

March 3, 1942.

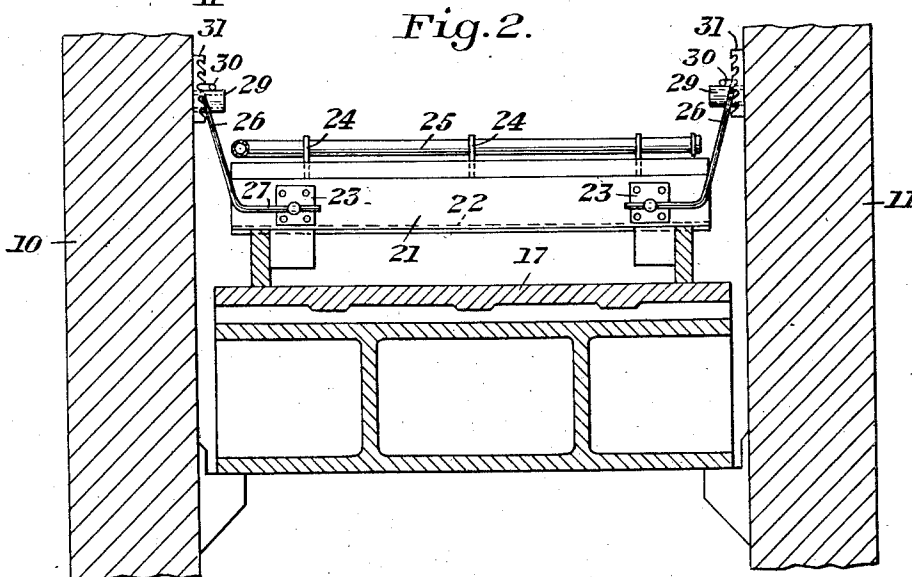
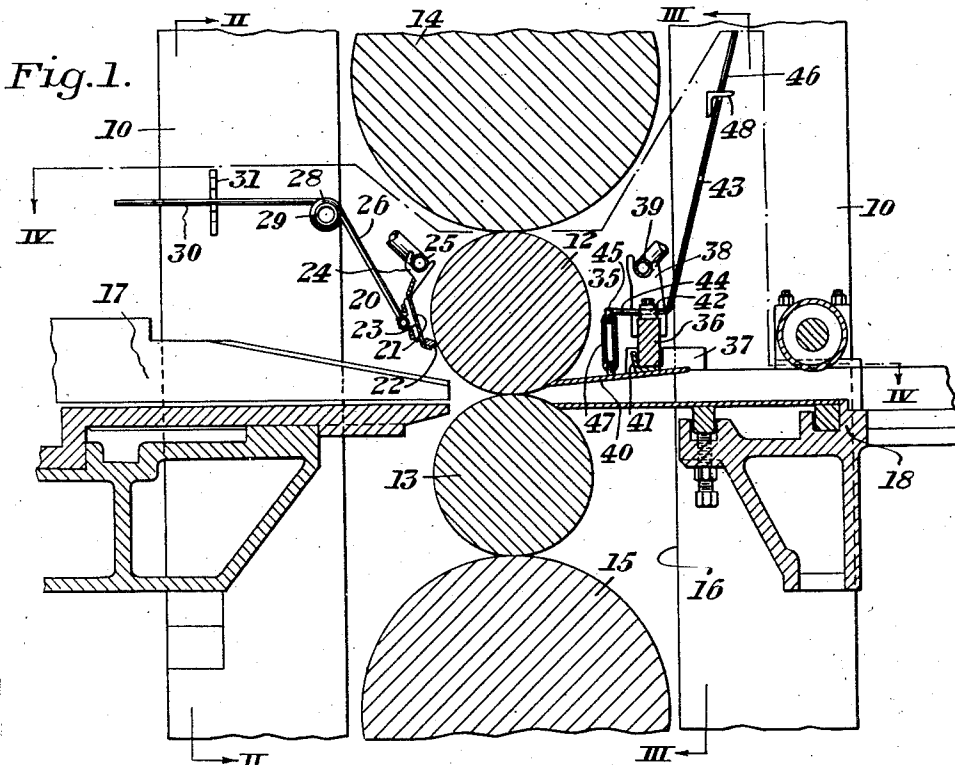
E. J. SIMBORG

2,275,113

WIPER FOR ROLLING MILLS

Filed July 24, 1940

2 Sheets-Sheet 1



INVENTOR

Edward J. Simborg

by his attorneys

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2 Sheets-Sheet 2

Fig. 3.

