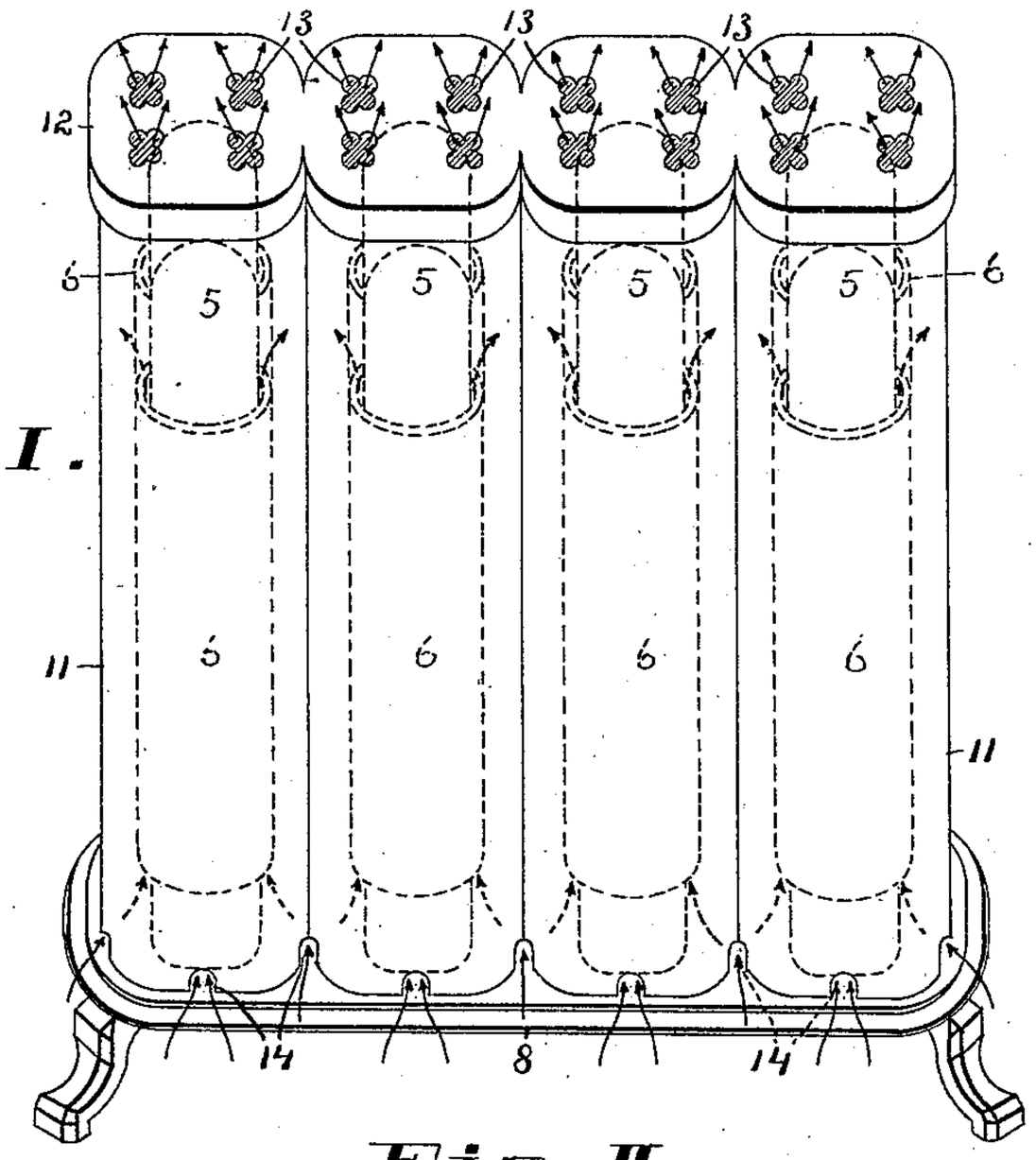


Fig. II.

