

April 28, 1925.

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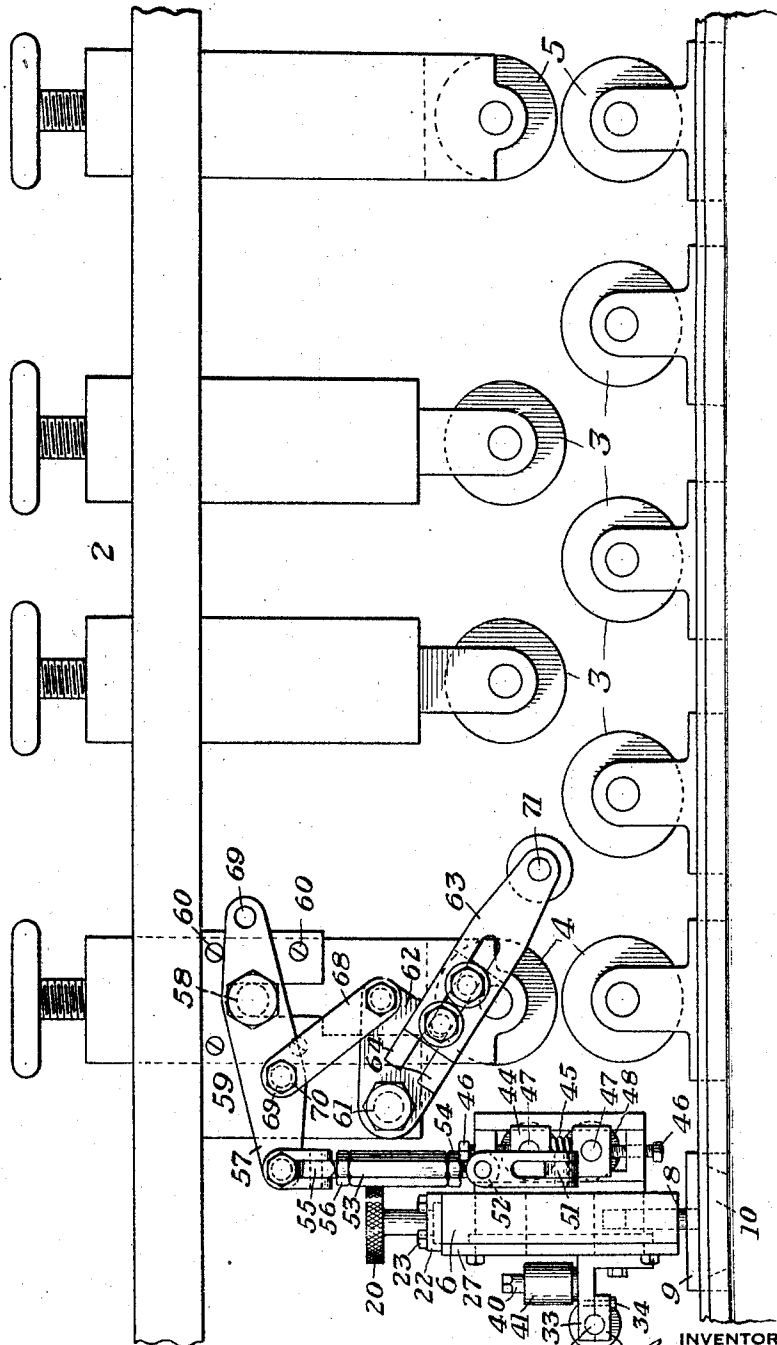
J. T. LEECH

TWISTER

Filed Oct. 21, 1924

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Fig. 1.



INVENTOR

*Jacob T. Leech*  
*By Eugene A. Shubin, Norman*  
*His Atty*

April 28, 1925.

