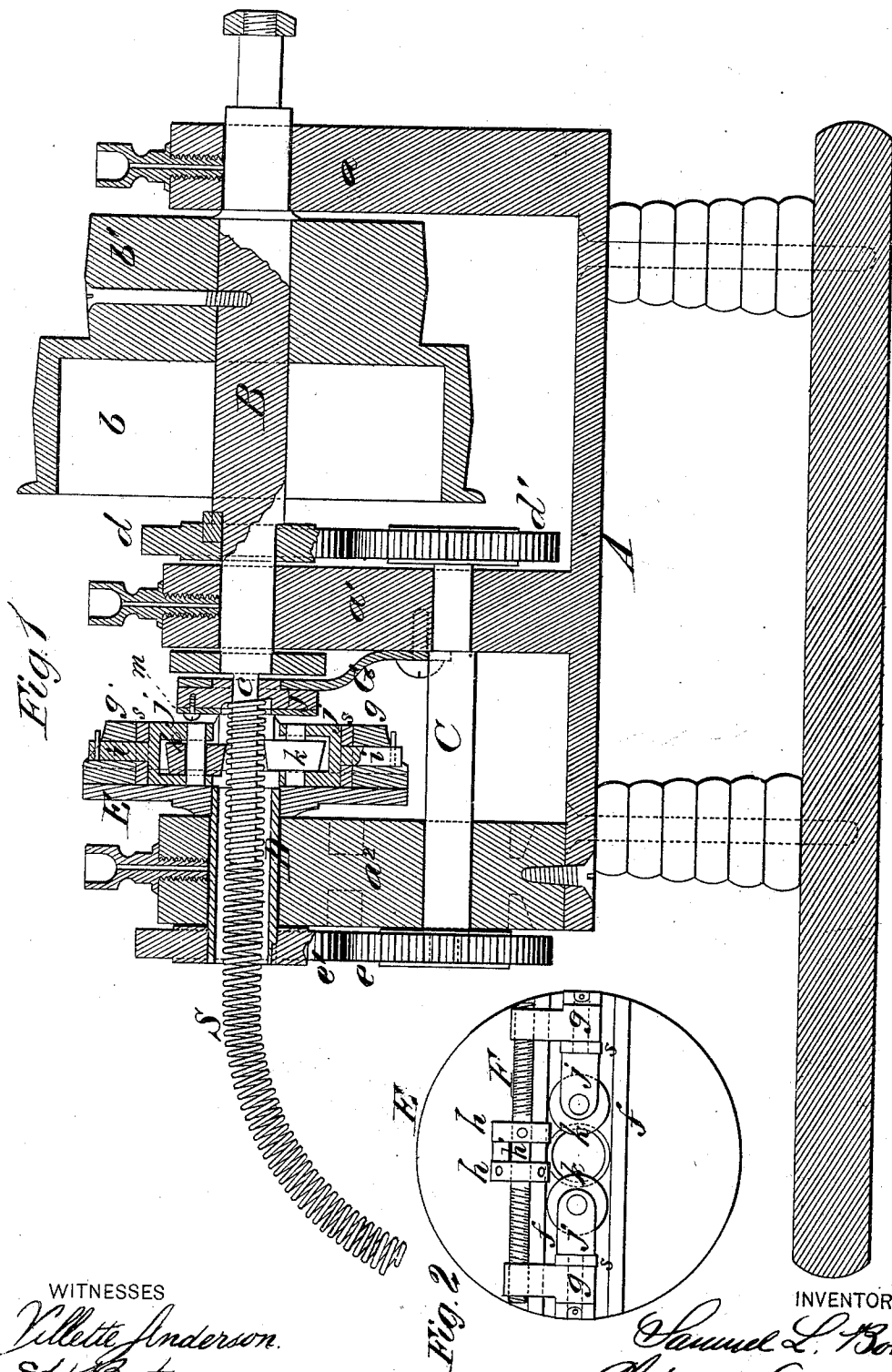


S. L. BOWER.

MACHINE FOR MAKING SPIRAL SPRINGS.

No. 171,089.

Patented Dec. 14, 1875.



