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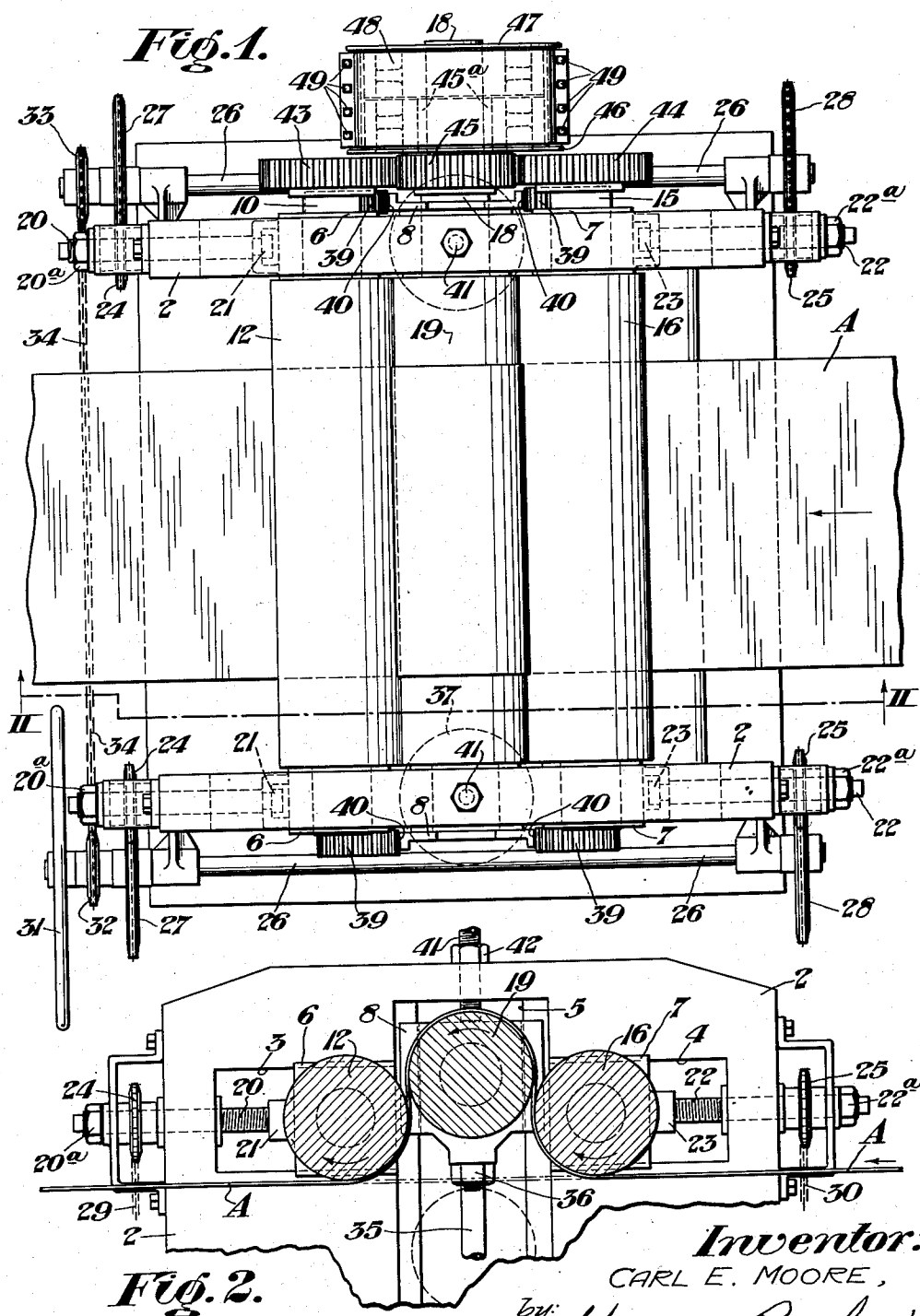
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1,986,776

