E. C. DICEY.

Spring-Coiling Machines.

No. 197,460. Patented Nov. 27, 1877.

Fig. 1.

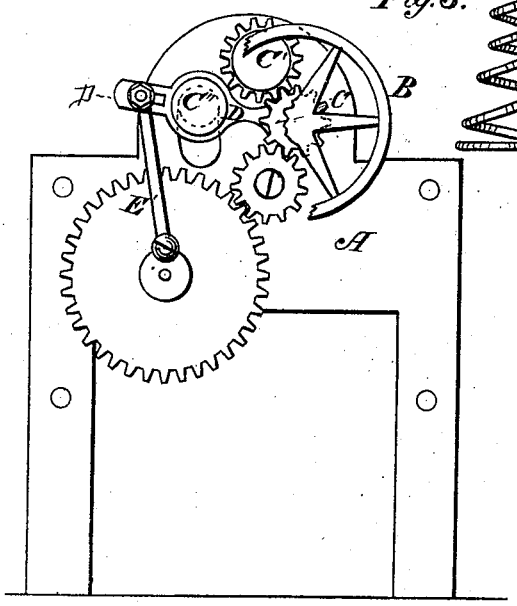


Fig. 5.

Fig. 2.

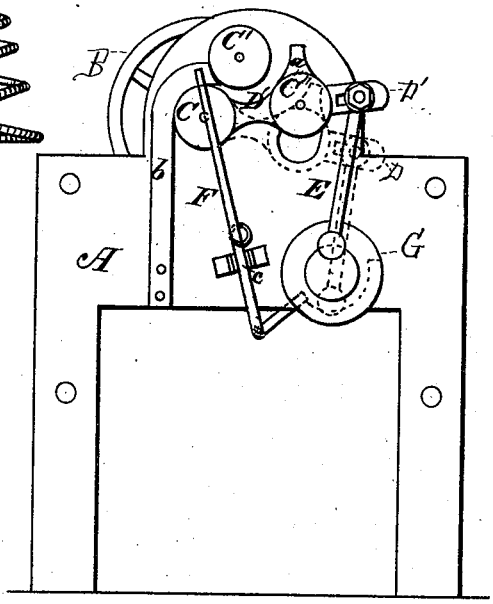


Fig. 3.

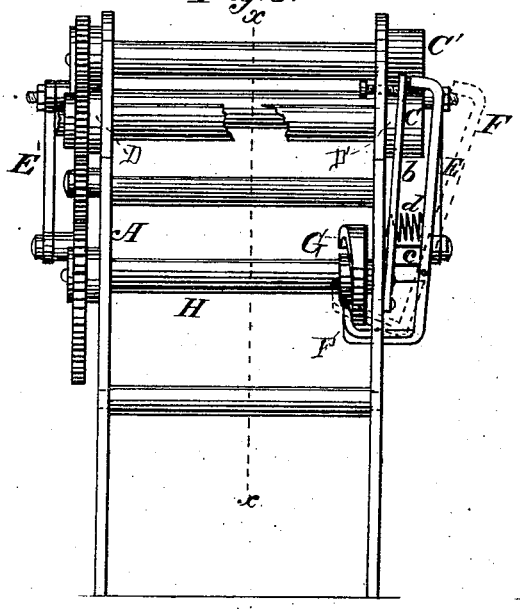
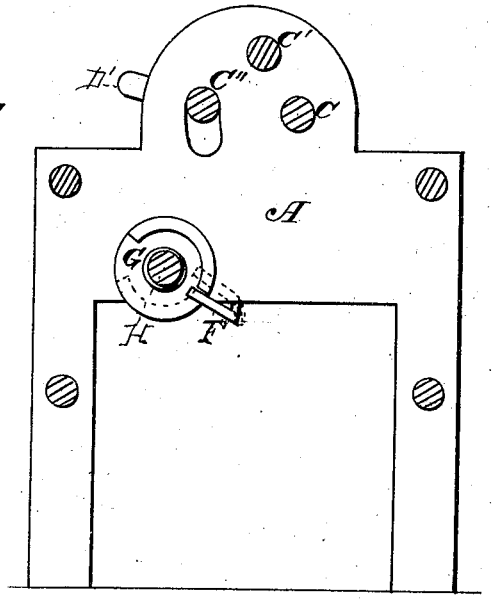


Fig. 4.



Attest:

F. H. Schott

J. Mason Gosler

Inventor:

E. C. Dicey

UNITED STATES PATENT OFFICE.

