E. F. RICHARDSON.

Screw-Wire for Boots and Shoes.

No. 213,938. Patented April 1, 1879.

Fig:1.

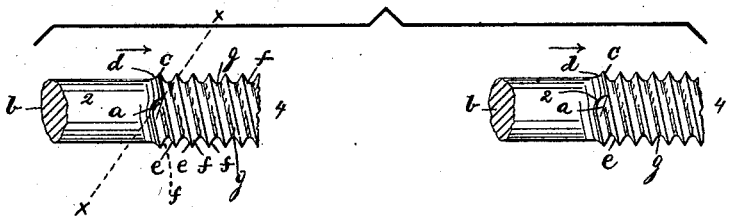


Fig:2.

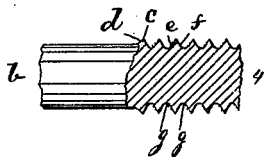
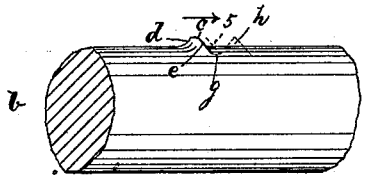


Fig:3.



Witnesses.

E. F. Connor

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UNITED STATES PATENT OFFICE.

ELTON F. RICHARDSON, OF READING, ASSIGNOR TO GORDON McKAY AND JAMES W. BROOKS, TRUSTEES OF THE McKAY METALLIC FASTENING ASSOCIATION, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SCREW-WIRE FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **213,938**, dated April 1, 1879; application filed January 29, 1879.

To all whom it may concern:

Be it known that I, ELTON F. RICHARDSON, of Reading, county of Middlesex, State of Massachusetts, have invented an Improvement in Screw-Wire, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to an improved screw wire or rod; and consists in a wire or rod having a thread lifted up from the body of the wire and moved longitudinally with relation to the center line of the length of the wire or rod, the diameter of the threaded portion of the wire or rod being enlarged beyond the original diameter of the wire or rod before it was threaded.

In the manufacture of screws from wire or rods it is customary to cut and remove from the material a portion of its surface to form the threads, which results in much waste.

It is also common to press a wire or rod between threaded rollers or wheels, which displace the material, forming threads corresponding substantially in shape and size with the projections upon the cylinders or other devices which are pressed into the surface of the rods; but in this plan the screw-threads are not as true as when cut in the way first cited, the threads cannot be evenly formed for any depth, and the wire or rod is apt to be elongated, which is objectionable, especially when the wire is being threaded as it is being used in a machine, say, for nailing boots and shoes.

Figure 1 of the drawings represents, on an enlarged scale, a piece of wire made in accordance with my invention; Fig. 2, a section, and Fig. 3 an enlarged detail.

This wire may be made upon a machine such as represented in United States Patent No. 206,688, heretofore granted to me.

When making this screw, a sharp-edged wheel, placed in contact with the surface of the wire or rod to be provided with a screw-thread, is made to rest against and cut into the periphery of the metal, and the axis of the wheel not being parallel with the axis of rotation of the wire, and the wire being moved in the direction of the arrow near it, the cutter, placed angularly, as described in the said patent, is caused, after it cuts into the wire, to plow or turn up the body or that part of the periphery of the wire above the bottom edge of the cutter, and at that side of it at its face toward which the wire moves, thereby forming one side of a thread, and at the same time it shoves or crowds the metal entered by the cutter longitudinally along over the central or uncut portion of the wire, leaving a space, *g*, between each thread. So far I have described the construction of but one side of the thread.

In the drawings, the dash or cut *a* represents the wire as it will appear when the cutter is removed from contact with the wire *b* during the formation of a screw-thread thereon.

It will be noticed that the dash or cut is in the direction of the line *x x*, and if continued would cut across the raised and half-formed thread *c*. This severing of the half-formed thread is obviated by longitudinal movement of the wire under the cutter. The cutter, by this change of position or feeding motion of the wire, is made to cut or ride upon and along the already half-formed thread and cut its unfinished side down, as at *e*, thus completing that side of the thread.

It will be observed, by referring to the said dash *a*, (and understanding that in it is placed a bevel-edged wheel, as in the patent herein referred to, the said wheel having its edge so placed as to bring it in contact with the body of the wire at an angle to the center of the wire,) that the part 2 of the dash is carried from the unfinished side of the thread into which the cutter cuts longitudinally along the wire, and as the wire *b* and disk are removed from contact the edge of the disk or cutter smooths and finishes the first half of the thread, as at *f*.

The body *b* of the wire is, it will be noticed, of less diameter than the threaded portion plowed up from the said body, and this is accomplished without any loss of metal.

It will also be noticed that the thread is quite sharp, more so than can be practically made by a squeezing or pressing operation.

That side, *e*, of the thread which is last completed is not as smooth and regular as the side, *f*, first completed, because at the time the sec-

ond side is being formed the metal is being moved longitudinally away from rather than toward the cutter; but this is turned to advantage in the use of the screw in this way, viz: the front or entering end of the screw will be at 4, and the smooth part *f* acts upon the material, displacing it as the screw is being inserted, and the rougher side *e* exerts a greater holding power, to prevent the screw being turned backward and out from the material.

Wire having a thread such as described may be readily distinguished from screw-threaded wire made by cutting away and wasting the stock, and is cheaper to make, and it is better than is the wire made by pressure of dies or rollers alone without cutting and plowing, as described, because of the sharpening of its threads and the increase of diameter.

This improved wire is especially adapted for uniting soles of boots and shoes, and for leather-work in general, and will also operate well in all soft woods. The thread portion of a screw made in this way is, by compacting the metal, made harder than the center part of the screw.

I denominate as "center part" all that portion of the wire or rod at its center from base of one thread diametrically through the wire to the base of a thread at its opposite side.

In Fig. 3 the projection *h* is supposed to represent a finished thread. To form the half-finished thread *d c*, the metal of the wire *b* was first cut into by the cutter, indenting the wire, as shown by the V-shaped dotted lines, and as the wire *b* was moved longitudinally the side 5 of the wire at the V-shaped cut was carried bodily along on the central part of the wire to the full-line position, completing side *e* and leaving space *g*.

It is obvious that I might employ two cutters instead of one, and by increasing the speed of feeding the wire I might make a double-threaded wire of greater pitch.

I claim—

As an improved article of manufacture, screw-threaded wire provided with a thread turned or plowed upward to project beyond the original diameter of the wire, and forming a uniform and continuous helix around it, 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:

G. W. GREGORY,

L. F. CONNOR.