J. C. LOGAN.

ELECTRIC HEATER.

APPLICATION FILED MAR. 20, 1909.

957,226. **Patented May 10, 1910.**

Fig. 1.

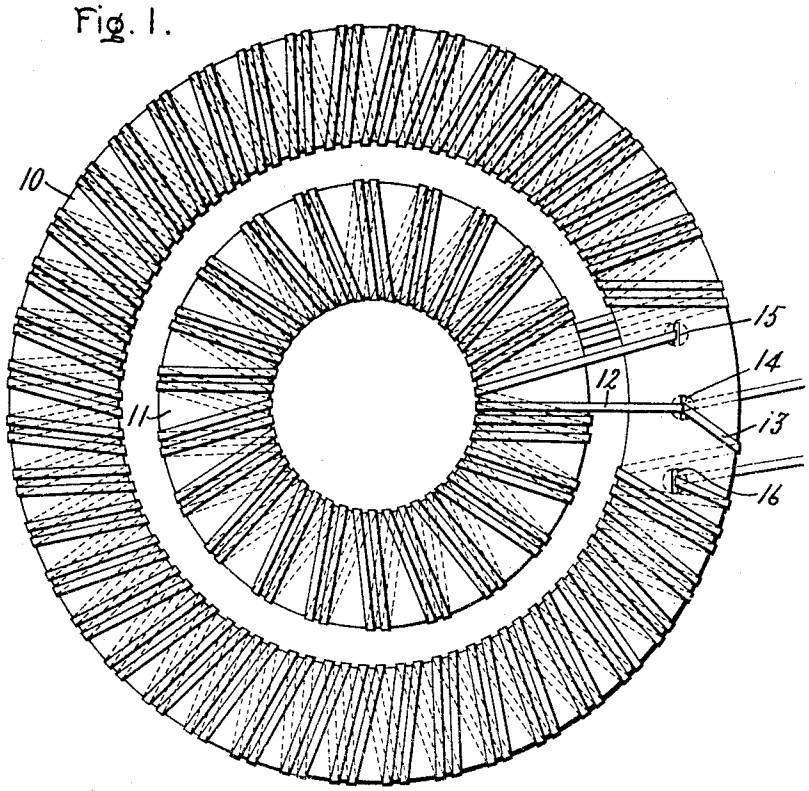
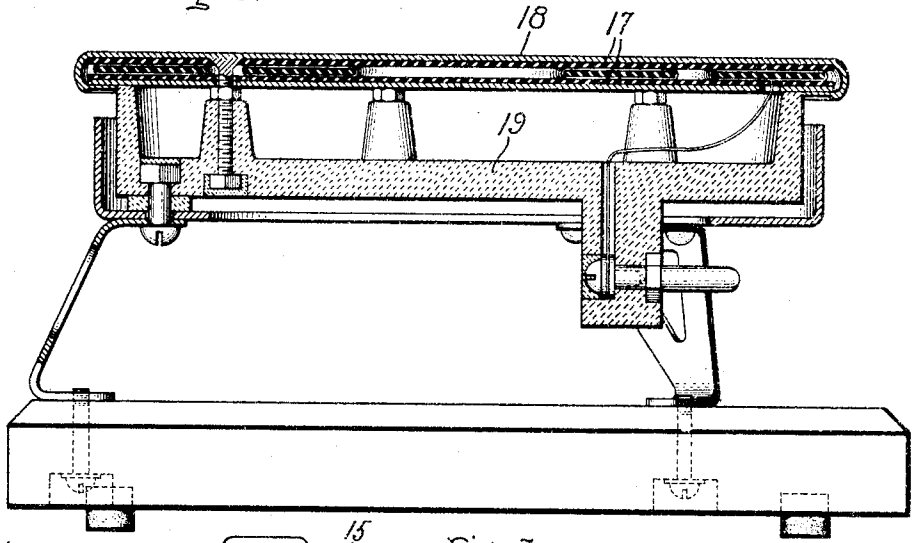


Fig. 2.

