Dec. 5, 1939. H. H. HARRIS 2,182,202

ROLLER RAIL FOR HEAT TREATING FURNACES

Filed March 19, 1938

Fig. 1.

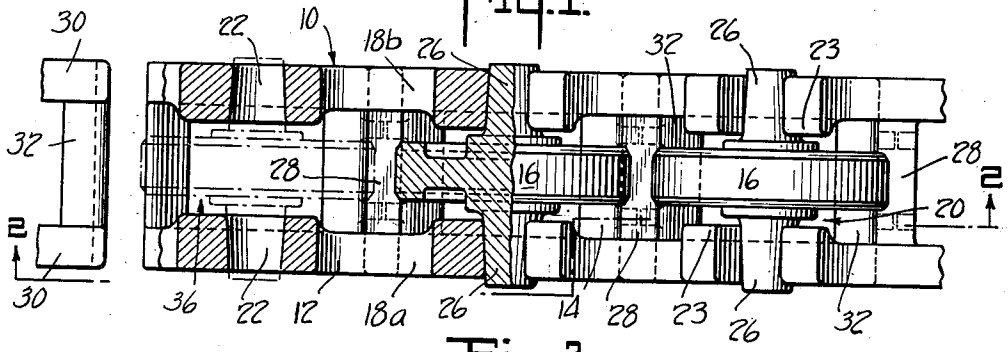



Fig. 2.

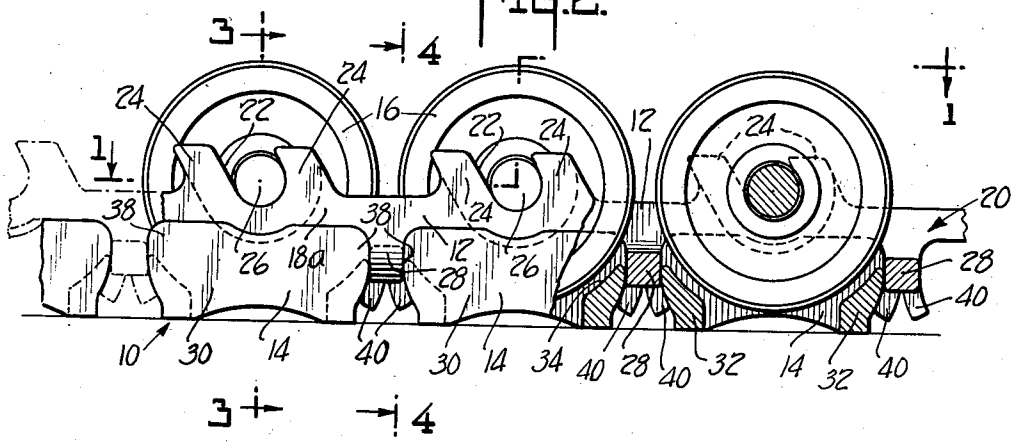



Fig. 3.

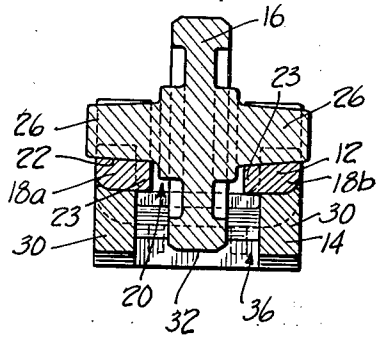
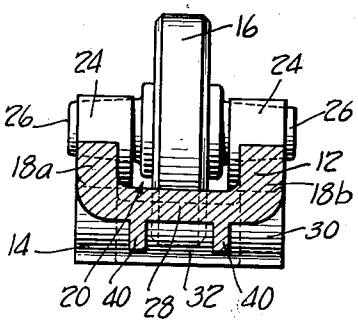



Fig. 4.

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# UNITED STATES PATENT OFFICE

2,182,202

## ROLLER RAIL FOR HEAT TREATING FURNACES

Henry H. Harris, Champaign, Ill.

Application March 19, 1938, Serial No. 196,852

6 Claims. (Cl. 193—35)

My invention relates to improvements in rails for use in industrial heat treating furnaces, for example, heat treating furnaces such as carbonizing furnaces in which preferably flat-bottomed work supports are pushed in tandem through the highly heated furnace while supported on rollers mounted to rotate in the roller rails.

Roller rails used in heat treating furnaces of this type are subjected not only to the load supporting and travelling stresses, but also and simultaneously to the heat conditions which prevail within the furnace. Roller rails have conventionally been made heavy and bulky to withstand these various causes of deterioration, and since weight is a prime factor in the determination of the cost of roller rails, these heavy and bulky rails have proven to be relatively expensive. It is one object of my invention, therefore, to provide a relatively cheap and simple rail for supporting rollers for use in heat treating furnaces which is light and of skeleton outline, my improved rail consisting of the roller supporting wall portions, members to connect same and supports therefor.

Through constant experimentation, it has been found that a metal alloy of nickel, chromium and iron compounds will best withstand the high heat of furnace conditions and the corrosion incident to use, during which the roller pintles revolve within the bearings formed as an integral part of the rails. This alloy material, while satisfactory from the standpoint of length of use, is very expensive, and its cost is high compared with the cost of other and cheaper alloys, and particularly so when the entire rail is formed of this material.

Another object of my invention, therefore, is the provision of a roller rail in which the supporting structure is composed of individual units and the rail section proper is a single separate unit.

Another object of my invention is the provision of a roller rail formed partly of high grade alloy, and partly of cheaper, lower grade alloy.

Further objects of my invention will in part be apparent and in part pointed out specifically in connection with the following description of an illustrative embodiment.

