March 1, 1949. H. H. HARRIS 2,462,960

WORK SUPPORT

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Fig. 2.

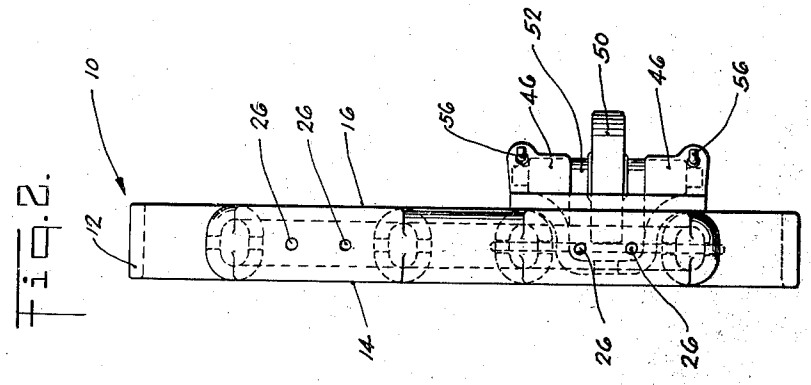
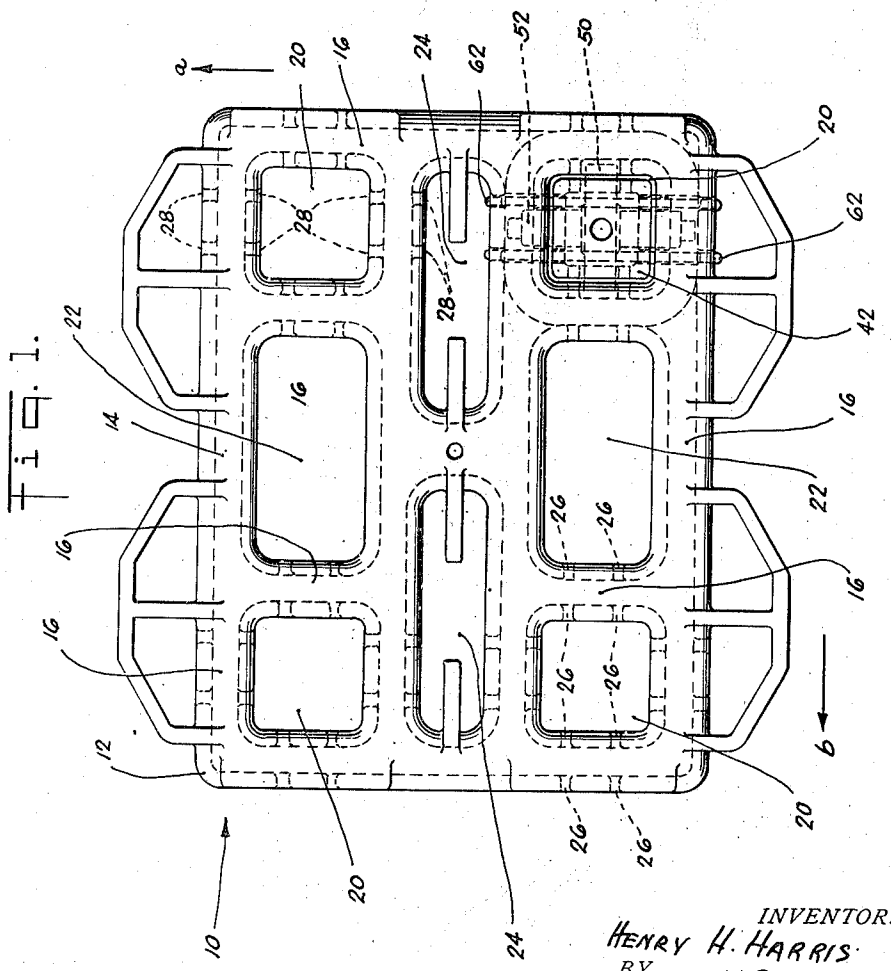


Fig. 1.



