(No Model.) 3 Sheets—Sheet 1.

M. L. POULTER.

WIRE FENCE WEAVING MACHINE.

No. 601,167. Patented Mar. 22, 1898.

Fig. 1.

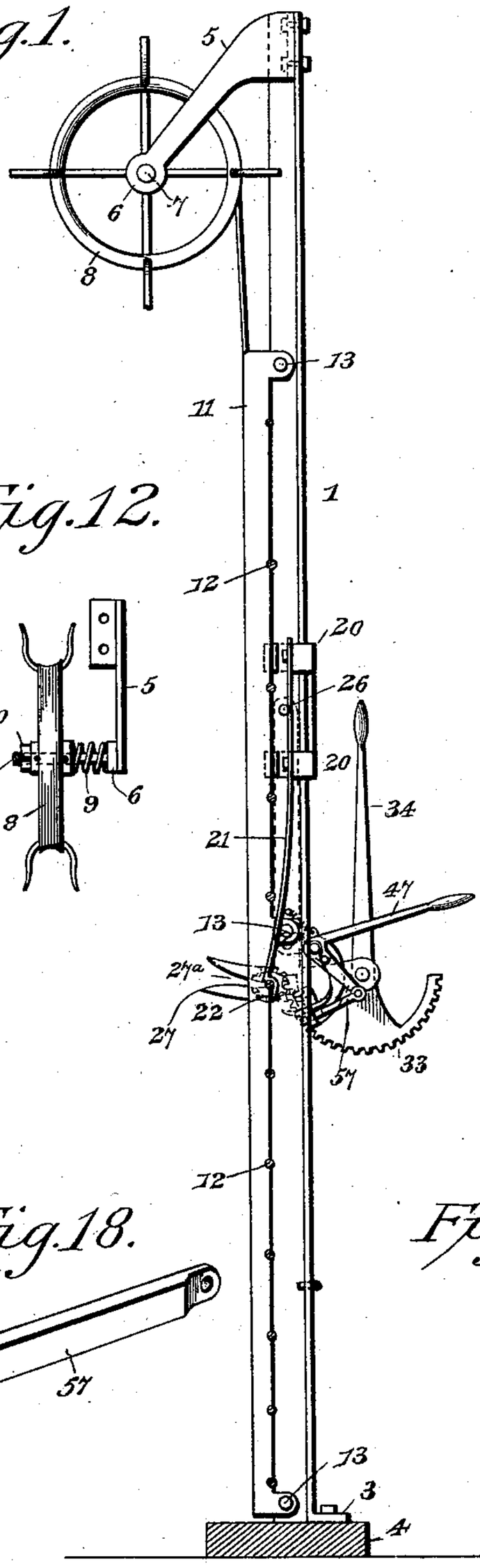

Fig. 12.

Fig. 18.

Fig. 3.

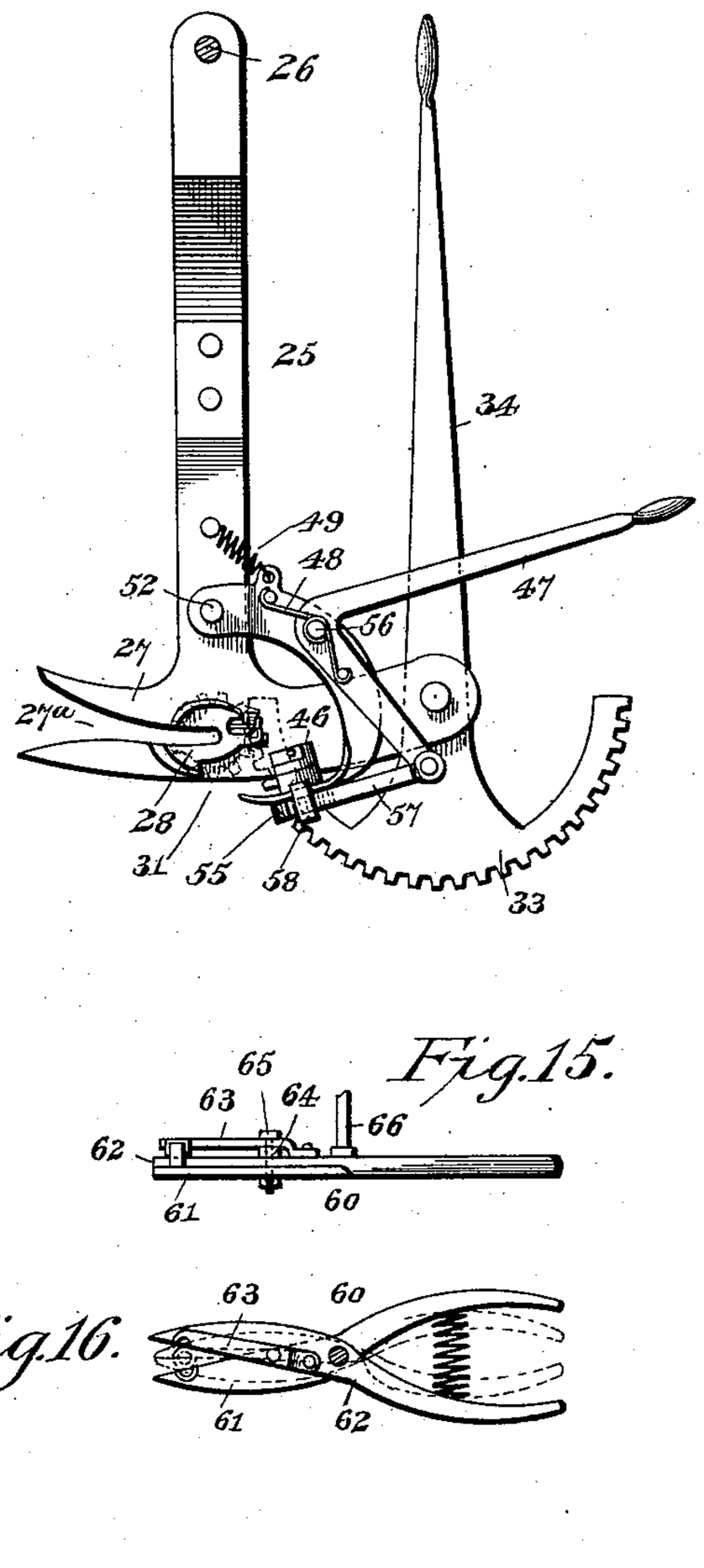

Fig. 15.

