(No Model.) 3 Sheets—Sheet 1.

W. H. SAWYER.

MACHINE FOR SPOOLING WIRE.

No. 385,684. Patented July 3, 1888.

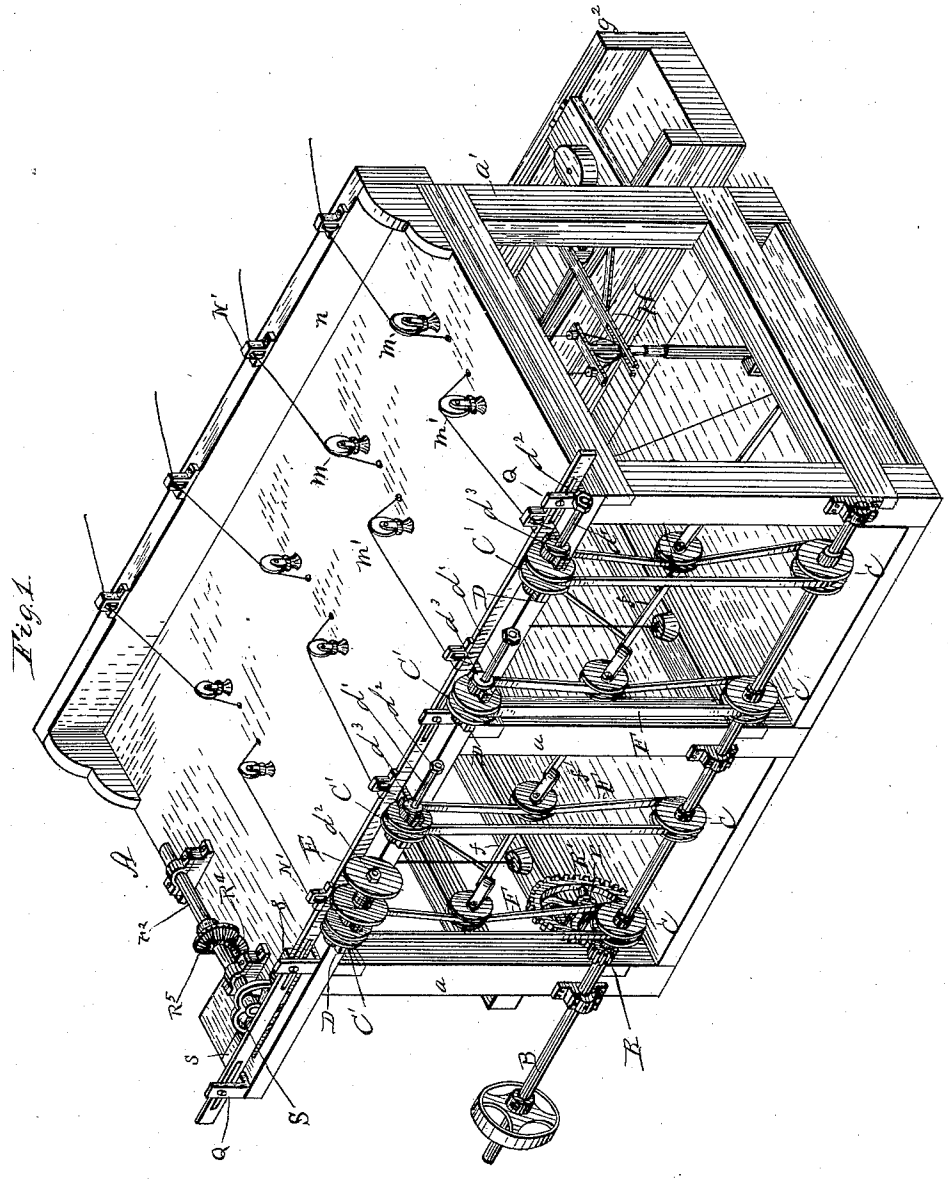


Fig. 1.

WITNESSES

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Fig. 2.

