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STRIP STRAIGHTENER

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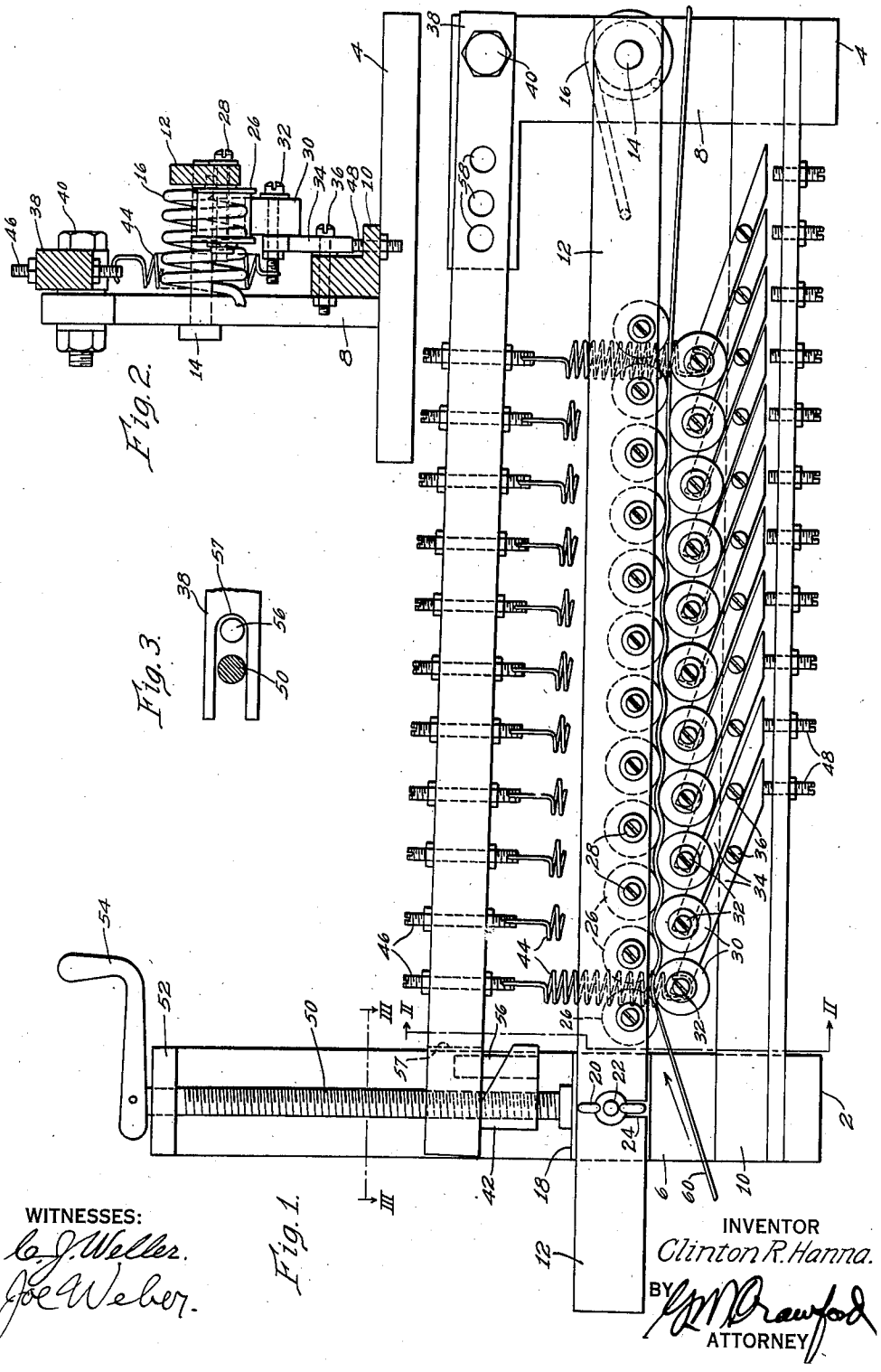

Fig. 2.

Fig. 3.

Fig. 1.

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STRIP STRAIGHTENER

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4 Claims. (Cl. 153—54)

My invention relates, generally, to strip straighteners and, more particularly, to mechanisms which act upon a length of material as it is passed through the mechanism to remove any bends that might exist in the length of material and deliver the length of material in a straight form.

