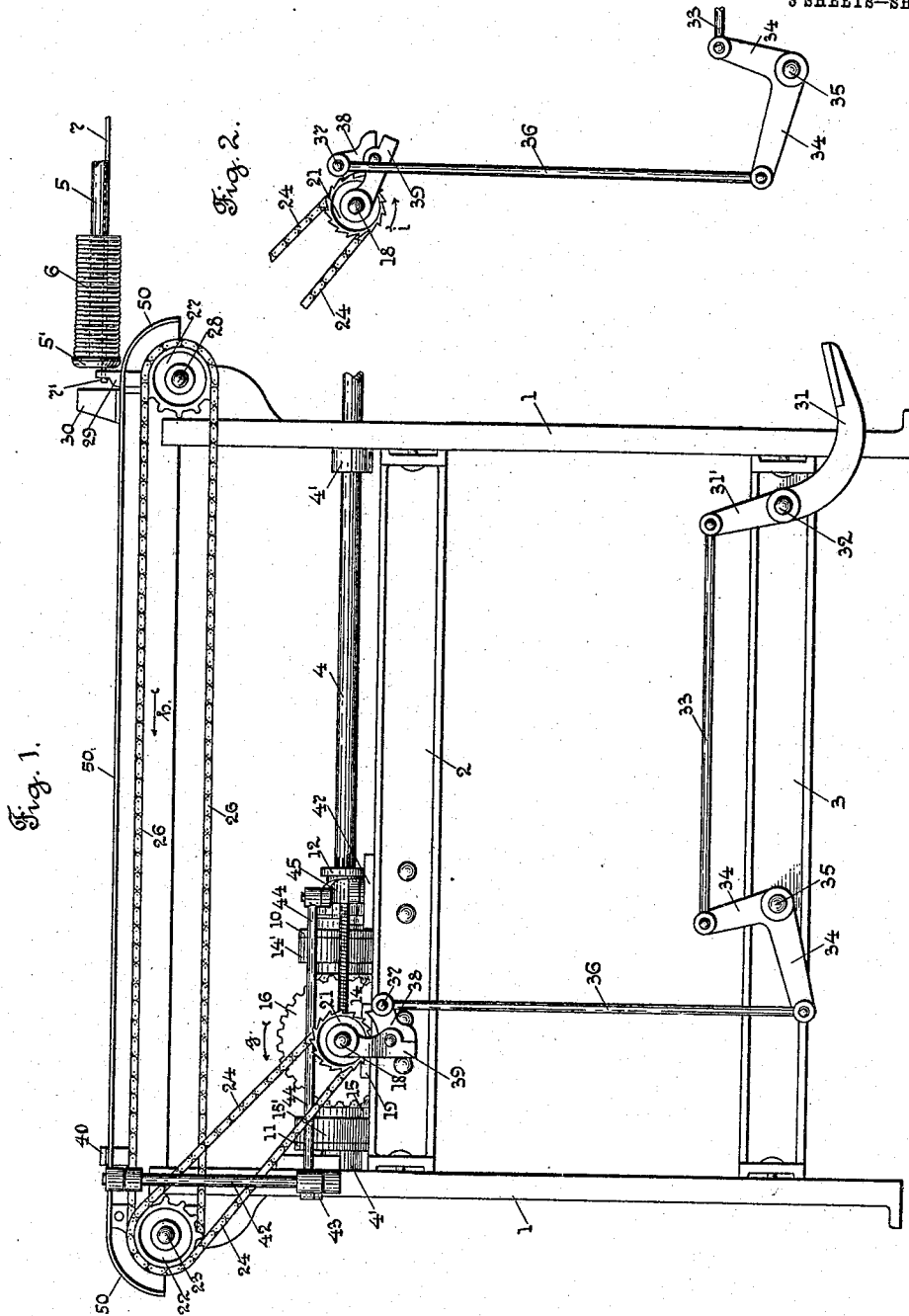


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SPOOLER FOR PILE FABRIC LOOMS.
APPLICATION FILED JAN. 2, 1908.

933,213.

Patented Sept. 7, 1909.
3 SHEETS—SHEET 1.



Witnesses
M. Bredt.
M. Hean.

