Sept. 12, 1939. H. H. HARRIS 2,172,379

ROLLER RAIL

Filed Nov. 20, 1937

Fig. 1.

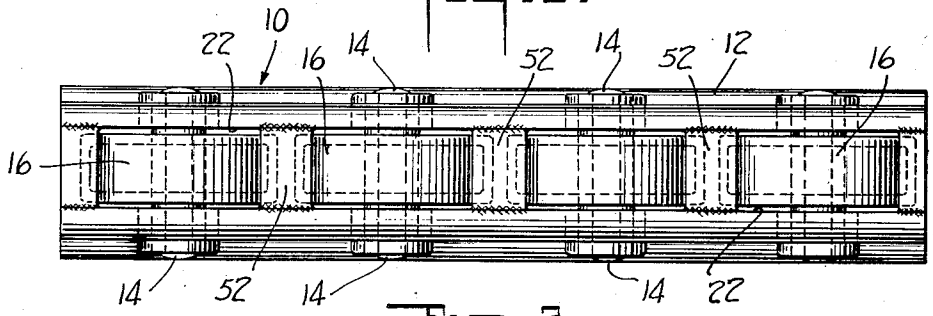


Fig. 2.

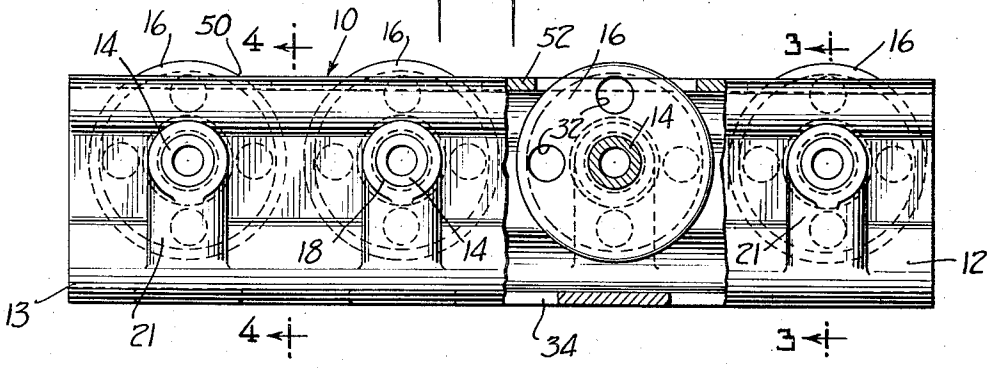


Fig. 3.

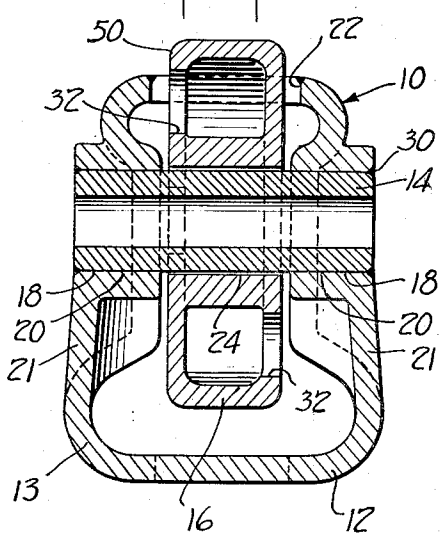
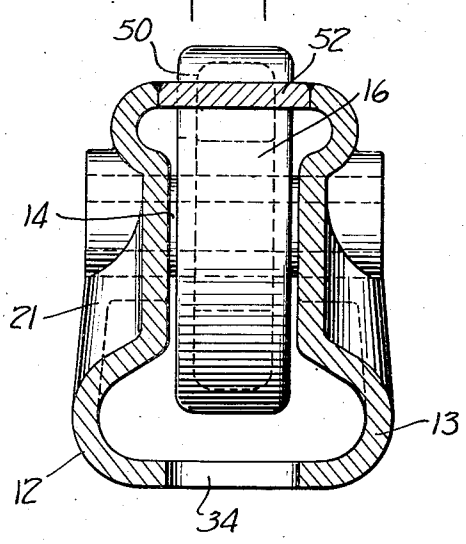


Fig. 4.



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2,172,379

UNITED STATES PATENT OFFICE

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ROLLER RAIL

Henry H. Harris, Champaign, Ill.

Application November 20, 1937, Serial No. 175,613

2 Claims. (Cl. 193—35)

My invention relates generally to industrial heat treating furnaces, such as carbonizing furnaces and the like, and specifically is concerned with the means employed within the furnace on which to move articles therethrough.

Articles to be heat treated within furnaces of this type are usually loaded onto flat bottomed supports, such as trays, boxes, or the like. These supports are disposed on top of skid rails or tracks, or on various types of roller rails, and are then usually pushed or otherwise moved through the heat treating furnace in tandem. The flat skid rails have been found to be unsatisfactory, both because of the destructive effects of the friction generated by the flat bottomed supports, and because of the injurious effects of the heat conditions within the furnace which, with the load-bearing stresses, cause warping, buckling and bending of the rails.

Ordinarily, roller rails, that is, rails on which rollers are mounted, while not subject to the destructive effects of travelling friction to the same extent as are flat skid rails, are nevertheless subject to the injurious effects of furnace heat and work support and travel thereover. To withstand these conditions, the conventional roller rails have been made very large and bulky. However, even these heavy and massive rails fail, and the entire roller rail must be replaced if any part thereof becomes worn or damaged through use. This is ordinarily an expensive operation, and among the objects of my invention, therefore, is the provision of a light and simplified roller rail assembly which is made up of relatively few and easily connected parts, which can be replaced or renewed quickly and relatively inexpensively.

