

Oct. 21, 1930.

C. D. DALLAS

1,779,115

COILING MACHINE

Filed Jan. 16, 1929

2 Sheets-Sheet 1

Fig. 1.

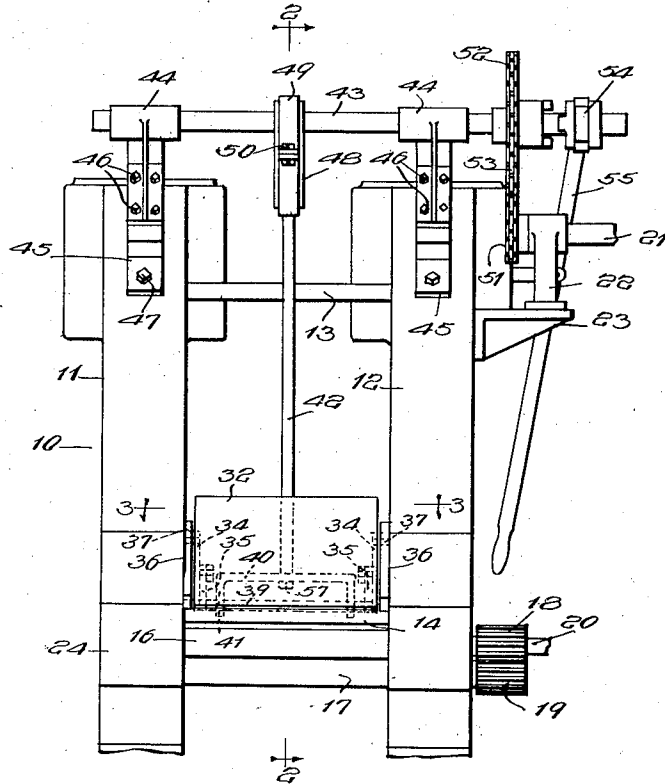
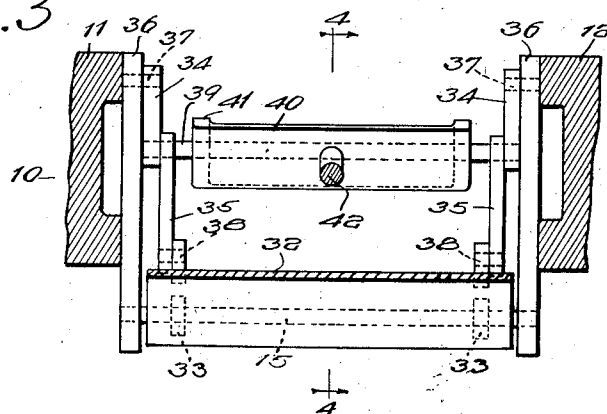


Fig. 3.



Witness:

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2 Sheets-Sheet 2

Fig. 2.

