June 5, 1928. 1,672,462

S. B. MANSELL

ROLL POLISHER

Filed Nov. 3, 1926 2 Sheets-Sheet 1

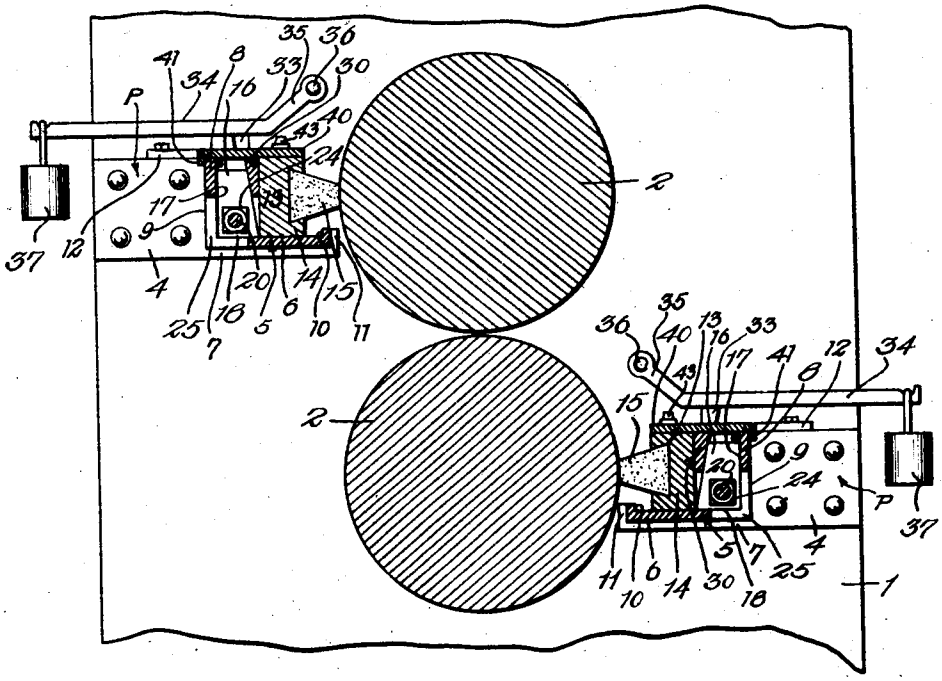


Fig. 1.

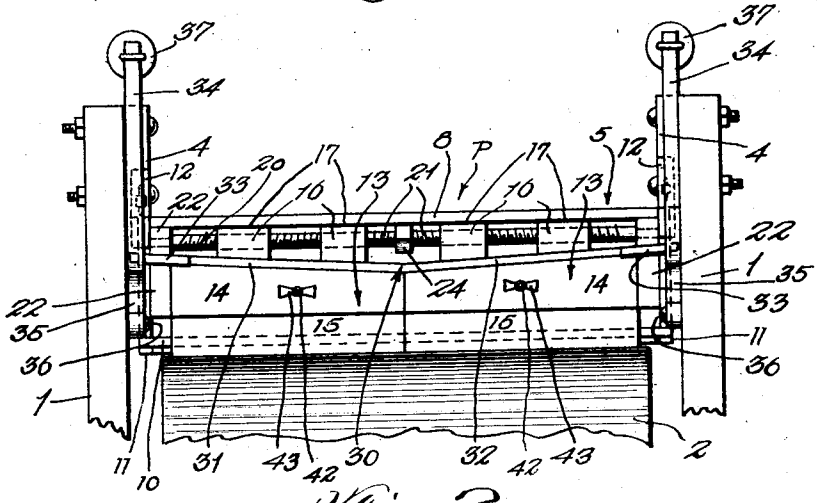


Fig. 2.

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Fig. 3.

