Aug. 25, 1953 H. R. LEHMAN 2,649,887

SCROLL BENDING APPARATUS

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FIG. 1.

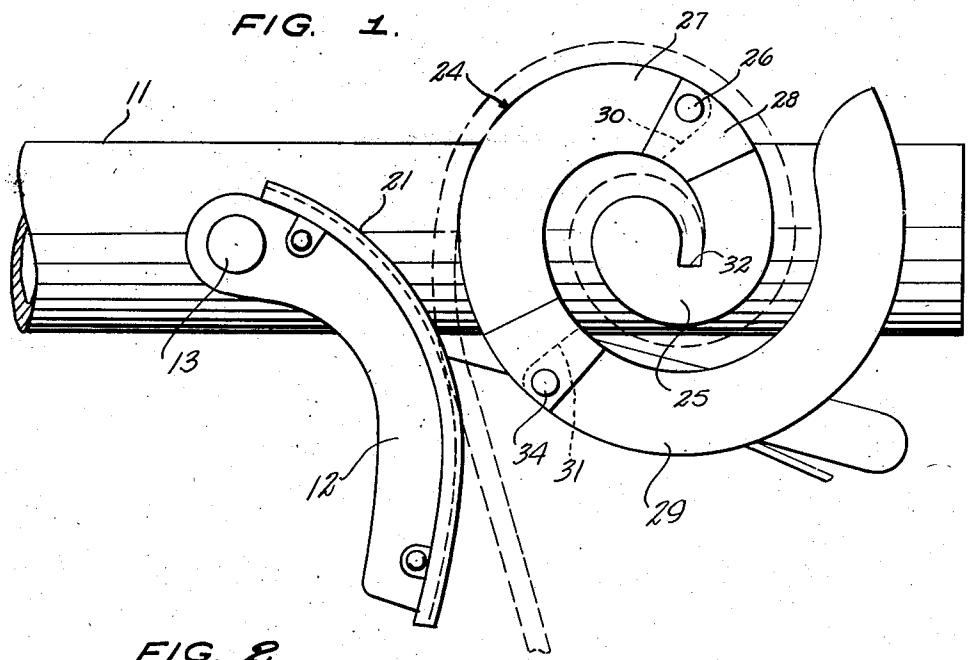
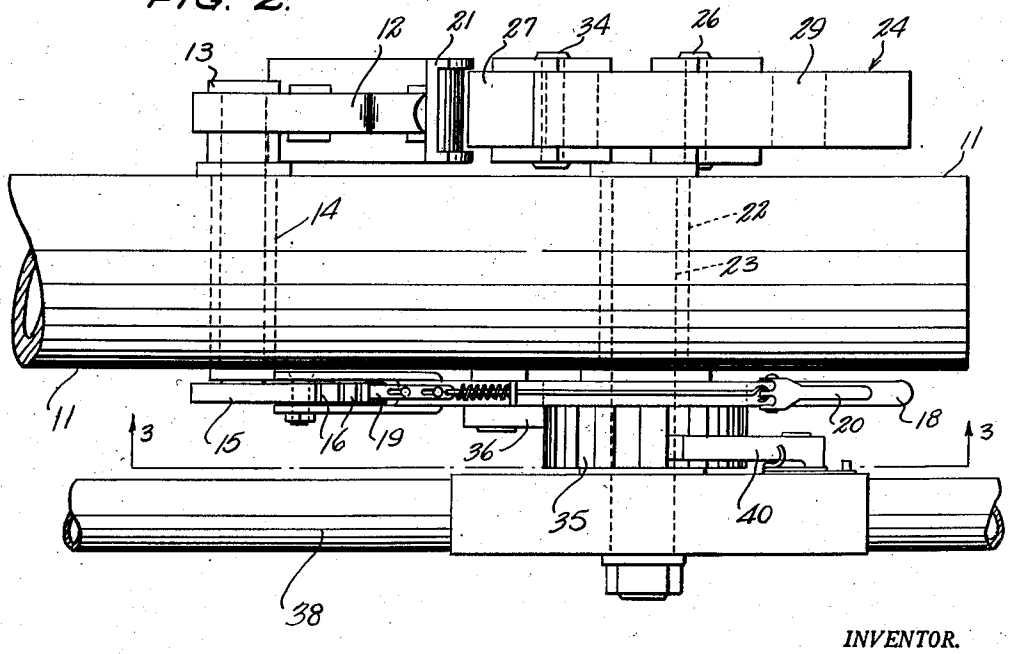


FIG. 2.



