L. C. SCHNEIDER.

PIPE COILING MACHINE.

APPLICATION FILED FEB. 17, 1909.

928,220.

Patented July 13, 1909.

Fig. 2.

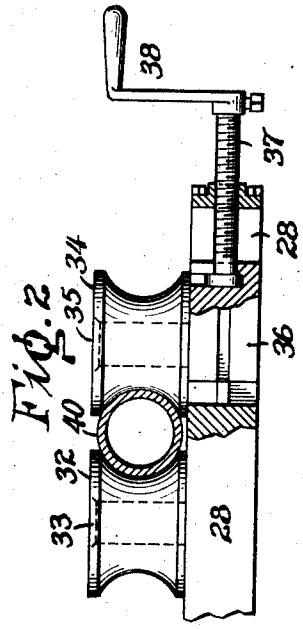


Fig. 3.

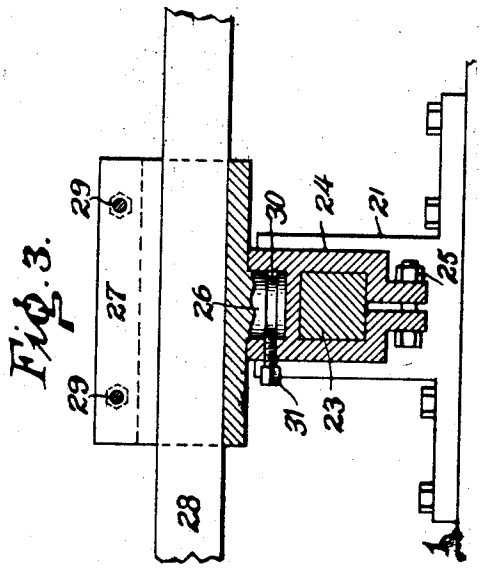
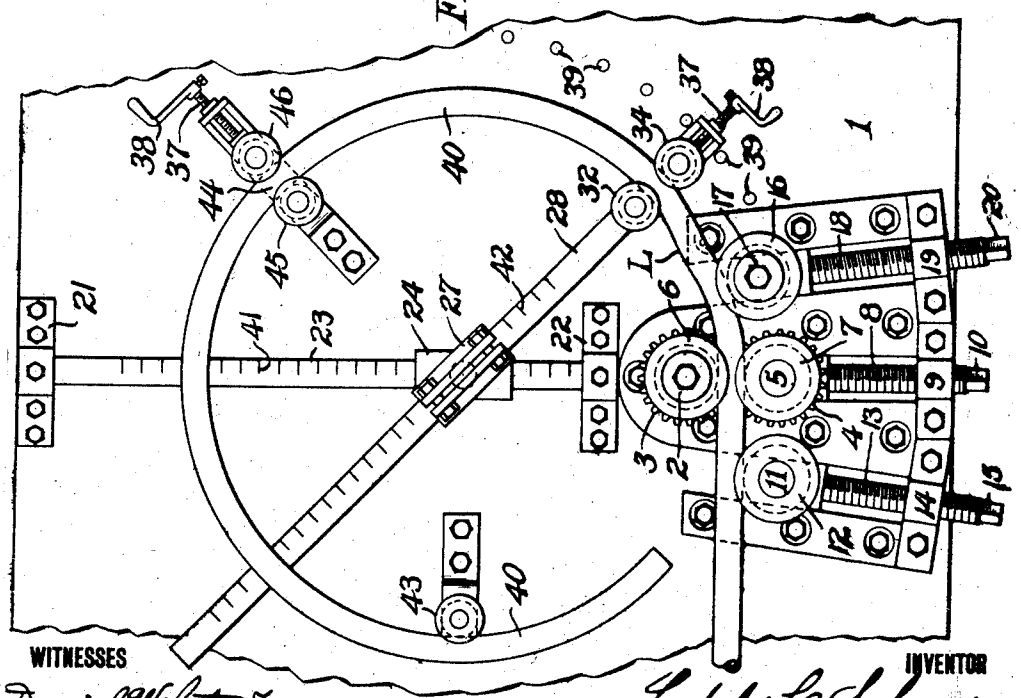


Fig. 1.