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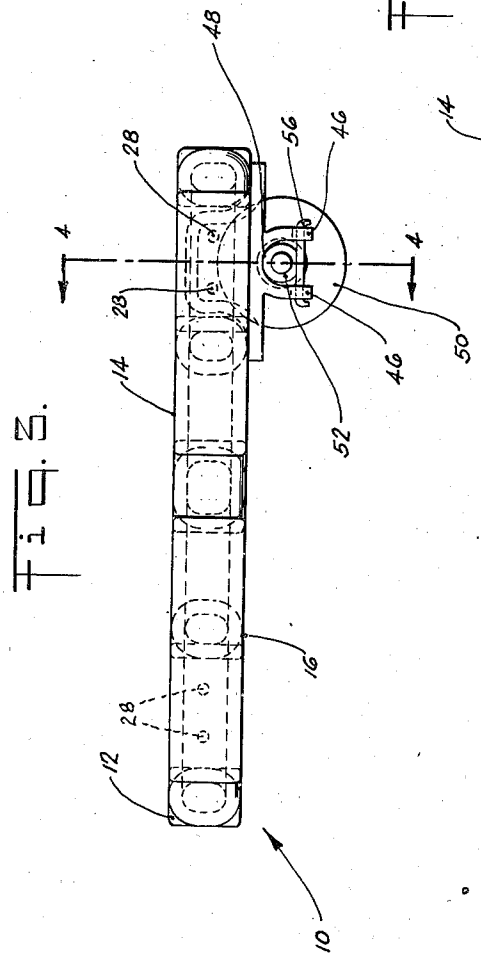


Fig. 3.

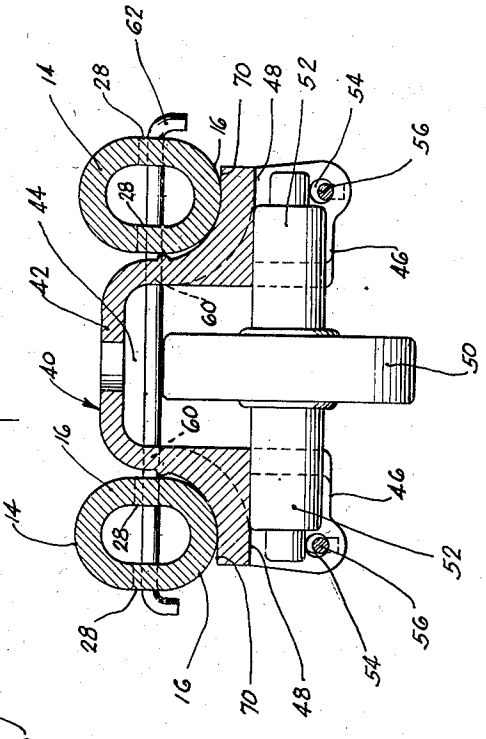


Fig. 4.

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Patented Mar. 1, 1949 2,462,960

UNITED STATES PATENT OFFICE

2,462,960

WORK SUPPORT

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Application July 6, 1946, Serial No. 681,732

4 Claims. (Cl. 263—47)

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My invention relates generally to heat treating apparatus, and in particular to work supporting components thereof, commonly referred to as trays.

Articles to be heat treated are either disposed within containers or boxes in a packing of a carburizing compound, and these containers disposed on the tray, or else the articles to be treated are disposed directly on the work supports as trays, and subjected to a carbonaceous atmosphere within the furnace, muffle or the like. In both cases, the tray load is usually quite substantial. When the loaded tray is placed within the furnace, muffle or the like, it is subjected to heat over the treating cycle, and ofttimes develops a sag under the prolonged heat and weight load. Of course, when the tray is removed from the furnace into a cooler atmosphere and the weight removed therefrom, the tray cools and the sag is reduced, but not completely so, and on repeated usage, the tray may become so warped and curved out of line as to render same useless for further furnace operation.

