W. A. KILMER.

WIRE FABRIC REEL.

APPLICATION FILED MAR. 8, 1915.

1,199,795.

Patented Oct. 3, 1916.

4 SHEETS—SHEET 1.

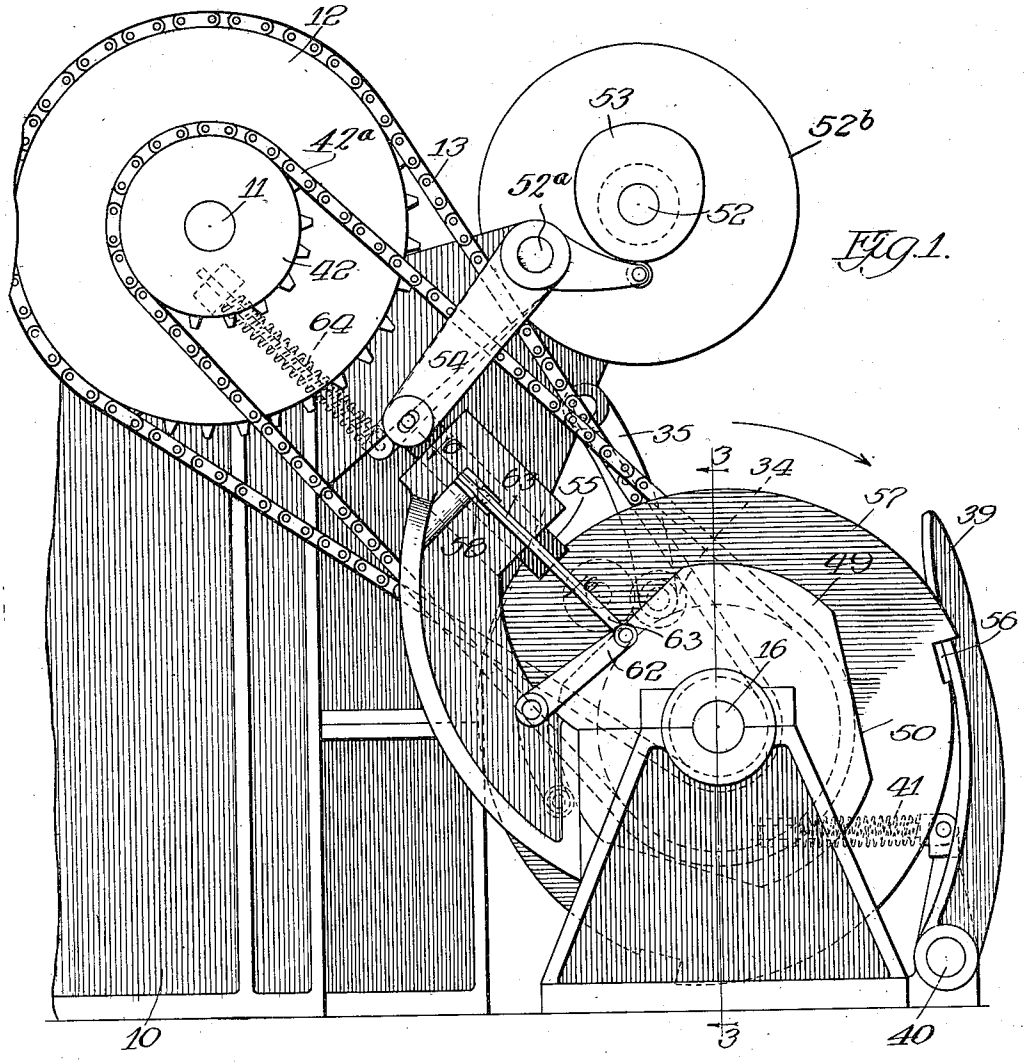


Fig. 1.