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FIG. 3.

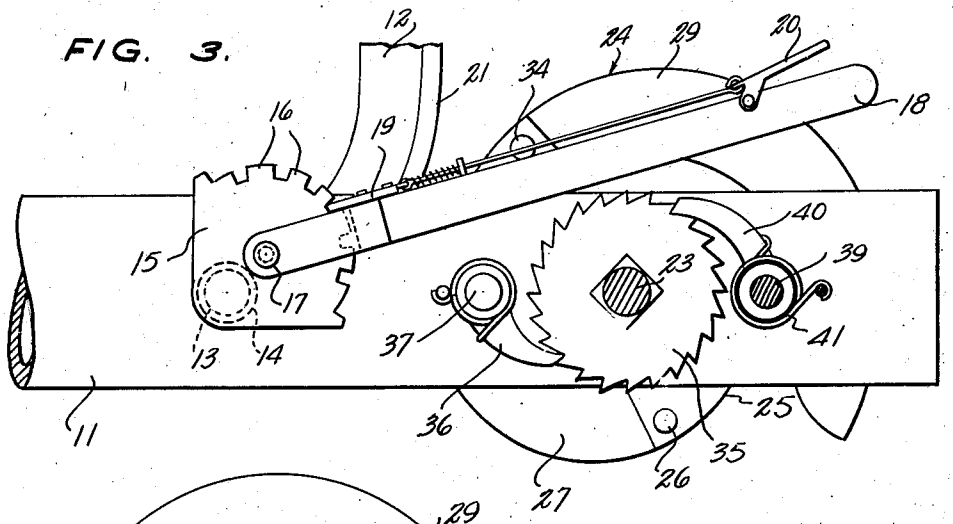
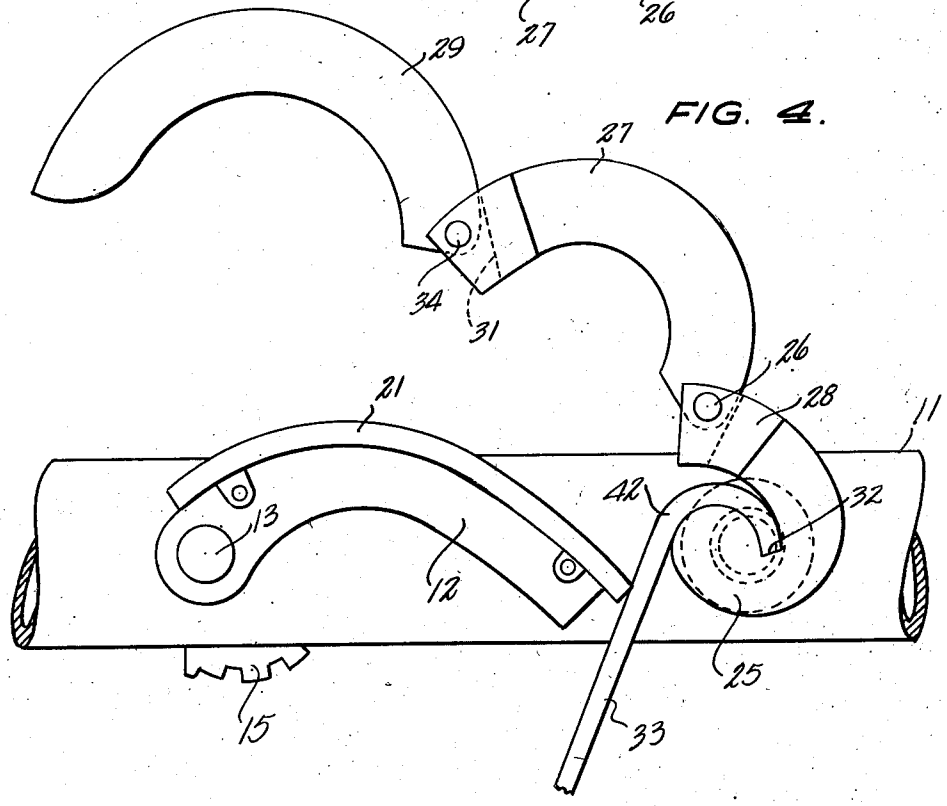


FIG. 4.