AUXILIARY FOR TENSION REELING DEVICES

Filed Nov. 27, 1933

4 Sheets-Sheet 1



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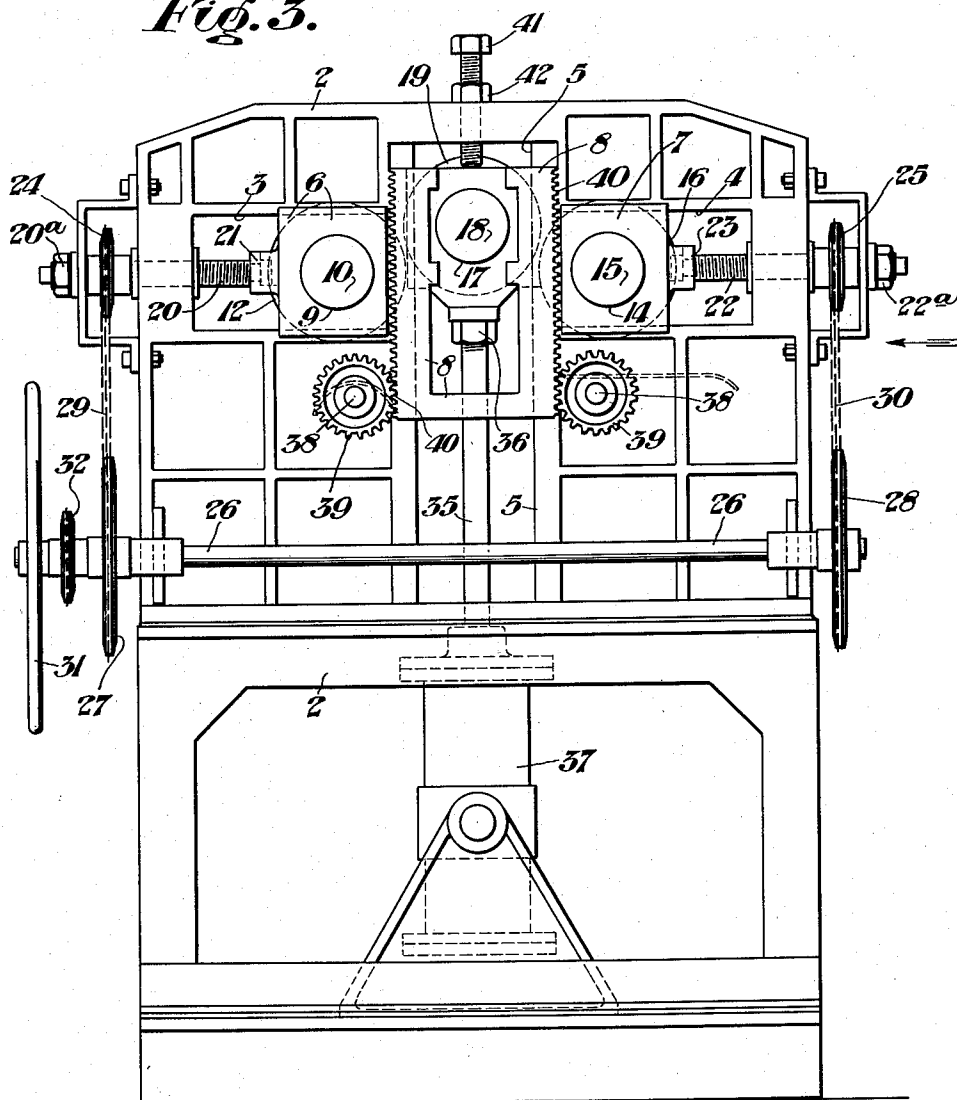
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Fig. 3.



