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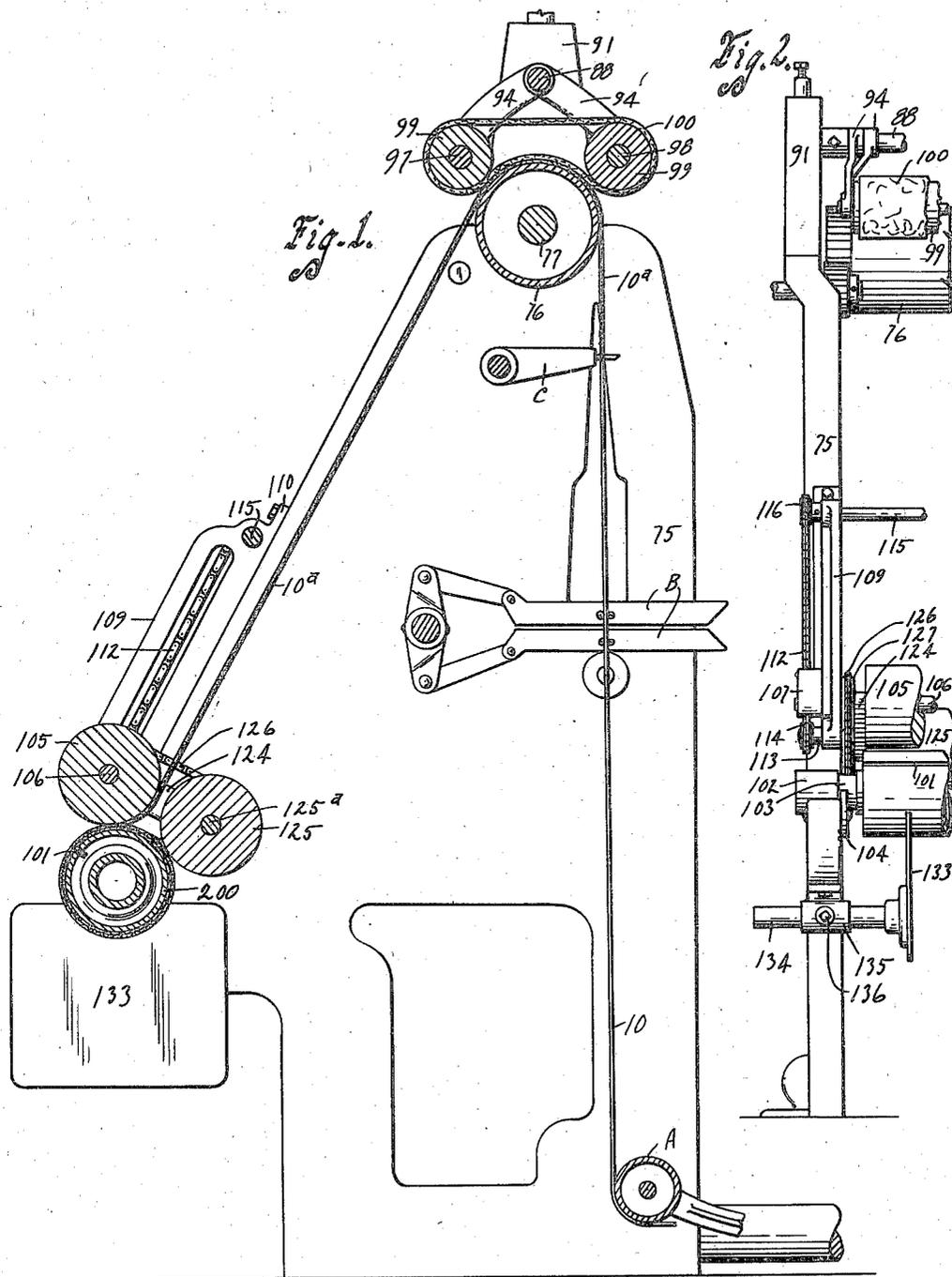
H. L. THOMPSON