The main object of my invention, therefore, is the provision of a work support for use in heat treating furnaces or the like which can be so used as to prevent or overcome objectionable sagging.

Another object of my invention is the provision of a reversible work support for use in heat treating furnaces.

Another object of my invention is the provision of a reversible work support for use in heat treating furnaces having means to maintain the support upwardly of the furnace track or floor, the maintaining means being securable to the tray as to extend from either face thereof.

Another object of my invention is the provision of a work support for use in heat treating furnaces which is provided with support means therefor, the tray being so constructed as to receive the support means and permit use of the tray on both faces thereof.

Still another object of my invention is the provision of a tray having support means therefor, and a plurality of openings through the tray into which the support means may be secured from both faces of the tray so that it can be used, as desired, with one or the other face thereof uppermost.

Still another object of my invention is the provision of a tray having support means therefor, the tray having a plurality of openings therethrough, the support means being securable within the openings from both faces of the tray, and disposable within the openings so that the tray

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can be used as desired, with either face uppermost, and with any edge thereof leading.

Other and further objects of my invention will in part be specifically pointed out, and still others will be apparent from the following description of an illustrative embodiment of my invention.

In the drawings annexed hereto and made a part hereof,

Figure 1 is a plan view of one form of device constructed according to and embodying my invention;

Fig. 2 is an edge elevational view thereof;

Fig. 3 is a side elevational view thereof; and

Fig. 4 is an enlarged section, partly in elevation, on the line 4—4 of Fig. 3.

My device is indicated generally by reference numeral 10, and comprises a perferably generally flat and rectangular member 12 of high heat and corrosion-resisting metal alloy (as nickel-chrome-iron). Member 10 may be formed as by casting or otherwise, and may be of hollow construction, as shown, providing a top face 14 and a bottom face 16, spaced therefrom. Member 10 may, in effect, comprise a grid of hollow, tubular, interconnected members 16 as seen in Fig. 4.

The grid members 16, 16 are spaced apart to define a plurality of openings 20, 20 through the device, and as illustrated in Fig. 1, these openings 20, 20 are uniformly located in from the corners of the device. Openings 20, 20 are square in outline, but they may, if desired, be circular within the scope of my teachings. The grid elements of my work support defining openings 20, 20 are preferably of uniform thickness, and additional openings as 22, 24 may be provided adjacent the grids defining openings 20, 20 so that free access may be had to the grid elements outlining and defining the several openings 20, 20 from the outside thereof. I insert means to support the tray upwardly of the furnace floor or track within these corner openings 20, 20, and access must be had thereto for the securing means.

The grids defining openings 20, 20 are provided with aligned and spaced pairs of transverse openings 26, 26 and 28, 28 on opposite sides thereof, the openings 26, 28 being located midway of the height of the grids.

The support components of my invention comprise roller units 40, 40, each of which comprises a shell 42 having a dished portion 44 in the center thereof, and a pair of spaced apart elements 46, 46, extending downwardly therefrom on opposite sides thereof, defining bearings 48, 48 on opposite sides of the shell recess. A roller 50 is provided for each shell having integral journals

52, 52, extending outwardly therefrom, on each side thereof, the journals 52, 52, fitting into and being received within the bearings 48, 48. Aligned apertures 54, 54 are formed near the bottom of each pair of opposing elements 46, 46, and rollers 50 secured within shell 40 as by pins 56 passing through openings 54, 54 below reduced ends of journals 52, 52, so as to trap them within the bearings.

As illustrated in Fig. 4, the body portion of each shell 42 is provided with a pair of opposing apertures 60, 60 on opposite sides thereof, axially aligned with bearings 48, 48 each pair of apertures 60, 60 being spaced apart to coincide with openings 26, 26 and 28, 28 through grid elements 16. The shell outline is slightly smaller than opening 20, so as to fit therewithin easily, and be pin-secured to the tray. The height of shell 42 is so dimensioned that when openings 20, 20 are fitted thereover, the grids rest on shoulders 70, 70 with grid openings 28, 28 in alignment with shell openings 60, 60. The top of shell 40 is below the level of the tray.

