No. 806,440. PATENTED DEC. 5, 1905.

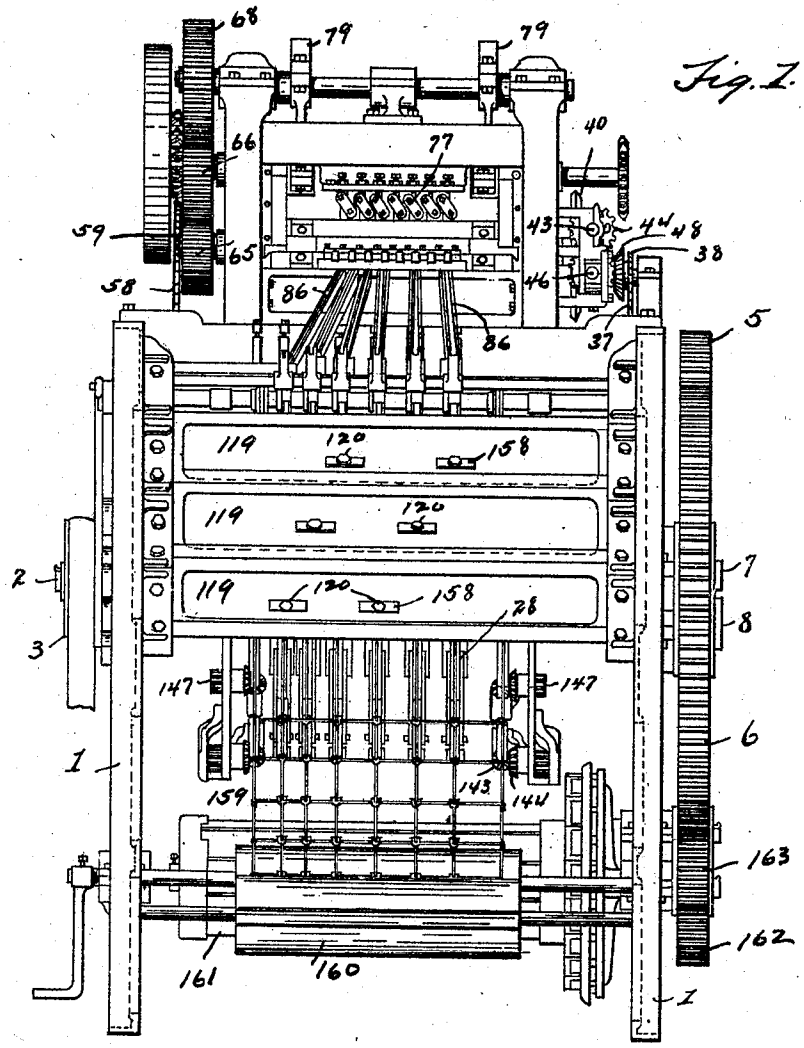
J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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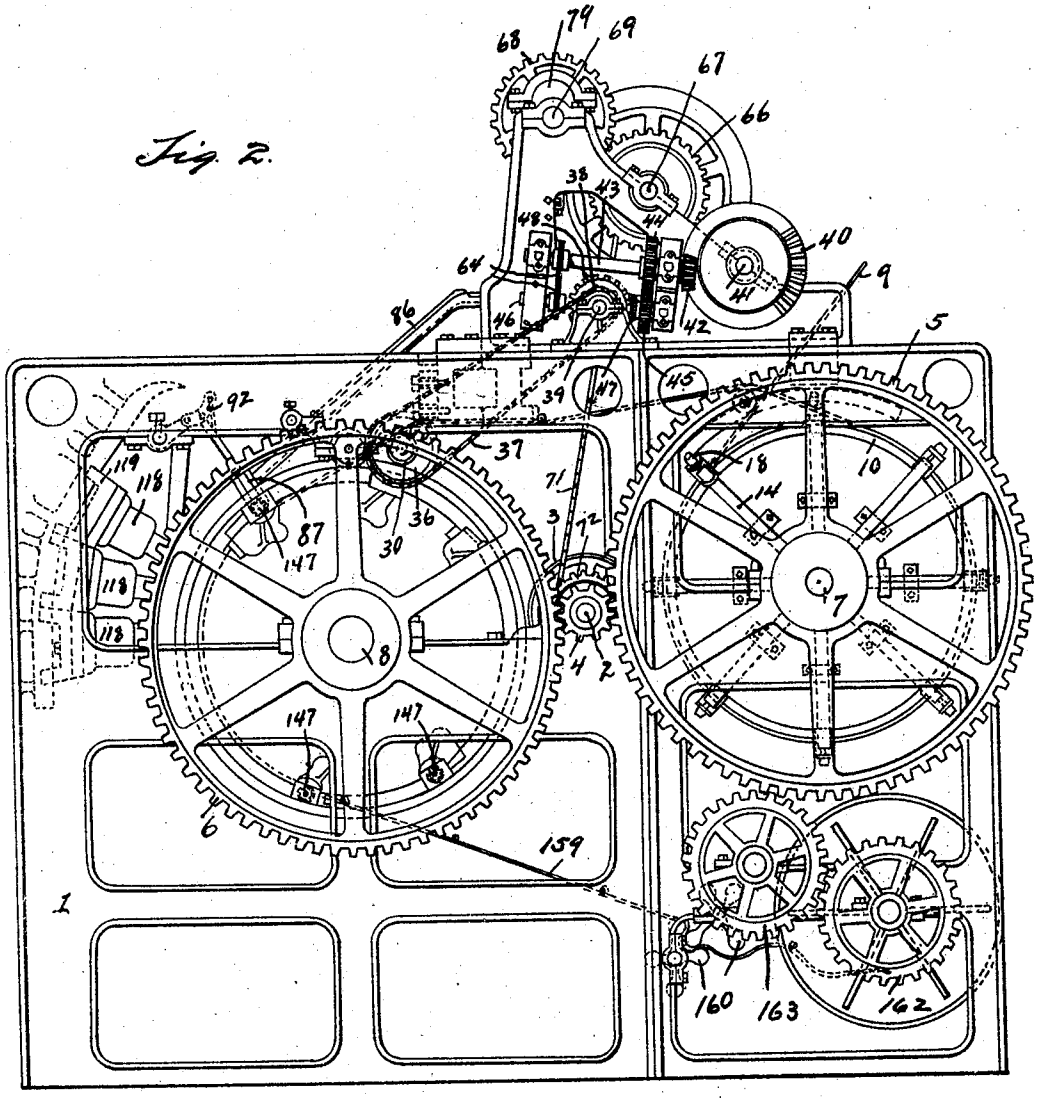
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APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
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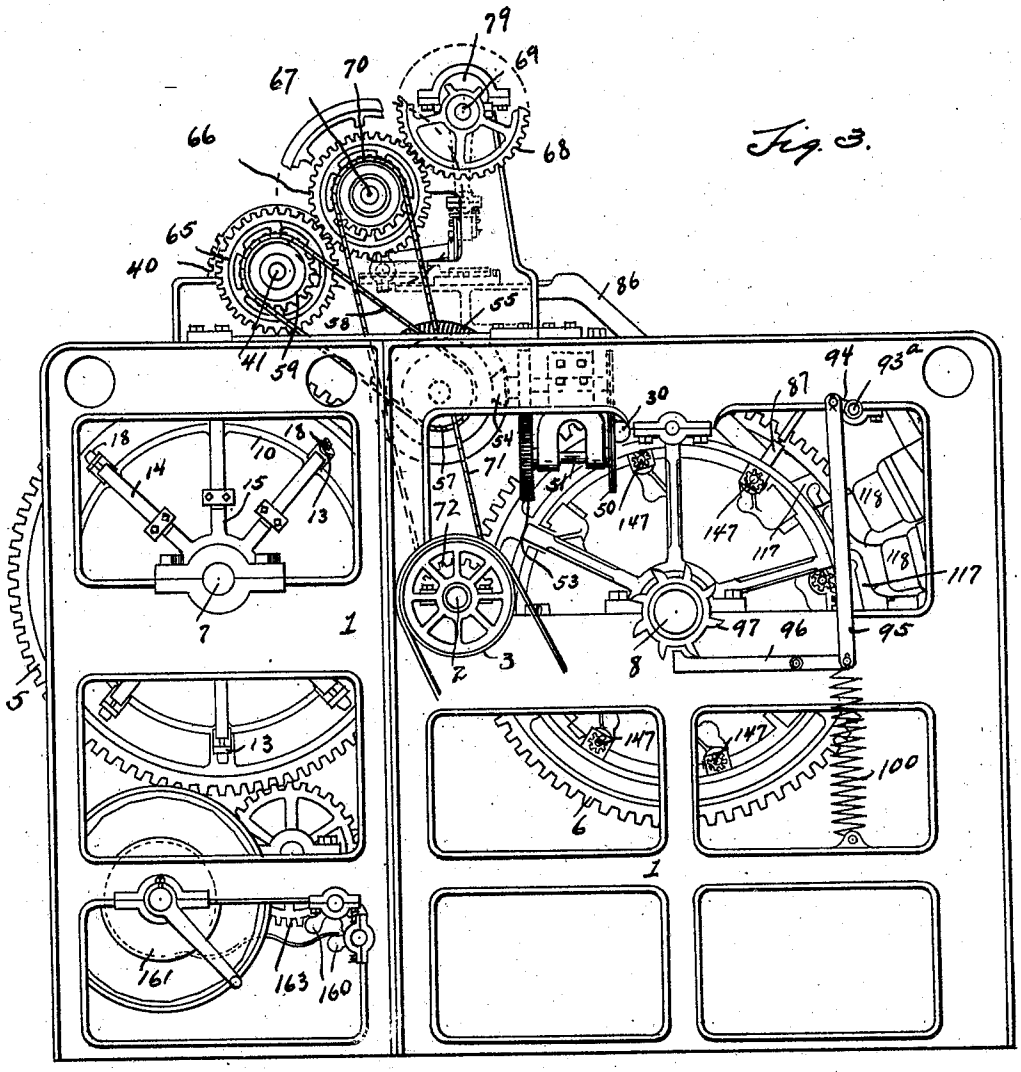
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APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
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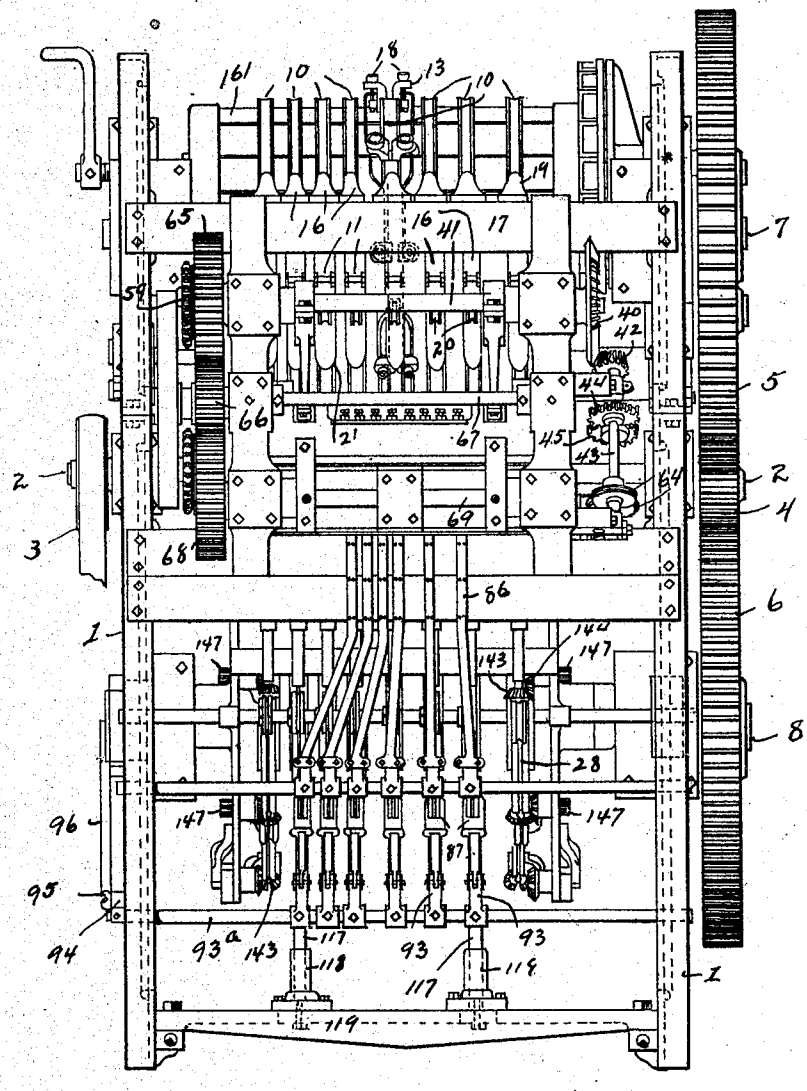
J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
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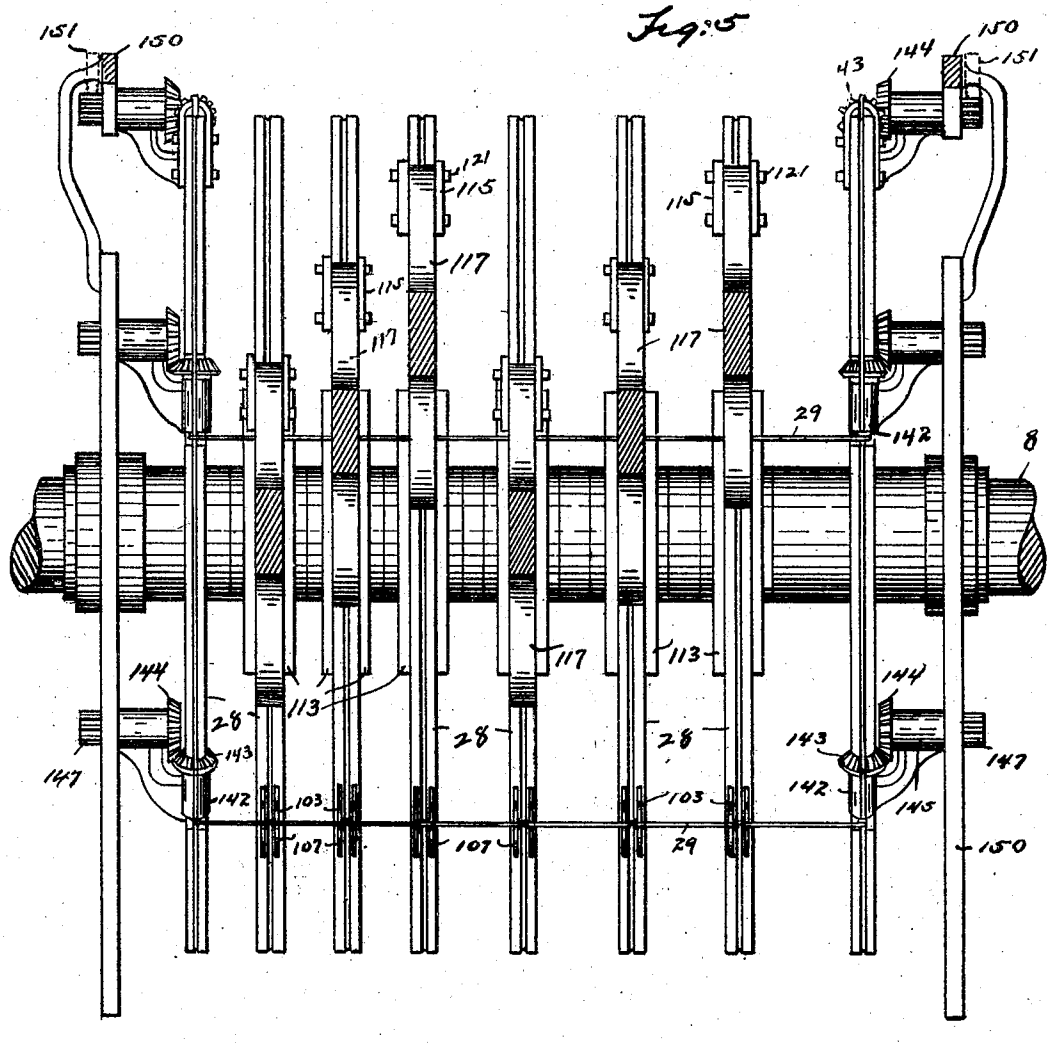
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APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 5.