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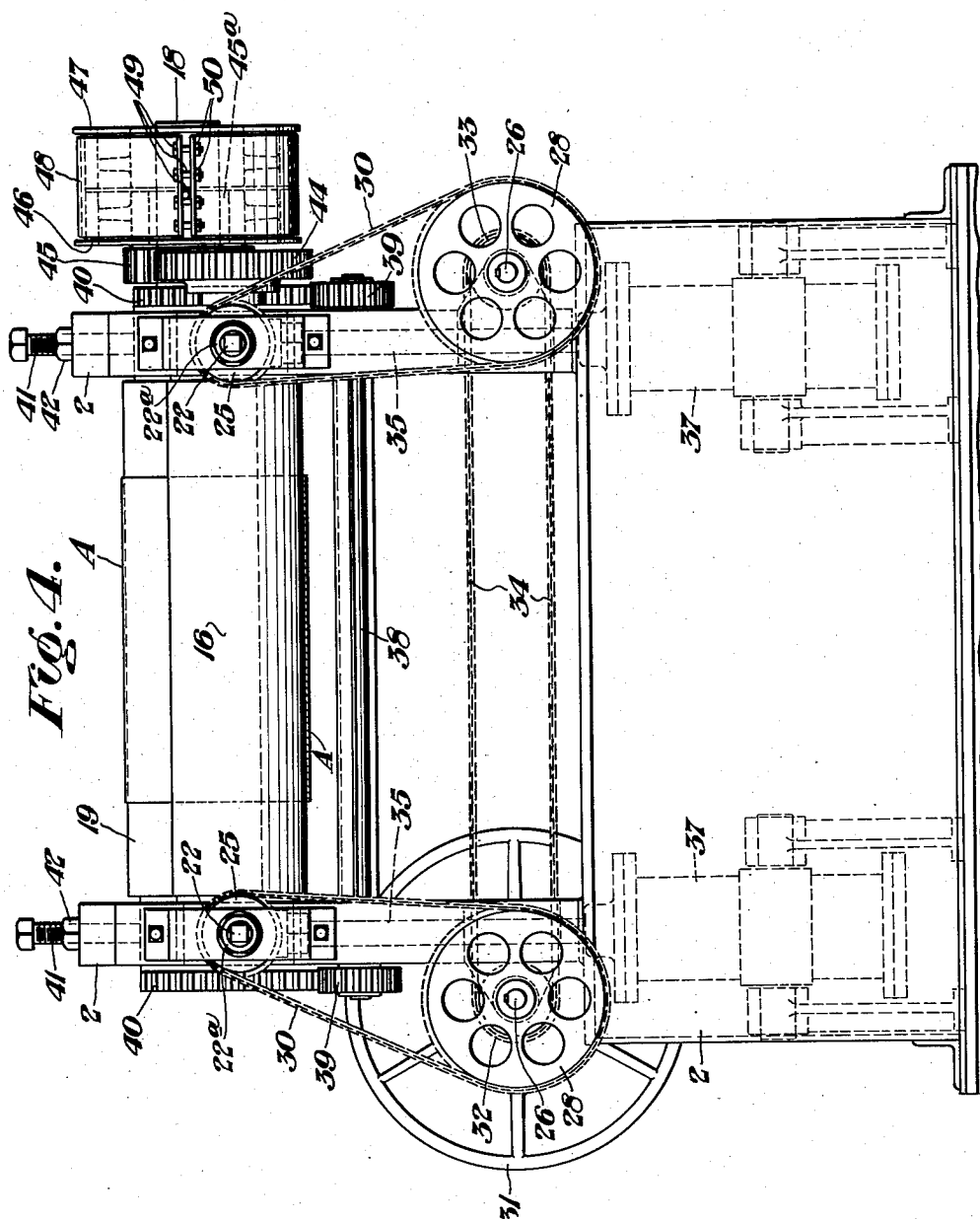
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AUXILIARY FOR TENSION REELING DEVICES

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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

Fig. 5.

