Jan. 20, 1948. H. F. JACKSON 2,434,852

GRID HEARTH

Filed Oct. 16, 1946 2 Sheets-Sheet 1

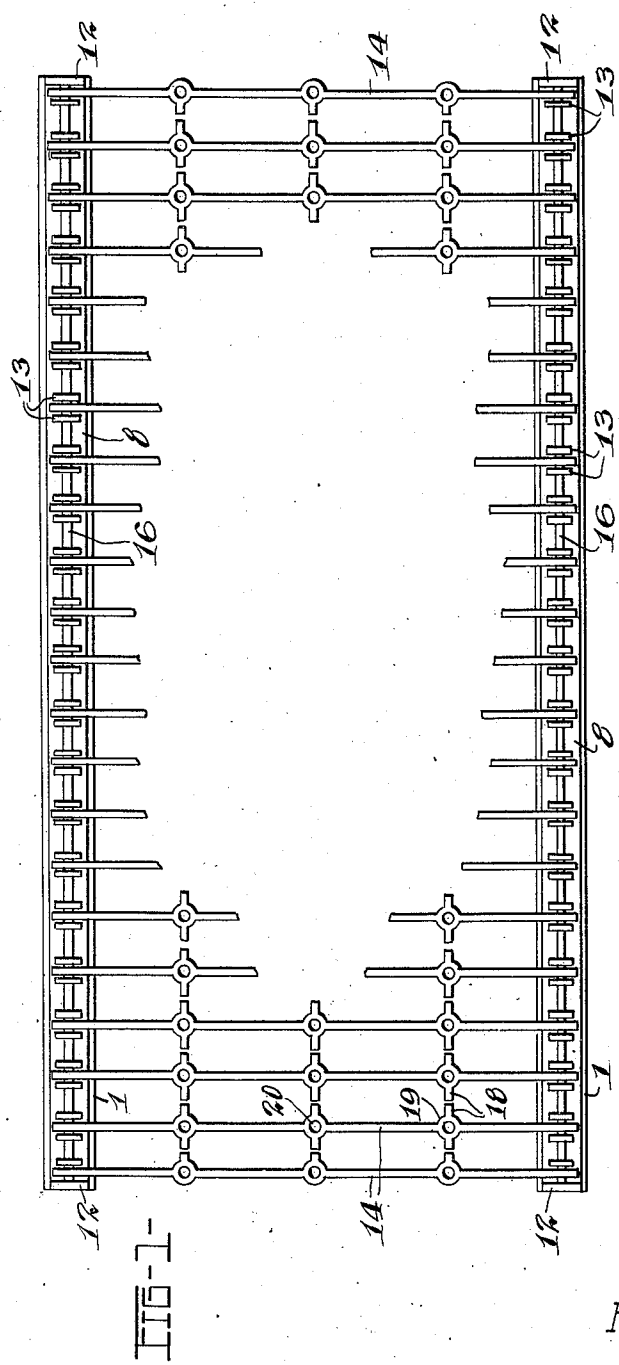


FIG-1-

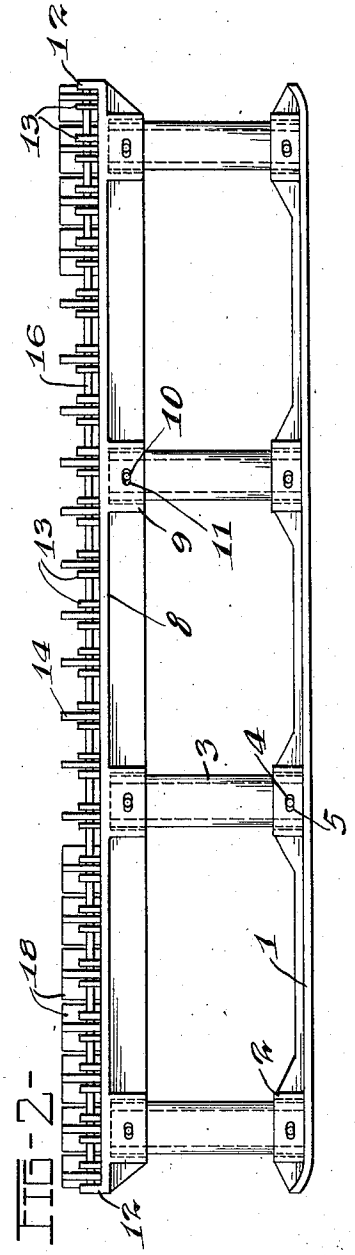


FIG-2-

INVENTOR.
HAROLD F. JACKSON
BY Owen & Owen,
ATTYS.