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SCROLL BENDING APPARATUS

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1 Claim. (Cl. 153—40)

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This invention relates to machines for bending scrolls into spiral shape from metal strips, and more particularly to an implement for bending straight strips of iron into spiral shape.

A main object of the invention is to provide a novel and improved machine for bending strips of iron into spiral shape for ornamental purposes, said machine being simple in construction, being easy to operate, and involving relatively few parts.

A further object of the invention is to provide an improved implement for bending strip metal into spiral shape, said implement being inexpensive to manufacture, being rugged in construction, providing smoothly curved spiral coils in the strip of iron being bent, and providing a means of forming ornamental iron scrolls in the field in a minimum amount of time and by the use of a minimum amount of labor.

Further objects and advantages of the invention will become apparent from the following description and claim, and from the accompanying drawings, wherein:

Figure 1 is rear elevational view of an improved scroll-bending machine constructed in accordance with the present invention;

Figure 2 is a bottom plan view of the scroll-bending machine of Figure 1, the handle portion of the machine being shown in fragmentary view;

Figure 3 is a cross-sectional view taken on line 3—3 of Figure 2;

Figure 4 is a rear elevational view of the machine of Figure 1 with the articulated segments of the die element shown in open positions and with the anvil element of the machine shown in its initial position at the beginning of a scroll-bending operation.

Referring to the drawings, 11 designates a support member which may be, for example, a tubular, horizontal bar fixed to any suitable stationary structure.

Designated at 12 is a curved arm which is pivoted at 13 to the support 11 for rotation in a vertical plane. The pivotal connection of the arm 12 may consist of a transverse shaft secured to arm 12 and journaled in a suitable transverse bearing sleeve 14 secured in the support 11. Secured to the opposite end of said transverse shaft is a sector plate 15 having the spaced peripheral notches 16. Pivoted at 17 to the sector plate 15 is a hand lever 18 provided with a spring-biased locking dog 19 slidably mounted thereon and lockingly engageable between adjacent notches 16. The lever 18 is provided with the conventional hand-release arm 20 pivoted thereto which is connected to the locking dog 19 and which is arranged to disengage said locking dog from the notched periphery of sector plate 15 responsive to clockwise rotation of the arm 20, as viewed in Figure 3. As shown, the arm 12 is provided at its convex surface with a grooved seat 21 defining a channel for receiving a strip of metal to be bent, as will presently be described.

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Secured in the support 11 parallel to the sleeve 14 and spaced therefrom is a bearing sleeve 22 in which is journaled a transverse shaft 23. Secured to the end of the shaft adjacent the arm 12 is an articulated spiral die member, designated generally at 24. The die member 24 comprises an inner spiral segment 25 rigidly secured to the end of shaft 23 and having a further spiral segment 27 pivotally connected thereto at 26. The connection at 26 comprises respective plate elements 28 welded to the opposite sides of the end of segment 25 which receive between them the end of segment 27 and which are pivotally secured to said segment by a hinge pin. Pivotally secured to the outer end of segment 27 in a similar manner is a further spiral segment 29 shaped to define a continuation of the spiral curve of segments 25 and 27. The end of the inner segment 25 is formed with an abutment surface 30 against which the adjacent end of segment 27 is engaged when the segments are arranged in operating position, as shown in Figure 1, and the segment 27 is provided at its outer end with an abutment surface 31 against which the adjacent end of segment 29 is engaged when die member 24 is in the operative position of Figure 1. However, the segments 29 and 27 may be swung outwardly from the operative position shown in Figure 1, as is illustrated in Figure 4. The positions of said segments, shown in Figure 4, represent the starting position of the die member 24 at the beginning of a scroll-bending operation. As shown, the inner segment 25 is formed with a recess 32 shaped to receive the ends of a metal strip to be bent, such as the metal strip 33 shown in Figure 4.

It will be noted that the hinge connections 26 and 34 are diametrically opposite each other relative to the axis of the shaft 23, and that the inner segment 25 extends substantially 180° around said axis.

It will further be noted that the convex, longitudinally grooved seat 21 of the anvil arm 12 is coplanar with and faces the peripheral outer surface of the spiral die member 24.

Secured to the shaft 23, as by engagement

with a squared portion on the shaft, adjacent the side of support 11 opposite to the spiral die 24 is a ratchet wheel 35. Designated at 36 is a spring-pressed dog pivoted at 37 to the support 11 and biased into engagement with the teeth of the ratchet wheel 35 and arranged to prevent clockwise rotation of said ratchet wheel, as viewed in Figure 3. Journaled on the end of shaft 23 adjacent ratchet wheel 35 is a handle bar 38, and pivoted at 39 to said handle bar is a dog member 40 provided with a biasing spring 41 which urges the dog member 40 into interlocking engagement with the ratchet wheel 35 and which positively prevents ratchet wheel 35 from rotating clockwise relative to the dog 40, as viewed in Figure 3. It will therefore be apparent that the handle bar 38 transmits torque to shaft 23 through the dog 40 and ratchet wheel 35 responsive to the counterclockwise rotation of the handle bar 38 relative to support 11, as viewed in Figure 3. The shaft 23 may rotate counterclockwise relative to the support 11, but clockwise rotation of shaft 23 relative to said support is prevented by the action of the dog member 36 which is in locking engagement with the rachet wheel 35.

In operation, the metal strip 33 to be bent is first formed at its ends with a hook portion 42, as shown in Figure 4, and the hooked end of the strip 33 is engaged in the recess 32 of the inner spiral die segment 25. At this stage of the process, the segments 27 and 29 are in their outwardly swung positions, as shown in Figure 4. With the handle bar 38 held so that the segment 25 is in the position shown in Figure 4, the operator rotates the hand lever 18 to move the curved arm 12 into the position shown in Figure 4, with the end of the grooved anvil element 21 in abutment with the strip 33 adjacent the hook 42. The handle bar 38 is then rotated to curl the strip around the inner segment 25 to form the inner portion of a spiral scroll. When the strip has been curled around the segment 25, the next segment 27 is disposed so that its end is then in abutment with the surface 30 of segment 25 to define a continuation of the spiral scroll. Rotation of the die member is then continued, the hand lever 18 being held by the opertor throughout the bending operation and manipulated by the operator to hold the convex member 21 in selected rotative positions and to adjust convex member 21 around its axis 13 to increase the radial distance of the surface of said convex member 21 from the pivotal axis of the die member. After the strip has been bent around the segment 27, the segment 29 is moved into position to define a continuation of the spiral die surface and the arm 12 is allowed to swing still further downwardly, to the position shown in Figure 1, providing the additional clearance required to complete the bending of the strip around the final die segment 29.

During the bending operation, the strip is received in the grooved anvil member 21 and is held in the plane of the die member 24, thereby preventing twisting of the strip during its bending into spiral coiled form. The position of the hand lever 18 relative to the sector plate 15 may be varied to suit the convenience of the user by disengaging the dog 19 from interlocking engagement between the teeth 16 by means of the arm 20 and resetting the lever so as to provide the desired relative setting of the lever with respect to the sector plate.

While a specific embodiment of an improved scroll-bending implement has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claim.

What is claimed is:

A scroll bending apparatus comprising a support, an anvil member pivotally secured to said support, means whereby said anvil member may be held in selected rotated positions relative to said support, a spiral-shaped articulated die member pivoted to said support adjacent said anvil member, said die member being formed of a first segment pivoted to said support and a plurality of additional segments, each of which extends through substantially 180°, the outer peripheral surface of the die member facing the anvil member and said die member being mounted for rotation in the same plane as said anvil member, said anvil member having a convex surface facing the outer peripheral surface of the die member and said anvil member being adjustable around its pivotal axis by said first named means to increase the radial distance of said convex surface from the pivotal axis of said die member.

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