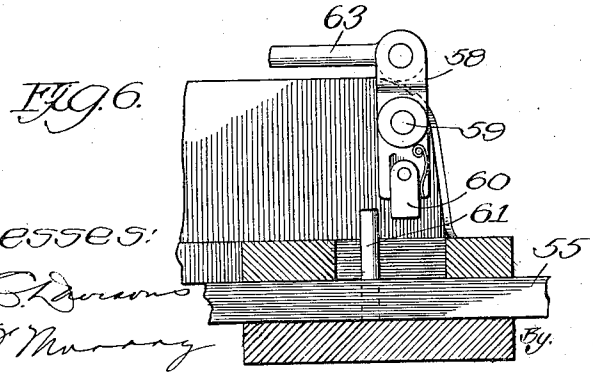


Fig. 6.

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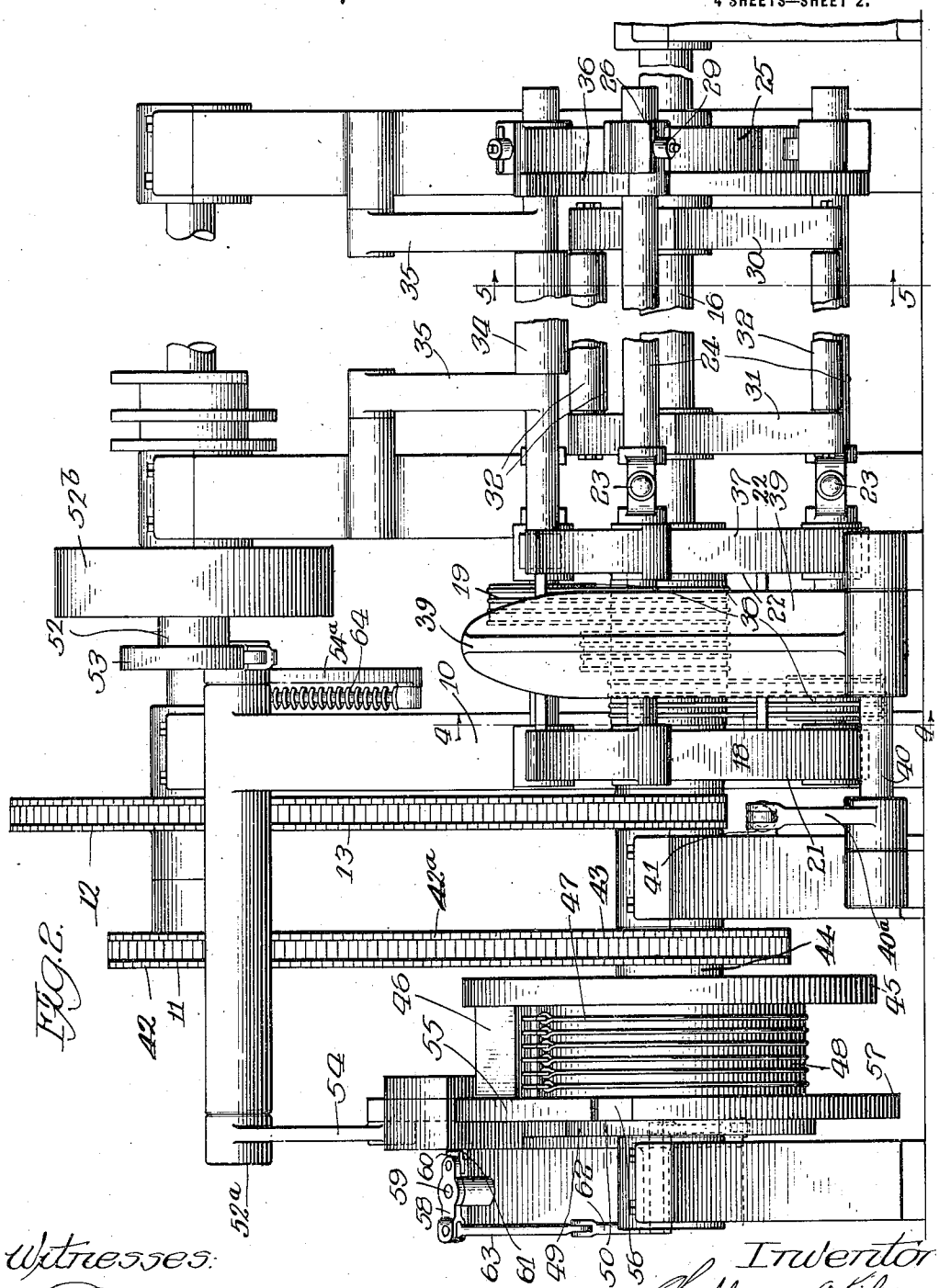


