E. F. RICHARDSON.

Machine for Cutting Threads on Wire.

No. 206,688. **Patented Aug. 6, 1878.**

Fig: 1.

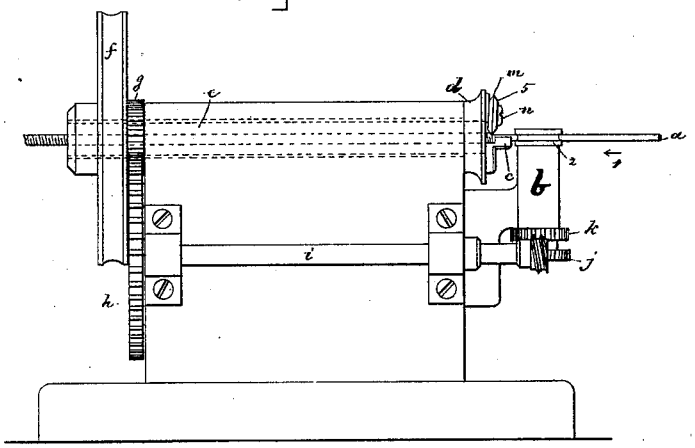


Fig: 2.

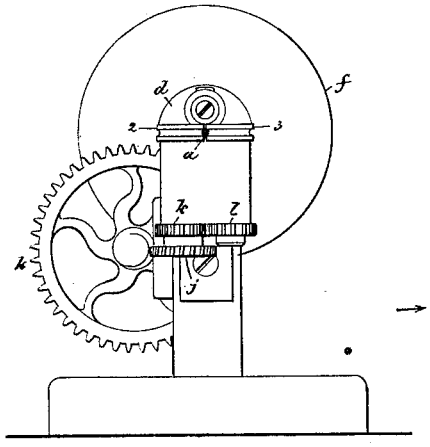


Fig: 6.

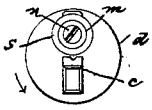


Fig: 3.

Fig: 5

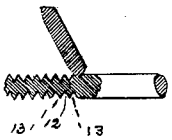
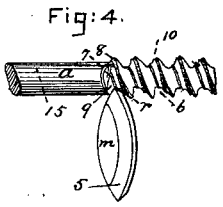


Fig: 4.



Witnesses.

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ELTON F. RICHARDSON, OF READING, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR CUTTING THREADS ON WIRES.

Specification forming part of Letters Patent No. **206,688**, dated August 6, 1878; application filed January 5, 1878.

To all whom it may concern:

Be it known that I, ELTON F. RICHARDSON, of Reading, Middlesex county, and State of Massachusetts, have invented an Improvement in Mechanisms for and Method of Forming Threads on Wire and Rods, of which the following is a specification:

This invention relates to mechanism to form threads on wire for use as fastenings for leather—as in boots and shoes—and for threading metallic rods for other purposes.

The invention consists in a disk-cutter to embed its edges into the wire at right angles to its length, or at an acute angle with reference to its length when viewing the wire at that side of the disk from which the wire or rod is fed, in combination with a feed to move the wire or rod longitudinally, the latter and the disk being also so changed relatively in position that the disk cuts a groove about the wire.

In a machine organized in accordance with this invention, the edge of a disk made to roll about and embed itself into the periphery or surface of the wire at an angle to the axis of the wire differing from the pitch of the thread, and to a depth less than the depth of the thread from its base to its crown, is, in connection with the longitudinal or feeding movement of the wire, made to so act upon that portion of the wire located in front of and moving toward the disk and between the periphery of the wire and the bottom of the cut made by the disk as to push it backward and crowd or shove the metal over above the periphery of the wire, so as to form a prominent screw-thread.

In the ordinary process of cutting screws on wire the outer edge of the thread corresponds with the periphery of the wire being cut, a portion of the wire being removed to leave the threads projecting. In my process none of the stock is removed, but is shoved backward to cause the thread to project prominently above the surface of the wire.

In some processes a die or cutter having several threads has been made to penetrate a rod being threaded, to impress in the surface of said rod a counterpart of the thread; but in my process the material at and between the bases of adjacent threads is separated or shoved along over the central portion of the wire not cut into by the disk, thereby considerably separating the bases of the screw-threads.