Fig. 16.

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(No Model.) 3 Sheets—Sheet 2.

M. L. POULTER.

WIRE FENCE WEAVING MACHINE.

No. 601,167. Patented Mar. 22, 1898.

Fig. 2.

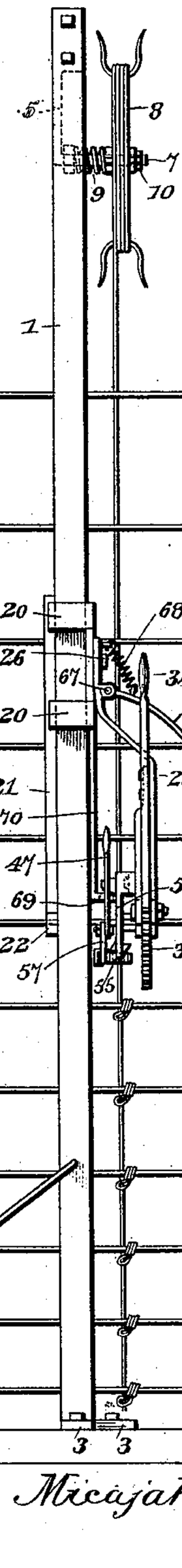
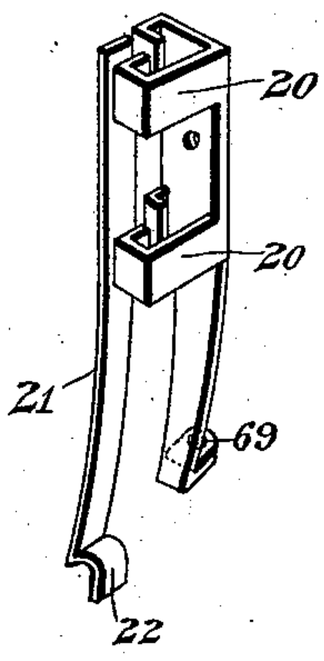


Fig. 17.



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(No Model.) 3 Sheets—Sheet 3.

M. L. POULTER.

WIRE FENCE WEAVING MACHINE.

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Fig. 4.

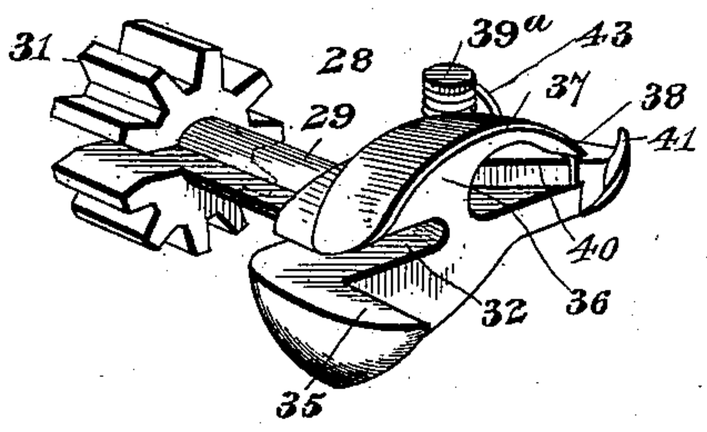


Fig. 5.

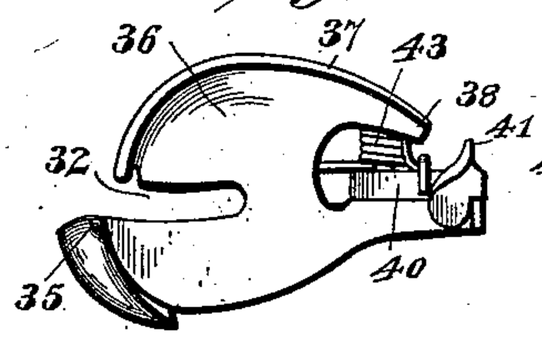


Fig. 6.

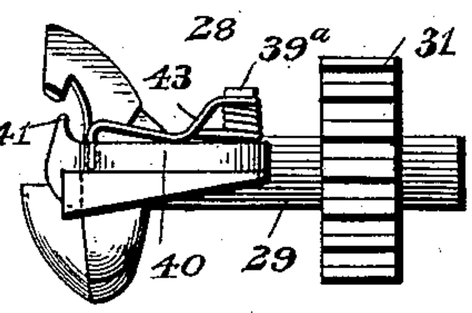


Fig. 7.

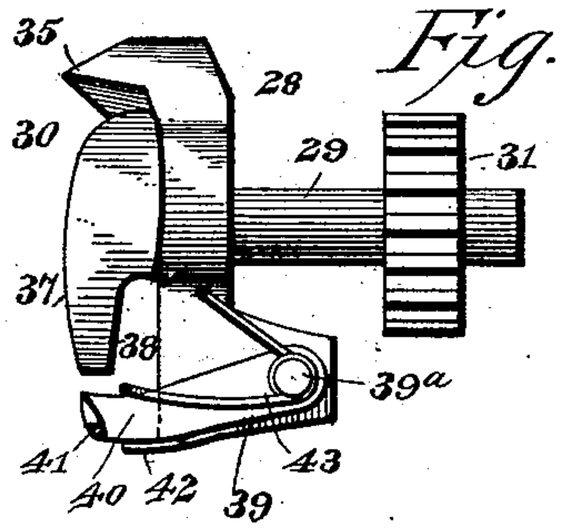


Fig. 8.