FIG. 2.

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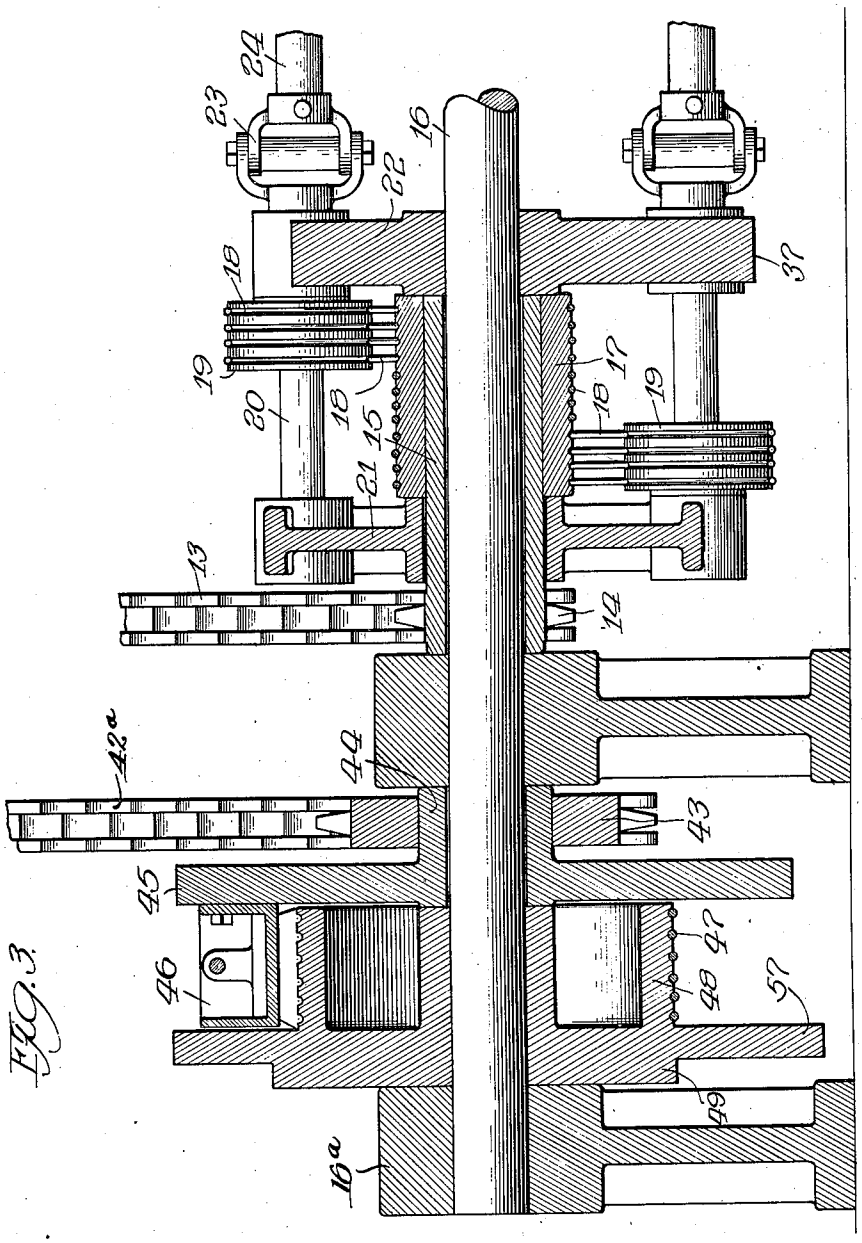


FIG. 3.

