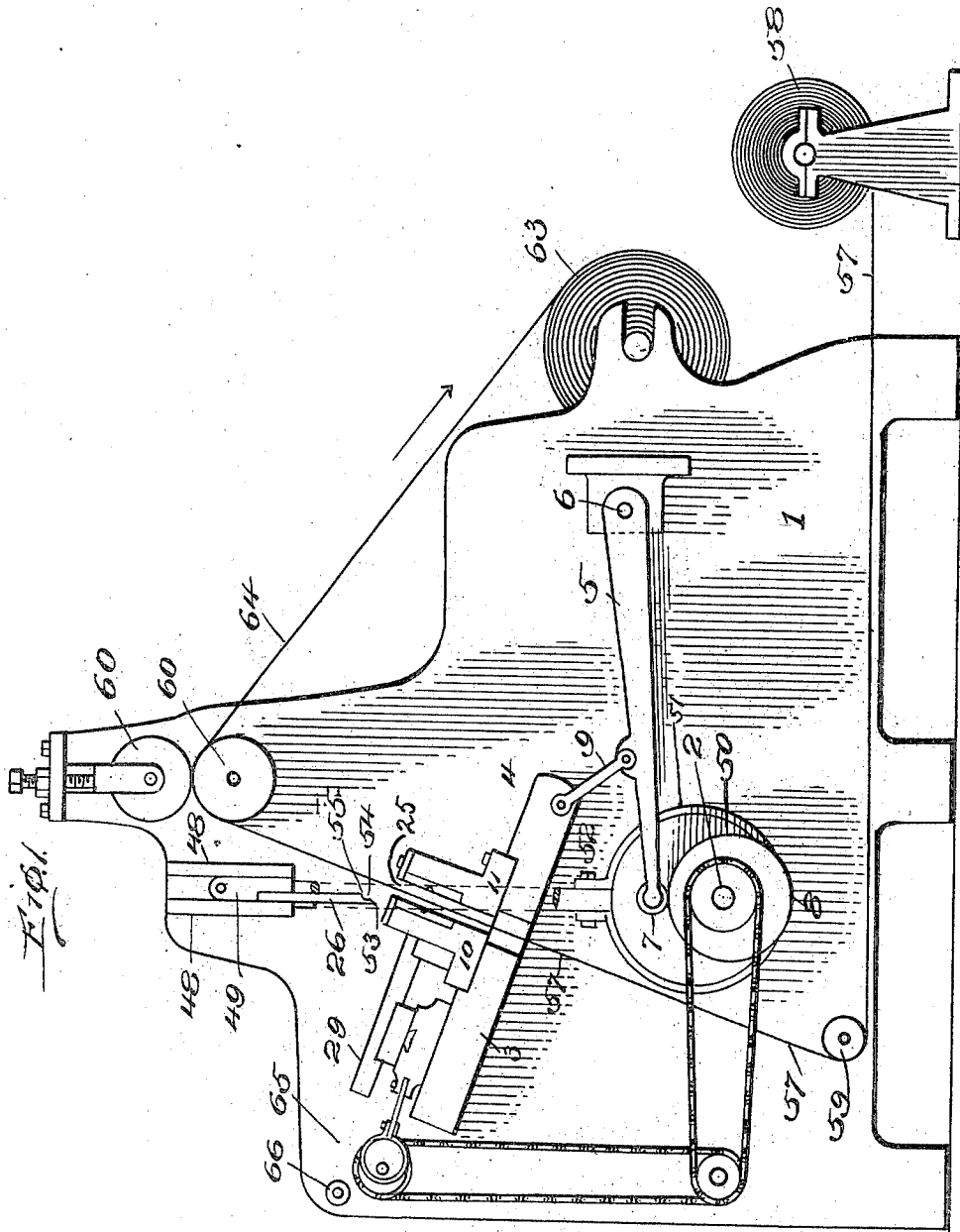


J. A. RECK.
FENCE MAKING MACHINE.
APPLICATION FILED JUNE 2, 1909.

947,848.

Patented Feb. 1, 1910.
2 SHEETS—SHEET 1.



