

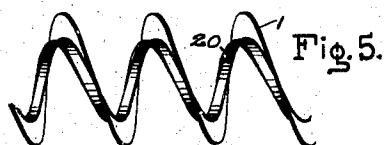
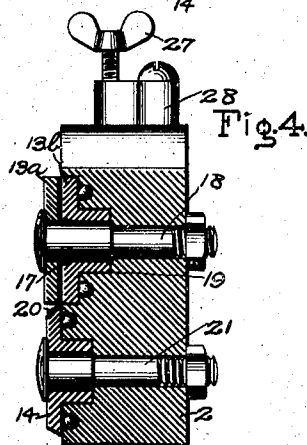
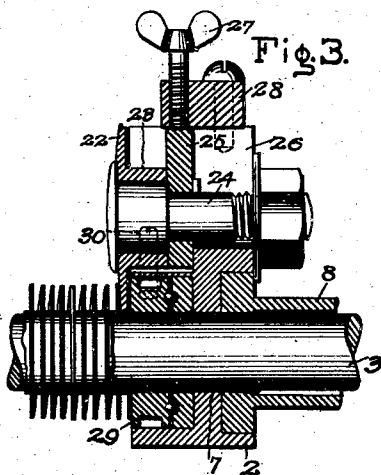
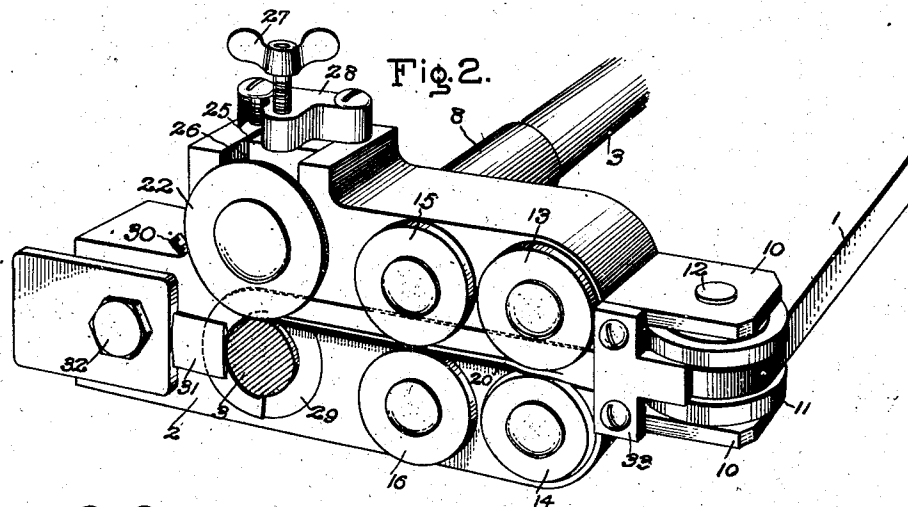
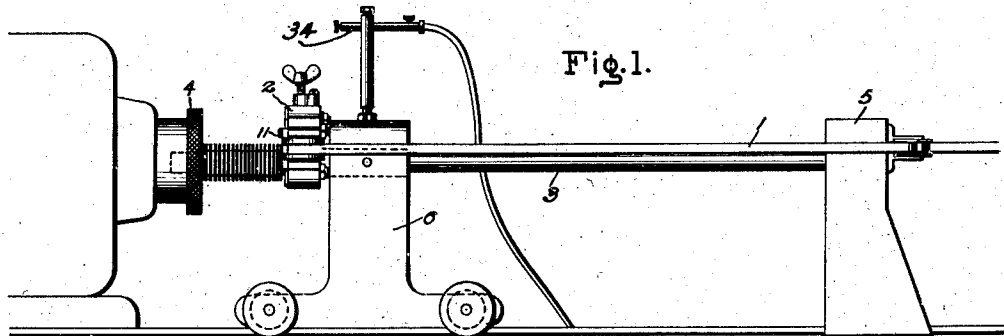
April 5, 1927.

A. O. WAY

1,623,766

COIL FORMER

Filed Aug. 11, 1922



Inventor:
Alva O. Way,
by *Alfred S. Davis*
His attorney.

Patented Apr. 5, 1927.

1,623,766

UNITED STATES PATENT OFFICE.

ALVA O. WAY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

COIL FORMER.

Application filed August 11, 1922. Serial No. 581,117.

The present invention relates to means for forming and shaping metal strips or ribbons into edge-wound coils or helixes having integral flanges at the inner edges thereof whereby they are adapted to be attached to pipes in the manufacture of heat radiators and kindred apparatus.

Heretofore it has been the custom to form such an edge-wound coil from the metal ribbon by drawing it through a die adapted to press upon and frictionally engage the entire profile of the ribbon during its passage therethrough. On account of the great amount of friction involved, the ribbon was injuriously stretched and the dies quickly worn out.

The object of my invention is the provision of an improved coil former in which the metal strips may be longitudinally folded or flanged and coiled edgewise without excessive stretching of the material and which may be subjected to high speed operation without injury to itself or the product.

One embodiment of the invention is shown in the accompanying drawing forming a part of this specification in which Figure 1 is a side elevation of a portion of a winding lathe with a coil former embodying my invention mounted thereon; Fig. 2 is a perspective view of the coil former with a metal ribbon in the process of being longitudinally folded and coiled edgewise; Fig. 3 is a vertical section of the former through the coiling end thereof; Fig. 4 is a similar section through the leading or starting pair of folding rollers, and Fig. 5 is a side elevation of a distended section of coil made in the former.

