June 30, 1925. 1,543,714

G. M. LITTLE

HEAT TREATING FURNACE

Filed Feb. 3, 1923

Fig. 1.

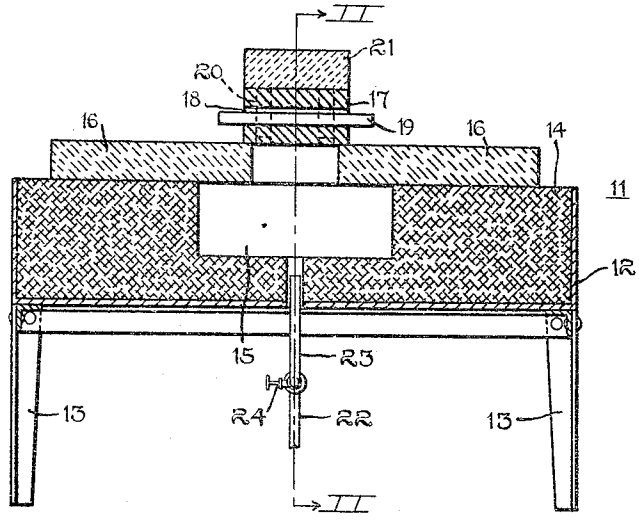


Fig. 2.

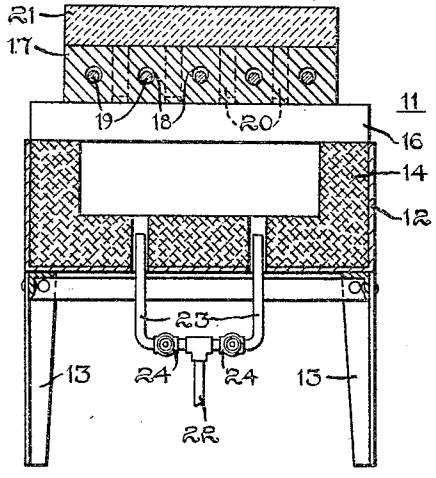
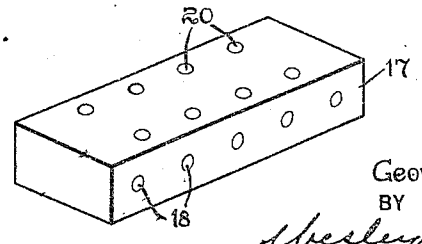


Fig. 3.



WITNESSES:

C. M. Cochran

H. M. Biebel

INVENTOR

George M. Little.

BY

Wesley & Sloan

ATTORNEY

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UNITED STATES PATENT OFFICE.

GEORGE M. LITTLE, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

HEAT-TREATING FURNACE.

Application filed February 3, 1923. Serial No. 616,758.

To all whom it may concern:

Be it known that I, GEORGE M. LITTLE, 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 Heat-Treating Furnaces, of which the following is a specification.

My invention relates to furnaces and particularly to heat-treating furnaces.

The object of my invention is to provide a relatively simple and rugged construction for a heat-treating furnace.

In practicing my invention, I provide a furnace chamber defined by a plurality of refractory walls and having an open side, which is partly closed by a pair of movably spaced, refractory plates or slabs supported by the furnace structure. A refractory block is located on, and supported by, the adjacent spaced edges of the refractory blocks or slabs and is provided with a plurality of openings therethrough or chambers therein. Suitable means for heating the furnace chamber and the perforated or chambered refractory block, and means for heat-insulating the outer surface of the perforated block are provided.

In the single sheet of drawings,

Figure 1 is a view, in vertical longitudinal section, of a heat-treating furnace embodying my invention,

Figure 2 is a vertical lateral section therethrough, taken on the line II—II of Fig. 1, and

Fig. 3 is a view, in perspective, of a heating block constituting a part of the device embodying my invention.

A furnace 11 comprises an outer open-top metallic casing 12, provided with a plurality of supporting members 13 suitably secured thereto. Within the casing 12 is located a lining 14 comprising either a plurality of blocks or bricks of a suitable heat-insulating and high-temperature-resisting material or a mass of initially plastic material having substantially the same properties. The combination of bricks or blocks or the plastic material constitutes a lining 14 to provide a furnace chamber 15 having an open side.

The end walls of the lining 14 are made relatively thick and a plurality of slabs or relatively thick plates 16, of a suitable refractory heat-insulating material, are located thereon and are movable relatively thereto. The two plates 16 are spaced apart a suitable distance to provide a relatively narrow opening therebetween. A block 17, of a suitable refractory material rests upon the adjacent edges of the blocks 16, whereby a top closure of the chamber 15 is effected. The block 17 may be substantially rectangular in cross-section and is provided with a plurality of holes 18 extending horizontally therethrough to receive rods 19 of resistance material or of metal where intermediate portions only of their lengths are to be heated. If it is desired to heat only the ends of rods or bars, chambers 20 may be provided which extend only partially through the block. The block 17 may be of cast iron if only a relatively low temperature is to be employed, or it may be of nichrome or of some other suitable high-temperature-resisting material if a higher temperature is to be employed.

A block 21, of a suitable refractory heat-insulating material may be located upon the outer surface of the block 17 in order to reduce the heat loss therefrom.

Any heating means may be employed to heat the furnace chamber 15 and the block 17, such as solid, liquid, or gaseous fuel, or any desired kind of electrically generated heat. I have indicated a supply conduit 22 which may be connected to a source of supply of a gaseous fuel and a plurality of burner pipes 23 controlled by suitable valves 24.

In the manufacture of resistance rods of carbonaceous material, it is frequently necessary to heat-treat the rods to effect a change in the electrical resistivity thereof by oxidation of predetermined portions, and this is easily accomplished by heating them to relatively high temperature in an oxidizing atmosphere, such as air. By placing the rods in the holes 18 in the block 17, the intermediate portions are heated and oxidation of such portions occurs, while the end portions, which are air cooled, are not oxidized, and therefore, permit of effecting good contact with terminal devices.

If metal rods or bars are to be heated, this may be done by the hereinbefore described furnace in substantially the same manner.

The slabs 16 need rest only upon the upper surface of the lining 14, which as has hereinbefore been pointed out, is made relatively thick at the ends of the furnace, and

they may be spaced apart a suitable distance to permit of supporting the refractory heating block 17 at its edges. The superposed heat-insulating member 21 reduces the amount of heat lost from the heated block.

Various changes in detail and arrangement may be made without departing from the spirit and scope of the invention and such modifications are intended to be covered by the appended claims.

I claim as my invention:

1. In a heat-treating furnace, in combination, a plurality of refractory walls defining a furnace chamber having an open side, movable refractory blocks partly closing said open side, a refractory block for completely closing said open side and having a plurality of material-receiving openings therein, and means for heating said furnace chamber and said refractory block.

2. In a heat-treating furnace, in combination, a plurality of refractory walls defining a furnace chamber having an open side, movable refractory blocks partly closing said open side, a refractory block for completely closing said open side and having a plurality of material-receiving openings therein, means for heating said furnace chamber and said refractory block and heat-insulating means for reducing the amount of heat lost from said refractory block.

3. In a heat-treating furnace, in combination, a refractory block perforated to receive material to be heat-treated, means for heating said block and means for reducing the amount of heat lost from said block.

In testimony whereof, I have hereunto subscribed my name this 30th day of January 1923.

GEORGE M. LITTLE.