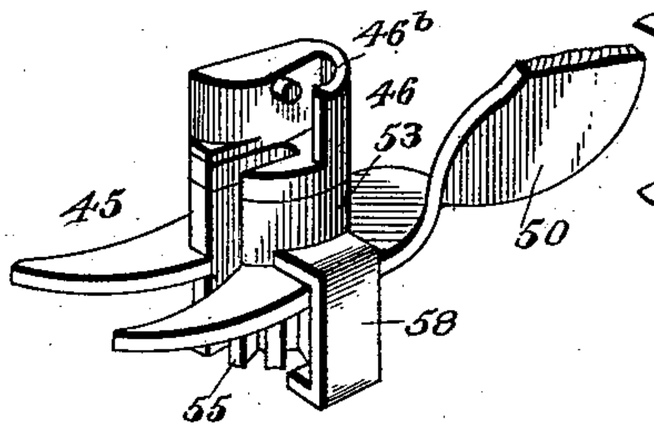


Fig. 9.

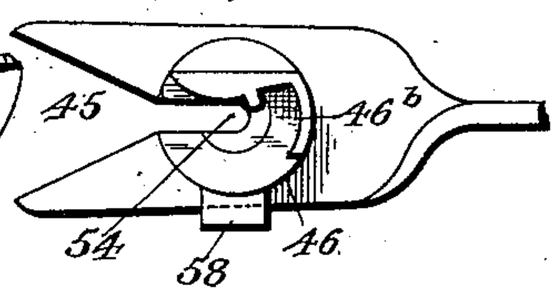


Fig. 10.

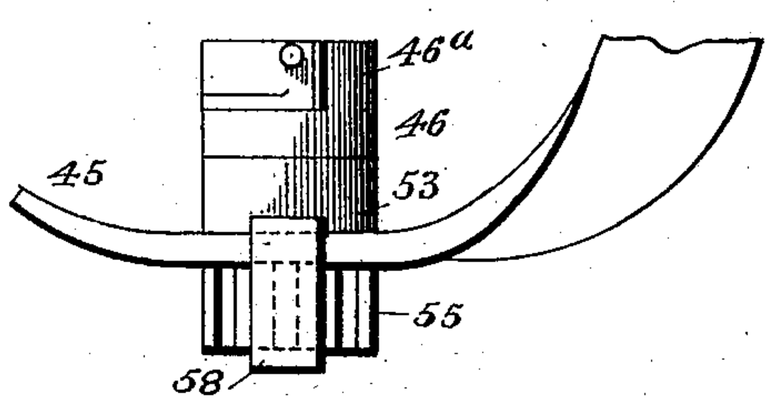


Fig. 11.

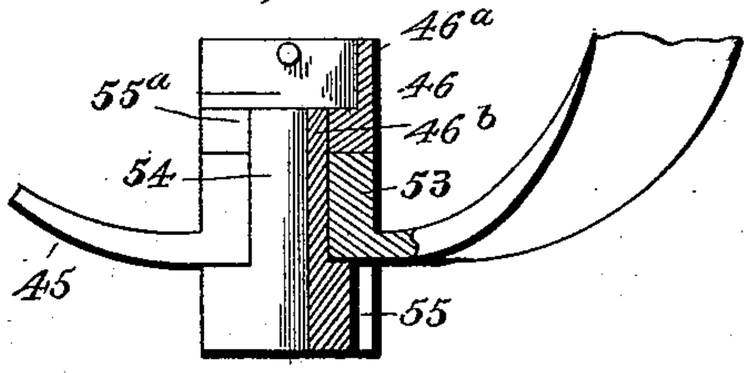


Fig. 13.

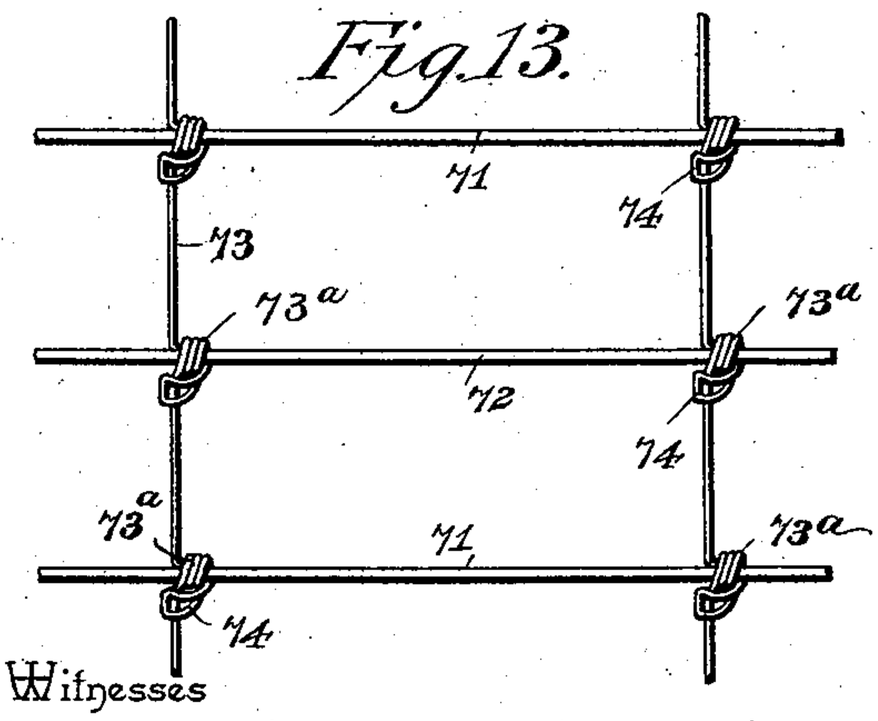


Fig. 14.