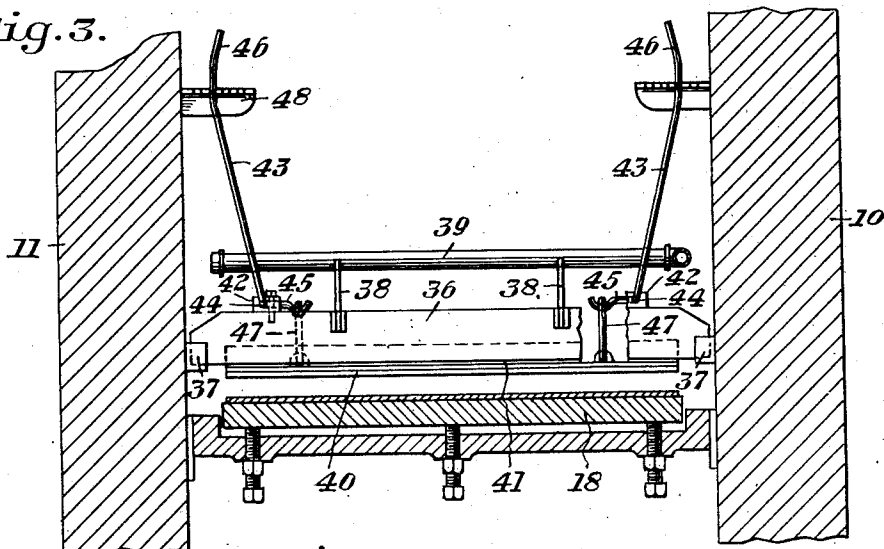
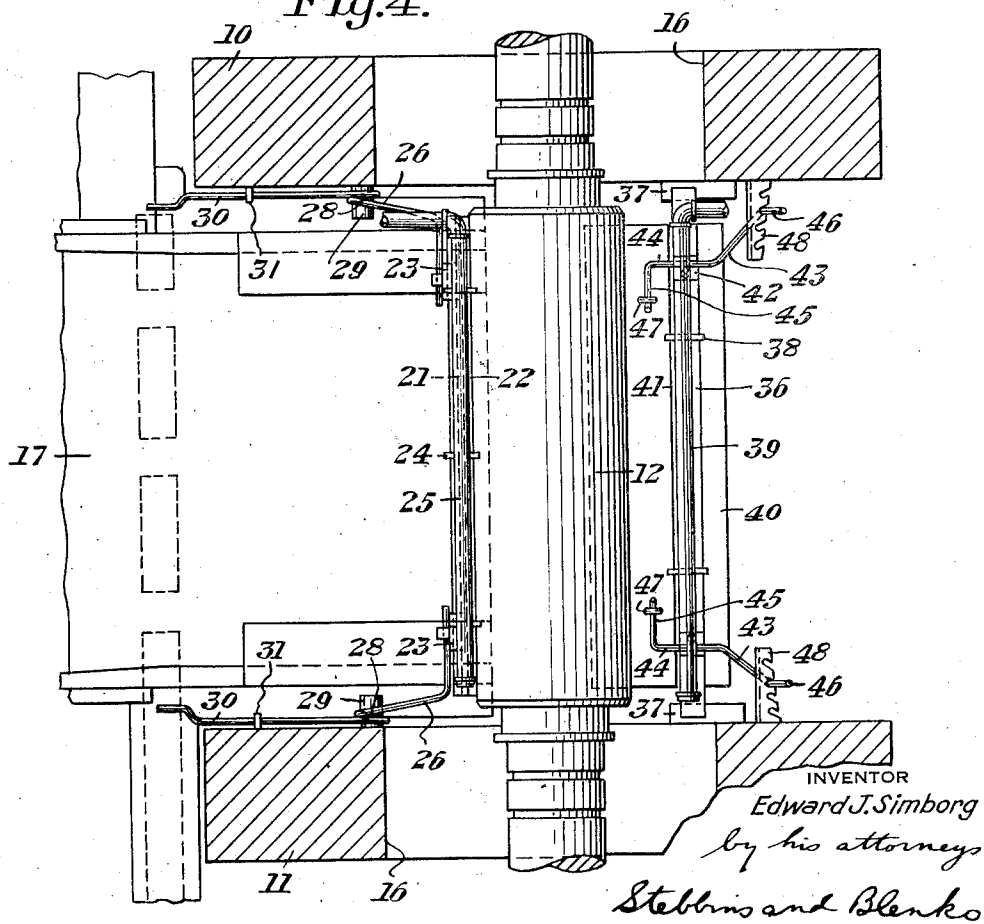