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WIND-UP FOR WIRE CLOTH LOOMS

Original Filed April 3, 1933

2 Sheets-Sheet 1



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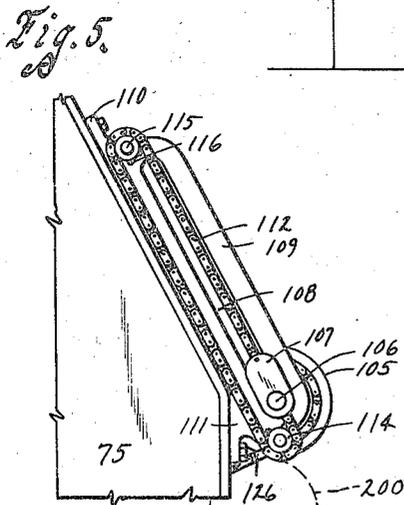
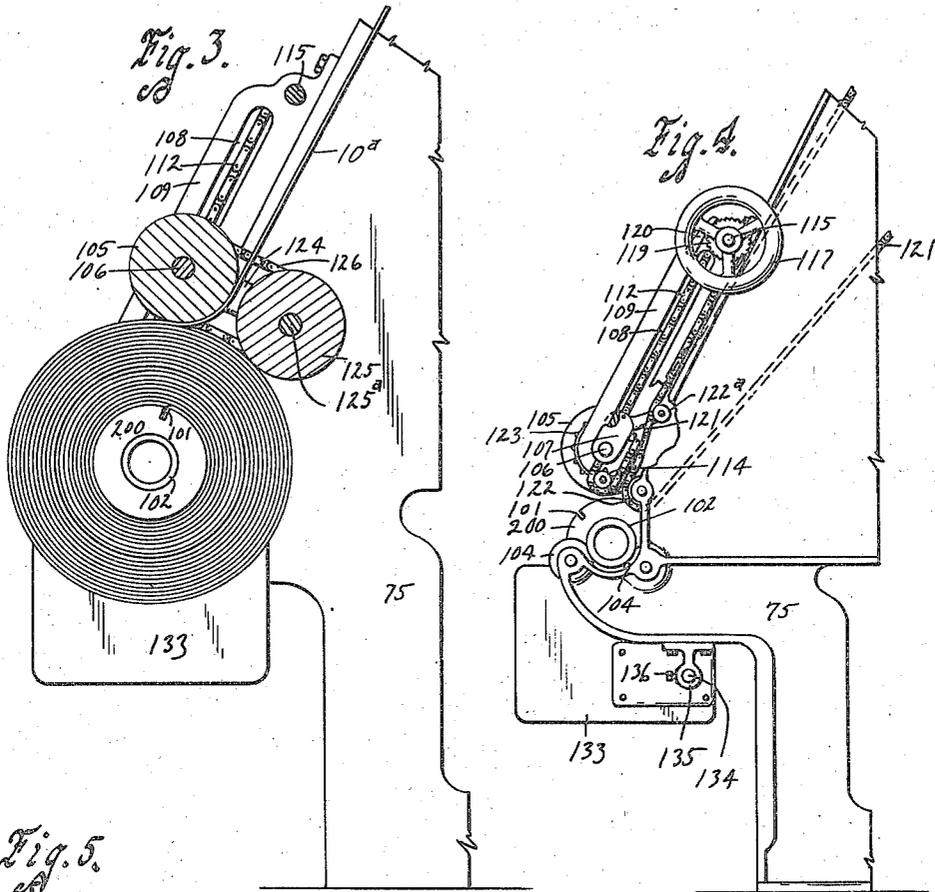
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UNITED STATES PATENT OFFICE

2,125,824

WIND-UP FOR WIRE CLOTH LOOMS

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Original application April 3, 1933, Serial No. 664,192. Divided and this application October 21, 1935, Serial No. 45,981

10 Claims. (Cl. 139—304)

The object of my invention is to provide a wind-up mechanism for woven wire cloth, particularly adapted for use in a wire cloth weaving machine of the kind that has other means for advancing the woven cloth through the machine.