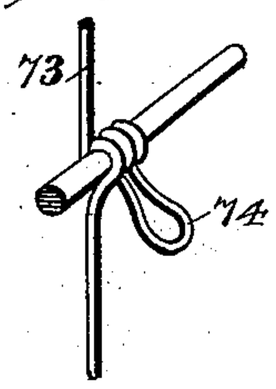
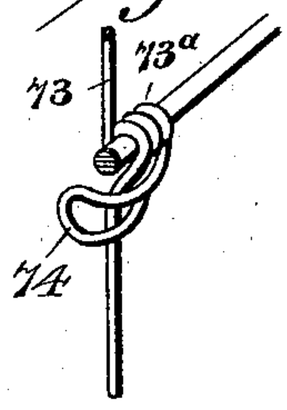


Fig. 14a.



Witnesses

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UNITED STATES PATENT OFFICE.

MICAJAH L. POULTER, OF SALEM, IOWA.

WIRE-FENCE-WEAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 601,167, dated March 22, 1898.

Application filed November 22, 1897. Serial No. 659,451. (No model.)

To all whom it may concern:

Be it known that I, MICAJAH L. POULTER, a citizen of the United States, residing at Salem, in the county of Henry and State of Iowa, have invented a new and useful Fence-Weaving Machine, of which the following is a specification.

My invention relates to a machine for weaving fences in which I have embodied a peculiar knotter mechanism by which the cross or stay wire is first twisted or woven around the longitudinal strands and subsequent to the formation of the loop or twist around each longitudinal strand the knot is tied and completed, so as to unite the longitudinal strand and the stay-wire rigidly together in a manner to prevent displacement of the wires one upon the other, thereby making a very strong and durable construction of woven-wire fencing.

The improvement relates more particularly to that class of machines which may be used in the field for the formation of the fence fabric after the longitudinal strands shall have been stretched between the posts; and one of the objects of the invention is to provide a simple structure which may be easily moved from one place to another, in which the parts are arranged for convenient and easy operation, so as to produce the improved fence fabric with rapidity, and in which the stay or cross wires may be spaced apart at suitable regular intervals. In this connection it is proper to state that while my machine is shown in the accompanying drawings as adapted for work in the open air I would have it understood that I do not desire to strictly limit myself to the embodiment of the machine for this special purpose, because I am aware that my knot-forming mechanism may be built in a machine for use in a factory for the formation of a fence fabric in which the stay-wires are twisted and knotted around the longitudinal strands or cables in a manner to practically tie the several strands rigidly together and prevent displacement of the strands one on the other at the points where they are united together.

The generic feature of my invention is a knot-forming mechanism in which I have embodied a twister for coiling the stay-wire around the longitudinal strand and subsequently tying the stay-wire upon itself by the operation of a clenching device.

The invention further consists in the novel combinations of elements and in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated one embodiment thereof for field-service in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of my improved fence-fabric-weaving machine. Fig. 2 is a front elevation thereof, showing the relation of the machine to the longitudinal strands. Fig. 3 is an enlarged detail view of the mechanism for forming the joint or knot between the longitudinal strand and the stay-wire. Fig. 4 is a detail perspective view of the twister forming one of the elements of the knot-forming mechanism. Figs. 5, 6, and 7 are views in side elevation, front elevation, and top plan, respectively, of the twister. Fig. 8 is a perspective view of part of the means for clenching the looped part of the twisted stay-wire. Figs. 9, 10, and 11 are views in plan, side elevation, and longitudinal section, respectively, of the clencher device. Fig. 12 is a view of the reel and tension device to carry the wire from which the stays are produced. Fig. 13 is a view of part of a fence fabric produced by a machine embodying my invention. Figs. 14 and 14ª are enlarged detail views of one of the joints or knots. Figs. 15 and 16 are views of a nipper used in my machine to hold the strand forming the stay-wire. Fig. 17 is a detail perspective view of the vertically-adjustable slide with the spring holding-arm and the guide for the wire from which the stays are to be formed. Fig. 18 is a detail view of the rack-formed slide between the rotary clencher-head and the separating-lever therefor.

Like numerals of reference denote corresponding parts in all the figures of the drawings.

In the embodiment of the invention illustrated by the drawings I employ a standard or upright 1, which may be constructed in one or two parts, as may be desired. The lower end of the upright or standard is forked to provide the flanged foot 3, which rests upon

the flat elongated base 4, said foot of the upright being rigidly secured to the base by bolts or any suitable fastenings.

At the upper extremity of the standard or upright is provided a horizontal overhanging arm 5 of any suitable construction. This overhanging arm extends from the standard substantially at right angles thereto, and said arm carries a shaft-bearing 6, in which is mounted a horizontal arm or shaft 7. On said arbor or shaft is fitted the reel 8, on which is wound or coiled the wire from which the stay or cross wires are drawn, and said reel 8 is held from rotating freely on the arbor or shaft by a suitable form of tension device. In one embodiment of the tension device I employ a coiled spring 9, which is fitted loosely on the shaft or arbor to have one end bear against the hub of the reel, which is fitted loosely on said shaft or arbor, and against the other side of this loose or idle reel bears a take-up or adjusting nut 10, which is fitted on a threaded end of the shaft or arbor. This nut may be adjusted on the arbor to move the idle-reel against the spring with a view to regulating the pressure of the spring against said reel, and the reel is thus prevented from rotating freely on the shaft or arbor, whereby the wire is held under tension by the action of the spring against the reel.

