N. S. HARTER.

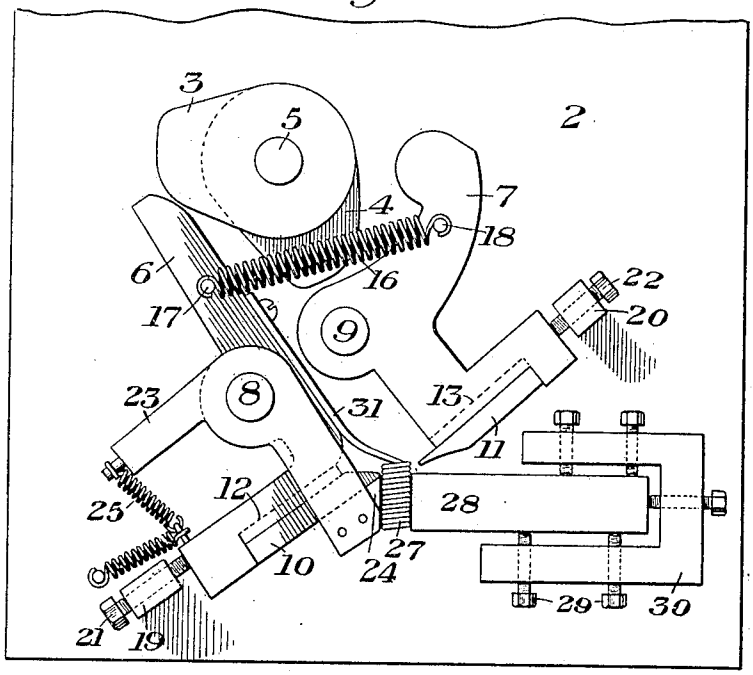
APPARATUS FOR LOOPING SPRINGS.

APPLICATION FILED MAR. 13, 1908.

906,418. Patented Dec. 8, 1908.

2 SHEETS—SHEET 1.

Fig. 1.



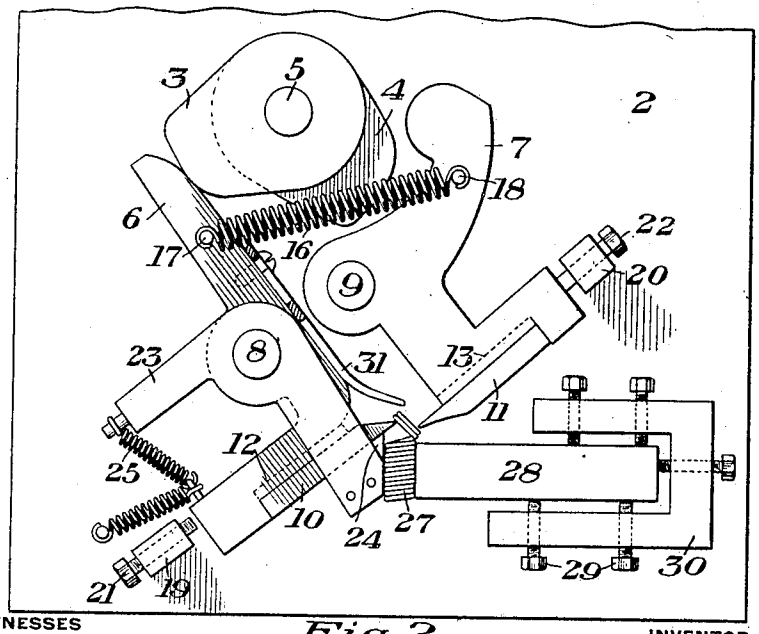


Fig. 2.

