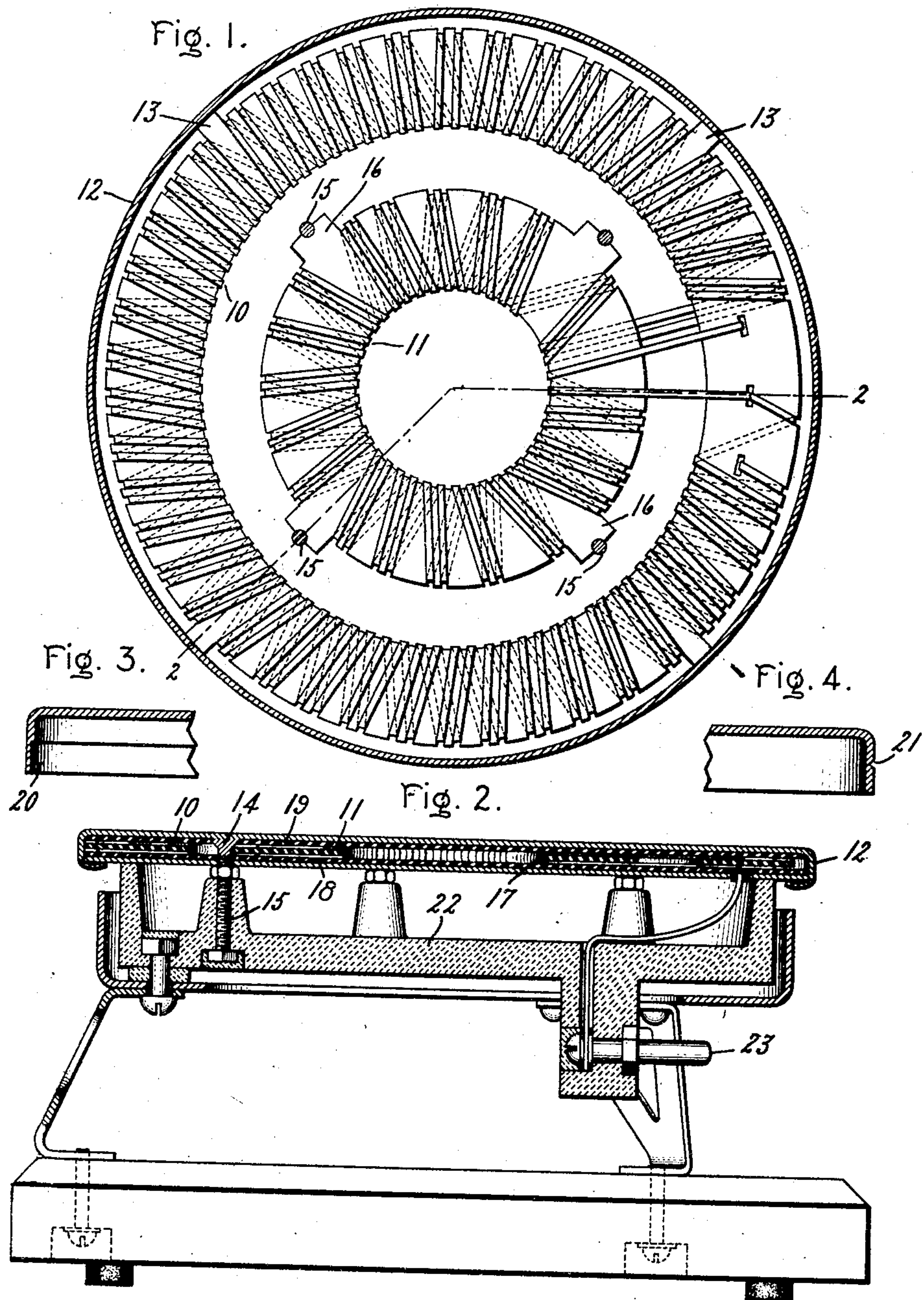


H. M. SMITH.
ELECTRIC HEATING UNIT.
APPLICATION FILED MAR. 29, 1909.

962,793.

Patented June 28, 1910.



Witnesses:
George H. Tilden
J. Ellis Glen

Inventor:
Herbert M. Smith,
by *Alfred H. Davis*
Att'y.

UNITED STATES PATENT OFFICE.

HERBERT M. SMITH, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC HEATING UNIT.

962,793.