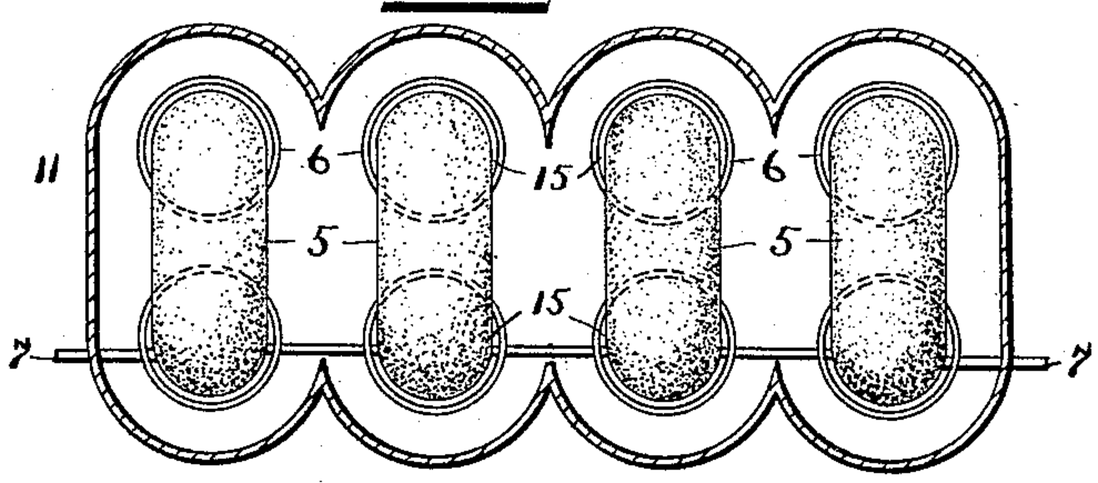
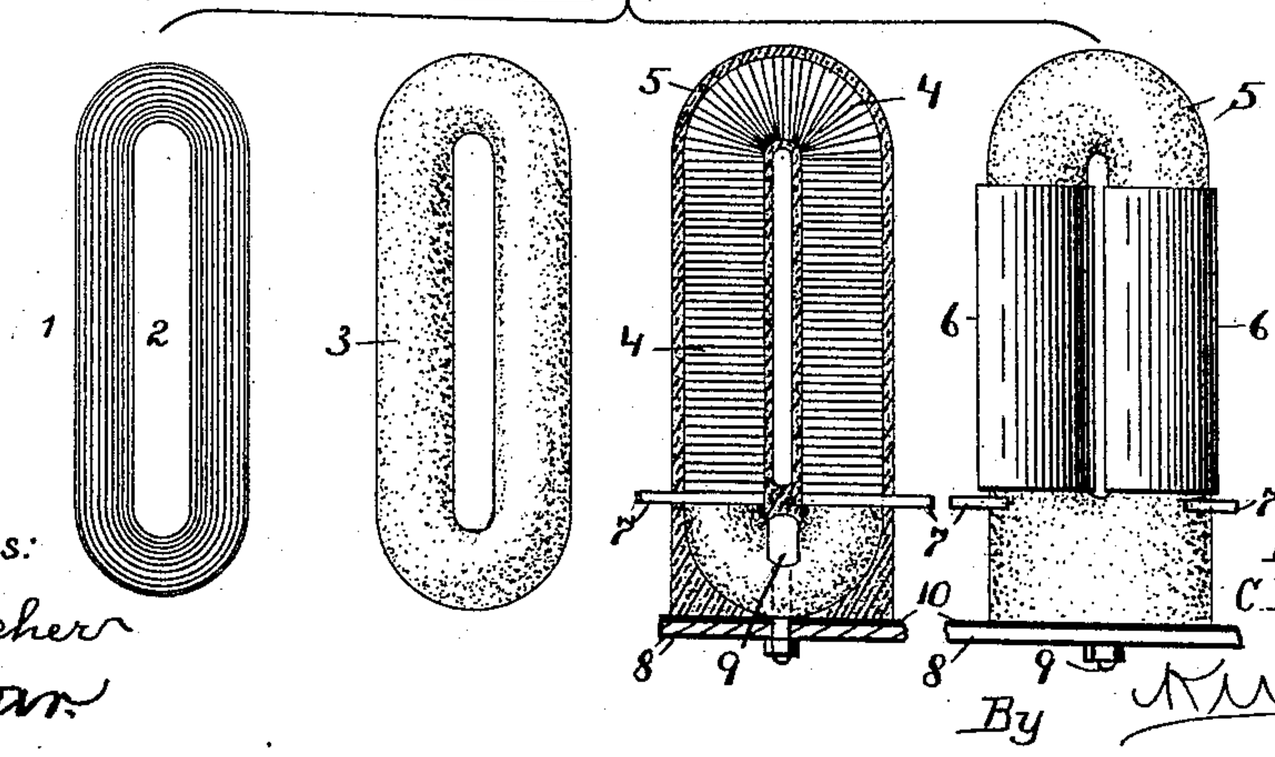


Fig. III.



