No. 652,635. Patented June 26, 1900.

H. N. POTTER.

ELECTRIC HEATER AND SUPPORTING MATERIAL THEREFOR.

(Application filed Aug. 9, 1899.)

(No Model.)

Fig. 1

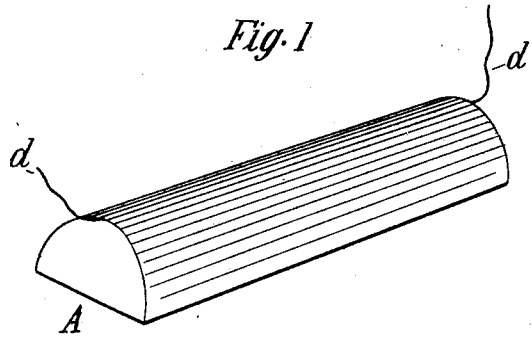


Fig. 2

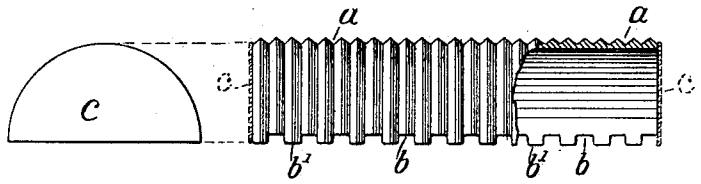
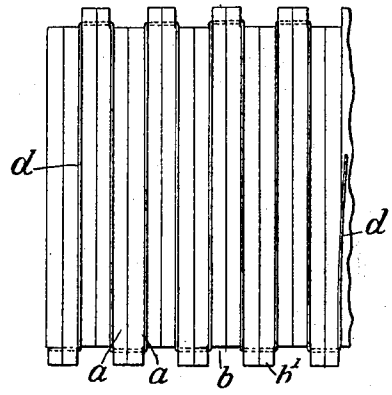


Fig. 3



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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER AND SUPPORTING MATERIAL THEREFOR.

SPECIFICATION forming part of Letters Patent No. 652,635, dated June 26, 1900.

Application filed August 9, 1899. Serial No. 726,620. (No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States of America, and a resident of Göttingen, Germany, have invented certain new and useful Improvements in Electric Heaters and Supporting Material Therefor, of which the following is a specification.

In the class of electric lamps in which glowers or illuminants are employed which are practically non-conductors when cold and require to be raised to a moderate temperature before they become conductive it has been customary to make use of electric heaters for imparting to the glowers the initial temperature. For this purpose coils of fine wire are usually placed in proximity to the glower, and these coils are raised to a high temperature by the passage of electric current through them. When the current for operating the heater is derived from the same circuit as the current which traverses the glower, there is, unless special means are provided to avoid it, the danger of an arc being established between the glower or its terminals and the heating device by reason of a difference of potential between the two parts. This is the more liable to occur by reason of the heated atmosphere between the two. It is usual also to so support the heater with reference to the glower that the two may be separated when the heater has performed its function of raising the glower to its conductive temperature. It is desirable, therefore, that means be employed for preventing the occurrence of arcs between the glower and the heater and also that the heater itself, which is usually the movable part, should be of such material and construction as to be of as little weight as practicable.

My invention aims to so organize the parts that there shall be only a slight difference of potential between any portion of the glower and the adjacent portion of the heater and also to form the heater so that it shall be of light weight and at the same time capable of imparting the heat to the glower in an efficient manner.