The upright or standard is held in proper relation to the longitudinal strands of the fence by means of the retaining-bar 11. This retaining-bar is made of metal to fit the upright or standard in a manner to have a part of the metallic bar project from the face of the standard or upright. This retaining-bar is provided with a plurality of transverse notches or recesses 12, through which the longitudinal strands of the fence may be passed, and to provide for the ready adjustment of this retaining-bar to the strands or longitudinal wires of the fence I employ a series of bolts 13, which pass through the standard and the retaining-bar 11. The bolts 13, except the upper bolt, may be removed to release the standard. The bar may then be swung outward on the upper bolt as a pivot, the machine adjusted in place with the longitudinal strands fitting in the notches or recesses of the retaining-bar, and the bolts replaced in order to hold the retaining-bar in a fixed position on the standard and to maintain the machine in proper relation to the longitudinal strands of the fence. These strand-wires pass loosely through the notches or recesses in the retaining-bar, and the machine is adapted to slide endwise along the longitudinal strands in order that the stay-wires may be applied at suitable intervals to said strands.

As one means for adjusting the machine lengthwise of the longitudinal strands I employ a feeding-lever 14 and an anchor 15. This feeding-lever is arranged in an upright position at or near one end of the machine, and it is fulcrumed, as at 16^a, on a short standard 16, fastened rigidly to the base. The anchor 15 has an elongated bar arranged in a substantially horizontal position, and this bar is formed at one end with a forked foot 17, having a number of prongs which are adapted to be forced into the ground to take a firm hold therein. The other end of this horizontal bar of the anchor is attached pivotally to the lower end of the upright feeding-lever, as by a pivotal bolt 18, and when the lever is swung to a position away from the upright or standard it pulls on the anchor and thereby drags the machine endwise. To indicate to the operator the extent of adjustment of the machine necessary to properly space the stay-wires at regular intervals, I provide a gage 19, which is attached to the base and projects upwardly therefrom, so as to strike against or come opposite to the stay-wire last applied to the longitudinal strands in the operation of weaving the fence.

On the upright or standard 1 is fitted a vertically-adjustable slide 20, which is adapted to move easily over the standard in a vertical direction thereon, and this slide is held in any one of a number of positions on the standard by means of a holding-arm 21. This holding-arm is a spring or elastic bar which is rigid with or fastened to the slide at its upper end, and the lower free end of the arm is formed with an offset or shoulder 22, which is quite broad and is adapted to have a firm bearing on any one of the series of longitudinal strands, whereby the holding-arm is adapted to sustain the knot-forming mechanism at different elevations and in proper relation to each of said longitudinal strands in succession as the knot-forming mechanism is raised progressively during the operation of applying each stay-wire to the series of longitudinal strands.

The knot-forming mechanism is carried by a swinging frame 25. The swinging frame is pivotally attached, as at 26, to the vertically-adjustable slide in a manner to swing at right angles to the line of the longitudinal strands, so as to bring the operative elements of the knot-forming mechanism in proper position to the desired longitudinal strand or to move said knot-forming mechanism out of the plane of the strands for the purpose of permitting the slide and the frame to be raised or lowered on the standard or upright 1, as may be desired in the practical service of the machine. This swinging frame 25 is in two members or parts which are spaced laterally at the free end of said frame to accommodate between themselves the shaft of the twister to be presently described, and at one end this branched frame 25 is forked to provide a guide 27, which flares or widens at the outer end and which is in line with a slot 27^a, into which one of the strands is adapted to be received in order to present the twister properly to the strand with which the stay-wire is to be joined or tied.

The twister is designated in its entirety by the numeral 28, and it consists of a shaft or journal 29, a head 30, and a gear-pinion 31,

all of which are made or cast in a single piece of metal. A longitudinal channel or slot 32 is formed in the twister 28, so as to extend entirely through the gear-pinion, the shaft, and the head of said twister, and this channel or groove opens radially through one side of the twister, and it is of such depth that the longitudinal strand may fit in the twister to occupy an axial relation thereto, whereby the twister may rotate upon the longitudinal strand as upon an axis in the operation of twisting or coiling the stay-wire around said strand. The journal or shaft 29 of the twister is fitted in suitable openings in the branched swinging frame 25 to bring the longitudinal radial groove or slot 32 in line with the fork and slot 27 27ª of the swinging frame when the twister occupies its normal position, thus arranging the parts for the entrance of the strand-wire into the twister and making the forked and slotted part of the frame serve as a guide in directing the longitudinal strand into the twister when the frame is swung toward the strand. The slotted gear-pinion of the twister is housed or arranged between the branched or divided part of the swinging frame 25, and with this gear-pinion 31 meshes the teeth on a gear-segment 33, which is integral with an operating-lever 34 for the twister. This lever 34 is arranged in the branched or divided part of the swinging frame, so as to be fulcrumed therein at an intermediate point of its length, and the handle end of this twister-operating lever protrudes from the swinging frame, so as to be readily accessible for convenient manipulation by the operator. The head 30 of the twister is of peculiar formation, for the purpose of carrying and twisting the stay-wire around the longitudinal strand and of producing sufficient slack in the stay-wire to form a loop, which is to be clenched at a subsequent operation around the stay-wire, so as to form the knot by which the stay-wire and the longitudinal strand are united rigidly together against tendency to displacement of the parts. The head 30 of the twister is formed on one side of the longitudinal groove or slot 32, where it opens through the twister-head, with a well-defined beak 35, which has a straight inner side or wall coincident with the line of the slot or groove 32, while the other edge of the beak 35 is curved or inclined to enable the beak to ride against the stay-wire and to force the wire out of the path of the twister in the operation of forming the twist. On the opposite side of the open end of the slot or channel 32 through the twister-head is formed the web 36, having an extended or protruding heel 38 and a beveled or curved face 37, the latter serving to ride against the stay-wire to force the wire out of the path of the twister as the stay is coiled on the line-wire.