WITNESSES

Daniel Webster, Jr

A. E. Steinbach

INVENTOR

Leopold C. Schneider

BY Cornelius D. Ehret

his ATTORNEY

UNITED STATES PATENT OFFICE.

LEOPOLD C. SCHNEIDER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA PIPE BENDING COMPANY, A CORPORATION OF NEW JERSEY.

PIPE-COILING MACHINE.

No. 928,220. Specification of Letters Patent. Patented July 13, 1909.

Original application filed August 21, 1908, Serial No. 449,626. Divided and this application filed February 17, 1909. Serial No. 478,443.

To all whom it may concern:

Be it known that I, LEOPOLD C. SCHNEIDER, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Pipe-Coiling Machines, of which the following is a specification.

My invention relates to improvements in a machine for coiling or bending pipes, or other articles, composed of metal, such as wrought iron, or other materials, and particularly to a machine for coiling or bending the material while cold.

Pipes, rods, and other forms of wrought iron, or other material, are non-uniform, as bought in the open market, in hardness, thickness, or in other regards, and in coiling or bending them in the manner common heretofore in the art, uniformity of coiling or bending is not attained because of this lack of uniformity in the stock material.

It is the object of my invention to produce coils or bends which are uniform in curvature or shape, and irrespective of this lack of uniformity in the material to be bent or coiled.

My invention resides, therefore, in a machine for coiling or bending rods or pipes, or other forms of material and comprises means for over-coiling or over-bending the pipes or rods to a curvature sharper than the finish curvature, and then coiling or bending the stock back to the desired shape or curvature. By this means, perfectly uniform coils or bends can be produced, irrespective of the irregularities and non-uniformity of the material of the stock operated upon.

My invention resides also in the features hereinafter described and claimed.

For an illustration of one of the forms my invention may take, reference is to be had to the accompanying drawing, in which:

Figure 1 is a plan view of a coiling or bending machine involving my invention. Fig. 2 is a vertical elevation, partly in section, of the back-coiling or back-bending means. Fig. 3 is a view, partly in elevation, partly in section, showing means for adjusting and holding the auxiliary back-coiling or back-bending means.

Referring to the drawing: A base plate 1, of iron or other suitable material, has mounted thereon a vertical spindle 2 driven by an electric motor, belt, or other suitable source of power. Secured to the spindle 2 and driven thereby is the gear 3 which meshes with and drives the gear 4 mounted upon the spindle 5. Carried by the spindles 2 and 5 respectively are the rollers or rolls 6 and 7, having concave peripheries to receive the pipe, rod, or other stock, as well understood in the art. The gear 4 and roller 7, mounted upon the spindle 5, are adjustable toward and away from the gear 3 and roller 6 by the screw 8 operating in the bracket 9, and square headed at 10 to receive a wrench or the like. To one side of the spindle 5 on the spindle 11 is mounted a roller 12, also having a concave rim or periphery and slidable inwardly and outwardly under the control of the adjusting screw 13, operating in bracket 14 and having the squared head 15; and on the other side of the rollers 6 and 7 is a roller 16, also having a concave rim or periphery and mounted upon the spindle 17 and adjustable inwardly and outwardly by the screw 18 operating in bracket 19 and square headed at 20. The brackets 21 and 22, bolted to the base plate 1, are alined with each other and support and secure the bar 23 which may be of square or other suitable cross section. Movable along the bar 23 is the clamp 24 which may be clamped securely to the bar 23 at any desired position.