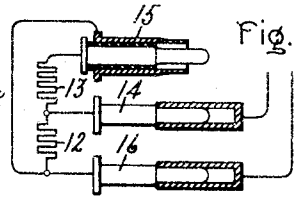


Witnesses:

George H. Tilden

J. Ellis Glen.

Fig. 3.



Inventor:

Judson C. Logan,

by Albert G. Davis

Att'y.

UNITED STATES PATENT OFFICE.

JUDSON C. LOGAN, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC HEATER.

957,226. Specification of Letters Patent. Patented May 10, 1910.

Application filed March 20, 1909. Serial No. 484,692.

To all whom it may concern:

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

My invention relates to electric heaters and has for its object the provision of a device of this character in which more than one heat can be developed in the windings in a simple and efficient manner.

In carrying out my invention, I employ a plurality of rings of insulating material such as mica or the like, upon which the resistance conductors are wound. These rings are placed one within and spaced from the other. Two independent resistance conductors are then wound upon the ring so as to extend throughout the area of both of them. The conductors are wound adjacently and have a common terminal in addition to an independent terminal for each conductor, the arrangement being such that current may be passed through one conductor or through the two in parallel, as desired. In either case, the current will extend over and heat uniformly the entire surface of both rings.

In the accompanying drawing, in which I have shown my invention embodied in concrete form, Figure 1 represents a plan view of the heating unit; Fig. 2 represents a sectional view of an electric stove having my invention applied thereto; and Fig. 3 is a diagram of the circuit connections.

Referring to the drawings, 10 represents an outer ring of insulating material, such for instance as mica or the like, and 11 represents an inner ring of similar material spaced from the outer. Two resistance conductors 12 and 13 are wound upon these rings. These conductors are in the form of resistance ribbon, and are of high resistance material, such for instance as that disposed in the patent of Dempster, No. 901,428, Oct. 20, 1908. These two resistance conductors have a common terminal at 14. Starting from this terminal, the resistance conductor 13 is wound first upon the outer ring in one direction and then crosses over to the inner ring and is wound thereon in an opposite direction coming back to the terminal 15 arranged on the outer ring. Conductor 12 starting from the terminal 14 is wound around the inner ring in one direction and then crosses over to the outer ring and is wound around it in an opposite direction, ending in the terminal 16 on the outer ring. The two windings thus have a common terminal at 14 and independent terminals at 15 and 16 respectively. By this arrangement the terminals may be connected so that either one of the conductors is connected in circuit alone or the two may be connected in parallel. This may be done by the means shown in Fig. 3, the particular arrangement of which forms no part of my invention. In this arrangement the terminal 15 is compound, being arranged to contact with both resistances 12 and 13 as shown. By applying the two socket terminals to contacts 14 and 16, the resistance 12 will be connected in circuit, while if socket terminals are applied to contacts 14 and 15 the resistances 12 and 13 will be connected in parallel. In other words, the resistance conductor would extend through the entire area of the surface to be heated in either case.

In Fig. 2 I have shown the heating unit applied to an electric stove in which the two rings are clamped between two sheets of mica 17 by a metallic casing 18. This is secured to the insulating ring 19 and the terminals brought down to the terminal pins. The mica is very much exaggerated in thickness in the drawing for clearness. In practice it is only a few mills thick.

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 still 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 heating unit comprising concentric spaced rings of insulation having two independent resistance conductors wound thereon adjacent each other and having three terminals, one of which is common to both windings.

2. An electric heater comprising concentric spaced rings of insulation having two independent resistance conductors wound thereon from a common terminal, one of

which is wound first on the inner ring and then on the outer, while the other is wound first on the outer and then on the inner ring.

3. An electric heater comprising an inner and an outer ring of insulating material, and a plurality of independent resistance conductors wound upon said rings.

4. An electric heater comprising an inner and an outer ring of insulating material and a plurality of independent resistance conductors wound thereon adjacent each other and having a terminal common to both windings.

In witness whereof, I have hereunto set my hand this 18th day of March, 1909.

JUDSON C. LOGAN.

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