WITNESSES

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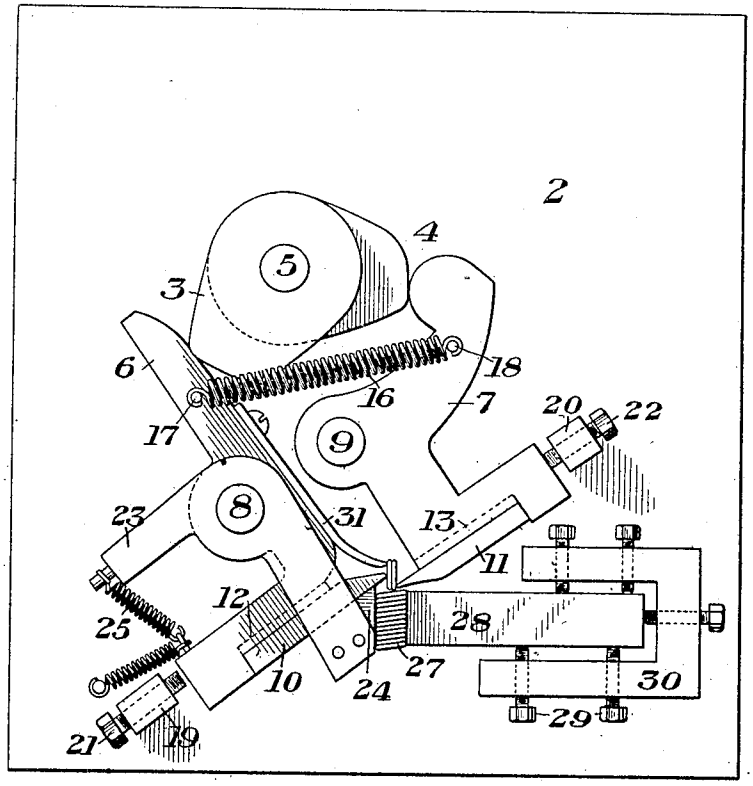
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Fig. 3.



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APPARATUS FOR LOOPING SPRINGS.

No. 906,418. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed March 13, 1908. Serial No. 420,879.

To all whom it may concern:

Be it known that I, NOAH S. HARTER, of Waukegan, Lake county, Illinois, have invented a new and useful Apparatus for Looping Springs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1, 2 and 3 are plan views of apparatus embodying my invention, and showing its successive operations.

My invention relates to apparatus for looping springs, and has for its object to provide mechanism by means of which the end coil or coils of springs may be turned up to form a loop or eye thereon, and which will perform its operations in a simple, positive and rapid manner.

Referring to the drawings, 2 is the frame upon which is journaled a shaft 5, carrying thereon the cams 3 and 4 driven by any suitable means.

6 and 7 are tool-carrying levers, which are fulcrumed respectively on the studs 8 and 9 of the frame 2.

10 and 11 are tools secured to the levers 6 and 7, preferably by slots 12 and 13, into which the projections of the tools 10 and 11 fit.

16 is a tension spring which connects the levers 6 and 7 by means of pins 17 and 18 thereon to which the ends of the spring are attached, and 19 and 20 are posts mounted on the frame 2 and seating adjustable screws 21 and 22 which form stops to limit the outward movement of the tool-carrying arms of the said levers. Upon the stud 8 and over the lever 6, is mounted the clamp lever 23, which has a removable and interchangeable jaw 24 secured thereto. The rearwardly extending arms of the lever 6 and clamp lever 23 are held in tension by the spring 25, and the lever 6 is also held in tension by a spring attached to the frame 2.

27 designates a spring, on which the apparatus is to act, and which is held in position between the face plate or jaw 24 of the lever 23 and the keeper block 28 or fixed jaw, which is adjustably mounted by screws 29 in the frame 30 attached to the main frame 2. A leaf spring 31 is adjustably mounted on the lever 6 to regulate the number of coils which it is desired to turn up to form the loop. The jaw 28 and keeper block may be adjusted to the size of the spring to be used. The stroke of the tools may be lengthened or shortened as desired by means of the screws 21, 22.

