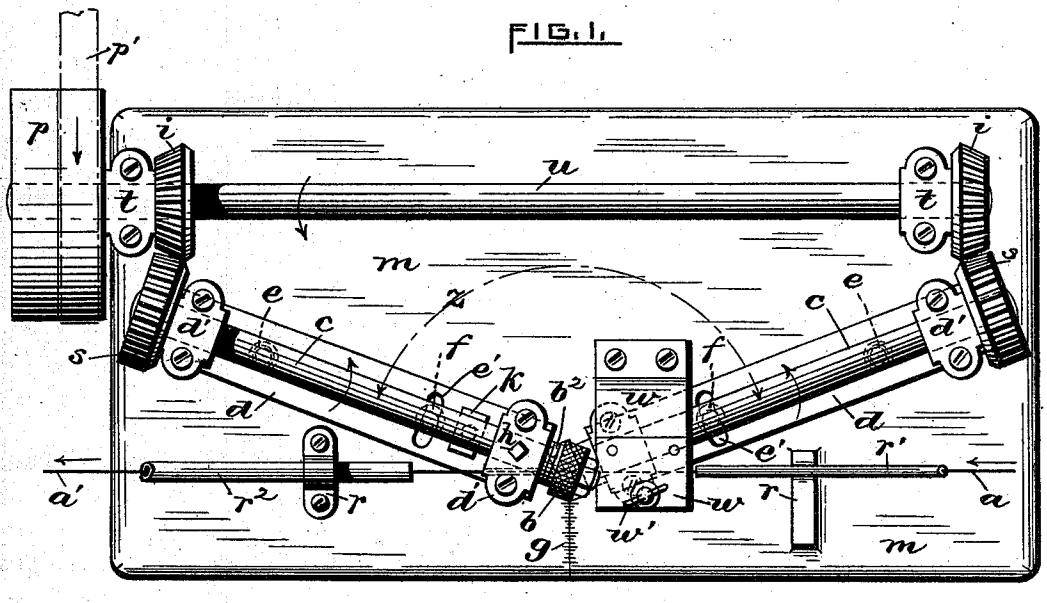
(No Model.)

# S. MOORE.

## MACHINE FOR ORNAMENTING WIRE.

No. 413,625. Patented Oct. 22, 1889.

FIG. 1.



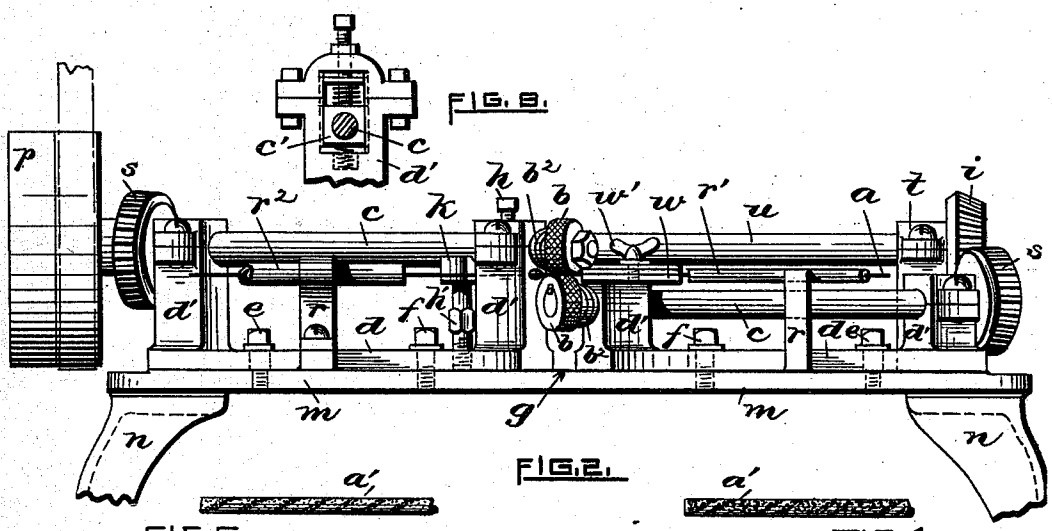




FIG. 2.




FIG. 5.




FIG. 4.




FIG. 6.




FIG. 3.




FIG. 7.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

SAMUEL MOORE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO CHARLES D. REYNOLDS, OF SAME PLACE.

## MACHINE FOR ORNAMENTING WIRE.

SPECIFICATION forming part of Letters Patent No. 413,625, dated October 22, 1889.