Fig. 5



Witnesses:
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APPLICATION FILED MAY 9, 1904.

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Fig. 6.

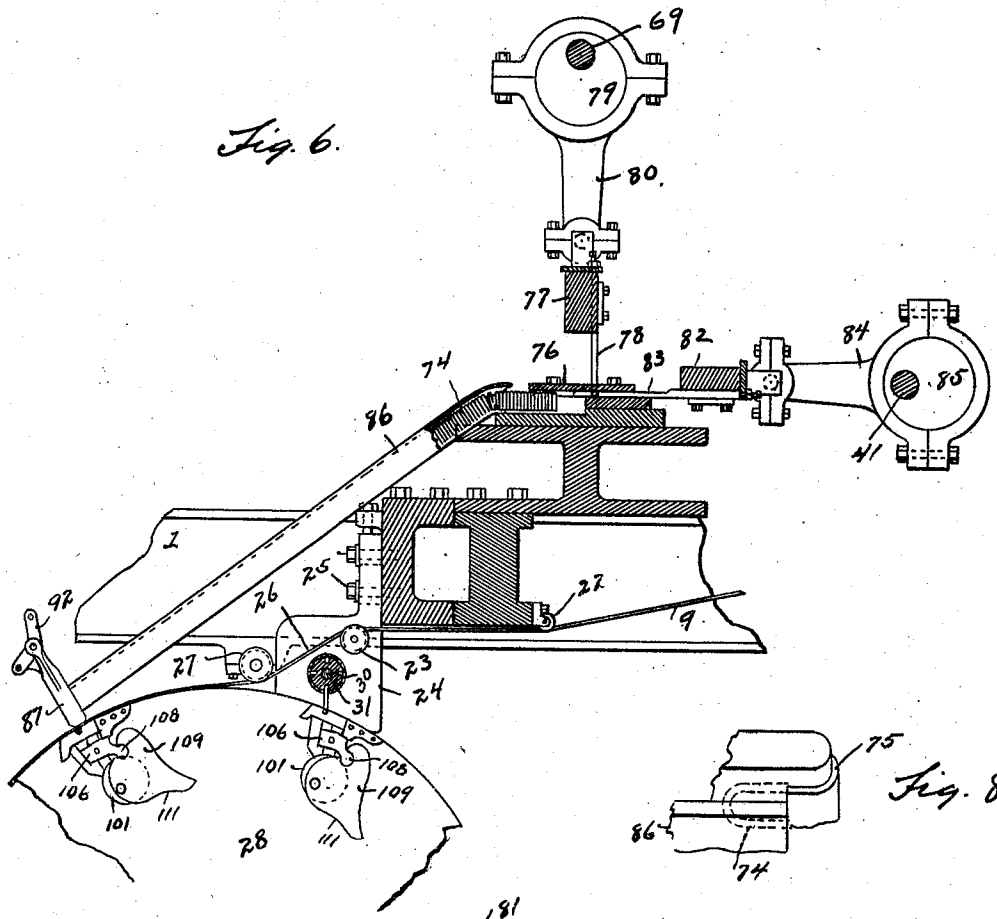
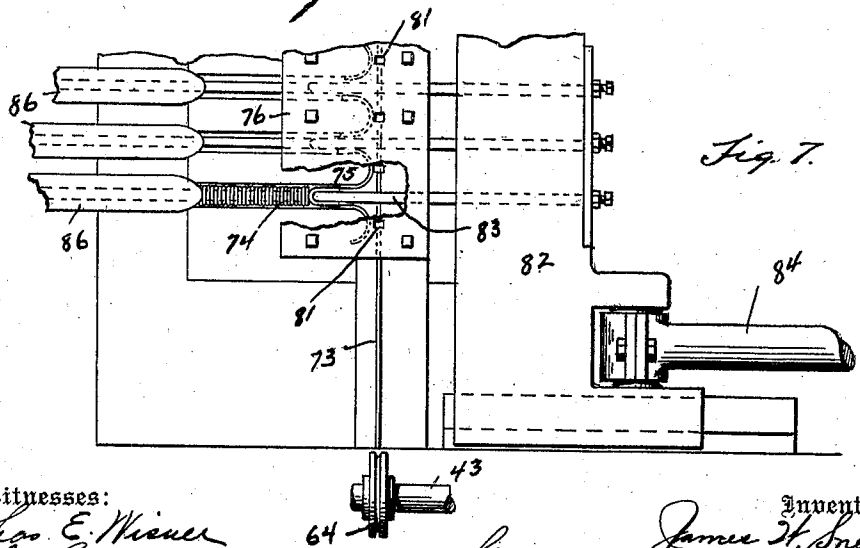


Fig. 8.

Fig. 7.



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No. 806,440. PATENTED DEC. 5, 1905.

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STAPLE FENCE MACHINE.