More particularly, it is my object to provide such a wind-up mechanism, having parts so arranged as to receive the woven cloth from the machine, impose necessary tension thereon and wind the same in a proper roll on a mandrel.

In greater detail, it is my purpose to provide such a wind-up apparatus provided with a wind-up mandrel, a pressure roll and a weight roll for engaging the wire on the mandrel and for rotating the mandrel by friction, and for guiding and controlling the wire, said pressure and weight rolls being automatically movable away from the mandrel in accordance with the growing size of the wire cloth roll on the mandrel.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my wind-up for a wire cloth loom, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a vertical, sectional view through a portion of a wire cloth loom equipped with a wind-up embodying my invention.

Figure 2 is a front elevation of one end of one side of the loom.

Figure 3 is a vertical, sectional view of the wind-up mechanism, showing a roll of cloth on the mandrel.

Figure 4 is a side elevation of that part of the loom having the wind-up mechanism; and

Figure 5 is a side elevation of the opposite side of the wind-up mechanism.

This application is a division from my Patent No. 2,022,225, issued November 26, 1935.

The wind-up mechanism here illustrated is intended to be used with a loom of the kind shown in that patent, which has the side frame members 75.

In order to show the general relationship of the wind-up mechanism to the other mechanisms, of the weaving machine, I have indicated at A a part of the warp feed and control mechanism. At B, the heddles are shown, and at C is the beater.

The incoming warp wires are illustrated at 10 and the woven cloth at 10a.

This is a loom of the type in which the warp

wires are drawn upwardly vertically for the weaving operation. At the upper front part of the loom is the cloth advancing means consisting of a roller 76 mounted on a shaft 77. The cloth 10a travels upwardly from the weaving mechanism and over the roller 76 on which it is held by the endless belt 100 traveling on the rollers 99 carried by the shafts 97—98, which are supported by the arms 94 pivoted on the shaft 88, which in turn is journaled adjustably in brackets 91 on the main frame members. This cloth advancing apparatus is the special subject of my co-pending application, Serial No. 45,979 filed October 21, 1935.

From the roller 76, the cloth 10a travels downwardly and forwardly, preferably over an inspection apron, not here shown, to the wind-up mechanism.

In looms in ordinary use, the finished wire is usually wound upon a wind-up member and tension is provided by means of a transverse weighted roller bearing upon a bight in the cloth. The action of the weighted roller is made constant regardless of the mechanism, which rotates the take-up mandrel and winds up a certain amount of cloth, thus raising the weighted roller each time after it has dropped low enough to trip a wind-up clutch. In such ordinary looms, the wind-up mandrel is the final warp tension support since the wire is stretched between it and the drum from which the warp wire is fed. Warp tension is established and maintained by the rotation of this wind-up member. At the beginning of a run, the cloth is wound tangent to perhaps a two inch radius. As each layer or convolution of cloth is added to the intermittently rotating mandrel, the radius at which it is received becomes greater by the thickness of one layer of cloth.

Since the weight roll imposes an average uniform tension on the cloth, it is obvious that each successive convolution of cloth on the mandrel imposes a greater torsional stress upon the mandrel. The cloth being attached at one end to the mandrel must carry the same torsional load as the mandrel on the inside convolution, and if the roll becomes twice the size of the mandrel, the cloth next the mandrel is subject to stress nearly twice the weaving tension. As this tension reaches the elastic limit of the wire, permanent elongation of the wire results. Since warp wires vary in their elastic limits and some stretch more than others, this sometimes results in what is known as "pulled cloth." When the "pull" is bad enough, the cloth can not be mar-

keted. The present wind-up mechanism, particularly when used with the breast roll 76 may be employed in a loom without any such tendency to produce "pulled" cloth.

5 At the lower front part of the loom is a wind-up mandrel 200, having the form of a hollow metal cylinder and constituting a roll. The mandrel 190 has a longitudinal slot 101. The purpose
10 of the slot 101 is to receive the edge of the woven wire cloth as illustrated for instance in Figure 1 when the cloth is started on the mandrel.

