M. M. BEEMAN & J. F. KITCHEN.

DEVICE FOR STRAIGHTENING METAL STRIPS.

APPLICATION FILED JAN. 22, 1912.

1,051,063.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.

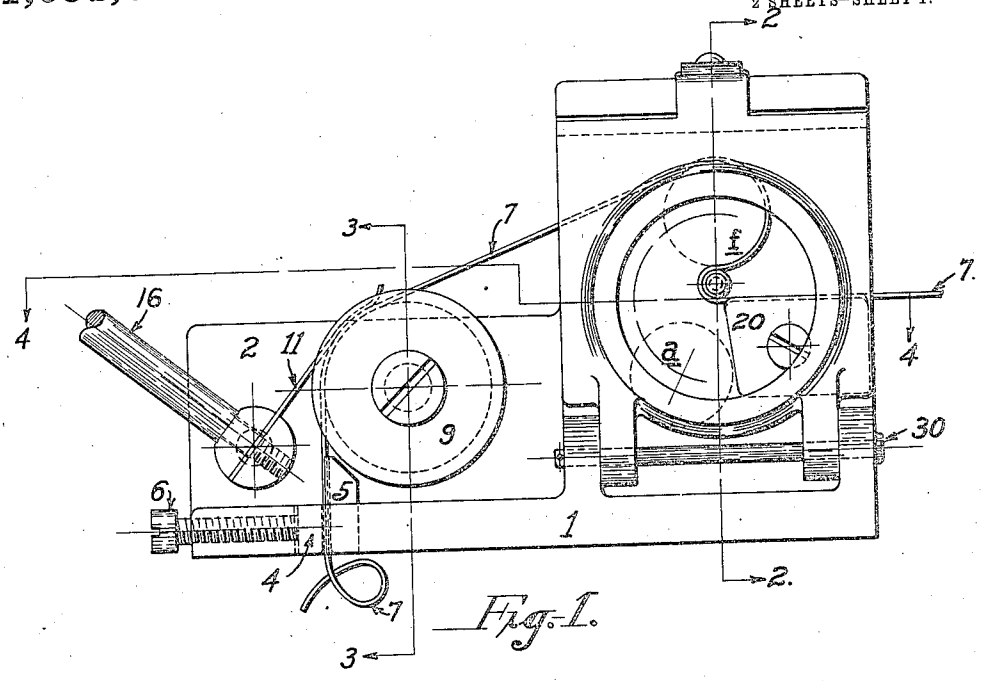

Fig. 1.

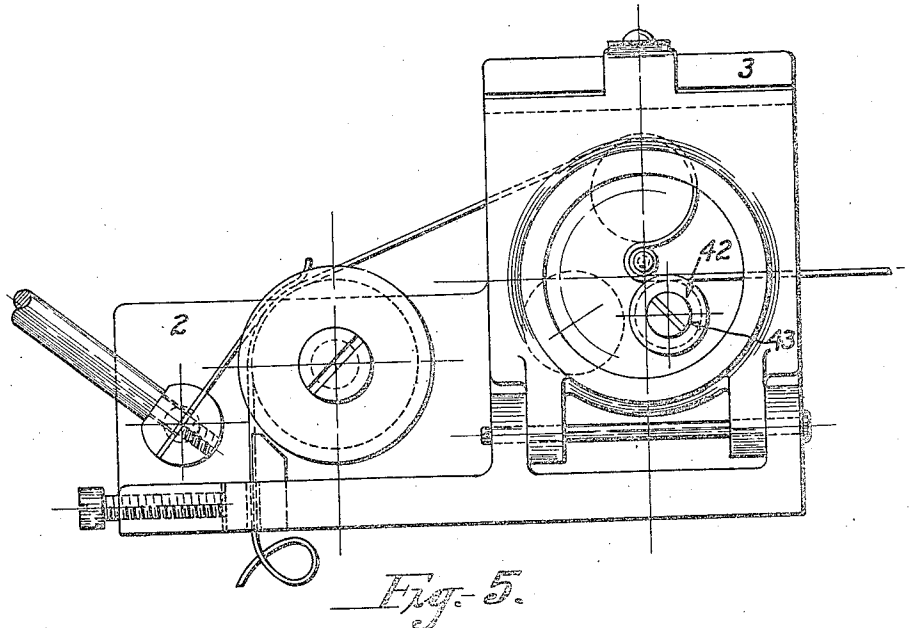

Fig. 5.