The invention consists generally in forming a support for the heating-conductor of a U-shaped cross-section or in the form of a tube having a longitudinal opening from end to end, and thus adapted to more or less encircle the glower itself when in its position for heating the glower. The ends of the tube may themselves be closed, if desired. Upon the exterior of this support the heating-wire is wound back and forth, commencing at one end, suitable grooves being provided in which to lay the convolutions of the wire. These convolutions are laid in planes approximately at right angles to the length of the glower, so that the fall in potential from end to end of the heater-wire will be in accord with the fall of potential from end to end of the glower, and there will be pratically the same difference of potential between the one end of the glower and the adjacent end of the heating-conductor as between the other end of the glower and the end of the heating-conductor adjacent to it. In other words, by this arrangement of the heating-conductor I avoid the difficulty which would be encountered were the convolutions of the heating-conductor laid from end to end along the support or in some other manner whereby the fall of potential in its length would not be in the same direction and more or less in proportion to the fall in the adjacent portions of the glower. The material which I usually employ for the support of the heating-conductor is a magnesium silicate, such as talc or soapstone powder. This material will be referred to hereinafter as "talcite."

The invention will be described more in detail in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of one of the heating devices. Fig. 2 is a side elevation of the support before the wire is placed in position, and Fig. 3 is an enlarged view of a detail.

Referring to the figures, A represents the supporting-body for the heating-conductor. This I usually prepare by first making a thick paste or dough of talc or talcite by mixing it with a vehicle such as gum arabic or tragacanth or some other suitable material. This is then rolled into thin sheets, and the grooves *a* are pressed into one surface thereof. If desired, the sheet may be cut into the proper shape and size before the grooves are formed,

and the notches *b* may at the same time be formed at the edges for forming projections *b'*, around which the conductor is to be subsequently wound. The sheet is then bent over into a semicylindrical or U-shaped cross-section, and, if desired, end pieces *c* may be placed on after the sheet has been baked, or they may be omitted entirely. When the sheet has been formed into the desired shape, it is baked—as, for instance, by being placed in a porcelain oven or other suitable baking-furnace and heated to a sufficient temperature to solidify and harden it, giving it more or less the appearance of unglazed porcelain. The heating-conductor *d* is then wound upon the outer surface of the support within grooves *a*, commencing at one end and proceeding from edge to edge back and forth until the other end is reached. At the edges the conductor is hooked or wound about the projections *b'*. After the wire is in position it is covered by a paste of the same or a similar material as that employed for making the body of the support. This protects the conductor and holds it in position.

By winding the conductor upon the outer surface of the heater the body of the support intervenes between the heating-conductor and the glower, and thus diminishes the opportunity for arcs forming between the two. Moreover, if the glower itself were to break while in a heated condition and fall against the heater-support it would not come into contact with the heating-conductor, and thus the danger of injury to the heating-conductor is lessened. In forming the projections *b'* at the edges it is usually desirable to round them off, as shown in the drawings, so that they shall not offer sharp edges to the conductor wound about them.

The material talcite is very light and has considerable strength, and thus it is possible to make the heater-support of this material with much less weight than with porcelain or other similar materials. Moreover, it is less liable to crack or become distorted under the influence of considerable changes of temperature than is porcelain or other such materials as have heretofore been used for this purpose.

The special form of support for the heating-conductor may be employed with other materials than talcite. It is not necessary that the particular method of disposing the heating-conductor which has been described nor the particular shape of the support itself should be always adhered to in making use of talcite as a support.

I claim as my invention—

1. A heating device for electric lamps consisting of a thin insulating-body of curved or U-shaped cross-section, the said body being provided upon its outside with grooves transverse to its longitudinal axis and being cut completely through at the ends of the grooves so as to form teeth along the edges of the heating device, in combination with a heating-conductor wound back and forth within the said grooves and around the said teeth.

2. A heating device for electric lamps consisting of a thin insulating-body of curved or U-shaped cross-section, the said body being provided upon its outside with grooves transverse to its longitudinal axis, in combination with a heating-conductor wound back and forth within the said grooves.

3. A heating device for electric lamps consisting of a thin insulating-body of curved or U-shaped cross-section, the said body being provided upon its outside with grooves transverse to its longitudinal axis, in combination with a heating-conductor wound back and forth within the said grooves, and a suitable paste or cement for holding the conductor in place.

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