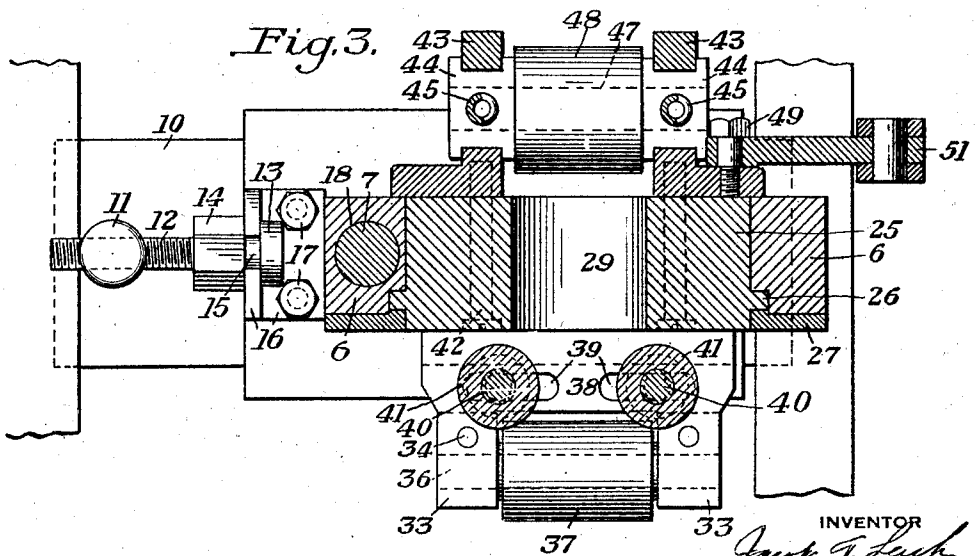
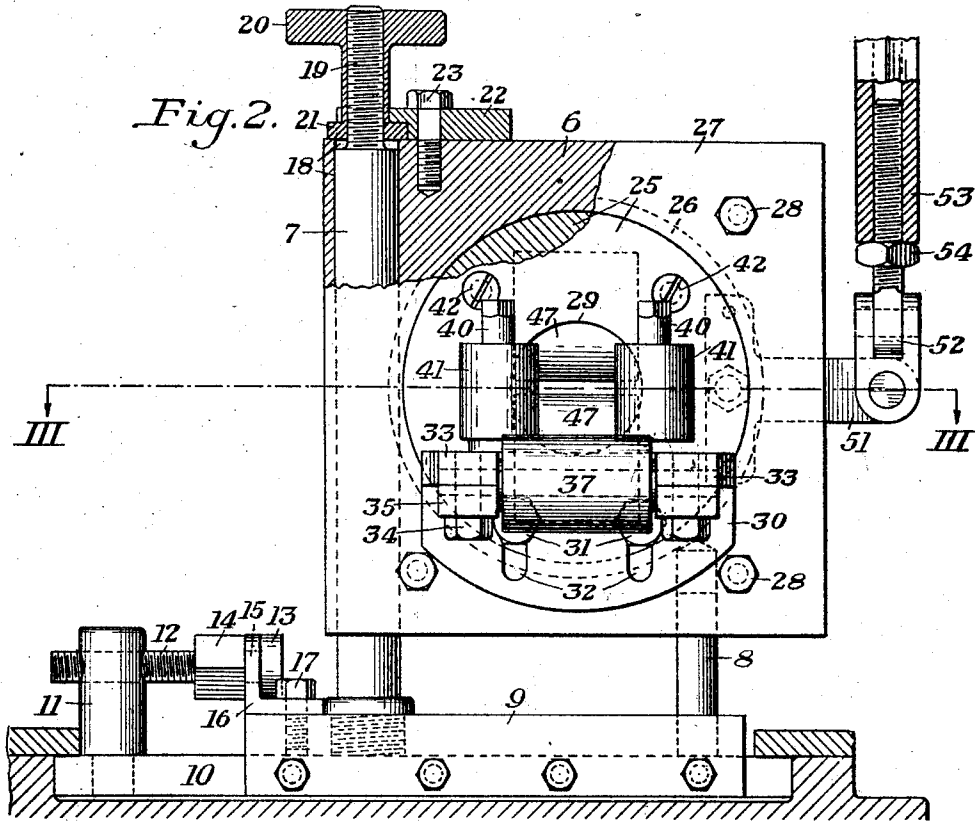
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J. T. LEECH

TWISTER

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INVENTOR  
*J. T. Leech*  
*By [Signature] Attorney*

April 28, 1925.

