

(No Model.)

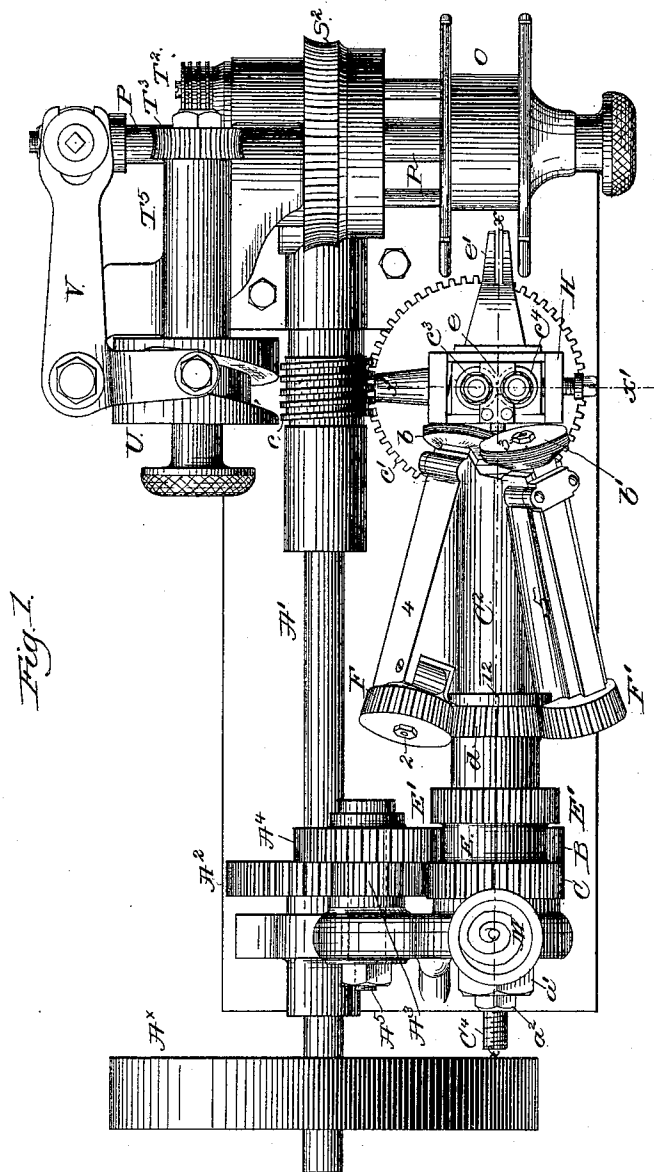
2 Sheets—Sheet 1.

L. GODDU.

MACHINE FOR THREADING WIRE.

No. 351,372.

Patented Oct. 26, 1886.



Witnesses.
Fred L. Conroy.
John F. C. Pomeroy.