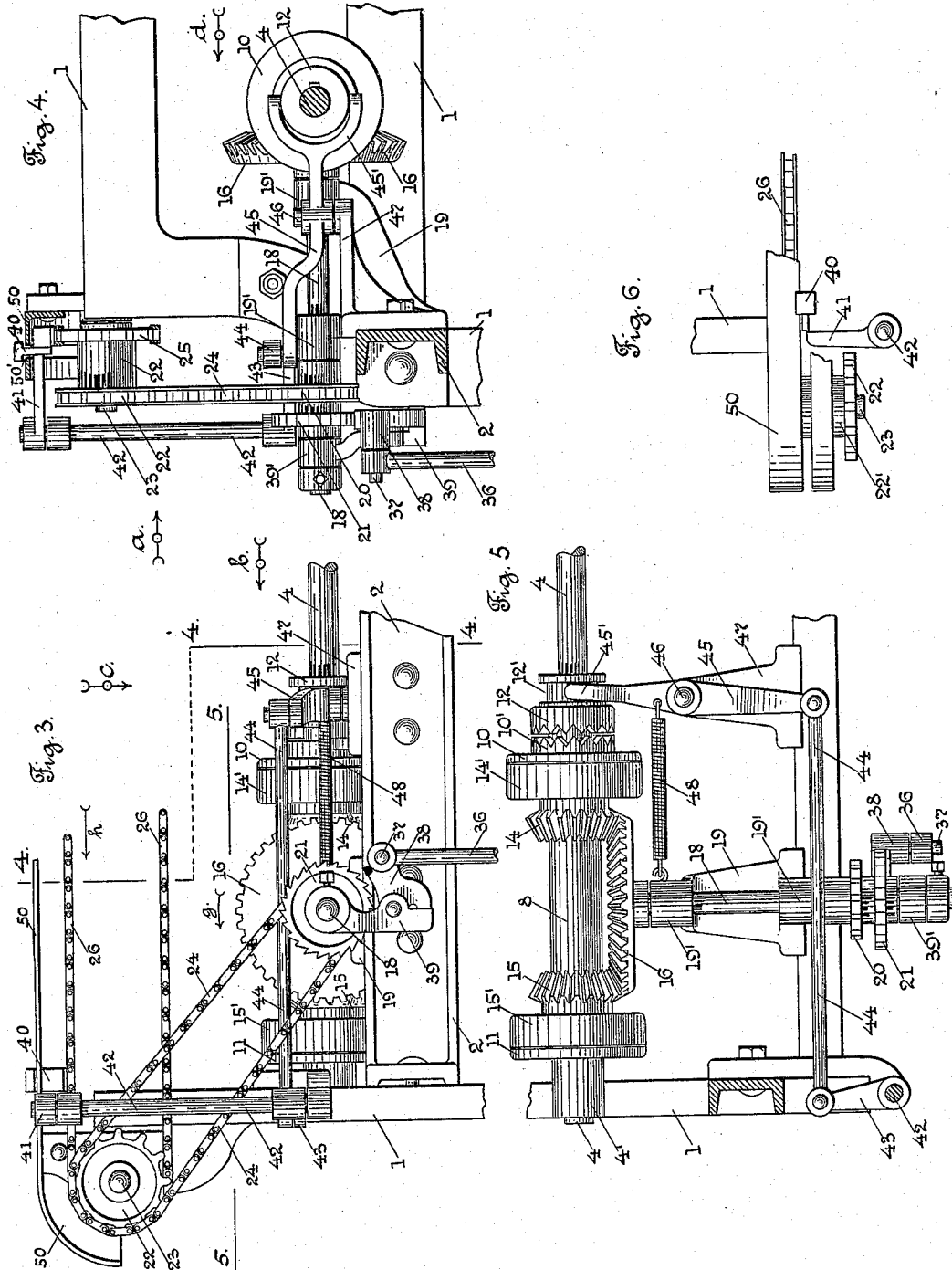
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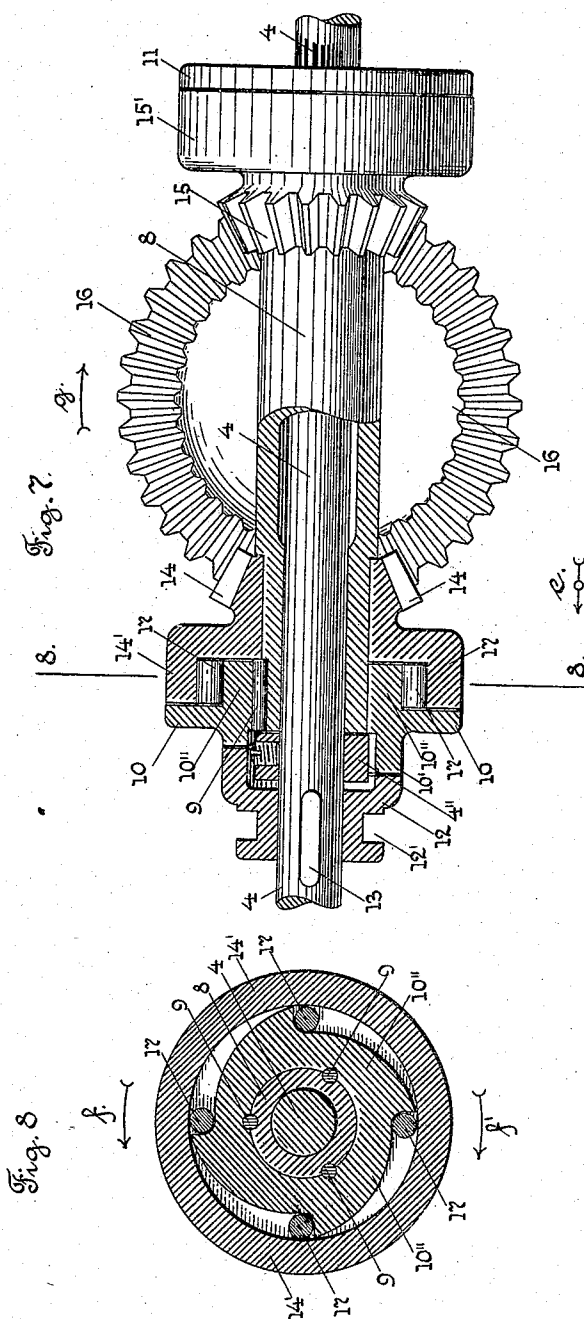
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UNITED STATES PATENT OFFICE.