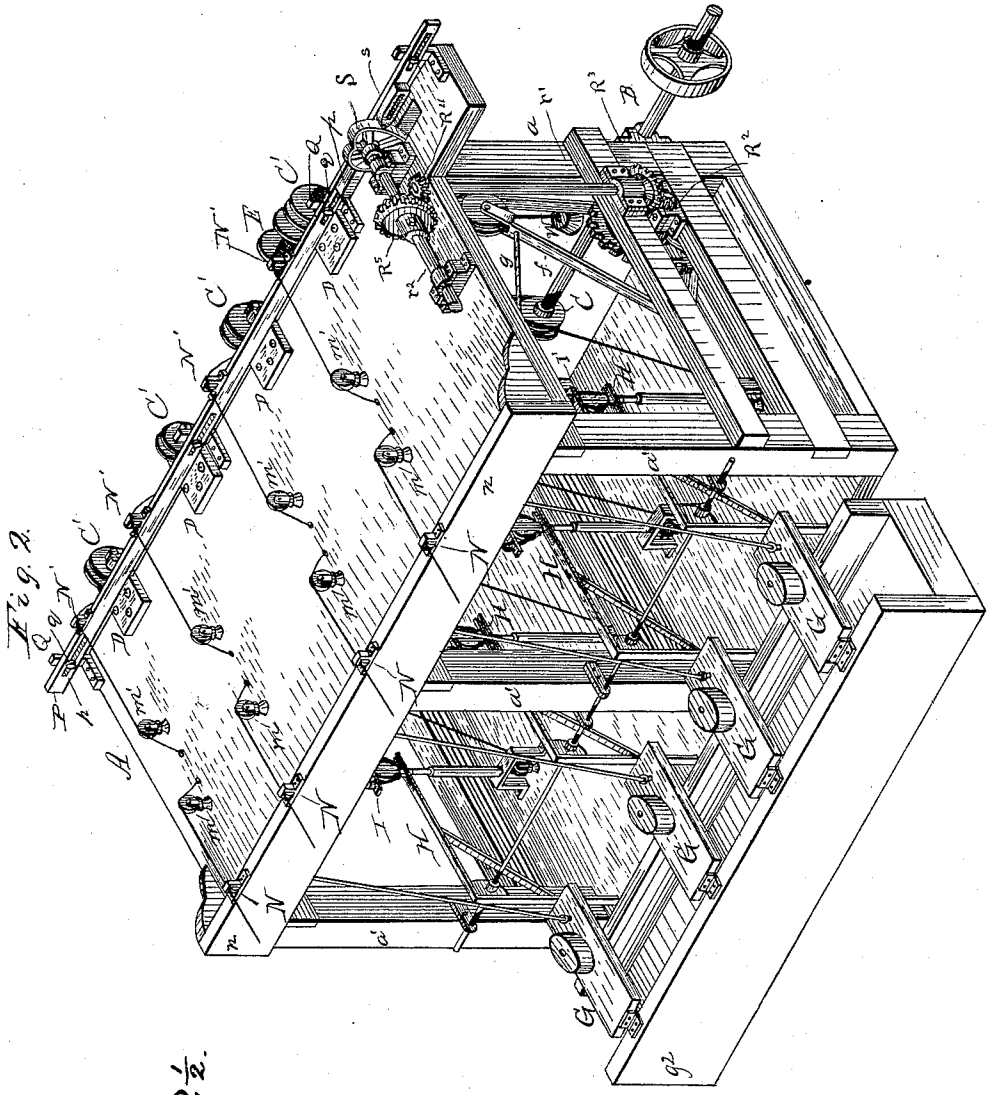
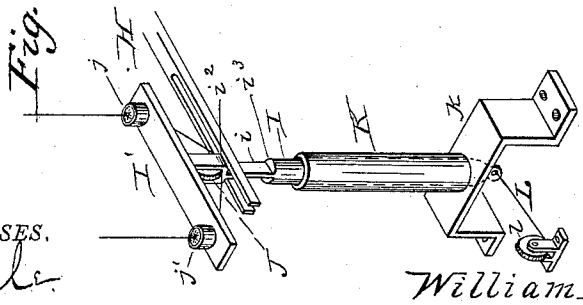


Fig. 2½.



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Fig. 3.