Fig. 4.



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UNITED STATES PATENT OFFICE

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WIPER FOR ROLLING MILLS

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2 Claims. (Cl. 80—1)

This invention relates generally to rolling mills and, particularly, to a wiper and stripper guide therefor.

In the operation of hot strip mills, it is necessary to cool the work rolls by water sprays but it is desirable to prevent the flooding of the work-piece by the sprays directed onto the rolls. For this reason, wipers are positioned in engagement with the roll, to hold the cooling water in contact therewith for a limited time. It is also necessary to employ so-called top stripper guides engaging the upper work roll on the exit side of the mill, to deflect the work-piece downwardly, in the event it should curve upwardly in an attempt to follow around the periphery of the top working roll.

Numerous forms of wipers and stripper guides for rolling mills have been devised heretofore and it is the object of this invention to improve generally on such devices and, in particular, to provide a wiper and stripper guide which may be easily adjusted or removed, when necessary and which interferes as little as may be with the changing of the rolls. In a preferred embodiment, the wiper comprises a plate mounted on spring levers pivoted on the mill housings. The stripper guide comprises a plate suspended from spring levers pivoted on a fixed support. The construction of both the wiper and stripper guide is such that the pressure with which they engage the working roll depends on the adjustment of the spring levers, and I provide means for holding the latter in various adjusted positions.

Numerous novel features and advantages of the invention will become apparent during the following detailed description thereof and will be specifically mentioned hereinafter.

The accompanying drawings illustrate a preferred embodiment of the invention such as that briefly described above. In the drawings,

Fig. 1 is a partial central section through a rolling mill having the invention incorporated therein, the plane of section being perpendicular to the axes of the mill rolls;

Fig. 2 is a partial section taken along the plane of line II—II of Fig. 1;

Fig. 3 is a similar view taken along the plane of line III—III of Fig. 1; and

Fig. 4 is a horizontal cross section taken substantially along the plane of line IV—IV of Fig. 1.

Referring now in detail to the drawings, a rolling mill comprises spaced housings 10 and 11 having working rolls 12 and 13 journaled therein and also backing rolls 14 and 15. The drawings are largely diagrammatic in respect to

the rolls and housings, the roll bearings which are adjustable in the housing windows 16 being omitted. Entry and exit guides 17 and 18 are provided on opposite sides of the mill, in alignment with the pass between the working rolls. Such guides, however, are not part of the present invention and will not, therefore, be described in detail.

The wiper of my invention is indicated generally at 20 and comprises a plate 21 bent to the shape shown and extending along the roll 12 substantially the full length thereof. The plate 21 has a packing strip 22 secured to the lower edge thereof adapted to have sliding engagement with the periphery of the roll 12. Bearing blocks 23 are secured to the plate 21 adjacent each end thereof. Forked bearing brackets 24 are secured to the plates 21 at intervals along its length and are adapted to engage a transverse spray pipe 25 more or less rigidly mounted in the known manner, adjacent the roll 12.

The wiper 20 is supported on spring levers 26. The levers 26 comprise simply lengths of bar spring stock having their inner ends bent as shown at 27 whereby they may be received in the bearing blocks 23. Eyes 28 are formed intermediate the ends of the levers 26 whereby the latter may be pivotally mounted on sleeves 29 secured to the housings in any convenient manner as by welding. The outer ends of the levers 26 extend rearwardly from the mill as indicated at 30 and cooperate with notched plates 31 secured to the housings. As clearly shown in Fig. 2, the notches in the plates 31 serve to hold the outer ends 30 of the levers 26 in one of several adjusted positions.