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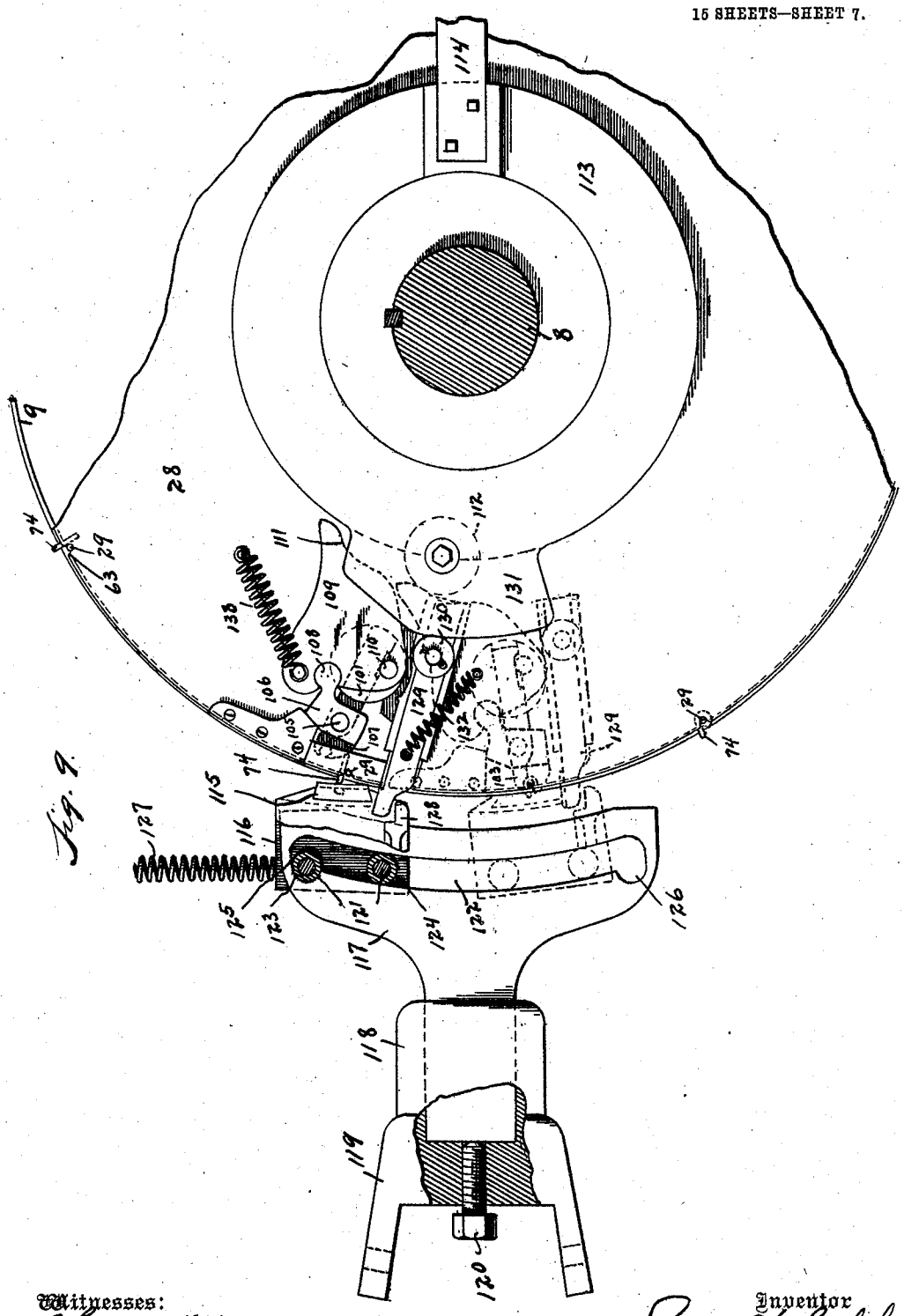


Fig. 9.

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No. 806,440. PATENTED DEC. 5, 1905.

J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 8.

Fig. 10.

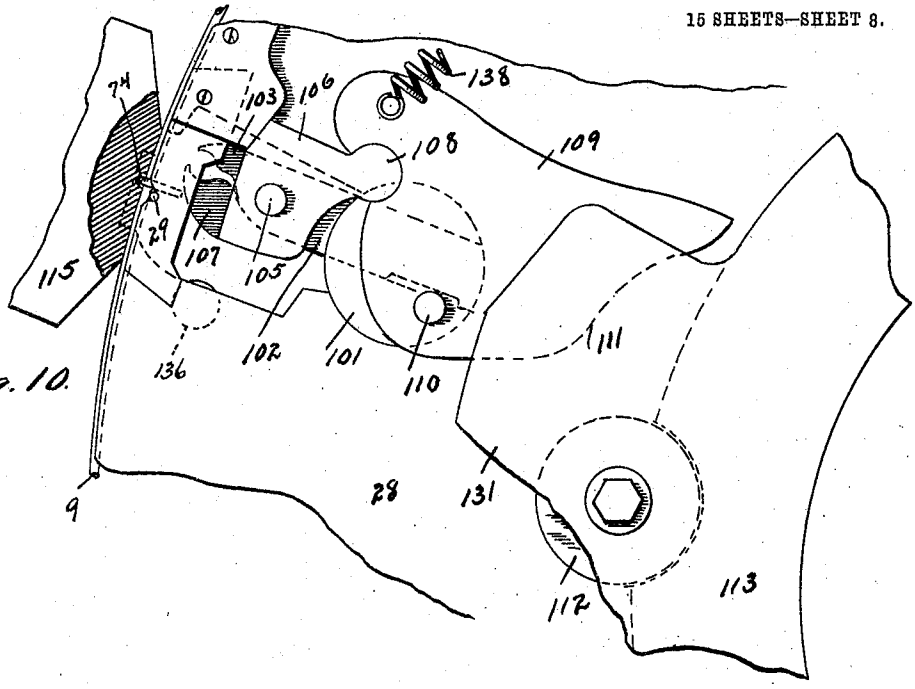
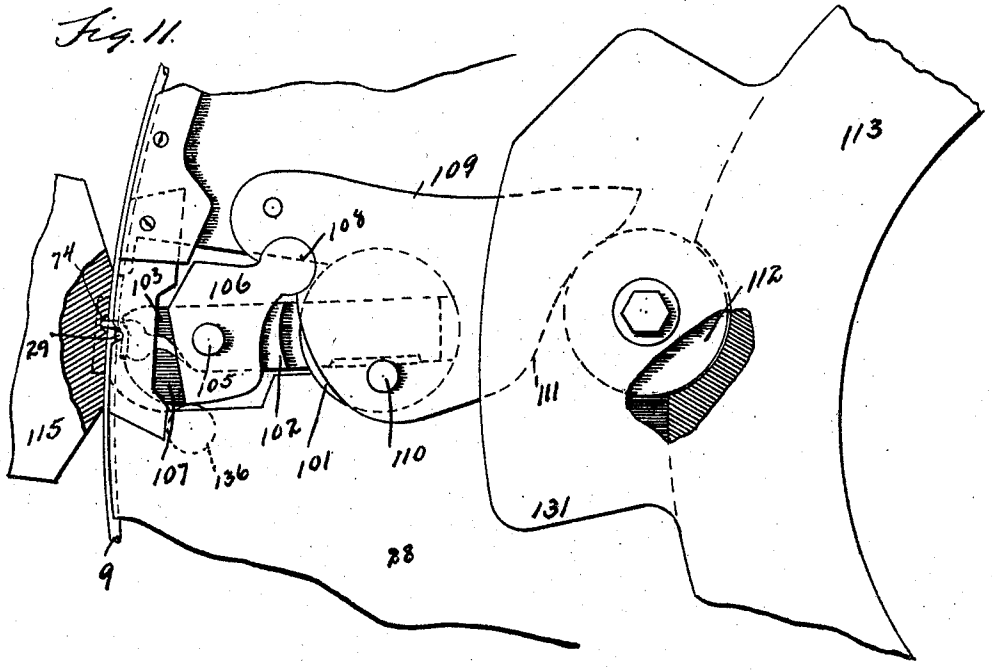


Fig. 11.



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STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 9.

Fig. 12.

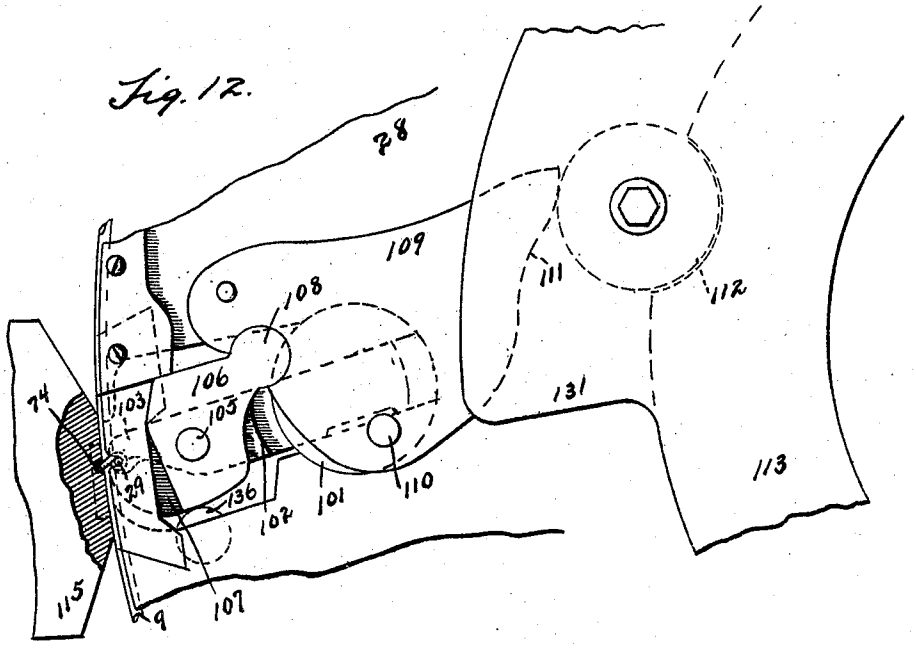


Fig. 13.

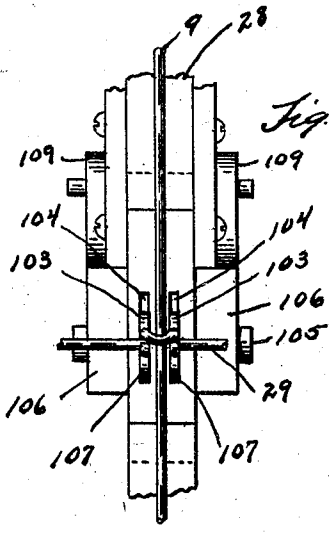


Fig. 14.