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(No Model.) 2 Sheets—Sheet 2.

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ELECTRIC HEATER.

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Fig. IV.

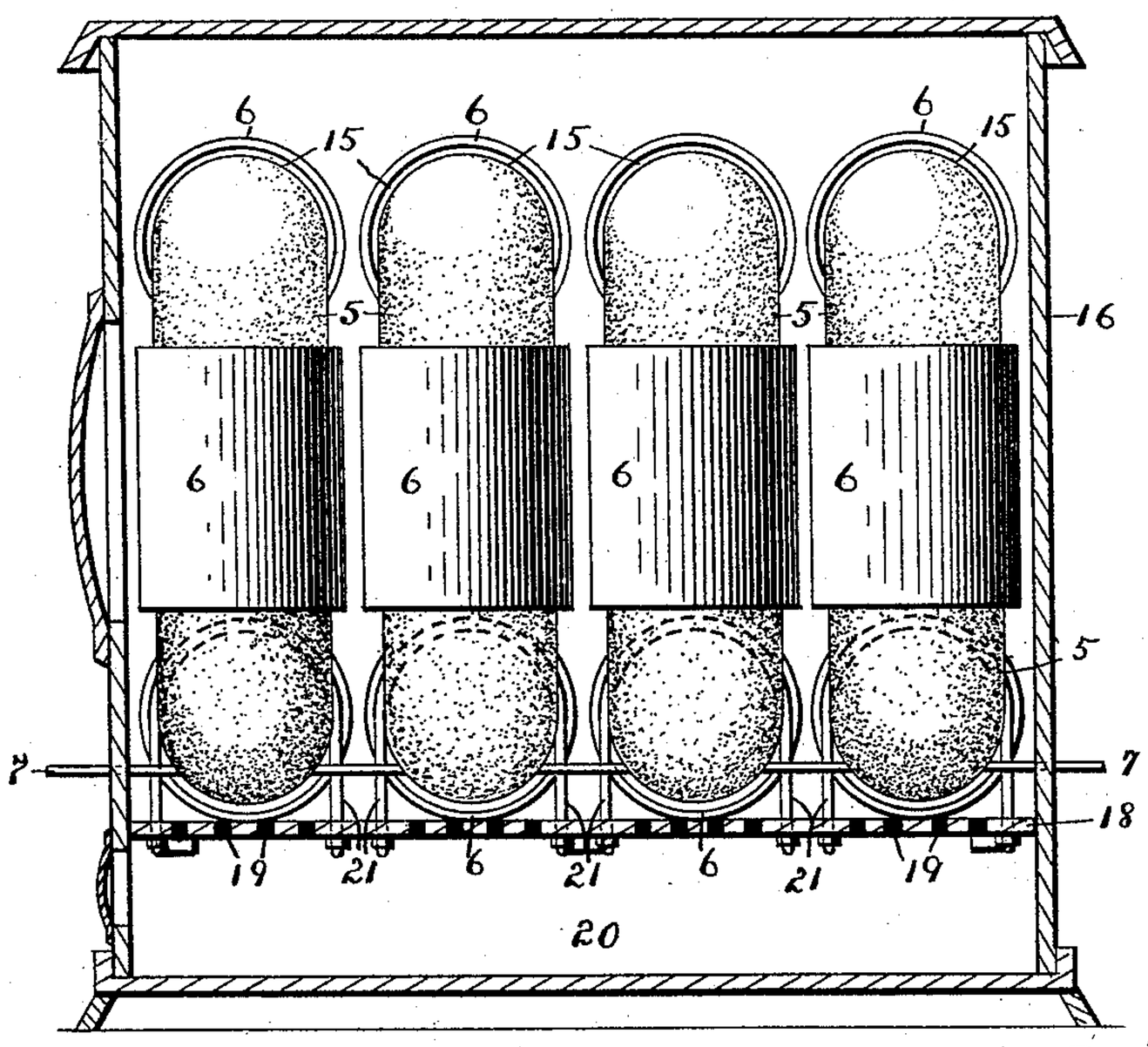


Fig. V.