ELMER C. DICEY, OF STERLING, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO HARRY C. ALBEE, OF SAME PLACE.

IMPROVEMENT IN SPRING-COILING MACHINES.

Specification forming part of Letters Patent No. **197,460**, dated November 27, 1877; application filed April 14, 1877.

To all whom it may concern:

Be it known that I, ELMER C. DICEY, of the city of Sterling, in the county of Whiteside and State of Illinois, have invented a certain new and useful Machine for Making Springs; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, making a part of this specification.

The object of my invention is to provide a machine for making springs, either helical or spiral, as desired, and of any required diameter or pitch, from a rod or wire, so that the springs may be spun and cut off without stopping the machine.

Figure 1 is a rear-end elevation of the machine. Fig. 2 is a front-end elevation. Fig. 3 is a side view. Fig. 4 is a vertical transverse section, showing those parts of the machine which are at the right hand of the dotted line *x x* across Fig. 3. Fig. 5 is a spiral spring.

A is the frame of the machine, which should be substantially constructed to resist the vibrations of the operating parts. B is the driving-pulley, which is hung to the roller C, from which motion is communicated to the operating parts by means of the train of gear shown in Fig. 1. C and C′ are live-rollers, by means of which the wire or rod is fed through while the spring is being formed. C″ is an idler-roller, hung in the yokes D and D′, the inner ends of which articulate around the roller C, the outer ends being pivoted to the connecting-rods E and E′. The yoke D′ is provided with a projection, *a*, which serves as a guide for the wire or rod as it passes through the rollers, causing it to enter at the right point. *b* is a guide placed behind the rollers, which can be adjusted to give the desired pitch to the spring. F is a cutting-off chisel, hinged to the frame of the machine, as shown at *c*. G is a cam on the shaft H, and operates the chisel F.

To manufacture springs, the machine is set in motion by means of a belt on the pulley B, and the rod or wire which is to form the spring is inserted between the rollers C and C′, which should be close enough together to feed the material through. The idler-roller C″ being at its lowest point, and farthest from the live-rollers, the machine will now form the large part of the spiral, and as the wire passes through, the idler C″ will be slowly raised up toward the live-rollers, reducing the diameter of the spring until it has reached its minimum diameter, when the roller C″ will gradually descend until it reaches the point whence it started. The cam G, having made one revolution, carrying the chisel well back from the rod or wire, will now release it, when the chisel will be brought forward toward the wire with great force by the spring *d*, and, being carried by its momentum past its point of rest, will strike the wire with sufficient force to sever it and allow the spring to drop out of the way of the following one.

To manufacture helical springs, or springs in which all the coils are of the same diameter, I place the movable roller C″ at a point that will make the coils of the right diameter, then detach the connecting-rods E and E′, and proceed as before described.

In the working machine, I provide a yielding box for one of the live-rollers, to prevent any unevenness of the wire from obstructing its working.

I am aware that springs have been used for reacting the cutting-tool after it has severed the wire, the cutting being done by the tool under the direct action of a cam, forcing the cutting-tool slowly toward the wire in a direction at right angles to the cam-shaft, thereby making it necessary to stop the feed-rolls while the wire is being cut off. This I do not claim, as in my machine the cutting is done instantaneously by the tool in its rebound after having been drawn back by the spiral bearing-surface on the cam G.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. In a machine for making springs, the combination of two stationary feeding-rolls with an automatically-adjustable forming-roll, hung in yokes and vibrating on one of the stationary rollers, substantially as specified.

2. The slotted vibrating yokes D and D′, carrying the forming-roll C″, in combination

with the connecting-rods E and E′, and driving-shaft H, for the purpose of giving to the roll C″ a vibratory movement, as set forth.

3. The shaft H, provided with a cam, G, having a spirally-inclined surface, with an abrupt termination acting directly upon and in combination with the cutting-off chisel F, as and for the purpose set forth.

4. The adjustable spring *b*, acting as a guide and anvil, in combination with the cutter F and spring *d*, as and for the purpose specified.

5. In a spring-forming machine, the positively-driven feeding-rolls and automatically-adjustable forming-roll, in combination with the spring-anvil *b* and abruptly-terminating spiral cam-acted cutter, substantially as hereinbefore specified.

In testimony whereof I have hereunto affixed my signature this 13th day of April, 1877, in the presence of two witnesses.

ELMER C. DICEY.

Witnesses:

J. MASON GOSZLER,

F. H. SCHOTT.