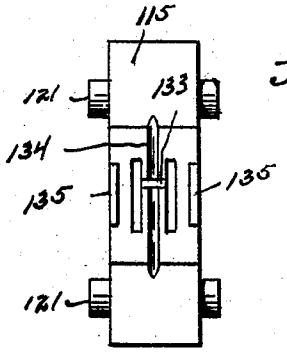
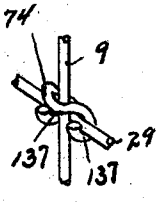


Fig. 15.



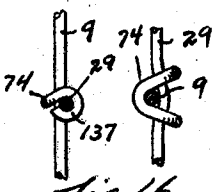


Fig. 16.

Witnesses:
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No. 806,440. PATENTED DEC. 5, 1905.

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STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

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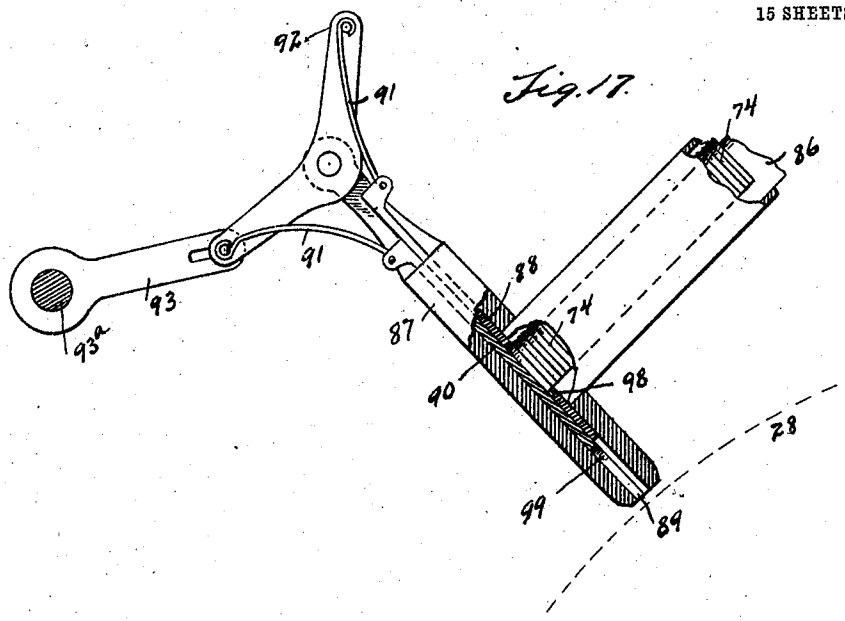


Fig. 17.

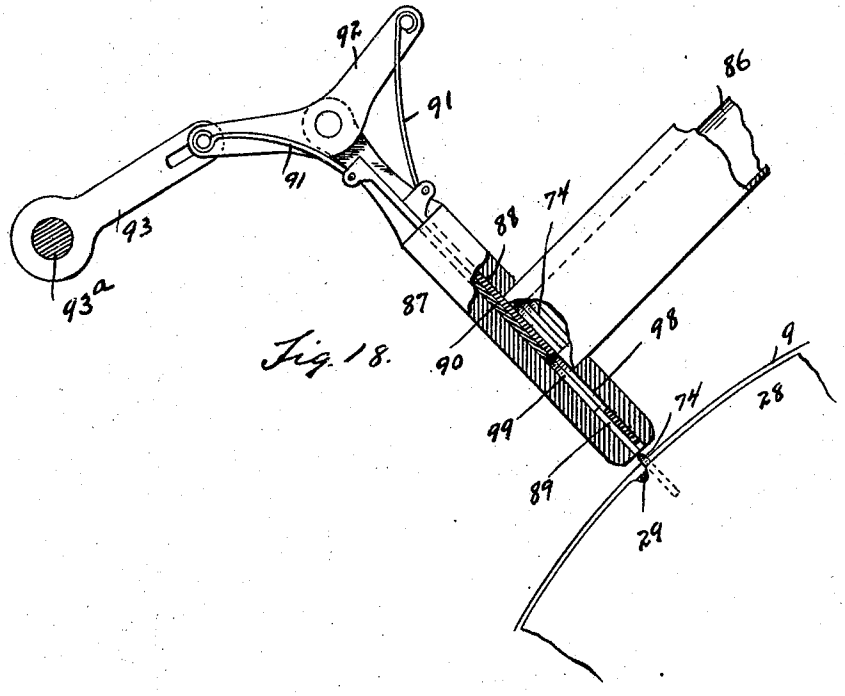


Fig. 18.

Witnesses:
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No. 806,440. PATENTED DEC. 5, 1905.

J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 11.

Fig. 19.

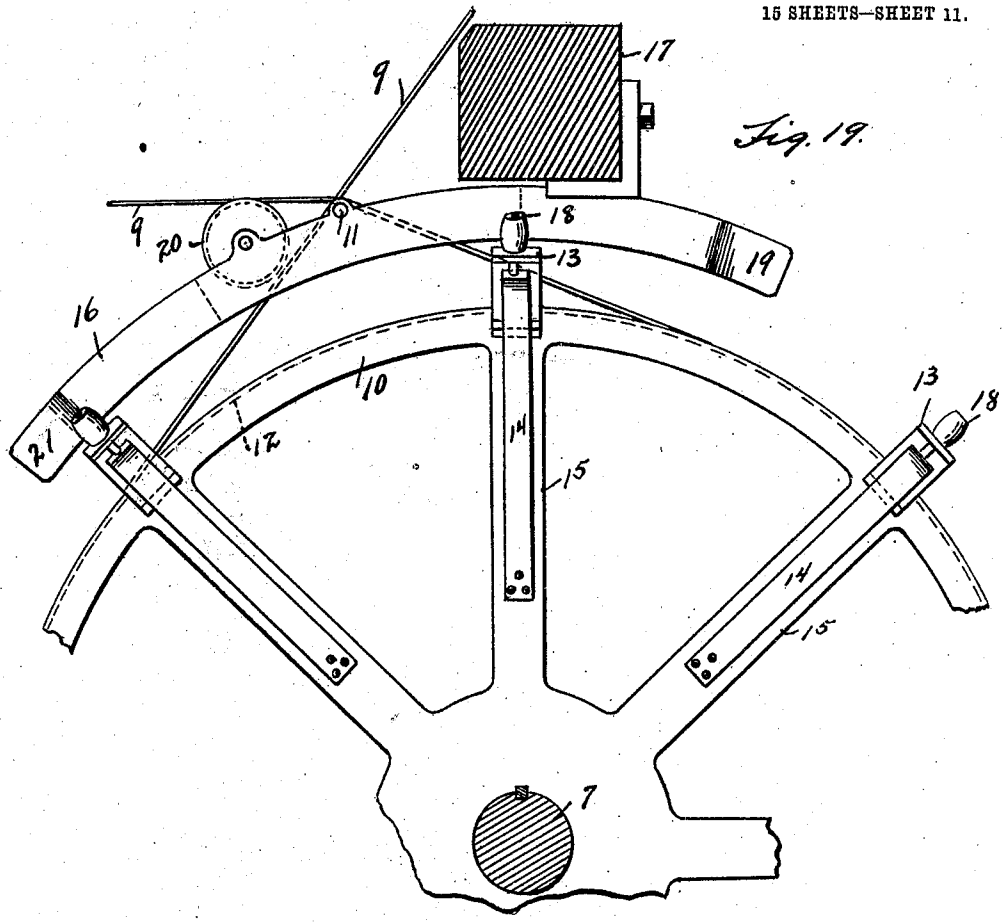


Fig. 20.

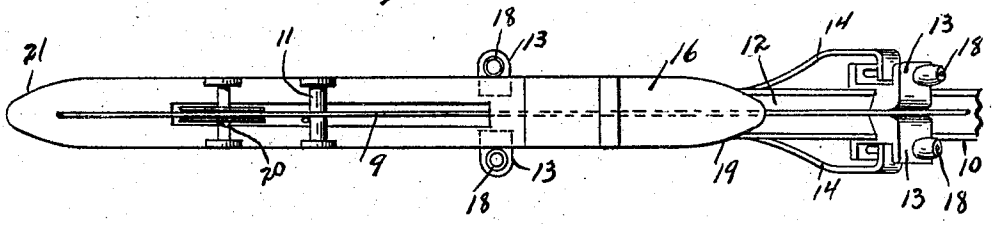
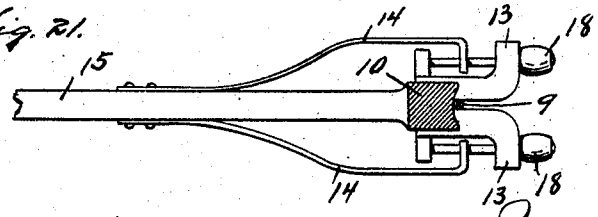


Fig. 21.



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J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

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Fig. 22.

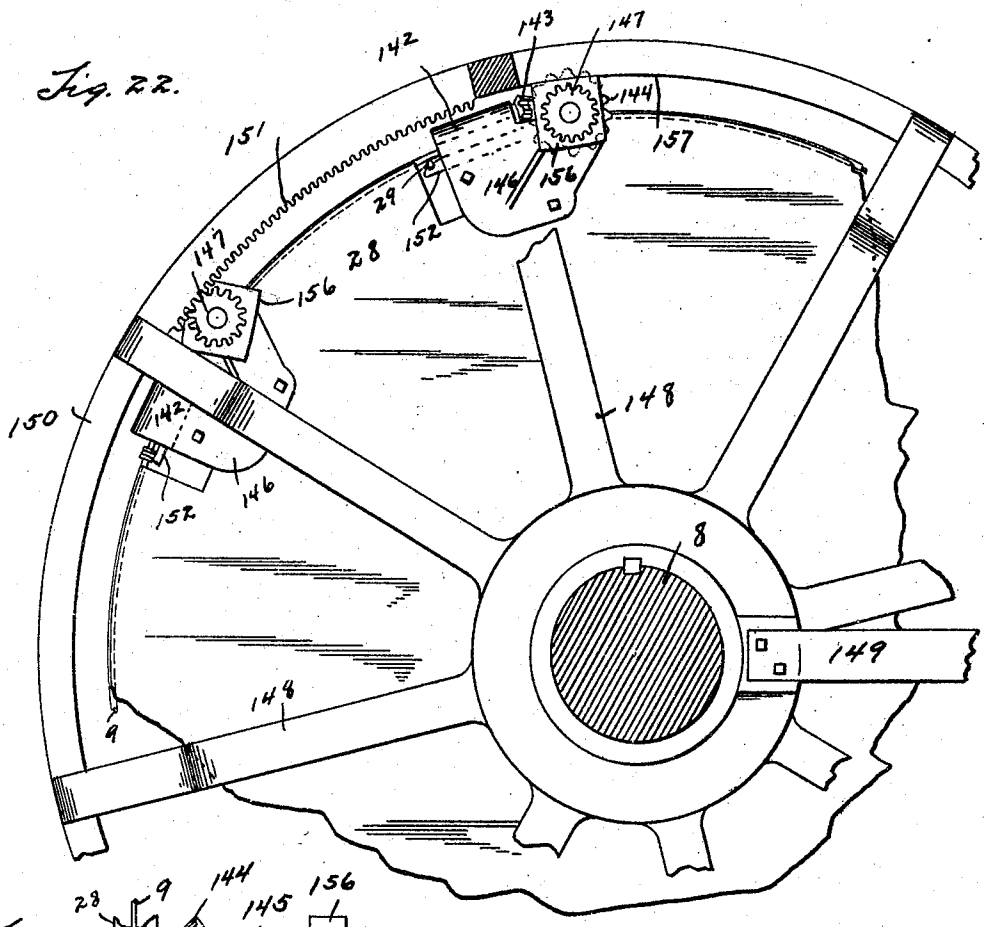


Fig. 23.