FRED A. WHITMORE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

SPOOLER FOR PILE-FABRIC LOOMS.

933,213.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed January 2, 1908. Serial No. 408,875.

To all whom it may concern:

Be it known that I, FRED A. WHITMORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Spoolers for Pile-Fabric Looms, of which the following is a specification.

My invention relates to spoolers for Axminster, or other pile fabric looms, and the object of my invention is to improve upon the construction of a spooler of the class referred to, as ordinarily made, and more particularly to provide improved mechanism for drawing out the wire from the spool, after the spool is wound.

In my improvements, I provide a chain or flexible band, having connected therewith a device for pulling out the wire from the spool, which chain has a movement always in the same direction, without regard to the rotary direction of the driving shaft, and I also provide mechanism to automatically stop the drawing out movement, when the wire is separated from the spool.

My invention consists in certain novel features of construction of my improvements as will be hereinafter fully described.

I have only shown in the drawings a sufficient portion of a spooler of the class referred to, with my improvements combined therewith, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a front view of a portion of a spooler embodying my improvements. Fig. 2 shows a part of the mechanism shown at the left in Fig. 1, detached, and in an opposite position. Fig. 3 shows, on an enlarged scale, the mechanism shown at the left in Fig. 1, detached, looking in the direction of arrow *a*, Fig. 4. Fig. 4 is a section, on line 4, 4, Fig. 3, looking in the direction of arrow *b*, same figure. Fig. 5 is a section, on line 5, 5, Fig. 3, looking in the direction of arrow *c*. Fig. 6 is a plan view of the parts shown at the upper portion in Fig. 3, detached, looking in the direction of arrow *c*, same figure. Fig. 7 shows, on a larger scale, the clutch and driving mechanism detached, looking in the direction of arrow *d*, Fig. 4; the parts at the left are shown in section, and, Fig. 8

is a section, on line 8, 8, Fig. 7, looking in the direction of arrow *e*, same figure.