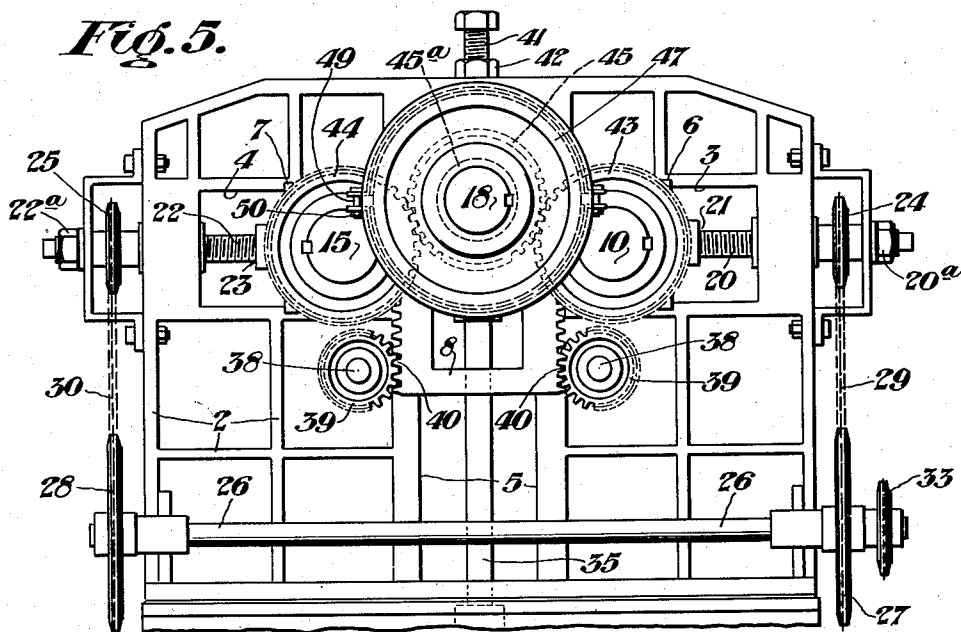
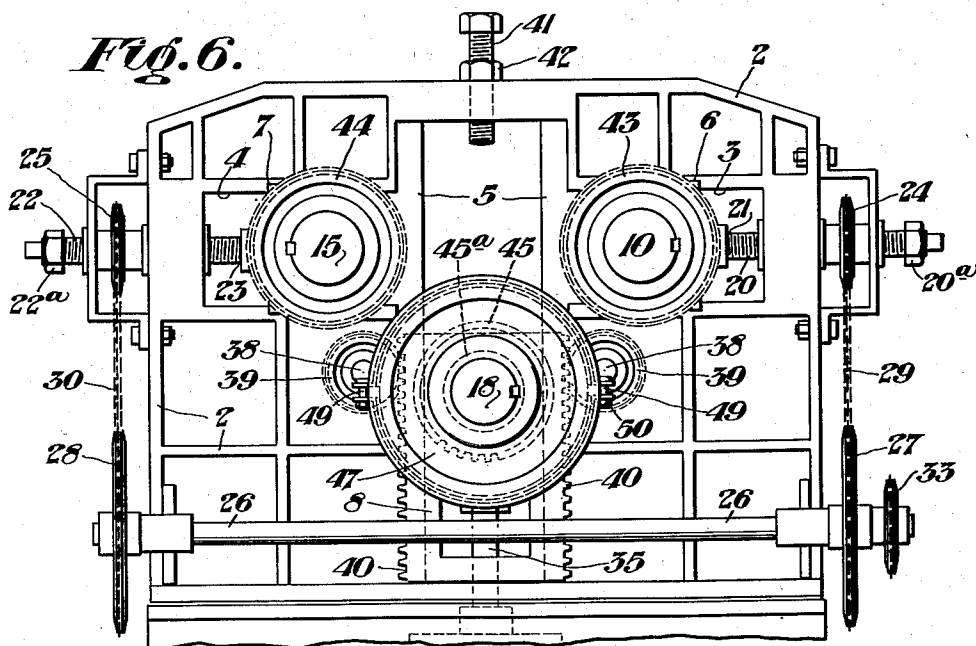


Fig. 6.



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UNITED STATES PATENT OFFICE

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AUXILIARY FOR TENSION REELING
DEVICESCarl E. Moore, Gary, Ind., assignor to American
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Application November 27, 1933, Serial No. 700,001

8 Claims. (Cl. 271—2.1)

This invention relates to a novel auxiliary for tension reeling devices wherein a roll of strip material is wound, and more particularly to sheet metal for use in continuous metal processing mills, such as 4-high cold reduction units, although not limited thereto.

In the manufacture of continuous metallic strip material for subsequent processing into commercial sheets and plates, considerable difficulty is encountered in its handling. Due to its great length and substantial thickness, it occupies considerable space and should therefore be tightly coiled. In addition, considerable trouble is experienced in the mills if the edges of the material do not occupy a common plane. That is to say, if the edges of the strip material are uneven, wrinkling, stretching and even breaking might occur while it is being rolled in, for instance, a 4-high cold reduction unit. Very often the strip material, prior to its finishing operation and having been obtained through the relatively rough processing of a conventional hot mill, is of varying width and should be stretched to make it uniform. Even after its width has been properly adjusted, it is highly desirable to reel the material with its edges occupying a common plane.

One object of the present invention is the provision of a novel auxiliary for tension reeling devices for accomplishing the tight coiling of metallic strip material.

Another object is to provide novel means for stretching metallic strip material in such manner as to procure uniformity of width, accompanied by the resultant coil having all of its edges occupying a common plane.

A further object is to provide a novel device of the class described which will be readily adjustable, cheap and easy to manufacture, and one which will prove very durable in service.

A still further object is to provide a novel auxiliary for tension reeling devices embodying mechanism for enabling the easy and rapid distribution of the material therein.

These and still further objects will be apparent after referring to the drawings, in which: Figure 1 is a plan of the apparatus of the invention.

Figure 2 is a sectional view on the line II—II of Figure 1.

Figure 3 is a side elevation.

Figure 4 is an end elevation.

Figure 5 is an elevation taken on the side opposite that of Figure 3.