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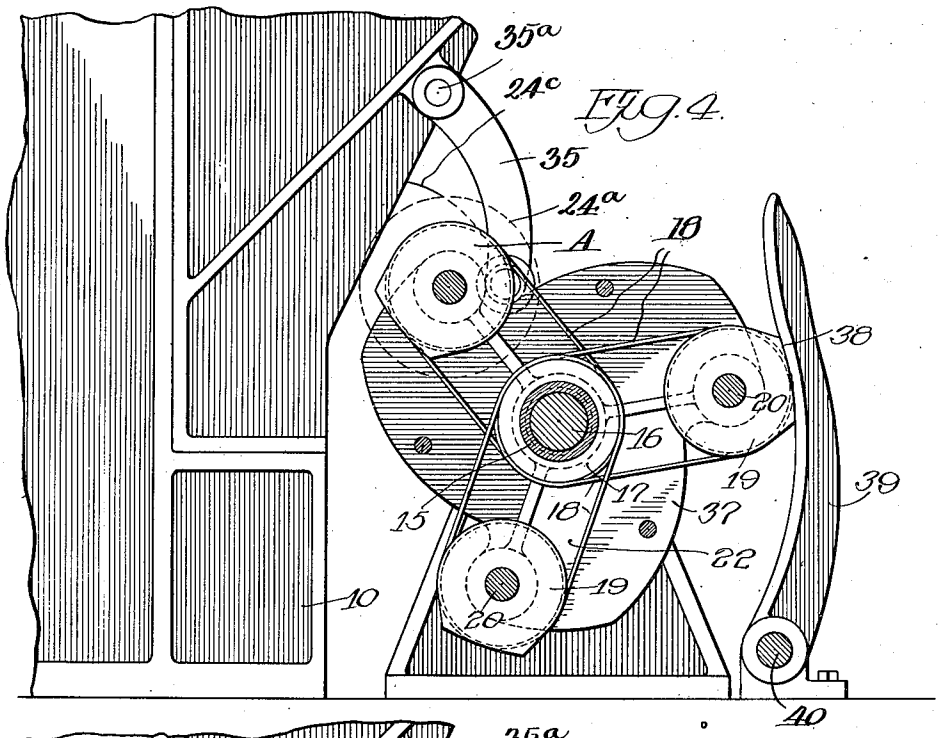


Fig. 4.