In the accompanying drawings, 1 are the side or end frames of a spooler of the class referred to; 2 and 3 are the upper and lower transverse girths, respectively, secured to the end frames 1.

4 is the driving shaft mounted in suitable bearings 4' on the end frame.

5 is a portion of a wooden spool, and 6 is the pile yarn wound thereon.

7 is a wire which extends into a longitudinal groove in the spool 5 to hold the ends of the yarn, in winding the same on the spool. The wire 7 extends out beyond the head 5' of the spool, and has its end made hooked, or provided with a projection 7' thereon.

All of the above parts may be of the usual and well known construction in spoolers of the class referred to.

I will now describe my improvements, which as above stated, relate particularly to the mechanism for drawing out the wire 7 from the spool, after the spool is wound.

On the driving shaft 4 is loosely mounted a sleeve 8, which is prevented from having a longitudinal movement on said shaft 4, in this instance by a bearing 4' at one end, and a collar 4'' at the other end, see Fig. 7. On one end of the sleeve 8 is secured, in this instance by dowel pins 9, see Fig. 8, a disk 10, and on the other end is secured by dowel pins, not shown, a disk 11. The disk 10 has in this instance a V shape tooth portion 10', see Fig. 5, on the hub thereof, adapted to be engaged by a similar tooth portion on a collar 12, which is splined on the shaft 4, in this instance by a key 13, see Fig. 7, to cause the disk 10, and also the sleeve 8, to rotate with the shaft 4.

The sleeve 8 has loosely mounted thereon two bevel pinions 14, and 15, both of which mesh with the bevel gear 16. Either one of the bevel pinions 14 and 15 may be secured to the sleeve 8, through the disks 10 or 11, to cause the rotation of said pinion with said sleeve. The bevel pinions 14 and 15 have enlarged hubs 14', and 15', adapted to bear against the disks 10, and 11, respectively, see Fig. 7, and to extend over the hub portions of said disks, only one of which, 10'', is shown in Figs. 7, and 8. The hub portion 10'' is shaped in transverse section as

shown in Fig. 8 with cam-shaped, or curved exterior surfaces, to receive between said surfaces, and the inner surface of the enlarged hub 14', the rolls 17, in this instance four in number, see Fig. 8.

The clutch mechanism formed by the disk 10, and the expanded hub 14', shown at the left in Fig. 7, should be revolved in the direction of arrow *f*, Fig. 8, and the rolls 17 act to lock the enlarged portion 14' of the bevel pinion 14 to the disk 10, to cause the rotation of said pinion 14, loose on the sleeve 8, and the rotation of the bevel gear 16 in the direction of the arrow *g*, Fig. 7. When the shaft 4 revolves in the opposite direction, the hub of the disk 10 rotates loosely within the enlarged hub portion 14' of the pinion 14, in the direction of arrow *f'*, Fig. 8, leaving the pinion 14 loose on the sleeve 8, and the other disk 11 locks the bevel pinion 15 on the sleeve 8, and causes the rotation of the bevel gear 16 in the same direction as before, and in the same manner as above described in connection with the disk 10 and pinion 14, so that the rotation of the driving shaft 4 in either direction, will cause the rotation of the bevel gear 16 in the same direction.

The bevel gear 16 is fast on a shaft 18, mounted in bearings 19' on a stand 19, attached to the transverse girth 2, see Fig. 5. Also mounted on said shaft 18 is a sprocket wheel 20, and a ratchet 21. A second sprocket wheel 22 has a hub loosely mounted on a stud 23, at the upper end of the frame 1. An endless chain 24 connects the sprocket wheels 20 and 22. A second sprocket wheel 25, on the hub 22' of the sprocket wheel 22, receives an endless chain 26, which also passes around a sprocket wheel 27, mounted on a stud 28 at the opposite end of the spooler, see Fig. 1. On the endless chain 26 is in this instance secured a device 29, which has a slotted end to receive the wire 7 and engage the hooked end 7' thereon, to draw said wire 7 out of the spool 5, when the end 5' on the spool 5 engages the stationary stand 30 on the spooler. The movement of the chain 26, in the direction of arrow *h*, Fig. 1, moves the device 29 thereon, and with it the wire 7, until the device 29 reaches the opposite end of the spooler; the operating mechanism then stops, and the operator removes the wire 7 from the chain, and starts the mechanism again, and the movement of the chain 26 continues, until the device 29 is brought to its normal position, shown in Fig. 1, ready for the next spool. This operation is going on while another spool is filling on the machine, so that no time is lost.

