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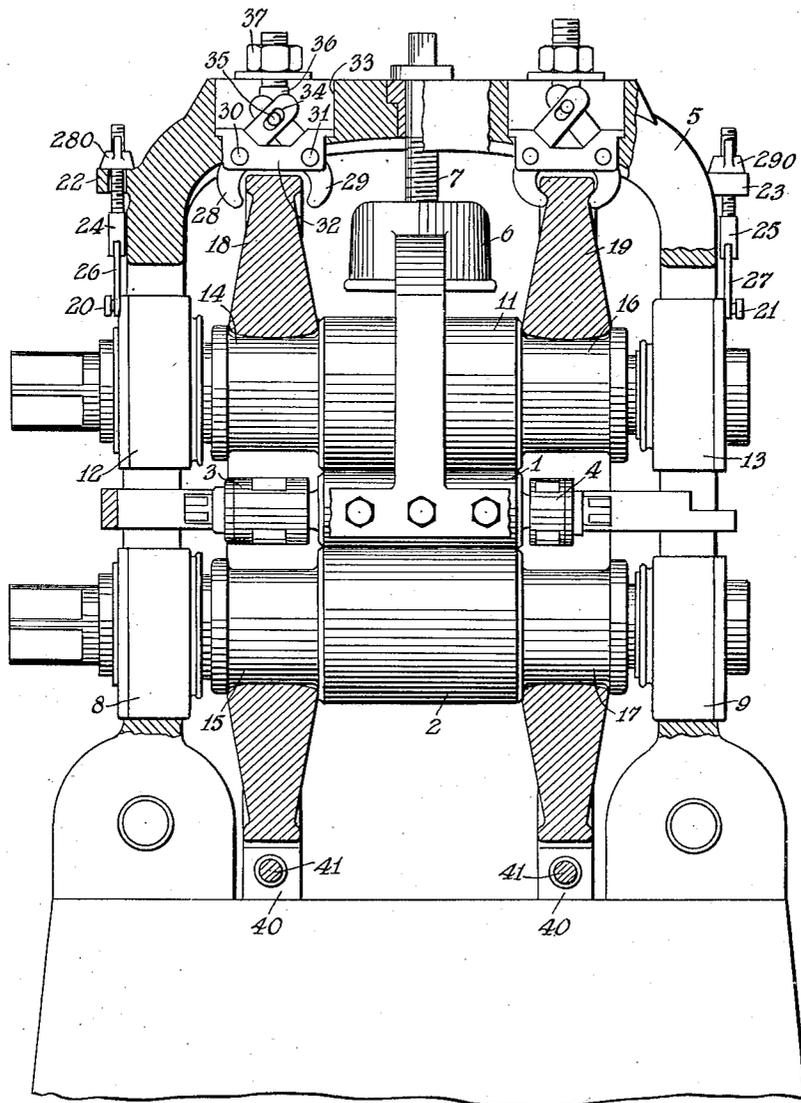
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ROLLING MILL

Filed Aug. 19, 1931

2 Sheets-Sheet 1

Fig. 1.



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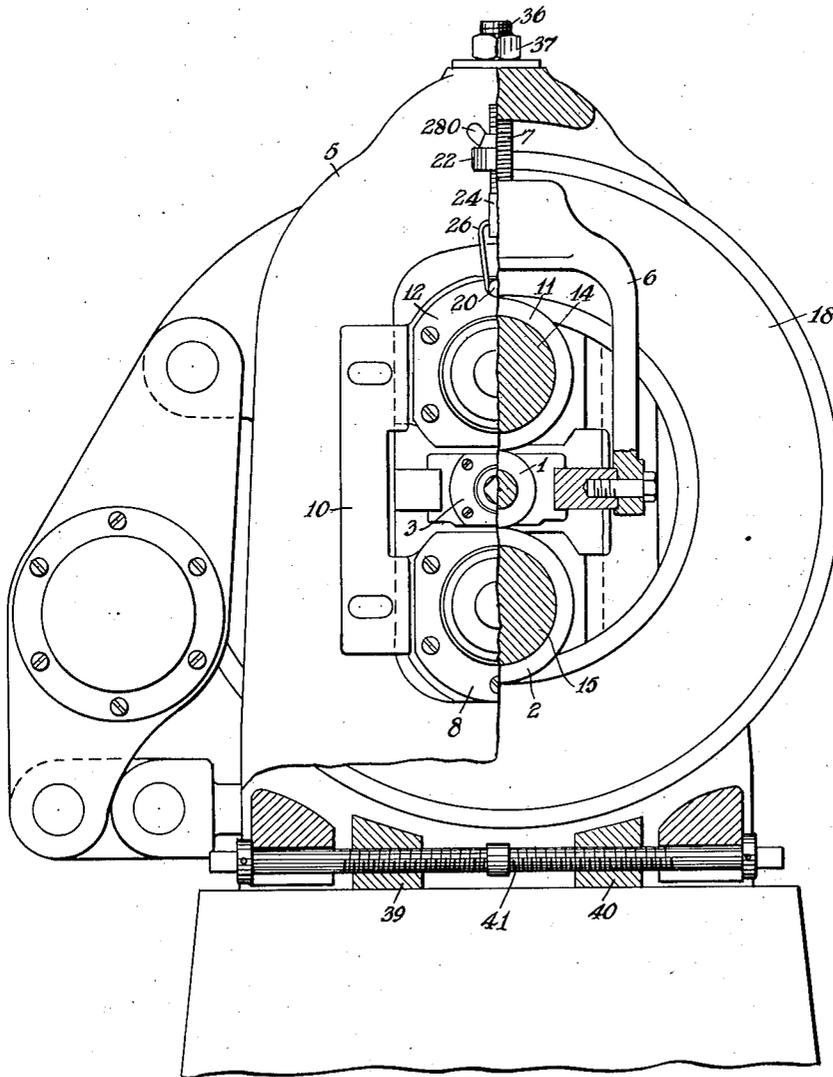
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Fig. 2.



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UNITED STATES PATENT OFFICE

PER GUNNAR PALMGREN, OF GOTTENBORG, SWEDEN, ASSIGNOR TO AKTIEBOLAGET SVENSKA KULLAGERFABRIKEN, OF GOTTENBORG, SWEDEN, A CORPORATION OF SWEDEN

ROLLING MILL

Application filed August 19, 1931. Serial No. 558,013.

The present invention relates to rolling mills of the type in which the pressure on the rolls is transmitted to and taken up by rings surrounding the roll necks instead of bearings in the usual manner. Rolling mills of this type have the advantage over rolling mills of the ordinary type that the bearings and stands are only required to withstand comparatively small radial loads and can therefore be dimensioned accordingly.

The use of rolling mills of this type has been connected with certain drawbacks. It is thus necessary to withdraw them endwise from the surrounding rings. This has been attended by considerable difficulties. The removal of the lower roll allows the upper roll to drop since the bearings of the upper roll are slidable in the stands. Further, since the rings surround the roll necks and are supported by the rolls, they have been found to greatly impede the changing of rolls.

The present invention has for its object to provide means for suspending the upper roll when changing the lower roll and also means for supporting the rings, when changing any of the rolls.

One embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 shows a side elevation partly in section of the rolling mill of the type to which the invention relates, and

Fig. 2 shows an end elevation of such mill partly in section.

The material is rolled between the rolls 1 and 2. The intermediate roll 1, in the preferred form, is carried in bearings mounted in housings 3 and 4 suspended from the stand 5 by means of the yoke 6. The yoke can be vertically adjusted by turning the screw 7. The lower roll 2 is carried in bearings mounted in housings 8 and 9 which are held in axial position by means of a plate 10. The upper roll 11 is in a similar manner carried in bearings mounted in housings 12 and 13 vertically slidable in the stand 5 and held in place by the plate 10. Surround-

ing the roll necks 14-15 and 16-17 are rings 18 and 19.

When the material is introduced between the rolls 1 and 2 the rolling pressure is transmitted to these rings, the bearings in the housings 8, 9, 12 and 13 being only required to take up the comparatively small horizontal component of the rolling pressure and any thrust that may arise in the roll system. In the embodiment according to the illustration all the rolls are shown as being intended to be positively driven, although when roller bearings are used this is not necessary, it being sufficient to drive only one of the rolls.