In the arrangement shown in the drawing, the metal strip 1 is led through the former 2 and coiled into its permanent position upon a mandrel or tube 3. The mandrels or tubes 3 are coupled at their leading (or as shown the left-hand) ends to the positively driven head 4 of the winding lathe, while the other ends are supported freely in a bracket 5 of the lathe. The former 2 is fastened to the side of the lathe carriage 6 movable longitudinally of the lathe bed.

The former 2 comprises an oblong bearing block having a transverse guide aperture 7 near one end for the winding mandrel or tube 3 to pass freely therethrough. Extending rearwardly from the former and in alignment with the aperture 7 is a mandrel

or tube holder 8 adapted to extend through the lathe carriage 6 and be rigidly connected thereto. The former has its end opposite the transverse aperture 7 bifurcated to form lugs 10 spaced for receiving between them a grooved guide roller 11 for the metal ribbon 1 and carrying the shaft 12 therefor.

Arranged centrally along one side of the former are two pairs of frictionless ribbon folding or flanging rolls 13-14 and 15-16. The upper or steadying roll 13 of the leading pair is made in two parts 13^a and 13^b connected together by a central collar 17 on one part tightly engaging a recess in the other part and operating to space apart their adjacent ends and thus forming in effect a grooved roll through which a metal ribbon 1 may be freely passed edgewise with its top edge in contact with the collar 17 and its bottom edge projecting beyond the periphery a distance corresponding to the width of the flange to be formed. The roll 13 is journaled on a shaft bolt 18 passing through the former block and the inner part 13^b is countersunk in a recess 19 so that its outer end is substantially flush with the surface of the former and anti-friction balls are disposed between the inner end thereof and the wall of the recess 19. The lower roll 14 of the leading pair has its periphery made conical with the larger diameter adjacent the face of the former so that the portion 20 of the metal ribbon 1 that projects below the periphery of the upper roll 13 will be bent over through a relatively small angle according to the angularity of the conical surface of the roller. The roll 14 is likewise journaled on a shaft bolt 21 and anti-friction balls are disposed between the inner end of the roll and the former block.

The second pair of progressively flanging rolls 15 and 16 are arranged and constructed like the leading pair 13 and 14, except that both have cylindrical peripheries so that the flange 20 is bent up thereby the full ninety degrees to the main portion of the ribbon 1.

Beyond the second pair of flanging rolls the former is provided with a coiling roll 22 which serves to support the main portion of the metal ribbon during the edgewise bending thereof about the mandrel 3. The coiling roll 22 has an extended hub 23 journaled on a shaft bolt 24 carried by a pressure bar 25 vertically adjustable in a transverse notch

26 in the former block 2 by means of a thumb screw 27 carried by a cross bar 28.

In order to relieve the inner surface of the metal ribbon of friction during the coiling thereof, a free ring 29 is inserted in a recess about the outer end of the aperture 7 with anti-friction balls at the inner side and held in place by a set screw 30 engaging a peripheral groove therein.

10 For the purpose of uniformly spacing the convolutions of the coil and also for preventing buckling of the ribbon as it leaves the coiling roll 22, a spacing finger 31 is attached to the face of the former block 2 just beyond the coiling roll 22 by a set screw 32, and to retain the ribbon in contact with the guide roller 11 as it passes to the leading flanging rolls 13 and 14, a guide bracket 33 is fastened across the lugs 10 to bridge the path of the ribbon.

In order to introduce a metal ribbon into the former, the edge adjacent the end is trimmed off so that it may pass the flanging and coiling rolls freely. The end is attached to the mandrel as by gripping thereon by the coupling of the lathe head 4 and upon applying power to the latter the ribbon will be drawn through the former, insuring the flanging and coiling thereof in the manner intended without further attention on the part of the operative, except the supplying of suitable lubricant which may be accomplished by means of a nozzle 34 mounted on the lathe carriage 6.

35 While I have shown and described the best embodiment of the invention known to me, I do not desire to be restricted thereto.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

40 1. A former for producing flanged edge-wound coils from metal ribbon comprising pairs of rolls for supporting and flanging the metal ribbon, and rolling contact means for guiding and staying the flanged ribbon on both sides during winding thereof.

2. A former for producing flanged edge-wound coils from metal ribbon comprising pairs of rolls for supporting and progressively flanging the metal ribbon, and rolling contact means for guiding and staying the flanged ribbon on both sides during winding thereof.

3. A former for producing flanged edge-wound coils from metal ribbon comprising a bearing block having a guide passage for a mandrel, a mandrel, a grooved roll journaled on said block and adapted to support the ribbon, a second roll journaled on said block adjacent the said grooved roll and operating to flange the ribbon as it passes between said rolls to the mandrel, and a third roll journaled on said block adjacent to the said guide passage and operating to stay the flanged ribbon during winding thereof.

4. A former for producing edge-wound coils from metal ribbon comprising a bearing block having a guide passage for a mandrel, a mandrel, a freely rotatable ring arranged concentrically of said guide passage at one end thereof and adapted to engage one side of the ribbon during winding thereof, and a guiding and staying roll journaled adjacent said guide passage and adapted to engage the opposite side of the ribbon during winding thereof.

5. A former for producing edge-wound coils from metal ribbon comprising a bearing block having a guide passage for a mandrel, a mandrel, a rotatable ring arranged concentrically of said guide passage at one end thereof and adapted to engage the inner side of the ribbon during winding thereof, means for flanging said ribbon, and a guiding and staying roll journaled adjacent said guide passage and adapted to engage the outer side of said ribbon and its flange during winding thereof.

In witness whereof, I have hereunto set my hand this 8th day of August, 1922.

ALVA O. WAY.