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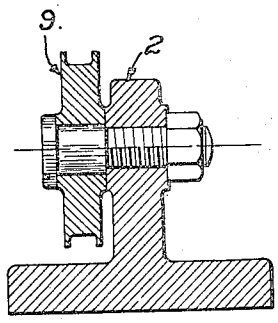

Fig. 3.

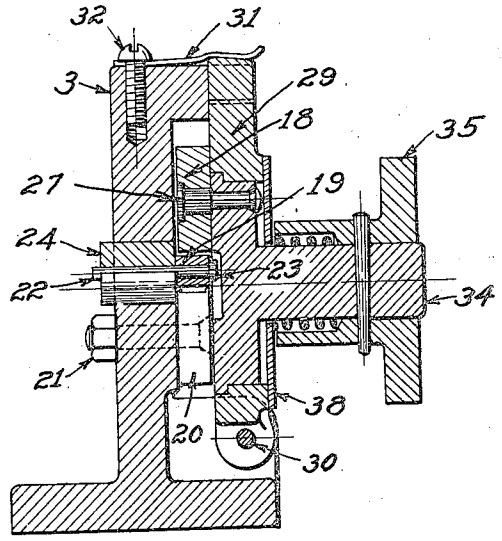

Fig. 2.

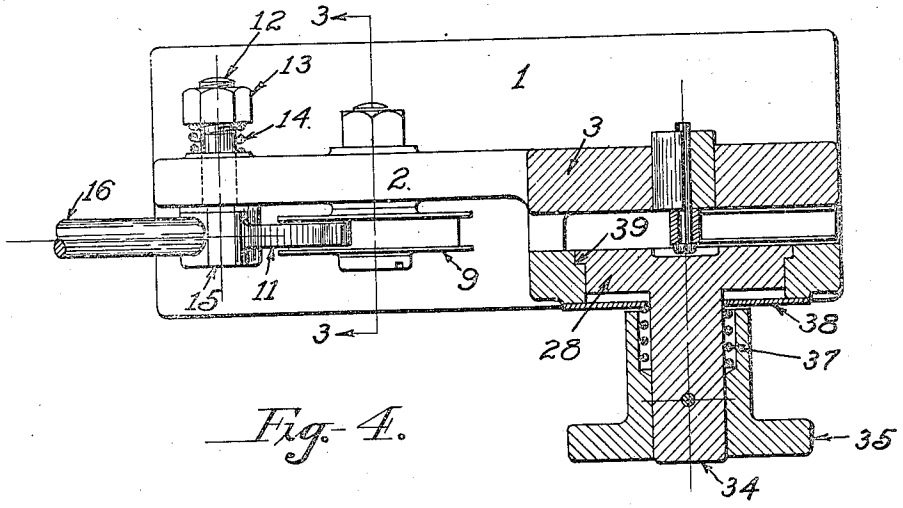

Fig. 4.

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UNITED STATES PATENT OFFICE.

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DEVICE FOR STRAIGHTENING METAL STRIPS.

1,051,063. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed January 22, 1912. Serial No. 672,568.

To all whom it may concern:

Be it known that we, MARCUS M. BEEMAN and JOHN F. KITCHEN, residents of Meadville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Devices for Straightening Metal Strips, of which the following is a specification.

This invention relates to devices for straightening metal strips, and more particularly to devices for straightening strips formed by bending wire into a series of loops to form a fabric to be afterward cut into suitable lengths to serve as garment stays.

The fabrication of garment stays from a high quality of steel wire by bending the same into a series of loops produces a strip which curves and kinks to varying degrees, due to the action of the bending devices, variations in the temper and twist of the wire and other causes. The strip or fabric must be straightened before the product can be used for garment stays.

The present invention has for its object to provide a device for straightening such strips, by means of which the strip is entirely relieved of its curls, bends or curves, and caused to be straight and flat, and which device is so arranged as to be readily adjusted or varied to exert varying degrees of effect on the strip according to the varying conditions of the latter.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawings Figure 1 is a side elevation of the device; Fig. 2 is a vertical transverse section on the line 2—2, Fig. 1; Fig. 3 is a similar view on the line 3—3, Fig. 1; Fig. 4 is in part a plan view and in part a horizontal section on the line 4—4, Fig. 1; and Fig. 5 is a diagrammatic view of a modified form.

The frame of the device is a casting comprising the base 1, and an upright or web having a relatively low portion 2 and a relatively high portion 3. The base 1 near one end is provided with an opening in which are set guide or wear blocks 4, 5, and grooved to form a passage for the strip therebetween and secured by screw 6 working in a threaded hole in the base 1.