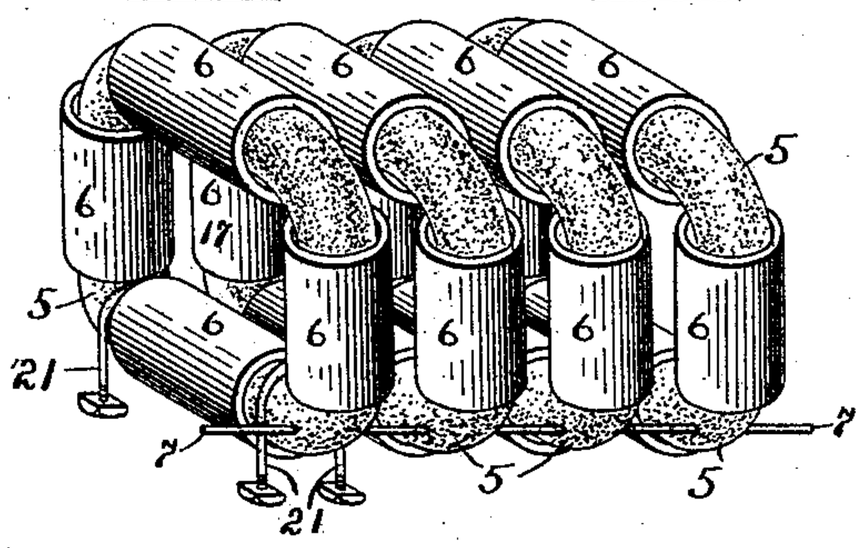


Fig. VI.

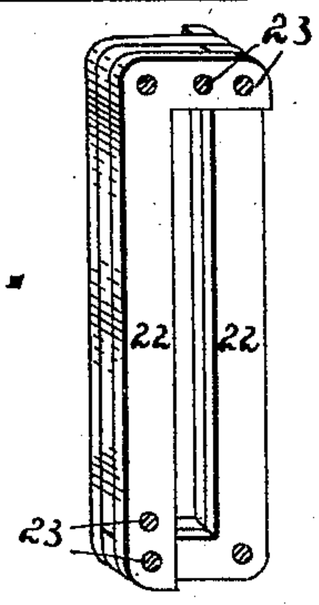
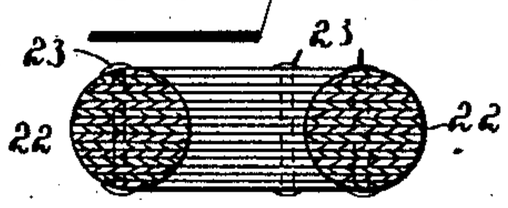


Fig. VII.



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UNITED STATES PATENT OFFICE.

CHARLES H. TALMAGE, OF KANSAS CITY, MISSOURI.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 442,649, dated December 16, 1890.

Application filed April 11, 1890. Serial No. 347,473. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. TALMAGE, of Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Electric Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This application is for an improvement on my application filed November 23, 1889, Serial No. 331,337.

My invention relates to an electric heater; and consists in features of novelty hereinafter described, and pointed out in the claims.

Figure I is a perspective of my improved heater constructed in the form of an ordinary steam or hot-water radiator. Fig. II is a top view showing the radiating-jacket in section. Fig. III is an elevation showing the form of construction. Fig. IV is a vertical section of an ordinary oven, showing my improvement applied thereto. Fig. V is a perspective of my heater constructed in the form used in ovens. Fig. VI is a perspective showing a modification of my magnet or core. Fig. VII is a transverse section of my modified core.

Referring to the drawings, 1 represents the core or magnet, preferably formed of annealed wrought-iron wire wound into an oval shape, as shown in Fig. III, with an intervening space 2 in the center of the core. Around the core 1 is an insulation 3, made of plaster-of-paris or other suitable material.

