April 2, 1940. J. E. ASHWORTH 2,196,091

TIGHT COILER FOR METAL STRIP AND METHOD OF COILING

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FIG. 1.

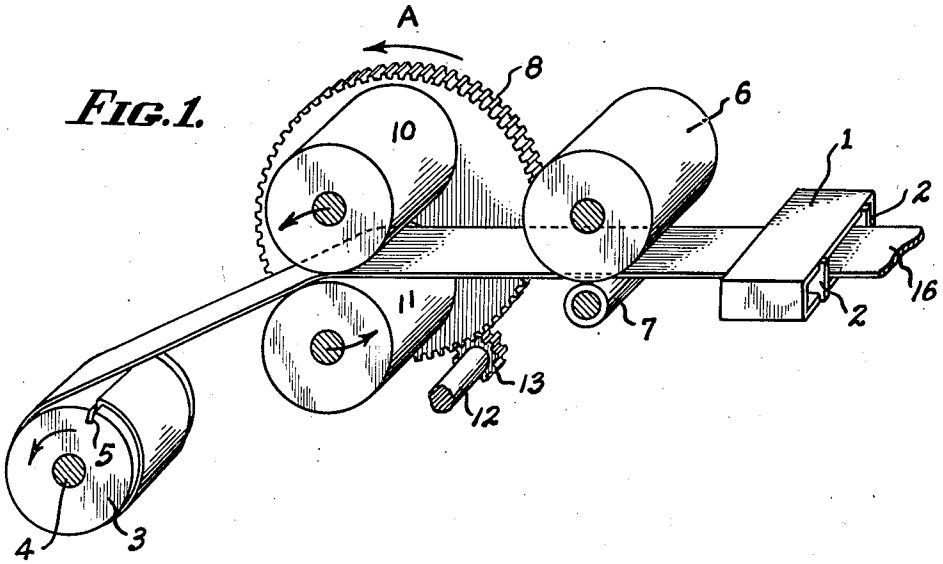
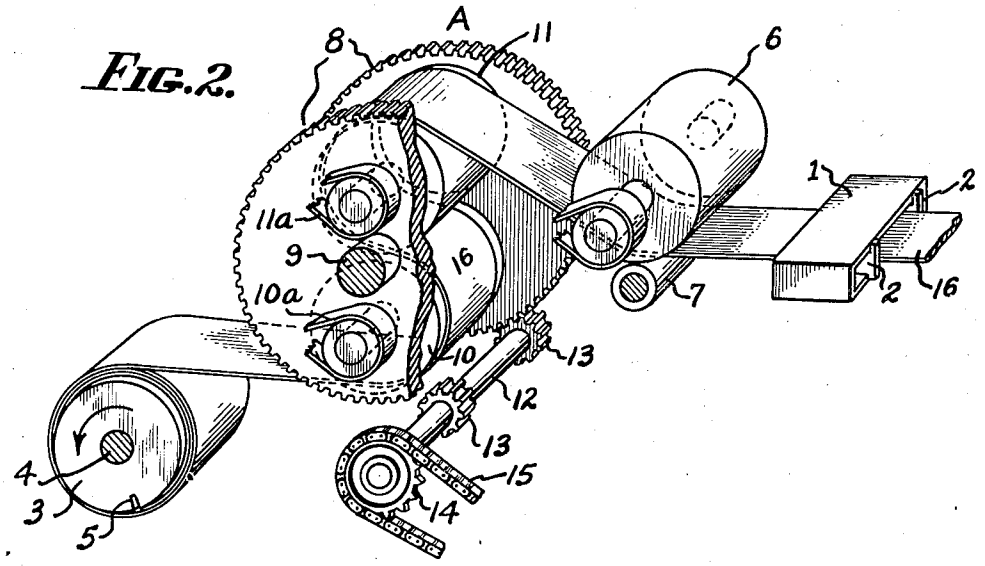


FIG. 2.



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TIGHT COILER FOR METAL STRIP AND METHOD OF COILING

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4 Claims. (Cl. 242—78)

This invention relates to devices for coiling metal strip and more particularly to that class of coilers known as tight coilers. Tight coilers are characterized by the fact that the strip is wound upon a drum, and that the drum is driven, whereas in a loose coiler, the strip is merely led into a more or less circular enclosure and is wound upon itself without the use of a drum.

Specifically, my invention relates to a tight coiler which I have found exceedingly useful in the coiling of strip as it comes from a galvanizing treatment. During my experimentation, several difficulties were encountered and my invention comprises, among other things, the overcoming of such difficulties.

It is of paramount importance that coiled galvanized strip be flat transversely, i. e., free of crown or cross-bow. It is one of the objects of my invention to provide a coiler which will coil such strip and at the same time will neutralize any crown or cross-bow which may have been imparted to the strip during the course of its treatment or by its passage about certain rolls.

In view of the fact that this coiler is designed to be used for coiling galvanized strip or the like, and in view of the fact that such galvanizing treatment is usually continuous on strip, it is an object of my invention to provide a coiler having means whereby any slack which accumulates during a change of coils may be rapidly taken up.