Inventor:
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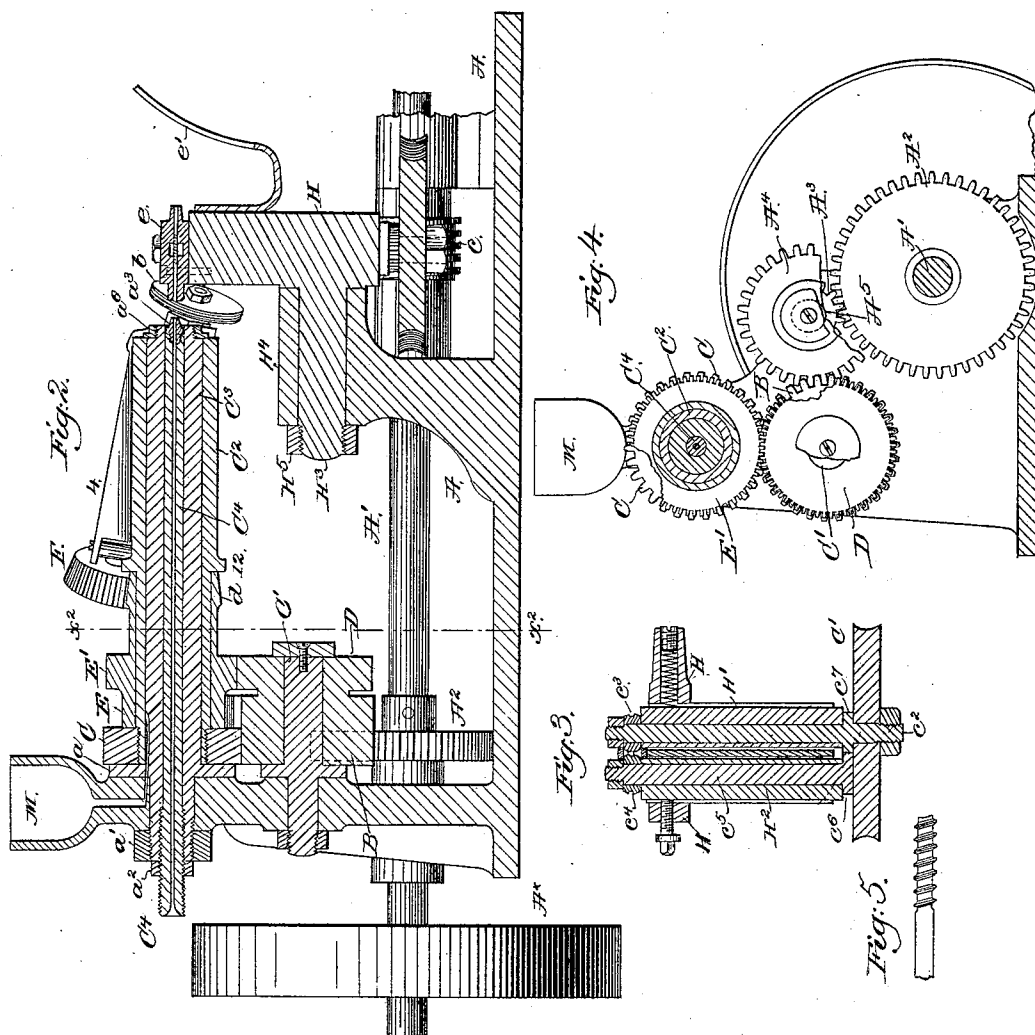
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UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE,
OF CAMBRIDGE, MASSACHUSETTS.

MACHINE FOR THREADING WIRE.

SPECIFICATION forming part of Letters Patent No. 351,372, dated October 26, 1886.

Application filed June 8, 1885. Serial No. 168,007. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GODDU, of Winchester, county of Middlesex, and State of Massachusetts, have invented an Improvement in Machines for Threading Wire, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of an improved machine by which to form threads on wire, the latter being applicable for boot and shoe and other work.

In accordance with my invention the wire is acted upon at substantially diametrically-opposite points by the annularly-grooved peripheries of two pressure-rollers on axes inclined with relation to the longitudinal center of the wire being acted upon, the axes of the said wheels being more or less inclined with relation to the longitudinal axis of the wire, according as the pitch of the thread is to be more or less, the axes or shafts of the pressure-rollers being carried by a rotating hollow shaft, and being provided with bevel-gears driven by teeth on a sleeve surrounding the said hollow shaft, and having a slower speed of rotation, the parts being so moved as to compel the pressure-wheels to revolve with their shafts about the wire, the said wheels during such revolution rotating about their own axes, the peripheries of the pressure-wheels rolling around and in contact with the periphery of the wire, but without rubbing friction thereon, such contact and method of operation resulting in so pressing the wire as to cause the material displaced by the annular projections of the pressure-rollers to be thrown out, so as to fill the annular grooves between the annular projections of the said rollers, and this without removing any of the metal of the wire, as would be the case if the rollers had a more rapid movement about their own axes, so as to cause them to cut into the surface of the wire and plow up the metal, forcing a part of it along longitudinally, as has been done. The wire as it is threaded is taken away by drawing-rollers which grasp it, and the wire is wound upon a spool substantially as in a patent of the United States granted to me, No. 167,760.

This invention is an improvement on the class of machine represented in United States Patent No. 181,010, and also on the class of machine represented in my application, Serial No. 141,936, filed September 1, 1884.

Prior to this invention rolls have been employed for pressing or forming threads on rods and screw-blanks, the said rolls being positively rotated and acting against the said rods or blanks; but prior to my invention I am not aware that the axles carrying the rotating rolls have ever been revolved about the wire, thus giving to the said rolls a planetary motion about the axis of the wire.

My invention in machines for threading wire consists, essentially, in a tube or guide for the wire and a pressure-roll revolving about the wire to indent a thread thereon, the roll being set at an angle with relation to the axis of the wire and rolling about the wire in the direction of the thread thereon, combined with means to automatically rotate the said pressure-roll on its own axis at such a rate of speed as will cause the roll in contact with the wire to travel about it without causing twisting strain.