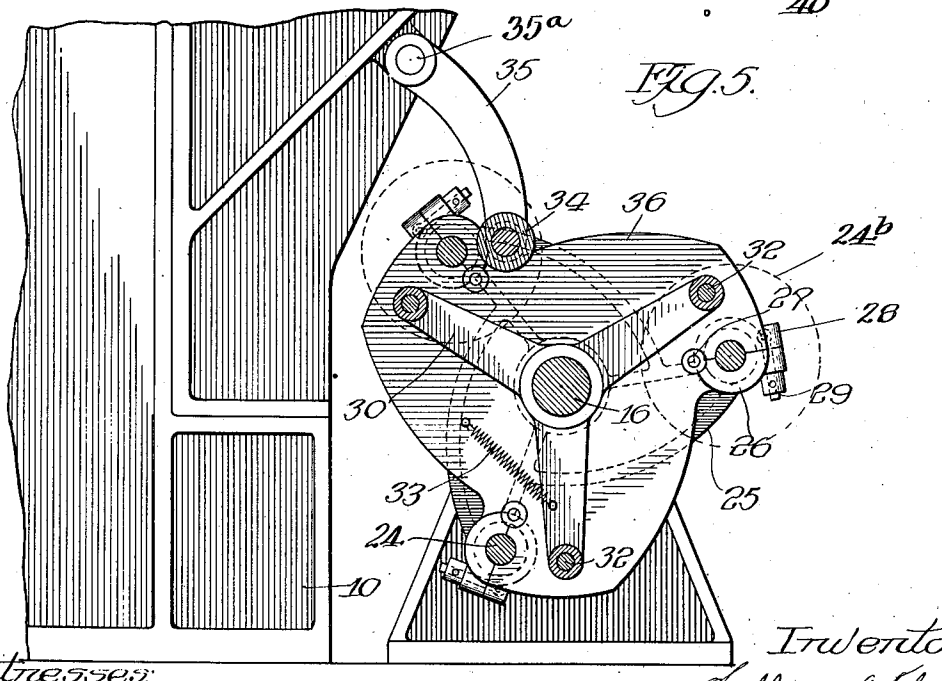


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM AUGUSTUS KILMER, OF DE KALB, ILLINOIS, ASSIGNOR TO THE AMERICAN STEEL & WIRE COMPANY OF NEW JERSEY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WIRE-FABRIC REEL.

1,199,795. Specification of Letters Patent. Patented Oct. 3, 1916.

Application filed March 8, 1915. Serial No. 13,023.

To all whom it may concern:

Be it known that I, WILLIAM A. KILMER, a citizen of the United States, and resident of De Kalb, in the county of Dekalb, in the State of Illinois, have invented certain new and useful Improvements in Wire-Fabric Reels, of which the following is a specification.

My invention relates to mechanism for reeling wire fabric which has previously been formed in a machine such as shown in my copending application, Serial No. 13,024, filed concurrently herewith.

An object in the construction of the present machine is to provide a simple mechanism by means of which the fabric after having been formed in an automatic machine, is reeled into suitable bundles. Then the reeled bundle after having been sheared from the line of fabric is bodily moved to an inoperative position where it may be removed from the reel.

I am aware that it is not broadly new to provide a reeling mechanism including a plurality of reel spindles, one of which may be operating to accumulate a bundle of wire while a previously formed bundle is removed from the machine. However, the present machine is much more simple and adaptable to the performance of such work in the proper manner.

A further object is to provide a mechanism which shall be almost entirely automatic in character by means of which the reeled bundle will stop at the proper point after having moved a full spindle into inoperative position.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is an end elevation of a machine constructed in accordance with my invention; Fig. 2 is a side elevation of the same; Fig. 3 is a section on the line 3—3 of Fig. 1; Figs. 4 and 5 are sections on the lines 4—4 and 5—5 respectively of Fig. 2, and Fig. 6 is a section taken on the line 6—6 of Fig. 1.

Referring more particularly to the drawings it will be seen that in the frame 10 I mount a shaft 11 to which power is applied in a suitable manner. On this shaft is a large sprocket 12 which transmits power through a chain 13 to the pinion 14 rigid with sleeve 15 (best seen in Fig. 3). This sleeve 15 is loosely mounted on a shaft 16 carried in suitable bearings 16ª. The mechanism described herein consists of wire fabric reels arranged to have wire fabric, made in a machine such as that described in my co-pending application above referred to, wound thereon, and includes a reel carrier adapted to support a plurality of reels and means for automatically actuating the wire reels to reel the wire thereon, and, when a reel is full, to move the carrier so that the wire fabric may be wound onto the next reel. The manner in which I prefer to accomplish this is shown in the accompanying drawings.

