Oct. 26, 1943. C. A. BALL 2,332,550

SKID SHOE

Filed June 15, 1942

Fig. 1.

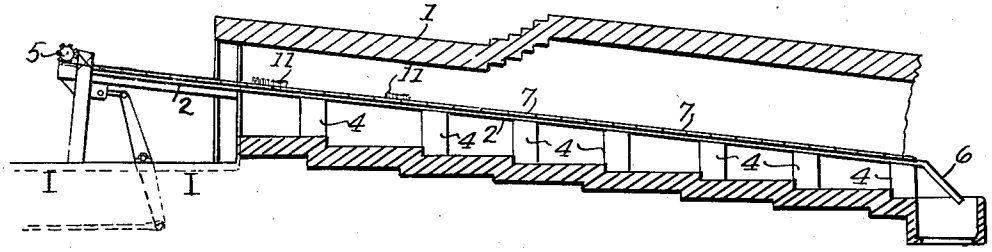


Fig. 2.

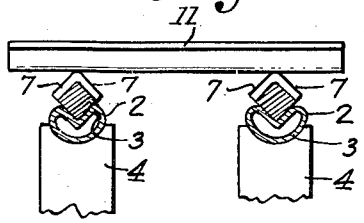


Fig. 3.

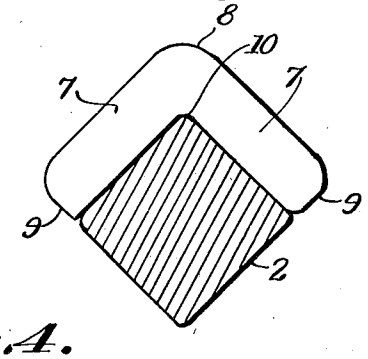


Fig. 4.

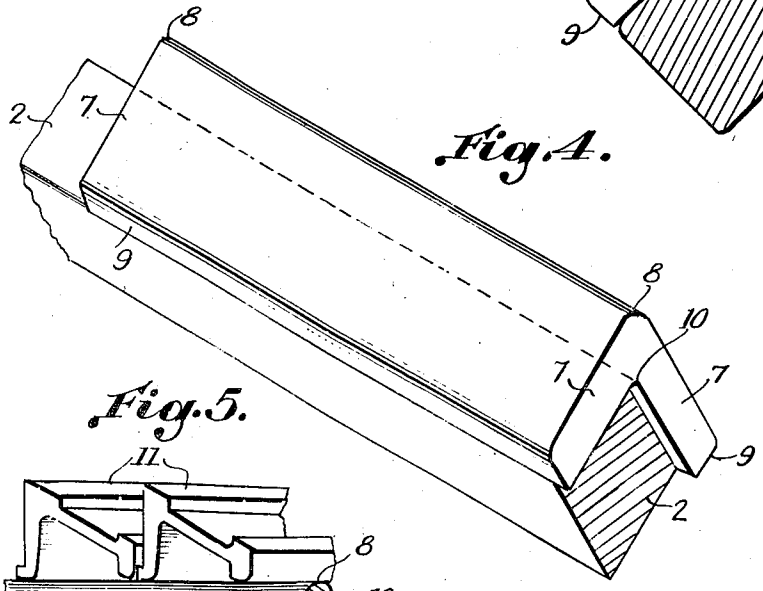
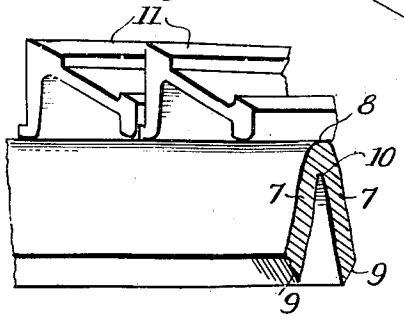


Fig. 5.



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2,332,550

SKID SHOE

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Application June 15, 1942, Serial No. 447,029

2 Claims. (Cl. 214—18)

This invention relates to improvements in skid shoes or saddles adapted to overcome skid markings on articles that are being passed through a furnace and it more especially comprises the features pointed out in the claims.

The purpose of the invention is to provide an exceedingly simple and effective means for eliminating skid bar marks formed on articles that are being pushed through a furnace when such articles are only supported on skids; that provides shoes or saddles to slide on triangular or other angular shaped skids; that utilizes the simplest means in standardized form which employs reversible ended shoes of the same cross section throughout their length for immediate use from the foundry without subjecting them to any machining operations whatever; that assembles the shoes in pairs opposite each other, one on each of two parallel skids in tandem with other pairs on the same skids throughout the length of the furnace; that utilizes a pair of shoes loaded by the same articles such as slice bars, etc., placed transversely of the skids to be intermittently pushed forward into the furnace and be intermittently pushed out of the furnace.