Application filed March 16, 1889. Serial No. 303,538. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL MOORE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Ornamenting Wire; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention herewith relates to mechanism for producing figured or ornamental wire; and it consists, essentially, of two driven figure-impressing oppositely-revolving rolls so mounted that the axes thereof cross each other at an angle as contradistinguished from rolls having parallel or substantially parallel axes, the wire being continuously fed along and revolving by reason of its contact with both rolls, which also at the same time impress the figures or ornamental characters into the wire's surface in a spiral manner, all as will be more fully described and claimed.

The object I have in view is to facilitate the manufacture of figured wire. Wire of this class is largely employed in the production of articles of jewelry, &c. Such figured wire has been heretofore produced by hand to a considerable extent by the well-known but obviously slow process of "chasing." Figured wire has also been produced by means of separated parallel rolls revolving in the same direction, the surfaces of the rolls having a spirally-arranged pattern engraved thereon, which is impressed into the surface of the wire, the latter passing between and in line with the axes of the rolls.

By means of my improvement the figured rolls may be readily adjusted to receive between them wire of any suitable size, round, oval, or polygonal in cross-section. The two roll-shafts are mounted in bearings susceptible of lateral adjustment, thereby changing their angular relation, or, in other words, the degrees of the included angle. I would state that the greater the included angle the slower the speed of the revolving traveling wire. Consequently the arrangement of the figures upon the wire will be of less pitch, whereas the same shafts and rolls if adjusted to a less angle will produce the figured wire at a proportionately increased rate and pitch.

In the annexed drawings, Figure 1 represents a plan view of a machine embodying my improvements. Fig. 2 is a front side view. Fig. 3 shows a piece of plain wire before passing between the figured rolls. Figs. 4, 5, and 6 represent various styles of ornamentation which may be produced upon the wire. Fig. 7 shows cross-sectionally a few forms of wire adapted to be employed, and Fig. 8 is a modified form of the roll-shaft bearing.

A more detailed description of the machine and the manner of its operation are as follows:

*a* indicates the wire or stock before passing between the two revolving figured upper and lower rolls *b*. The wire *a* may have any suitable form cross-sectionally—as, for example, the forms shown in Fig. 7. Plated wire may be used, or brass, or any other metal adapted to have the ornamentation impressed into its surface by means of the steel rolls *b*. In case oval wire be used I provide the forward end of the upper roll-shaft *c* with an adjustable spring-bearing, substantially as shown in Fig. 8. By means of this device the box *c'* is adapted to move up and down automatically in unison with the revolving wire.

The bed of the machine is indicated by *m*, which is supported by legs *n*. Bearings *t* at the rear side of the bed support the main or driving shaft *u*. A belt *p'*, leading from a suitable driver, imparts motion to the shaft *u* by means of the connected pulley *p*. To the shaft *u* are oppositely secured suitable gears *i*, which intergear with gears *s*, mounted on the roll-shafts *c*, which latter are susceptible of limited lateral adjustment.

*d* designates the frames, having bearings *d'*, in which the shafts *c* are mounted to revolve. The frames are secured to the bed *m* by bolts *e* and *f*, the bolts *e* being located near the outer end of the frames and serving each as a pivot, the other bolts *f* passing through elongated curved openings *e'*, formed in the frames near the opposite end. By means of this ar-

rangement it will be seen that upon loosening the said bolts the frames *d* (and consequently the shafts *c* and attached rolls) may be vibrated nearer to or farther from the main shaft *u*, the amount of such movement being limited only by the gearing and the slotted openings *e'*, the bolts *e* being the pivots or centers from which the angular movement is taken. Practically the arrangement of the shafts *c* is such that the included angle *z* (shown by dotted lines in Fig. 1) is always greater than ninety degrees, or an obtuse angle, although the shaft, &c., may be set to less than ninety degrees by an obvious change in the arrangement of the parts.

The roll-shafts are arranged in different horizontal planes, one being at the right and one at the left, the axes crossing at their inner ends, as clearly shown in Figs. 1 and 2. The shafts are separated vertically a distance substantially equal to the diameter of the rolls employed. The rolls *b* are made of steel and secured to the inner ends of the shaft *u*. The surface or periphery of each roll has engraved therein the ornamental figure or pattern to be produced upon the surface of the wire *a* during its passage between the rolls. The rolls are so adjusted that a line passing vertically through their centers will also extend through the center of the shaft at the point where they cross each other. The upper shaft is susceptible of a slight vertical adjustment in the front bearing *d'* by means of a cap-screw *h* and an adjusting-screw *h'*, the latter being tapped into the frame *d* and provided at its upper end with a loose block *k*, adapted to engage the shaft. By means of this arrangement the rolls can be nicely set with relation to each other, thereby producing wire having the ornamentation impressed into its surface to any desired practical depth.

