

(No Model.)

J. F. McLAUGHLIN.
ELECTRIC HEATER.

No. 490,082.

Patented Jan. 17, 1893.

Fig. 1.

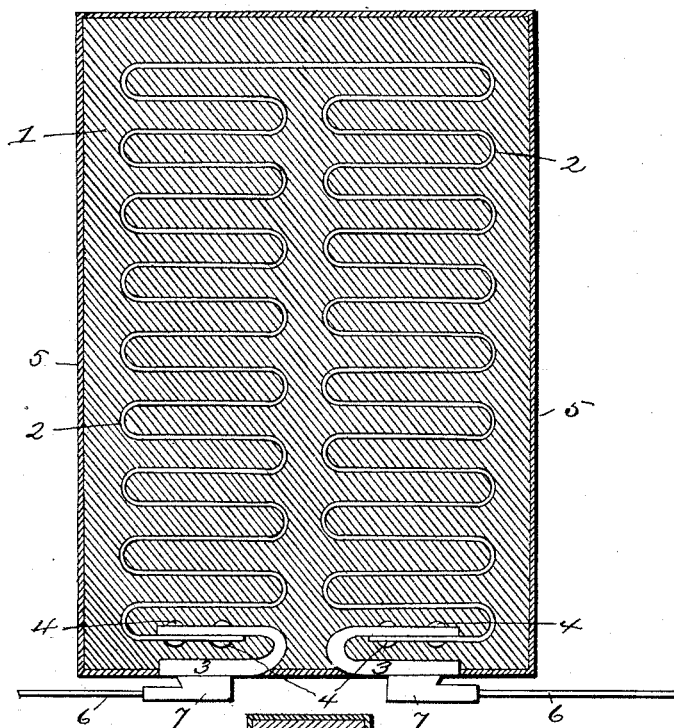
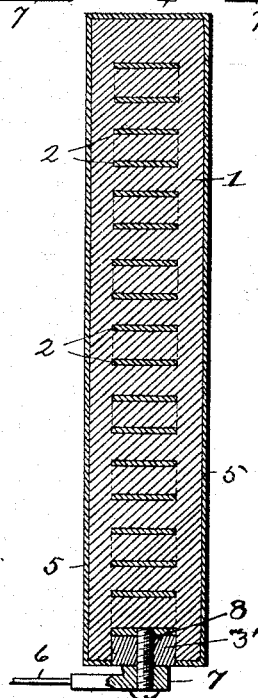


Fig. 2.



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JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 490,082, dated January 17, 1893.

Application filed April 28, 1892. Serial No. 431,020. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

My invention has reference to improvements in electric heaters, and its object is to furnish an effective heater that will not be deteriorated by the admission of air to the heater element or by the admission of moisture to the material which envelops the heater element.

In my Letters Patent No. 432,205, granted July 15, 1890, I have described a heater of that character; in that heater a conductor of high electrical resistance was embedded in an air tight material composed of a mixture of clay, plaster, of-paris, and asbestos. This embedding substance protects the heating conductor sufficiently against the admission of air so that the conductor when heated by the passage therethrough of an electric current, will not oxidize and become deteriorated. My present invention secures the same result in a cheaper and more convenient way and secures the additional beneficial result, that it prevents the absorption of water by the embedding material. It involves the use as an embedding material of one of the ingredients only which are used in the invention described in my aforesaid Letters Patent, that is to say, in my present invention the embedding material is composed entirely of clay, and of that species which is known as fire clay. This is baked in the ordinary manner, while the heating conductor is embedded in the same, and in order to positively exclude the air from the heating conductor and moisture from the embedding material, the latter is provided with a coat of glazing or enamel, whereby the appearance of the heater is at the same time improved; it can be made highly ornamental by designs in colors, and does not require an ornamental mantle of iron or other material, as is commonly used in connection with ordinary electric heaters, when the same are mounted in drawing rooms, or other places where rough and unsightly structures could not be tolerated.

Broadly speaking, therefore, my invention consists in an electric heater composed of a conductor of comparatively high resistance embedded in baked fire clay, and made air and water-proof by a layer of glazing or enamel.

A further improvement consists in making the terminals of the heating conductor flush with the body of the embedding material, but so exposed that electrical contact may be made with the same.

My improved electrical heater may assume a great variety of forms and may be shaped, if so desired, to represent the general outline of radiators, stoves, &c., but my invention is not limited to any particular shapes or configurations, and in the accompanying drawings which form a part of this specification, only one of the simplest shapes is illustrated, with the understanding that this shape may be changed at will.

