

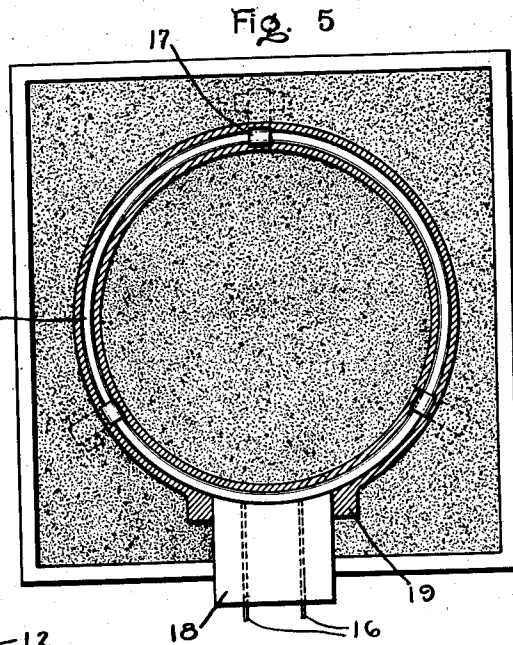
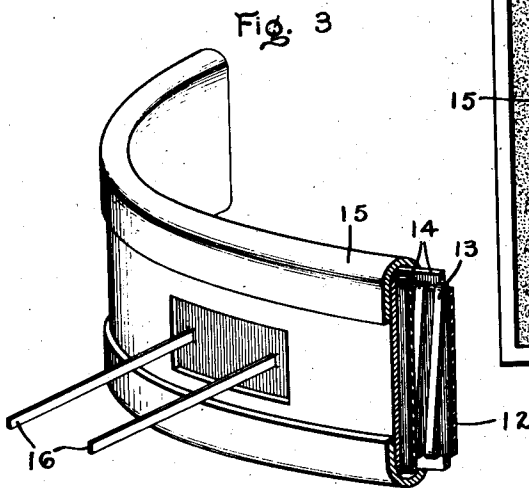
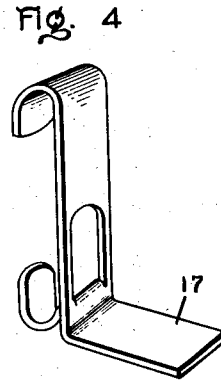
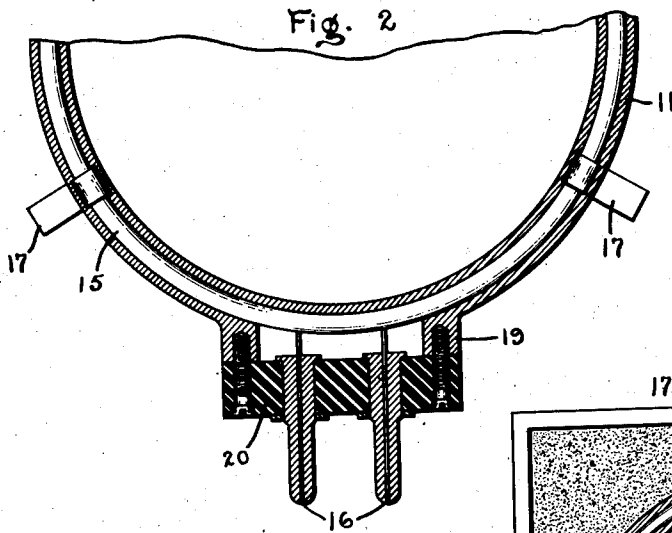
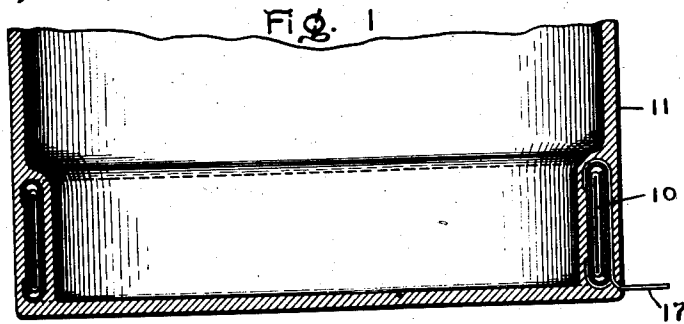
W. STANLEY.
ELECTRIC HEATER.