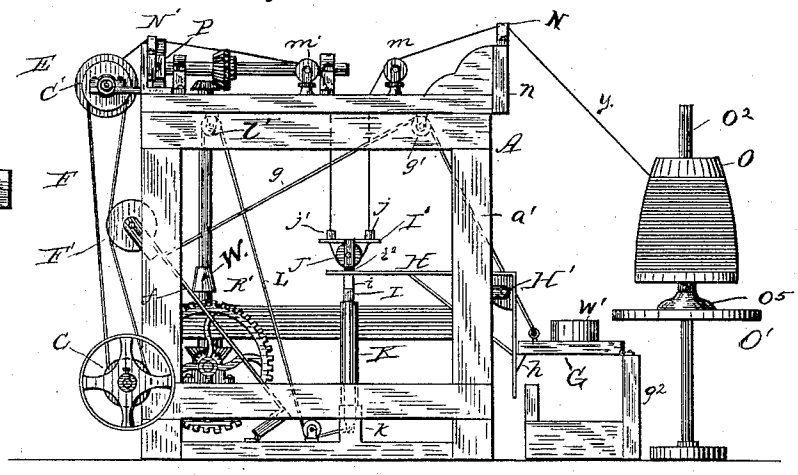


Fig. 4.



Fig. 5.

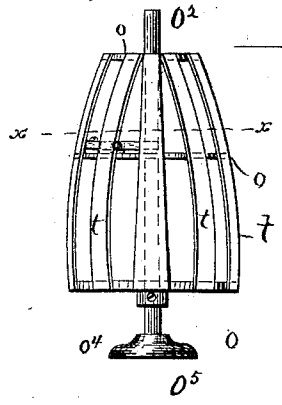


Fig. 6.

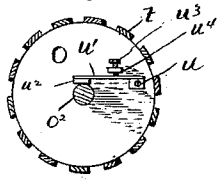
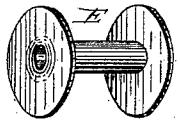


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM H. SAWYER, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR SPOOLING WIRE.

SPECIFICATION forming part of Letters Patent No. 385,684, dated July 3, 1888.

Application filed November 28, 1884. Serial No. 149,121. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SAWYER, 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 Spooling Wire, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in wire-spooling machines.

The object of the invention is to automatically transfer wire from hanks or skeins to spools or bobbins in even layers and to intercept kinks or snarls in the wire and automatically stop the winding before they reach the spools or bobbins.

The invention consists in certain novel combinations of devices, which will be fully understood from the following particular description, in connection with the accompany drawings, in which—

Figure 1 is a perspective view of a wire-spooling machine constructed according to my invention, the supply-reels and their supports being omitted. Fig. 2 is a similar view from the opposite side. Fig. 2½ is a detail view of some of the parts. Fig. 3 is an end view of the machine. Fig. 4 is a detached top view of one of the lifting-heads carrying wire guides. Fig. 5 is a view in elevation of one of the reels and its supporting-rod. Fig. 6 is a cross-section of the same on line $x\,x$ of Fig. 5. Fig. 7 is a perspective view of one of the wire-spools.

The letter A indicates a table or platform supported by legs $a\,a'$, upon which near their feet a driving-shaft, B, is mounted in suitable bearings, and is provided at intervals with flanged belt-pulleys C.

At one edge of the table are secured outwardly-projecting brackets D, in which are mounted short shafts or arbors, upon which are fixed belt-pulleys C', said arbors each having a spindle, d', projecting from one end. The spindles are to carry spools—such as at E, Figs. 1 and 7—for receiving the wire, said spools being bored centrally to fit on the spindles, and secured by nuts d^2, which bind them against shoulders d^3 of said spindles. The pulleys C and C' are connected by belts F, which are too loose to transmit motion, except when tightened by tightening-pulleys F', carried at the upper ends of arms f, which have their lower ends hinged to the floor or some suitable support under the table.