In the said drawings—Figure 1, represents a vertical section of my improved electric heater, and Fig. 2, a vertical section at right angles to that of Fig. 1, showing also a modified form of terminal.

Like numerals of reference indicate like parts.

The heater as shown, is composed of a prismatic body 1, of fire-clay, and is preferably made of considerable width and height, but only of moderate thickness. In this body of fire-clay is embedded the heating conductor 2, which is in the form of a flat strip of metal of high electrical resistance, such as iron, German silver or platinum; but iron, having been found to be very effective, is preferred on account of cheapness and general durability. This band of iron is bent in sinuous loops traversing the body of the fire-clay, as shown, and to each end of the strip is connected a contact terminal 3, which is considerably thicker than the band proper, and which is so disposed that it projects slightly beyond the edge of the slab or body 1, as shown. The terminals 3, 3, may be connected with the sinuous band in any desired manner, but will ordinarily be riveted to the same, as shown in Fig. 1, by rivets 4.

In Fig. 1, the terminals are shown as U-shaped, one of the branches of which is riveted to the band 2, while the other band ex-

tends parallel with, but slightly beyond, the surface of the lower edge of the body 1. In the construction shown in Fig. 2, the terminals may be connected with the band in the same manner, but are there shown as heavy pieces 3', of metal, with a screw-nut formed in the same, for connection therewith of the leading conductors, as will presently appear. The fire brick body 1, is molded about the sinuous band in a manner well understood by those skilled in the art, and is then baked or burned in the usual manner of bricks. In this condition the electric heater would have the defect that on account of the porosity of burned fire clay, air would find access to the heating conductor and would oxidize the same in the course of a short time, so that this conductor would gradually burn away, its resistance thereby gradually increasing, so that from time to time the tension of the current used would have to be increased, until finally the resistance would become so great that the heater would be practically useless. This has been found to be the case with electric heaters in which the heating conductor was embedded in fire-clay pure and simple, and this difficulty I avoid by producing upon the body of the heater a good layer of glazing or enamel 5. This glazing or enamel is of such thickness that the surfaces of the termini of the heating conductor are flush with the glazing. In the practical manufacture, however, the glazing mass will be applied to the whole slab, including the contact surfaces of the termini, but when the glazing is complete the portions which cover the contact surfaces are removed so that the latter become flush with the glazing.

An electric heater thus constructed absolutely prevents the admission of air to the heating conductor, which can therefore be made of a base metal like iron, which by reason of the exclusion of air, will remain unaltered by continued use; the absorption of moisture by the heater is also effectively prevented by the glazing, and the steaming after exposure to a damp atmosphere, is avoided.

Another advantage due to the glazing is that it prevents the lodging of particles of dust in the pores of the embedding body, which always takes place when that body has a more or less cellular or porous surface. These particles which lodge in the superficial

pores of ordinary heaters, cannot be perfectly removed by the ordinary way of dusting and brushing, and when the heater is brought up to a high temperature, these dust particles are burned and produce a disagreeable odor. When, however, the surface of the embedding body is glazed, every particle of dust, that may have settled upon the surface, can be removed without trouble.

The leading conductors 6, may be connected with the termini 3, 3, either by allowing the heater to rest by gravity upon contact plates 7, 7, connected with the leading conductors, so that the termini 3, 3, will bear upon the contact plates 7, 7, as shown in Fig. 1, or the heating conductors may be secured to the termini by means of a screw 8, as shown in Fig. 2, or the connection may be made in any other suitable manner.

It will be understood that I may assemble any number of my improved heaters in one structure, and may connect the termini of the different heaters with a switch-board, in such manner as to enable me to place one or more of said heaters in circuit, according to the amount of heat required, as shown in my patent No. 432,205 of July 15, 1890.

Having now fully described my invention, I claim and desire to secure by Letters Patent:—

1. An electric heater composed of a conductor of high electrical resistance, embedded in a mass of fire proof material coated with glazing or enamel, substantially as described.

2. An electric heater, consisting of a conductor of high electrical resistance, embedded in burnt clay, coated with glazing or enamel, substantially as described.

3. In an electric heater, the combination with a conductor of high electrical resistance and an embedding body of burnt fire clay covered with glazing or enamel, of contact terminals for the conductor, disposed flush with the glazing of the embedding body, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

ROBT. S. GLASS,
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