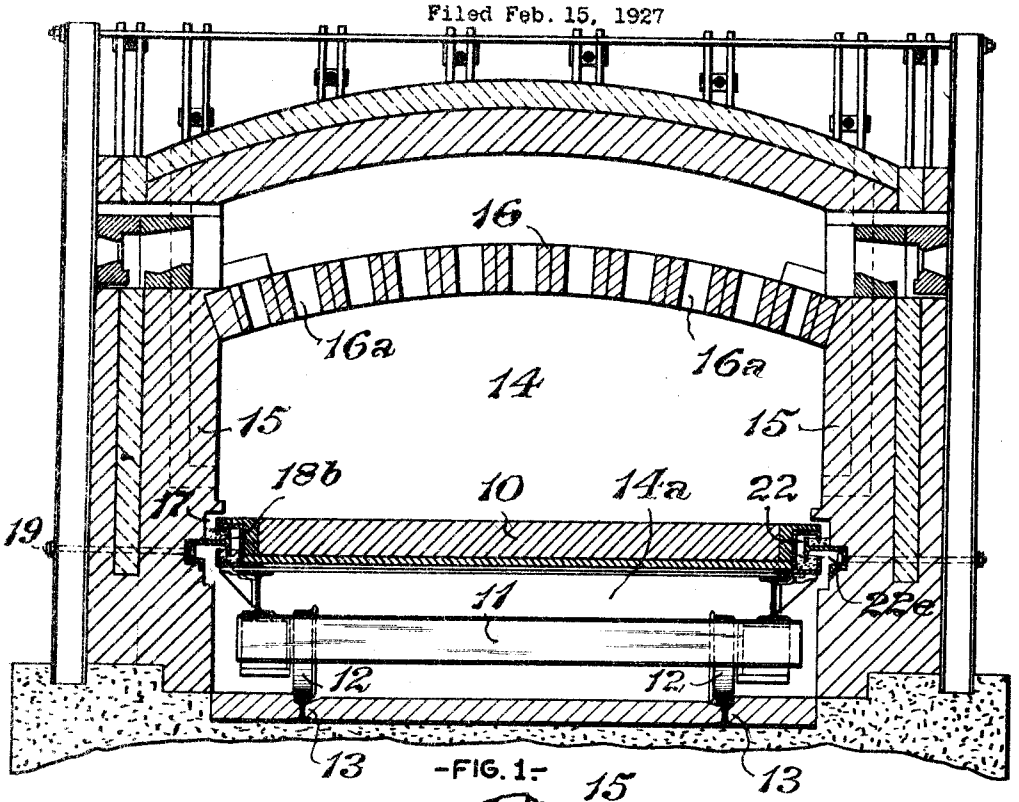
Nov. 6, 1928. 1,690,555

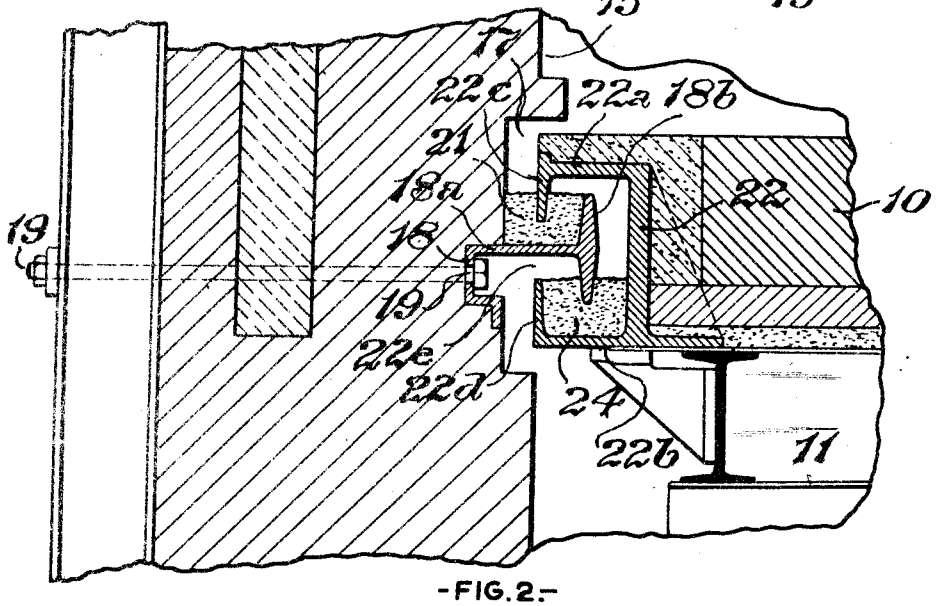
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APPARATUS FOR HEAT TREATING ARTICLES