From each of the arms f a rope, g, passes across under the table over a guide-pulley, g', and down to a small platform, G, hinged at its outer edge to a support, g^2, and having its inner edge arranged to rest upon a shoulder or step, h, formed on the vertical edge of an angle-piece or bent lever, H, which is pivoted at its angle upon a rod, H', supported by the rear legs, a', of the table. The upper edge or horizontal arm of the angle-piece or bent lever extends inwardly under the table, and is slotted or bifurcated at its inner end to receive a flattened portion, i, of a rod, I, the lower portion of which fits loosely through a vertical guide-tube, K, the lower end of which is screwed through the top plate of a bracket or bridge, k, the feet of which rest upon the floor or base of the table. The flattened portion of the rod I terminates at each end at shoulders $i^2\,i^3$ of the rod, which cannot pass through the slot in the end of lever H.

To the lower end of the rod I is attached one end of a cord, L, which passes under a pulley, l, thence upward over a pulley, l', and then downward, its depending end being attached to a weight, W. Upon the upper end of the rod I is secured a cross-head, I', in the ends of which are holes surrounded by cups $j\,j'$, in which are preferably secured centrally-perforated glass or porcelain beads, which serve as wire guides, and in a slot of the rod below the cross-head is pivoted a guide-pulley, J. The shoulder i^2 or lower end of the upper enlarged portion of the rod I rests normally upon the inner end of the horizontal arm of angle-piece H.

Upon the top of the table directly over the cross-head I' are mounted two guide-pulleys, $m\,m'$, between which are two openings for the vertical passage of the wire or a single opening large enough for both portions of the wire. Upon the rear edge of the table is a rim or ledge, n, upon which are mounted guides N for directing the wires to the pulleys m from reels O, mounted on supports O', located at the rear of the table at a suitable height, or the reels

may be supported in any other suitable manner. The guides N are preferably grooved pulleys mounted in suitable bearings.

Near the front edge of the table is arranged a traverse-bar, P, having slots *p*, into which pins or studs *q* project from standards Q, so that the bar may have a limited longitudinal reciprocating motion. The means for giving to said bar such motion will be described farther along. Upon the top of this traverse-bar are mounted guides N′, preferably such as guides N, for directing the wires upon the bobbins, as at E, Fig. 1, carried by the spindles *d*′.

Near one end of driving-shaft B a pinion, R, is fixed upon said shaft and gears with a cog-wheel, R′, fixed upon a short shaft, *r*, mounted in suitable bearings and carrying at its opposite end a bevel gear-wheel, R^2, which meshes with a horizontal bevel gear-wheel, R^3, carried at the lower end of a vertical shaft, *r*′, which at its upper end carries a similar bevel gear-wheel, R^4, meshing with a larger bevel gear-wheel, R^5, carried by a horizontal shaft, r^2, mounted transversely in bearings on top of the table. At one end this horizontal shaft carries a heart-wheel, S, which revolves between and in contact with two friction-bearings, *s s*, projecting from one side of the traverse-bar P, so that as said heart-wheel revolves it will communicate a reciprocatieg motion to the traverse-bar in the well-known manner, this motion being such as to carry the guides N′ slowly back and forth a distance equal to the space between the heads of each spool carried by the spindles.

Each of the reels O is composed of two or more disks, *o*, to the peripheries of which are secured slats *t* after the manner of a cage, the slats being preferably separated sufficiently to allow access between them to the interior of the reel. The disks decrease in size successively upward, so that the reel will have the shape of the frustum of a cone in order to receive different-sized hanks or skeins of wire, and each disk is bored centrally for the passage of a supporting-rod, O^2, which projects upwardly from the heavy base O^5, which is adapted to rest upon the support O′, said rod being provided with a collar, o^4, upon which the lower disk of the reel rests, said collar being capable of vertical adjustment upon the rod O^2 by means of a set-screw, *x*, as shown in in Fig. 5. By means of this collar the reel may be supported in proper vertical adjustment upon its supporting-rod.

Upon one of the disks of the reel, preferably the middle one, is secured a post, *u*, to one side of which is secured one end of an elastic bar, *u*′, preferably of metal, having its other end provided with a pad, u^2, of leather, wood, or other suitable material, which stands flatwise adjacent to the supporting-rod O^2, and may be pressed against it with more or less force by a set-screw, u^3, which plays through a post, u^4, and has its tip arranged to bear against the elastic bar. By regulating the pressure of the pad on the supporting-rod the reel may be caused to turn steadily and keep the wire properly taut.