The carrier consists of spiders 21, 22 and 25, spiders 22 and 25 being keyed to shaft 16 and spider 21 being loosely mounted on sleeve 15. Spiders 21 and 22 are provided with a plurality of drums 19, the purpose of which will be explained later. Between spiders 22 and 25 are shafts 24 connected to the overhanging ends of shafts 20 by universal joints 23 (Figs. 2 and 3). The opposite ends of shafts 24 are held in spider 25, as best shown in Fig. 5, by members 26 hinged at 27, the hinged portion being locked by means of the lugs 28 with bolts 29 passing therethrough. Also mounted on sleeve 15 is a rope drum 17. The drums 19 on shafts 20 are connected to drum 17 by means of ropes 18 so that when drum 17 is rotated—which it is whenever the sleeve 15 is rotated—motion is transmitted to drums 19 and shafts 20, the ropes 18 being in frictional engagement with drums 17 and 19 whereby one of the drums 19 may be stopped against rotation without having to disconnect or change in any manner the driving element between drums 17 and the stopped drum 19.

In Fig. 4, the numeral 24ª designates a reel which is mounted on shaft 24 and adapted for rotation therewith. To mount such a reel on the shaft, the member 26 on spider 25 is opened and the end of the shaft is swung outwardly, which is made possible by the universal joint 23, and the reel 24ª is put on or removed, as the case may be. The shaft is then returned to engage member 26 and the same is locked by means of the bolt 29. After a reel has been filled with the fabric the fabric is sheared and the reel

moved to inoperative position. As a means for preventing the unwinding of the fabric after it has been sheared, I provide two spiders 30 and 31 with the rods 32 connecting same. The rods are maintained in compression against the bundle of wire by means of spring 33.

It will be observed that the sleeve 15 is rotated continuously as the shaft 11 is driven continuously, and consequently drum 17 mounted on sleeve 15 rotates continuously. By means of the rope drive 18 two of the drums 19 are driven all the time, the third shaft being held against rotation (by means described later) for the purpose of removing or applying the reel 24ª to the shaft.

To impart rotation to the shaft 16 I connect the small sprocket wheel 42 by a chain 42ª to sprocket wheel 43 (Fig. 3) which is keyed to the sleeve 44 integral with or attached to the disk 45, the sleeve 44 and disk 45 being loosely mounted on the shaft 16. It will be observed that this sleeve 44 and disk 45 will rotate as long as the shaft 11 is caused to rotate. I provide a bracket 46 on disk 45 for holding the ends of ropes 47. Keyed to shaft 16 is a drum 48 adapted to underlie the bracket 46 and provided with grooves in its periphery for the reception of the ropes 47 attached to the bracket 46. The drum 48 is integral with or attached to two disks 49, 57, disk 57 being larger than disk 49. Referring to Fig. 1 it will be seen that the disk 49 is provided with a plurality of flattened portions 50 in its periphery and that the disk 57 is provided with a series of notches 56 in its periphery, one notch for every reel mounted on the spiders 21, 22 and 25, said notches registering with said reels. The drums 19 on shafts 20 are provided with disks 38 slightly larger than the drums 19 which have a flattened portion (best seen in Fig. 4). This disk, of course, rotates whenever motion is transmitted to the drum 19.

Best seen in Figs. 1, 2 and 4 is a brake 39 mounted on a shaft 40 and extending upwardly. Also mounted on shaft 40 is an arm 40ª carrying a spring 41, the other end of which is secured to the frame of the machine. This spring 41 tends to pull the brake 39 toward the shaft 16. This brake is made wide enough to cover the several disks 38 attached to the drums 19. The object is always to bear against the disks 38 and so hold against rotation the particular disk 38 whose flattened portion comes into engagement with the face of the brake 39, thus stopping rotation of that particular shaft 20 for disconnecting shaft 24 and reel 24ª and permitting the removal of the reel from the shaft and the insertion of the empty reel. In Fig. 4 there is shown one of the disks 38 in engagement with the brake 39. The spiders are so arranged that when one reel is being wound with wire fabric 24ᶜ another is held against rotation in the position shown.