Extending laterally from the twister-head on the same side of the twister as the beak 35 is the angular arm 39, which carries a pivotal post or stud 39ª for the yieldable latch or finger 40. This yieldable latch or finger is pivoted on the post or stud to have its operative end protrude beyond the face 37 of the web 36, and this operative end of the latch or finger is formed with a tooth 41, adapted to impinge against the stay-wire and to draw thereon during the rotation of the twister, so as to produce sufficient slack in the stay-wire for the formation of the loop therein, which loop is to be clenched around the stay-wire by the operation of the clencher after the loop and twist have been formed. At its free end this finger or latch is formed on the side opposite to the tooth 41 with a stop lug or shoulder 42, which is adapted to abut against the edge of the angular arm 39 to limit the movement in one direction of said latch or finger, and around the pivotal post or stud is fitted the coil of a retracting-spring 43, one arm of which is connected to the body of the twister, while the other arm of the spring acts against the finger or latch to normally hold it in a position where its stop-shoulder abuts against the angular arm 39. This finger or latch is thus yieldingly mounted on the twister in such relation to the beak 35 that the toothed end of the latch will engage with the stay-wire when the twister is rotated around the longitudinal strand, so that the finger or latch will produce sufficient slack in the stay-wire under tension from the overhead reel to form the loop necessary to produce the clenched knot or joint, and during the revolution of the twister and its latch or finger which is engaged with the stay to form the loop therein the faces of the web and beak ride against the stay-wire and move the latter out of the path of the twister in a manner to prevent the latch or finger from catching on the stay-wire during the continued rotation of the twister to complete the joint. As the twister is reversed by moving the lever upward the latch or finger is detached from the stay-wire and the twister assumes a position to permit its withdrawal from the line-wire, the latter passing through the slot in the twister.

The swinging frame 25 carries a clencher device which is supported on said swinging frame above the rotatable twister-head. This clencher mechanism comprises a clencher-fork 45 and a rotatable clencher-head 46, which are arranged to be controlled and operated by a clencher-operating lever 47 and the retracting-springs 48 49. The clencher-fork 45 is made from a bar or length of metal which is of angular bent form to produce a shank 50, having its upper end lapping the swinging frame 25 and which is pivoted thereto by a bolt 52 to give the clencher-fork a swinging movement on the frame 25 independently of the swinging movement of said frame 25 on the vertically-adjustable slide.

The bar forming the clencher is bent or twisted near its free end, and said free end of the bar is bifurcated to form the fork 45, which is adapted to straddle the stay-wire be-

neath the twisted portion thereof around the longitudinal strand and between two of said strands, in order that the clencher-head 46 may be presented for engaging properly with the loop in the stay-wire formed by the operation of the yieldable latch or finger in connection with the rotation of the twister-head. In rear of this fork 45 of the clencher the bar is formed with a boss 53 and with a radial slot 54, the latter (the slot) opening into the fork and the former (the boss) forming a journal for the rotatable clencher-head 46. This rotatable clencher-head has a shaft or journal 46^a, which fits in the bearing provided for its reception in the boss 53 of the clencher-fork, and on one end of this shaft 46^a is a gear-pinion 55, while on the other end of the shaft is the clencher-head proper, which clencher-head protrudes beyond the boss 53, in which its shaft is journaled. Through the rotatable part of the clencher is formed a longitudinal groove or slot 55^a, which extends radially with respect to the shaft, the pinion, and the head of the rotatable member of the clencher, thus adapting the clencher to properly fit to the stay-wire for the purpose of turning axially thereon, so as to bend or carry the looped part of the stay-wire around that part of the stay between two adjacent strands. The head of the rotatable member of the clencher is formed with an angular offstanding flange 46^a, which is adjacent to one side and the inner terminal of the radial slot or channel in the rotatable clencher-head, and this angular offstanding flange is adapted to bear or press against the looped part of the stay for the purpose of bending the same around the stay, as before indicated. The pivoted shank of the clencher-fork 45 is normally held out of position and in rear of the fork of the twister by means of the spring 49, which is attached at one end to the swinging frame 25 and at its other end to the shank of the clencher-fork. On this clencher-fork, at one side of the pivotal connection thereof to the frame 25, is a lateral stud or post 56, on which is fulcrumed a bell-crank lever 47, one arm of which extends outwardly from the knotting mechanism and provided with a handle, so that it may be operated conveniently. The other arm of this bell-crank lever is pivoted to a rack-formed bar or slide 57, which is fitted and guided in a bracket-arm 58, rigid with the clencher-fork 45, and arranged in a position to hold the toothed end of said slide in engagement with the gear-pinion on the rotatable clencher-head. This operating-lever 47 for the clencher mechanism is normally held in a position to retract the operating-slide 57 by the spring 48, which is fitted to the pivotal stud or post of the lever 47, and this spring 48 is somewhat stronger than the spring 49, which holds the clencher-fork 45 retracted, so that when the lever is grasped and moved the spring 49 will yield first to permit the clencher-fork to be swung into position for the fork and head to embrace the stay-wire, and then when greater pressure is applied to the clencher-operating lever the spring 48 will yield or give to permit the clencher-operating lever to move the slide 57, which in turn rotates the clencher-head 46 to cause its angular flanges 46^a to bend the looped part of the wire around the stay at a point adjacent to the twist or coil of said stay around the longitudinal strand. After the pressure required to force the clencher in position is removed from the lever 47 the springs 48 49 return the parts of the clencher to their proper normal position to free themselves from the wire and to return the entire clencher mechanism out of the way of the strand and stay, so that the machine may be raised or lowered, as required.