As seen in Fig. 3, the clamp 24 embraces the bar 23 and may be clamped snugly thereto by tightening the bolt 25. The top of the clamp 24 is recessed to receive the cylindrical pin or pivot 26 secured to or integral with the clamp 27 which embraces the bar 28, which may be snugly clamped thereto by the bolts 29. The pivot 26 has an angular groove 30 in which may engage the end of the screw 31 threaded in the bracket 24, thus preventing the clamp 27 from lifting out of or away from the clamp 24. By this pivotal connection between the clamps, each may be adjusted to different positions with respect to their respective bars 23 and 28, and the bar 28 may be adjusted to different angular positions with respect to the bar 23.

Upon the bar 28 is mounted the roller 32 having a concave rim or periphery, and mounted upon the spindle or pin 33 carried by the rod 28. Beyond the roller 32 is a

similar roller 34 mounted upon a spindle or pin 35 carried by the block 36, which is slidable inwardly and outwardly on the bar 28 by means of a screw 37 provided with the hand crank 38, as seen in detail in Fig. 2.

In the base plate 1 are provided a plurality of holes 39, in which may be placed a pin or pins to prevent the rod 28 from rotating about the pivot 26 during the operation of the machine.

The operation is as follows: The pipe, rod, or other stock 40 is fed in from the left, as viewed in Fig. 1, between the rollers 6 and 7, and lies against the roller 12. Due to friction and the power delivered through the spindle 2, the stock 40 is fed or drawn toward the right and engages in the concave periphery of the roller 16. This roller is set in, by screw 18, a sufficient distance to cause the pipe to coil or bend, as well understood in the art. By the action thus far described, the stock 40 is over-coiled or over-bent, tending to form a coil or bend of sharper curvature or less radius than the finish coil or bend. This preliminary coiling or bending is, in fact, local over-bending or over-coiling, as indicated at L. Assuming that it is desired to produce a bend or coil of a diameter of, say, three feet, the roller 16 is set in far enough to over-coil or over-bend the stock, so as to tend to form a coil or bend of a diameter of less than three feet. The pipe or stock 40 is, however, guided between the rollers 32 and 34 which are set out far enough to determine a coil or bend of three feet diameter, the operation being a local back-bending or back-coiling after leaving the roller 16 from the lesser diameter to the greater or finish diameter of three feet. In other words, at the roller 16, the stock is over-coiled or over-bent, and at the roller 32 the stock is back-coiled or back-bent to the finish diameter, the coiling or bending and back-coiling or back-bending occurring at and between roller 16 and roller 32. By this over-coiling or over-bending and back-coiling or back-bending, the coil or bend will take the desired finish diameter and the diameter of the finish coil will be perfectly uniform, whereas, by merely setting the roller 16 in to a point to produce a three-foot coil or bend, the finish coil or bend will not be uniformly of three feet diameter, but will vary considerably from point to point, and the result is not a perfectly uniform and smoothly coiled or bent pipe or stock.

It will be noted that by the apparatus above described, the over-coiling or over-bending and the back-coiling or back-bending is accomplished within less than a complete turn or coil or convolution, and, indeed, within a small fraction of a complete bend or coil. Thus, the over-bending or over-coiling is accomplished at roller 16 and immediately thereafter, and during the same continuous feeding, at rollers 32 and 34, the back-coiling or back-bending is accomplished.

The bars 23 and 28 may have suitable graduations, such as 41 and 42 respectively, by which the position of the rolls 32 and 34 with respect to the other rolls may be accurately determined. Thus, the distance of the center of the pivot 26 from the axis of the stock 40 as it passes between the rolls 6 and 7 may be made the same as or different from the distance between the center of the pivot 26 and the axis of the stock 40 as it passes between the rolls 32 and 34.

I have found that by the herein described machine, the capacity for coiling stock is very greatly increased, and that an uniform coil or bend is produced, and is made much more rapidly and at far less cost than heretofore.

While I have shown two rollers 32 and 34 for the back-coiling or back-bending operation, it is to be understood that the roller 34 may be omitted, though its presence is preferable.

Upon the base plate 1 there may be provided a single roll or idler 43, or the double roll idler 44 having the rolls 45 and 46, the latter adjustable by screw 37 and hand crank 38. It is to be understood also that the idlers, single or double roll, may be multiplied in number.