With these and other ends in view there is illustrated such an instance of adaptation that will show the broad underlying features without being limited to the specific details shown thereon and described herein.

Fig. 1 is a diagrammatic elevation through a furnace with its skids and shoes and pushing means.

Fig. 2 is an enlarged cross section of Fig. 1.

Fig. 3 is an enlarged end elevation of a saddle and a skid bar in section.

Fig. 4 is a semi-perspective of a shoe.

Fig. 5 shows splice bars assembled on a shoe.

In carrying the invention into practice there may be used whatever modifications that the exigencies of varying conditions may demand without departing from the broad spirit of the invention.

The reversible saddles or shoes may be used within any desired furnace in which separate fabricated steel parts, bars etc., may be subjected to a second heat-treatment after having been formed originally, without producing any "telltale" skid marks on the product. This is accomplished by a conventional furnace 1, in which two or more parallel rows of skids 2 of any desired type of construction may be placed on continuous water cooled sub skids 3. Two upper faces of these skids are V shaped at approximately 90° to receive the similar shaped lower portion of the main skids 2. Suitable pier-like supports 4 are placed beneath each line of skids.

Any well known conventional pusher 5 is used. At the delivery end an inclined chute 6 leads the shoes into a cooling pit from where they may be returned to the entry end by hand barrow or in any other way. The individual shoes 7 are approximately twelve inches long, though this may be changed to suit different conditions. They comprise two sides joined together to form an inverted V. The apex 8 is rounded and the lower edges of the sides are also rounded at 9. The underside of the point of the V, opposite 8, at 10 is also rounded. This form of structure, on account of its simplicity makes it possible to use the saddles just as they come from the foundry without machining operations of any kind. Splice bars for railroad rails 11 or similar articles of varying lengths are placed on the shoes transverse of the skids.

The presence of skid marks on the products of steel mills is a noticeable defect which has attracted the attention of engineers, to such an extent that special I beam form of skid bars with similarly shaped riders, have been proposed and machined throughout their length to conform to the cross section of the T portion of the I beam; others have designed specially formed riders, with up turned material limiting projections; and others have sought a solution by forming sheet metal saddles with up turned flanges transverse of the skids. The invention in its utmost simplicity and the absence of all machining provides an article of wide commercial use and value.

The cross sectional area of the shoes used by applicant is approximately the same as the cross section of the skid bar on which the shoes slide. Naturally a furnace provided with a continuous length of heat absorbing skid bars supplemented by a continuous length of shoes will tend to hold the temperature at a more equalized rate than if the materials were placed directly on the skid bars. The number of shoes used will of course depend upon the length of the furnace. If forty feet long then obviously at 12 inches for each shoe there would be forty in the furnace to occupy its entire length at the same time. For each time that the material and the shoes are pushed forward a distance slightly greater than the length of a shoe the pusher then returns to its original position when another shoe and its load of material is positioned on ahead of the pusher. After a full stroke is made of the pushing block at the same time against both line of shoes the backward movement of the block provides an open or blank

space for the placement of a pair of shoes brought from the delivery end of the furnace and loading them.

As a matter of fact the entire operation of a furnace provided with these shoes can be made semi-automatic to facilitate an increase in the volume of production. This can be accomplished simply in the use of well known manual or mechanical expedients by dropping the shoes onto the skid bars 6 in front of the pusher 5. The shoes are loaded while the pusher 5 is idle.

In contrast to the complexity of expedients for avoiding skid marks on materials passing through a furnace this construction is so basicly simple that the cost of producing the carrying shoes is a minimum and skid marks are entirely eliminated.

What is claimed is:

1. A heat treating furnace which comprises a pair of continuous lengthwise suitably supported skid bars having angularly disposed bearing faces, a plurality of interengaging shoes having two bearing faces complementary to and resting on said skid bars, means for pushing loaded shoes through the furnace intermittently and in continuous contact with each other, the top surface of the shoes corresponding approximately to the angular under surface of the shoes, thus forming an inverted V shaped cross section.

2. A reversible shoe having a uniform cross section throughout its length for use on furnace skid bars having two angularly disposed bearing faces, said shoe having an inverted V cross section complementary to the two bearing faces of said skid bar on which the shoe is to slide, the cross sectional area of the shoe approximating that of the skid bar.

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