In Figs. 15 and 16 of the drawings I have shown a nipper device which I employ to hold the end of the stay-wire after the latter has been joined to the top longitudinal strand and while the machine is being lowered in position to attach the next stay-wire, beginning with the bottom longitudinal strand and at a suitable distance from the stay-wire last applied to the longitudinal strands. This nipper 60 consists of three parts (indicated at 61, 62, and 63,) of which the middle and lower members are arranged to work like a pair of shears, while the upper member is provided with a rounded edge. This upper member is arranged to be spaced from the middle member by a thin washer 64, so that the members will not fit close together, and the several members are united together by a pin or arbor 65, which passes through all of the parts. This nipper device has its members arranged to grip the stay-wire, so as to form a bend or crook therein and thus engage the stay-wire very firmly and securely to prevent loosening or detachment of the stay-wire during the operation of adjusting the knot-forming mechanism from the top to the bottom strand of the fence. This nipper is mounted on the machine so as to be always within convenient reach of the operator, and to this end I attach the nipper to a carrying-arm 66, which is pivoted at 67 to the swinging frame 25 near the point where the latter is pivoted on the vertically-adjustable slide, and said arm and the nipper are normally drawn out of the way by the action of a retracting-spring 68, attached to the frame 25 and the nipper-carrying arm, as shown.

The wire forming the stays is led from the overhead reel through a guide-eye 69, formed in the lower end of a pendent arm 70, attached to the vertically-adjustable slide of the machine. This guide 69 70 is arranged to terminate in a plane above the wire-twister mechanism, and it sustains the stay-wire in a proper position across the longitudinal strands for the twister mechanism to engage therewith when the frame 25 is swung toward the strands.

In Figs. 14 and 14^a of the drawings I have

shown the loop, joint, or knot produced by the operation of the twister and clencher mechanisms forming the knotting mechanism of my invention. The strand-wires or the longitudinal strands are represented at 71 72 and the stays at 73. Each stay is joined to a plurality of the longitudinal strands or wires 71 72 by the joint 73ª. The stay-wire is coiled or twisted around the longitudinal strand, and in the operation of the twister an offstanding loop 74 is produced, after which the final turn or twist of the stay-wire around the longitudinal strand is made. Subsequent to this twisting of the stay-wire around the strand and the formation of the offstanding loop the clencher is brought into service for the purpose of bending the offstanding loop around the stay at a point in close proximity to the twisted part of the joint around the strand.

This being the construction of my machine for making wire fences, the operation may be described as follows: The desired number of longitudinal strands are first stretched between the posts and the strands are secured so that they will be under tension at all times, particularly during the operation of fastening the stays thereto. The machine is then adjusted alongside of the longitudinal strands, the retainer-bar is engaged with the strands at the proper intervals, and the retainer-bar is then fastened in place. The wire is then conducted or drawn from the overhead reel and led through the eye of the guide 70. The swinging frame and the slide are lowered into position for the foot of the holding-bar to rest upon the bottom longitudinal strand, and the end of the wire from the reel is attached to the nipper to be held thereby during the operation of forming the first joint or knot to attach the stay-wire to the bottom strand. The swinging frame 25 is moved toward the strand for the fork 27 to embrace the strand and to have the strand fit in the slot of the frame and the slot or channel of the twister, thus bringing the twister into engagement with the stay-wire, which is held under tension between the overhead reel and the nipper. With the parts adjusted, as just indicated, the operator moves the lever 34 to actuate the segment 33 and rotate the twister, which causes the latch to carry the stay-wire around the strand, and during the operation of twisting the stay-wire on the strand the latch or finger 40 forms the loop 74 in the stay-wire. The swinging frame 25 is now moved away from the strand a suitable distance and with the other hand the operator then grasps and moves the lever 47 to bring the clencher into a position where the fork 45 embraces the stay below the loop 74, and the head 46 of the clencher embraces the loop 74 itself. A continued movement of the lever 47 operates the slide 57 to rotate the clencher-head and cause its flange 46ª to bend the loop 74 around the stay at a point adjacent to the twist of the stay around the strand. The clencher is now moved out of position, and the slide, with the knot-forming mechanism, is raised for the foot of the holding-bar to rest on the strand next above the one to which the stay-wire has been attached, and the operation is then repeated. The stay is thus successively fastened to each strand until the top strand is reached, where the stay is coiled and looped; but before cutting the wire the pincers are adjusted to hold the free end of the stay-wire. The machine may now be moved forward by operating the feeding-lever, and the frame 25, with the parts associated therewith, is now lowered, after which the operation of attaching the stay-wire to the bottom strand is repeated, the pincers or nippers detached, and the stay-wire subsequently connected to each of the longitudinal strands.

In my improved machine the parts are arranged for operation in a very expeditious manner, so that a person is able to apply the stay-wires very quickly to the strands, the levers 34 and 47 being designed for operation by the two hands of the operator.

One important feature of my invention is that the strand and stay-wires are joined very firmly and solidly together in a manner to brace each other, prevent any slipping or displacement of the wires, and to produce a light but exceedingly strong and durable fence.

It is evident that changes in the form and proportion of parts and in the details of construction may be made without departing from the spirit or sacrificing the advantages of the invention, and I therefore reserve the right to make such modifications as fairly fall within the scope of the invention.

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

1. In a fence-machine, the combination of a twister mechanism for applying a stay-wire with a loop to a strand-wire, and a clencher mechanism operating subsequently to the twister mechanism to bend said loop around a wire, substantially as and for the purposes described.

2. In a fence-machine, the combination of a twister mechanism having a rotatable head with a loop-forming finger or latch, and a clencher mechanism arranged to be brought into engagement with the loop and to bend the same around a wire, for the purposes described, substantially as set forth.

3. In a fence-machine, the combination of a twister mechanism for producing a loop as it twists one wire around the other, and a clencher mechanism having a rotatable head to bend said loop around one of the wires, substantially as and for the purposes described.

4. In a fence-machine, the combination with an intermittently-moving frame, of a twister mechanism mounted on said frame, and a clencher mechanism also mounted on the

frame and arranged for operation independently of the twister mechanism, substantially as and for the purposes described.

