

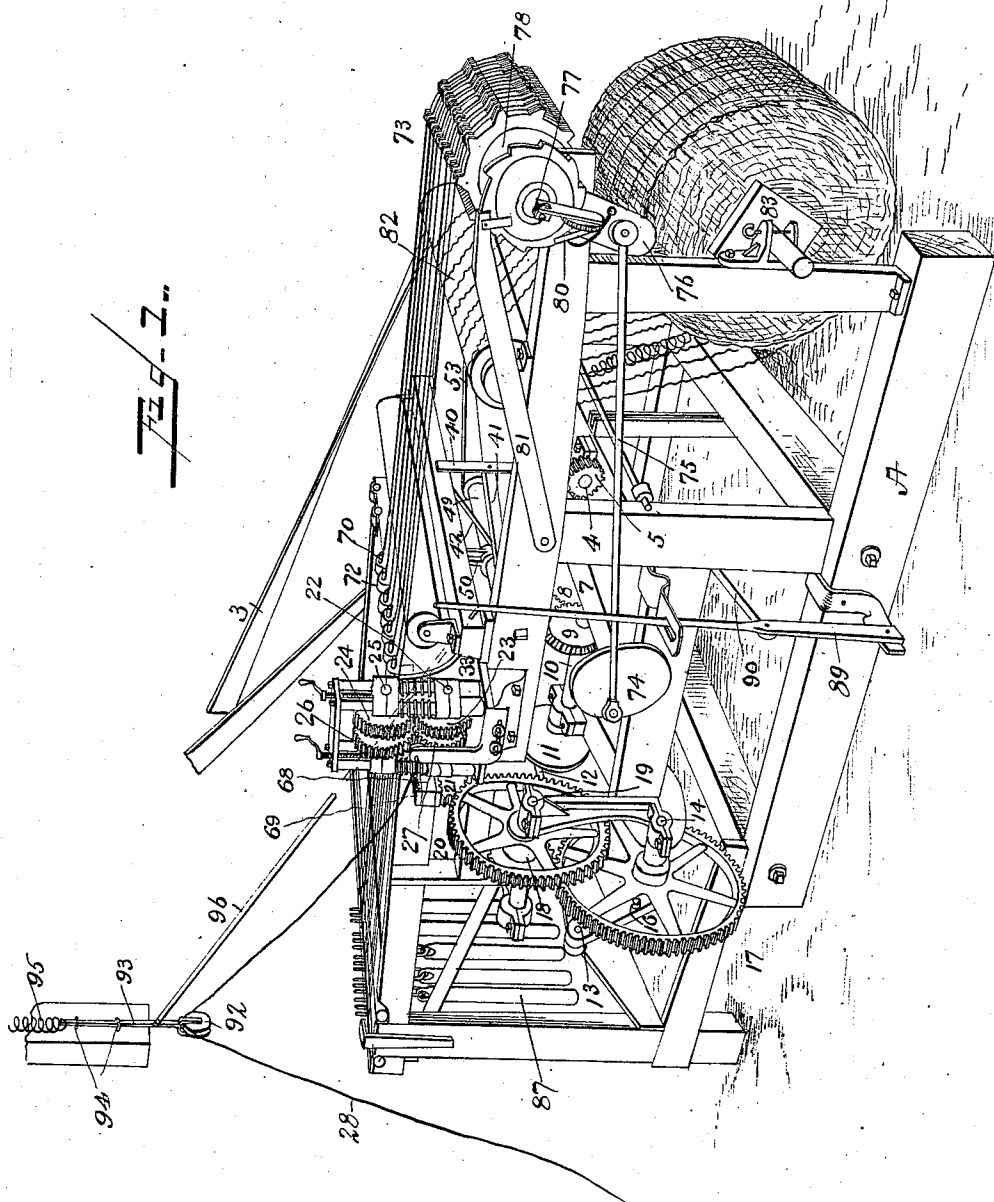
(No Model.)

6 Sheets—Sheet 1.

A. WESTERBERG.
WIRE FENCE MAKING MACHINE.

No. 583,557.

Patented June 1, 1897.



Witnesses
J. L. Ourand.
George J. Weber.

Inventor.
Alfred Westerberg.
By John A. Marahan
his Attorney.