In the annexed drawings, forming part of this specification, Figure 1 represents, in side elevation, a screw-threading machine provided with my invention; Fig. 2, a front-end view thereof. Fig. 3 shows the head in front elevation. Fig. 4 represents a piece of wire or a rod threaded in accordance with my invention; Fig. 5, a wire provided with a thread simply embedded or formed by a cutter penetrating its surface, and Fig. 6 a top view of the cutter or disk and head.

The wire *a* to be screw-threaded will be led from a suitable rest and inserted between the feeding device *b*, (shown as two rollers, 2 3, annularly grooved to fit the wire,) will be fed over the wire-rest *c* and through the revolving head *d* in the direction of the arrow 1. The head *d* is connected with the forward end of a rotating shaft, *e*, (shown in dotted lines,) it being driven by a belt or otherwise, through the pulley or wheel *f*. Next to wheel *f* is a pinion, *g*, which engages with a pinion, *h*, on a shaft, *i*, provided with a worm, which engages a worm-gear, *j*, on the shaft to which is secured the feed-roller 2, such shaft having a pinion, *k*, which engages a pinion, *l*, on the shaft which carries the feed-roller 3 to move the two rollers in unison.

The wire-guiding rest *c* sustains the wire against the action of the disk *m*, which, as shown, has a smooth-cutting edge, and is beveled at 4 5. This disk is supported on a stud, *n*, connected with the head, the stud being so placed with reference to the axis of rotation of the head that the forward edge of the disk, or that edge in the direction of its rotation, is inclined, with reference to the axis of the wire, so that such forward edge cuts into the wire at an angle differing from the pitch of the screw-thread to be produced upon the wire. The more this disk is inclined from the direction of the pitch of the thread the more the threads will be separated, and the more prominent and sharp will be the edges of the threads above the original diameter of the wire. The disk resting in the cut in the wire, as the wire is fed in the direction of the arrow 10, will cause that portion of the surface of the wire

next the edge 5 of the disk, and between the periphery of the wire and the point 6 to which the cutter works to be pressed or shoved longitudinally and upward above the original diameter of the wire, forming a prominent screw-thread. The side of the thread resting against the front face of the cutter, viewing it in the direction of movement of the wire or rod, will be acted upon by the cutter completely to the crown or sharp edge of the thread; but the opposite side of the thread, just below the sharp edge, will not be touched by the cutter, and consequently that portion of the thread not acted upon is left rough or ragged, as shown at 10. The pitch of the thread is varied by the action of the feed. It is obvious that the wire might be rotated and the head retained stationary, but that would not be the preferable way.

In Fig. 5 the spaces 12 between the crowns 13 of the threads are as if made by a bevel-edge disk cutting axially into the wire in the direction of the pitch of the thread, whereas in Fig. 4 the bases of the threads are separated, and the crowning or edge portions of such threads are elevated above the level of the original surface of the wire, as shown at 15.

In Fig. 4 the disk *m* has been rotated far enough in the direction of the arrow (see Fig. 3) to cause it to cut into the wire up to the point 7, and then the head and disk have been turned back a little. It will be noticed that the edge of the cut, as represented at 7, next the unthreaded portion of the wire, inclines toward the crown of the thread 8.

The angle of the cut into the wire having been thus shown, it will be understood, as the disk and head are rotated in the direction of the arrow, Fig. 3, that the outer face 5 of the beveled disk will act upon the portion 9 back of the point 7, and will force it up and back, as shown at *r*, into a sharp thread.

The threaded wire herein shown and described will form the subject-matter of another application for Letters Patent of the United States.

I claim—

1. A head and a disk provided with a beveled edge set at an angle to the wire or rod to be cut differing from the angle of the thread to be formed thereon, in combination with a feed to move the wire or rod longitudinally, to operate substantially as and for the purpose described.

2. The wire-guiding rest to hold the wire, in combination with the edged disk to roll over the periphery of the wire and cut into it as the wire is moved longitudinally, and feeding mechanism to simultaneously move the wire, substantially as described.

3. In the manufacture of screws, the herein-described method of raising the thread, consisting in cutting into the periphery of a wire or rod at an angle differing from the pitch of the screw-thread to be produced, and then crowding or shoving the portion of the wire or rod between its periphery and the central uncut portion of the wire laterally with relation to such uncut portion, and raising it as a thread prominently, forming edges above the original surface of the wire, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELTON F. RICHARDSON.

Witnesses:
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L. A. BAXTER.