At the ends of the mandrel 200 and projecting therefrom are the hollow gudgeons 102. The gudgeons 102 are provided with the circumferential grooves 103. The main frame members 75
15 support hardened steel rollers 104, which support the gudgeons 102 with their edges received in the grooves 103.

The wire cloth 10a after it passes over the roller 76 is drawn downwardly and forwardly in
20 the machine until its edge can be inserted into the slot 101.

The mandrel is then turned by hand until the slack in the cloth is taken up.

25 Above the wind-up mandrel 200 is a pressure roll 105 mounted on a shaft 106. The ends of the shaft 106 are journaled in bearing blocks 107. The bearing blocks 107 are slidably mounted
30 in inclined guide slots 108 formed in frame elements 109, which have bracket arms 110 and 111 bolted to the frame members 75 as shown in Figure 5.

Secured to the opposite ends of each bearing block 107 are the ends of chains 112.

35 At the lower ends of the frame members 109 are stub shafts 113 (Figure 2 for example) on which are idler sprockets 114, over which the chains 112 travel.

In the upper ends of the frame members 109 is
40 mounted a shaft 115 on which are sprockets 116 over which the chains 112 travel.

It will be seen that by rotating the shaft 115 and the sprockets 116 fixed thereon, the chains
45 may be manipulated for raising or lowering the pressure roll 105. This mechanism also insures that the pressure roll 105 will always be kept parallel with the cloth and the wind-up mandrel.

On the shaft 115 is a hand wheel 117 by which
50 the shaft 115 can be manually operated.

On the shaft 115 is a ratchet 119. On one of
55 the frame members 109 is pivoted a pawl 120 arranged to coast with the ratchet 119. This pawl may be manipulated for holding the pressure roll 105 after it has been manually raised
60 for any purpose, as for instance to permit the removal of a wind-up mandrel with the roll of cloth thereon. The mandrel and the roll of cloth thereon are rotated by the friction imparted from the pressure roll 105 and the weight roll
65 hereinafter referred to.

Motion is imparted to the pressure roll from a
70 traveling endless chain 121 which travels over sprockets not shown and receives motion from one of them and also travels over a sprocket 122,
75 which may be an idler sprocket or roller supported on the frame just below and rearwardly from the pressure roll 105 and over an idler sprocket or roller 122a mounted on a suitable bracket on one of the guide blocks 107.

Fixed with relation to the pressure roll 105 is
80 a sprocket 123 between the sprockets 122 and 122a. The sprockets 122 and 122a so guide the chain 121 that the chain engages the rearward part of the periphery of the sprocket 123.

85 It will be observed that the sprocket 122a

travels with the bearing blocks 107 and that the
90 construction described permits the bearing blocks 107 and the pressure roll 105 to slide up and down in the frame members 109 according to the diameter of the roll of wire on the wind-up
95 mandrel.

There is enough play in the chain 121 to permit this operation without the use of any special take-up or chain tightener.

Pivotaly supported on the shaft 106 between
100 the frame members 75 are rearwardly extending arms 124. A shaft 125a has its ends journaled preferably by antifriction bearings, not shown, in the arms 124. On the shaft 125a is the weight roll 125. This weight roll is driven from
105 the pressure roll 105 by a chain 126 traveling on sprockets 127 on the pressure roll and weight roll (Figure 2).

In the complete machine, the parts are so
110 designed that the pressure roll and the weight roll travel at a surface speed which slightly exceeds that of the breast roll and hence slightly exceeds the speed of the feed of the cloth.

This results in a continuous slight slip between the pressure and weight rolls on the one
115 hand and the roll of the cloth on the wind-up mandrel on the other.

The purpose of providing for this slip is to impart to the cloth that tension derived from its
120 friction with the pressure and weight roll surfaces.