The strip 7 to be straightened passes upwardly into the forward or front part of the device between the guide or wear blocks 4 and 5 but it is not intended to exert any friction or pressure thereon at this point. The strip passes thence over an idle guide roll 9, which rotates on a suitable pin mounted in the web. The roll 9 is grooved to receive the strip and coöperating therewith is a tension spring 11 which presses on the strip to exert the necessary tension thereon. This spring is secured to a headed stud or bolt 12 rotatable in a hole in web 2, and is frictionally held thereon by a nut 13 and spring 14 on its one end drawing its head 15 against the low portion 2 of the web. By means of the nut the friction can be varied as desired to hold the spring 11 with any desired tension on the strip to be straightened.

The stud or bolt 12 can be turned or rotated in either direction, by means of handle 16, to any desired position, the friction of nut 13 and spring 14 being sufficient to hold the stud or bolt in adjusted position. For convenience in inserting the strip to be straightened the tension spring 11 can be swung entirely clear of roll 9, if so desired.

From the idler roll 9 the strip 7 passes over a swinging roll 18, thence over a small roll or stud 19, and thence over a horizontal grooved guide 20 and out at the rear of the machine. The guide block 20 is secured to the web 3 of the frame by means of screw 21 or other suitable means. The member 19 is a small roll running idly on a small arbor or shaft 22, provided with a head 23 to keep the roll in place and clamped in a split block or bushing 24, secured in an opening in web 3 and clamped thereon by suitable means.

The swinging roll 18 is journaled on a headed stud 27 secured to a circular member 28 set slightly eccentric to the axis of the guiding roll 19 and rotatably mounted in a swinging plate or door 29, which is pivoted at its lower edge on the horizontal pivot 30 and which is held in operative position by means of a spring catch 31 secured by screw 32 to the top of web 3 and engaging the upper portion of the swinging plate 29. The catch can be easily disengaged to allow the plate 29 to drop to horizontal position for inspection of the straightening rolls, and for convenience in inserting the strip to be straightened.

The circular member 28 carrying the roll 18 is provided with an axial projection or hub 34 to which is secured a hand wheel 35 by means of which the plate 28 can be rotated to vary the position of the roll 18 to more or less deflect the strip 7, depending on the quality thereof and the amount of stress to be applied thereto to straighten the same.

In Fig. 1 the dotted line position *a* indicates the extreme lower position of the roll 18 in which the strip can take a straight course from idler 9, under roll 19 and over guide 20. At *f* is indicated the extreme upper position of roll 18 in which position the strip 7 is given maximum deflection. It can be held at any point between these two extremes, and is adjusted by the operator by means of hand wheel 35. The operator watches the effect of the rolls on the strip 7 and adjusts the position of roll 18 back and forth depending upon whether the device is failing to take all of the curvature out of the strip or is overdoing the same. The roll is stopped in its lowermost position by abutting the guide 20, and in its extreme uppermost position by approaching the roll 19 so closely as to be stopped by the strip 7 between said rolls.

The roll 18 is held in adjusted position frictionally by means of helical spring 37 interposed between hand wheel 35 and a plate 38 surrounding hub 34 and bearing against the outer face of the swinging plate 29. The spring draws the rotating member 28 outwardly and brings a flange 39 on its periphery against a shoulder on plate 29 with sufficient pressure to frictionally hold the member 28 with roller 18 in any position to which it may be moved by means of hand wheel 35.

The strip 7 may be drawn through the device by hand or by any suitable traction device, such as a reel, spool or the like, but in actual use it has been drawn through the device by means of a pair of driven rolls placed at the rear of the device and pinching the strip therebetween. As such traction devices are well known in the art, the action thereof will be readily understood.

In Fig. 5 we have illustrated somewhat diagrammatically a modified form of device in which the fixed guide 20 is replaced by a movable guide. As shown the guide consists of an idle roller or wheel 42 mounted for rotation on a stud or pin 43 secured to the high portion of the web 3 and located below and slightly in advance of the stud 19. Preferably the roll 42 is grooved to receive the strip 7 in the same manner as the guide 20. Other forms of guide will readily suggest themselves.

The operation of the device will be readily understood from the foregoing description in connection with the drawings. The device is of simple construction and readily adjustable to give any desired amount of deflection to the strip to instantly meet the varying conditions of the strip to be straightened. All the parts subject to wear are readily accessible and can be easily replaced in case of excessive wear.

