

(No Model.)

T. E. MORFORD.
ELECTRIC HEATER.

No. 490,034.

Patented Jan. 17, 1893.

Fig. 1

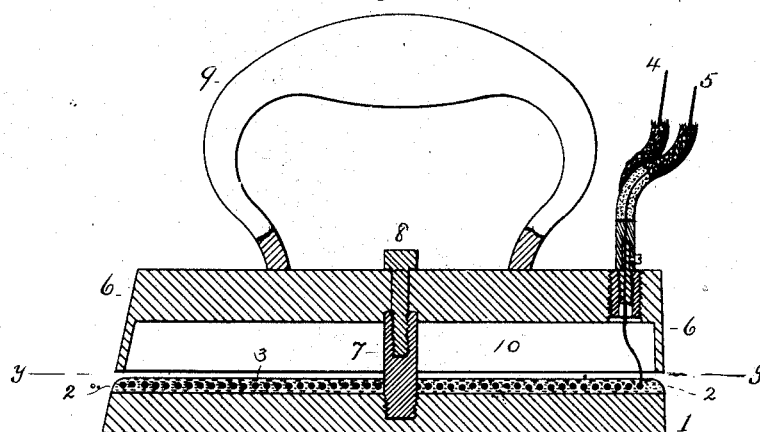
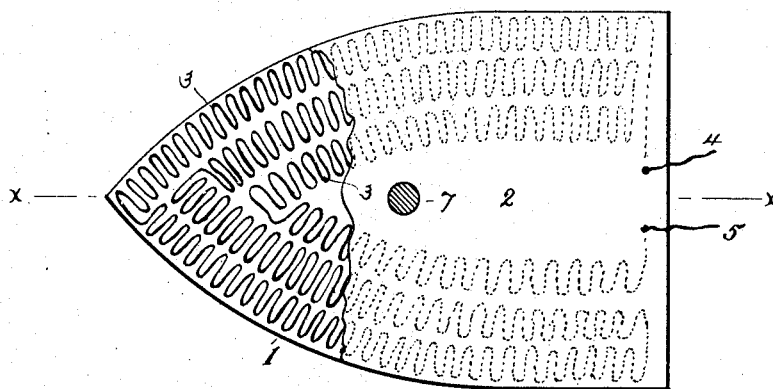


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS E. MORFORD, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE HALF, BY DIRECT AND MESNE ASSIGNMENTS, TO THE ENAMEL INSULATOR COMPANY, OF ILLINOIS.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 490,034, dated January 17, 1893.

Application filed December 19, 1890. Serial No. 375,175. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. MORFORD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Electric Insulators, of which the following is a specification.

My invention relates to means for insulating wires and other conductors of electricity.

It is the primary object of the invention to provide an efficient and desirable means for the insulation of the conductors used in connection with devices that are to be heated by means of an electric current. It will be apparent, however, that like means of insulation of electric conductors may be used in connection with devices other than such as are required to be heated to perform their functions.

The invention, stated generally, consists in embedding electric conductors in an enamel of insulating material that is made to adhere to the device that is to be heated by or otherwise used in connection with an electric current and which serves to insulate the conductors while connecting them to the device.

For the purpose of illustrating the application of my invention I have shown, in the accompanying drawings, in Figure 1, a vertical longitudinal section (on the line $x-x$ of Fig. 2) of a sad-iron provided with an electric conductor or "resistance" as it is commonly termed, insulated according to my improvements; and in Fig. 2 a plan view of the lower portion of the sad-iron on the plane of the line $y-y$ of Fig. 1.

In such drawings 1 designates the metal base, or portion of the sad-iron which comes in contact with the clothes or articles to be smoothed. On the upper surface of this base is an enamel, 2, of any desired substance adapted to serve as an electric insulator. Within the enamel are embedded the coils of an electric conductor 3 in such manner that all portions of the conductor are completely embedded and are separated from one another, and only the incoming and outgoing connections, 4 and 5 respectively, of the conductor are exposed. To enable such sad-iron to be conveniently

used there may be connected to the base an upper shell 6 by means of a post 7 and screw 8, or by any other desirable means; and to this shell is attached a handle 9 for convenience in manipulating the device. The incoming and outgoing wire connections 4 and 5, may be entered through openings in this shell, as indicated in Fig. 1. If desired a space 10 may be left between the enamel and the upper portion of the shell 6 and this may be filled with asbestos or any desirable non-conductor of heat.

In the application of the enamel and electric conductor it is preferable to first spread on the surface of the object a thin coat of enamel in soft condition, which is then caused to harden; afterward the coils of the conductor are laid upon this, and next a second coat of enamel in soft condition is spread thereon and subjected to a sufficient degree of heat to cause the two coats of enamel to unite and firmly adhere together and to the base. In this manner the several coils of the conductor may be completely surrounded and embedded in a compact and integral insulator that is made to adhere to the surface of the object which carries the conductor.

The method herein referred to of applying the insulator and conductor to the base or body is part of the subject-matter of a concurrently pending application Serial No. 411,832, filed November 13, 1891, and is reserved to be claimed therein.

In using the term "enamel" I refer to any of the adhesive substances commonly employed to produce on the surface of metallic and other objects an adherent coating or film usually called an enamel, and which is made permanent by heating it after its application; but I prefer to use such substances as are commonly applied to iron-ware in the manufacture of cooking utensils, generally known as granite-ware. However, I do not regard as equivalents glass or such other vitreous substances as have not the capability of requisite adhesion to the body they coat, and the property of expanding and contracting with it sufficiently to avoid breaking of the insulation.

It will be apparent that while my invention is illustrated only in connection with a sad-iron, its principles are applicable to the insulation of electric conductors in connection with many other devices. And, hence, I do not wish to confine myself to its application to specific devices, nor to the exact manner, heretofore described, of its application; but

What I claim and desire to secure by Letters Patent, is:

1. In an electro-heating apparatus, the combination, with the heated-surface plate and the resistance, of a coating of enamel or its equivalent securing the resistance to, but insulating it from said plate, substantially as set forth.

2. In an electro-heating apparatus, the combination, with the plate to be heated and the resistance, of a coating of adhesive enamel or its equivalent for securing the resistance to, but insulating it from said plate, substantially as set forth.

3. In an electrical apparatus, the combination with a supporting body and an electric conductor, of a coating of enamel or its equivalent securing the conductor to while insulating it from the body, substantially as set forth.

THOMAS E. MORFORD.

Witnesses:

F. W. NEVINS,
P. H. GUNCKEL.