June 7, 1932. J. C. WOODSON ET AL 1,861,947

RESISTOR SUPPORT

Filed Feb. 7, 1931

Fig. 1.

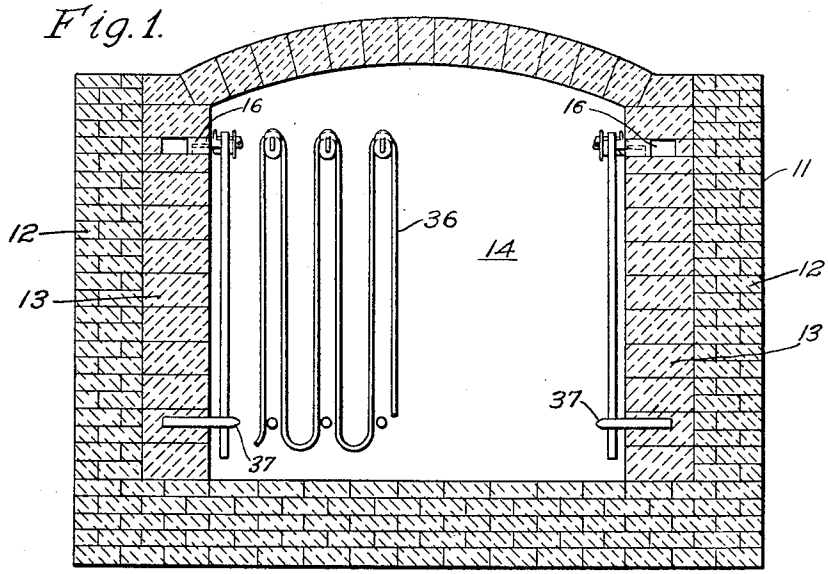


Fig. 2.

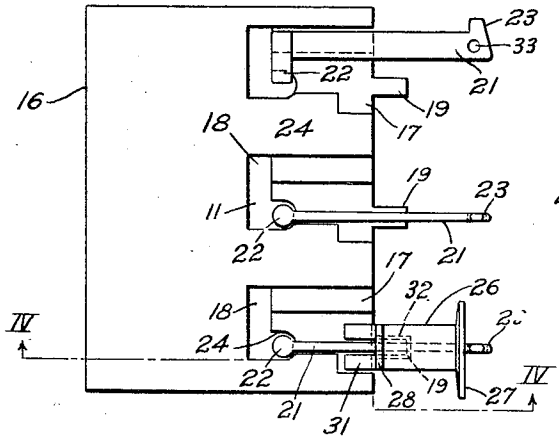


Fig. 3.

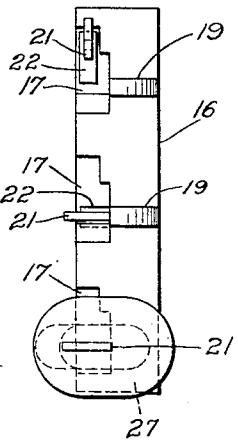


Fig. 4.

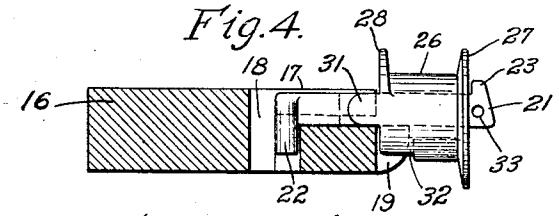


Fig. 5.

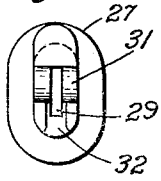
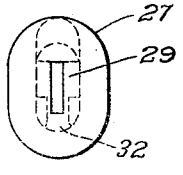


Fig. 6.



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UNITED STATES PATENT OFFICE

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RESISTOR SUPPORT

Application filed February 7, 1931. Serial No. 514,222.

Our invention relates to electric furnaces and more particularly to resistor-supporting means in electric-resistor furnaces.

An object of our invention is to provide a relatively simple and easily installed resistor-supporting means in the side walls of a furnace.

Another object of our invention is to provide a resistor-supporting means including a plurality of separable parts which have interfitting engagement with each other.

In practicing our invention, we provide a block of refractory electric-insulating material set in the side wall of a furnace, having one or a plurality of substantially horizontally-extending recesses at the front portion thereof, the block having forward-extending integral lugs or projections the upper surfaces of which are even with the bottom surfaces of the recesses. A metal hook of elongated Z shape has one end portion fitted into the recess and the other end portion extending outwardly of the recess. A bushing of refractory electric-insulating material is located on the forwardly-projecting portion of the metal hook, and the bushing has two integral projections at its inner end, one at each side of the metal hook fitting into the recess in the block, while the bottom portion of the inner end is provided with a recess into which the lug on the block may fit.

In the single sheet of drawing:

Figure 1 is a view, in lateral section, through a furnace including the device embodying our invention;

Fig. 2 is a top plan view of a refractory block to be located in a wall of the furnace, with metal hooks shown, respectively, in three different positions;

Fig. 3 is a view, in front elevation, of the elements shown in Fig. 2;

Fig. 4 is a view, in lateral section, taken on the line IV—IV of Fig. 2;

Fig. 5 is a view, in rear-end elevation, of a refractory bushing, and

Fig. 6 is a view, in front elevation, of a refractory bushing.

