Oct. 30, 1923. 1,472,139

T. A. REID

ELECTRIC FURNACE

Filed Nov. 2, 1921

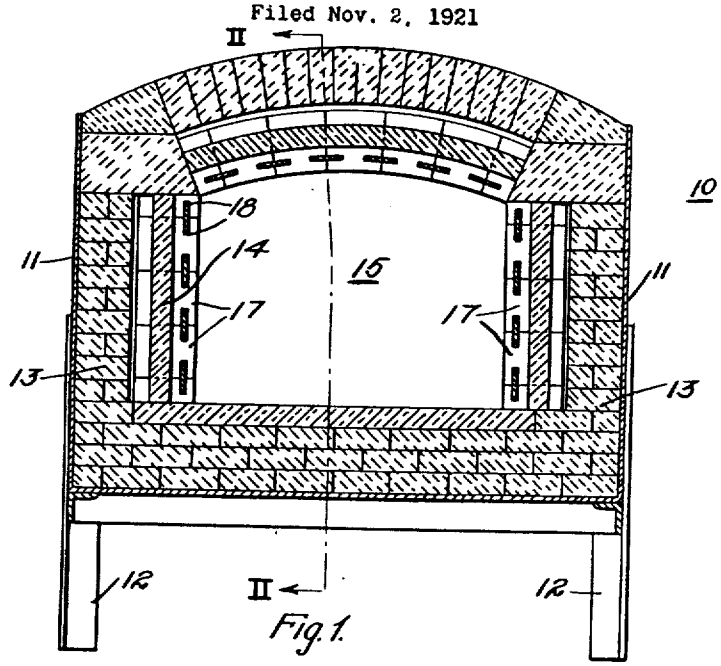



Fig. 1.

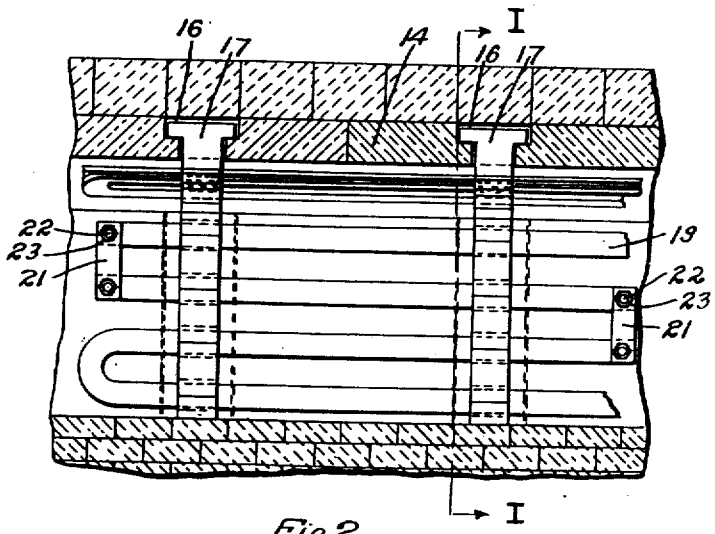



Fig. 2.

WITNESSES:

A. L. Jeffrey

H. M. Bielby

INVENTOR

Thomas A. Reid

BY

Wesley G. Carr

ATTORNEY

Patented Oct. 30, 1923.

1,472,139

# UNITED STATES PATENT OFFICE.

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

## ELECTRIC FURNACE.

Application filed November 2, 1921. Serial No. 513,168.

*To all whom it may concern:*

Be it known that I, THOMAS A. REID, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Furnaces, 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 form of resistor and a resistor mounting for an electric-resistance furnace.

In practising my invention, I provide a plurality of spaced sets of refractory members of substantially T-shape supported by the roof or walls of the furnace. Each member is provided with a groove in each of the contiguous faces immediately inside of the inner surface of the member, the two grooves registering to form a slot in which is placed a relatively heavy resistor rod or bar.

In the single sheet of drawings,

Figure 1 is a view, in vertical lateral cross section, of an electric furnace comprising the device embodying my invention, taken on the line I—I of Fig. 2, and

Fig. 2 is a partial longitudinal vertical section of a furnace comprising the device embodying my invention taken on the line II—II of Fig. 1.