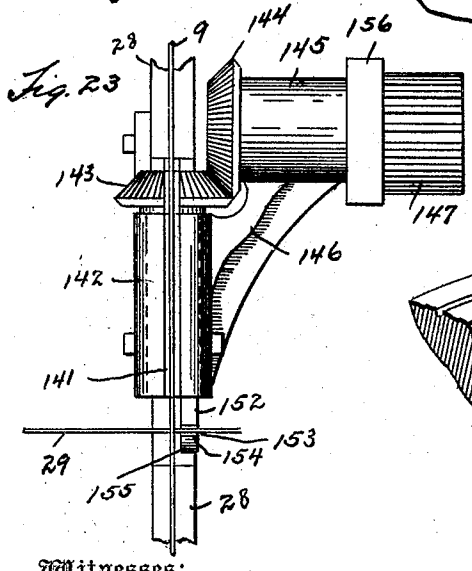
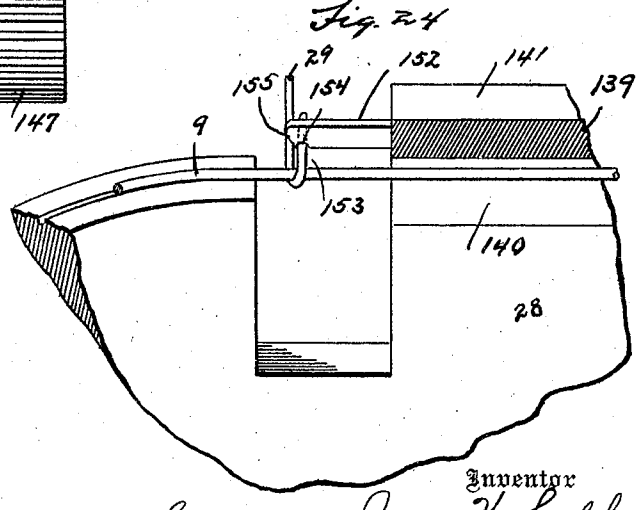


Fig. 24.



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No. 806,440. PATENTED DEC. 5, 1905.

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STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 13.

Fig. 25

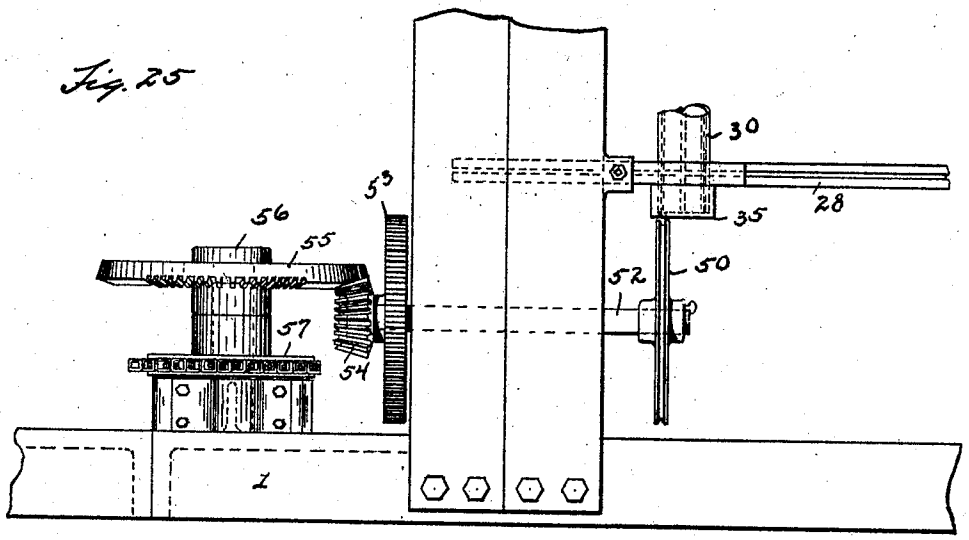
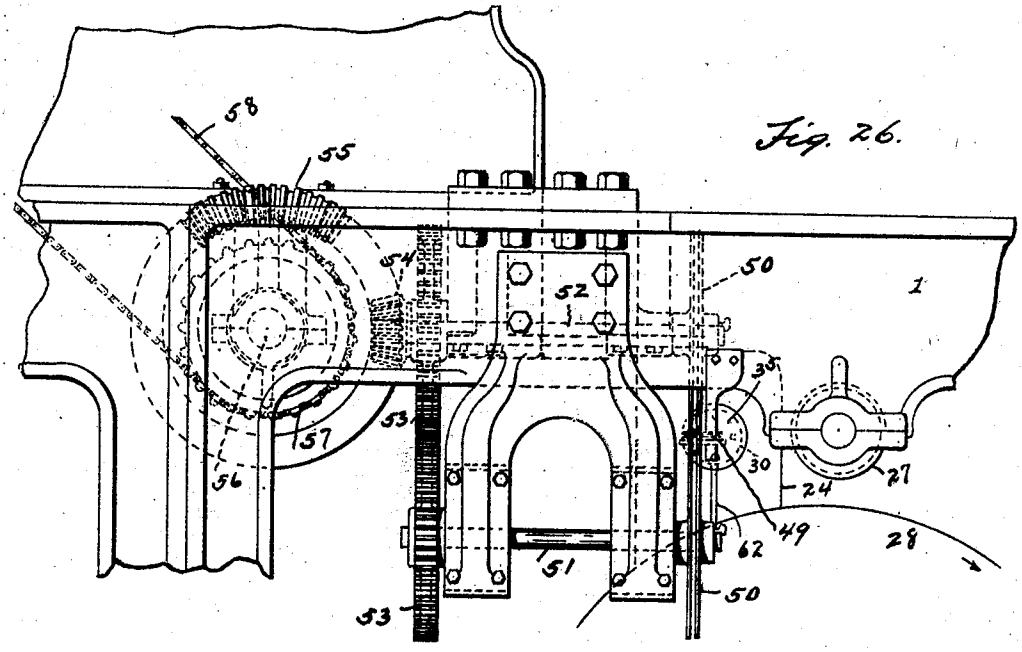


Fig. 26.



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No. 806,440. PATENTED DEC. 5, 1905.

J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 14.

Fig. 28.

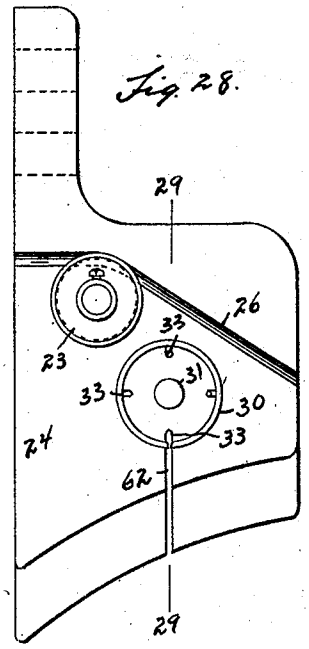


Fig. 29.

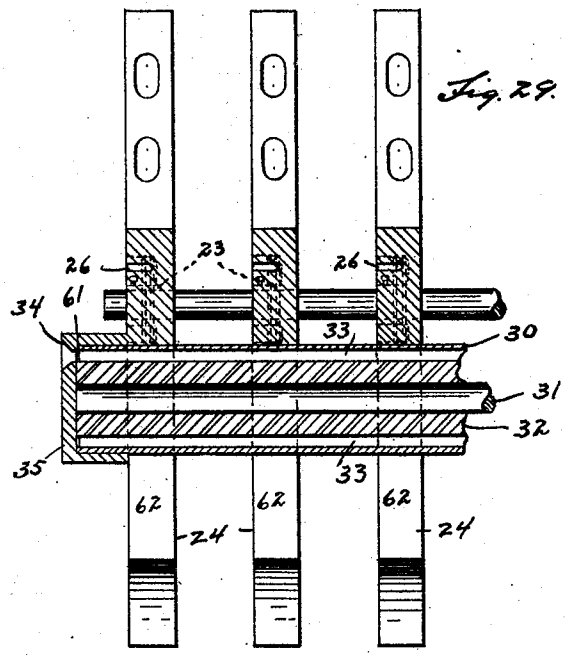
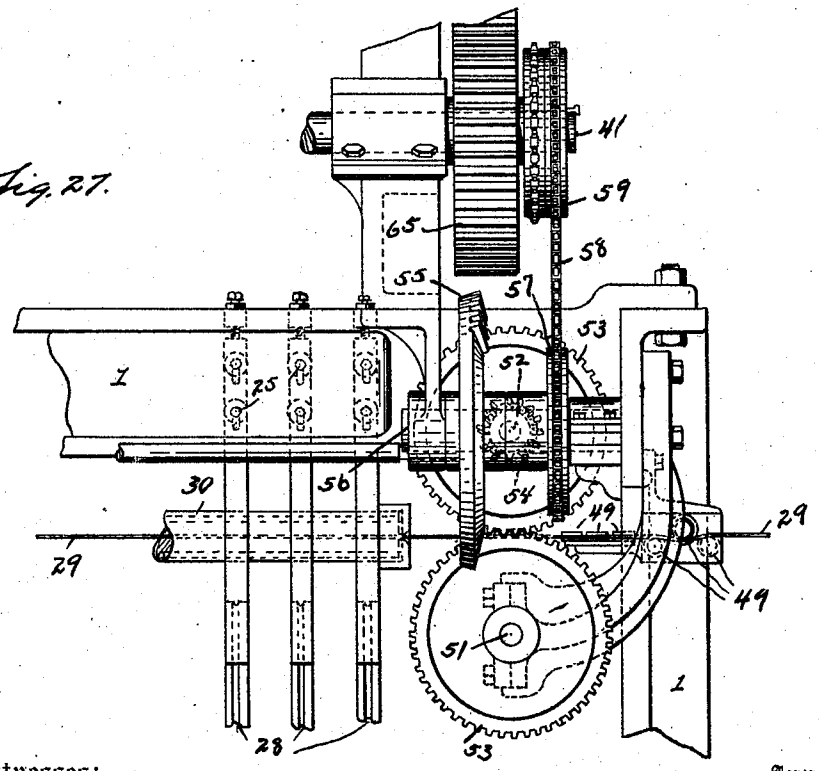


Fig. 27.