The weight W should be sufficient to keep taut a loop of wire passing down around the pulley J, but not too heavy to be lifted by such loop should occasion require.

Upon the hinged platform G is placed a weight, W′, so heavy that if the platform swings downward on its hinge the rope *g* will raise the arm *f* to lift the tightening-pulley F′ from the belt F and leave said belt so loose that it will not transmit motion from the pulley C to pulley C′.

The holes in the beads in the cups *j j*′ should be of sufficient diameter to allow the wire to pass freely when clear of kinks and knots, but not otherwise.

In Fig. 3 the wire being spooled is designated by the letter *y*. It will be seen that this wire passes from the reel O over guides N, down over pulley *m*, through the guide-bead in cup *j*, under pulley J, then up through the guide-bead in cup *j*′, over pulley *m*′, and thence horizontally over guides N′ to the spool E. Now, when the driving-shaft B is caused to rotate by suitable connection with a motor motion will be transmitted by the belts F to the shafts and spindles carrying the spools. The spools will draw the wires from the reels and the guides on the traverse-bar, operated as already explained, will cause the wires to be laid in smooth successive layers upon the spools.

If there should be a kink, snarl, or knot in the wire it cannot pass the guide-beads, but will there be arrested, and the drawing of the spool upon the wire beyond will cause the strand of wire which travels upward over pulley *m*′ to lift the rod I, so that the shoulder i^3 of said rod will strike and lift the horizontal arm of angle-piece H, so that its pendent arm will swing inwardly, releasing the platform G from shoulder or step *h* and allowing said platform to fall. As before explained, the falling of this platform causes rope *g* to lift the tightening-pulley F′ from belt F, and therefore the rotation of the spool will be automatically stopped until the wire is cleared. In practice the stoppage of the spool is instantaneous when a kink, snarl, or knot is arrested by the guide.

I do not limit myself to the precise constructions and arrangements of parts as shown in my drawings, but may vary the same as may be found expedient without departing from the essential principle of my invention.

What I claim is—

1. The combination, with the spool-spindle, driving-shaft, belt for transmitting motion from the driving-shaft to the spool-spindle, the delivery-reel, the traverse-bar provided with a wire-guide, and mechanism for operating said traverse-bar, of the belt-tightening pulley, the hinged arm, the platform G, the cord *g*, the pivoted angle-piece H, having on its depending arm a shoulder for supporting the platform G, the loop wire-guide connected with

the horizontal arm of said angle-piece, and the guide-pulleys for directing the wire to and from the loop-guide, the whole being arranged for operation substantially in the manner as and for the purpose specified.

2. The rod I, a surrounding vertical tube, K, base *k*, a weighted cord connected with the lower end of said rod, a cross head, I′, mounted upon the upper end of said rod, having cups *j j′*, and a guide-pulley, J′, in combination with the angle-piece H, having shoulder *h*, and the platform G, substantially as and for the purpose specified.

3. In a wire-spooling machine, the combination, with the frame and a movable loop-guide, of a bent lever having one end forked and its opposite end provided with a step, a weighted platform having a hinged connection at one end and its other end adapted to rest on said step, a swinging belt-tightening pulley, a flexible connection between said platform and pulley, and the shafts and belts for spooling the wire, substantially as described.

4. The combination, with supporting-rod O^2, of the reel O, formed of the disks *o* and slats *t*, and provided with an elastic bar arranged on one of said disks between the slats, which bears against said supporting-rod O^2, and a thumb screw for adjusting the bar, substantially in the manner and for the purpose specified.

5. In a wire-spooling machine, the combination, with the spooling-spindle, driving-shaft pulley, and belt, of a belt-tightener having a weight attached thereto and a lever for retaining said weight in an elevated position, and having guides connected therewith through which the wire may pass, whereby it is adapted to release the weight on the occurrence of snarls or knots in the wire, substantially as described.

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

WILLIAM H. SAWYER.

Witnesses:
GILMAN E. JOPP,
WM. A. HATHAWAY.