When it is desired to change one of the lower rolls, as for instance roll 1 or 2, the upper roll is suspended from the stand in the following manner. The bearing housings 12 and 13 are provided with projections 20 and 21. On the stand 5 are lugs 22 and 23 through which freely pass threaded bars 24 and 25. At the ends of the bars 24 and 25 are formed or attached eyes 26 and 27 adapted to be hooked over the projections 20 and 21. Wing nuts 280 and 290 are shown screwed on to the bars 24 and 25 and adapted to be tightened against the lugs 22 and 23. In this manner the upper roll may be suspended while either of the lower rolls is being changed.

When the upper roll 11 is to be changed it is necessary to support the rings 18 and 19 and it is preferable to suspend them from the stand. For this purpose the gripping device illustrated may conveniently be used, which consists of two claw members 28 and 29 pivoted at 30 and 31 to a member 32 in a recess 33 in the stand. The claws 28 and 29 are at their upper ends provided with slots 34 in which a projection 35 on a bar 36 is slidably movable. The bar 36 is threaded at its upper end and may be raised or lowered by turning the nut 37. The gripping device is shown in the open or lower position to the left in Fig. 1. To the right in the same figure the gripping device is shown in the closed or upper position which it is caused to assume when it is desired to suspend the ring 19. By screwing the nut 37 the bar 36 is raised and the projection 35 slides along the slots 34

forcing the upper ends of the claw members 28 and 29 outwards. The claw members then turn about 30 and 31 whereby their lower ends grip the ring 19 holding it suspended. The ring 18 is suspended in a like manner. After removing the roll 1 the roll 11 can be lowered by turning the wing nuts 280, 290 until the shoulders of the roll clear the rings 18 and 19 after which the roll can be removed endwise.

If preferred, the nut 37 can be turned further thereby raising the bar 36 and the claw members 28 and 29 and thus lifting the member 32 in the recess 33 and also raising the ring 19 freeing the roll 11 and enabling it to be removed endwise.

In order to steady the rings when raised by the gripping device a pair of blocks 39 and 40 are provided for each ring. These blocks are drawn together, or separated, when required by means of a bar 41 having right and left screw threads. These blocks, upon being drawn together and adjacent the ring, chuck it. These blocks may, if desired, be used to support or raise the rings, either independently or cooperatively with the suspending device.

It will be understood that changes may be made within the scope of the claims without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a rolling mill having a frame, an upper roll, a lower roll and an intermediate roll disposed one above the other, bearing housings for the respective ends of the rolls, pressure transmitting rings mounted between the bearing housings surrounding the rolls inwardly thereof, each ring at its inner periphery bearing against a plurality of rollers, means engaging the housings of the upper roll for suspending the upper roll and means for engaging and supporting the rings.

2. In a rolling mill having rolls provided at their ends with roll necks and a pressure receiving ring surrounding the set of roll necks at each end and bearing with its inner periphery against a plurality of roll necks, of means disposed substantially symmetrically with reference to the vertical plane thru the axis of the rolls for sustaining the rings independently of the rolls for freeing the rolls to permit of their removal endwise through one of the pressure receiving rings.

3. In a rolling mill having a frame, an upper roll, a lower roll and an intermediate roll disposed one above the other, bearing housings for the respective ends of the rolls, pressure transmitting rings mounted between the bearing housings surrounding the rolls inwardly thereof, each ring at its inner periphery bearing against a plurality of rolls, means free of the lower rolls for engaging and suspending the upper roll assembly and

means for engaging and supporting the rings.

4. In a rolling mill having rolls provided at their ends with roll necks and a pressure receiving ring surrounding the set of roll necks at each end and bearing with its inner periphery against a plurality of roll necks, of means engaging at the outer periphery of the rings for sustaining the rings independently of the rolls, for freeing the rolls to permit of their removal endwise through one of the pressure receiving rings.

Signed at Gottenborg, Sweden, this 3rd day of August, 1931.

PER GUNNAR PALMGREN.