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No. 806,440. PATENTED DEC. 5, 1905.

J. W. SNEDEKER.

STAPLE FENCE MACHINE.

APPLICATION FILED MAY 9, 1904.

15 SHEETS—SHEET 15.

Fig. 30.

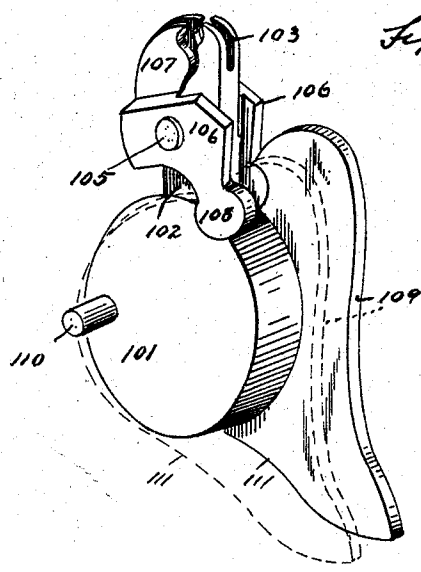


Fig. 31.

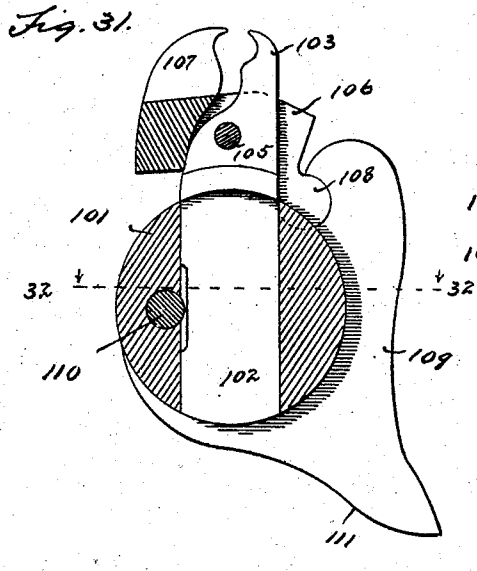
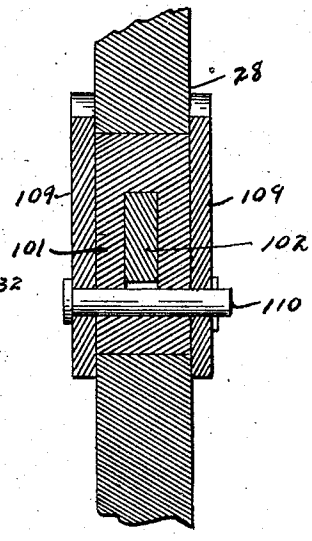


Fig. 32.



Witnesses:
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I. G. Howlett.

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By His Attorneys
E. S. Wheeler & Co.

UNITED STATES PATENT OFFICE.

JAMES W. SNEDEKER, OF ADRIAN, MICHIGAN.

STAPLE-FENCE MACHINE.

No. 806,440. Specification of Letters Patent. Patented Dec. 5, 1905.

Application filed May 9, 1904. Serial No. 207,059.

To all whom it may concern:

Be it known that I, JAMES W. SNEDEKER, a citizen of the United States, residing at Adrian, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Staple-Fence 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 figures of reference marked thereon, which form a part of this specification.

This invention relates to a machine for making wire fabric more expressly designed for the manufacture of wire fencing of the class wherein the cross-wires are united at their junction by means of tie-wires which are fed into the machine in the form of staples; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to produce a machine of this character wherein the arrangement is such as to enable the crossed strands to be united by the tie-wires during the continuous passage of the wires or fabric through the machine as distinguished from machines of this character wherein the movement of the wires through the machine is intermittent.

A further object is to provide for feeding the transverse wires into the machine from a reel, straightening said wires, and severing them from the continuous strand in proper lengths.

A further object is to provide for presenting the staples astride of the longitudinal or warp wires adjacent the transverse or woof wires and bending the ends of the staples around the woof-wires on each side of the warp-wires to make a perfect union of said wires at the junction thereof.

A further object is to so position the operative parts as to prevent all of the staples or tie-wires which unite the cross-wires being placed upon them at the same time, thereby more equally distributing the load during the operation of the machine.

The above-mentioned objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a side elevation opposite to that shown in Fig. 2. Fig. 4 is a plan view. Fig. 5 is a detail, partly in section, showing the relative position of the anvils against which the staples forming the tie-wires are held while being bent or clenched around the transverse wires. Fig. 6 is a fragmentary view, partly in section, showing the manner of feeding the staples into the machine astride of the longitudinal wires and the introduction of the transverse wires below said longitudinal wires. Fig. 7 is a fragmentary plan view of a part of the staple-forming mechanism. Fig. 8 is a fragmentary view in perspective of a portion of the staple-making mechanism. Fig. 9 is an enlarged elevation, partly in section and from which parts are broken away, showing the initial position of the operative parts at the commencement of the operation of tying a staple upon the crossed wires of the fencing or fabric. Fig. 10 is an enlarged view of the staple-tying parts in the position shown in Fig. 9. Fig. 11 is a like view of said parts, showing the first step in forming the legs of the staple around the transverse wire. Fig. 12 is a similar view of said parts, showing the completion of the operation of tying the staple. Fig. 13 is a front elevation of Fig. 12. Fig. 14 is an elevation of the face of the anvil. Fig. 15 is a perspective view of the completed knot, showing the crossed strands of the fabric united thereby. Fig. 16 shows two elevations of said knot. Fig. 17 is a fragmentary view, partly in section, of the staple-feeding mechanism, showing the position of parts prior to the entering of a staple into one of the feeding-slides. Fig. 18 is a view of said parts in an act of depositing the staple astride of the longitudinal wire and adjacent the transverse wire. Fig. 19 is a fragmentary view, partly in section, showing a portion of one of the feeding-wheels around which the longitudinal wires pass before the application of the cross-wires thereto. Fig. 20 is a plan view of Fig. 19, showing the clamping-jaws between which the strand of wire is clamped as it passes around the periphery of said wheel, also showing the curved tapered bar which separates the clamping-jaws to release the wire at the proper time to allow it to pay out from the clamping-wheel. Fig. 21 is a sectional view through the rim of the clamping-wheel adjacent one of said jaws. Fig. 22 is a fragmentary view in elevation of the mechanism which twists the ends of the transverse wires around the top and bottom wires of the fencing or fabric. Fig. 23 is a plan view of a portion

of said mechanism, parts being broken away. Fig. 24 is a fragmentary view in perspective of said mechanism in the act of twisting the end of a stay-wire around the longitudinal wire. Fig. 25 is a plan view of the mechanism which feeds the transverse wires into the machine. Fig. 26 is an elevation of said mechanism, other parts being broken away. Fig. 27 is a side elevation of said mechanism, other parts being broken away. Fig. 28 is an elevation of one of the adjustable brackets which support the longitudinal channeled shaft into which the transverse wires are fed and from which said wires are successively discharged through registering vertical slots in said brackets to the rotary disks that carry the longitudinal wires and which convey the transverse wires to the point where the staple is applied and tied. Fig. 29 is a vertical section on line 29 29 of Fig. 28. Fig. 30 is a perspective view of the parts for tying the staple detached from the carrying-disk. Fig. 31 is a sectional view through the forming-jaws and rotary hub. Fig. 32 is a transverse section as on line 32 32 of Fig. 31.

Referring to the characters of reference, 1 designates the frame, which may be of any suitable construction and which carries the operative mechanism. Journaled in and extending transversely of the frame is the drive-shaft 2, carrying upon one end the drive-pulley 3 and upon the other a pinion 4, which meshes with and drives the large gear-wheels 5 and 6, fastened to the projecting ends of the transverse shafts 7 and 8, which cross the frame parallel to the main shaft and are journaled therein. The gear-wheels 5 and 6 are of the same diameter and are driven in unison by the pinion 4, so as to cause their respective shafts to make the same number of revolutions. The longitudinal or warp wires 9 of the fencing or fabric pass from the reels or bundles (not shown) onto and around the feed-wheels 10. There are as many of said longitudinal wires as desired to form the requisite height of fencing, the machine herein shown having a capacity for eight bars, and there are as many of the feed-wheels 10 as there are bars or longitudinal wires. The wires in feeding onto the wheels 10 pass over a roller 11 (see Fig. 19) and lie in a groove 12 in the periphery of said wheels, being clamped therein by the opposed jaws 13, which are let into the opposite faces of the feed-wheels and embrace the longitudinal wires, as shown in Fig. 21, said jaws being held forcibly in contact with the wires by means of the springs 14, which engage said jaws and are attached to the spokes or arms 15 of the feed-wheels. Said wheels are keyed to the shaft 7 such distance apart as to properly space the longitudinal wires, and are thereby caused to turn in unison as the shaft 7 is rotated through the operation of the pinion 4. The clamping-jaws 13 serve to prevent the slipping of the longitudinal wires, so that said wires are fed evenly and a variation in length is obviated.

In order to allow the longitudinal wires to pay out from the feeding-wheels, the jaws are released therefrom at the proper time by a series of curved bars or plates 16, which are suspended from a fixed cross-bar 17 of the frame and curve concentric with said wheels, the ends of said plates being tapered, as clearly shown in Fig. 20. The bars 16 are located in the path of the rollers 18, carried by the jaws 13, so that the tapered ends 19 of said bars will separate in succession the rollers of each pair of jaws and open said jaws to allow the strand of wire 9 to pass from said wheels over the rollers 11 and sheaves 20, which are journaled to said bars, and thence through the machine, as hereinafter described, the length of the plates or bars 16 being such as to cause the rollers 18 to pass from the tapered end 21 thereof at a time to allow the jaws to close upon the strands of wire which are paying out on said wheels, all of which features are clearly shown in Figs. 19, 20, and 21.

