May 4, 1943. C. D. JOHNSON 2,318,160

WIRE STRAIGHTENER

Filed Feb. 20, 1942

Fig. 1.

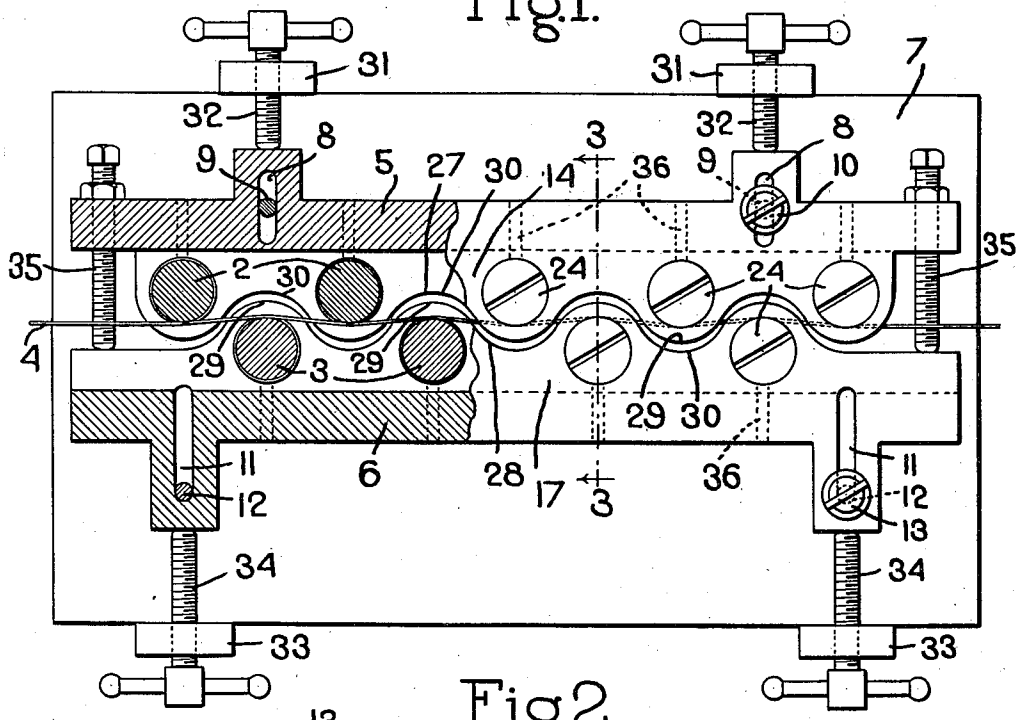


Fig. 2.

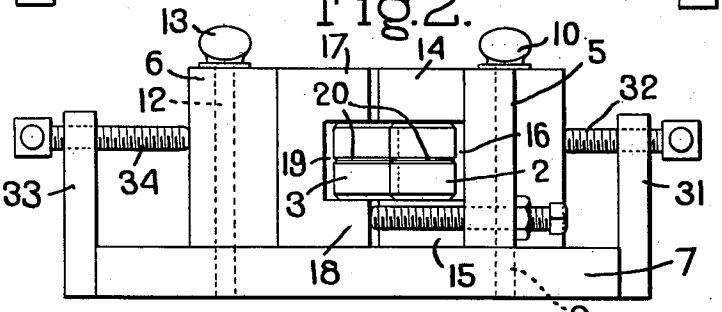
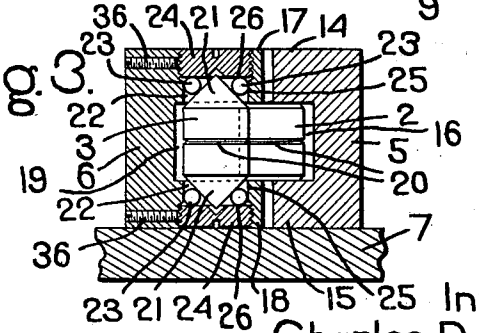


Fig. 3.



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WIRE STRAIGHTENER

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Application February 20, 1942, Serial No. 431,674

1 Claim. (Cl. 140—148)

This invention relates to wire straighteners of the type which comprises two rows of straightening rolls between which the wire to be straightened passes, the rolls of one row being staggered with relation to the rolls of the other row and the two rows of rolls having such a relation that as the wire passes between the two rows, it is bent first in one direction and then in the other by its contact with successive rolls.

For straightening some wire, it is advantageous to employ relatively small rolls, even as small as ½ inch in diameter. It is also desirable to mount the rolls in ball bearings so as to ensure that they will always rotate freely and without undue friction, for if any roll in a wire straightener sticks in its bearing to such an extent that it has a sliding instead of a rolling contact with the wire, a different straightening effect in the wire may be produced than if such roll was freely rotating and had only a rolling contact with the wire.

One object of the present invention is to provide a novel manner of mounting the rolls in a wire straightener which permits relatively small rolls to be used and yet which provides a suitable ball bearing for both ends of each roll.

In order to give an understanding of the invention I have illustrated in the drawing a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claim.

Fig. 1 shows a plan view of a wire straightener embodying my invention with parts broken out.

Fig. 2 is an end view of Fig. 1.

Fig. 3 is a section on the line 3—3, Fig. 1.