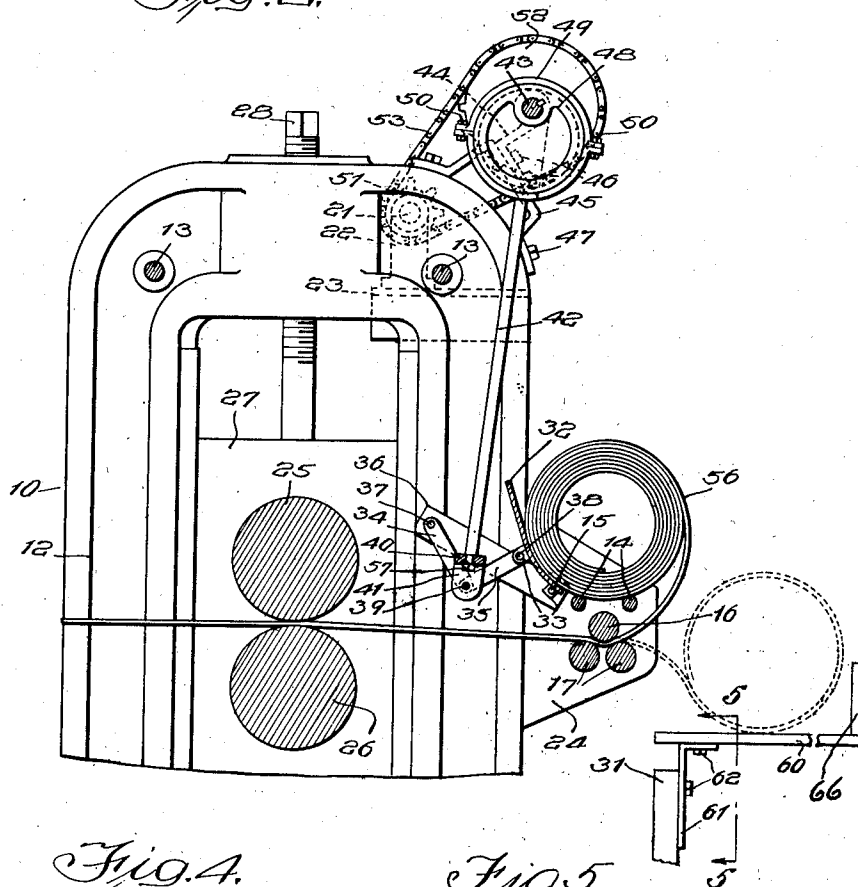


Fig. 4.

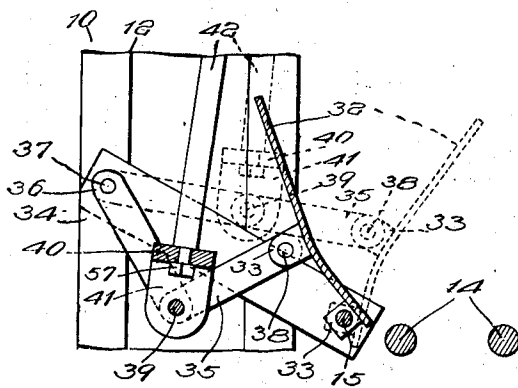
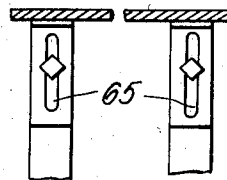


Fig. 5.



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COILING MACHINE

Application filed January 16, 1929. Serial No. 332,797.

My invention relates to a device sometimes called a tail-puller which is adapted for winding flat strips or sheets of material into coils, and more particularly it relates to a device adapted to impart a permanent curvature to a substantial portion of such sheets whereby the curved portion is caused to coil about itself leaving one straight end forming a tail or appendage for convenience in handling the coil or roll of metal after winding.

In annealing or re-winding long strips, sheets of metal or performing other operations thereon, it is necessary to have such sheets formed into coils for economy of space and convenience in handling. If the sheet of material from which the coil is formed is of any considerable thickness, it is frequently difficult to again engage the free end of the coil between rollers for re-rolling, re-winding or other purposes. To meet this difficulty, it is desirable that a short portion of the outer free end of the coil be tangential to the coil or otherwise substantially straight, and one object of the invention is to provide a device capable of imparting a permanent curvature to a portion of the sheet of metal, whereby it is formed into a coil and leaves an uncurved portion which forms an appendage or tail of any desired length for the purpose described.

Another object of the invention is the provision of a machine or device of the class described which is simple in construction, easily manipulated and can be manufactured economically.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a front elevational view of the device;

Fig. 2 is a view along the line 2—2 of Fig. 1;

Fig. 3 is a view along the line 3—3 of Fig. 1 drawn to a larger scale;

Fig. 4 is a view along the line 4—4 of Fig. 3; and

Fig. 5 is a view along the line 5—5 of Fig. 2.

Referring now to the drawings forming a part of this specification, the numeral 10 generally designates a frame comprising upright end portions 11 and 12 suitably fastened together by transversely extending rods 13 and 15. A pair of forwardly projecting plates 24 are mounted one on each of the upright portions 11 and 12. The plates 24 provide a mounting for an upper roller 16 and a pair of rollers 17 between which a sheet of material 56 travels while being subjected to the curving or the winding operation. One end of the roller 17 projects through the plate 24 and provides a mounting for a gear 18 to which a driving shaft 20 is operatively connected. The rollers 17 each have a gear 19 mounted thereon in position to mesh with the gear 18. The shaft 20 is connected with a source of power (not shown), and actuates the rollers to feed the sheet of metal to the right as observed in Fig. 2.

