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Feb. 13, 1923.

1,444,940.

T. A. REID.

RESISTOR SUPPORTING MEANS.

FILED JUNE 3, 1921.

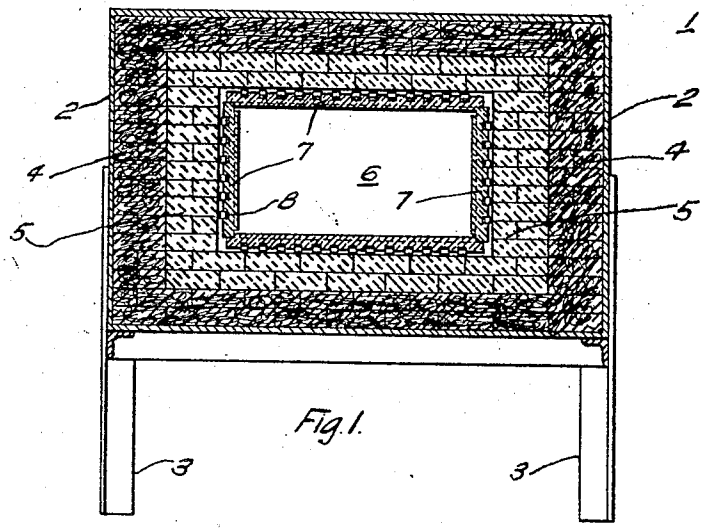


Fig. 1.

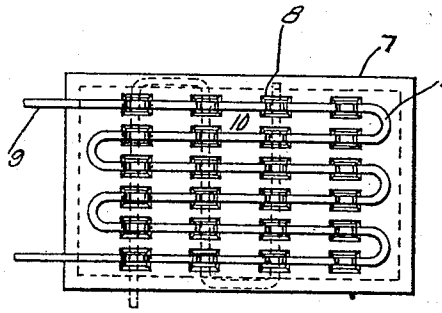


Fig. 2.

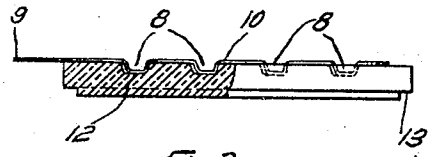


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

THOMAS A. REID, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

RESISTOR-SUPPORTING MEANS.

Application filed June 3, 1921. Serial No. 474,807.

To all whom it may concern:

Be it known that I, THOMAS A. REID, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Resistor-Supporting Means, of which the following is a specification.

My invention relates to electric furnaces and particularly to electric resistance furnaces, and it has for its object to provide a relatively simple, inexpensive and easily manufactured resistor-supporting means for electric resistance furnaces.

In practicing my invention, I provide a plurality of flat refractory members each having a plurality of relatively small alined recesses in one or more surfaces thereof. I provide a metallic resistor member which is preferably of relatively large cross-sectional area, and is provided with a plurality of crimped or offset portions adapted to be located in said recesses to prevent movement of said resistor member relatively to said refractory supporting member. The refractory supporting members are adapted to operate also as a muffle for the furnace chamber.

In the single sheet of drawings,

Figure 1 is a view, in vertical cross-section, of an electric resistance furnace comprising a device embodying my invention;

Fig. 2 is a top plan view of a heating element embodying my invention, and

Fig. 3 is a view, partly in section and partly in side elevation, of the members illustrated in Fig. 2.

An electric resistance furnace 1 comprises an outer metallic framework or casing 2 and a plurality of supporting members 3. Outer walls 4 comprise a plurality of bricks or blocks of suitable heat insulating material. Inner walls 5 comprise a plurality of bricks or blocks of a suitable highly refractory material. The walls 5 are suitably spaced apart to provide a furnace chamber 6 of any suitable or desired contour and dimensions.

The muffle or lining of the furnace chamber 6 comprises a plurality of flat refractory resistor-supporting members 7 which may be substantially rectangular in contour, as illustrated in Fig. 2, if it is desired to provide a furnace chamber substantially rectangular in outline. Each of the members 7 is provided on either one or both of its flat surfaces with a plurality of relatively small recesses 8, which are alined both longitudinally and laterally of the member 7. While I have illustrated the member 7 as being provided with recesses 8 substantially rectangular in contour, I do not desire to be limited to this, as I may make these recesses substantially circular in contour.