We desire to be understood that "front" and "rear," appearing in the specification and claims, are used with reference to the places or direction of entrance and exit of the strip from the device. In other words, the guides nearer, along the line of movement of the strip, to its place of entrance may be considered as in front of those guides which are nearer to the place of exit of the strip, which is at the rear of the device.

What we claim is:—

1. In a device for straightening metal strips, the combination of a pair of guides arranged one on each side of the strip and adapted to direct the same, a roll adjustably mounted to swing around one of said guides and across the space between said guides to deflect the strip, and means for holding said roll in adjusted position.

2. In a device for straightening flexible flat metal strips, the combination of a stationary frame, a pair of guides thereon arranged one on each side of the strip to direct the same, a roll mounted on an axis parallel to the plane of the strip and arranged to be adjusted across the space between said guides and around one of said guides to deflect the strip, and friction means for holding said roll in adjusted position.

3. In a device for straightening metal strips, the combination of a pair of spaced guides arranged on opposite sides of the strip, a roll on the same side of the strip as one of said guides and mounted to swing around the other of said guides to deflect the strip, and a rotatable member eccentric with said guide and carrying said deflecting roll.

4. In a device for straightening metal strips, the combination of front and rear guides arranged to direct the strip, a roll mounted to swing around said rear guide to deflect the strip, a rotatable member eccentric with said rear guide and carrying said deflecting roll, and friction means for holding said rotatable member in adjusted position, said front guide and said deflecting roll being disposed on the same side of the strip.

5. In a device for straightening metal strips, the combination of a frame, a pair of guides thereon arranged to direct the strip, a roll mounted to swing around one of said guides to deflect the strip, means for adjusting the position of said roll, and a plate movably secured to the frame and supporting said roll and permitting endwise movement thereof.

6. In a device for straightening metal strips, the combination of a frame, a pair of

guides thereon arranged to direct the strip, a roll mounted to swing around one of said guides to deflect the strip, a rotatable member eccentric with the last named guide and on which said roll is mounted, and a plate hinged to the frame and on which said rotatable member is mounted and permitting endwise movement thereof.

7. In a device for straightening flexible flat metal strips, the combination of a pair of guides arranged to direct the strip, a roll mounted to swing around one of said guides to deflect the strip, means for adjusting the position of said roll, and a grooved guide in rear of the last named guide and arranged to receive the strip flatwise and direct it in a straight course, one of said pair of guides, said deflecting roll, and said grooved guide being on the same side of the strip.

8. In a device for straightening metal strips, the combination of front and rear idle rolls arranged on opposite sides of the strip and serving as guides over which the strip is led, and a roll coöperating with the rear roller guide and arranged to swing around the same and deflect the strip.

9. In a device for straightening metal strips, the combination of front and rear idle rolls serving as guides over which the strip is led, and a roll coöperating with said rear roller guide and arranged to swing around the same and deflect the strip, and a stationary straight faced guide in rear of the rear roller guide and tangential thereto, said front roll, deflecting roll, and straight faced guide, being on the same side of the strip.

10. In a device for straightening metal strips, the combination of a pair of idle rolls serving as guides over which the strip is led, and a roll coöperating with the second roller guide and arranged to swing around the same and deflect the strip, a member rotatably mounted eccentric to the second roller guide and carrying the deflecting roller, said member being also mounted to be endwise movable from the second roller guide.

11. In a device for straightening metal strips, the combination of a pair of idle rolls serving as guides over which the strip is led, a roll coöperating with a second roller guide and arranged to swing around the same and deflect the strip, and an endwise movable member rotatably mounted and eccentric to said roller guide and carrying said deflecting roll, said deflecting roll and the first roller guide being on the opposite side of the strip from said second roller guide.

12. In a device for straightening metal strips, the combination of a pair of metal guides arranged to direct the strip, a guide adjustably mounted to swing around one of said guides to deflect the strip, means for holding said deflecting guide in adjusted position, a rotatably adjustable stud carrying a spring and arranged to apply varying degrees of tension to the strip at the first guide, and a spring frictionally holding said stud in adjusted position.

13. In a device for straightening metal strips, the combination of a pair of metal guides arranged to direct the strip, a guide adjustably mounted to swing around one of said guides to deflect the strip, means for holding said deflecting guide in adjusted position, a rotatably adjustable stud carrying a spring and arranged to apply varying degrees of tension to the strip at the first guide, a spring frictionally holding said stud in adjusted position, and a lever connected to said stud for rotating the same to vary the tension.

In testimony whereof, we have hereunto set our hands.

M. M. BEEMAN.
JOHN F. KITCHEN.

Witnesses:
J. H. PARDEE,
F. W. WINTER.