Rollers 25 and 26 are positioned at the middle of the device and spaced apart sufficiently to permit the sheet 56 to travel therebetween. Blocks 27 and threaded rods 28 are provided at each end for adjusting the space between the rollers 25 and 26. The rollers 25 and 26 perform the initial operation of removing such kinks or bends as may be in the sheet 56. A driving shaft or any other suitable means (not shown) connected with a source of power may be provided to rotate the rollers 25 and 26. That portion of the sheet 56 which has been subjected to the rolling operation resulting in its permanent curvature is shown in full line position as coiled about itself in Fig. 2.

The curvature imparted to the sheet of metal or the like as it passes between the rollers 16 and 17 causes the sheet to turn upwardly and to wind itself into a roll which is supported by the rods 14 and a plate 32. In the full line position of the sheet 56 as

shown in Fig. 2, the curving operation is substantially completed and if permitted to continue unimpeded to the end of the sheet will result in a self wound roll or coil of metal having its outer exposed end in close contact with the contiguous winding. The rigidity of the curved metal will offer sufficient resistance to unwinding of the free end of the sheet as to make it difficult, or almost impossible, in the case of thick sheets of metal to unwind the free portion for again starting the sheet between rollers or the like for new or additional operations. In order that the end of the sheet may be formed into a tail or appendage which is substantially tangential to the coil resulting from the operation I find it desirable to permit the entire sheet, including the tail end, to be subjected to the rolling operation causing curvature, rather than release the sheet before it has passed entirely through the device, for the reason that if the metal has an initial curvature, the appendage or tail will retain such curvature following such release. Because the tail end of the sheet of material is subjected to the curvature resulting from being fed between the rollers 16 and 17, I have provided means producing a secondary operation tending to curve the tail end in the opposite direction in substantially the same amount as is caused by the rollers and thereby straightening out or neutralizing such curvature thus produced.

The secondary operation is independent of the primary operation of rolling and has the advantage of simplicity and permitting of continuous operation of the rollers 16 and 17 or the like in their operative position. This secondary operation consists in moving the self-wound coil from its natural position above the path of travel of the sheet to a position below such path of travel, thereby causing the sheet to curve downwardly over the right hand roller 17 and straighten out the curvature. In order that this straightening process may be accomplished without interfering with the advance of the sheet through the device and that the tail end not be wrapped around the main body of the sheet, I have provided a platform 60 and means for projecting the substantially completed coil or roll forwardly to its dotted line position upon the platform as shown in Fig. 2.

The platform 60 is supported by posts 31. Angle irons suitably fasten the platform 60 to the posts 31. Bolts 62 provide adjustable fastening means through slotted holes 65 whereby the platform 60 can be raised or lowered at will.

It is obvious that if the roller 16 were positioned below the roller 17 and in the same relation thereto, that the resulting curved sheet of material 56 would naturally form into a coil below the plane of the plate. In

such a case the partially wound coil would, of necessity, have to be elevated to a position above this plane, in order to neutralize the resulting curvature.

The plate 32 has an extension 33 at each end, by means of which it is pivotally mounted upon the rod 15. Bars 36 are positioned one on each upright frame 11 and 12 to support the ends of the rod 15.

Toggle mechanism is provided to rock the plate 32 about its mounting on the rod 15 and thereby impel the coil of metal forwardly and downwardly to the platform 60. The toggle mechanism includes links 34 and 35 at each end of the frame 10, the links being pivotally fastened together by a pin 39. Each link 35 is pivotally connected by means of a pin 38 to an extension 33 formed on the plate 32. Each link 34 is connected to the adjacent bar 36 by a pin 37. The oppositely positioned links 34 and 35 are connected by a bar 40. The bar 40 has downwardly turned ends 41 through which the pins 39 project and forms a pivoted connection with the links 34 and 35. A toggle rod 42 is fastened to the middle of the bar 40 by means of a bolt 57. The upper end of the arm 42 is forked and forms a semi-circular band operatively engaging an eccentric cam 48. A band 49 is fastened to the upwardly projecting ends of the arm 42 by means of bolts 50, thereby keeping the cam 48 in operative engagement with arm 42. The eccentric cam 48 is mounted upon a shaft 43. The shaft 43 is rotatably mounted in bearings 44 which are fastened to brackets 45 by a plurality of bolts 46. Each of the brackets 46 is fastened to one of the upright portions 11 or 12 by means of bolts 47. A driving shaft 21 is rotatably mounted in a bearing block 22. A bracket 23 projecting from the upright portion 12 supports the bearing block 22.