Inventor:

Joseph A. Reck

Witnesses:

J. M. Fowler
E. A. Cole

By

Chas. Baggett & Co.
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH A. RECK, OF ADRIAN, MICHIGAN, ASSIGNOR OF ONE-FOURTH TO STEPHEN J. RECK AND ONE-FOURTH TO PETER C. RECK, OF ADRIAN, MICHIGAN.

FENCE-MAKING MACHINE.

947,848.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed June 2, 1909. Serial No. 499,668.

To all whom it may concern:

Be it known that I, JOSEPH A. RECK, a citizen of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Fence-Making Machines, of which the following is a specification.

This invention relates to wire working machines and it has particular reference to that class of machines which are used in the construction of wire fencing and more particularly that class of wire fencing which is composed of a plurality of running wires or line wires upon which picket wires are placed approximately at right angles to said line wires upon which they are securely made fast by means of wire knots or tying devices.

In fence making machines of the class generally outlined above, it has heretofore been customary to form the knots or ties from staples, the same having been previously cut and formed through the instrumentality of a separate machine provided for this special purpose. This has involved the necessity of additional labor for the purpose of carrying the staples as issued through the staple-forming machine to the fencing machine proper and placing them there in position to be acted upon by feeding and setting devices provided for that purpose. It may also be incidentally mentioned that considerable loss is usually caused by misshapen and defective staples which not only involve a great loss of material but sometimes vexatious delays. A staple-forming machine moreover is an expensive structure.

The present invention has for its object to provide means whereby the auxiliary stapling machine may be entirely dispensed with, this result being accomplished by providing mechanism whereby a tying wire is intermittently fed through a wire guiding device and into a die where it is shaped to form the desired lock or tie; the invention further consists in means for severing the tying wire at a proper time and point, and for simultaneously completing the lock or tie by bending the severed end upon the picket wire adjacent to the body of the lock.

The invention further consists in certain details of construction which will be hereinafter fully described, it being understood that no limitation is necessarily made to the

precise details of construction shown, but that changes and modifications within the scope of the invention may be resorted to if desired.

In the accompanying drawing has been illustrated a simple and preferred form of the invention, and in said drawing—

Figure 1 is a sectional elevation of a device embodying the invention, such parts of an ordinary fencing machine being shown as would serve to clearly illustrate the operation of the invention. Fig. 2 is a side elevation, enlarged, showing the stationary and movable die sections in separated position, together with the tying wire feeding mechanism, the cutter for severing said wire, and other related parts. Fig. 3 is a top plan view showing the die sections in a closed position together with the wire feeding mechanism. Fig. 4 is a side view of the wire guide. Fig. 5 is a face view of one of the die sections. Fig. 6 is a detail view showing the line wire and a picket wire connected by the finished tie or locking device. Fig. 7 is a side view of one of the die sections.

Corresponding parts in the several figures are denoted by like characters of reference.

1 designates the frame structure of a fencing machine embodying the invention.

2 is the main driving shaft which receives motion from the source of power and from which motion is transmitted to the various moving parts of the device.

3 designates a table or supporting device which will be hereinafter referred to as the front table; the same being supported stationary in a tilted or inclined position, the inclination being downward from the front part of the machine. This table, as will be hereinafter shown, serves to support the stationary part of the die as well as the means whereby the tying wire is fed into the die. The rear table 4, which supports the movable die member is suitably supported in an inclined position, in registry with the front table with relation to which it is intermittently reciprocated.

Any suitable means may be utilized for imparting the desired reciprocatory motion to the rear table; in the drawing, Fig. 1, has been illustrated a lever 5 pivotally supported or fulcrumed at 6 and having at its free terminal end a roller 7 suitably engaging an eccentric disk or cam 8 mounted upon the

main shaft 2 from which the terminal end of the lever derives its upward thrust or movement; the downward movement being effected by gravity which, if desired, may be aided by any suitable means such as a retracting spring which, however, it is deemed unnecessary to illustrate. A link 9 connects the lever 5 with the rear table to which a reciprocatory movement will thus be imparted, said movement being timed to operate in unison with other parts of the device.