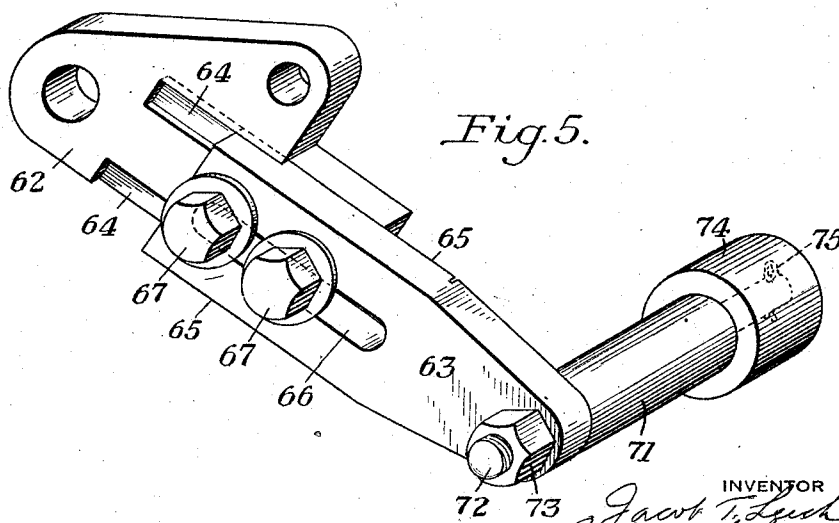
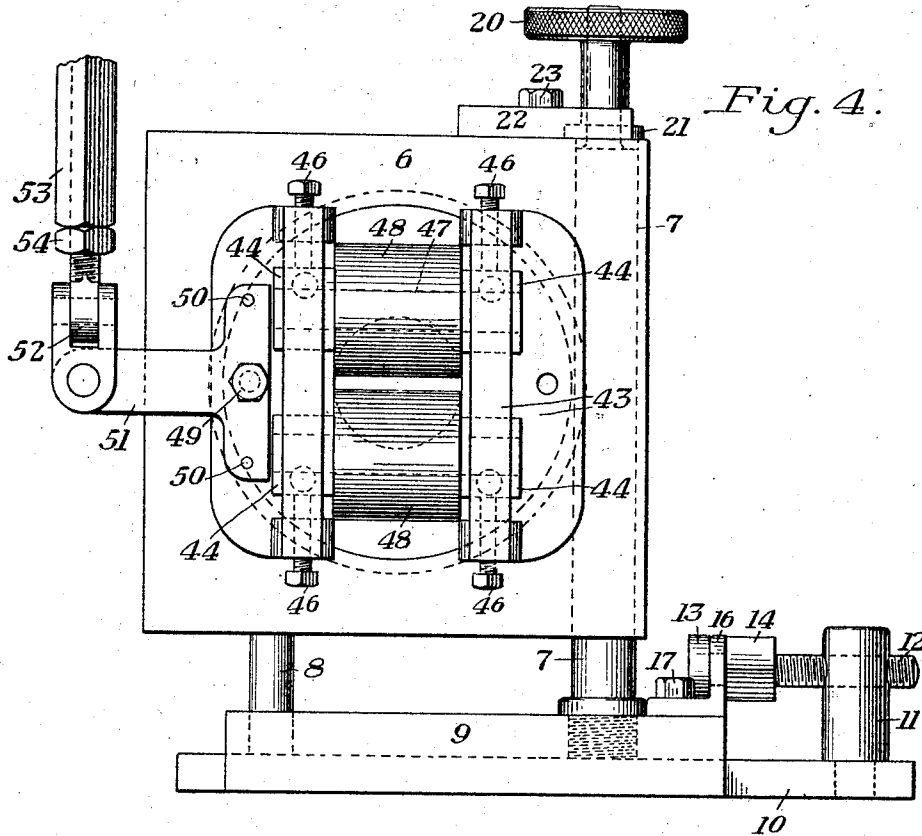
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J. T. LEECH

TWISTER

Filed Oct. 21, 1924

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INVENTOR

Jacob T. Leech  
By Raymond H. Stebbins, Counselor  
His Atty

Patented Apr. 28, 1925.

1,535,323

## UNITED STATES PATENT OFFICE.

JACOB T. LEECH, OF BEAVER, PENNSYLVANIA, ASSIGNOR TO UNION DRAWN STEEL COMPANY, OF BEAVER FALLS, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TWISTER.

Application filed October 21, 1924. Serial No. 744,874.

*To all whom it may concern:*

Be it known that I, JACOB T. LEECH, a citizen of the United States, residing at Beaver, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Twisters, of which the following is a full, clear, and exact description.

The present invention relates to means for taking the twist out of metal bars and shapes.

Metal bars and shapes, particularly cold-drawn bars and shapes, usually have a corkscrew twist in them which is not taken out by running them through a straightening machine. If such bars and shapes, while passing through the straightening machine, are given a reverse twist slightly greater in amount than their original twist they will come out of the straightening machine with their original corkscrew twist entirely removed. The present invention provides a means for giving this reverse twist to metal bars and shapes and is particularly adapted for use in connection with straightening machines, but is not limited to such use.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation showing a preferred form of twister embodying my invention in connection with a straightening machine;

Fig. 2 is a front elevation, partly in section and partly broken away, of the twister;

Fig. 3 is a sectional plan view on the line III—III of Fig. 2;

Fig. 4 is a rear elevation of the parts shown in Fig. 2; and

Fig. 5 is a detail perspective view of the control arm and associated parts.