Many of the rollers used in conventional roller rails have the journals formed integrally therewith, and much of the wear on the bearings occurs due to the rolling friction generated by the revolving journals within the bearings; affecting both the bearings and the roller journals. Failures of rails as a whole are due mostly to worn or cracked bearings since the bearings are an integral part of the rail and, therefore, another object of my invention is the provision of a roller rail with separate, independent roller support or axle members, which can be incorporated into the roller rail and removed therefrom quickly, easily and inexpensively.

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

In the drawing annexed hereto and made a part hereof,

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

Fig. 2 is a side elevational view thereof, with a part of the shell or housing broken away to show the interior;

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

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

My new and improved roller rail is indicated generally by reference numeral 10, and comprises shell or housing 12, within which a plurality of preferably hollow tubular axles or pins 14 are disposed, providing journals for rollers 16 mounted thereon, the tops of the wheels or rollers 16 projecting upwardly beyond the shell or housing 12, as indicated at 50, permitting work to be moved through the furnace upon the rollers.

Shell 12 comprises a somewhat flattened, elongated tubular member formed, if desired, as a one-piece casting of heat and corrosion resisting alloy metal, preferably of nickel, chromium and iron composition. The member is set on edge and extends longitudinally of the furnace. It is enlarged laterally at the bottom, as at 13, to form a broad, substantially flat base adapted to provide a firm support for member 12 by being rested or otherwise disposed on the floor or other support within the furnace.

A plurality of pairs of opposed, transversely aligned bores 18, 18, for receiving the roller pins or axles 14, are formed through the side walls of the shell or housing 12, the side walls of such member 12 being formed with outwardly extending reinforcing bosses 20, wherein the cored bore openings 18, 18 are made. The side walls of tubular member 12 are preferably formed so as to be in spaced apart parallel relationship, defining a roller channel therebetween, but at those regions beneath the bosses 20, the walls of the shell are formed with local, outwardly extending portions 21 adapted to support the bosses 20 and provide increased load-bearing strength in the portions of the side walls of the shell or housing 12 where the rollers are located.

An elongated slot 22 is formed in the top of the tubular member 12, said slot 22 extending longitudinally of said member 12 in line with the roller channel, and being of sufficient width to receive the rollers 16 and permit said rollers to extend into the interior of the hollow shell or housing 12.

In assembling the parts of the roller rail, rollers 16 are passed into the interior of the shell

through roller slot **22** and the pin or axle **14** is then passed through the bore **20** in one side wall, through hub bore **24** of the roller, and then through bore opening **20** in the further side wall of the tubular member **12**, and the axle **14** welded to the tubular housing member **12**, as at **30**.

Rollers **16** and axles **14** are also preferably hollow for lightness as well as strength, and like the shell or housing **12** are also formed as one-piece castings of heat and corrosion resisting alloy, preferably of nickel, chromium and iron composition. Rollers **16** and shell **12** are cored, as at **32** and **34** respectively, to provide outlets for the accumulation of scale and other waste, to render the rail self-cleaning, and rollers **16** are mounted sufficiently high above the bottom of shell **12** to permit same to rotate freely despite any accumulation of scale on the bottom of shell **12**.

In my improved rail, the only movement is rotation of the roller **16** around the axle **14**. Most of the wear is thus borne by the axle, and when the need for replacement arises, the weld at **30** is reduced, the worn axle knocked out and a new one inserted and welded in place to renew the rail as a unit and restore it to full operative condition. The roller may also be replaced with a new one if desired.

Wide gaps are left in roller slot **22** between the upwardly projecting portions **50** of the adjacent rollers, and these may be closed, as by means of plates **52** welded into the inter-roller spaces, see Fig. 1. These plates need not be removed to renew the axles but they may be removed by reducing the weld, if desired, to replace rollers **16**.

The advantages of my improved form of roller rail are numerous. It has but three basic components; the shell or housing, the individual rollers, and the individual axles. These parts are all of simple construction, and lending themselves readily to mass production, can be formed easily and inexpensively. The parts which take much of the wear are readily accessible and easily replaceable. The unit as a whole is light, and hence relatively inexpensive, weight being a prime factor in determining cost.

Various modifications may be made without departing from the spirit of my invention, which is to be limited only by the scope of the appended claims.

I claim:

1. A roller rail for use in heat treating furnaces comprising an elongated, hollow member, having a base portion, and side wall portions, the upper portions of said side walls being spaced apart to define a slot extending the length of said member, a plurality of pairs of aligned and cored bosses in said side walls, the bosses extending inwardly of the member from the side walls thereof, each pair of bosses being spaced apart to define a channel therebetween substantially equal to the slot, the channel and slot being vertically aligned, a similar plurality of cored rollers within the member, and a plurality of axles each of which passes through a pair of the cored bosses and the cored roller whereby the roller is mounted within the member with its upper portion projecting up from the slot.

2. A roller rail as in claim 1, in which the base is enlarged and flattened on its underside; the tops of the side walls are bent over to define the slot therebetween; the side walls are curved beneath the bosses and at their outer ends; and the side wall portions between the bosses are in substantial alignment with the inner ends of the bosses and the slot and channel.

HENRY H. HARRIS.