In use, of course, all the shell units are so secured to the tray that the rollers extend in the same direction from the same face of the tray. It will be obvious that the roller housings may be inserted into openings 20, 20 from the opposite side of the tray, so that face 16 thereof will be uppermost.

Since openings 20, 20 are square, and since shells 42, 42 are similarly square, the shells may be turned 90° from the position shown in Fig. 1 wherein the tray moves in the direction of the arrow *b*, and moved instead in the direction of the arrow *a* (see Fig. 1), the shells being secured in the new position by pins 62, 62 passing through the aligned apertures 26, 26 and 60, 60.

Thus, if the tray illustrated in Fig. 1 is used for some time with face 16 uppermost, it may sag either in the center or at some other portion thereof, making it difficult to properly locate and support work to be treated thereon. At that time, instead of discarding the tray as no longer usable, pins 62, 62 are withdrawn, the support members 40, 40 removed from opening 20, 20, and the tray reversed thereover, so that face 16 is now uppermost, and the pins 62, 62 reinserted. In this manner, I am enabled to prolong the useful life of my tray. In like manner, I may alter the direction of movement of the tray, from *b* as shown in Fig. 1 to *a* at right angles thereto, merely by removing pins 62, 62 from apertures 28, 28 and turning each shell 90° and reinserting pins 62, 62 through apertures 26, 26.

The tray component of my invention may be formed as a unitary member and the grids may be hollow as illustrated, or solid, the operation with regard to turning being identical in both cases.

Having now described my invention, what I claim and desire to secure by Letters Patent is:

1. A flat, reversible work tray for use in heat treating furnaces and the like, and means to support same upwardly of the furnace floor, the tray comprising a rectangular member composed of a plurality of laterally spaced apart grids the spacing therebetween defining a plurality of rectangular apertures through the support, certain of which apertures are located in from the corners of the support, the grids defining these certain apertures being horizontally apertured midway of the height thereof, the support comprising housings disposable within the grid openings, the housings also being apertured horizontally therethrough, and pin means to secure the housings to the support within the apertures, said pins passing through the aligned openings through the work support and through the housing.

2. A reversible work tray for use in heat treating furnaces and the like, and means to support same upwardly of the furnace floor, the tray comprising a flat, generally rectangular member composed of laterally spaced apart grids defining a plurality of rectangular apertures through the support, the four grids margining certain of the apertures being horizontally apertured midway of the height thereof, the supports comprising rectangular housings receivable with the apertured grid openings, the housings also being horizontal, and pin means to secure the housings to the tray within the apertures, the pins passing through the aligned openings through the work tray and through the housing, whereby the housings may be turned axially through 90° within their respective apertures to change the direction of tray movement on the supports.

3. An openwork, flat-surfaced, reversible work sustaining tray for use in heat treating furnaces and the like, and means to support same upwardly of the furnace track, the tray comprising a plurality of laterally spaced-apart and crisscrossed hollow tubes, flat on the tops and bottoms thereof, certain of the openings through the tray, adjacent the edges thereof, defining sockets for the support means insertable thereinto from either face of the tray, the tubes defining the sockets being horizontally apertured to provide support anchorings in either position thereof with respect to the tray.

4. A tray as in claim 3, in which the supports are transversely apertured, the support apertures being alignable with the tube apertures when inserted from either surface of the tray, and pin means passing through the registering apertures to releasably secure the support to the tray on either surface thereof.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,020,184	Hodson et al.	Nov. 5, 1935
2,173,682	Fahrenwald	Sept. 19, 1939
2,297,054	Garrison	Sept. 29, 1942