In the device shown in the drawing, the wire straightening rolls of one row are indicated at 2 and those of the other row are indicated at 3, these rows of rolls being arranged as usual in wire straighteners of this type so that as the wire 4 to be straightened passes between the rows of rolls, said wire is bent first in one direction and then in the other by its contact with the rolls.

The rolls 2 are mounted in a roll-carrying block 5 and the rolls 3 are mounted in another roll-carrying block 6. Both of these blocks 5 and 6 are shown as mounted on a suitable base or support 7. The block 5 is provided with two slots 8, each of which receives a clamping bolt 9 by which the block is clamped to the base plate 7, each bolt having a head 10 by which it may be turned to screw it into the base plate.

The block 6 is also formed with two vertical slots 11 adapted to receive clamping bolts 12, said bolts being provided with heads 13 by which they can be turned for screwing them into the base 7.

The roll-carrying block 5 is formed with two bearing flanges 14 and 15 forming between them a roll-receiving channel 16 in which the rolls 2 are located. Similarly, the block 6 is provided with two bearing flanges 17 and 18 forming between them a roll-receiving channel 19 in which the rolls 3 are received. Each roll will preferably be provided with a peripheral groove 20 to receive the wire being straightened.

A ball bearing for each end of each roll 2 or 3 is provided by making the ends of the rolls conical in shape as shown at 21 and by providing each of the bearing flanges 14, 15 of the block 5 and 17, 18 of the block 6 with openings 22 adapted to receive balls 23 which bear against the conical ends of the rolls and also the side walls of the openings. Each opening 22 is screw-threaded at its outer end and receives a plug 24, the inner face of which forms a backing for the balls 23. There is thus provided a ball bearing at each end of each roll in which the balls 23 of each ball bearing are confined between the conical surface 21 at the end of the roll, the wall 25 of the aperture or opening 22 and the inner face 26 of the screw plug 24.

The openings 22 are preferably of a size large enough to permit the rolls 2 or 3 to pass therethrough, and a ball bearing is thus provided in which the balls and the ball race is located within the confines of a cylinder formed by extending the cylindrical face of the rolls.

With this construction it is possible to make the bearing flanges 14, 15, or 17, 18 of a minimum width and to use rolls of relatively small diameter.

The blocks 5 and 6 are so constructed that the upper and lower flanges 14 and 15 of the block 5 are in the same plane as the upper and lower flanges 17 and 18 of the block 6, and in order to permit the blocks to be brought close enough together so that the wire will be bent slightly as it passes under successive rolls, I propose to make the inner faces 27 of the flanges 14 and 15 and the inner faces 28 of the flanges 17 and 18 with a scalloped formation as best seen in Fig. 1, and with the convexly curved portions 29 of each scalloped face facing the concavely curved portions 30 of the other scalloped face.

Any suitable means may be employed for adjusting the blocks toward and from each other in order to give the wire the desired amount of multi-flexing as it passes between the rows of rolls.

In the construction herein shown, the base 7 has two arms 31 rising therefrom which carry adjusting screws 32 adapted to engage the backside of the block 5 and by which said block can be positioned on the base 7. The base also has two other vertically extending arms 33 which carry adjusting screws 34 adapted to engage the backside of the block 6. By means of these adjusting screws, 32 and 34, the two blocks can be adjusted to the desired relative position in order to give the desired bending effect to the wire.

35 indicate positioning screws which are carried by the ends of the block 5 and are adapted to engage the inner face of the block 6, said screws serving to limit the adjusting movement of the blocks toward each other.

The screw plugs 24 not only form part of the ball bearings for the rolls, but they also provide means by which the rolls can be adjusted in the direction of their axes in order to line them up correctly.

36 indicate set screws by which the screw plugs 24 can be locked in their adjusted position.

The rolls and their ball bearings can be readily assembled in the flanges of the blocks by first inserting the screw plugs in the lower flanges and then dropping in the balls and placing the rolls in position through the opening in the upper flange. After the rolls have been assembled, then the balls 23 of the upper ball bearing can be dropped into place and the upper screw plugs screwed into the upper flanges thus completing the assembly.

I claim:

A wire straightener comprising two roll-holding blocks, each having two bearing flanges forming between them a roll-receiving channel and each flange having a plurality of spaced openings, a plurality of spaced wire-engaging rolls in each channel, each roll presenting a cylindrical body of uniform diameter which is received entirely within the channel and no part of which projects beyond the edges of the bearing flanges, each roll also having conical ends, each conical end located in an opening of the corresponding flange, ball bearings in the openings in one flange of each block provided with balls engaging the corresponding conical ends of the rolls, the openings in the other flange of each block being through openings, and each through opening having a diameter at least as great as that of the corresponding roll whereby the rolls may be assembled in the flanges by introducing them through said through openings in an axial direction, a plug having a flat inner face screw threaded into the outer end of each through opening, balls in each annular space forming part of a through opening and bounded by the wall of said through opening, the inner flat face of the screw plug screwed into the outer end of said opening and the conical end of the corresponding roll, each flange of each block having a recess between adjacent rolls, which recess is situated opposite a roll of the other block and means to adjust the blocks toward and from each other.

CHARLES D. JOHNSON.