Since the cloth is advanced by the breast roll, I find that by providing for this slip, there is
125 afforded a satisfactory means of producing the desirable slight tension on the cloth for winding it up.

The frictional contact between the pressure and weight rolls and the cloth is constant within
130 close limits and is not altered to any harmful extent by the amount of cloth, on the mandrel.

It will be observed that the parts are so
135 arranged that the cloth is guided around a portion of the periphery of the pressure roll 105 and then reaches and is wound on the wind-up mandrel. The pressure roll alone would make a fair
140 roll of cloth upon the wind-up mandrel but I find that the addition of the driven weight roll, urging the cloth forward at about the point where it passes under the pressure roll the second time
145 serves to give the cloth tension clear around the outside convolution of the cloth roll and results in a snug but not unduly tensioned roll of wire cloth, which roll does not unduly bind the mandrel and can be removed from the mandrel by
150 the simple expedient of pushing the mandrel out of the roll of cloth after the removal of the mandrel from the machine.

In operation the pressure roll and weight roll
155 are raised by means of the hand wheel 117 and the end of the cloth is connected to the mandrel and the mandrel is manually rotated until the cloth is snugly taut, whereupon the pressure roll and weight roll are lowered until they engage the cloth on the mandrel as shown in Figure 1.

It will be understood that the chain 121 is
160 operated in synchronism with the breast roll.

As the machine operates and the roll of wire cloth becomes larger, the bearing blocks 107 may
165 slide upwardly in the slots 108 of the frame members 109, and the pressure and weight rolls also move upwardly, but always bearing against the roll of cloth (see Figure 3).

When a sufficiently large roll of cloth has been
170 formed upon the mandrel, the cloth may be cut above the wind-up mechanism, and then the

pressure and weight rolls are lifted away from contact with the roll of cloth on the mandrel by manipulation of the hand wheel 117.

The roll of cloth is tied by means of wire fastened around it.

Bars may be placed in the openings of the gudgeons 102 and the workman can use the bars for lifting the mandrel up and away from the rollers 104 and out of the machine. The mandrel can then be slid lengthwise from the roll of cloth and replaced in the machine.

For preventing any telescoping of the inner convolutions of cloth on the mandrel by axial crawl, I have provided an additional precautionary means. Near each end of the wind-up mandrel is a flat metal guide 133 (Figure 2), which is arranged to be adjacent the end of the roll being formed. Each guide 133 is supported by a rod 134, which is horizontally slidable in a bearing 135 on the main frame member. By means of set screws 136 threadedly mounted in the guides 135 and adapted to be adjusted to engage the rods 134, the rods and guides can be locked in any of their adjusted positions.

The guides 133 act as retaining means at the ends of the roll of wire cloth to confine the cloth to a roll of a length corresponding to the width of the cloth being woven.

I have thus provided in my wind-up mechanism a simple means for taking care of the cloth as it comes from the weaving loom, winding it on a mandrel under adequate tension, keeping the outer layer of wire tensioned and smooth and guiding the wire, so that the roll is kept straight.

The mandrel with the roll thereon is easily removed from the machine and the mandrel can be quickly and easily replaced.

Such a structure in a loom of the kind under consideration where the wire cloth is advanced through the machine by other means makes it possible to get a smoother and better roll of cloth than can be produced where the wind-up mandrel is employed for pulling the cloth through the machine.

It will, of course, be understood that it is my purpose to cover by the claims appended hereto any such changes in construction or arrangement of parts that may be included within the scope of my invention and of the wording of the claims.

I claim:

1. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it, with a mandrel, and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, and means for operating the pressure roll at a speed faster than that of the advance of the cloth from the first means.

2. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it to a wind-up device, with a wind-up device including a mandrel, and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of the travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, and a weight roll adjustably mounted, on the opposite side of

the fall of cloth traveling between the means and the mandrel, to impose weight on the cloth on the mandrel.

3. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it, with a mandrel and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of the travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, and a weight roll adjustably mounted, on the opposite side of the fall of cloth traveling between the means and the mandrel, to impose weight on the cloth on the mandrel, and means to operate the pressure roll faster than the first means.

4. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it, with a mandrel and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of the travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, a weight roll adjustably mounted, on the opposite side of the fall of cloth traveling between the means and the mandrel, to impose weight on the cloth on the mandrel and means to operate the pressure roll at a speed faster than that of the travel of the cloth from the first means.

5. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it, with a mandrel and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of the travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, and a weight roll adjustably mounted, on the opposite side of the fall of cloth traveling between the means and the mandrel, to impose weight on the cloth on the mandrel, and means to operate the weight roll at a speed faster than that of the travel of the cloth from the first means.

6. In a wind-up apparatus for a wire weaving machine, the combination of means for engaging woven cloth and advancing it, with a mandrel and mechanism for winding the cloth on the mandrel after it has been acted on by said means, said mechanism including a pressure roll adjustably mounted above the mandrel in the path of travel of the cloth from the means to the mandrel, so that such cloth is pressed against the mandrel by the weight of the roll, and a weight roll adjustably mounted, on the opposite side of the fall of cloth traveling between the means and the mandrel, to impose weight on the cloth on the mandrel, and means to operate the pressure roll and the weight roll at a speed faster than that of the travel of the cloth from the first means.

7. In a wind-up device for a wire weaving machine, a frame, a mandrel mounted thereon for free rotation, a pressure roll above the mandrel, means for mounting the pressure roll for imposing its weight on the cloth being wound on the mandrel and to permit the pressure roll to move away from the mandrel as the roll of cloth on the mandrel increases in size, means for raising said last-named means for moving the pressure

roll away from the mandrel, means for imparting rotation to the pressure roll, and a weight roll hung from the pressure roll to impose its weight on the mandrel and the cloth thereon on the opposite side of the fall of cloth advancing to the mandrel, from the pressure roll.

8. In a wind-up device for a wire weaving machine, a frame, a mandrel mounted thereon for free rotation, a pressure roll above the mandrel, means for mounting the pressure roll for imposing its weight on the cloth being wound on the mandrel and to permit the pressure roll to move away from the mandrel as the roll of cloth on the mandrel increases in size, means for raising said last-named means for moving the pressure roll away from the mandrel, means for imparting rotation to the pressure roll, a weight roll hung from the pressure roll to impose its weight on the mandrel and the cloth thereon on the opposite side of the fall of cloth advancing to the mandrel, from the pressure roll, and means for imparting rotation synchronously to the pressure and weight rolls.

9. In a wind-up device for a wire weaving machine, a mandrel, means for supplying wire cloth to the mandrel, a roller mounted adjacent the mandrel to engage the fall of wire cloth as it approaches the mandrel and to engage the roll of wire cloth on the mandrel substantially as shown, the pressure roll being mounted to impose its weight on the roll of wire cloth on the mandrel

and to be moved away from the axis of the mandrel as the roll of cloth on the mandrel increases in size, and means for imparting rotation to the pressure roll, so that its surface travels slightly faster than does the fall of wire cloth with which it engages.

10. In a wind-up device for a wire weaving machine, a mandrel, means for supplying wire cloth to the mandrel, a roller mounted adjacent the mandrel to engage the fall of wire cloth as it approaches the mandrel and to engage the roll of wire cloth on the mandrel substantially as shown, the pressure roll being mounted to impose its weight on the roll of wire cloth on the mandrel and to be moved away from the axis of the mandrel as the roll of cloth on the mandrel increases in size, and means for imparting rotation to the pressure roll, so that its surface travels slightly faster than does the fall of wire cloth with which it engages, a weight roll for engaging the roll of wire cloth on the mandrel and arranged on the opposite side of the fall of wire cloth approaching the mandrel, said weight roll being actuated for rotation at a speed slightly greater than that of the approach of the wire cloth to the pressure roll and mandrel, whereby the wire is impelled toward the mandrel by the pressure roll and is impelled toward the pressure roll by the weight roll.

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