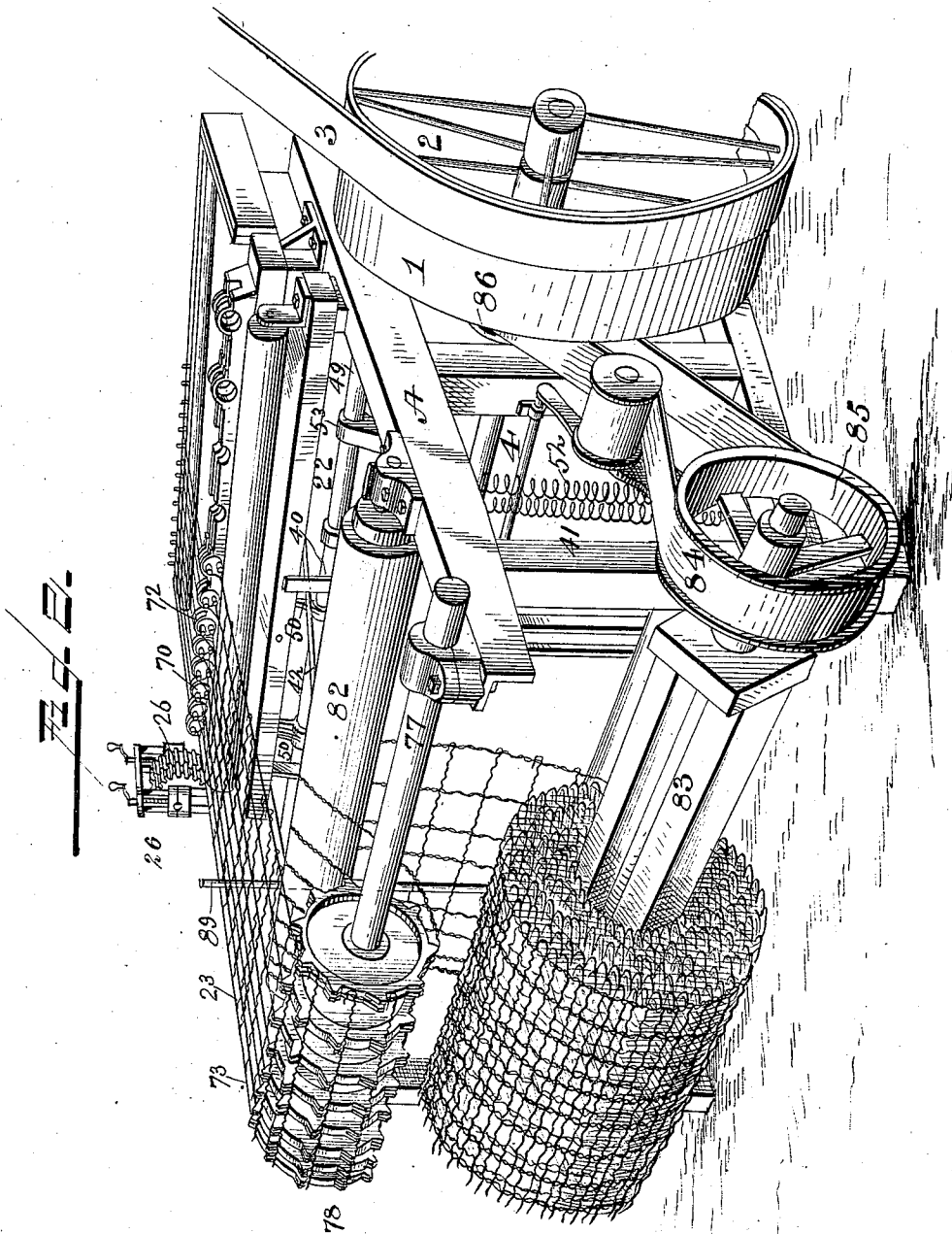
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A. WESTERBERG.
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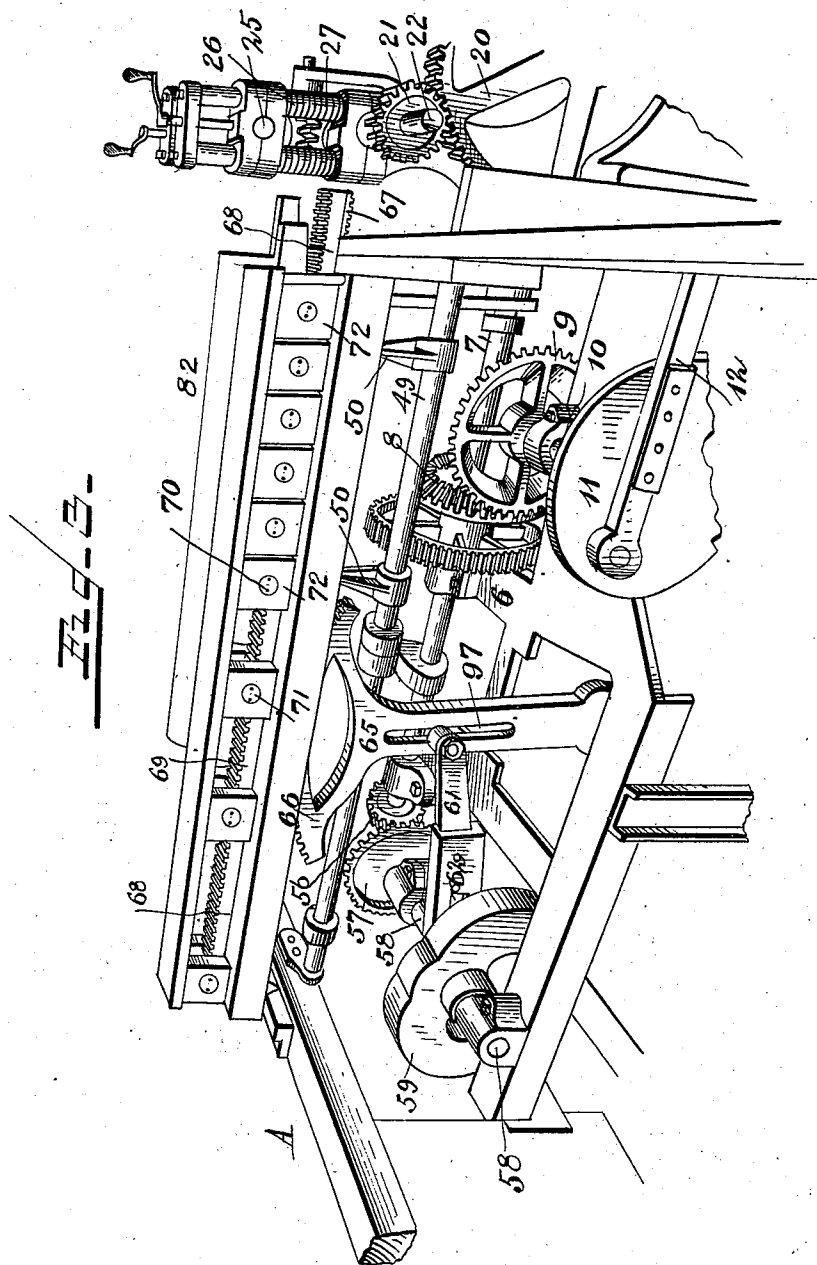
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6 Sheets—Sheet 3.