Figure 1 is a top or plan view of a wire-threading machine containing my invention; Fig. 2, a section thereof in the line $x x$; Fig. 3, a partial section of Fig. 1 in the line x' , the winding mechanism being omitted; Fig. 4, a section in the line $x^2 x^2$, looking toward the left; and Fig. 5 shows a piece of wire provided for part of its length with a thread cut in accordance with my invention.

The frame-work A, of proper shape to contain or support the working parts, has a shaft, A', which is driven from any suitable source. This shaft, provided with a belt-pulley, A^x, has a gear, A², which engages a pinion, A³, connected with an intermediate gear, A⁴, loose on a stud, A⁵, of the frame-work, the said gear engaging and driving a gear, B, loose on the shaft or stud C', the latter engaging a toothed gear, C, fast on and rotating the hollow shaft C², mounted loosely in the hollow stud C³, provided with a flange, a , and having one end extended through an upright of the framing and provided with a set-nut, a' .

The hollow shaft C² is shown as having outside of it wings or projections 4 and 5, two

such projections being shown. The wing or projection 4 receives a shaft or axle, 2, and the wing or projection 5 a shaft or axle, 3, the said shafts or axles having attached to them, respectively, the pressure-rolls $b\ b'$.

The hollow stud C^3 has screwed into it in an adjustable manner the tubular wire-guide C^4 , it being confined in place by a set-nut, a^2 . The front end of the guide C^4 will preferably have a nose, a^3 , of steel, screwed into it, and made tapering externally, the nose supporting the wire close to the point where the pressure rollers or wheels $b\ b'$ act upon the wire.

The hollow shaft C^2 or pressure-roller-carrying frame is reduced at one end to form a shoulder, 12, and the end of the reduced part is threaded, and the gear C is screwed thereon, the hollow shaft being surrounded between the said shoulder and gear by the sleeve E .

The hollow shaft C^2 is held upon the stud C^3 by a nut, a^6 , screwed upon the reduced end of the stud and overlapping the end of the shaft, as shown in Fig. 2.

The gear B , having rather coarse teeth, has at one side a second gear, D , of slightly less diameter and having finer teeth, the latter gear engaging the gear E' on the hollow sleeve E . The gear D is shown as forming an integral part of the gear B , so as to rotate in unison with it, each gear $B\ D$, however, driving the gears C and E' , engaged by them, at different speeds.

While the hollow shaft C^2 and the wings or projections holding the shafts 2 3 are revolved about the hollow stud C^3 , the bevel-gears $F\ F'$, in engagement with the bevel-toothed gear d , cause the rotation of the shafts 2 and 3, each about its own axis, the peripheries of the pressure-rolls $b\ b'$ acting against the periphery of the wire at two opposing points and traveling about the wire, the surface speed of the said wheels $b\ b'$, in contact with the wire, being determined by the rotation of the shafts 2 and 3 about their own axis, and by the revolution of the said shafts with the hollow shaft C^2 . The surface speed so gained for the rolls is such as to enable the peripheries of the rolls $b\ b'$, in contact with the surface of the wire, to roll about and indent the wire without twisting it.

The shaft A' has on it a worm, e , which engages and drives a worm-gear, e' , on the end of a shaft, c^2 , having at its upper end one of the wire-drawing wheels, c^3 , the latter being provided with an annular groove, and having cooperating with it a second like wheel, c^4 , on a shaft, c^5 , having a toothed gear, c^6 , engaged and driven by a gear, c^7 , on the shaft c^2 . The block H , which receives loosely the bearings $H'\ H^2$ for the shafts $c^2\ c^5$, has a stem or extension, H^3 , which is extended through an upright on the frame A , and secured in place by a nut, H^4 .

The shafts and rolls for drawing the wire through the guide-tube and causing it to travel between the rolls are substantially such as shown in my Patent No. 167,760, September 14, 1875.

The threaded wire will preferably be led through a guide, e , (see Figs. 1 and 2,) and a guide, e' , and thence to a spool, O . The spool O , shaft P , worm-gear S^2 , worm T^2 , worm-gear T^3 , bearing T^3 , cam U , and elbow-lever V are substantially the same as in United States Patent No. 167,760, referred to, where the parts are designated by like letters, and the worm-gear S^2 will be rotated, as in the said patent, by a second worm on the main shaft A' , the said worm not being herein shown.