Strip material which is used in the manufacture of certain structures must be as straight and free from bends as possible in order to function properly in the structure. When strip material is manufactured and packed for shipment, it is usually wound upon a reel, and this winding imparts a curvature to the strip which must be removed before the strip can be used in certain mechanisms.

It is an object of my invention, therefore, to provide a mechanism which shall function to remove bends from a length of material and deliver a length of material in straight form, which shall be simple and efficient in operation and inexpensive to manufacture, install, operate, and maintain.

Other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevational view, partly broken away of a strip straightener embodying the principal features of my invention; and

Fig. 2 is a sectional view taken along the line II—II of Fig. 1.

Fig. 3 is a sectional view taken along line III—III of Fig. 1.

In practicing the invention in one form thereof, I provide base members 2 and 4 to which are attached, in any suitable manner, upright members 6 and 8. A horizontal member 10 extends between and is attached to, in any suitable manner, the base members 2 and 4 and the upright members 6 and 8.

A horizontal bar or support member 12 has one end rotatably mounted upon the upright member 8 by means of a bolt 14 and is biased toward upward movement around its pivotal mounting by means of a coil spring member 16 which has its ends attached to the bar member 12 and the upright member 8, respectively. The other end of the bar member 12 is secured to a block 18 by means of releasable latch means comprising a wing nut 20 threadedly engaging a screw-threaded bolt 22 which extends through a slot 24 in the bar member 12, and which is secured to the block 18.

A group of rollers 26 is arranged in a row along the bar 12 and rotatably mounted thereon by means of bolt members 28. A similar group of rollers 30 is mounted each by means of a bolt 32 on supporting arms 34 in a row substantially parallel to the row of rollers 26, and in staggered relation therewith. The supporting arms 34 are, in turn, pivotally mounted upon the longitudinal member 10 by means of bolts 36.

A bar member 38 is pivotally mounted at one end upon the upright member 8 by means of a bolt 40. The other end of the bar member 38 rests upon a block 42. A group of elastic spring biasing members 44 is mounted on the bar member 38, each having its lower end engaged with a separate one of the bolts 32 and its upper end supported by a bolt 46 extending through the bar member 38 and provided with screw-threaded nuts. By turning the nuts on the upper ends of the bolts 46 the bolts may be moved up or down to vary the tension of the springs 44. The ends of the support arms 34 opposite those on which the rollers 30 are mounted are disposed to engage stop means or members 48, which are screw-threaded bolts engaging the horizontal member 10 and adjustable to limit the upward movement of the rollers 30 as desired.

A screw-threaded member 50 engages the block 42, has its lower end resting upon the block member 18, extends through the bar member 38, and is rotatably supported in a block member 52, which, in turn, is suitably secured to the upright member 6. The screw member 50 may be rotated by a suitable handle 54 to thereby raise or lower the end of the bar member 38, which, in turn, will vary the tension on the springs 44 simultaneously. A pin member 56 is secured to the block member 42 and extends into an opening 57 in the bar member 38 to prevent rotation of the block member 42 when the screw member 50 is rotated. The pivotal support for the bar member 38 on the pright member 8 may be changed from the position in which it is shown in the drawing by inserting the bolt 40 in either of the openings 58, which coincide with similar openings in the upright member 8 to thereby vary the relative degrees of spring tension variation by the movement of the bar member 38 as desired.

In the operation of the device, when it is desired to straighten a strip of material, the wing nut 20 may be loosened on the bolt 22 to thereby release the left-hand end of the bar member 12 and permit the spring member 16 to raise it so that the rollers 26 will be removed from engagement with the rollers 30 whose upward movement by the spring members 44 is limited by the stop

members 48. The strip of material 60 which is to be straightened may then be inserted between the spaced rows of rollers, and the bar member 12 may be manually returned against the tension of the spring 16 to its normal position shown in the drawing and clamped in position by means of the wing nut 20. The spring members 44 will be adjusted by means of their supporting bolts 46 so that the tensions of the spring members will decrease in the direction in which the strip 60 is pulled through the straightening device. Thus, when the strip 60 is to be pulled from left to right, as shown in the drawing, the degree of tension of the spring members 44 will be gradually decreased from left to right.