A. WESTERBERG.
WIRE FENCE MAKING MACHINE.

No. 583,557.

Patented June 1, 1897.



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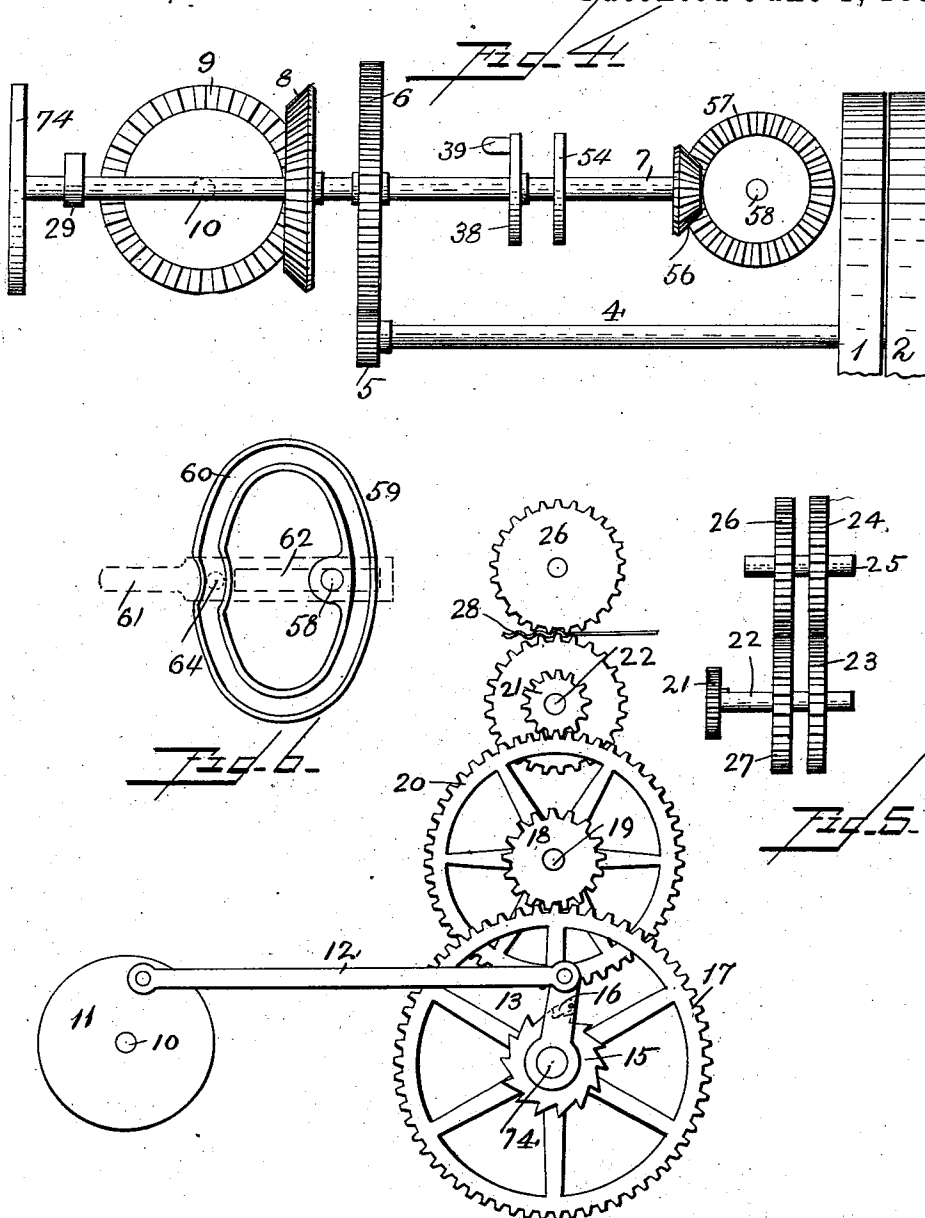
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A. WESTERBERG.
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No. 583,557.

Patented June 1, 1897.