It is regarded as proper to mention at this point that while the drawing illustrates only a single equipment, said equipment will obviously be multiplied in a complete machine; it being further understood that such instrumentalities as driving gears and the like may be utilized in multiple whenever it shall be necessary, in order to render the operation of the machine effective. The number of equipments used in a complete machine will obviously depend upon the number of line wires that may be utilized in the construction of the fencing, and may be varied accordingly.

The die for forming the knot or tie is composed, as above stated, of two members or sections namely, a stationary member A and a movable member B. These die members are securely held and retained in operative position by means of die holders 10 and 11 of massive construction, said die holders being illustrated as being provided with flanges 12, 13 for the passage of fastening members, such as bolts 14, that extend through supporting members 15 and engage dovetailed ribs 16 mounted in similarly shaped grooves in the members 3 and 4, and by which these parts are connected. The die-holders are provided with shoulders or offsets 17 to support the die members which are equipped with dowels 18 engaging suitable recesses in the die holders, thus insuring perfect registry when the faces of the die members come together. The die members are additionally secured upon the respective holders by means of cap plates 19 overhanging the upper edges of the die members and firmly secured upon the die holders by suitable means such as bolts or stud screws 20. The faces of the die members are provided with vertical grooves 21 for the accommodation of the line wire and with transverse intersecting grooves 22 for the accommodation of the picket wire; the faces of the die members are furthermore provided with curvilinear grooves 23 through which the tying wire is forced by the feeding mechanism to be hereinafter described for the purpose of forming the body of the lock or tie whereby the line wire and a picket wire are connected. The exact formation of the grooves or channels 23 will depend entirely upon the kind of knot or tie that it may be desired to form; it being very obvi-

ous that the device may be utilized in the construction of an almost indefinite number of variously formed knots or ties. The front member A of the die and the holder of said member is moreover provided with a bore 24, clearly indicated in dotted lines in Fig. 2 of the drawings, through which the tying wire may be fed into the die when the movable member of the latter is in operative position. Provision is also made in the nature of a groove or aperture 25, indicated by dotted lines on the die-holder 10, in Fig. 2, for the passage of the cutter 26 when the latter descends for the purpose of performing the functions assigned to it.

The holder 10 of the stationary die member A supports a block 27 which serves as a supporting member for the stationary dogs 28 of the feeding device which will be presently more fully described. The block 27 also serves as a means for the attachment in a fixed and stationary position of the wire guide 29, which latter is composed of an elongated block of metal having a bore or channel 30 which extends longitudinally therethrough. The wire guide is additionally supported in a groove 31 formed in the upper surface of a beam or cross-bar 32 that extends transversely of the machine where it is supported for reciprocation upon a carrier 33 likewise extending transversely of the machine and with which it may be connected detachably by means of a dove-tailed rib 34. The slide or carrier 33 which is supported for reciprocation upon the front table 3 is connected by a link 35 with a strap or band 36 mounted upon an eccentric disk or cam 37 upon a suitably supported counter shaft 38 which is preferably driven from the main shaft 2 by means of a chain 39 and such auxiliary gear as may be needed to effect the properly timed movement of the carrier 33.

The reciprocatory beam or cross-bar 32 supports a pair of dogs 40 which may be termed the movable wire feeding dogs in contra-distinction to the stationary dogs 28, which have been previously mentioned. These dogs which are pivotally mounted upon pins or pivots 41 are arranged to operate in narrow slots 42 formed longitudinally in the sides of the wire guide 29 and communicating at their inner ends with the bore or channel extending through said guide; said slots being of sufficient length to correspond with the thrust or movement of the cross-bar 32; it being obvious that each rearward movement of the carrier and cross-bar will serve to feed exactly the proper quantity of tying wire into the die to form the desired knot or tie. The working faces of the dogs 40 are equipped with teeth or serrations 44 and said dogs, which by preference are eccentrically mounted upon their respective pivots, are actuated by springs 43 the tension of which is exerted