As the strip is pulled from left to right through the straightening device, the spring member will cause the lower rollers 30 to subject the strip to bending, and the amount of bending will gradually decrease as the strip moves through the straightening device because of the variation of the tensions of the spring members 44, and the strip 60 will be delivered from the device in substantially straight form.

When the material to be straightened is of heavy gauge, the tension of the spring members 44 may be increased simultaneously by rotating the handle 54 to operate the screw-threaded member 50 to thereby raise the left-hand end of the spring supporting bar 38. The tensions of the springs may be decreased similarly by reverse rotation of the screw-threaded member 50 when lighter gauge material is to be straightened by the device.

Thus, it will be seen that I have provided a mechanism which shall function to remove bends from a length of material and deliver a length of material in straight form, which shall be simple and efficient in operation and inexpensive to manufacture, install, operate, and maintain.

In compliance with the requirements of the patent statutes, I have shown and described herein a preferred embodiment of my invention. It is to be understood, however, that the invention is not limited to the precise construction shown and described, but is capable of modification by one skilled in the art, the embodiment herein shown being merely illustrative of the principles of my invention.

I claim as my invention:

1. In a strip straightener, a first group of rollers, a support member, means mounting said first group of rollers in a row on said support member, a second group of rollers disposed substantially parallel with the first group of rollers and in staggered relation with the rollers of the first group, means biasing the rollers of the second group toward a position in engagement each with two adjacent rollers of the first group, stop means for limiting the movement of the second group of rollers in the direction in which they are biased, a pivotal support for one end of said support member, means biasing the support member for rotation about its pivotal support in the direction away from the second group of rollers, and releasable latch means for securing the support member in normal position with the first and second groups of rollers in cooperative relation.

2. In a strip straightener, a first row of rollers, means mounting said first row of rollers in a fixed position, a second row of rollers, means mounting said second row of rollers substantially parallel with the first row of rollers and with the rollers of the second row in staggered relation with the rollers of the first row, separate elastic biasing means for biasing each of the rollers of the second row toward a position in engagement with two adjacent rollers of the first row, separate adjusting means for the separate biasing means for varying the biasing forces acting upon the rollers of the second row separately, and means for varying the biasing means acting upon the rollers of the second row simultaneously.

3. In a mechanism for straightening a length of material, a first row of rollers, means mounting said first row of rollers in a fixed position, a second row of rollers, means mounting said second row of rollers substantially parallel with the first row of rollers and with the rollers of the second row in staggered relation with the rollers of the first row, means biasing each of the rollers of the second row toward a position in engagement with two adjacent rollers of the first row, said biasing means comprising a bar member disposed substantially parallel to the plane of motion of the rollers of the second row, means pivotally mounting one end of said bar, means for supporting the other end of said bar, a plurality of elastic members extending between the rollers of the second row and the bar, means for varying the tension of said elastic members individually, and means for variably positioning said supporting means to thereby vary the tension of said elastic members simultaneously.

4. In a strip straightener, a first group of rollers, a support member, means mounting said first group of rollers on said support member, a second group of rollers, means mounting said second group of rollers substantially parallel with the second group of rollers and in staggered relation with the rollers of the first group, means biasing each of the rollers of the second group toward a position in engagement with two adjacent rollers of the first group, said biasing means comprising a bar member disposed substantially parallel to the plane of motion of the rollers of the second group, means pivotally mounting one end of said bar, means for supporting the other end of said bar, a plurality of elastic members extending between the rollers of the second group and the bar, means for varying the tension of said elastic members individually, and means for variably positioning said supporting means for the bar to thereby vary the tension of said elastic members simultaneously, a pivotal support for one end of said support member, means biasing said support member for rotation about its pivotal support in the direction away from the second group of rollers, and releasable latch means for securing the support member in normal position with the first and second groups of rollers in cooperative position, whereby release of said latch means will cause said first group of rollers to move away from said second group of rollers to thereby provide a space between the groups of rollers into which a strip may be inserted to be engaged by the rollers as the strip is drawn between the groups of rollers.

CLINTON R. HANNA.