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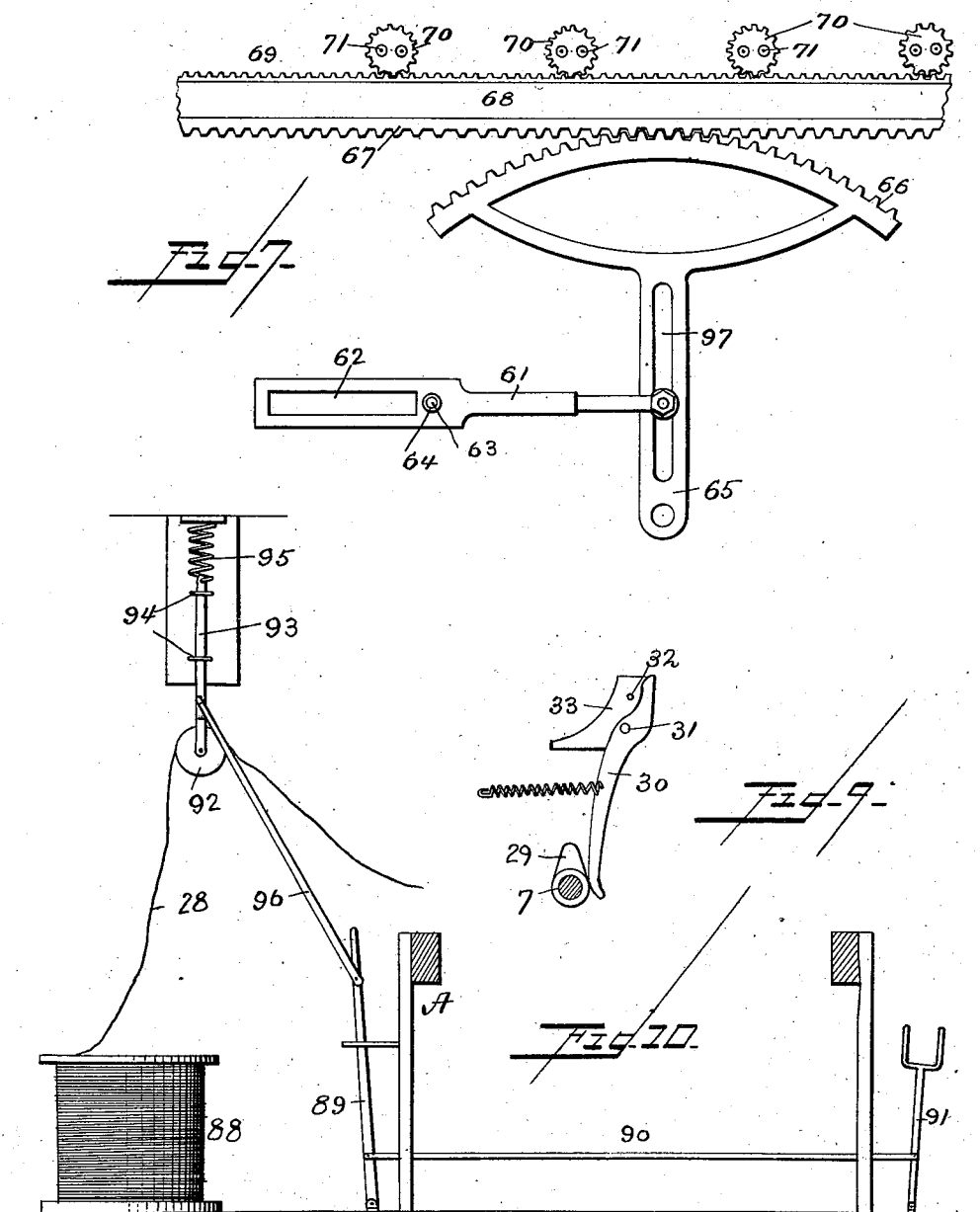
(No Model.)

6 Sheets—Sheet 5.

A. WESTERBERG.
WIRE FENCE MAKING MACHINE.

No. 583,557.

Patented June 1, 1897.