Referring to Fig. 1 of the drawing, we have there illustrated a furnace structure 11 including a plurality of walls 12 which may be built up of bricks or blocks of heat-insulating material and which may have located therein an auxiliary wall 13 built up of bricks or blocks of a suitable refractory high-temperature-resisting material to enclose a furnace chamber 14. The particular structure surrounding the furnace chamber constitutes no particular part of our present invention, except insofar as it provides a plurality of walls and insofar as it provides, in certain of the side walls, places for locating a plurality of blocks 16 of a refractory high-temperature-resisting and electric-insulating material. These blocks are made conformable to the general size of bricks or blocks used in furnace structures of this general kind, so that the erection of the walls of a furnace structure of this kind shall be interfered with to a minimum degree.

Each of the respective blocks 16 is provided with a plurality of recesses 17 therein which, when the blocks are located in a vertically-extending side wall, extend horizontally of the furnace structure. The respective recesses 17 are substantially of rectangular shape having two depths, as is shown more particularly in Fig. 3 of the drawing, and having also a rear or inner portion 18 which extends entirely through the block laterally thereof. Each of the blocks is also provided with integral forwardly-extending lugs 19 the upper surfaces of which are substantially even with the upper surface of the lowermost wall portion defining the recesses 17.

A metal hook 21, of elongated Z-shape and having a substantially circular lateral extension 22 at its inner end and a short lateral extension 23 at its forward end, has its inner end located in the recess 17 in the block 16. To insert one of the hook members 21, it may be laid flatwise, as is shown in the upper portion of Fig. 2 of the drawing, with the projection 22 extending either to the right or to the left longitudinally of the hook. The portion 23 of the hook is pushed in until the hook may be turned, so that the portion 23 extends downwardly in a portion 24 of the recess 18, as is shown more particularly in the mid portion of Fig. 2 of the drawing.

A refractory bushing 26 of electric-insulating and high-temperature-resisting material may then be located on the forwardly-projecting end portion of hook 21, and it includes, in general, a peripheral flange 27 at the front thereof and an upstanding flange 28 at the rear portion thereof, with an opening 29 therethrough which is sufficiently high to permit of the bushing 27 being slipped over the forward end of hook 21.

The bushing 27 is provided also with two integral and longitudinally extending lugs 31 at each side of the opening 29 which fit into a recess 17. The bushing 27 is provided also with a recess 32 at its bottom side and at that end which is located adjacent to the forward end of the block 16, so that the lug 19 may fit therein.

Each of the hooks 21 may be provided with an opening 33 at its forward end into which a cotter pin or other suitable metal means may be inserted in order to prevent accidental removal of the bushing 27 therefrom.

A wire or strip 36 of a suitable electrical resistor is to be suspended from, and in direct contact with, the bushing 27, the distance between the flanges 27 and 28 being, of course, made such as to receive the wire or strip and prevent excessive longitudinal movement thereof on the bushing. As shown in Fig. 1 of the drawing, we may provide refractory lugs 37 at or near the bottom of the depending resistor portions to ensure that lateral motion of the loops shall not result in engagement between adjacent loops and short-circuits therebetween.

It may be noted that the integral lugs 19, extending forwardly of the front surface of the block 16 and, therefore, of the wall in the furnace in which a plurality of blocks 16 may be located, will extend well into the bushing 27, as well as into the forward or outside half of the hook member 21, so that the tendency to a downward movement of the forward end of hook 21, by reason of the weight of the resistor suspended therefrom, will be decreased to a relatively small value. It is, of course, obvious that it is impossible to make the clearances very small in a construction of this kind, and it is not always possible to maintain even the desired clearances because of the excessive and variable shrinkage in refractory material of this kind when being burned at a relatively high temperature. Hence, the forwardly extending lugs 19, interfitting with the bushing 27, will, to a great extent, reduce the tendency toward downward tilting movement of the forward end of the hook members.

The rearwardly-extending lugs 31, interfitting with the recesses 17 will tend to prevent large lateral movement of the bushing and of the hook member in a substantially horizontal direction, and this is aided by the interfit between the lug 39 and the walls of the recess 32.

In case of breakage of one of the bushings 27, it is an easy matter to remove the same after the furnace chamber has been cooled sufficiently, and the removal and reinsertion of a hook 21 is also easily and quickly accomplished.

Various modifications may be made in our invention without departing from the spirit and scope thereof, and we desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or are set forth in the appended claims.

We claim as our invention:

1. A support for a side-wall furnace resistor, including a recessed refractory block in a side wall of a furnace, an elongated metal hook having one end portion located in the recess of the block and having its other end portion extending forwardly of the block, a bushing of refractory electric-insulating material on the projecting end of the hook for supporting a resistor, and a lug on said block extending forwardly of its front face and below the hook to provide a hook support inside of the bushing.

2. A support for a side-wall furnace resistor, including a recessed refractory block in a side wall of a furnace, an elongated metal hook having one end located in the recess in the block and its other end extending forwardly thereof, said block having a projection at its front face below and engaging the hook to support the same, and a bushing of refractory electric-insulating material on the forward end of the hook having its inner end portion closely adjacent to the outer face of the block and having also a recess at its inner end into which the projection on the block will fit to reduce lateral movement of the forward end of the hook.

3. A support for a side-wall furnace resistor, including a recessed refractory block in a side wall of a furnace, a forwardly extending lug on the front surface of the block with its upper surface even with the bottom of the recess, an elongated metal hook having one end portion in the recess and the other end portion extending forwardly of the block, and a refractory bushing on the forward end of the hook having portions at its inner end, at each side of the hook, fitting into the recess and having a recess at its inner end to receive the forwardly extending lug on the block, the interfitting lugs and recesses tending to reduce lateral movement of the forward end of the hook.

In testimony whereof, we have hereunto subscribed our names this 30 day of January, 1931.

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ORA A. COLBY.