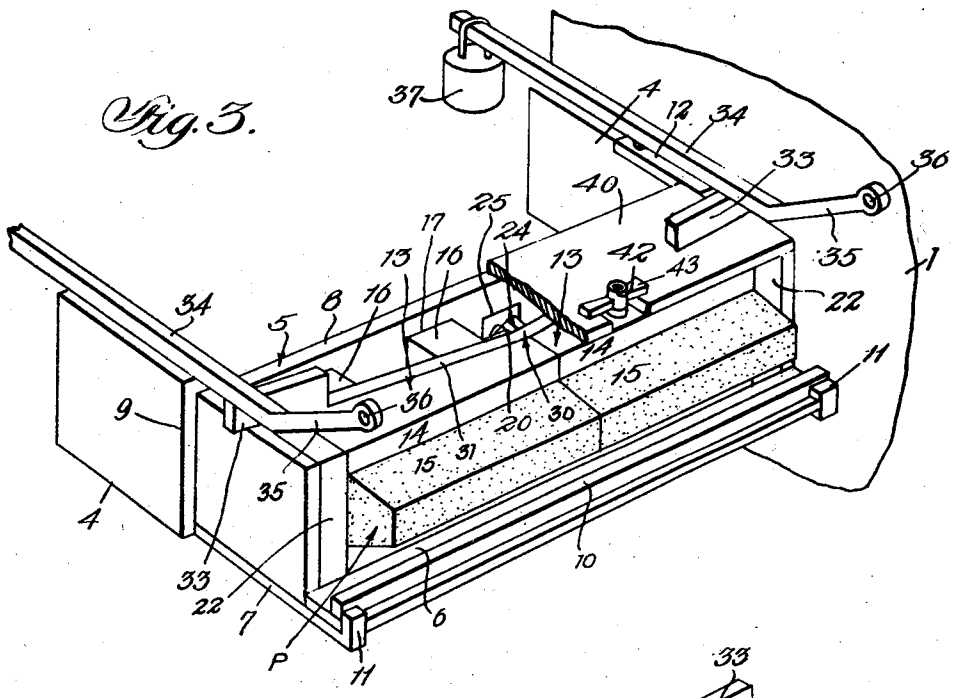


Fig. 4.

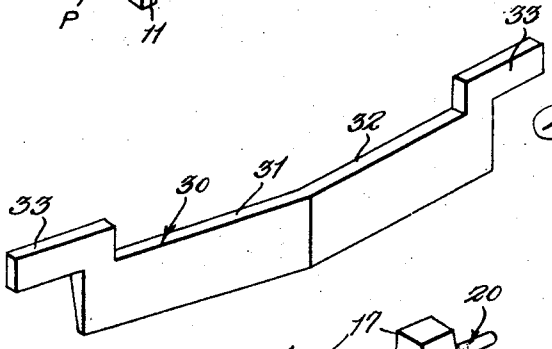
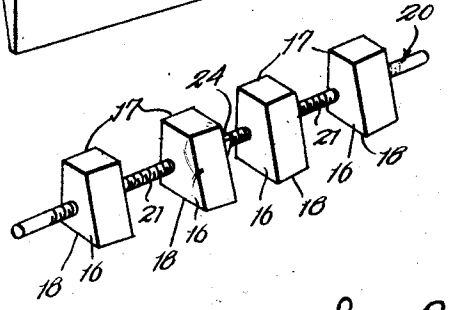


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ROLL POLISHER.

Application filed November 3, 1926. Serial No. 146,039.

This invention relates in general to roll polishers and is particularly designed for use in resurfacing the rolls of sheet steel rolling mills, although adapted for practically universal application.

As is well known, sheet steel rolling mills are used to produce sheets of steel from steel bars, the bars, after being heated, being passed and repassed between the rolls of the mill until they have been reduced to the desired sheet-like form. The rolls are constrained to exert a heavy pressure on the heated bars and this results in the imposition of severe mechanical stresses and strains on the metal surfaces of the rolls which, together with the action of the heat, tends to, and eventually does, break down the necessarily smooth surfaces of the rolls. When the roll surfaces become rough, uneven and pitted or otherwise worn and defaced for the reasons stated, it is necessary to shut down the mill to manually polish the rolls. Such manual polishing is done by the foreman of the crew and during the time of the manual polishing, ordinarily from three to ten minutes, the other members of the crew are idle. As the crew usually consists of a foreman and eight men, and as the polishing must be done frequently, the loss that results from the shutting down of the mill and the idleness of the men is quite material in a large plant having a number of rolling mills. These disadvantages of the standard practice have been long been recognized and numerous attempts have been made to devise an automatic roll polisher that will avoid these undesirable and costly suspensions in production and idleness of the crew, but the automatic roll polishers that have been heretofore devised have all been unsatisfactory and unsuccessful for the reason, among others, that they continually grind or polish the rolls and abrade away the surfaces of the rolls irrespective of whether polishing is or is not required.

