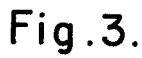
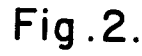
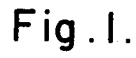


R. R. SLOAN
ROLLING MILL GUIDES
Filed April 1, 1964

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3,225,577

ROLLING MILL GUIDES

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3 Claims. (Cl. 72-12)

This invention relates to rolling mill guides and particularly to a guide for a rolling mill exit designed to control the preceding mill to direct the product in a straight line for subsequent mill feed or other treatment by correcting camber in the mill.

The guides presently used in rolling mills remain in fixed position once they have been set. As the steel coming from a rolling mill is forced through these preset guides from the ejecting mill, there is no way of correcting camber until it has passed through several mills. This can be done only manually and depends upon the alertness of an operator handling the mill. If the operator fails to detect a camber at the time it occurs, and it is very difficult to detect a camber in modern mills because of the high speed of operation, many tons of steel are rolled with a camber and with a very great chance for a cobbler between mills or a pile-up on the run out table. Both occurrences are costly in material waste, loss of man hours, damage to equipment and human injuries. By promptly detecting camber and correcting it, these losses and operating costs are drastically reduced, if not eliminated.

The rolling mill guide of my invention will eliminate the problems of cambering hereinabove described together with the human, material and financial losses which accompany such cambering and the cobbles which result therefrom. For example, in hot strip approximately 95% of the lop-sided gauge is the result of camber which can be eliminated by the gauge of this invention; similarly in slabbing mills the non-uniformity of slab width is caused primarily by camber in the slabbing mill and is of great significance in the case of slabs being rolled for future reduction.

In a preferred embodiment of my invention I provide in a rolling mill having a pair of work rolls on opposite sides of a path of strip travel, means for urging said work rolls together, the improvement comprising a pair of preset vertically extending guide members one on each side of and parallel to said path of strip travel forming an entry and exit end, a pair of hinged guides, one hinged to each of the preset guides at the entry end of thereof, means resiliently urging the free end of said hinged guides toward the path of strip travel, a top guide member on each preset guide extending angularly downwardly above the path of strip travel from a point adjacent the entry end to a point slightly above the path of strip travel at the exit end, sensing means on said hinged guide members sensing any change in position from a predetermined desired position and providing a signal for any such change in position. Preferably drive means actuated by said sensing means signal are provided to act on the means for moving each end of the work rolls so as to position said rolls to maintain a product passing therethrough on a predetermined path through the moving guides. Alternately, the signal means may warn the operator of the mill to make a manual adjustment of the roll position.

In the foregoing general description I have set out certain objects, advantages and purposes of my invention. Other objects, purposes and advantages will be apparent from a consideration of the following description and the accompanying drawings in which:

FIGURE 1 is a side elevation of a rolling mill incorporating the guide of my invention;

FIGURE 2 is a schematic top plan view of the rolling mill of FIGURE 1; and

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FIGURE 3 is an isometric view of the guide of FIGURE 1 having parts broken away.

Referring to the drawings, I have illustrated a rolling mill incorporating the guide of my invention. A pair of mill stands 10 and 50 each having rolls 11 and 12, one above and one below a path 13 of strip travel, are provided at spaced apart points on the path of strip travel. A pair of generally triangular preset guide members 14 are set on opposite sides of a run out table 15 between the two mills 10 and 50. Each of the preset guides 14 is provided with a hinged guide member 16 at the large end thereof extending toward the exit end of the first mill stand 10 and receiving the product from said mill between them. Each of said hinged members 16 is provided with a curved entry guide portion 17 to guide the product from mill 10 between them. An air cylinder 18 within a housing 19 forming a part of preset guide member 14 urges the hinged members 16 toward the path of strip travel. An angularly extending top guide 20 is provided on each preset guide extending over the path of strip travel from a point adjacent the hinge joint with the hinged member angularly downwardly to a point just above the path of strip travel. A limit switch 21 is provided in housing 19 and is connected to any well known signal device 22 such as a signal light, a warning bell or a relay and inching device. Connections 23 between the signal device 22 and drive motors 24 for screw downs 25 are provided.