In the drawing annexed hereto and made a part hereof,

Figure 1 is a plan view, partly in section, of one form of roller rail constructed according to and embodying my said invention, the view being taken along the broken line 1—1 of Fig. 2;

Fig. 2 is a side elevational view, partly in section along the broken line 2—2 of Fig. 1;

Fig. 3 is a transverse section on the line 3—3 of Fig. 2; and

Fig. 4 is a transverse section on the line 4—4 of Fig. 2.

Reference numeral 10 indicates the form of roller rail of my invention here illustrated which comprises rail 12, a plurality of supports 14, and a similar plurality of rollers 16 journalled for rotation in the rail 12.

Each rail section 12 comprises a pair of wall portions 18*a*, 18*b*, arranged in spaced apart parallel relation, the space between the walls 18*a*, 18*b*, defining a roller channel 20. A plurality of pairs of transversely aligned, open bearing slots 22, 22 are formed in the upper portion of walls 18*a*, 18*b*, the sides 24 of which slots 22 are angulated as shown with the open sides thereof opposed to the direction of work travel to prevent the rollers from jumping out therefrom, although, if desired, slots 22 may be formed with vertical, straight sides sufficiently deep to accomplish the same result. Slots 22 are tapered to receive the correspondingly tapered pintles 26 formed as an integral part of rollers 16, and the sides of walls 18*a*, 18*b* are extended or shouldered inwardly at the slots to provide lengthened bearing surfaces, as indicated at 23.

Wall members 18*a*, 18*b* are joined together by a plurality of cross bars 28, which extend from the bottom of one wall 18*a* across channel 20 to the bottom of the other wall 18*b*. These cross bars 28 are formed midway between the pairs of transversely aligned bearing slots 22, 22 and depend downwardly from the underside of walls 18*a*, 18*b*, so as not to interfere with the free rotation of rollers 16 within the roller channel 20.

Each support 14 comprises a generally rectangular member, having side wall portions 30, 30, and end portions 32, 32 connecting the side walls, said cross portions 32 being narrower and lower than the side portions 30, as seen at 34, the space between the various portions defining a roller slot 36 into which the bottom portions of rollers 16 extend during rotation thereof.

The sides 30 of supports 14, the upper portions of which are bulged outwardly as indicated at 38, are equal in length to the distance between cross-bars 28, and when the supports and rail are secured together, each of the supports is received thereunder between each pair of cross bars 28, as illustrated in Fig. 2. Each cross bar 28 is provided with a plurality of downwardly depending fingers 40 which are bent around the bulged por-

tion 38 of the supports on each side thereof to secure the rail 12 to said supports 14.

The complete rail is assembled by placing the supports 14 against the underside of rail 12, between cross bars 28, bending or otherwise forcing the fingers 40 around the sides of the supports, and securing them in such position as by welding, if desired.

An entire roller rail assembly is formed by placing a number of such rail sections end-to-end within a furnace, and secured in such position as by welding or by any other suitable means. A plurality of rails is provided, with the separate rails preferably arranged parallel to one another, and two or three parallel rails are usually provided, although more may be used, if desired. After the rails are formed, the rollers are placed in the bearing slots, and the assembly is ready for use.

Among the advantages of my form of construction is the fact that the portion of the rail which contains the bearing slots, and thus bears most of the wear, can be constructed of a high grade, high heat and corrosion resisting alloy material. The wear-bearing portion of my improved rail is of light and skeleton formation and is hence relatively inexpensive. The supporting blocks are of a lower grade alloy material and are relatively cheap, there being no functional necessity for forming these supports of expensive material and they may therefore be made as heavy as necessary to properly support the rail section and the loads to be moved thereover. The supporting blocks may easily, quickly and inexpensively be replaced if necessary.

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

1. A roller rail assembly for use in heat treating furnaces comprising a plurality of spaced-apart individual support blocks, a pair of parallel and spaced-apart wall members resting on and in direct contact with said supports, rollers mounted on said wall members for rotation therebetween, cross members connecting said wall members, and means to secure the wall members to the supports.

2. A roller rail assembly for use in heat treating furnaces comprising a plurality of spaced-apart individual support blocks, a pair of parallel and spaced-apart wall members resting on and in direct contact with said supports, rollers mounted on said wall members for rotation therebetween, cross members integral with and connecting said wall members, and means on the cross members to secure the wall members to the supports.

3. A roller rail assembly for use in heat treating furnaces comprising a plurality of spaced-apart individual support blocks, a pair of parallel and spaced-apart wall members resting on and in direct contact with said supports, rollers mounted on said wall members for rotation therebetween and between the support blocks, cross members integral with and connecting said wall members which cross members fit between the support blocks, and means to secure the wall members to the supports.

4. A roller rail assembly for use in heat treating furnaces comprising a plurality of spaced-apart individual support blocks, a roller channel in each of said blocks, a pair of parallel and spaced-apart wall members resting on and in direct contact with said supports, rollers mounted on said wall members for rotation therebetween and between the support blocks, a plurality of cross members integral with and connecting said wall members which cross members depend between the support blocks, and means on the cross members to secure the wall members to the supports.

5. A roller rail for use in heat treating furnaces comprising a plurality of spaced-apart support blocks, a pair of wall portions resting on said supports, said walls being spaced apart to define a roller channel therebetween, and means to secure said walls to said supports comprising a plurality of cross-members integral with said walls, said cross members being received between the spaced-apart supports and having an engagement with the blocks, and rollers mounted on said walls for rotation therebetween.

6. A roller rail as in claim 5 in which the upper portion of the support member is enlarged, and the cross members have fingers thereon fitting about the enlargements to secure said supports to the cross members.

HENRY H. HARRIS.