One of the principal objects of the present invention resides in the provision of a roll polisher which has all of the advantages of both the manual and automatic polishing practices and none of the disadvantages of either, and in which the rolls are periodically polished when polishing is required, and without the necessity of shutting down the operation of the rolling mill.

A further object is to provide a roll polisher of this character which is of simple and durable construction, reliable and controllable in operation and easy and comparatively inexpensive to manufacture and apply.

In carrying out the present invention, a roll polishing device is provided for each roll of the rolling mill. Each roll polishing device has brackets fastened to the side housings of the mill, said brackets supporting a frame which is preferably of angular formation. On the frame a polishing block holder is slidably mounted, said holder carrying a polishing element of emery or the like. On this same frame and rearwardly of the polishing block holder, transversely slidable wedges are mounted, and with these wedges a manually operable screw is threadedly engaged and may be turned to shift the wedges transversely to effect the advancement of the polishing element toward and into engagement with the roll. Interposed between the transversely slidable wedges and the polishing block holder is a vertically movable wedge which is pressed downwardly by weighted levers. By means of this organization, when the rolls are in need of polishing, the screw is turned to advance the polishing element into engagement with the roll and during this adjustment, the vertically-movable wedge is lifted to its uppermost position and out of the space between the transversely slidable wedges and the polishing block holder. The vertically-movable wedge is then lowered so that its bottom edge is inserted between the transversely slidable wedges and the polishing block holder, and the polishing operation will be automatically carried out by the operation of the vertically movable wedge and weighted levers. The invention in its broader aspect thus proposes a polishing element cooperable with each roll, manually and positively operable means for urging the polishing element into operative engagement with its roll and automatically operable means for maintaining the polishing element in operative engagement with the roll for a limited period. Suitable covers are provided for each device to protect its parts against the ingress and action of dirt and scale.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the

appended claims, reference being made to the accompanying drawings forming a part of this specification and in which:

Figure 1 is a transverse vertical sectional view showing the rolls of a rolling mill equipped with polishing devices embodying the present invention,

Figure 2 is a fragmentary plan view of one side of the rolling mill shown in Figure 1,

Figure 3 is a fragmentary perspective view of one of the polishing devices, parts being broken away and shown in section for the sake of illustration,

Figure 4 is a detail perspective view of the vertically movable wedge, and

Figure 5 is a similar view of the transversely movable wedges and the screw for operating the same.

Referring to the drawings the numeral 1 designates the housings of a rolling mill in which the rolls 2 are rotatably mounted in the usual manner.

The present invention proposes polishing devices designated as a whole at P, there being one polishing device for each roll. Each polishing device has a pair of brackets 4 secured to the housings 1, and between the members of each pair of brackets an angular frame, designated generally at 5, extends, the frame 5 being provided with closed ends and having a base flange 6 resting on extensions 7 of the brackets 4 and also having a vertical flange 8 engaging edges 9 of the brackets 4. The forward edge of the base flange 6 has an upturned marginal rib 10 engaging upstanding lugs 11 at the ends of the extensions 7 of the brackets 4. Clamps 12 bolted to the brackets, engage the upper edges of the frame to secure the frame in position on the brackets.