The operation of the device of this invention is as follows: A strip, or slab or sheet 26 as the case may be, leaving the rolls 11 and 12 of mill stand 10 enters between hinged guide members 16 on opposite sides of run out table 15 and from thence between set guides 14 and into rolls 11 and 12 of mill stand 50. The upper guides 20 bring any curved ends or the like down onto the table rolls 15 to guide the end into the nip of the rolls in mill stand 50. If the strip leaving mill stand 10 has deviated from the center line between hinged guides 16, the guide 16 on the side toward which deviation has occurred will be moved inwardly against the limit switch 21. The switch 21 will promptly energize signal device 22 which will in turn energize one of the motors 24 operating screw downs 25 to adjust the gap between the rolls at the end where camber is occurring so that the mill gauge is returned to provide uniform reduction. This will in turn bring the strip back to the center line between guides 16 and the air cylinder 18 will return the hinged guide to its original position.

It is obvious that in place of air cylinder 18, there might be used any well known resilient urging means such as a spring or a hydraulic cylinder and constant pressure accumulator or similar device. Preferably I provide a cover member 27 attached to the top of the hinged guide members 16 and moving therewith to enclose the portion of between housing 19 and hinged guides 16.

While I have illustrated and described a present preferred embodiment of my invention in the foregoing description, it will be understood that this invention may be otherwise embodied within the scope of the following claims.

I claim:

1. In a rolling mill structure having a pair of work rolls one above and one below a path of strip travel, said rolls having an entry and an exit end and means for moving each end of said work rolls toward and away from each other, the improvement comprising a pair of preset vertically extending guide members one on each side of and parallel to said path of strip travel and spaced from the exit end of said rolls, said guide having an exit and an entry end, a pair of hinged guides, one hinged to each of the preset guides at the entry end thereof nearest the exit end of the rolls, and extended toward said rolls, means

resiliently urging the free end of said hinged guides toward the path of strip travel, a top guide member on each preset guide member extending angularly downwardly above the path of strip travel from a point adjacent the entry end to a point slightly above the path of strip travel at the exit end, sensing means on said hinged guide member sensing any change in position from a predetermined desired position and drive means actuated by said sensing means selectively acting on the means for moving each end of the work rolls toward and away from each other to position the rolls to maintain a product passing therethrough on a predetermined path through the moving guides.

2. In a rolling structure having a pair of work rolls one below a path of strip travel, said rolls having an entry and an exit end and means for moving each end of said work rolls toward and away from each other, the improvement comprising a pair of preset vertically extending guide members one on each side of and parallel to said path of strip travel and spaced from the exit end of said rolls, said guide having an exit and an entry end, a pair of hinged guides, one hinged to each of the preset guides at the entry end thereof nearest the exit end of the rolls, and extending toward said rolls, an air piston resiliently urging the free end of said hinged guides toward the path of strip travel, a top guide member on each preset guide member extending angularly downwardly above the path of strip travel from a point adjacent the entry end to a point slightly above the path of strip travel at the exit end, sensing means on said hinged guide member sensing any change in position of said guide member from a predetermined desired position and drive means actuated by said sensing means selectively acting on the means for moving each end of the work rolls toward and away from

each other to position the rolls to maintain a product passing therethrough on a predetermined path through the moving guides.

3. In a rolling mill structure having a pair of work rolls one above and one below a path of strip travel, said rolls having an entry and an exit end and screw down means for moving each end of said work rolls toward and away from each other, the improvement comprising a pair of preset vertically extending guide members one on each side of and parallel to said path of strip travel and spaced from the exit end of said rolls, said guide having an exit and an entry end, a pair of hinged guides, one hinged to each of the preset guides at the entry end thereof nearest the exit end of the rolls, and extended toward said rolls, means resiliently urging the free end of said hinged guides toward the path of strip travel, sensing means on said hinged guide member sensing any change in position from a predetermined desired position and drive means actuated by said sensing means selectively acting on the screw down means for moving each end of the work rolls toward and away from each other to position the rolls to maintain a product passing therethrough on a predetermined path through the moving guides.

References Cited by the Examiner

UNITED STATES PATENTS

672,466	4/1901	Wayland-Smith	172—16
1,406,084	2/1922	Rose	72—15
1,814,354	7/1931	Webster	72—16
2,014,475	9/1935	Hughes	72—12
2,211,658	8/1940	Hudson	72—12
2,226,500	12/1940	Matthews	72—12

CHARLES W. LANHAM, *Primary Examiner*.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,225,577

December 28, 1965

Roy R. Sloan

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 14, after "rolling" insert -- mill --;
same line 14, after "one" insert -- above and one --.

Signed and sealed this 27th day of December 1966.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents