

Feb. 28, 1950

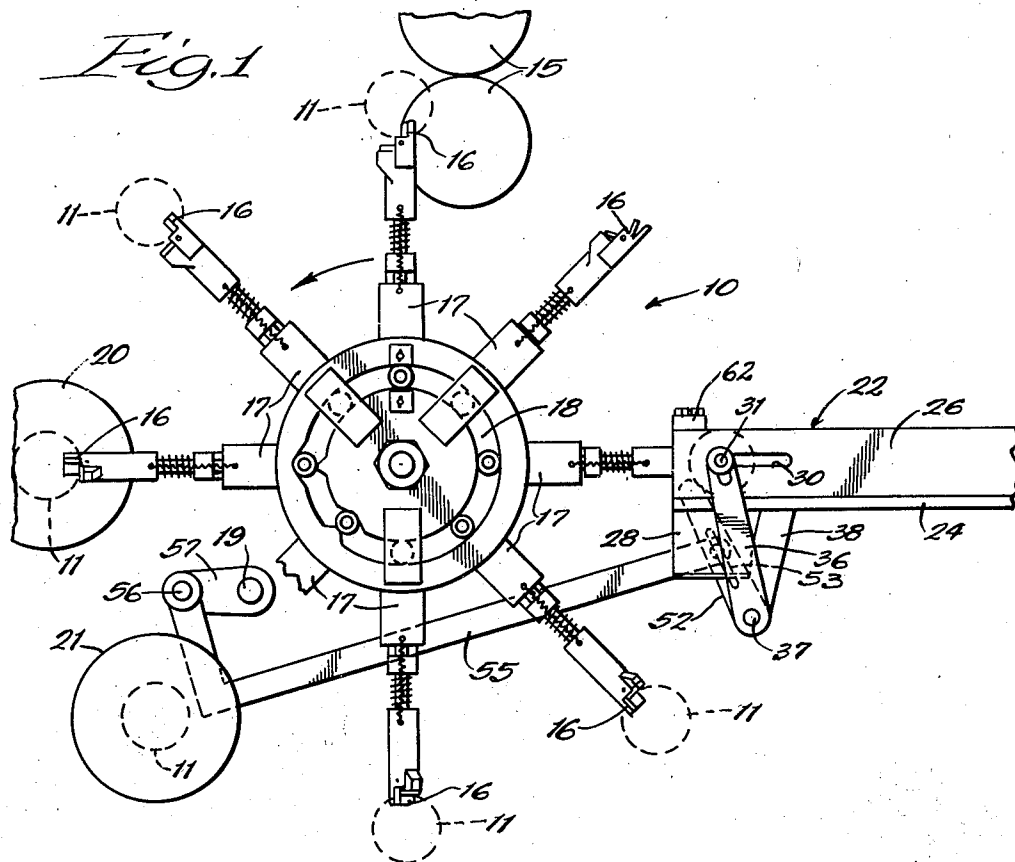
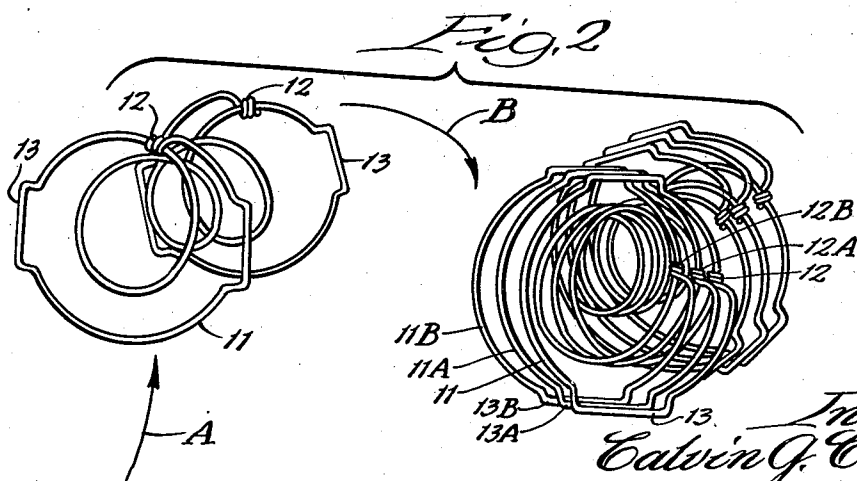
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2,498,850

STACKER MECHANISM FOR COIL SPRINGS

Filed Feb. 6, 1948

3 Sheets-Sheet 1



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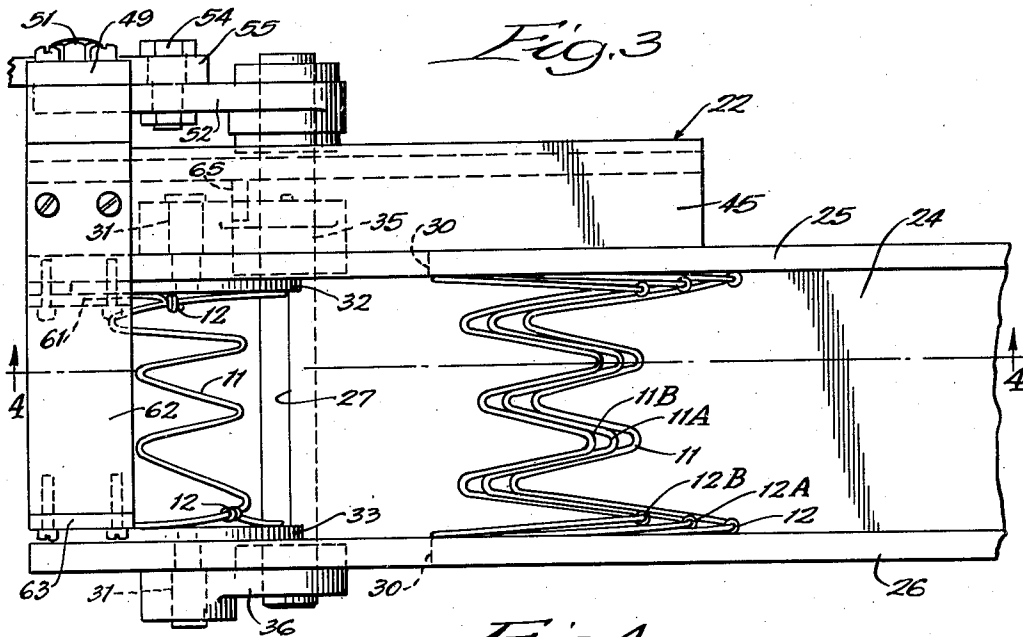
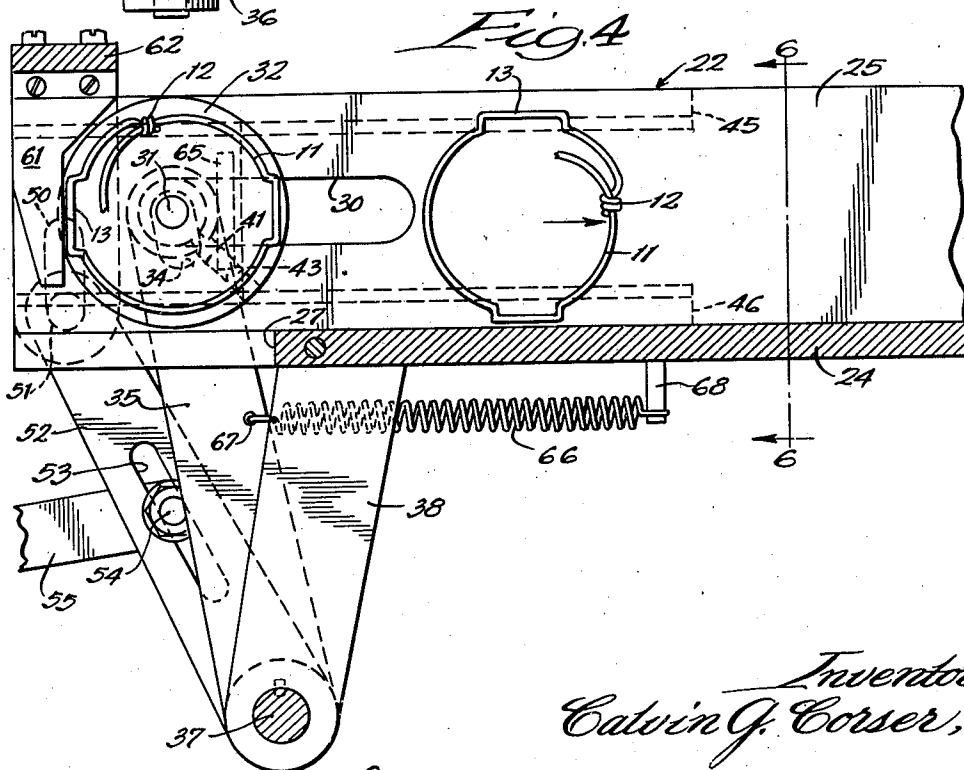
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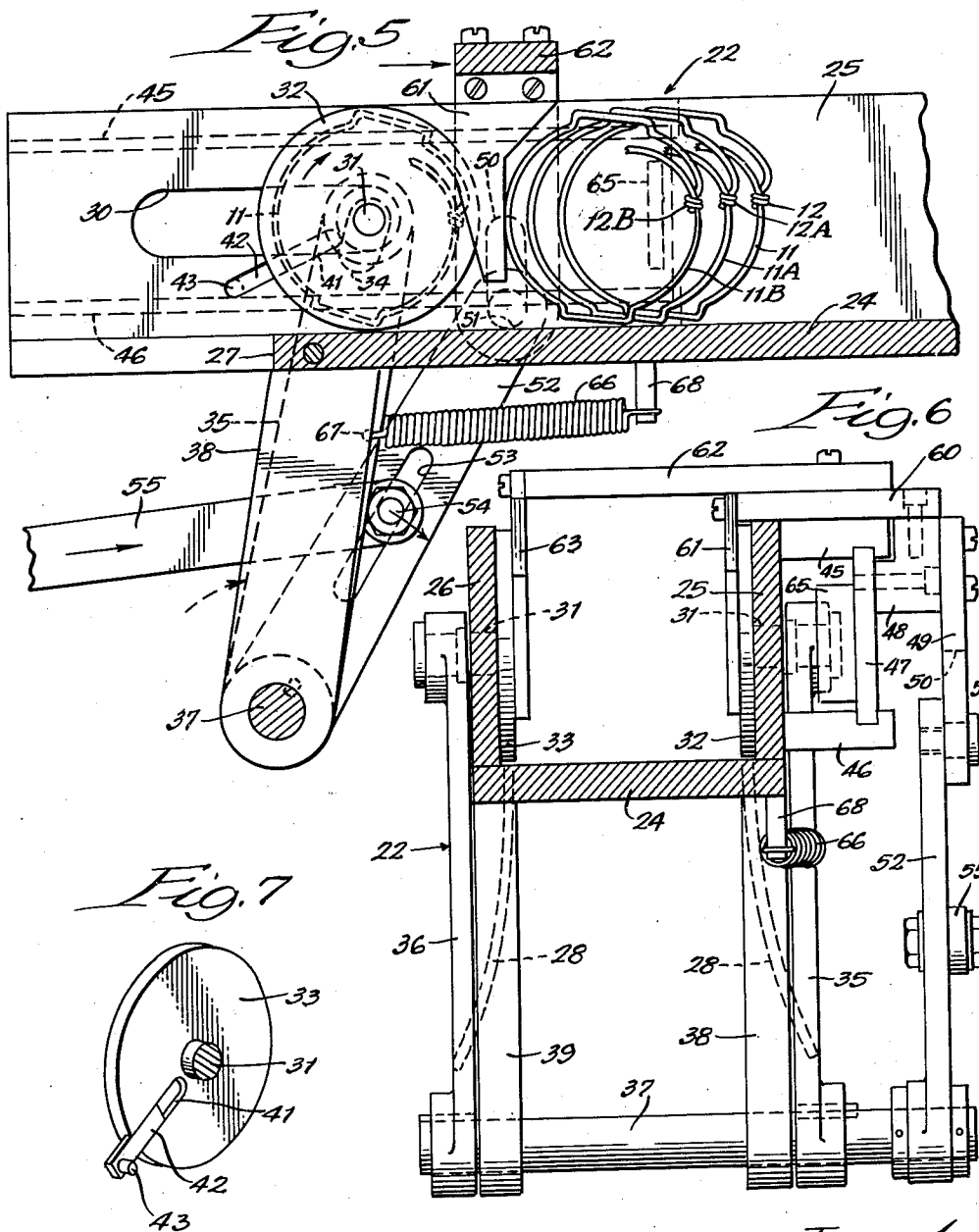
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STACKER MECHANISM FOR COIL SPRINGS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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STACKER MECHANISM FOR COIL SPRINGS