To secure tight and uniform winding of the fabric on the reel I provide pivoted arms 35 mounted on the shaft 35ª carried on the framework 10. The arms 35 carry at their other ends rollers 34 which bear against the wire fabric being wound onto the reel. To govern the movement of the arms 35 so that the rollers 34 will always bear against the fabric, I provide cams 36 and 37 integral with or secured to shaft 16 (Figs. 2 and 5) and extend portions of the arms 35 laterally to engage the cam surface of the disks 36 and 37. These cams are designed to cause the arms 35, when the reel carrier is rotated, to move upwardly. If desired, suitable rollers may be provided on the extension of the arms 35 to engage the cam surfaces of disks 36 and 37. The cam surfaces 36 are provided to raise the rollers 34 carried by arms 35 from engagement with the reel while the filled reel is being moved into inoperative position and an empty reel is being moved into the operative position. It will be observed that the cams 36 are so made that the rollers 34 carried by arms 35 will drop and bear against the reel as soon as the reel is brought into operative position. However, after a reel has been filled and the fabric sheared the reel should be rotated one step. It will be understood that during the interval of shearing the shaft 16 is idle and that shaft 52 actuates the shearing mechanism (not shown).

It will now be observed that as motion is continuously transmitted through sprockets 12 and 14 to sleeve 15 and drum 17 (Fig. 3) that the ropes connecting drum 17 with drums 19 are always moving, imparting rotation to two of the reels and slip on the drum 19 on the reel that is held against rotation by means of the brake 39.

The means of moving the shaft 16 are as follows: In Fig. 1 it will be seen that the disk 57 is held against rotation by means of the latch 55 in engagement with one of the notches 56 on the periphery of the disk. This latch is withdrawn from engagement by means of a cam 53 mounted on shaft 52 which engages one end of bell crank 54 pivoted to the frame 10 of the machine, the other end of the bell crank being connected to the upper end of latch 55. Shaft 52 is driven by means of pulley 52ᵇ keyed thereto in such manner that it will make one revolution in the time necessary to wind one reel 24ª with wire fabric, the pulley 52ᵇ having a diameter commensurate with the speed of the power delivery element belted thereto so that shaft 52 will be rotated once in the time necessary to wind one reel. The means for driving shaft 52

are in connection with shaft 11. The cam 53 is so designed and positioned on shaft 52 that during a greater part of the rotation of shaft 52 there is no action by the cam on bell crank 54, hence latch 55 is undisturbed. As before stated, the shaft 52 is arranged to make one revolution during the time necessary for winding the fabric onto one reel, so that by the time the reel is full the larger part of the cam 53 will engage the short arm of the bell crank 54 and depress it, which will cause the other arm thereof to withdraw the latch 55 from the notch. At the instant the restraint is removed from disk 57 the rope drive 47, in frictional engagement with the drum 48 on disk 57 will grip said drum and rotate it and its attached disk 57 until stopped, which stopping occurs when the latch 55 engages the next notch 56 in the disk 57. The rotating of disk 57 rotates the reel-carrying spiders so that every time the disk 57 is moved a reel is moved from winding position into position for removal. At the instant that latch 55 is withdrawn from the notch 56, the disk 57 is at rest. Consequently the latch 55 must be withheld from dropping back into position until the disk 57 has been moved. To accomplish this I provide the means shown in Fig. 6, said means consisting of the pivoted arm 58 carrying at its lower end a one-way trigger 60. Extending upwardly from the latch 55 is a pin 61 which engages with trigger 60. It will be seen that as the shaft 55 is withdrawn by the bell crank 54 that it will be caused to pass trigger 60. In Fig. 6 the motion will be in the right hand direction and consequently will hold the latch 55 a sufficiently long time to permit the starting of the disk 57 and as the cam 53 moves farther the latch 55 will fall downwardly and the pin 61 will engage the trigger 60. This being a one-way trigger the pin 61 will not be permitted to pass until the arm 58 is actuated by means of arm 62, which is adapted to bear against the flattened portions 50 of disk 49. As soon as the arm 62 leaves engagement with one of the flattened portions 50 of the disk 49 it will cause movement of the arm 58 through the connecting rod 60 and thus permit pin 61 to pass trigger 60 allowing the latch 55 to rest against the periphery of disk 57 for engagement with the following notch 56. Referring to Fig. 3 it will be seen that as soon as restraint is removed from disk 57 the ropes 47 connected to bracket 46 will immediately grip the drum 48 and carry the drum along with the rotation of the disk 45, thus imparting rotation to shaft 16 which in turn carries the reel carrier spiders 22 and 25, the ropes 47 being in frictional engagement at all times with their drum 48.