In operation the hollow shaft C^2 is rotated, carrying with it the shafts 2 and 3, on which are secured the pressure-rollers $b\ b'$, and by means of the gears $F\ F'$ and the teeth d of the sleeve E , the latter being rotated at a different speed from that of the hollow shaft, the pressure-rolls are rotated as they are revolved about the wire, so that the surface speed of the pressure-rollers about their own axes is just equal to the speed of revolution of the rollers about the wire, which results in causing the pressure-rollers to roll steadily about the wire, thus avoiding twisting strain, and as the result the wire is pressed hard between rolling-surfaces, and that part of the wire opposite the grooves in the pressure-rollers is made to rise, while the parts of the wire acted upon by the annular projections of the pressure-rollers are sunk, thus forming upon the wire a waved but spiral surface, like a screw-thread; but in the formation of the thread the skin of the wire is not broken or removed, or, in other words, the stock is not cut out and wasted.

Fig. 5 shows a piece of wire partially threaded in my machine.

To lubricate the surfaces between the stud C^3 and the hollow shaft, I have provided an oil-cup, as at M .

The pressure-rollers may have one or more projections, and the projection or projections will be of greater or less width, according to the fineness of the thread to be produced, and of greater or less pitch, according to the pitch desired.

In another application, Serial No. 141,936, I have shown three rotating disks, which are set at an inclination to the axis of the wire according to the pitch of the thread to be produced, and I have therein provided means whereby the edges of the disks roll over and indent the wire, forming threads by pressure alone, instead of by removing part of the stock. In the said application I have provided means to rotate the wire, and the bearings for the shafts of the disks are stationary, but the disks are rotated at a surface speed corresponding with the surface speed of the wire.

I claim—

1. In a machine for threading wire, a tube or guide for the wire, and a pressure-roll revolving about the wire to indent a thread therein, the roll being set at the proper angle with relation to the axis of the wire to roll in the direction of the thread, combined with means, substantially as described, to automatically rotate the pressure-roller on its own axis

at such a rate of speed as to roll upon the wire without causing twisting strain, substantially as described.

2. In a machine for threading wire, a rotary tube or hollow shaft through which the wire passes, and opposing pressure-rolls carried by and revolving with said shaft around the wire to indent the thread, the rolls being set at such an angle with each other and with the axis of the wire as to roll in the direction of the thread, combined with means, substantially as described, to automatically rotate the pressure-rollers upon their own axes at such a rate of speed as to roll upon the wire without causing twisting strains, substantially as and for the purpose described.

3. The combination, in a machine for threading wire by pressure, of two grooved pressure-rolls set at an angle to the wire and to each other, and a rotary hollow shaft having bearings for the pressure-roll shafts, the rolls being automatically revolved, by means substantially as described, with relation to the wire, and also at the same time rotated about their own axes, by means substantially as described, whereby the pressure-rolls are made to pass over the surface of the wire, substantially as described.

4. The combination, in a machine for threading wire by pressure, of shafts having grooved pressure-rollers set at an angle to the axis of the wire and to each other, and a rotating hollow shaft provided with bearings for the shafts carrying the pressure-rollers, the pressure-rollers being revolved with relation to the wire, and being rotated about their own axes during their revolution, whereby the pressure-rollers are made to roll over the surface of the wire, substantially as described.

5. The combination, in a machine for threading wire by pressure, of a nose to hold the wire to be acted upon, shafts having grooved pressure-rollers set at an angle to the axis of the wire and opposing each other, and a rotating

hollow shaft provided with bearings for the shafts carrying the pressure-rollers, the pressure-rollers being revolved with relation to the wire, and being rotated about their own axes during their revolution, whereby the pressure-rollers are made to roll over the surface of the wire, substantially as described.

6. In a machine for threading wire, a nose to hold the wire to be acted upon, shafts having grooved pressure-rollers set at an angle to the axis of the wire and in opposition each to the other, and a rotating hollow shaft provided with bearings for the shafts carrying the pressure-rollers, the pressure-rollers being revolved with relation to the wire, and being rotated about their own axes during their revolution, whereby the pressure-rollers are made to roll over the surface of the wire, combined with rolls to act upon and move the wire longitudinally, substantially as described.

7. In a machine for threading wire, a nose to hold the wire to be acted upon, two shafts having grooved pressure-rollers set at an angle to the axis of the wire and in opposition each to the other, each pressure-roller supporting the wire at opposite sides, and a rotating hollow shaft provided with bearings for the shafts carrying the pressure-rollers, the pressure-rollers being revolved with relation to the wire, and being rotated about their own axes during their revolution, whereby the pressure-rollers are made to roll over the surface of the wire, combined with rolls to act upon and move the wire longitudinally, and with a spool and means to rotate it, to wind the said threaded wire upon the spool, substantially as described.

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

LOUIS GODDU.

Witnesses:

GEO. W. GREGORY,
B. J. NOYES.