It will be apparent that downward pressure on the outer ends 30 of the levers 26 forces the wiper plate against the roll 12. The levers are of such character that considerable deformation thereof may take place in actuating the wiper into engagement with the roll. When so deformed, the levers cause the wiper to be yieldingly urged against the roll continuously. The wiper, however, may be easily and expeditiously retracted, if desired, merely by releasing the outer ends of the levers 26 and swinging them upwardly.

The wiper of my invention is characterized by numerous important advantages. In the first place, it is light in weight and inexpensive to manufacture. It accomplishes its function, i. e., cooling of the top roll, very effectively because it holds a substantial volume of water. It will be understood, of course, that the water collecting between the wiper and the roll eventually flows

outward past the ends of the wiper. It is not necessary to remove the wiper when changing working rolls. The wiper may easily be withdrawn, as explained above, when changing backing rolls but this change is made only infrequently. By providing supports for the spray pipe on the wiper, removal of the pipe when changing rolls is also obviated. This avoids breakage of the flexible connection to the spray pipe which has represented a considerable cost item in the maintenance of wipers known heretofore. The mechanism requires no attention when it has once been adjusted and the cost of upkeep is small. The construction is such, furthermore, that the hazard of the entire mechanism being carried through the mill on the occurrence of a cobble in the strip, which has been experienced at times heretofore, is largely eliminated, together with the attendant possibility of roll breakage.

The top stripper guide is indicated generally at 35. A rest bar 36 extends between the mill housings, being supported on blocks 37 secured thereto. Brackets 38 extending upwardly from the bar 36 support a spray pipe 39. A top stripper guide plate 40 is adapted to be suspended against the lower edge of the rest bar 36 and the face of the roll 12. The plate 40 is provided with an angle bar 41 adapted to engage the rest bar 36 to position the plate 40 against lateral displacement.

Bearing blocks 42 are secured to the rest bar 36 adjacent the ends thereof and provide bearings for spring levers 43. Each lever 43 has a horizontal portion 44 extending through the bearing block, an inwardly extending end 45 on which a hook is formed, and an outwardly extending end 46. The levers 43 are made from the same stock as the levers 26. The stripper guide plate 40 is suspended from the hook ends 45 of the levers 43 by links 47. The outer ends 46 of the levers 43 cooperate with notched plates 48 in the form of short lengths of angle bar welded endwise to the inner faces of the housings 10 and 11. By shifting the levers inwardly or outwardly, the tension on the links 47 may be decreased or increased as desired. When it is necessary to remove the top stripper guide, this may easily be accomplished by shifting the levers 43 inwardly, and detaching the links 47 from the

hook ends 45. This is necessary, however, only when changing backing rolls, as it is sufficient merely to release the tension on the stripper guides when changing working rolls.

5 The stripper guide of my invention is characterized by most of the advantages pointed out above in connection with the wiper, as will be apparent to those skilled in the art. The wiper and stripper guide together make possible a time saving of from four to ten minutes on each roll change. Since the entire hot mill production is necessarily suspended during roll changes, the importance of this saving is readily apparent.

10 Although I have illustrated and described but a preferred embodiment of the invention, it will be understood that changes in the construction and arrangement of the mechanism disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

20 I claim:

1. A wiper for one of the rolls of a rolling mill including spaced housings, said wiper comprising a generally flat plate extending along the roll and substantially co-extensive therewith, the side of the plate adjacent to the roll being adapted to engage the roll edgewise, a pivot pin on each housing, spring levers each having one end thereof connected to the plate adjacent one end thereof, each lever being coiled about one of the pivot pins, said coils forming bearings for the levers as well as tension springs, and means for fixedly holding the other end of each lever at different positions to vary the pressure of the wiper against the roll.

35 2. A wiper for one of the rolls of a rolling mill including spaced housings, said wiper comprising a generally flat plate extending along the roll and substantially co-extensive therewith, the side of the plate adjacent to the roll being adapted to engage the roll edgewise, a pivot pin on each housing, spring levers each having one end thereof pivotally connected to the plate adjacent one end thereof, each lever being coiled about one of the pivot pins, said coils forming bearings for the levers as well as tension springs, and means for fixedly holding the other end of each lever at different positions to vary the pressure of the wiper against the roll.

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