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5 Claims. (Cl. 214-6)

1

This invention relates to stacker mechanisms for coil spring producing machines. The stacker mechanism of this invention, while generally applicable to various types of coil spring producing machines, is particularly adaptable for use with the coil spring producing machine shown and described in William E. Wunderlich application Ser. No. 700,197, filed September 30, 1946.

Coil spring producing machines, such for example as the one disclosed in the aforementioned application, usually include a coiling mechanism, knotting mechanisms, a stacker mechanism, and a transfer mechanism for advancing the coil springs from the coiling mechanism through the knotter mechanisms to the stacker mechanism. The stacker mechanism receives the coil springs from the transfer mechanism and stacks the same in conveniently handled bundles. In so stacking each coil spring is telescopically received within each previously stacked spring.

It has been found desirable to stack the springs in such manner that the knotted portions of the springs are at the forward part of the springs as they are advanced and telescopically received in the stack of springs. This greatly facilitates the stacking. However, many coil spring producing machines do not accurately present the coil springs to the stacker mechanism with the knotted portions of the springs leading so that difficulty is encountered in the stacking operation.

The principal object of this invention, therefore, is to provide an improved stacker mechanism for coil springs wherein the coil springs are received from the coil spring producing machine, wherein the coil springs are accurately rotated to a position having the knotted portions thereof leading, and wherein the coil springs are advanced and telescopically received in the stack and wherein the stack is advanced as coil springs are added thereto.

More specifically, it is an object of this invention to provide the improved stacker mechanism with a pair of spaced side plates, a pair of spaced discs rotatably mounted between the side plates for receiving coil springs to be stacked and for rotating the same to the desired position and a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs, for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates. The discs and fingers are moved in timed relation and the discs may also be slidably moved as well as rotatably moved.

2

Further objects of this invention reside in the details of construction of the stacker mechanism and the cooperative relationship between the component parts thereof.

Other objects and advantages of this invention will become apparent to those skilled in the art upon reference to the accompanying specification, claims and drawings in which:

Figure 1 is a diagrammatic illustration of a coil spring producing machine with the stacker mechanism of this invention applied thereto.

Figure 2 is a composite perspective view showing the position of the coil spring as it is presented to the stacker mechanism and the positions of the coil springs stacked by the stacker mechanism.

Figure 3 is a top plan view of the stacker mechanism.

Figure 4 is a vertical sectional view taken substantially along the line 4-4 of Fig. 3 and showing the parts in one position.

Figure 5 is a sectional view similar to Fig. 4, but showing the parts in another position.

Figure 6 is a vertical sectional view taken substantially along the line 6-6 of Fig. 4, and

Figure 7 is a perspective view of one of the discs and its associated mechanism.

Referring first to Fig. 1, a coil spring producing machine is generally designated at 10 and it may be of the type shown and described in the aforementioned application. The machine 10 operates to produce coil springs 11 such as shown in Fig. 2, wherein the ends of the springs are knotted as at 12. The end convolutions of the springs may, also, be provided, if desired, with offsets 13.

The coil spring producing machine 10 includes a coiling mechanism 15 for coiling wire into the double-ended coil spring 11. When the coil spring is thus formed, it is grasped by fingers 16, carried by a radial arm 17 of a transfer mechanism 18 which is intermittently rotated through a Geneva motion (not shown) by a rotary shaft 19. The transfer mechanism 18 includes a plurality of such radial arms 17 and fingers 16 for grasping and transferring the coil springs as they are formed by the coiling mechanism. The coil springs thus formed are advanced to a knotting mechanism 20 wherein one end of the coil spring is knotted, and if desired, crimped into an offset. The coil springs are then advanced to a second knotting mechanism 21 wherein the other end of the coil spring is knotted and may also be crimped into an offset. The knotted coil springs are then advanced by the transfer mecha-

nism to the stacker mechanism of this invention generally designated at 22. Since the coil producing machine diagrammatically illustrated in Fig. 1 is fully disclosed in the aforementioned application a further description thereof is not necessary.

As will be noted in Fig. 2, the coil springs 11 are advanced along the path of the arrow A into the stacker mechanism 22 with the knots 12 being located on the upper side of the spring. In order to stack the coil springs in the most expeditious manner the coil springs are rotated about their axes in the direction indicated by the arrow B so that the knots of the springs are at the forward parts thereof as they are moved into the stack. Thus, the springs as they are advanced in the stacker mechanism are readily telescopically received in the stack of springs as indicated in Fig. 2.

The stacker mechanism 22 includes a bottom plate 24 and side plates 25 and 26. The bottom plate 24 terminates at 27 to permit coil springs to be inserted between the side plates 25 and 26 by the transfer mechanism 18. Converging guides 28 extending downwardly from the side plates operate to guide the springs as they are fed to the stacker mechanism and to compress the same between the side plates.

Each of the side plates 25 and 26 are provided with a longitudinal slot 30 for slidably receiving a pin 31. The pin 31 associated with the side plate 25 carries a disc 32 and the pin 31 associated with the side plate 26 carries a disc 33. The discs 32 and 33 are thus spaced from each other and are located within the side plates 25 and 26. When the coil springs are fed to the stacker mechanism under the guidance of the converging guides 28 they are interposed between the discs 32 and 33 with the knots of the springs being located upwardly. In this respect the spacing between the guides 28 at their upper ends is substantially equal to the spacing between the discs 32 and 33. The pins 31 extend outwardly through slots 34 in levers 35 and 36, which in turn are keyed to a shaft 37 rotatably mounted in opposed brackets 38 and 39. In this way the levers 35 and 36 are connected to oscillate together and when the levers oscillate they move the pins 31 longitudinally along the slots 30 for imparting longitudinal movement to the discs 32 and 33. The discs are thus moved from the receiving position as indicated in Fig. 4 to the ejecting position as indicated in Fig. 5, the extent of such sliding movement being determined by the length of the slots 30.

As indicated in Figs. 4, 5, and 7 the discs 32 and 33 are each provided with a radial groove 41 for receiving blocks 42 which are pivoted by pins 43 to the side plates 25 and 26. Thus as the discs 32 and 33 are slidably moved by the levers 35 and 36 the slots 41, blocks 42 and pivot pins 43 cause the discs to rotate simultaneously. As will be seen from Figs. 4 and 5, the discs are rotated through substantially 90° as they are moved between the receiving position and the ejecting position. In this way the coil springs 11 which are interposed between the discs 32 and 33 are advanced by the sliding movement of the discs and are rotated by the rotary movement thereof so that when the springs arrive at the ejecting position as illustrated in Fig. 5 the knots 12 of the springs 11 are at the forward side of the springs.

The side plate 25 exteriorly carries a pair of spaced guides 45 and 46 provided with guide ways

for slidably receiving a shoe 47. A bracket 48 is secured to the shoe 47 and in turn carries a depending arm 49 provided with a slot 50. The slot 50 receives a pin 51 carried by a lever 52 which is loosely journaled on the shaft 37. The lever 52 is in turn provided with a slot 53 for adjustably receiving a pin 54 connected to one end of a link 55, the other end of which is pivoted at 56 to a crank arm 57 carried by the power shaft 19 of the coil producing machine 10. Thus, as the coil producing machine 10 operates to form coils and advance the same, the power shaft 19 through the link 55, lever 52 and arm 49 imparts sliding motion to the bracket 48 and shoe 47, this motion being in timed relation with the operation of the coil spring producing machine 10.