A polishing block holder, designated generally by the numeral 13, is slidably mounted on the base flange 6 of the frame for movement toward and away from the roll and comprises a pair of sections 14 and a polishing element 15 of emery or the like. The sections 14 are wider at their outer ends than at their inner ends so that the rear face of the polishing block holder as a whole tapers from its center to its ends. Transversely movable wedge blocks 16 are mounted on the frame 5 between the vertical flange 8 and the rear face of the polishing block holder 13, and have flat faces 17 at their rear slidably fitted against the vertical flange 8 of the frame and their flat lower faces 18 snugly and slidably fitted against the lower horizontal flange 6 of the frame. The forward faces of the wedge blocks are slanting, that is, gradually sloping outwardly and downwardly from their tops to their bottoms. The lower forward edges of the wedge blocks engage the lower portion of the rear of the polishing block holder 13. The wedge blocks have horizontally disposed threaded openings which are threadedly engaged with a screw designated generally at 20. As shown in Figure 2, there are two wedge blocks 16 for each section 14 of the polishing block holder and the screw 20 has oppositely threaded sections 21, one section 21 engaging the two blocks 16 that are associated with one section 14 of the polishing block holder and the other section 21 engaging the two blocks 16 that are associated with the other section 14 of the polishing block holder. The ends of the screw 20 are reduced and smooth and are rotatably mounted in bearings provided therefor in side plates 22. With this arrangement, the screw 20 may be turned to cause the blocks 16 to move outwardly to simultaneously advance the sections 14 of the polishing block holder toward the roll. To facilitate the turning of the screw, a hexagonal nut 24 is keyed or otherwise fixed to its center and is adapted to be actuated by a suitable wrench, the frame 5 being provided with an opening 25 through which the nut 24 is readily accessible.

A vertically movable wedge designated generally at 30 is provided and consists of a bar of metal which tapers from an upper blunt edge to a lower sharp edge and which is bent at its center to provide inclined sections 31 and 32 to correspond to the formation of the sections 14 of the polishing block holder, so as to snugly fit in between the polishing block holder 13 and the wedge blocks 16 in all of its adjustments. At this point it is to be noted that the two wedge blocks 16 nearer the center are larger than the two end wedge blocks 16 and that the downwardly sloping faces of their respective blocks are also tapered outwardly as best shown in Figure 2. At the ends of the vertically movable wedge 30, upwardly and laterally offset projections 33 are integrally formed, and on these projections 33 levers 34 bear, the levers having upwardly offset ends 35 fulcrumed as at 36 on the side housings 1 of the rolling mill. On the free ends of the levers, weights 37 are suspended.

When the rolls 2 need polishing, the screw 20 is turned to advance the polishing element 15 into engagement with the roll, the wedges 16 being moved transversely to effect this adjustment. This adjustment is had with the lower sharp edge of the wedge 30 elevated to its uppermost position, the weights 37 being removed while making this adjustment if this is found desirable. When the weights are replaced and the wedge 30 lowered so that its lower sharp edge enters the space between the sections 14 and the blocks 16, they cause the levers 34 to bear down on the wedge 30 and the wedge 30 tends to force the emery or other polishing element 15 into engage-

ment with the roll to maintain the polishing operation for the period necessary to properly resurface the roll. When the wedge has descended as far as it can the polishing operation has been completed and the emery 15 no longer abrades the rolls until another adjustment of the screw 20 is made by the operator of the device. The polishing operation is maintained for the desired period without interfering with the operation of the mill and the loss and inconvenience of shutting down the mill is avoided. These advantages are had without subjecting the rolls to a continuous grinding operation, the rolls being polished only when polishing is needed. It is to be noted that the projections 33 engage rigid parts carried by the frame when they have descended as far as the movable wedge 30 is intended to travel, thereby providing means to limit positively the downward movement of the wedge 30.

A cover plate 40 is provided for the device to prevent the ingress of scale and dirt and is held in position on the frame 5 by means of ribs 41 formed on its under face and engaging the opposite sides of the upper edge of the vertical flange 8 of the frame. The plate 40 is made sufficiently large to overlap the polishing block holder 13 and has slots to accommodate stud bolts 42 carried by the polishing block holder 13. On these stud bolts 42 wing nuts 43 are threaded and are designed to prevent upward displacement of the cover plate. The cover plate also has slots at its ends to permit the projection 33 to extend above the cover plate to permit the weighted levers 34 to engage said projections to permit the wedge 30 to partake of its movements.

What is claimed is:—

1. A roll polisher comprising a polishing element, screw operated means for urging said element into position to engage the roll, a movable wedge interposed between said means and the polishing element and a weighted lever engaging said wedge for maintaining the polishing element in polishing engagement with the roll for a limited period.