Figure 6 is a view similar to Figure 5 of the apparatus in a modified position.

Referring more particularly to the drawings, the numeral 2 designates a frame for the apparatus of the invention. The frame 2 is provided on either side thereof with horizontal guideways 3 and 4 and an intermediately disposed vertical guideway 5. A slidable block 6 is disposed in each of the horizontal guideways 3 while a slidable block 7 is disposed in each of the other horizontal guideways 4. A frame 8 is adapted for sliding movement in each of the vertical guideways 5. The slidable blocks 6 provide journals 9 for the ends of a shaft 10 on which there is mounted a roll 12, while the slidable blocks 7 provide journals 14 for the ends of a shaft 15 on which there is mounted a roll 16.

The vertically slidable frames 8 provide journals 17 for the ends of a shaft 18 on which there is mounted a roll 19.

A pair of screws 20 are threaded through a portion of the frame 2 and connected to the slidable block 6, as at 21, while a corresponding screw 22 is similarly threaded through the frame 2 and connected to the slidable block, as at 23. Each of the screws 20 and 22 is provided with a sprocket, as at 24 and 25, respectively. A shaft 26 is journaled on each side of the frame 2 and carries a pair of sprockets 27 and 28 which are adapted to motivate the sprockets 24 and 25 by means of chains 29 and 30, respectively.

A hand-wheel 31 is secured to one of the shafts 26 and also an adjacent sprocket 32 which is adapted to rotate a cooperating sprocket 33 on the other shaft 26 by means of a chain 34.

A rod 35 is connected to each of the vertically slidable frames 8, as at 36, and are each associated at their lower ends with a fluid cylinder 37. A pair of shafts 38 are journaled on either side of the frame and are each provided on both of their ends with gears 39 which are adapted to engage a rack 40 on each side of each of the vertically slidable frames 8, in order to provide for the movement of the latter in unison.

An adjusting bolt 41 and lock-nut 42 are provided on both sides of the frame 2 for restraining both of the vertically slidable frames 8 against excessive upward movement.

A gear 43 is secured to one end of the shaft 10, and a gear 44 is secured to one end of the shaft 15. The shaft 18 has a sleeve-gear 45 of lesser diameter loosely mounted adjacent one of its ends on a bushing 45* for constant engagement with the gears 43 and 44 on the ends of the shafts 10 and 15, respectively. The sleeve-gear

45 carries one-half of a split pulley 46 while the other half 47 is keyed on the end of the shaft 18. A friction band 48, having the usual internal friction facing, is mounted on the split pulleys 5 46 and 47 in order to provide a frictional drive for the latter, adjustment being effected through bolts and nuts 49 and 50, respectively. In practice, the friction band 48 will permit the roll 19 to have a slower peripheral speed than that of 10 the rolls 12 and 16.

In operation, the fluid cylinders 37 are emptied of fluid and the sliding frames 8 permitted to descend in unison by means of the racks 40 on each of their sides and the cooperating shafts 15 and gears 38 and 39, respectively. The hand-wheel 31 is rotated sufficiently to permit of the slight withdrawal of each of the sliding blocks 6 and 7 from the vertically slidable frame 8.

The position of the center roll 19 at this stage 20 of the operation is indicated in dotted lines in Figure 2. The strip material A is passed under the horizontally movable rolls 12 and 16 and over the top of the lowered center roll 19. The fluid cylinders 37 are next actuated to raise the 25 center roll 19 in such manner as to very materially tension the material against the rolls 12 and 16, which are adjusted into position by means of the hand-wheel 31. The screws 20 and 22 on each side of the housing are provided with lock-nuts 20^a and 22^a, respectively, for restraining the blocks 6 and 7 against excessive inward 30 movement. The advance end of the continuous strip material A is attached to a suitable tension reel (not shown), and the reeling operation commenced. 35

As the tension reel mentioned draws the strip through the rolls in the manner described, their respective surface speeds will be identical. The sleeve gear 45, being smaller than the gears 43 40 and 44 for the rolls 12 and 16, respectively, causes a differential in speed between the two halves of the split-pulley, 46 and 47. The friction band 48, which makes contact with both 45 elements of the split-pulley, operates through the shaft 18 to constantly tension the strip between the rolls 12, 19 and 16 and the tension reel (not shown) by imparting resistance to the 50 rotative action of the rolls.

The tensioning of the continuous strip between the various rolls must be held down to a comparatively slight degree, otherwise slipping will result and cause scratches, etc., which would 55 render the material unfit for commercial use.