The bracket 48 carries a plate 60 which in turn carries a depending finger 61 and also a plate 62 which in turn carries a depending finger 63. The fingers 61 and 63 are therefore spaced from each other and are located inwardly of the discs 32 and 33. By reason of this spacing the fingers 61 and 63 are permitted to sweep across the faces of the discs 32 and 33 to eject coil springs from between the discs 32 and 33 when the discs are moved to the ejecting position shown in Fig. 5.

The shoe 47 carries an abutment 65 adapted to be engaged by the lever 35. A spring 66 is hooked to the lever 35 as at 67 and to a post 68 carried by the bottom plate 24. The spring 66 therefore presses the lever 35 into engagement with the abutment 65 to form a spring biased one way connection between the shoe 47 and the lever 35 and hence between the spaced fingers 61 and 63, and the spaced discs 32 and 33.

With the parts in the position shown in Fig. 4, the fingers 61 and 63 are retracted and the discs 32 and 33 are also retracted by reason of the spring biased one way connection. The parts are thus in the receiving position. The transfer mechanism of the coil spring producing machine then inserts a coil spring between the discs 32 and 33 as illustrated in Fig. 4. The fingers 61 and 63 are then caused to advance and as the fingers are advanced the spring biased one way connection advances the discs 32 and 33 to the ejecting position at the ends of the slots 30 as illustrated in Fig. 5. Further motion of the discs is arrested at this point. Thus the coil springs 11 are advanced by the sliding movement of the discs and are rotated by the rotating movement thereof. Following the arrest of the movement of the discs, the fingers 61 and 63 continue to move for sweeping the coil spring from between the discs and for telescopically inserting the coil spring into the stack of springs. As springs are continued to be fed to the stack of springs the stack of springs is automatically advanced between the side plates 25 and 26 by the feeding action of the fingers 61 and 63. Because the spacing between the discs 32 and 33 is less than the space between the side plates 25 and 26 proper telescopic feeding of each spring into the stack of springs is assured. Also, because the springs are rotated by the discs to cause the knotted portions thereof to be at the forward part of the springs, the springs are readily received in the stack.

While for purposes of illustration one form of this invention has been disclosed, other forms thereof may become apparent to those skilled in the art upon reference to this disclosure, and therefore, this invention is to be limited only by the scope of the appended claims.

5

I claim:

1. A stacker mechanism for coil springs comprising a pair of spaced side plates, a pair of spaced discs slidably and rotatably mounted between the side plates for receiving coil springs to be stacked and for advancing and rotating the same, a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs, for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates, and means for slidably and rotatably moving the discs and for slidably moving the fingers in timed relation.

2. A stacker mechanism for coil springs comprising a pair of spaced side plates, a pair of spaced discs rotatably mounted between the side plates for receiving coil springs to be stacked and for rotating the same, a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates, and means for rotatably moving the discs and for slidably moving the fingers in timed relation.

3. A stacker mechanism for coil springs comprising a pair of spaced side plates, a pair of spaced discs slidably and rotatably mounted between the side plates for receiving coil springs to be stacked and for advancing and rotating the same, a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs, for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates, means for slidably moving the discs and fingers in timed relation, and means including stationary pins and radial grooves in the discs for rotating the discs as they are slidably moved.

4. A stacker mechanism for coil springs comprising a pair of spaced side plates, a pair of

6

spaced discs slidably and rotatably mounted between the side plates for receiving coil springs to be stacked and for advancing and rotating the same, a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs, for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates, means for slidably moving the fingers, a spring biased one way connection between the fingers and the discs for slidably moving the discs as the fingers are moved, stops for limiting the movement of the discs, and means for rotating the discs as they are slidably moved.

5. A stacker mechanism for coil springs comprising a pair of spaced side plates, a pair of spaced discs slidably and rotatably mounted between the side plates for receiving coil springs to be stacked and for advancing and rotating the same, a pair of spaced fingers slidably mounted between the side plates for ejecting the rotated coil springs from between the discs, for stacking the coil springs between the side plates and for advancing the stacked coil springs between the side plates, means for slidably moving the fingers, a spring biased one way connection between the fingers and the discs for slidably moving the discs as the fingers are moved, stops for limiting the movement of the discs, and means including stationary pins and radial grooves in the discs for rotating the discs as they are slidably moved.

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The following references are of record in the file of this patent:

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