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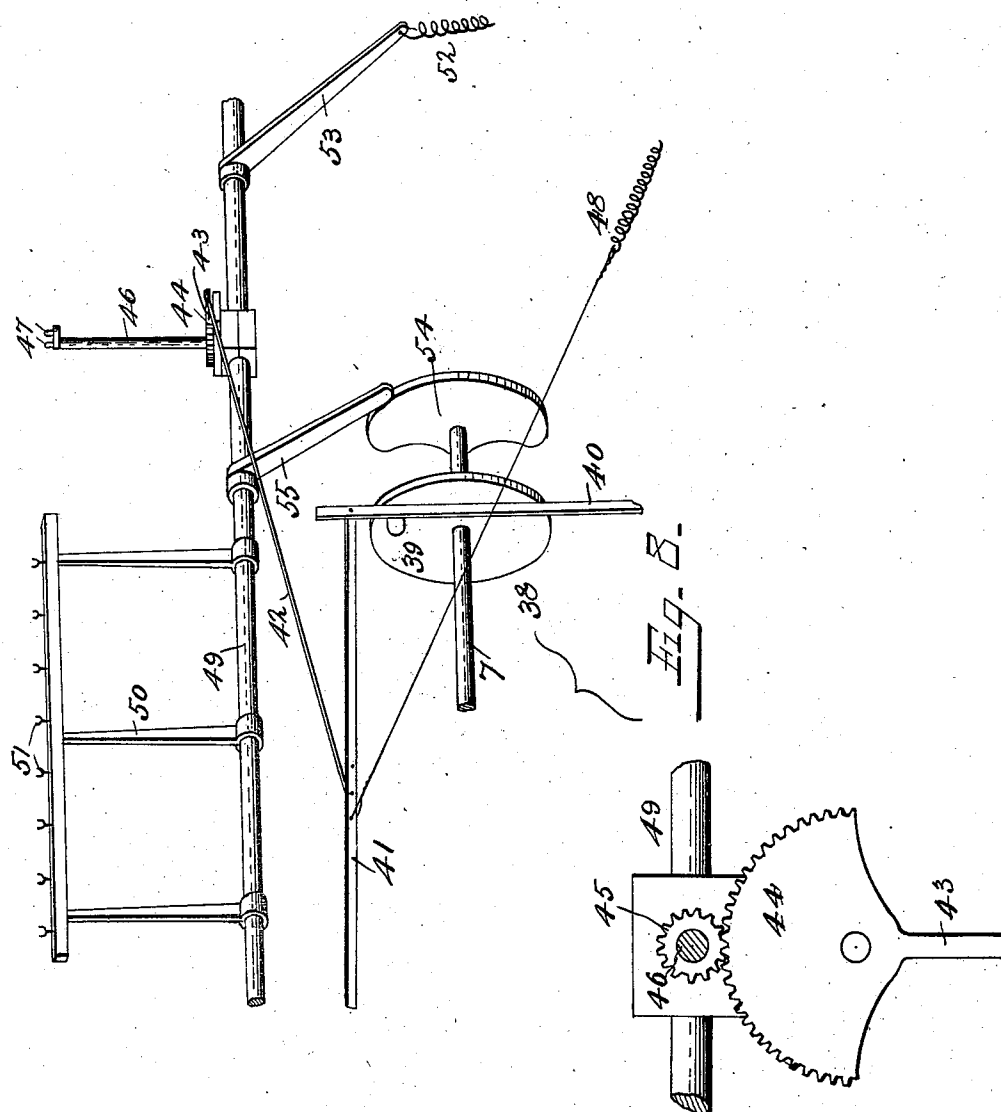
(No Model.)

6 Sheets—Sheet 6.

A. WESTERBERG.
WIRE FENCE MAKING MACHINE.

No. 583,557.

Patented June 1, 1897.



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UNITED STATES PATENT OFFICE.

ALFRED WESTERBERG, OF DE KALB, ILLINOIS, ASSIGNOR TO THE HAISH
MANUFACTURING COMPANY, OF SAME PLACE.

WIRE-FENCE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,557, dated June 1, 1897.

Application filed September 19, 1896. Serial No. 606,363. (No model.)

To all-whom it may concern:

Be it known that I, ALFRED WESTERBERG, a citizen of the United States, residing at De Kalb, in the county of De Kalb and State of Illinois, have invented certain new and useful Improvements in Wire-Fence-Making Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has reference to machines for making wire fence; and it consists of mechanism for intermittently feeding the runners or cables which constitute the horizontal strands when the fence is in place, and in also intermittently feeding the cross-stays between the strands of the aforesaid runners, which stays are vertical when such stays are in position; also in the provision of an automatic stop for the machine in case of any interruption in the feeding of the cross or stay wires.

I attain the above purposes by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective of a machine embodying my invention, viewed obliquely from one side thereof. Fig. 2 is the same, viewed obliquely from the opposite side of the machine, with the product in position on the machine. Fig. 3 is a partial view of the rear of the machine. Fig. 4 is a detail of the main driving-shaft and adjunctive parts. Fig. 5 is a detail of part of the devices used to transmit the power from said main shaft to the feeding-pinions of the cross-wire. Fig. 6 is a detail of the eccentrically-grooved wheel which drives the twisters. Fig. 7 is a detail of the connection between said eccentric and the transverse reciprocating bar which intermittently rotates the twisters of the cables. Fig. 8 is a detail of the transverse rod which rocks longitudinally of the machine and carries the strippers which seat the stays uniformly and snugly against the twist in the cables, so as to insure the stays being at right angles with said cables. Fig. 8 also shows in detail the portion of the mechanism

for driving the upright spindle which forms the loop at the upper end of the stay and inserts the short side of said loop in the next succeeding mesh of the top cable, as shown in Fig. 2. Fig. 9 is a detail of the oscillating knife which severs the stays and the mechanism adjunctive to said knife. Fig. 10 is a detail of the mechanism for automatically stopping said machine.

Similar letters and figures refer to similar parts throughout the several views.

Referring to Fig. 1, A is the frame of the machine, upon which the cables are drawn in a horizontal position and under some tension through a series of twisters arranged on the top of the machine parallel with each other, and with two openings in each longitudinally of the machine, through which the strands of the cables pass to the winding-axle and to the reel, seated on what we will term, by way of distinction, the "front" of the machine.