2. A roll polisher comprising a polishing element, a holder for said polishing element having a rear face tapering from its center to its ends, tranversely movable wedges cooperable with said rear face for advancing said polishing element into position to engage the roll, a screw for operating said wedges, a vertically movable wedge interposed between said transversely movable wedges and the polishing block holder, said vertically movable wedge being made up of inclined sections conforming to the shape of the rear face of the polishing element holder and tapering from the blunt upper edge to a relatively sharp lower edge, and means for urging the vertically movable wedge downwardly for maintaining the polishing element in polishing engagement with the roll for a limited period.

3. A roll polisher comprising a polishing element, a holder for said polishing element, positively and manually operable means for urging said polishing element into engagement with the roll, a movable wedge interposed between said means and the polishing block holder, and means for moving said wedge downwardly for maintaining the polishing element in polishing engagement with its roll for a limited period.

4. A roll polisher comprising a frame, a polishing block holder slidably mounted on the frame and having inclined surfaces on its rear face a polishing element carried by said holder, transversely movable wedges mounted on the frame and cooperable with the inclined surfaces of the rear face of the polishing block holder, a screw engaging the wedges for shifting the same laterally, a vertically movable wedge interposed between the transversely movable wedges and the polishing block holder, and means for pressing the vertically movable wedges downwardly.

5. A roll polisher comprising a frame, a polishing block holder slidably mounted on the frame and having its rear face inclining outwardly from its center to its ends, a polishing element carried by said holder, transversely movable wedge blocks slidable on said frame and having inclined faces, the lower edges of the blocks engaging the rear face of the polishing block holder, a vertically movable wedge interposed between said wedge blocks and the polishing block holder, said vertically movable wedge being made up of inclined sections conforming to the shape of the rear face of the polishing block holder and tapering from a blunt upper edge to a relatively sharp lower edge and cooperating with the inclined faces of the wedge blocks and with the rear face of the polishing block holder, and means for pressing the vertically movable wedge member downwardly.

6. A roll polisher of the character described and in accordance with claim 5 and wherein the means for pressing the vertically movable wedge member downwardly comprises weighted levers, said wedge member having projections with which the weighted levers engage.

7. A roll polisher for use with rolls of rolling mills and comprising brackets adapted to be secured to the housings of the rolling mill, a frame extending between and secured to the brackets, a polishing block holder slidably mounted on the frame, a polishing element carried by said holder, screw operated wedges mounted on the frame and manually operable to advance the polishing element into engagement with the

roll, a lever operated wedge interposed between the screw operated wedges and the polishing block holder, and means for forcing the lever operated wedge to maintain the polishing element in polishing engagement with its roll.

8. A roll polisher of the character described and in accordance with claim 7 and wherein a cover is provided for the wedges and screw and is mounted on the frame.

9. A roll polisher for use with the rolls of rolling mills and comprising brackets adapted to be secured to the housings of the rolling mill and having extensions provided with upstanding lugs, an angular frame mounted on the extensions of the brackets and having a base flange and a vertical flange engaging the brackets and extensions, a polishing block holder slidably mounted on the base flange of the frame, a polishing element carried by said holder, transversely movable wedges slidably mounted on the frame and engaging the base flange and the vertical flange thereof, a screw coacting with the wedges and having means adapted to coact with a wrench whereby the screw may be turned, said frame having an opening adjacent said means for entry of the wrench, a vertically movable wedge interposed between the polishing block holder and said transversely movable wedges and limited in its downward movement by the base flange of the frame, and means for pressing the vertically movable wedge downwardly.

10. A roll polisher for use with the rolls of rolling mills and comprising brackets adapted to be secured to the housings of the rolling mill, an angular frame mounted on the brackets and having a base flange and a vertical flange, a polishing block holder slidably mounted on the base flange, a polishing element carried by said holder, transversely movable wedges engaged with the flanges of the frame and with the polishing block holder, a screw coacting with the wedges for shifting the same, a vertically movable wedge interposed between the polishing block holder and said transversely movable wedges and limited in its downward movement by the base flange of the frame, levers pivoted to the housings and engaging the vertically movable wedge, and weights on the levers.

In testimony whereof I hereunto affix my signature.

SAM B. MANSELL.