Jan. 20, 1948. H. F. JACKSON 2,434,852

GRID HEARTH

Filed Oct. 16, 1946 2 Sheets-Sheet 2

FIG-3-

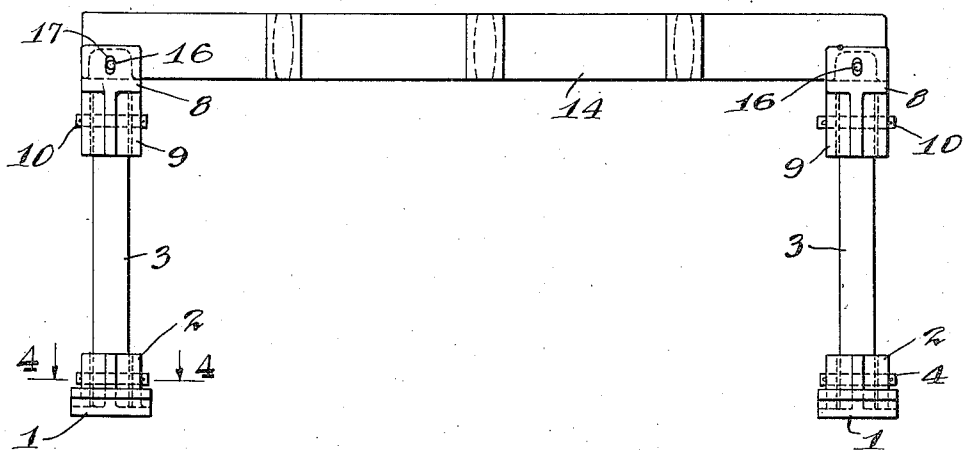


FIG-4-

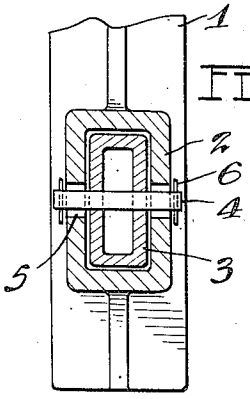


FIG-5-

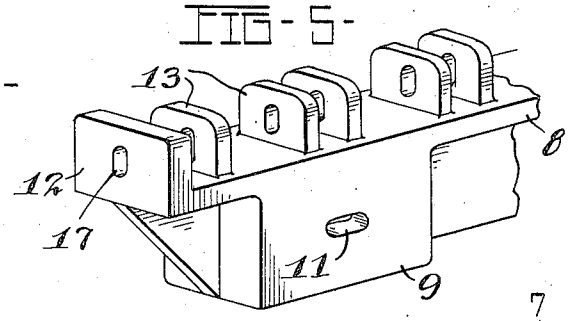


FIG-6-

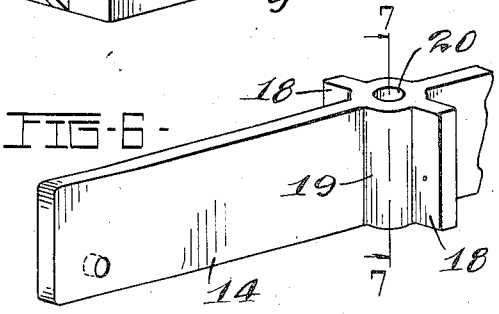
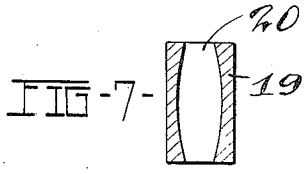


FIG-7-



INVENTOR.
HAROLD F. JACKSON
BY
Owen & Owen,
ATTYS.

Patented Jan. 20, 1948 2,434,852

UNITED STATES PATENT OFFICE

2,434,852

GRID HEARTH

Harold F. Jackson, Springfield, Ohio, assignor to The Ohio Steel Foundry Company, Lima, Ohio, a corporation of Ohio

Application October 16, 1946, Serial No. 703,625

7 Claims. (Cl. 263—47)

1

This invention relates to means for supporting work for treatment in a carborizing or other heat treating furnace, and particularly to such means of the flexible type adapted to rest on a furnace hearth and to be moved therefrom into a furnace and then returned to the hearth.

An object of the invention is the provision of novel means of simple, efficient and economical construction which permits supporting the work to be treated in elevated form by a grid-like construction of a flexible nature to prevent warping, distorting and breaking during the heat treatment, and also permits easy movement of the means with the work thereon into and from the treating furnace.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings illustrating one embodiment thereof, in which—

Fig. 1 is a plan view of an apparatus embodying the invention; Fig. 2 is a side elevation thereof; Fig. 3 is an enlarged end elevation thereof; Fig. 4 is an enlarged cross-section on the line 4—4 in Fig. 3; Fig. 5 is an enlarged perspective view of one end portion of a top side rail of the apparatus; Fig. 6 is an enlarged perspective view of an end portion of one of the cross grid members, and Fig. 7 is a section on the line 7—7 in Fig. 6.

Referring to the drawings, 1, 1 designate two parallel transversely spaced skid-bars, each having a plurality of upwardly opening longitudinally spaced socket portions 2 in which the lower ends of upright posts or legs 3 are loosely mounted for free limited rocking movements in various directions therein. These posts are retained in the socket members by pins 4 projecting, in the present instance, through holes in the lower ends of the respective posts and having their ends mounted in horizontally elongated openings 5 in the socket walls, as best shown in Fig. 4. Cotter pins 6 engage the pins to prevent removal from the openings.