From the feeding-wheels the longitudinal wires 9 pass under the rollers 22, journaled in a cross-bar of the frame, thence over the rollers 23, journaled in recesses in the brackets 24, bolted at 25 to a cross-bar of the frame, said wires lying in a channel 26 in the face of said brackets and passing therefrom under the rollers 27, (see Fig. 6,) which direct the strands of wire into the channels in the peripheries of the rotary disks 28, around which said wires partially pass during the operation of tying the cross-wires thereto. There are eight of the rotary disks employed in the machine illustrated herein, which are fixed to the shaft 8 and spaced to correspond with the feed-wheels. The transverse wires 29 are introduced to and across said disks below the longitudinal wires as said disks revolve, and are tied to the longitudinal wires during their passage around a portion of the peripheries of said disks. The introduction of the transverse wires to the machine is accomplished by means of the mechanism shown more clearly in Figs. 25 to 29, inclusive, in which is shown a tubing 30, passing through and seated in the brackets 24. Passing longitudinally of said tubing is a shaft 31, having fixed thereto a rotary barrel 32, which fills the diameter of said tubing and is provided in its periphery with four longitudinal channels 33. The barrel is of sufficient length to receive the transverse wires 29, in the channels of which said wires are introduced through the flaring aperture 34 of the cap 35 over the end of the tubing 30. The shaft carrying the barrel 32 is intermittently driven through the rotation of the sprocket-wheel 36, fast to the end thereof opposite to that in which the wire is introduced, as shown in Fig. 2, which is driven by a sprocket-chain 37 leading from

a sprocket-wheel 38 upon a shaft 39 of the staple-wire-feeding mechanism located on the top of the frame of the machine and driven intermittently by the mutilated gear 40 upon the shaft 41, which meshes with the pinion 42 on the shaft 43, carrying the spur-gear 44, which meshes with a like gear 45 on the shaft 46, carrying the beveled pinion 47, which meshes with the beveled gear 48 on the shaft 39. This mechanism is so timed as to cause the barrel to make a one-quarter turn at each operation and present one of the channels 33 in alinement with the opening 34 in the cap 35, so as to receive a strand of stay-wire which is fed into said channels successively through said opening. As the strand of stay-wire is fed into the machine it passes between the staggered straightening-rollers 49 and thence between the grooved feed-wheels 50, fixed to the shafts 51 and 52, suitably journaled in the frame and carrying at their opposite ends the meshing gear-wheels 53, the shaft 52 having thereon a beveled pinion 54 adapted to mesh with the mutilated beveled gear 55 on the shaft 56, carrying the sprocket-wheel 57, which is driven by a chain 58, running from the sprocket-wheel 59 on the shaft 41. By this arrangement the proper intermittent movement is imparted to the feed-wheels to carry the strand of stay-wire into the channel of barrel 32 when said barrel is at rest. The margin of the beveled opening 34 in the cap 35 extends slightly beyond the inner face of said cap, as shown at 61 in Fig. 29, and is provided with a shearing edge, which as the barrel 32 starts to rotate will shear the strand of stay-wire at that point the proper length for the stay required and carry said severed stay in said channel until the barrel is rotated to bring said channel to register with the vertical channels 62 passing through the brackets 24 and communicating with the peripheries of the disks 28, the arrangement being such that as the barrel 32 is arrested to allow of the introduction of a strand of stay-wire into one of the channels thereof the undermost of said channels will be in a position to discharge a strand of stay-wire through the channels 62 to the peripheries of the disks 28, said strand entering the transverse notches 63 in said disks 28, in which position said strand is carried under the longitudinal wires 9 by the rotation of said disks, thereby firmly holding the transverse strands in position until the tying-staples are introduced into the machine and the operation of uniting said strands by the tying of said staples is completed.

The staples which are employed to join or tie the longitudinal and transverse wires at their point of crossing are made in this machine, and the operation of making said staples will be briefly described with reference to Figs. 2, 4, 6, 7, and 8. The wire from which the staples are formed is fed into the machine by means of the feed-wheels 64, mounted on the shafts 43 and 46, driven by the same train of gears as employed for rotating the channeled barrel 31, which receives the transverse wires of the fencing. The shaft carrying the mutilated gear 40 is driven by means of the gear-wheel 65 thereon, which meshes with the gear-wheel 66 on the transverse shaft 67. Shaft 67 is turned through the medium of the sprocket-wheel 70 thereon, around which passes the chain 71 from the sprocket-wheel 72 on the drive-shaft 2, whereby movement is imparted through said gearing to the shafts 41 and 69.

The wire strand 73, from which the staples 74 are formed, is fed into the machine by means of the intermittently-rotated feed-rollers 64, so as to lie in front of the staple-forming dies 75 (see Figs. 7 and 8) under the plate 76. Above said plate is a reciprocatory cross-head 77, carrying a series of cutting-plungers 78, said cross-head being actuated through the eccentrics 79 on the shaft 69, connected thereto by the eccentric-rods 80. Upon the descent of said cross-head the strand 73 is severed into lengths to form the staples by said plungers, which pass through the apertures 81 in the plate 76. Mounted in the frame is a horizontal reciprocatory bar 82, carrying a series of reciprocatory shaping-plungers 83, which engage the severed strands of wire and carry them between the forming-dies, thereby shaping them into staples, as clearly shown in Fig. 7. The reciprocatory bar is actuated through the eccentric-rods 84, which are connected to the eccentrics 85 upon the shaft 41, whereby the desired reciprocatory movement is imparted to the bar 82. As the staples are formed in succession they are forced onto the tracks 86, down the inclined portion of which they slide to the staple-feeding heads 87. (Shown more clearly in Figs. 17 and 18.) The staple-feeding heads are provided with recesses, into which said staples pass and in which they are arrested by the feeding-slide 88, working in a vertical way 89 through said heads contiguous to the reciprocatory slides 90, said slides being actuated through the medium of the rods 91, which pivotally connect their upper ends to the ends of the rock-arms 92, which are pivoted to the heads 87, said rock-arms being actuated by the crank-arms 93 on the rock-shaft 93^a, having at one end a crank-arm 94, to which is pivoted the link-bar 95, which at its lower end (see Fig. 3) is pivoted to the lever 96, whose free end extends into the path of the curved fingers 97, projecting from a collar on the end of shaft 8, which fingers actuate the lever to impart a rocking motion to the shaft 93^a, whereby the slides 88 and 90 are caused to reciprocate. Formed through slide 88 is an aperture 98, into which a staple passes as said slide is raised, so as to register with the staples on the track 86, and as said slide 88 descends a single staple is carried downwardly and the remaining

staples on the track are held back. At the time slide 88 is descending slide 90 is ascending, so that when the aperture 99 therein is brought into alinement with aperture 98 in slide 88 the staple passes through and falls into the channel 89, down which it is directed to the periphery of the disk 28 astride of the longitudinal wire 9 upon said disk and just above and against the cross-wire 29, the operation of the staple-feeding slides in the heads 87 being so timed as to discharge the staples onto the disks at proper periods during their revolution. In order to return the rock-shaft 93ª after it has been actuated through the operation of the lever 96, a strong spring 100 is employed.

The staple-tying mechanism will now be described with reference more particularly to Figs. 9 to 16, inclusive. Each of the disks 28, except the two outside disks, is provided in its perimeter at the points where the transverse wires cross said disks with an oscillatory hub 101, adapted to have a limited reciprocal rotation about its own axis and having loosely seated in and projecting from its periphery an arm 102, which projects outwardly to a point near the periphery of the disk 28 and terminates in a curved bifurcated jaw 103, whose divided members are adapted, during a portion of their operation, to pass through the slots 104 in the periphery of said disk on each side of the longitudinal wire. Pivoted upon the transverse pin 105 to the arm 102 is a dog 106, which is recessed centrally to receive the arm 102 and which projects upon opposite sides of the disk 28, as shown in Fig. 13, said disk having the divided jaw member 107, whose parts are adapted to pass through the slots 104 in the periphery of the disk 28 astride of the wire 9 and upon the opposite side of the transverse wire 29 to that occupied by the divided jaw member 103 during the operation of tying the staple, as also shown in Fig. 13. Upon the opposite sides of the dog 106 are the rounded end portions 108, which fit into sockets in the edges of the cam-plates 109, located upon the opposite sides of the disk 28 and eccentrically pivoted on the pin 110 to the oscillatory hub 101 and having the curved cam-faces 111. These cam-faces of the plates 109 are adapted to be carried by the rotation of the disk 28 into contact with the rollers 112, journaled on the stationary rings 113, which embrace the hubs of the disks 28 and are rigidly held from rotation by a bar 114, (see Fig. 9,) which leads to the frame of the machine, whereby said cam-plates are actuated to cause the jaws 103 and 107 to form the staple around the crossed wires of the fabric, so as to unite them, as shown in Figs. 15 and 16. Assuming that a staple has been placed properly in position in the machine, the rotation of the disk 28 will present said staple opposite the anvil 115, which is mounted in a movable carriage 116, adapted to slide vertically on the slotted head 117, which projects from a supporting-boss 118, made fast to a cross-bar 119 of the frame, said slotted head being adjustable horizontally by means of the set-screw 120. The carriage carrying the anvil is secured to the slotted head and allowed to travel vertically thereon by means of the transverse shafts 121, which cross between the sides of the carriage 116, which embrace the opposite faces of said head and pass through the slots 122 through said head, which is curved concentric with the periphery of the disk 28, there being upon the upper shaft a roller 123 and upon the lower shaft a roller 124, which travel in said slot. It will be noted that said slot is provided at its upper end with an offset 125 and at its lower end with a similar offset 126, into which said rollers are adapted to pass upon reaching the limit of said slot. Attached to the carriage containing the anvil is a strong expansion-spring 127, whose upper end is secured to any suitable portion of the frame and whose tension normally holds the anvil and carriage at the upper end of the head 117. Upon the side of the carriage, at its lower edge, is a projecting shoulder 128, adapted to be engaged by the projecting end of a finger 129, carried in a way on the side of the disk 28 and adapted to slide longitudinally, the inner end of said finger having journaled thereto an antifriction-roller 130, which is adapted to engage the beveled face of the flange 131, projecting from the fixed ring 113, which forces said finger outwardly against the action of the restraining-spring 132, so as to cause its outer end to project sufficiently to engage the shoulder 128 on the anvil-carriage and start said carriage downwardly in the slot 122. As the upper roller of the carriage leaves the recess at the upper end of said slot the carriage-frame is tilted outwardly at its upper end, so as to present the face of the anvil parallel to the periphery of the disk 28 and against the loop of the staple 74, which sits astride of the longitudinal wire 9, lying in the channel of said disk, the loop of the staple lying in a small transverse recess 133, (shown more clearly in Fig. 14,) whereby the staple is firmly held in place. Crossing the recess 133 and extending longitudinally of the face of the anvil is a channel 134, which receives the longitudinal wire, while upon the outer edges of the face of the anvil are the raised bearing-ribs 135, that bear upon the cross-wire 29 upon each side of the staple and hold said wire against being crowded away from the periphery of the disk 28 during the operation of tying the staple. After the finger has engaged the carriage and brought the anvil into proper position with respect to the disk 28 a further rotation of said disk will carry the cam-faces of the plates 109 against the rollers 112, causing said plates to swing on their pivot 110, and thereby actuate the dog 106 from the position shown in Fig. 10 to the position shown in Fig.