It is a further object of my invention to provide a coiler having the advantages above pointed out which will provide extreme ease in threading so that as soon as one coil is finished, the leading end of a second strip may be threaded into the coiler during the time that the galvanizing or other treatment is progressing continuously and whereby the slack which has accumulated during the threading operation is rapidly taken up and whereby tension is exerted upon the strip as it is being coiled.

These and other objects of my invention, I accomplish by that certain construction and arrangement of parts, and by that process of which I shall now describe an exemplary embodiment.

Reference is now made to the drawing forming a part hereof and in which

Figure 1 is a more or less diagrammatic representation of my coiler with parts in section showing the coiler in threading position.

Figure 2 is a view similar to Figure 1 showing the coiler in coiling position.

Briefly, in the practice of my invention, I provide at one end a guide block 1, containing a pair of side guide members 2. At the other end, I provide a coiler drum 3, rotatable about a shaft 4 and if desired, provided with an expansible slot 5. I shall not describe the drum further inasmuch as drums of this type are well known in the art. I have indicated at 6 a brake roll and at 7 a wringer roll, co-acting therewith. The roll 7 may be provided with a crank to assist in threading the strip and is spring-pressed against the brake roll 6. A indicates generally a slack-accumulating device consisting of a pair of bull wheel gears 8, mounted for rotation on hubs 9. Journaled in the gears 8 are a pair of rolls 10 and 11, both of which are preferably provided with braking means diagrammatically indicated at 10*a* and 11*a*. The rollers 10 and 11 are spaced apart a small distance so that they do not touch and I have found that a space of $\frac{3}{16}$ of an inch proves quite satisfactory.

Mounted on a shaft 12, parallel to the axis of the gears 8, are the pinions 13 positioned to mesh with the gears 8. Rotation may be imparted to the shaft 12 by means of a sprocket 14 and chain 15 from any suitable source of power. It is to be understood that the driving means form no part of my invention and that the important point is that some means be provided for rotating the assembly comprising the members 8, 10 and 11 to alter the position of the two rollers. It would be possible to provide discs instead of the gears 8 and apply driving means directly to the hubs 9.

The operation of my device is as follows: The strip 16 as shown in Figure 1, is passed through the guide block 1 and through the bite between the roll 6 and wringer roll 7. A crank may be provided as above pointed out for turning the roll 7 to feed the strip forwardly through the space between the rolls 10 and 11 and into the slot 5 on the drum 3. When the strip has been clamped in the drum 3, the gears 8 are rotated in the direction of the arrow through 180° by means of any suitable mechanism such as that indicated, whereby the position of the rolls 10 and 11 is reversed so that the roll 11 is now at the top and the roll 10 at the bottom, and whereby the strip 16, which heretofore passed to the coiler in a substantially straight path, is now caused to traverse a circuitous path which passes up under and partially around the roll 6, around and under the roll 11, and around and under the roll 10 to the coiling drum. It will be seen that the length of strip between the guide block 1 and the coiling drum 3 is considerably greater in Figure 2 than in

Figure 1, by at least the circumference of the roll 10 or 11 whereby accumulated slack is quickly taken up.

Thus I have not only provided means for taking up slack, but have at the same time provided a device which is easy to thread.

It will be noted that when the device A is in coiling position as shown in Figure 2, the strip passes around the roll 10 in one direction and onto the drum 3 in a reverse direction. This is an important phase of my invention. I have found that when strip was passed around a roll it usually became bowed or crowned with the concave side of the strip toward the axis of the roll about which it passed, and I have found further that if the strip was caused to pass in a reverse direction about another roll, that the above mentioned crown or cross-bow was neutralized. Thus, while the strip in passing around the roll 6 acquires a partial crown with the concavity adjacent to the roll, this crown is effectively removed when the strip is coiled around roll 11, which cycle is repeated when the strip is passed around the roll 10 and onto the coiler drum 3. If the strip were passed directly from the roll 11 onto the drum 3, the strip would not be flat and thus would not prove acceptable to purchasers.

It is to be understood that modifications may be made in my device without departing from the spirit of my invention, and that I do not intend to limit myself otherwise than as pointed out in the claims which follow.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A tight coiler comprising a drum and a pair of rollers through which a strip is threaded in a substantially direct line in passing onto the drum and means for alterning the position of said pair of rollers for imparting to said strip a circuitous path, said drum being positioned with regard to said rollers in their altered position so that the strip passes onto said drum in a direction opposite to that in which it passes around the last of said pair of rollers in their altered position.

2. A tight coiler comprising a drum and a pair of rollers through which a strip is threaded in a substantially direct line in passing onto the drum and means for reversing the position of said pair of rollers for imparting to said strip a circuitous path, said drum being positioned with regard to said rollers in their reversed position so that the strip passes onto said drum in a direction opposite to that in which it passes around the last of said pair of rollers in their reversed position.

3. That process of tight coiling metal which includes the steps of passing the metal onto the coiler drum, and immedeiiately before passing it onto the coiler drum, bending it in a direction opposite to that in which it passes onto the coiler drum about an arc of substantially the same radius of curvature as that of the coiler drum.

4. That process of tight coiling metal which includes the steps of passing the metal onto the coiler drum, and immediately before passing it onto the coiler drum, bending it in a direction opposite to that in which it passes onto the coiler drum about an arc of substantially the same radius of curvature as that of the coiler drum, and applying resistance to the metal being coiled.

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