The mechanism automatically stops itself, but it is necessary for the operator to start the drawing out motion of the wire 7, and in this instance it is done by means of a

foot treadle, and mechanism connected therewith. The foot treadle 31 is in this instance pivotally mounted on a stud 32 on the transverse girth 3, and has its upwardly extending end 31' connected by a rod or connector 33, with one arm of an angle lever 34, which is pivotally mounted on a stud 35 on the transverse girth 3. The other arm of the angle lever 34 is connected by a rod or connector 36 with a pin 37 on a pawl 38, which is pivotally mounted on an arm 39, the hub 39' of which is loosely mounted on the shaft 18. The downward movement of the treadle 31, through intermediate connections to the pawl 38, causes the pawl to be raised and engage the ratchet 21, as shown in Fig. 2, to rotate said ratchet and with it the sprocket wheel 20, and through the chain 24, the sprocket wheel 22 on the shaft 23, to move the chain 26, and cause a device 40, on or connected with said chain, to engage an arm or lever 41, see Fig. 6, fast on the upper end of a vertically extending rock shaft 42, mounted in suitable bearings and move said lever 41 to the left in Fig. 6, and communicate a partial rotation to the vertically extending shaft 42. On the lower end of the shaft 42 is fast an arm 43, which is connected by a rod or connector 44 with a lever 45, which is pivoted on a stud 46 on a stand 47 attached to the transverse girth 2, see Fig. 4. The lever 45 has a yoke shaped end 45', which is adapted to extend into an annular groove 12' in the hub of the member 12 of the tooth clutch mechanism, see Fig. 5, splined on the driving shaft 4. The movement of the lever 41, by the engagement of the device 40 therewith, through intermediate connections, acts to move the clutch member 12 away from the disk 10, as shown in Fig. 5. When the device 40 passes by the lever 41, a helically coiled contraction spring 48, attached at one end to the lever 45, and at its other end in this instance to the bearing 19' of the shaft 18, acts to move said lever 45 and the clutch member 12 in an opposite direction, to cause the same to engage with the tooth portion 10' on the disk 10, and cause the revolution of the disk 10, in the operation of the mechanism, and the starting of the drawing out mechanism, as above described.

On the upper end of the spooler frame is in this instance secured a bar or plate 50 of angle iron shape in cross section, shown in Fig. 4, and having a longitudinal slot 50' therein, which forms a track or way for the drawing out device 29 and the device 40 to travel in.

From the above description in connection with the drawings the operation of my improvements will be readily understood by those skilled in the art, and briefly is as follows:—During the operation of winding the warp ends 6 on the spool 5, which is accom-