A sprocket wheel 51, is fixedly mounted upon the shaft 21, to operatively connect the shaft with the driven shaft 43. For this purpose I have provided a rotatably mounted sprocket wheel 52 on the driven shaft 43. The sprocket wheel 52 is connected with the sprocket wheel 51 by a sprocket chain 53. The driving shaft 21 is continuously operated and is connected with a source of power (not shown).

The shaft 43 is normally inactive and is caused to rotate near the end of the winding process by manual operation of a clutch 54 which is slidably mounted upon the shaft. A downwardly extending arm 55 is provided for the purpose of throwing the clutch 54 into and out of operative engagement with the constantly rotating sprocket wheel 52.

The operation of the device is as follows: The sheet of metal 56 having travelled past the rolls 25 and 26, or to a point where the unwound portion is the desired length of the tail or the appendage, the clutch is thrown

into operative position, thereby causing the shaft 43 to rotate. One half of a rotation of the shaft 43 actuates the cam 48 and the toggle mechanism to throw the plate 32 forwardly to the dotted line position shown in Fig. 4, in which position the roll of metal is thrown to its dotted line position on the platform 60. Completion of one rotation of the shaft brings the plate 43 and the toggle mechanism back to their full line positions, making it necessary that the clutch be held in operative position only for one revolution of the shaft 43. Since the rolls 16 and 17 are continuously operated, the sheet of metal 56 continues its forward movement during and after the projection of the roll upon the platform 60. The position of the roll upon the platform 60 operates to bend the metal downwardly and counteracts the tendency to curve upwardly to the full line position. A vertical member 66 provides a stop limiting the outward movement of the roll upon the platform 60.

The particular portion of the sheet which passes between the rolls 16 and 17 when the coil is in its dotted line position is uncurved sufficiently that it tends to remain substantially straight. It is obvious that the platform should be lower for straightening thick sheets of metal by the counter curvature than for thin sheets, and that it should be lower for straightening sheets of sharp curvature than for those having a flat curvature. The adjustability of the height of the platform 60 by the bolts 62 adapts the device for providing tails or appendages for coils of material of any degree of thickness or curvature.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, means operable to curve a sheet of material fed therethrough, a platform at the discharge end of the device on one side of the plane of said sheet suitably positioned to support said sheet and to permit the curved portion to wind about itself, a second platform operable to receive said partially wound coil, said second platform being positioned on the opposite side of the plane of said sheet, and means operable to impel the partially wound coil from said first mentioned platform to the second platform.

2. In a device of the kind described, a plurality of rollers operable to curve a sheet of material fed therebetween, a platform adjacent the discharge side of said rollers adapted to receive and support the curved portion of the sheet, as it is discharged from the roll-

ers, said platform being so positioned as to permit the discharged curved portion of the sheet to unrestrainedly coil about itself and a second platform operable to receive said partially wound coil and so positioned relative to the discharge side of said rollers as to cause the sheet in travelling to the second mentioned platform to be curved oppositely to the curvature produced by said rollers.

3. In a device of the kind described, a plurality of rollers operable to curve a sheet of material fed therebetween, a platform adjacent the discharge side of said rollers adapted to receive and support the discharged portion of the sheet, said platform being so positioned relative to the sheet as it emerges from the rollers as to permit the curved portion of the sheet to unrestrainedly coil about itself, a second platform so positioned relative to the discharge side of said rollers that the sheet in travelling to the second mentioned platform is curved oppositely to the curvature produced by said rollers, and means operable to move the discharged portion of the sheet from the first mentioned platform to the second mentioned platform while said sheet is being fed through the rollers.

4. In a coiling machine, means operable to curve a sheet of material fed therethrough, a platform on one side of the line of travel of the sheet so positioned as to receive and support the discharged portion of the sheet and to permit the sheet to form a coil in accordance with its curvature, a second platform positioned on the other side of the line of travel of said sheet, and means operable to transfer the partially wound coil from said first mentioned platform to said second mentioned platform while said sheet is travelling through the machine.

5. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform above the line of travel of the sheet so positioned relative to the discharge side of said means as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature, a second platform positioned below the line of travel of said sheet, and means operable during said curving operation to move the discharged portion of said sheet from the first mentioned platform to the second mentioned platform.

6. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform positioned above the line of travel of the sheet so as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature, a second platform positioned below the line of travel of

said sheet, means operable to move the discharged portion of said sheet from the first mentioned platform to the second mentioned platform, said second platform being positioned a sufficient distance below the line of travel of the sheet that continued operation of the device tends to curve the remaining portion of the sheet oppositely to the curvature caused by said means.

7. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform above the line of travel of the sheet so positioned relative to the discharge side of said means as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature; a second platform positioned below the line of travel of said sheet, means operable during said curving operation to move the discharged portion of said sheet from the first mentioned platform to the second mentioned platform for the purpose described, and adjustable means operable to vary the distance of said second platform below the line of travel of the sheet.

8. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform above the line of travel of the sheet so positioned relative to the discharge side of said means as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature, a second platform positioned below the line of travel of said sheet, means operable to move the discharged portion of said sheet from the first mentioned platform to the second mentioned platform, said second platform being positioned a sufficient distance below the line of travel of the sheet that continued operation of the device curves the remaining portion of the sheet oppositely to the curvature caused by said means and leaves said remaining portion of the sheet substantially straight, and adjustable means operable to vary the distance of said second platform below the line of travel of the sheet.

9. In a coiling machine, means operable upon feeding a sheet of material therethrough to impart a permanent curvature to the sheet, mechanism operable to actuate said means continuously, a platform on one side of the line of travel of the sheet so positioned as to receive and support and to permit the sheet to form a coil in accordance with its curvature, a second platform positioned on the other side of the line of travel of said sheet, means operable to transfer the discharged portion of said sheet from said first mentioned platform to said second mentioned platform without interrupting the operation

of said mechanism, and a stop member on the second mentioned platform operable to limit the forward movement of the coiled portion of said sheet.

10. In a device of the class described, an upper roller, a pair of rollers positioned below and on either side of the upper roller to impart an upward curvature to a sheet of material fed between the upper roller and the lower rollers, an upper platform suitably positioned above the rollers, to receive and support the discharged portion of the sheet and to permit the sheet to wind itself into a coil, a platform suitably positioned below the rollers to receive said partially wound coil, and means operable to impel said coil from the upper to the lower platform during the advance of the sheet between the rollers.

11. In a device of the class described, an upper roller, a pair of rollers positioned below and on either side of the upper roller to impart an upward curvature to a sheet of material fed between the upper roller and the lower rollers, an upper platform suitably positioned above the rollers to receive and support the discharged portion of the sheet and to permit the sheet to wind itself into a coil, a platform suitably positioned below said rollers to receive said partially wound coil means operable to impel said coil from the upper to the lower platform during the advance of the sheet between the rollers, and means permitting vertical adjustment of the second platform.

12. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform positioned above the line of travel of the sheet so as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature, a device operable to straighten the sheet as it is discharged from the machine, a second platform, said device comprising means manually operable to move the discharged portion of the first mentioned sheet from said platform to said second platform, said second platform being positioned at such a distance below the line of travel of the sheet that the sheet is curved downwardly in travelling to said second platform.

13. In a coiling machine, means operable to feed a sheet of material therethrough in a generally horizontal direction and to curve the sheet so that its upper face is concave, a platform above the line of travel of the sheet so positioned relative to the discharge side of said means as to receive and support the sheet as it is discharged from said means and to permit the sheet to coil about itself in accordance with said curvature, a device operable to oppositely curve the rear end of the

sheet upon its discharge from the machine,
said device comprising a second platform po-
sitioned below the line of travel of said sheet
and means operable during said curving op-
eration to move the discharged portion of said
5 sheet from the first mentioned platform to
the second mentioned platform for the pur-
pose described, and adjustable means operable
to vary the distance of said second platform
below the line of travel of the sheet.

10 In witness whereof, I hereunto subscribe
my name this 10th day of January A. D.,
1929.

CHARLES D. DALLAS.

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