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-FIG. 1-



-FIG. 2-

WITNESSES

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APPARATUS FOR HEAT-TREATING ARTICLES.

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My invention more particularly relates to means for insulating the supporting and operating mechanism of movable hearths, from the heat applied to the articles supported by the hearth for heat treatment.

It has been the practice in transporting articles into the heating chambers of furnaces, kilns, ovens, or the like, for heat treatment, to place them on a movable hearth, by which means they are conveyed into and out of the heating chamber. In some instances, the hearths are supported on a metal frame mounted on suitable axles and wheels. In other instances, the hearths are supported on rotatable tables. In still other instances, the hearths are supported on endless conveyors. In such apparatuses no provision has been made to efficiently insulate the supporting mechanisms for the movable hearths, from the heat applied to the articles under treatment, and as a result, rapid break down of the supporting mechanisms has occurred, requiring considerable expense for the renewal of parts. In carrying out annealing processes for metal, the supporting mechanisms are subjected to high temperatures, for long periods of time, and the resulting injuries to such mechanisms have added greatly to the cost of production. A further disadvantage of the heating apparatuses heretofore known, is that that the escape of heat below the hearth, materially lessens the efficiency of the apparatuses.

The object of the present invention is to provide an improved heating apparatus, embodying sealing means whereby the supporting mechanism for the movable hearth is efficiently insulated from the heat applied to the articles under treatment, and the useless escape of heat is prevented.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawing: Figure 1 is a view, in vertical transverse section, of an annealing furnace, to which my invention is applied; and, Fig. 2, a similar section, on an enlarged scale, through one side of the movable hearth and a portion of the side wall, of the furnace, showing the details of my improved heat insulating means.

In the practice of my invention, referring descriptively to the specific embodiment thereof which is herein exemplified as applied to an annealing furnace of usual type, the movable hearth, 10, for supporting the articles to be annealed, is formed of heat insulating material and is supported on a truck having a frame, 11, mounted on wheels, 12, adapted to travel on rails, 13, which extend along the floor of the heating chamber, 14. The heating chamber has side walls, 15, and a perforated crown, 16, both formed of suitable heat insulating material.

The heated gases for applying the requisite heat to the articles to be annealed, descend into the heating chamber through the perforations, 16^a, in the crown, 16. In order to prevent the escape of the heated gases into the space, 14^a, below the hearth, I provide each of the side walls, 15, of the chamber, with a longitudinal recess, 17, adapted to receive a side of the hearth, said recess having a deepened portion, in which is fitted a beam having a vertical portion, 18, which abuts on the bottom of the deepened portion of the recess, and is secured thereto by bolts, 19. The beam has a web portion, 18^a, which extends horizontally from the top of the vertical portion, 18, and is joined to the middle of a vertical flange, 18^b. The web, 18^a, and flange, 18^b, have the form of a T disposed horizontally, the flange, 18^b, having an upstanding portion, and a depending portion. The upstanding portion of the vertical flange, 18, the web, 18^a, and the side wall, 15, constitute a trough shape pocket, open at one end, which is filled with loose, comminuted, heat insulating material, 21, such as sand.