APPLICATION FILED MAY 13, 1909. RENEWED APR. 10, 1912.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.

1,046,888.



WITNESSES:

Robert H. Palmer,
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Fig. 6

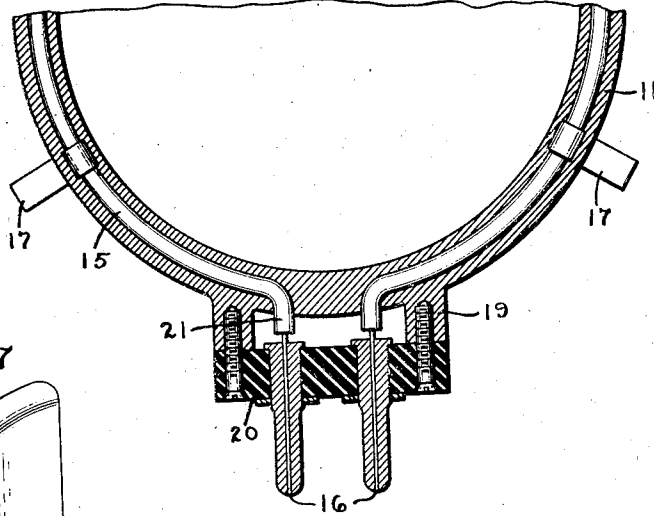


Fig. 7

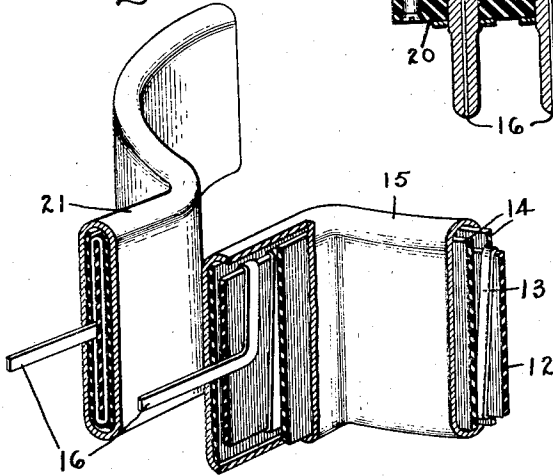
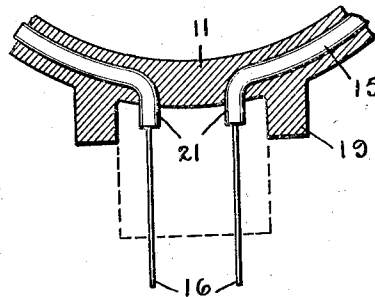


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM STANLEY, OF GREAT BARRINGTON, MASSACHUSETTS, ASSIGNOR TO
GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC HEATER.

1,046,888.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed May 13, 1909, Serial No. 495,754. Renewed April 10, 1912. Serial No. 689,900.

To all whom it may concern:

Be it known that I, WILLIAM STANLEY, a citizen of the United States, residing at Great Barrington, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to resistance devices, such as heaters and the like, and has for its object the provision of a device of this character in which the electric energy is transformed into heat in a simple, efficient and reliable manner.

One of the objects of my invention is to produce an electric heater in which the heating unit is arranged so as to be in the most intimate thermal relation possible with the body to be heated.

The ideal condition for an electric heater is to have a minimum thickness of insulation surrounded at every point by a mass of heat conducting metal in intimate thermal relation with it, so that the heat will be conducted away quickly to the place where it is to be applied. In my previous application, Serial No. 495,753, filed May 13, 1909, I have disclosed and claimed broadly the process whereby this desired result may be brought about. In the said application I disclose a method of casting the resistance into the receptacle or body to be heated without injuring the resistance conductor.