The operation of the machine is as follows: The wire fabric 24^c (Fig. 4) which is formed in the mechanism indicated in frame 10 (not shown) is fed outwardly from the machine and toward the reeling mechanism. The fabric passes over the reel in the position A (Fig. 4) and is held against the core of said reel by the arms 35 and the rollers 34. The shaft 24 carrying the reel 24^a being in rotation, the fabric will be wound immediately on the reel 24^a. It will be understood that the reel 24^a is provided with the usual well known pins projecting from its surface for engaging the wire fabric. During the time that the reel 24^a is being wound the shaft 52 (Fig. 1) is rotating and the cam 53 comes in engagement with bell crank 54 at the time reel 24^a is full. The engagement with the bell crank 54 releases the latch 55 from engagement with disk 57, thus permitting rotation of disk 57 and shaft 16 whereby the reel carrier is moved so that another reel comes into the position A (Fig. 4) and thereby stops engagement of the latch 55 with the next notch 56. The reel which has just been wound is now removed from the reel carrier by opening the members 26 (Fig. 5) and swinging the shaft outwardly, and the filled reel is replaced by an empty one; the shaft returned to position, and is now ready for movement with the next movement of the reel carrier.

I claim:

1. In a reel for wire fabric machines, the combination of a rotatable reel carrier, a plurality of reels mounted on said carrier, and a rope friction drive for each of said reels, and means for stopping the rotation of one of said reels, substantially as described.

2. In a reel for wire fabric machines, the combination of an axially revoluble reel carrier, a plurality of reels mounted on and bodily movable with said carrier, means for rotating said carrier and said reels, said reel rotating means including rope driven engaging elements, and means for stopping the rotation of one of said reels, substantially as described.

3. In a reeling device, the combination of a reel carrier, a plurality of reels mounted on said carrier, a rope drive for said reels, means for stopping the rotation of one of said reels and holding same against rotation, and means for securing a step by step movement of said carrier, substantially as described.

4. In a reeling device, the combination of a rotatable reel carrier, a plurality of reels mounted on said carrier, a rope drive for said reels and a rope drive for said carrier, and means for stopping the rotation of one of said reels, substantially as described.

5. In a reeling device for wire fabric machines, the combination of a plurality of

reels bodily rotatable in a fixed path, an independent friction drive for each of said reels, and means for preventing the rotation of each of said reels at one point in their bodily travel, substantially as described.

6. In a reel for wire fabric machines, the combination of a carrier, a plurality of reels mounted on said carrier, means for independently frictionally driving each of said reels, means for interrupting the rotation of one of said reels at a point in its bodily travel, said carrier having a step by step movement, substantially as described.

7. In a reeling device, the combination of a reel carrier, a plurality of reels radially arranged with reference to the axis of said carrier and bodily rotatable with the carrier, an independent rope drive for each reel, a rope drive for said carrier, automatic means for causing a step by step movement of said carrier, and means preventing rotation of one reel at the unloading stage thereof, substantially as described.

Signed at De Kalb, Illinois, this 25th day of February, 1915.

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