Each side of the hearth is provided with a hollow beam, rectangular in cross section. Each of the hearth beams comprises a vertical rear wall, 22, a horizontal top wall, 22^a, a horizontal bottom wall, 22^b, a front wall, 22^c, depending from the top wall, 22^a, and a front wall, 22^d, upstanding from the bottom wall, 22^b, and spaced from the front wall, 22^c, to provide a slot, for the passage of the web, 18^a, of the wall beam. The bottom wall, 22^b, front wall, 22^d, and rear wall, 22, of the hearth beams, provide trough shape pockets, which are filled with loose, comminuted heat insulating material, 24, such as sand.

When the hearth, 10, is rolled into the heating chamber, 14, the webs, 18^a, of the wall beams, enter the slots of the hearth beams, and the flanges 18^b, of the wall beams, enter the chambers, in the hearth beams, the depending portions of the flanges, 18^b, embedding themselves in the loose, comminuted, heat insulating material 24, in the hearth

beam pockets. Simultaneously, the depending front walls, 22ᵉ, of the hearth beams, embed themselves in the loose, comminuted heat insulating material, 21, in pockets, in the wall beams.

From the foregoing description, it will be obvious that my improved construction effects two seals at each side of the hearth, which effectively prevent the heated gases in the chamber, 14, from escaping past the sides of the hearth into the space, 14ᵃ, below the hearth. Thus, the supporting mechanism of the hearth is protected from excessive heating, and its life, consequently, greatly prolonged. A further advantage of the invention is that by preventing the wasteful escape of the heated gases into the space, 14ᵃ, the thermal efficiency of the furnace is promoted.

It is to be understood that the invention is applicable, to many forms of heating apparatus, such as, furnaces, kilns, or ovens; and that the invention may be employed with various types of movable hearths, such as those supported on trucks, endless chain conveyors, and rotary tables.

I claim as my invention and desire to secure by Letters Patent:

1. In a furnace, or the like, the combination of a chamber member, and a hearth member movable in said chamber member; one of said members comprising a hollow beam having a trough like pocket, the other member comprising a beam having a trough like pocket, and a filling of loose, comminuted, heat insulating material in said pockets; each of said beams having a flange portion adapted to project into the insulating filling of the other beam.

2. In a furnace of the type described, the combination with the side walls of the chamber and the hearth traveling in said chamber, of interpenetrating flanged beams on said walls and the sides of said hearth, respectively, each beam comprising a pocket for sand, or the like, into which a flange of the other beam penetrates.

3. In a furnace of the type described, the combination with the side walls of the chamber and the hearth traveling in said chamber, of a T-head beam projecting horizontally from each wall, and a U-shaped beam carried in each side of the hearth with its legs horizontal and having inwardly extending flanges on the ends of said legs, the upper of said flanges entering the space between the wall and the upper half of the T-head, and the lower half of said T-head entering the space behind the lower of said flanges, said spaces being adapted to contain loose, comminuted heat refractory material.

4. In a furnace of the type described, the combination, with the side walls and the traveling hearth, of a T-head beam secured to each side wall so as to form a pocket between the wall, the web of the beam, and the upper flange of the T-head; a flanged U-shaped beam carried on each side of the hearth, so as to form a pocket between its vertical base portion, one of its leg portions, and the upstanding flange on the latter, into which last mentioned pocket the lower part of said T-head of the wall beam enters, the web of said wall beam passing between the upstanding and depending flanges on the legs of the hearth beam, and the depending flange on the upper leg of said hearth beam entering the said wall pocket, and a filling of sand, or the like, in each of said pockets.

5. In a furnace of the type described, the combination with a side of the heating chamber and a side of the hearth, traveling in said chamber, of a beam projecting laterally from one of said sides, and having vertical flanges on the outer end of its web, so as to form a pocket on said web; a hollow, U-shaped beam, having vertical inwardly projecting flanges on the ends of its legs, the lower flange forming a pocket on the lower leg, carried by the other of said sides, the web of said first beam passing between the ends of the flanges on said U-shaped beam, the lower flange of said first beam entering the pocket in said U-shaped beam, and the flange on the upper leg of said U-shaped beam entering the pocket on said first beam, and fillings of sand, or the like, in said pockets.

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