Referring to Fig. 1, 2 designates a straightening machine which, as shown, comprises a plurality of relatively adjustable straightening rollers 3 and two pairs of pinch rolls 4 and 5 which may be driven by any suitable means. I have shown one form of straightening machine merely for the purpose of illustrating my invention in connection therewith, it being understood that the invention is independent of any particular form of straightening machine and, in fact, may be used entirely independently of a straightening machine.

The twister comprises a housing 6 mounted for vertical adjustment on a guide

post 7 and a guide pin 8. The post 7 and the pin 8 are carried by a slide 9 mounted on a base plate 10 and having a dovetail slot in its lower face to receive said plate. Mounted on the base plate adjacent one end thereof is a vertical post 11 having a screw-threaded bore extending transversely there-through, with which a screw 12 cooperates. This screw has a head 13 at one end and a wrench-engaging portion 14 adjacent said head. The screw has an unthreaded portion 15 intermediate the head and wrench-engaging portion which is received in a slot in an angle plate 16 secured to the upper face of the slide 9 adjacent one end thereof by screws 17. It will be apparent that by turning the screw 12 in one direction or the other the slide 9 and the parts carried thereby may be adjusted on the base plate 10 transversely of the straightening machine, that is, in a direction parallel to the axes of the pinch rolls 4.

The guide post 7 has its lower end portion screw-threaded and is screwed into the slide 9. This post extends through a vertical bore 18 in the housing 6 adjacent one edge thereof and has a screw-threaded upper end portion 19 of reduced diameter. Cooperating with the screw-threaded portion 19 is a hand-wheel 20 which has a flange 21 engaging under a clamp plate 22 secured to the upper edge of the housing 6 by a screw 23. The guide pin 8 extends into a vertical bore in the housing. By turning the hand-wheel 20 the housing 6 and the parts carried thereby may be adjusted vertically with respect to the slide 9.

The housing 6 has a rotor 25 journaled therein. This rotor has a peripheral flange 26 which engages in an annular recess in the housing, the rotor being held in position in the housing by a face plate 27 secured to one face of the housing by screws 28. This face plate engages one face of the flange 26. The rotor has a central circular opening 29 therein through which the material to be straightened passes.

A plate 30 is secured to the front face of the rotor by screws 31 which extend through vertical slots 32 in the plate whereby it may be adjusted vertically. This plate has two spaced horizontal arms 33 projecting therefrom. Secured to the lower faces of the arms 33 by screws 34 are clamps 35. A roller pin 36 is journaled in bearings

formed partly in the arms 33 and partly in the clamps 35. A horizontal roller 37 is carried by this pin between the arms 33. The arms 33 form extensions of a horizontal flange 38. This flange has longitudinal slots 39 therein in which are mounted vertical pins 40. These pins are screw-threaded at their lower ends and have nuts (not shown) mounted thereon which engage the lower face of the flange 38 whereby the pins are adjustable towards and from each other. The pins carry vertical guide rollers 41.

Secured to the rear face of the rotor by screws 42 are two spaced roll housings 43. Each roll housing has a pair of blocks 44 slidable vertically therein, and interposed between each pair of blocks is a coil spring 45. These blocks are engaged by adjusting screws 46 which are tapped into the upper and lower ends of the housings. The blocks 44 have roll pins 47 journaled therein which carry a pair of horizontal rolls 48. Secured to one of the roll housings 43, by a screw 49 and dowel pins 50, is an arm 51, to the outer end of which is pivoted a screw clevis 52. This screw clevis is screwed into one end of a turn buckle 53 and is adjustably secured therein by a lock nut 54. Screwed into the other end of the turn buckle is a screw clevis 55 which is held in adjusted position by a lock nut 56. The screw clevis 55 is pivoted to one end of a lever 57 which is pivoted intermediate its ends on a pivot 58 which is mounted in a plate 59 secured by screws 60 to the housing of the upper pinch roll 4. A control arm is pivotally mounted at one end on a pin 61. This control arm is made in two parts 62 and 63. The part 62 has slots 64 into which extend ribs 65 on the part 63. The part 63 has a longitudinal slot 66 therein through which extend screws 67 which adjustably secure the parts of the arm together. It will be seen that the construction is such that the length of the control arm may be adjusted. The control arm is connected to the lever 57 by a link 68. This link is adapted to be connected to the lever 57 on either side of its fulcrum, the lever having two openings 69 to receive the pivot bolt 70.