While the advantages of my apparatus are available for the coiling or bending stock in heated condition, they are particularly available to the cold coiling or bending of pipes, rods, or other stock.

This application is a division of my application Serial No. 449,626 filed August 21, 1908.

What I claim is:

1. In a machine of the character described, means for continuously feeding pipe, means for continuously locally coiling or bending the pipe to tend to form a coil of less than finish diameter, and means for continuously locally back-coiling or back-bending said pipe to form an uniform coil of finish diameter.

2. In a machine of the character described, means for continuously feeding pipe or other stock, a roll for operating continuously upon said pipe or stock to over-coil or over-bend the same, and a roll operating subsequently and continuously upon said pipe or stock to back-coil or back-bend the same to form a coil of uniform diameter.

3. In a machine of the character described, the combination with means for continuously feeding pipe or stock, of means for continuously locally over-coiling or over-bending said pipe or stock, means for continuously back-coiling or back-bending the pipe or stock to form an uniform coil of finish diameter, and an adjustable mounting for said back-coiling or back-bending means.

4. In a machine of the character described, a plurality of bending or coiling means continuously operating in opposite directions, means for continuously feeding pipe or stock past said plurality of means, the first coiling or bending means encountered by said stock operating to locally over-coil or over-bend the same, and the means subsequently engaged by said pipe or stock operating to locally back-coil or back-bend the same to form a coil or bend of uniform finish diameter.

5. In a machine of the character described, means for continuously feeding pipe, means for continuously locally coiling or bending the pipe to tend to form a coil of less than finish diameter, and means continuously operating upon said pipe before a complete turn or convolution is formed for back-coiling or back-bending the same to form an uniform coil of finish diameter.

6. In a machine of the character described, means for continuously feeding pipe, means for continuously locally coiling or bending the pipe to tend to form a coil of less than finish diameter, and means located a short distance from said first mentioned means for continuously locally back-coiling or back-bending said pipe to form an uniform coil of finish diameter.

7. In a machine of the character described, means for feeding pipe or stock, a roll for operating upon said pipe or stock to over-coil or over-bend the same, and a roll located a short distance from said first mentioned roll and operating subsequently thereto upon said pipe or stock to back-coil or back-bend the same to form a coil of uniform diameter.

8. In a machine of the character described, means for feeding pipe or other stock, a roll for operating upon said pipe or stock to over-coil or over-bend the same, and a roll operating upon said pipe or stock subsequently to said first mentioned roll before the completion of a turn or convolution of the coil to back-coil or back-bend said pipe or other stock to form a coil of uniform diameter.

9. In a machine of the character described, means for feeding pipe, means operating locally upon said pipe in a relatively sharply defined region for coiling or bending the pipe to tend to form a coil of less than finish diameter, and means for back-coiling or back-bending said pipe to form an uniform coil of finish diameter.

10. In a machine of the character described, means for feeding pipe, means operating locally upon said pipe in a relatively sharply defined region for coiling or bending the pipe to tend to form a coil of less than finish diameter, and means operating locally upon said pipe in a relatively sharply defined region for back-coiling or back-bending said pipe to form an uniform coil of finish diameter.

11. In a machine of the character described, a plurality of rolls spaced apart, means for feeding pipe over said rolls in succession, a roll engaging said pipe between said separated rolls, and means for adjusting the position of said last mentioned roll, whereby the pipe is first overcoiled or overbent and thereafter back-coiled or back-bent to finish diameter of the coil.

12. In a machine of the character described, the combination with pipe feeding means, of separated rolls over which said pipe is fed in succession, a roll engaging said pipe between said separated rolls, and means for setting said last mentioned roll, whereby the pipe first tends to form a coil of less than desired finish diameter and to thereafter assume uniform finish diameter.

In testimony whereof I have hereunto affixed my signature in the presence of the two subscribing witnesses.

LEOPOLD C. SCHNEIDER.

Witnesses:
G. M. HARDEN,
T. FRANK PHINNY.