An electric furnace 10 comprises a metallic skeleton casing or frame 11, a plurality of supporting members 12, an outer lining 13 consisting of bricks or blocks of a suitable refractory heat-insulating material and disposed to form a bottom and outer side walls and a roof. An inner lining 14 comprises a plurality of bricks or blocks of a suitable high-temperature-resisting refractory material. The two linings are disposed to form a furnace chamber 15 of any suitable or desired contour and dimensions.

The bricks comprising the inner lining 14 are spaced apart at suitable intervals to form a recess 16 therebetween, the ends of the refractory blocks immediately adjacent the recess 16 having overhanging shoulder portions so that the space is of substantially T-shape in cross-section. A plurality of refractory members 17, substantially of T-shape have their outer ends located in the recesses 16 and their inner narrow ends projecting into the furnace chamber 15. In the roof of the furnace the members 17 may be so shaped as to permit of their being built up to form a substantially self-supporting arch. A slot 18 is formed in each of the contiguous faces of each of the refractory members 17 immediately inside of the inner surface, the two slots registering to form openings through the set of refractory members. While I have illustrated the openings formed by the adjacent and registering slots 18 as substantially rectangular in contour, any desired contour of opening may be obtained by suitably shaping each of the registering slots.

A resistor member, composed of a plurality of relatively heavy and unyielding bars or rods 19 is located in the openings formed by the registering slots, the contour of the cross section of the member 19 being such as to substantially fill the opening in which it is located. I may use a plurality of substantially straight bars 19, which may be connected by means of short cross-connecting members 21, secured thereto by means of bolts 22 and nuts 23, or I may use a plurality of two-part resistor units, each unit comprising two integral end-connected and substantially parallel-extending convolutions. The sets of refractory supporting members 17 are spaced apart a suitable distance, and the resistor members 19 are sufficiently heavy to permit them to be substantially self-supporting between the refractory supporting members. The resistors may extend through the rear wall of the furnace so that the connectors 21 may be located outside of the furnace, if desired.

The resistor members 19 may be moved into their operative position by movement longitudinally of the furnace chamber and of the resistor member, after which the cross connecting members may be bolted in place. In case of damage to a resistor member, the reverse operation permits of easily and quickly removing the same.

The device embodying my invention provides a relatively simple form of a relatively heavy and unyielding resistor member and of a supporting means therefor, wherein the resistor member is moved longitudinally of its length to insert it in its proper operative position in the furnace.

Various modifications may be made in the device embodying my invention without de-

parting 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. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of refractory members of T-shape, having their narrow ends projecting into said chamber and each having a transversely extending slot in each of two opposite faces, and a resistor member extending through said slots and between and beyond said sets of refractory members.

2. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of refractory members of T-shape supported by said walls, having their narrow ends projecting into said chamber and having transversely extending slots in the contiguous faces, and a relatively heavy preformed resistor member extending through said slots between and beyond said sets of refractory members to be supported thereby clear of said furnace walls.

3. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of refractory members of T-shape supported by said walls, having their narrow ends projecting into said chamber and having transversely extending slots in the contiguous faces, said slots combining to form an opening of predetermined contour, and a preformed, relatively heavy and unyielding resistor member having a lateral cross-sectional contour substantially similar to that of said opening, extending through said slots and between and beyond said sets of refractory members to be supported thereby clear of said furnace walls.

4. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of refractory members of T-shape supported by said walls, having their narrow ends projecting into said chamber and having transversely extending slots in the contiguous faces and a plurality of relatively heavy preformed resistor members, substantially of U-shape, extending through said slots and between and beyond said sets of refractory members.

5. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of refractory members of T-shape supported by said walls, having their narrow ends projecting into said chamber and having transversely extending slots in the contiguous faces, a plurality of relatively heavy preformed resistor members, substantially of U-shape, extending through said slots and between and beyond said sets of refractory members, and means for electrically connecting said resistor members.

6. In an electric furnace, in combination, a plurality of walls spaced apart to enclose a furnace chamber, a plurality of spaced sets of relatively narrow refractory members of T-shape supported by said walls having their narrow ends projecting into said chamber and having slots in the contiguous faces extending longitudinally of said chamber, and a relatively heavy, preformed resistor member substantially of U-shape extending through said slots and between and beyond said sets of refractory members and removable therefrom by a longitudinal movement of said resistor member.

In testimony whereof I have hereunto subscribed my name this 17th day of October, 1921.

THOMAS A. REID.