In operation, the spring is thrust between the faces of the jaws 24 and 28, until its inner end impinges against the leaf spring 31. The revolution of the shaft 5 causes the cam 3 to act upon the lever 6, and move the tool 10 into contact with the inner end coils of the spring 27, thereby bending said coils into the oblique position shown in Fig. 2. During this operation, the spring 25 has been placed in tension, causing the jaw 24 to bite the spring 27 and thus hold it securely in place. The cam 4 now comes into engagement with the lever 7, and thereby actuates said lever to move the tool 11 into engagement with the opposite side of these raised coils. The continued action of the two tools, one bearing against one side of the coils near their top, and the other against the opposite side, near the bottom, brings said coils into the position shown in Fig. 3, in which they are in line with the axis of the spring 27 in a plane at right angles to the other coils thereof, and forming the completed eye or loop. As the cams 3 and 4 continue to revolve, they pass out of contact with the cam levers 6 and 7, and the spring 16 draws said levers back to their original positions, thus releasing the spring 27 with the finished loop thereon from the grip of the tools 10, 11, and the jaws 24 and 28 and allowing another spring to be inserted.

It will be seen that one of the advantages of the mechanism described is its simplicity and the rapidity with which its operations are performed. Also, that by a simple adjustment of the various parts, a loop or eye of any desired number of coils can be formed upon the end of a spring. Also that springs of various characters and sizes may be operated upon by a simple adjustment of the parts.

Various changes may be made in my apparatus without departing from my invention, since what I claim is:—

1. Apparatus for forming eyes or loops on coil springs, consisting of movable tools arranged to engage the end portion of a coil at opposite sides thereof and bend one or more of the coils thereof at an angle to the remaining coils, means for holding the spring, and means for actuating the tools, substantially as described.

2. Apparatus for looping end coils of springs, having levers with tools mounted thereon, and means for actuating said levers to engage the tools with at least one end coil of a spring to turn said coils to form an eye or loop; substantially as described.

3. In apparatus for looping end coils of springs, cams and levers arranged to be actuated by the cams and having tools positioned thereon and adapted to engage and turn the end coils of a spring for the purpose of forming a loop or eye; substantially as described.

4. Apparatus for looping end coils of springs having adjustable jaws for holding the spring, and tools positioned adjacent to said jaws and at opposite sides of the longitudinal axis of the coil held thereby and adapted to be actuated to turn one or more of the end coils of the spring to form a loop or eye; substantially as described.

5. In apparatus for looping springs, tools adapted to engage the end coils of said spring at opposite sides of its longitudinal axis and at different distances from its ends, adjustable jaws for holding the spring, and a stop to hold the spring against longitudinal movement; substantially as described.

6. In apparatus for looping the end coils of springs, the combination with means for holding a coiled spring, of a pair of oppositely arranged pivoted levers, a tool carried by each lever, and means for actuating said levers to cause the tools to engage one end portion of the spring from opposite sides, said tools working in oblique planes, substantially as described.

7. In apparatus for looping end coils of springs, adjustable gripping jaws, and a gagging stop adapted to engage and hold a spring, cams, levers having tools positioned thereon to engage the end coil or coils of the spring when actuated by said cams, means for releasing the spring from the grip of the tools and jaws, and means for regulating the stroke of the tools; substantially as described.

8. In mechanism of the character described, means for holding a coil spring, a pair of tool-carrying levers having tools arranged to engage the end portion of the spring successively from opposite sides, and means for actuating said levers; substantially as described.

9. In mechanism for the purpose described, a pair of gripping jaws, one of which is movable, two levers pivoted at opposite sides of the gripping point of said jaws, tools carried by said levers, cam means for actuating the levers, and means whereby the actuation of the tool-levers causes the actuation of the movable gripping jaws; substantially as described.

In testimony whereof, I have hereunto set my hand.

NOAH S. HARTER.

Witnesses:
F. F. PULSE,
A. C. WARD.