plished by the spooler machine, not shown, of any usual construction and operation, the drawing out mechanism embodying my improvements is not operated, but when the spool 5 has the warp ends 6 wound thereon, the attendant operates the treadle 31, in this instance presses down said treadle, and causes, through intermediate connections, the rotation of the ratchet 21 by the engagement of the pawl 38 therewith, in the direction of arrow *i*, Fig. 2. The rotation of said ratchet 21 causes the rotation of the sprocket wheel 20, and through the endless chain 24, the rotation of the sprocket wheel 22 loose on the stud 23, and the rotation of the sprocket wheel 25 attached to the sprocket wheel 22, the starting of the endless chain 26, which passes around the sprocket wheel 25 and also the sprocket wheel 27. The movement of the chain 26, in the direction of arrow *h*, Fig. 1, causes the device 40, fast on said chain 26 and in engagement with the lever 41, see Fig. 6, to move said lever to the left, and pass by said lever, to release said lever and allow the spring 48 to act, see Fig. 5, to move the lever 45 to the left, Fig. 5, and the clutch member 12 into engagement with the clutch member 10' on the disk 10, and be held in engagement therewith by said spring 48, to cause said disk 10 to be revolved with the driving shaft 4, and through the revolution of said disk to cause the revolution of the enlarged hub 14' on the bevel pinion 14, through the rolls 17, see Fig. 8, in the direction of arrow *f*. The revolution of the bevel pinion 14 revolves the gear 16 fast on the shaft 18, and causes the revolution of the sprocket wheel 20 fast on said shaft, and through the endless chain 24, the revolution of the sprocket wheel 22 fast on the shaft 23, and through the revolution of said shaft 23, the revolution of the second sprocket wheel 25, and the continued movement of the endless chain 26. The movement of the chain 26, in the direction of arrow *h*, Fig. 1, causes the movement of the drawing out device 29 fast on said chain, to draw the spool 5 toward the left, Fig. 1, until the head 5' thereon, engages the stationary stop 30 on the frame of the machine. The engagement of the head 5' of the spool 5 with the stationary stand 30 stops any further movement of the spool 5, but the continued movement of the chain 26 and the drawing out device 29 thereon, which engages the hook end 7' on the wire 7, draws out the wire 7 from the spool 5. When the drawing out device 29, after having drawn out the wire 7, reaches the left hand end of the frame shown in Fig. 7, the operator disconnects the wire from said drawing out device 29, and the continued movement of the chain 26 in the same direction, returns the device 29 to its normal position at the right of the machine, as shown

in Fig. 1, and also returns the device 40 to its normal position at the left of the machine, as shown in Fig. 1, and in engagement with the lever 41, to move, through intermediate connections, the clutch member 12 out of engagement with the clutch member 10' of the disk 10, against the action of the spring 48, to automatically stop the operating mechanism for automatically moving the chain 26.

In case the driving shaft 4 is rotated in an opposite direction from that above described, then the rotation of the disk 10, by the engagement of the clutch member 12 therewith, will be in the opposite direction, or in the direction of arrow *f'*, Fig. 8. The rotation of the disk 10 in this direction, will cause the sleeve 8 to rotate in the same direction, and leave the bevel pinion 14 loose on the sleeve 8, and will cause the locking of the hub of the disk 11 to the enlarged hub 15' of the bevel pinion 15, and cause the revolution of the bevel pinion 15, and the revolution of the bevel gear 16 in the direction of arrow *g*, Fig. 7, and through intermediate connections above described, the movement of the chain 26 in the direction of arrow *h*, Fig. 1, and the operation of the wire drawing out mechanism, as above described.

It will be understood that the details of construction of my improvements may be varied if desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a machine of the class described, the combination with a chain or flexible band, and a wire drawing out device connected with said chain or band, of non-automatic means for starting the movement of said chain, and automatic means for continuing the movement of said chain, and for automatically stopping the movement thereof.

2. In a machine of the class described, the combination with a chain or flexible band having a wire drawing out device connected therewith, and also a device for automatically putting into operation the means for moving said chain, of non-automatic means for starting the movement of said chain, and automatic means for stopping the movement thereof.

3. In a machine of the class described, the combination with a chain or flexible band, a device connected therewith for engaging and drawing out the wire from a spool, a second device connected therewith for putting into operation mechanism for automatically moving said chain, of said mechanism, comprising a driven shaft, a sleeve loose on said shaft, two disks attached to said sleeve, two bevel pinions, one of which is adapted to be locked to said sleeve at a time, a bevel gear operated by one of said pinions, intermediate connections from said bevel gear to said

chain or flexible band, to move the same in one direction.

4. In a machine of the class described, automatic means for moving a chain or end-
5 less band having a device connected therewith for engaging and drawing out a wire from a spool, said means combined with a driving shaft, and adapted to move said chain in the same direction without regard to the
10 direction of movement of said driving shaft, and said means comprising a sleeve loose on said driving shaft, two disks attached to

said sleeve, connections intermediate said disks and the hubs of two bevel pinions, a bevel gear in mesh with both of said pinions, 15 connections from said bevel gear to said chain or flexible band, and means to attach one of said disks to said driving shaft to revolve therewith.

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Witnesses:

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