A resistor 9 comprises a rod or bar of any suitable material preferably of a metal adapted to withstand the relatively high temperature which it is desired to maintain in the furnace. The resistor 9 is so bent as to comprise a plurality of substantially straight convolutions 10 which are connected by means of small integral end connections 11. The portions 10 are each provided with a plurality of offset or crimped portions 12 adapted to be located in the recesses 8. While I have illustrated a resistor, the convolutions of which extend longitudinally of the rectangular member 7, I may, if this becomes necessary or desirable, so form the resistor member that the convolutions extend laterally of the member 7, as is illustrated by the broken lines in Fig. 2.

The members 7 located at the bottom of the furnace chamber are so placed that the recesses 8 are on the under side while the members 7 at the sides of the furnace chamber are so placed that the recesses 8 are adjacent to the side walls of the furnace. If the bottom members 7 are placed in position first, it being understood that the resistor member 9 is in its operative position on the member 7, the members 7 located at the sides of the furnace may next be placed in position, the back of the members 7 being provided with a peripheral shoulder 13 to permit of resting the vertically extending members 7 thereon. The members 7, adjacent to the ceiling of the furnace, may now be placed in position, being supported by the side members, and by the end walls of the furnace in any suitable or desired manner.

It is to be understood that the refractory resistor-supporting members may be made of different proportions and dimensions and that they may be combined to form furnace chambers of different proportions and dimensions in a manner well known in the art.

It may be noted that the device embody-

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ing my invention provides a relatively simple and easily molded refractory resistor-supporting member in which, in certain positions of the member relatively to the furnace, the furnace walls cooperate with the member to maintain the metallic resistor in its proper operative position.

It may be noted that the plurality of relatively small alined recesses permit of locating a preformed metallic resistor either laterally or longitudinally of the resistor supporting member, and with the crimped portions of the resistor operatively engaging the recesses, substantially prevent motion of the resistor relatively to the resistor supporting member.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:

1. An electric resistor supporting means comprising a refractory member having a plurality of rows of relatively small recesses in one surface thereof, the recesses being operatively alined in two directions.

2. An electric resistor supporting means comprising a refractory member having a plurality of rows of relatively small recesses in a surface thereof, the recesses in adjacent rows being symmetrically aligned longitudinally of said member.

3. In an electric heating element, in combination; a resistor supporting means comprising a refractory plate having a plurality of rows of alined relatively small recesses on its surface, and a resistor placeable in proper operative position on said plate by a movement substantially at right angles to the surface of said plate.

4. An electric resistor supporting means comprising a refractory member having a plurality of alined relatively small recesses in a surface thereof, said recesses being symmetrically alined longitudinally and laterally of said member.

5. An electric heating element comprising a refractory plate having a plurality of rows of alined relatively small recesses in its surface and a resistor member located mainly on the surface of said plate and having crimped portions thereof located in said recesses.

6. An electric furnace comprising a plurality of walls spaced apart to form a chamber, a refractory plate in said chamber substantially parallel to one of said walls and spaced apart therefrom, and having a plurality of alined, relatively small recesses in the surface facing said wall, and a resistor member located between said plate and said wall and having a plurality of crimped portions located in said recesses.

7. An electric heating element comprising a refractory plate having a plurality of alined relatively small recesses in its surface and a resistor member located on said plate consisting of a plurality of end-connected convolutions, said convolutions having crimped portions located in said recesses.

8. An electric heating element comprising a refractory plate having a plurality of alined relatively small depressions in its surface and a resistor member located on said plate consisting of a plurality of end-connected parallel extending convolutions, said resistor member having integral portions cooperating with said recesses to prevent substantial movement of said resistor on said plate in both lateral and longitudinal directions thereof.

In testimony whereof, I have hereunto subscribed my name this 19th day of May, 1921.

THOMAS A. REID.