As the wires come through the twisters and are held open by the spaces between the openings in said twisters the cross-stays are instantly shot horizontally through all of the cables by means of feeding-pinions 26 and 27, shown in the front of Fig. 1. The entire fabric is then advanced the distance between the stays, and during this advance the strip-rack (shown in Fig. 8) drives the stays 23 against the previous twist of the cables 73 and, in a line transversely through the latter at right angles thereto. The twisters are then given three or four revolutions, temporarily stopped, a succeeding stay driven through, and the fabric slightly advanced, as aforesaid, for the operation of said strippers. The fabric is wound under tension on a removable reel 83, shown at the right in Fig. 1. At the time the stays are shot across the web a portion of the forward end is turned back by a spindle 46, (shown in Fig. 8,) so as to be caught in the twist next succeeding that which follows the stay. Provision is also made for severing the stay the instant it has passed through all the cables. This is shown partly in Fig. 9.

Referring to Fig. 2, 1 is the general driving-pulley of the machine, and 2 an idler on the same shaft, to which the driving-belt 3 is shifted when it is desired to stop the machine.

The shaft 4 of the pulley 1 (shown in Fig. 4) extends to about the center of the machine and is provided on its inner end with a pinion 5, which meshes with a gear 6, seated rigidly on the shaft 7, journaled across the machine parallel to shaft 4 and from which substantially all of the movements of the machine have their origin. A beveled gear 8, seated on shaft 7, engages a corresponding beveled gear 9, seated in the rear of shaft 7 and perpendicular thereto on a shaft 10, on the rear end of which is rigidly seated a disk 11, to which there is adjustably attached the inner end of a pitman 12. The outer end of the pitman 12 is pivotally connected to the upper end of a nearly vertical arm 13, (see Fig. 5,) the lower end of which arm is pivotally seated on the shaft 14, on which shaft is rigidly seated a ratchet 15. A pawl 16, pivotally seated intermediately on the arm 13 in the rotation of the wheel 11, successively engages the notches on the periphery of the ratchet 15 and thereby imparts intermittent rotation to the shaft 14. On the shaft 14 is keyed a gear 17, which engages the pinion 18, seated on the shaft 19. On the shaft 19 is also rigidly seated a gear 20, which engages at its upper surface a pinion 21, keyed on the shaft 22. On the opposite end of shaft 22 there is keyed a pinion 23, which engages and actuates the pinion 24, (see Fig. 5,) keyed on the shaft 25, upon which there is also keyed the corrugated stay-feeding pinion 26. On the shaft 22, between the pinions 21 and 23, is rigidly seated the opposite stay-feeding pinion 27. The twin feeding-pinions 26 and 27 intermesh sufficiently at their adjacent peripheries to insure the certain movement of the stay-wire 28, and also to somewhat corrugate the said stay that the cables through which said stay is projected may have a firmer grasp on the latter. It will be noticed that the motion is "geared up" from the ratchet 15 to the pinion 21, so that the intermittent action of the feed-wheels 26 and 27 is very rapid. This is essential, as the stay must be very quickly driven across the entire width of the web.

On the shaft 7 is rigidly seated a cam 29, (see Fig. 9,) which intermittently engages the vertical knife 30, pivoted at 31 to the machine, throwing the upper end of said knife outward and severing the stay 28 the instant the latter has been projected across the web, which when completed constitutes the fence. The stay 28 enters the machine through an eye 32 in the stationary metallic plate 33, suitably attached to the machine. The knife 30 passes along the inner surface of the plate 33 and instantly severs the wire 28 at the inner surface of said plate. A suitably reacting spring returns knife 30 to its normal position.

A wheel 38 is rigidly seated on shaft 7 (see Figs. 4 and 8) and provided with a lug 39, which intermittently engages a vertical bar 40, pivoted at its lower end to the frame of

the machine and at its upper end to the inner end of a transverse horizontal bar 41, the outer end of which reciprocates through a suitable opening in the frame of the machine. The rotation of the shaft 7 causes the lug 39 to intermittently engage the bar 40 between its pivotal points and throw it and the bar 41 outwardly. A pitman 42 is adjustably pivoted at its outer end to the intermediate portion of bar 41, and at its inner end attached to an arm 43, integral with and extending forwardly from a rocking horizontally-seated segmental gear 44, which engages the small pinion 45, rigidly seated on the vertical spindle 46, the upper end of which is provided with vertical twin fingers 47, having a slight interval between them for the reception of the projecting ends of the stay 28. Such projecting end passes between said fingers while said spindle is at rest, and the next instant the cam 39, striking the bar 40, through the mechanism before described, imparts a rapid rotation to the spindle 46, thereby turning the projected end of the stay 28 back into the adjacent cable. A spring 48, suitably attached to the frame A at one end and to the bar 41 at the other, returns the bar 40, after each impulse of the cam 39, to its original position. The vertical spindle 46 is seated on the rock-shaft 49, suitably journaled transversely of the machine parallel with the shaft 7, and as said shaft 49 is rocked forward the fingers 47 are withdrawn below the plane of the web. On the shaft 49 is also seated a frame 50, transversely of the machine, on the upper side of which are placed bifurcated strippers 51, adapted to bestride the cables from below and engage the stay 28 the instant it is severed and drive it forward squarely across the web and against the last previous twists of said cables. The normal position of the strippers 51 is back against the twisters through which the cables are fed to the machine. The said strippers are held thus normally back by means of a coiled spring 52, the lower end of which is suitably attached to the machine and the upper end of which is connected to the rear end of a substantially horizontal arm 53, seated at its front end rigidly on the shaft 49 and extending rearwardly therefrom. The shaft 49 is rocked forward by means of a half-wheel 54, seated rigidly on the shaft 7 and intermittently engaging the lower end of an arm 55, the opposite end of which is rigidly seated on said shaft 49.

