This invention relates to continuous heating furnaces such as are used in steel mills for heating steel in various forms such as packs and sheets, and is more particularly concerned with an improved type of walking beam conveyor for such furnaces.

Referring to the drawings wherein the preferred form of the invention is shown, Fig. 1 is a vertical longitudinal section through a furnace embodying the improved walking beam conveyor;

Fig. 2 is a fragmentary plan view of the conveyor, shown in Fig. 1;

Fig. 3 is a vertical section on line 3-3 of Fig. 2;

Fig. 4 is a vertical cross section of the furnace shown in Fig. 1, and

Fig. 5 is a vertical cross section on line 5-5 of Fig. 2.

The furnace heating chamber, generally indicated at F, is of tunnel type with a door opening at each end and is fired by upper and lower rows of burners 10 arranged in the opposite side walls. The chamber floor is indicated at 11 and is supported by cross beams 12 which extend across a machinery pit 13, the machinery being part of the conveyor operating mechanism.

Extending in rows both crosswise and lengthwise within the furnace chamber are cast metal stools 14 which are supported on the floor-supporting cross beams 12 arranged in pairs. Supported on each longitudinally extending row of stools, in a channel 15 formed in the top of each stool, is a rail 16. These various rails extend out of one end of the furnace chamber and find support on cross beams 17 which in turn rest on a carriage 18 shown as riding on tracks 19. The carriage is arranged to be reciprocated by any preferred means but for illustrative purposes, there is shown a rack and gear drive 20. The rails 16 constitute a bed of transport rails for moving the work lengthwise of the furnace chamber in a manner hereinafter more fully described.

Associated with each stool 14 is a movable post 21. These posts are supported on cross beams 23 which are supported on longitudinally extending beams 23 which in turn are supported on rollers at the upper end of levers 24. Each longitudinally row of levers is converted by a link 25 which is connected to a frame 26 which is adapted to be reciprocated by any suitable driving mechanism shown as a gear and rack 27 whereby to raise and lower the posts 21 with respect to the stools 14. Secured to the upper end of each post is a U-shape support or yoke 28, the uprights of which are at opposite sides of the stool channel 15.

Supported by each longitudinally aligned row of yoke uprights is a rail 29. These various rails extend out of one end of the furnace chamber and find support on a cross beam 130 which is suitably supported on the lever-supported beams

The rails 29 together constitute a work lifting bed which cooperates with the transport bed of rails 16 in moving the work through the furnace chamber.

It will, of course, be understood that forward movement of the rail bed 16, when the rail bed 29 is lowered, will move the work forward, and that when the rail bed 29 is elevated the rail bed 16 is free to return to starting position after which the rail bed 29 is lowered to redetect the work on the rail bed 16 which thereupon again moves forward.

Referring more particularly to Figs. 3 and 5, it will be noted that a packing gland 30 seals the joint between each rod 21 and its stool and thus prevents free entry of air into the furnace chamber at that point. The stool is made of heat-resisting alloy as are also the other metal parts that are subject to high temperature. To further protect the stool from the intense heat of the lower row of burners protective brick work extends upwardly above the main level of the cham-ber floor.

The construction and arrangement of the stool so that it may serve not only as a rail support but also as a guide or support for the rod 21 is one of the important features of the invention. Among other things the construction materially simplifies and reduces the cost of the furnace construction as a whole.

The protection of the stool from the intense heat of the lower row of burners is made possible, in part by the provision of the U-shape supports 28 and the means for raising and lowering the same, as described above.

What we claim is:

1. In a walking beam conveyor for a furnace chamber having a floor, the combination of metal stools arranged in laterally and longitudinally aligned rows and comprising part of said floor, a rail supported on each longitudinally aligned row of stools, a post associated with each stool and vertically movable therein, a U-shape member at the top of each post with its uprights at opposite sides of the stool, a rail supported by each row of longitudinally aligned uprights in parallelism with the stool-supported rail, and means outside of said chamber for supporting said posts and moving them vertically.

2. In a walking beam conveyor for a furnace chamber having a floor, the combination of metal stools arranged in laterally and longitudinally aligned rows and comprising part of said floor, cross beams underlying said floor and on which said stools are supported, a rail supported by each longitudinally aligned row of stools, a post associated with each stool and vertically movable therein, means at the top of each stool for supporting a pair of rails arranged in parallelism at either side of said rail, a cross beam for supporting each row of transversely extending posts, and means for raising and lowering all of said posts in unison.

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