Mounted on the upper ends of the posts 3 above and in parallel relation to each skid-bar 1 is a top rail 8, in the present instance, of T-bar form in cross-section and provided at intervals with downwardly opening socket portions 9 by which the upper ends of the posts 3 are loosely received. The posts are loosely retained in these sockets by pins 10 projecting through holes in the upper end portions of the respective posts and through horizontal elongated openings 11 in the socket walls, the same as shown in Fig. 4 in connection

2

with the fastening of the posts in the skid-bar sockets.

Each rail 8 has each end of its top or horizontal flange turned upwardly to form an upstanding end lug 12. Intermediate these end lugs 12 the rail is provided on its top with a plurality of upstanding lugs 13 cooperating to form pairs between which the ends of cross grid-bars 14 are loosely mounted. One of these lugs also is disposed adjacent to each end lug 12 so as to cooperate therewith to loosely receive the ends of respective end bars 14 therebetween. A rod 16 projects freely through aligned apertures in the ends of the bars 14 and in the lugs 12, 13, with the apertures in such lugs preferably vertically elongated, as shown at 17, to permit limited vertical movements of the rods therein. In this manner the grid-bars 14 are mounted for limited universal twisting movements relative to the supporting rails 8 so that no strain is imparted either to the rails or the cross-bars by relative movements thereof occasioned by any warping action of the members of the grid structure.

The spacing between the bars 14 is narrow so that quite small articles may be supported by the grid, and each bar is provided intermediate its ends with one or more sets, three in the present instance, of laterally projecting lugs 18 which align with and are only slightly spaced from adjacent lugs of adjoining bars. To prevent hot spots occurring in the metal when cast at the portions of the bars from which the lugs project, enlargements 19 are provided at such points and each of these enlargements is provided vertically therethrough with a cored hole 20 of barrel-form. The provision of these barreled holes removes some of the metal at the center or worst point for hot spot conditions so that a more effective chilling of the metal at such points may be obtained and shrinkage thus reduced to a minimum. The bars thus have substantially a uniform chill so that strains and cracks are prevented at the points from which the lugs 18 project.

In the use of the grid hearth, the top of the grid is loaded with work while supported above the furnace hearth with the skid-bars 1 resting on the hearth. When loaded the grids are shoved into the furnace where they remain until the work has been properly heat-treated. The elevation of the grid portion of the device permits the heat to circulate around, under and above it so that each work part is properly treated. This having been accomplished, the grid devices are removed from the furnace by means of a forked dolly truck, or in any other suitable manner.

The supporting legs 3 having loose connection with the skid-bars 1 and respective top rails 8 and the loose connection of the grid-bars 14 with the top rails prevent the imparting of strain to any part of the device and consequent cracks or breakage occurring should there be any warpage of the parts during the heat treating action. The construction of the device, as is apparent, is simple, economical and strong and admirably adapts it for the conditions to which it is subjected in use.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A grid hearth of the class described, comprising a pair of transversely spaced skid-bars, legs rising from said bars, top rails supported by the legs in parallel relation above the respective skid-bars for limited movements relative thereto, and grid-bars connecting said rails in rather closely spaced relation and for limited movements relative thereto and to each other.

2. A construction as called for in claim 1 wherein the bars are provided intermediate their ends with at least one transverse enlargement with side lugs projecting therefrom and with the enlargement vertically cored to provide a barrel-shaped hole therethrough.

3. In a grid hearth of the class described, a pair of transversely spaced skid-bars each having a plurality of upwardly opening longitudinally spaced sockets, legs mounted at their lower ends in said sockets and connected to the socket walls for limited movements relative thereto, a top rail supported above each skid-bar in parallel relation thereto by the legs rising therefrom and having downwardly opening sockets loosely receiving the upper ends of the legs, said

rails and legs being connected together for limited relative movements, and a series of parallel grid-bars transversely connecting said rails adapted to rest thereon and having loose connection therewith.

4. A construction as called for in claim 3 wherein the bars are provided intermediate their ends with at least one transverse enlargement with side lugs projecting therefrom and with the enlargement vertically cored to provide a barrel-shaped hole therethrough.

5. In a grid hearth of the class described, comprising a pair of transversely spaced skid-bars each having a plurality of longitudinally spaced upwardly opening sockets on its top side, a leg mounted in and rising from each socket, a pair of transversely spaced top bars one over each skid-bar parallel thereto and having downwardly opening sockets loosely receiving the upper ends of the legs rising from such skid-bar, means retaining the legs in assembled relation to the respective top rails and permitting limited relative movements thereof, each top rail having a plurality of longitudinally spaced pairs of lugs rising therefrom with the lugs of each pair in spaced relation lengthwise of the rail, grid bars connecting said rails and resting at their ends thereon and also having their ends disposed between the lugs of respective pairs, and means connecting the lugs and grid-bars together for limited relative movements.

6. A structure as called for in claim 5 wherein the top rails are of T-form with the grid-bars resting on the top free sides of the cross-flange thereof.

7. A structure as called for in claim 5 wherein the grid-bars are provided intermediate their ends with at least one transverse enlargement with side lugs projecting therefrom and with the enlargements vertically cored to provide barrel-shaped holes therethrough.

HAROLD F. JACKSON.