The twisters 70 are actuated in the following manner: On the end of shaft 7, adjacent to the driving-pulley 1, is seated a beveled pinion 56, which engages and actuates a larger beveled gear 57, seated on the shaft 58, which latter extends horizontally rearwardly from said shaft 7. (See Fig. 4.) On the shaft 58, near its rear end, is seated an eccentric 59, (see Figs. 3, 6, and 7,) provided on its inner face with an elliptical groove 60. A pitman 61, carried on the shaft 58 by means of a slot 62 in said pitman, which bestrides shaft 58,

is provided with a stud 63, having the usual friction-roller 64, which traverses the groove 60. The inner end of the pitman 61 is pivoted adjustably in a vertical slot 97 in the intermediate portion of the vertical arm 65, pivotally seated at its lower end on the frame A and provided at its upper end with the segmental gear 66, adapted to be oscillated by said pitman transversely of the machine. The segmental gear 66 engages the gear-rack 67, formed on the lower surface of the transversely-reciprocating bar 68, which has on its upper surface a gear-rack 69, adapted to engage the geared peripheries of the twist-ers 70, provided each with the wire-openings 71 for the passage of the strands of the cables. The reciprocating bar 68 is seated in suitable ways transversely of the machine, and the twist-ers 70 are seated in boxes 72, suitably attached to the frame of the machine.

The cables 73 are intermittently progressed by the following mechanism: A disk 74 is formed on the end of shaft 7, at the end thereof opposite to the pinion 56 thereon, in which the rear end of a pitman 75 is pivoted, the outer end of said pitman being pivotally attached to the lower end of the arm 76, the upper end of which is pivotally seated on the shaft 77. On the shaft 77 is rigidly seated a sprocket-roller 78, adapted to draw the fence or web forward. A ratchet 79 is also keyed on shaft 77 outside of the pivotal seat thereon of the arm 76. Intermediately on the arm 76 there is seated a pawl 80, which in the oscillations of the arm 76 by the pitman 75 engages the ratchet 79 and intermittently rotates the sprocket-roller 78. A retaining-pawl 81, seated on the frame A, engages the ratchet 79 reversely to prevent its retrogression. The web or fence, after passing over the sprocket-roller 78, is passed backward over a smooth roller 82 and downward around the reel 83. The belt 84, passing around the pulley 85 on reel 83 and driven from a pulley 86 on shaft 4, tends to impart a constant rotation to the reel 83, but not with sufficient force to rotate the sprocket-roller 78, but with force enough to tightly wind the finished fence on the reel 83, as said fence is intermittently advanced by the action of the pitman 75 and adjunctive mechanism. The belt 84 slips on the pulley 85 during the stationary intervals of the reel 83, and the fence is thereby wound uniformly and tightly upon the reel 83. The strands for the cables 73 are held taut and prevented from premature progression by weights 87, suitably hung on said wires a short distance back of the twist-ers 70.

Sometimes in drawing the stay-wire 28 from the reel 88 the wire will become caught or tangled in some mode and thereby interrupt the normal feed of the wire 28. To avoid injury from this cause, I provide the following automatic stop: Referring to Fig. 1, a vertical lever 89 is pivoted at its lower end to the frame of the machine. A rod 90 is pivotally

attached to the lever 89 above the pivotal seat of the latter and extends horizontally through the machine and is pivotally attached at its opposite end to a laterally-oscillating vertical arm 91, in front of pulleys 1 and 2, pivoted at its base to the machine or the floor and bifurcated at its upper end to grasp and shift the belt 3. By moving the upper end of the lever 89 toward the machine the upper end of arm 91 is moved from the machine and the belt 3 thereby pushed from the driving-pulley 1 to the idler 2. In order to operate the lever 89 automatically, I provide a pulley 92, over which the stay-wire 28 is passed from the reel 88 to the machine. The pulley 92 is seated in the lower end of a vertically-reciprocating bar 93, carried in proper ways 94, and suitably hung on a coiled spring 95. Any stoppage in the delivery of the wire 28 from the reel 88 tends to draw the pulley 92 and its supporting-bar 93 downward. A rod or bar 96 is attached at its upper end intermediately to the bar 93 and at its lower end to the lever 89 above the pivotal seat of the latter. The downward movement of the bar 93, therefore, through the medium of the bar or rod 96, has the effect of crowding the lever 89 toward the machine and throwing the belt 2 off the driving-pulley 1 at the opposite side of the machine with the same effect as though the lever 89 had been thrown inward by the operator.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a wire-fence-making machine, the combination of a suitably-driven shaft 7, provided with beveled gear 8, the shaft 10 provided with a beveled gear 9 adapted to be engaged and actuated by said gear 8 and provided further with disk 11, the pitman 12 attached at its inner end to said disk, and at its outer end to the arm 13, shaft 14, ratchet 15 seated thereon, arm 13 provided with a pawl 16 adapted to engage and intermittently rotate the ratchet 15, the gear 17 seated on the shaft 14, shaft 19 provided with pinion 18 adapted to be actuated by said gear 17, gear 20 seated on shaft 19, shaft 22 provided with pinion 21 adapted to be engaged and actuated by the gear 20, pinion 23 seated on shaft 22, shaft 25 provided with pinion 24 and corrugated feeding-pinions 26 and 27 rigidly seated on shafts 25 and 22 respectively, substantially as shown and for the purpose described.