Such tensioning is very efficient as the slip- 60 page of the strip while traveling at a high rate of speed is taken up with a minimum of heat dissipation. This slow dissipation of heat renders a more constant tensioning effect than if the split pulley and drum were traveling at different and higher rates of speed.

While I have shown and described one specific embodiment of my invention, it will be apparent 65 that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention, as defined in the following claims.

I claim:

70 1. A tension device for strip material comprising a frame, a pair of horizontally disposed guideways on each side of said frame, a roll mounted for sliding movement in each of said 75 guideways, a vertical guideway disposed between each of said last named guideways, and a roll

mounted for sliding movement in said vertical guideways.

2. A tension device for strip material comprising a frame, a pair of horizontally disposed 5 guideways on each side of said frame, a roll mounted for sliding movement in each of said guideways, a vertical guideway disposed between each of said last named guideways, a roll mounted for sliding movement in said vertical guide- 10 ways, positive gearing connecting said first named rolls, and a friction connection for said last named roll.

3. A tension device for strip material comprising, in combination, a frame, a pair of horizon- 15 tally disposed guideways on each side of said frame, a slidable block in each of said guideways, a shaft journaled in each of said sliding blocks, a roll mounted on each of said shafts, means for moving each of said blocks horizontally, a vertical 20 guideway in said frame between each of said horizontally disposed guideways, a slidable frame in each of said vertical guideways, a journal in each of said slidable frames, a shaft in said journals, a roll mounted on said shaft, at 25 least one fluid cylinder mounted beneath said vertically slidable frames and having a piston-rod connected thereto, a rack on both sides of each of said frames, gearing for positively connecting each of said racks, and adjustable stops 30 for preventing the excessive vertical movement of said vertically slidable frames.

4. A tension device for strip material comprising, in combination, a frame, a pair of horizon- 35 tally disposed guideways on each side of said frame, a slidable block in each of said guideways, a shaft journaled in each of said sliding blocks, a roll mounted on each of said shafts, means for moving each of said blocks horizontally, a vertical 40 guideway in said frame between each of said guideways, a slidable frame in each of said guideways, a journal in each of said slidable frames, a shaft in said journals, a roll mounted on said shaft, a fluid cylinder mounted beneath 45 said slidable frames and having a piston-rod connected thereto, a rack on both sides of each of said frames, gearing for positively connecting each of said racks, gearing for positively connecting said first named shafts, a gear loosely 50 mounted on said last named shaft and adapted for constant engagement with said first named gears, and friction means adapted to impart rotation from said loosely mounted gear to said second named shaft.

5. A tension device for strip material comprising, in combination, a frame, a pair of horizon- 55 tally disposed guideways on each side of said frame, a slidable block in each of said guideways, a shaft journaled in each of said sliding blocks, a roll mounted on each of said shafts, means for moving each of said blocks horizon- 60 tally, a vertical guideway in said frame between each of said horizontal guideways, a slidable frame in each of said vertical guideways, a journal in each of said frames, a shaft in said journals, a roll mounted on said shaft, a fluid cylinder 65 mounted beneath said vertically slidable frames and having a piston-rod connected thereto, a rack on both sides of each of said frames, gearing for positively connecting each of said racks, adjustable stops for preventing excessive 70 vertical movement of said vertically slidable frames, gearing for positively connecting said first named shafts, a gear loosely mounted on said last named shaft and adapted for constant engagement with said first named gears. and 75

friction means adapted to impart rotation from said loosely mounted gear to the shaft upon which it is mounted.

5 6. A tension device for strip material comprising a pair of spaced rolls, a roll disposed between said spaced rolls and adapted to tension said material there between, a driving connection between said first named rolls for enabling their
10 rotation in unison, means for retarding the rate of rotation of said second named roll and means for adjusting the relative positions of all of said rolls.

15 7. A device for tensioning strip material comprising a frame, a pair of alined guideways on each side of said frame, a roll mounted for slid-

ing movement in each of said guideways, a guideway disposed between each of said last named guideways and a roll mounted for sliding movement in said interposed guideway.

8. A device for tensioning strip material comprising a frame, a pair of alined guideways on each side of said frame, a roll mounted for sliding movement in each of said guideways, a guideway disposed between each of said last named guideways, a roll mounted for sliding
10 movement in said interposed guideway, positive gearing connecting said first named rolls, and a friction connection for said last named roll.

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