Vose & Toshoch,

Coiling Springs.

No. 58,156. Patented Sep. 18, 1866.

Fig. 3.

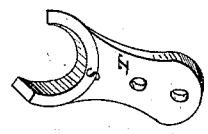


Fig. 4.

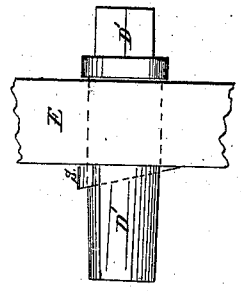


Fig. 1.

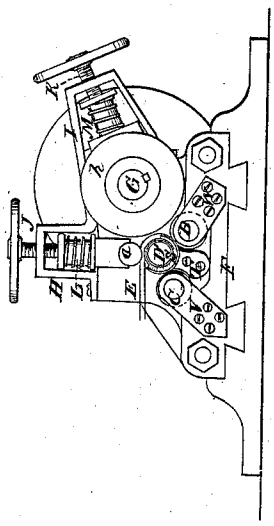
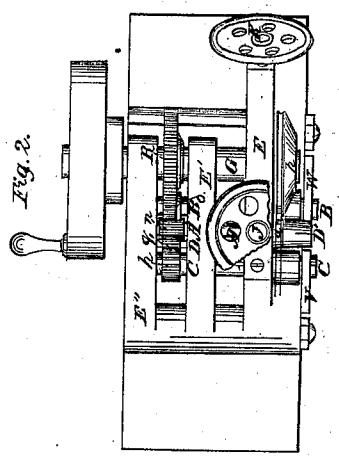


Fig. 2.



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UNITED STATES PATENT OFFICE.

RICHD. VOSE AND WM. TOSHACH, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINERY FOR COILING SPRINGS.

Specification forming part of Letters Patent No. **58,156**, dated September 18, 1866.

To all whom it may concern:

Be it known that we, RICHARD VOSE and WILLIAM TOSHACH, of the city, county, and State of New York, have invented certain new and useful Improvements in Spiral-Spring-Coiling Machines; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a front elevation of our improved spiral-spring-coiling machine; Fig. 2, a plan or top view of the same. Fig. 3, a perspective view of our tapering guide-plate detached; and Fig. 4, a top view of the revolving mandrel detached, showing a portion of the frame and illustrating the position of the tapering guide-plate.

Similar letters indicate like parts in all of the figures.

The nature of our invention consists in the construction of a machine for forming metallic spiral coils by the combination of one or more swaging-wheels and pressure-rollers with a central revolving mandrel, and with an inclined or tapering guide-plate partially inclosing said mandrel, or with suitably-arranged rollers, so inclined as to act as the equivalent of such guide-plate.

We use in the simplest form of our improved spiral-spring-coiling machine three parallel shafts, A B C, placed as nearly as possible equidistant from each other around a central shaft, D, carrying the mandrel. These shafts are made short, and revolve in suitable bearings formed in two upright supports, E E′, secured to a solid bed-plate, F. To give additional steadiness and security to the operation of the machine, the main driving-shaft G and the mandrel-shaft D are extended out through bearings in a third upright, E″, as seen in Fig. 2.

Upon the outer end of the shaft D, projecting through its bearings in the upright E, is secured a cylindrical mandrel, D′, of the diameter required in the spiral coil to be formed thereon. The end of the upper shaft, A, immediately over the mandrel D′, is provided with a grooved roller or swaging-wheel, *a*, of a diameter equal to that of the mandrel, while the ends of the lower shafts, B and C, are made to form plain rollers of a diameter somewhat larger than that of the mandrel D′. These roller-feeds of the shafts B and C are stayed by supporting-bars V and W, as shown in Figs. 1 and 2; but the end of the mandrel is left free.

As the wear is greater upon the mandrel D′ and swaging-roller *a* than upon the rollers B and C, the former are made separate from the shafts, and, although securely attached thereto, may be removed therefrom, to be repaired or replaced by others.

An additional grooved swaging-wheel, *h*, of a diameter three or four times greater than that of the mandrel D′, is placed in a right plane with the first swaging-wheel, *a*, in front thereof, being secured upon the end of the driving-shaft G, as clearly shown in Fig. 2 of the drawings. The interval between the circumference of each of the swaging-wheels and forming-rollers and the central mandrel, D′, is equal to the thickness of the bar to be coiled. In order, however, to give elasticity to the pressure of the swaging-wheels upon the bar to be coiled the outer half of the journal-boxes at the end next the mandrel are made to slide in ways formed in suitable frames H and I, and are held closely in place by means of set-screws J and K, bearing upon said journal-boxes by means of intervening springs L and M. The pressure of the set-screws upon these powerful springs thus regulates the pressure to be exerted by the grooved swaging-wheels upon the bar to be coiled thereby.

The roller and mandrel shafts A, B, C, and D are all geared together by means of pinions *n o p q*, so meshing into each other as that they must all revolve in unison with equal velocity. Motion is imparted thereto by means of a large cog-wheel, R, upon the main shaft gearing therein.

The pitch of the spiral coil to be formed upon the mandrel D′ is defined and controlled by means of a semi-cylindrical guide-plate, S, secured to a strong supporting-bar, T, so as to partially inclose the mandrel D′, and whose edge is cut away at the angle required in the pitch of the coil. The grooves in the swaging-wheels serve to hold the bar closely against the inclined edge of the guide-plate.

In place of a simple semi-cylindrical guide-plate having an inclined edge to give the proper pitch to the coil, guide-rollers may be

substituted in the position of said edge, and, like it, so inclined as to impart the desired pitch to the coil.

When the machine is in operation a suitable metallic bar is fed in between the small swaging-wheel *a*, in front of the inclined-edge guiding-plate S. This feeds it forward until caught under the second swaging-wheel, *h*, which bends and coils it around the mandrel D′, the edge of the guide-plate giving the coil the forward inclination, forming its pitch, and the lower rollers completing the formation of the coil, as illustrated in red lines, Fig. 1. As the bar is drawn in and coiled the inclination of the guide-plate gradually works the coil off of the end of the mandrel D′.

By the use of the above-described machine springs of any length or pitch may be made without the necessity of attaching the bar to the mandrel; and as a continuous motion is obtained, each spiral spring, when completely coiled, is carried from under the action of the rollers, and another immediately commenced. It is therefore obvious that, as one bar of metal is coiled and the end thereof leaves the space between the swaging-wheel and mandrel, another bar or rod may be immediately introduced, and so on continuously, no stoppage of the machinery being required.

Having thus fully described our invention, what we claim therein as new, and desire to secure by Letters Patent, is—

The inclined-edge stationary guide-plate S, or its equivalent, in combination with the cylindrical mandrel D′ and one or more swaging and forming wheels and rollers revolving in unison, all substantially in the manner and for the purpose herein set forth.

The foregoing specification of our improvements in spiral-spring-coiling machines signed by us this 9th day of December, A. D. 1865.

RICHD. VOSE.
WILLIAM TOSHACH.

In presence of—
ARTHUR I. MUNDY,
R. R. WOOD.