Secured to the outer end of the control arm is a roller shaft 71 which has a reduced screw-threaded extremity 72 extending through the control arm and engaged by a nut 73. The other extremity of the roller shaft is also reduced and has a roller 74 journaled thereon and maintained in position by a cotter pin 75.

Normally, the roller 74 is positioned, as shown in Fig. 1, in the path of a bar passing between the pinch rolls 4. In operation, a bar will be fed over the horizontal roller 37 and between the vertical guide rollers 41 and will pass through the opening

in the rotor 25. The end of the bar will pass between the horizontal twister rolls 48 and will thereafter be engaged by the pinch rolls 4. The pinch rolls 4 will feed the bar through the twister and between the rolls 3 of the straightening machine until the bar is engaged by the pinch rolls 5, whereupon it will be fed both by the pinch rolls 4 and pinch rolls 5. As soon as the leading end of the bar passes between the pinch rolls 4 it will engage the roller 74 and lift the control arm. This will cause the rotor to be turned to a position such that the axes of the twister rolls 48 will be inclined to the horizontal. By properly adjusting the turn buckle 53 and the length of the control arm the rotor will be turned to such a position that the rolls 48 will impart to the bar a reverse twist slightly greater in amount than the original twist in the bar. If the original twist in the bar is in one direction the link 68 may be connected to the lever 57, as shown in Fig. 1, but if the twist is in the opposite direction the link will be pivotally connected to the lever 57 on the opposite side of its fulcrum.

It will be seen that the construction is such that the material passing through the twister, by engagement with the roller 74, automatically sets the rotor into the desired position for taking the twist out of the material. The rolls 48 have been shown as plain rolls for cooperation with flat bars, but it will be apparent that if shapes are to be operated upon the rolls can be modified accordingly to receive such shapes.

While I have shown and described a preferred form of my invention, it will be understood that the invention is not limited to the details of construction shown but may be otherwise embodied within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. The combination with a twister for taking the twist out of work, said twister having means adapted to be set to different positions for imparting the desired reverse twist to the work, of means for drawing the work through the twister and holding the portion of the work engaged thereby against rotation, and means for automatically setting said first-mentioned means in the desired position after it has been engaged by said second-mentioned means, substantially as described.

2. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister, and means for automatically turning the rotor into the desired position after it has been engaged by said pinch rolls, substantially as described.

3. The combination with a straightening machine, of a twister for taking the twist out of work, said twister having means adapted to be set to different positions for imparting the desired reverse twist to the work as the latter is drawn through said means by said machine, and means for automatically setting said first-mentioned means into the desired position after it has been engaged by said straightening machine, substantially as described.

4. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister and a lever having a roller positioned to be engaged by the work after it is engaged by said pinch rolls, said lever being operatively connected to said rotor, whereby the latter is automatically turned into the desired position upon the engagement of said roller by the work, substantially as described.

5. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister and a lever having a roller positioned to be engaged by the work after it is engaged by said pinch rolls, said lever being operatively connected to said rotor, whereby the latter is automatically turned into the desired position upon the engagement of said roller by the work, said lever being adjustable in length to vary the position of said roller, substantially as described.

6. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister, and means operatively connected to said rotor and adapted to be

engaged by the work after it has been engaged by said pinch rolls for turning said rotor into the desired position, substantially as described.

7. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister, and means operatively connected to said rotor and adapted to be engaged by the work after it has been engaged by said pinch rolls for turning said rotor into the desired position, said means being adjustable to vary the amount that the rotor is turned, substantially as described.

8. The combination with a twister for taking the twist out of work, said twister having a rotor embodying means for imparting the desired reverse twist to the work, of a pair of pinch rolls for drawing the work through said twister, and means operatively connected to said rotor and adapted to be engaged by the work after it has been engaged by said pinch rolls for turning said rotor into the desired position, said means being adjustable whereby the direction of rotation of the rotor can be controlled, substantially as described.

9. The combination with a straightening machine, of a twister for taking the twist out of work, said twister having means adapted to be set to different positions for imparting the desired reverse twist to the work as the material is drawn through said means by said machine, and means controlled by the work after it has been engaged by the straightening machine for automatically setting said first-mentioned means in the desired position, substantially as described.

In testimony whereof I have hereunto set my hand.

JACOB T. LEECH.