4 represents the primary coil of wire wound around the core 1 outside of the insulation 3, the wire being of sufficient size to carry the primary current without heating. Around the primary wire is an insulation 5, and around this is wrapped one turn of very thin sheet metal 6, which constitutes the conductor for the secondary or induced current. This secondary circuit is closed upon itself or short-circuited, all the energy being spent in heating the conductor itself, which being very thin and very wide has a maximum radiating-surface in proportion to its cross-section, and thus immediately radiates the heat produced in it by the passage of the large volume of current. It is easily seen from the construction of the heater that the length of the secondary circuit is exceedingly short, and thus an exceedingly small electromotive force in the secondary circuit carries an enormous volume of current around the circuit.

In my heater, as shown in Fig. I, there may be several of the individual heaters, in which the primary coils in each are connected by the conducting-wires 7. The heaters are attached to the base 8 by hooked bolts 9. Interposed between the base 8 and the heaters is a suitable insulation 10, which avoids any chance of the current passing off into the base.

11 represents a heat-radiating jacket of thin metal surrounding the heater.

12 represents the top plate of the heater, having openings 13.

14 represents openings at the bottom of the jacket 11, through which the air passes, as shown by arrows, Fig. I, the air then circulating up through openings 15 between the core and secondary coil, also between the secondary coil and outside jacket, and out through the openings 13 in the top plate of the heater.

My device can be readily applied to ovens for cooking purposes as well as to be used as a heater.

16 represents a section of an oven to which my heater is applied.

For use in an oven the heater may be constructed in an oval form, as shown in Fig. V, with a central space 17, into which articles may be placed to be cooked. The oven may have a plate 18, suitably secured to the oven, with openings 19 therein leading into a chamber 20 beneath the heater. Said chamber may be used for cooking or for various other purposes, the openings 19 allowing a circulation of the heated air into said chamber.

21 represents U-shaped rods, by which the heater may be securely fastened to the plate 18.

22 represents a modification of my core or magnet, which is constructed preferably of a series of L-shaped thin plates of annealed wrought-iron connected to each other by rivets 23. These plates may be gradually reduced in size from the center plates outward, so that a section of the same would form a circle. (See Fig. VII.)

It will be readily understood that my heater can be applied to heating water as well as for the purposes described.

I claim as my invention—

1. A heater or transformer consisting of a closed secondary circuit of a sheet-metal cylinder surrounding the primary coil, said sheet-metal cylinder being separated from the primary coil by a plaster-of-paris insulation, whereby the current is conducted circumferentially, the magnetic lines of force at right angle thereto, and the heat radiates from the surfaces, substantially as described, and for the purpose set forth.

2. In an electric heater or converter, the combination of the primary coil surrounding a core of metal strips or wire and a secondary coil of thin sheet metal surrounding the primary coil, whereby the heat produced by the induced current is radiated for heating purposes, substantially as described, and for the purposes set forth.

3. In an electric heater or converter, the combination of the core formed of metal strips or wire, and the primary coil surrounding the core, with the cylinders surrounding the primary coil for carrying the induced current and to radiate the heat, there being a space between the cylinders and the primary coil for the circulation of air, substantially as described, and for the purpose set forth.

4. In an electric heater or converter, the combination of the core 1, primary coil surrounding the core, secondary coil surrounding the primary coil, suitable insulation material interposed between the core and primary coil and between the primary coil and the secondary coil, and a heat-radiating jacket surrounding the secondary coil, substantially as described, and for the purposes set forth.

5. In an electric heater or converter, the combination of the core, primary coil and secondary coil surrounding the core, base 8, to which the heater is attached, radiating-jacket 11, surrounding the heater, having openings 14, and top 12, having openings 13, said openings permitting a free circulation of air to the heating-surfaces, substantially as described, and for the purpose set forth.

6. In an electric heater or converter, the combination of the oven 16 and a series of electric heaters placed therein, said heaters so formed as to have a central opening for the reception of articles to be cooked, substantially as described, and for the purpose set forth.

7. In an electric heater or converter, the combination of the oven 16, having an additional chamber 20, plate 18, secured in the oven, said plate having openings 19 for the passage of air, and a series of electric heaters situated in the oven, said heaters being secured to the plate 18 by U-shaped rods 21, substantially as described, and for the purpose set forth.

CHARLES H. TALMAGE.

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