5. In a fence-machine, the combination with an intermittently-moving frame, of means for sustaining said frame at suitable intervals in operative relation to the longitudinal strands, a twister mechanism carried by said frame, a feed mechanism for holding a wire under tension in proper relation to be engaged by the twister mechanism, and a clencher device independent of the twister mechanism, substantially as and for the purposes described.

6. In a fence-machine, the combination of a suitable support, of a swinging frame arranged on the support to be movable toward or from wires around which a stay is to be twisted, a twister mechanism carried by the frame, and a clencher mechanism also carried by the frame and adapted for operation independently of the twister mechanism, substantially as and for the purposes described.

7. In a fence-machine, the combination with a suitable upright, and a vertically-adjustable support thereon, of a swinging frame connected by a horizontal pivot to said support and adapted to move in a plane at right angles to the line of a fence-wire, a stay-twisting and loop-forming mechanism on said frame, and an independent loop-clenching mechanism also carried by the frame, substantially as described.

8. In a fence-machine, the combination with an upright, of a vertically-adjustable support, a pendent guide-arm on the support and having a guide-loop substantially on the plane of a twister mechanism, a frame connected by a horizontal pivot to said support and adapted to swing in a vertical plane at right angles to the line of a fence-wire, an overhead reel, and a twister mechanism carried by said pivoted frame, substantially as described.

9. In a fence-machine, the combination with a suitable upright, and an adjustable support thereon, of a swinging frame mounted on said support, a twister mechanism carried by the swinging frame, and an independent clencher mechanism also carried by the swinging frame, substantially as described, for the purposes set forth.

10. In a fence-machine, a twister mechanism comprising a rotatable head and a yieldable loop-forming finger carried by said rotatable head, substantially as and for the purposes described.

11. In a fence-machine, a twister mechanism comprising a swinging frame provided with a guide-fork, a rotatable head journaled in said frame, a yieldable loop-forming finger carried by said head, and means mounted in the swinging frame for rotating said twister-head, substantially as described.

12. In a fence-machine, the combination with a suitable upright, and a vertically-adjustable slide thereon, of a swinging frame pivoted to the slide and carrying a strand-engaging fork, a twister carried by said frame and arranged to engage with the strand when the frame is adjusted toward the same, a clencher device having a fork to engage with the stay and a rotatable head to bend a loop around the stay, and independent operating devices for the twister and for the clencher, substantially as described.

13. In a fence-machine, the combination of a movable frame, a rotatable twister journaled in said frame and constructed to receive a strand-wire and having a yieldable loop-forming finger, a clencher also mounted on the frame and arranged to engage with a stay and having a rotatable head, and independent operating devices for rotating the twister and the head of the clencher, substantially as described.

14. In a fence-machine, a rotatable twister provided on one side of its radial slot with an extended beak, and a yieldable loop-forming finger carried by said twister on the opposite side thereof from the beak and slot, said finger being arranged to move toward and from the beak and slot to draw the wire laterally across the twister-head, substantially as and for the purposes described.

15. In a fence-machine, the combination with a movable frame, of the rotatable twister journaled in said frame and provided with a gear and with a longitudinal slot or channel-a yieldable finger mounted on the twister, head at one side of the channel therein, and a lever fulcrumed on the frame and having a gear-segment which meshes with the twister-pinion, substantially as described.

16. In a fence-machine, the combination with a movable frame, and a twist and loop forming mechanism, of a clencher-fork mounted on the frame, a rotatable clencher-head carried by said fork, and means for adjusting the clencher-fork and for rotating the clencher-head, substantially as and for the purposes described.

17. In a fence-machine, the combination with a twist and loop forming mechanism, of a swinging clencher-fork arranged to engage with a stay-wire, a rotatable slotted clencher-head having a gear-pinion, and a lever-controlled rack or slide which engages with the pinion of the clencher-head, substantially as described.

18. In a fence-machine, the combination with a swinging frame, and a twist and loop forming mechanism, of a swinging clencher-fork pivoted to the frame and controlled by a spring to retract it out of the path of the twist and loop forming mechanism, a rotatable clencher-head journaled in the clencher-fork near its free end, a spring-controlled lever fulcrumed on the clencher-fork, and operative connections between the lever and the clencher-head for rotating the latter, substantially as and for the purposes described.

19. In a fence-machine, the combination with a twist and loop forming mechanism, of a clencher mechanism independent of the

twist and loop forming mechanism and provided with a rotatable clencher-head having a slot or channel and an angular working face to bend a loop around a stay, for the purposes described, substantially as set forth.

20. In a fence-machine, the combination with an upright, of a vertically-adjustable slide fitted thereto, a spring-arm attached to said slide and having a foot to rest upon a longitudinal strand, a feed mechanism for the stay-wires carried by said upright, and a movable frame attached to said slide and carrying the knot-forming mechanism by which the stay-wires are joined to the longitudinal strands, substantially as and for the purposes described.

21. In a fence-machine, the combination with an upright, an overhead reel, and an adjustable support, of a depending arm attached to said support and having a lateral foot, a guide-arm with a guide-eye, and a frame attached to the support and carrying the operating mechanism, substantially as described.

22. In a fence-machine, the combination with an upright, and a tension-controlled reel carried thereon, of a vertically-adjustable knot-forming mechanism mounted on said standard, and a gripper device mounted on the vertically-adjustable frame of the knotting mechanism and arranged to engage with the wire from said reel, for the purposes described, substantially as set forth.

23. In a fence-machine, the combination with a standard, and a reel thereon, of a vertically-adjustable slide, a frame attached to the slide and carrying a knot-forming mechanism, and a spring-controlled carrying-arm pivoted to the swinging frame and having a nipper device for holding the wire from said reel, substantially as and for the purposes described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MICAJAH L. POULTER.

Witnesses:

CHARLES H. MARTIN,

JOHN C. MARSHALL.