WITNESSES
Villette Anderson.
E. H. Bates

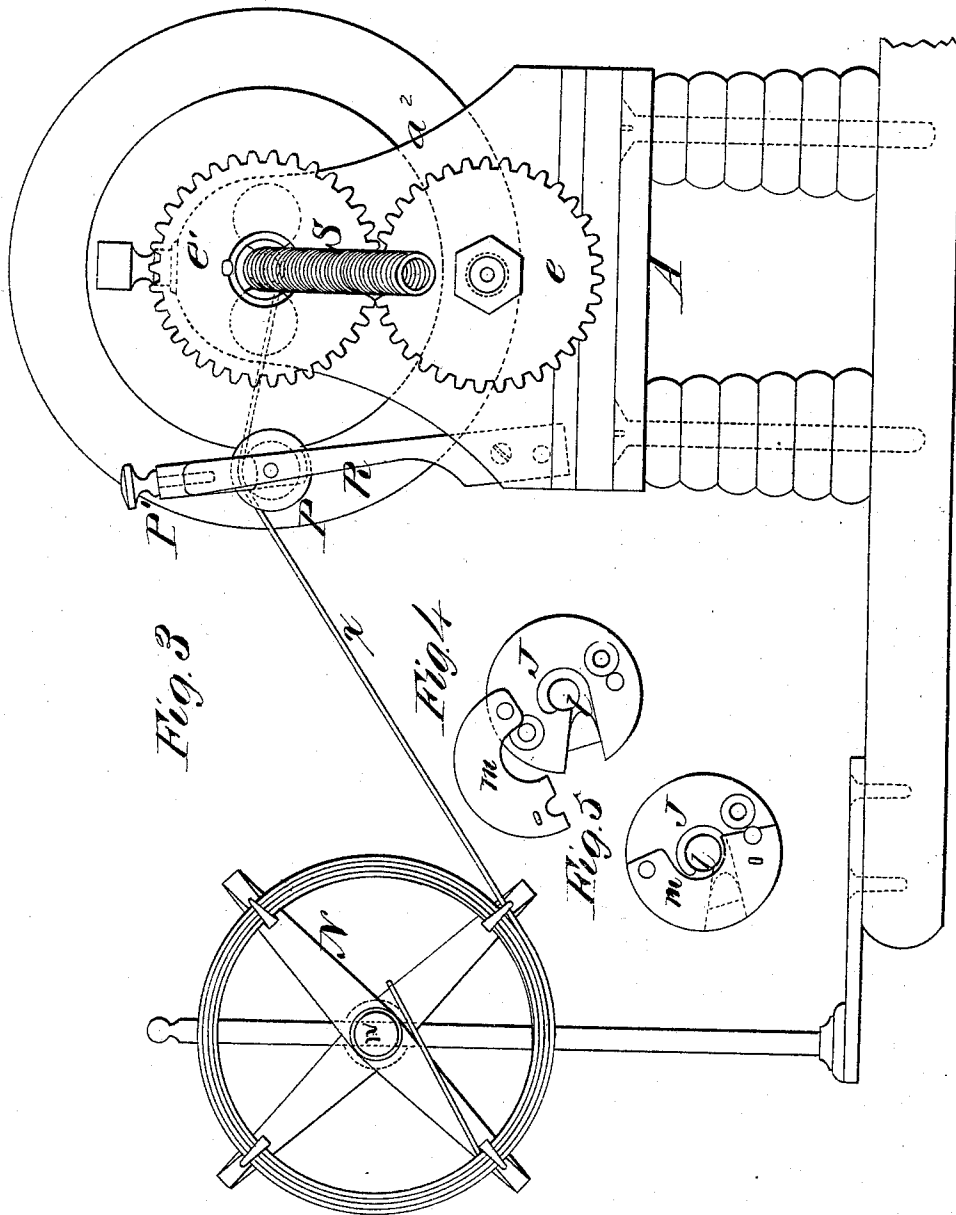
INVENTOR
Samuel L. Bower
Chipman & Son Co.
 ATTORNEYS

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UNITED STATES PATENT OFFICE

SAMUEL L. BOWER, OF AUBURN, NEW YORK.

IMPROVEMENT IN MACHINES FOR MAKING SPIRAL SPRINGS.

Specification forming part of Letters Patent No. 171,089, dated December 14, 1875; application filed

July 3, 1875.

To all whom it may concern:

Be it known that I, SAMUEL L. BOWER, of Auburn, in the county of Cayuga and State of New York, have invented a new and valuable Improvement in Machines for Making Spiral Springs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of my machine. Fig. 2 is a detail view thereof, and Fig. 3 is a side elevation.