To the front of the machine are arranged and supported in stands *r* stationary tubular guides $r'$ $r^2$, the same being parallel with the rear shaft *u* and in line with the space formed by the separation of the rolls. The wire *a* first enters the guide $r'$ at the right, and after being acted upon by the rolls *b* it enters the other guide $r^2$ at the left.

Intermediate of the rolls and the inner end of the guide $r'$ is located a friction-clamp *w*, between the faces of which the wire passes before being engaged by the rolls, an adjusting-screw $w'$ serving to impart the desired resistance or friction to the wire.

A gage *g* may be attached to the center of the machine to facilitate the adjustment of the rolls and shafts.

When the angular distance *z* is changed, more or less, the rolls may be maintained in their proper relations by the use of loose collars or washers $b^2$, or by rolls having different thickness.

The operation is as follows: The engraved rolls *b* are first selected and secured to the ends of the respective angularly-arranged shafts and separated vertically to properly engage the previously-straightened wire. Now, upon revolving the shafts, as indicated, the obliquely-set rolls in turning impress their engraved or cut figures or patterns into the wire's surface *a*, the rolls also at the same time acting to revolve the wire and feed it ahead, and producing the finished wire *a'*. In case the wire travels too freely, it may be corrected by a turn of the clamp-screw $w'$. The ornamentations of the wire *a'* will be found to be arranged spirally round its surface, each spiral or "pitch" representing one revolution of the wire. The size of the wire *a* is enlarged one or two numbers by reason of its passage between the figured rolls. It is evident that the number of turns imparted to the wire during one revolution of the rolls is directly proportional to their diameters. The pitch of the figures or rate of feed is in a measure proportional to the angular distance *z* between the two shafts *c*—that is to say, by increasing the angle the pitch is lessened, and vice versa.

The patterns are usually arranged and cut round the rolls in circles or concentrically, such rolls when set obliquely to each other producing a figured wire having the patterns continuously repeated spirally round its surface. In order to produce a wire having segregated or concentric figures, the patterns are cut spirally round the roll's surface.

In using the smaller sizes of wire, which may be a hundred or more feet in length, it need not be first straightened, as this is practically effected in its passage through the plates of the friction-clamp *w*.

I claim as my invention—

1. In a machine for ornamenting wire, the combination of two engraved rolls mounted on shafts arranged in different planes and forming an obtuse angle with each other and mechanism for revolving the rolls, substantially as hereinbefore described, and for the purpose set forth.

2. In a machine for ornamenting wire, the combination of two simultaneously-driven engraved rolls *b*, mounted one above the other in different parallel planes, the axes of the rolls crossing each other and forming obtuse angles, and guides for maintaining the wire in position during its passage through said rolls, substantially as shown, and hereinbefore described.

3. In a machine for ornamenting wire, the combination of two simultaneously-driven obliquely-arranged engraved rolls *b*, mounted one above the other in different but parallel planes and having the axes of the rolls cross each other, means for changing the angular relation of the rolls, and guides for maintaining the wire in position during its passage through the rolls, substantially as shown and described.

4. In a machine for ornamenting wire, the combination of two simultaneously-driven obliquely-arranged engraved rolls *b*, mounted

one above the other in different planes and having crossed axes revolving in the same direction, and a guided wire simultaneously acted upon by both rolls, which at the same time impress the pattern spirally into the wire's surface, thereby automatically revolving the wire and feeding it ahead, substantially as hereinbefore described.

5. In a machine for ornamenting wire, the combination, with a laterally-adjustable frame and the lower engraved roll mounted and revolving therein, of an oppositely-located and laterally-adjustable frame, a vertically-adjustable driven shaft mounted therein, an engraved roll secured to the shaft and forming a crossed axis with the lower roll, and guides for maintaining the wire in position between the rolls, substantially as hereinbefore described.

In testimony whereof I have affixed my signature in presence of two witnesses.

SAMUEL MOORE.

Witnesses:
CHARLES HANNIGAN,
GEO. H. REMINGTON.