In carrying out my present invention, I utilize the process described in my previous application in applying the unit in a specific manner to the body to be heated. In this case I cast the unit into the walls of the receptacle to be heated, preferably near the bottom of the receptacle. The unit is in the form of a flat ring with its surface parallel with the walls of the receptacle and the terminals are brought out at the bottom. The unit, before it is cast in place, may be constructed in the manner disclosed in my previous application, namely, by winding a resistance conductor upon a strip of thin insulating material such as mica and inclosing the conductor in a metallic shield to protect it from the heat of the cast metal.

In the accompanying drawing, in which I have shown my invention embodied in concrete form, Figure 1 represents a longitudinal sectional view of the bottom portion of the heater; Fig. 2 represents a fragmentary

transverse section of the same; Fig. 3 represents a fragmentary view of the unit before it is cast in; Fig. 4 represents a clip for holding the unit in place during casting; Fig. 5 shows the arrangement of the unit in a sand mold; Fig. 6 shows the unit cast in a slightly modified form; Fig. 7 shows a fragmentary perspective view of the unit; and Fig. 8 shows a detail of the receptacle at a point where the terminals are brought out.

Referring to the drawings, 10 represents the heating unit which is cast in the side walls of the vessel 11 in the bottom of the receptacle. This unit I have shown in the form of a ring or "dog collar", that is, cast with the flat surface parallel with the walls. The construction of the unit is similar to that disclosed in my previous application and will require no detailed description. Briefly, it consists of a strip of insulating material 12 such as mica or the like, bent flatwise in the form of a ring and having a resistance conductor 13 preferably of the ribbon type wound around the strip. This ribbon wound strip is then placed between two rings 14 of insulating material and is inclosed in a metallic casing 15 which must be a metal having a higher fusing point than that of the cast metal 11, as for instance, iron or steel. Terminals 16 are brought out through the insulation, as shown in Fig. 3. The unit is then secured in the clips 17, a detail of which is shown in Fig. 4. These clips are embedded in sand, as shown in Fig. 5, and hold the unit rigid so that the metal may be poured around it. This metal may be aluminum or soft metal, or may be iron, if desired. A core 18 is formed around the terminals so as to protect them and form an opening through the iron for the terminals. The vessel is preferably provided with lugs 19 to which the insulating plate 20, for carrying the terminal pins is secured.

In Figs. 6 to 8 I have shown a slightly modified form. In the form shown in Figs. 1 to 5 the resistance unit is in the form of a continuous ring and the terminals are brought out through the side of the ring.

In Figs. 6 to 8 I have shown a slightly modified form, as shown at 21, and these ends project through the cast metal. The unit, however, and the method of casting it in place, is the same as that above described.

While I have shown my invention embodied in concrete form for purposes of

illustration, 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,—
- 10 1. An electric heater comprising a fluid receptacle having a resistance conductor cast into its side walls adjacent the bottom of the receptacle.
 - 15 2. An electric heater comprising a fluid receptacle having an annular resistance unit cast in its walls adjacent the bottom of the receptacle.

3. An electric heater comprising a fluid receptacle having a flat resistance strip cast in its walls in the form of a ring with its flat surface parallel with the walls.

4. A fluid receptacle having a resistance unit cast in its side walls adjacent the bottom, said unit comprising an insulating strip in the form of a ring having a resistance conductor wound thereon and inclosed in a metallic casing.

In witness whereof I have hereunto set my hand this 6th day of May, 1909.

WILLIAM STANLEY.

Witnesses:

P. A. SMITH,
F. G. LARAMEE.

Corrections in Letters Patent No. 1,046,888.

It is hereby certified that in Letters Patent No. 1,046,888, granted December 10, 1912, upon the application of William Stanley, of Great Barrington, Massachusetts, for an improvement in "Electric Heaters," errors appear in the printed specification requiring correction as follows: Page 1, lines 24-25, for the word "conducted" read *conducted*; and same page, line 104, omit the paragraph indentation and for the words "I have shown a slightly" insert a comma and the words *however, the ends of the ring*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of January, A. D., 1913.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.