Specification of Letters Patent. Patented June 28, 1910.

Application filed March 29, 1909. Serial No. 486,419.

To all whom it may concern:

Be it known that I, HERBERT M. SMITH, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electric Heating Units, of which the following is a specification.

This invention relates to electric heaters and has for its object the provision of an electric heating unit in which the resistance conductor is inclosed in a metallic casing, the arrangement being such that the casing is bent around the unit without injury either to the unit or to the metal of the casing.

In carrying out my invention, I employ in connection with a flat heating unit, a container for the unit which is bent over it in such a way as to hold it firmly in place. It has been found necessary to use relatively heavy metal for forming this casing, which requires a hard blow and great pressure to close down. Moreover, in closing down the metal flange around the unit, the great pressure used in the folding operation bruises the mica insulation and renders the insulation imperfect so that short circuits are liable to result. To overcome this objection, I have cut away the metal at the point where the bend occurs, thus grinding a weak line where the shell is to be folded over.

Other objects of my invention will appear in the course of the following specification, in which I have shown my invention embodied in concrete form for purposes of illustration.

In the accompanying drawings, embodying my invention, Figure 1 is a sectional plan view of my device; Fig. 2 is a sectional elevation of the same on the line 2—2; Fig. 3 shows a fragmentary detail of the cup-shaped casing; and Fig. 4 shows a fragmentary detail of a modified form.

Referring to the drawings, 10 and 11 represent two sections of a heating unit arranged in the form of concentric rings, one within and spaced from the other. This particular arrangement of heating unit forms no part of my invention but I have shown it for purposes of illustration. Furthermore, this particular arrangement of unit is disclosed in an application filed by J. C. Logan, Serial No. 484,692, filed March 20, 1909, and requires no further description

aside from the means which I provide for keeping the unit central within the casing.

Generally speaking, the unit consists of two mica rings mounted within a cup-shaped casing 12. This casing may be of any desired material, as for instance, steel or iron. In order to hold the outer ring rigidly within the casing so that the wires will not touch the casing, I form projections 13 on the mica at various points around the ring, which engage the casing. The cup-shaped portion 12 is provided with bolts having heads 14 brazed to the inner side to project into the cup-shaped portion. The inner ring 11 is likewise provided with projecting portions 16 which receive the shanks of the bolts to hold the ring in place. A plate 17 fits snugly into the casing so as to cover the resistance conductor, rings of mica or other insulating material 18 and 19 being applied to each side of the conductors to insulate and protect them from the casing. In order to bend the cup-shaped casing over the plate 17 without injuring the insulation, I reduce the metal at the bend. In Fig. 3 I have shown the metal reduced by being entirely cut away or counterbored at 20. This enables the metal to be bent down more easily upon the plate 17, thus closing the parts firmly together without injury. In Fig. 4 I have shown another method of bringing about this result, which consists in forming a V-shaped groove 21 in the casing at a point where the bend occurs. The ring of insulation 22 is secured to the plate 17 by the bolts 15 as shown, and the terminals of the resistance conductor are brought down to the terminal pins 23, which are mounted in the insulating ring.

While I have shown and described my invention as embodied in concrete form for purposes of illustration, I do not desire to 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,

1. An electric heater comprising a flat heating unit and a cup-shaped container therefor bent over the unit and having the metal reduced at the bend.

2. An electric heater comprising a flat

heating unit, a cup-shaped container therefor and a plate covering said unit, said container being bent upon the plate and having the metal reduced at the bend.

5 3. An electric heater comprising a flat heating unit and a container therefor bent over the unit and having the metal reduced at the bend.

10 4. An electric heater comprising a flat heating unit, a circular container therefor bent over the unit and having the metal reduced at the bend.

15 5. An electric heater comprising a heating unit, a cup-shaped container therefor bent over the unit and having the metal reduced at the bend.

6. An electric heater comprising a flat heating unit, a circular cup-shaped container

therefor bent over the unit and having the metal reduced at the bend. 20

7. An electric heater comprising a flat heating unit, a circular cup-shaped container therefor and a circular plate covering said unit, said container being bent onto the plate and having the metal reduced at the bend. 25

8. An electric heater comprising a metal casing, a heating element, and mica insulation covering the element having projecting lugs to center the element and its insulation.

In witness whereof, I have hereunto set my hand this 23rd day of March, 1909. 30

HERBERT M. SMITH.

Witnesses:

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