2. In a wire-fence-making machine, the combination of suitable stay-feeding mechanism, a suitably-rotated shaft 7, provided with a cam 29, the metallic plate 33 provided with stay-entrance eye 32, oscillating knife 30 pivoted intermediately to the frame of the machine and adapted to engage and sever the wire 28 at its upper end, and to be engaged at its lower end and actuated by the cam 29, a suitably-reacting spring, and means, substantially as shown, for forcing the stay, after

severance, to its final position in the cables 73, for the purpose described.

3. In a wire-fence-making machine, the combination of a suitably-rotated shaft 7 provided with a half-wheel 54, a rock-shaft 49 suitably journaled on the frame A parallel with shaft 7 and provided with an arm 55 adapted to be engaged intermittently by the wheel 54 and thereby impart a rocking movement to the shaft 49, frame 50 seated on said shaft 49 and provided with strippers 51 adapted to seat the stay 28, arm 53 seated on said shaft 49 and the spring 52 connecting the frame of the machine with the arm 53 and adapted to draw the latter into normal position, substantially as shown and for the purpose described.

4. In a wire-fence-making machine, the combination of a suitably-rotated shaft 7, wheel 38 seated on said shaft and provided with lug 39, a horizontal bar 41 carried at its outer end in a suitable opening in the frame of the machine, vertical oscillating bar 40 pivoted at its lower end to the frame of the machine and at its upper end to the inner end of the bar 41 in position to be intermittently engaged and driven outwardly by the lug 39, a vertical spindle 46 seated on the shaft 49 and provided at its lower end with a pinion 45 and at its upper end with the fingers 47, a segmental gear 44 provided with the rearward arm 43 and adapted to engage the pinion 45, the pitman-rod 42 connecting the bar 41 with the arm 43, and the spring 48 connected at one end to the frame of the machine and at its opposite end to the bar 41 to return the latter bar to its normal position, substantially as shown and for the purpose described.

5. In a wire-fence-making machine, the combination of a suitably-driven shaft 7 provided with a beveled pinion 56, shaft 58 extending rearwardly from shaft 7 and provided at its front end with the beveled gear 57 adapted to be actuated by said pinion 56, eccentric 59 seated on the rear end of the shaft 58 and provided on its inner face with the elliptical groove 60, the pitman 61 supported on the shaft 58 and provided with stud 63 adapted to traverse the groove 60, the vertical arm 65 pivotally seated at its lower end on the frame A and provided at its upper end with a segmental gear 66 and pivotally connected to the inner end of pitman 61, the transverse reciprocating bar 68 provided on its lower sur-

face with a gear-rack 67 and on its upper surface with the gear-rack 69 adapted to be engaged and reciprocated by the segmental gear 66, the twistors 70 provided with wire-openings 71 and suitably journaled on the frame of the machine and further provided with geared perimeters adapted to be engaged by the gear-rack 69 on the bar 68, substantially as shown and for the purpose described.

6. In a wire-fence-making machine, the combination of suitably-rotated shaft 7, a disk 74 seated thereon, shaft 77 arm 76 pivotally seated at one end on said shaft and provided intermediately with a pawl 80, sprocket-roller 78 seated on shaft 77 and adapted to engage and draw the finished fence, ratchet 79 seated on shaft 77 and adapted to be engaged by the pawl 80, the pitman 75, pivotally connected at its respective ends to the arm 76 and disk 74, retaining-pawl 81, winding-reel 83, and suitable means for rotating the same, substantially as shown and for the purpose described.

7. In a wire-fence-making machine, the combination of the vertical lever 89 pivoted at its lower end to the machine, the rod 90 pivotally attached to said lever above the pivotal seat of the latter and extending horizontally through the machine, a laterally-oscillating vertical arm 91 seated at the opposite side of the machine and adapted at its upper end to engage the belt 3, and pivotally connected to the adjacent end of the rod 90, a suitably-supported coiled spring 95, a vertically-reciprocating bar 93 attached to said spring, the pulley 92 attached to the lower end of said bar and adapted to support the wire 28 between the reel 88 and the machine, the rod 96 attached at its upper end to the bar 93 and at its lower end to the lever 89 above the pivotal seat of the latter, whereby the downward pressure of the wire 28, caused by any interruption to the action of the reel 88, crowds the lever 89, through the medium of the rod 96, toward the machine, whereby the rod 90 and arm 91 shift the belt 3 and stop the machine, substantially as shown and for the purpose described.

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

ALFRED WESTERBERG.

Witnesses:

BENJAMIN S. WHITE,
CHARLES H. SALISBURY.