This invention has relation to machinery which is designed for making spiral springs; and the nature of my invention consists in certain novel devices, hereinafter explained, for making a continuous spiral spring, the length of which is limited only by the supply of wire to the mandrel, as will be hereinafter explained.

In the annexed drawings, A designates the base of the frame of the machine, from which rise perpendicularly three standards, $a^1 a^2$. The two standards $a^1 a^2$ afford bearings for a shaft, B, carrying two belt-pulleys, $b^1 b^2$, and having formed on or secured to one end, coincident with its axis, a mandrel, c , as shown in Fig. 1. There is also secured on the shaft B a spur-wheel, d , which engages with the teeth of a spur-wheel, d' , on a shaft, C, which has its bearings in the standards $a^1 a^2$, and which communicates rotation to a hollow shaft, D, through the medium of spur-wheels $e e'$. The tubular shaft on which wheel e' is keyed has its bearing in the standard a^2 , and its axis coincides with the axis of the mandrel c , which latter enters its bore a short distance, and is smaller in diameter than this bore, as shown in Fig. 1. E designates a circular head, which is secured on the shaft D, and formed with guiding-ribs $f f$ on one face, which receive dovetail slides $g g$, arranged diametrically opposite each other, and constructed with screw-tapped lugs, which receive the ends of a right and left screw-threaded shaft, F, on which perforated enlargements $h h$ are formed and arranged on opposite sides of a bifurcated

bearing, h' , secured into the head E. The slides $g g$ receive loosely the stems $i i$ of two bearings, $j j$, which have rollers $k k$ applied to them, and arranged obliquely to the mandrel c , and at opposite angles to each other. These rollers are held in contact with the coils of the spring S on the mandrel c by means of springs $s s$, which allow the rollers to yield and accommodate themselves to the inequalities of the spring-wire. Rollers $k k$, owing to their obliquity, not only gather the coils of wire under them, and thus feed along the spring, but they maintain a proper degree of tension on the wire coils, which will draw these coils closely and evenly around the mandrel.

It will be observed that the tension of the rollers k can be adjusted by means of the screw-shaft F, and in their operation they revolve a little faster than the mandrel c .

G designates a bracket, which is rigidly secured to the standard a^1 , and to which a circular plate, J, is secured, through which the mandrel c passes freely. This plate J has a spiral or scroll-shaped groove, l , in its face, which gradually diminishes in size from the periphery of the plate to the mandrel. It is through this groove that the spring-wire is fed to the mandrel during the winding operation, and by means of a segment, m , which is pivoted to the face of plate J, the groove l is covered, and the wire is held in this groove while it is being supplied to the rotating mandrel. The spring-wire x is supplied from a reel, N, regulated by a pivot tension-screw, n ; and this wire is passed over a deeply-grooved pulley, P, which has its bearings in a slide, P', which is adjustable on a frame, R. The horizontal bar of frame R, on which slide P' is adjustable, is parallel to the axis of the shaft B. Consequently, by adjusting the slide the wire may be delivered to the mandrel c at any desired angle or lead.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making spiral springs, the combination, with the mandrel c , of the pressure-rollers $k k$, adjustably mounted in the revolving head E, with their surfaces arranged obliquely to the mandrel c , substantially as described, and for the purpose set forth.

2. The plate J, provided with a spiral groove, *l*, gradually diminishing in depth from the periphery of the plate to its center, and provided with the pivoted segment *m*, in combination with the mandrel *c*, whereby the wire is fed and delivered to the mandrel, substantially as described.

3. The plate J, having the groove *l* and segment *m*, in combination with the rolls *k k* and mandrel *c*, whereby the wire is spirally coiled and pressed around the mandrel, substantially as described.

4. The frame R, carrying the adjustable slide P' and pulley P, in combination with the plate J, having the groove *l* and segment *m*, rolls *k k*, mandrel *c*, and rotary tubular shaft

D, whereby the wire is fed, coiled, and pressed around the mandrel, and delivered from the machine, substantially as described.

5. The circular head E, provided with the ribs *f f*, in combination with the slides *g g*, bifurcated bearings *h'*, rolls *k k*, spring *s*, and right and left screw-shaft, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

SAMUEL L. BOWER.

Witnesses:

CHRISTOPHER G. GIBBARD,
SAMUEL CAMPBELL.