11, in which movement the end of the jaw member 107 of the dog engages and bends the legs of the staple across and under the transverse wire 29, when a further rotation of the disk 28 will cause the points of the cam-faces 111 of the plates 109 to ride onto the rollers 112, as shown in Fig. 12, thereby turning said plates still farther on their pivot and causing the dog 106 to project outwardly through contact of the sides of said dog with the roller 136, which operation also carries with the dog the arm 102, so that the jaw member 103 thereof is also projected, at the same time moving the dog upon its pivot 105, so that its jaw 107 is caused to close toward the jaw 103, whereby the legs of the staple are formed or turned into eyes 137, which embrace the transverse wire 29, as clearly shown in Fig. 15. As a further rotation of the disk 28 carries the cam-face of the plates 109 past the rollers 112, the spring 138, attached to the plates 109, restores said parts to their normal position or the position shown in Fig. 10, at the same time the roller on finger 129 passes from contact with the flange 131 and allows the spring 132 to retract said finger just as the lower roller 124 of the carriage enters the offset 126 at the bottom of the slot 122, causing the face of the anvil to drop away from the periphery of the disk 28 and allow the knot or tie to pass free from the anvil, at which time the spring 127 returns the anvil to its normal position in readiness for a succeeding operation. It will be understood that the anvil moves downwardly in unison with the movement of the disk 28 during the operation of forming the staple upon the cross-wires of the fabric and is returned as soon as the knot or tie has been completed.

The foregoing-described operation occurs at the junction of each of the cross-wires with the longitudinal wires and is common to all of the disks 28 in the machine excepting the two outside disks, which instead of carrying the tying mechanism just described are provided with rotary heads which twist the ends of the stay-wires around the marginal wires of the fabric, which operation will be described with reference more particularly to Figs. 22 to 24, inclusive. Set in the periphery of the two outside disks 28 is a rotary head 139, which is slotted longitudinally, as at 140, to receive the line-wire 9, which passes into the slot in said head through the longitudinal opening 141 in the boxing 142, in which said head rotates. Projecting from one end of said head is a beveled pinion 143, which meshes with a beveled gear 144 on a short shaft journaled in the bearing 145, carried by the bracket 146, projecting from the face of the disk 28, the shaft of the gear 144 carrying at its outer end a pinion 147. Mounted loosely on the ends of the shaft 8 are the spiders 148, which are held from rotation by the bars 149, which are secured to the hub of said spiders and to a fixed part of the frame. Set into a portion of the periphery 150 of said spiders are the curved racks 151, which extend into the path of the pinions 147 and cause said pinions to successively revolve as the disks 28 turn through the rotation of the shaft 8. The length of the racks 151 is such as to cause said pinions to make two complete revolutions as they travel across said rack, thereby driving the rotary heads 139 through the pinion 143 to make three complete wraps of the ends of the cross-wires 29 around the upper and lower longitudinal wires 9 of the fencing, the wrapping of the ends of said cross-wires being accomplished through the medium of the fingers 152, which project from the rotary heads 139 and engage the projecting ends of the cross-wires, as shown at 153 in Fig. 23, there being a notch 154 in the edge of said finger in which the ends of the cross-wires are adapted to lie and the point of said fingers being beveled, as at 155, to permit them to slip past the cross-wires as they are rotated around the longitudinal wires, an operation illustrated in Fig. 24. These rotary heads are located in the outer disks 28 at the points therein where the cross-wires cross the longitudinal wires, and the racks 151 are so positioned as to cause the operation of the parts to wrap the ends of the stay-wires around the upper and lower longitudinal wires of the fabric prior to the attachment of the intermediate longitudinal wires to the cross-wires by means of the staples, as before described. Upon the hubs of the pinions 147 are the rectangular bearing-blocks 156, which engage the inner bearing-face 157 of the periphery of the spider 148 and hold said pinions and the rotary heads 139 against rotation after said pinions have passed from said rack, whereby the relative position of the parts is maintained until a succeeding operation.

In order to obviate an excessive strain upon the machine incident to tying all of the staples to the cross-wires at the same time, the staple-tying jaws on the rotary disks are not placed in the same horizontal plane, but are arranged in pairs, so that but two staples are tied during the same period of the machine's operation, and the slotted heads 117, which carry the anvils 115, are arranged to correspond therewith, as clearly shown in Figs. 1 and 5, whereby the load is distributed, enabling the machine to better perform its work. It will also be observed, on referring to Fig. 1, that the heads 117 are made laterally adjustable by means of the slots 158, formed in the cross-bars 119, through which pass the bolts 120, which support said heads. This arrangement provides for varying the spaces between the horizontal wires of the fencing.

The completed fabric (shown at 159 in Figs. 1 and 2) passes from the disks 28 to the fluted

crimping-rollers 160, between which said fabric passes and is crimped. From the crimping-rollers the fabric passes to the drum 161, on which it is wound, said drum being driven through the gear-wheel 162 on the shaft thereof, which meshes with the gear-wheel 163, which in turn meshes with the large gear 5 on the shaft 7.

By means of this machine the operation of making wire fabric by the union of the longitudinal and transverse wires through the tying of a staple around said wires at their junction is made continuous, as the passage of the fabric through the machine is not arrested during the operation of forming the staples into a knot upon said cross-wires, thereby enabling a greater output of manufactured fabric than is possible from machines of this class whose motion is intermittent.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making wire fabric, the combination with the means for feeding the longitudinal wires into the machine, of the rotary members over which said wires pass, means for introducing the transverse wires across said rotary members below the longitudinal wires, means for introducing tying-staples astride of the longitudinal wires and adjacent the cross-wires, means carried by said rotary members for engaging the legs of said staples and forming them around the transverse wires to unite said wires at their points of crossing, and the anvils against which the loops of the staples are held while their legs are being formed around the stay-wires.

2. In a machine for making wire fabric, the combination with the means for carrying the longitudinal wires through the machine, of the grooved disks over which said wires pass, means for introducing the transverse wires to said disks during their rotary movement, means for presenting the staples astride of the longitudinal wires on said disks and adjacent the cross-wires while said disks are turning, and means for forming the legs of the staples around said transverse wires during the rotation of said disks.

3. In a machine for making wire fabric, the combination with the means for carrying the longitudinal wires through the machine, of the means for introducing the transverse wires across said longitudinal wires, means for applying staples to the longitudinal wires adjacent the transverse wires, means for forming the legs of the staples around the transverse wires, and the movable anvils adapted to engage the loop of the staples and move with the fabric during the operation of attaching the legs of the staples to the transverse wires.

4. In a machine for making wire fabric, the combination with the means for carrying the longitudinal wires into the machine, of the means for introducing the transverse wires across said longitudinal wires, means for presenting staples to the longitudinal wires adjacent the transverse wires, movable jaw members adapted to engage the legs of the staples and form them upon the transverse wires, means for actuating said jaw members, and the movable anvils adapted to engage the loop of the staples and travel with the fabric as the staples are being tied.

5. In a machine for making wire fabric, the combination with the means for moving the longitudinal wires through the machine, of the disks over which said wires pass, means for introducing the transverse wires to said disks across said transverse wires, movable jaw members mounted in said disks for engaging the lugs of the staples and forming them around the transverse wires, means for actuating said jaw members, movable anvils adapted to engage the staples and move with the fabric while the legs of the staples are being tied, and means carried by the disks for engagement with said anvils to render their movement concurrent therewith.

6. In a machine for making wire fabric, the combination with the means for carrying the longitudinal and transverse wires through the machine, means for introducing staples to the fabric at the junction of said wires, and means for forming said staples around said wires to unite them, of the anvils adapted to engage and hold said staples while being tied, and to move with the fabric during the tying operation, said anvils being positioned to correspond with the position of the tying mechanism of the respective longitudinal wires.

7. In a machine for making wire fabric, the combination with the means for carrying the longitudinal wires through the machine, of the means for introducing the transverse wires, the rotary disks over which the longitudinal wires pass, and in the peripheries of which the transverse wires lie, means for introducing staples to said wires at their points of crossing, tying means carried by said disks variously disposed thereon for tying the legs of the staples, movable anvils adjacent the peripheries of said disks, means carried by said disks for engaging said anvils to cause them to travel therewith, said anvils being positioned to correspond with the tying mechanism of said disks, whereby all of the staples upon a single transverse wire are not tied during the same period of the machine's operation.

8. In a machine for making wire fabric, the combination with the means for carrying the warp-wires continuously into the machine, of means for introducing the woof-wires successively and severing said woof-wires from the continuous strand, means for directing the severed woof-wires into the machine below the warp-wires so as to cause the warp-wires to lie thereon as they pass into the machine,

and means for tying said wires together at their points of crossing.

9. In a machine for making wire fabric, the combination with the means for carrying the warp-wires into the machine, of a rotary barrel having longitudinal channels therein, means for feeding the woof-wires into the channels of said barrel successively and severing said woof-wires from the continuous strand, and means for rotating said barrel intermittently to discharge the woof-wires from the channels thereof below the warp-wires in position to cause the warp-wires to cross the woof-wires as they pass into the machine.

10. In a machine for making wire fabric, the combination of the rotary disks having channels in their peripheries adapted to receive the warp-wires and having transverse notches crossing said peripheries, means for introducing the woof-wires and severing them from the continuous strand, and means for depositing said woof-wires in the transverse notches of said disks during their rotary movement so as to cause the warp-wires to lie across the woof-wires as they wind onto said disks, and means for joining said wires at their points of crossing.

In testimony whereof I sign this specification in the presence of two witnesses.

JAMES W. SNEDEKER.

Witnesses:
F. E. OSGOOD,
GEO. L. BENNETT.