to hold the toothed working faces of the dogs in gripping engagement with the tying wire during the rearward thrust or movement of the carrier and cross-bar supporting the dogs so that by such movement the tying wire will be forcibly gripped and held and projected in a rearward direction into the grooves of the die where the formation of the knot is thus accomplished. The teeth 44 upon the working faces of the dogs are formed with inclined front faces so that during the forward movement of the beam and carrier supporting the dogs the latter will slide unobstructedly over the adjacent portion of the tying wire. The stationary dogs 28 are likewise provided upon their working faces with teeth 44, but these teeth are shaped so with respect to those upon the movable dogs that the feeding movement of the tying wire will not be obstructed thereby while, when the carrier and beam supporting the movable dogs is retracted the tying wire will be gripped and held securely by the said stationary dogs, thus preventing any possibility of retrograde movement of the tying wire. The stationary dogs operate through slots 45 in the sides of the wire guide, said slots being merely of sufficient length to admit of the very limited pivotal movement of the dogs 28; the latter being actuated and thrown into operative engagement with the tying wire by means of suitably arranged retracting springs 46.

Means of any description may be utilized for the purpose of supporting the picket wire while it is being connected with the line wires, and such means have been indicated at 47 in Fig. 2 of the drawings, it being obvious that such supporting means will be preferably placed adjacent to the die members in order not to interfere with the perfect operation of the latter.

Suitable guides, best seen at 48 in Fig. 1 of the drawings, serve to support a beam or cross-bar 49 with which the cutter 26 is securely connected in any suitable manner. Reciprocatory movement in an approximately vertical plane is imparted to the cutter carrying beam 49 from the main shaft 2 by means including an eccentric disk or cam 50 having a strap or band 51 which is connected with the cutter carrying beam by means of a link 52; it being clearly obvious that while the drawing illustrates only a single set of this equipment, a complete machine will include an additional set placed adjacent to the opposite side of the machine in order that the two ends of the cutter carrying beam may be simultaneously actuated so as to insure perfection in the operation of the device. The cutter 26, which is an important element of the invention, is provided with a sharp cutting edge 53 and in rear thereof with an overhanging shoulder 54, preferably emphasized by a

slightly down-turned rib 55 at the rear edge thereof. As will be apparent from this construction, when the cutter descends through the passage provided therefor in the die, it will not merely cut and sever the tying wire, but the shoulder 54 will engage and forcibly strike the severed end of that portion of the wire which forms the knot or tie, bending the same upon the picket wire adjacent to the body of the lock which is thereby completed and made extremely firm, solid and durable. This terminal bend has been indicated at 56 in Fig. 6 of the drawings.

The line wire 57 is taken from a suitably supported spool 58 from which it is carried through suitable tension mechanism, not shown, and over guiding means including an idler 59 from which it passes between the faces of the die members and between a pair of crimping rolls 60 which not only serve to assist in feeding the wire, but which are so constructed as to impart to the line and picket wires at the point where they cross or intersect each other slight kinks or bends indicated at 61, 62 in Fig. 6 of the drawings. This crimping operation is obviously performed after the connected wires leave the dies. From the crimping rolls 60 the completed fencing material passes to a receiving spool or roller 63 suitably supported upon the frame of the machine.

From the foregoing description taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it pertains. It will be seen that as the line wire 57 comes from its supporting spool it is guided properly between the faces of the die members as clearly indicated in Fig. 1 of the drawings. The tying wire is taken from a supporting spool, not shown, and is guided over suitable guiding means including an idler 66 which is suitably supported in front of the wire guide 29 and with its upper edge in alinement with the bore extending through said wire guide. The tying wire is initially threaded through the bore of the wire guide and through the aperture 24 which extends through the die holder 10 and through the stationary die member A, said latter aperture being regarded as constituting a portion of the wire guide. When the machine is set in motion, assuming the carrier 33 and dog supporting beam 32 to be at the forward limit of their movement, the movable dogs 40 will instantly grip the wire and feed the same into the die where it is compelled to follow the curvilinear groove 23 as being in the line of least resistance, and kinking and buckling of the wire being absolutely prevented by the wire guide the bore of which merely affords room for the passage of the wire. This feeding movement is obviously

performed while the members of the die are in what may be termed a closed position, the face of the movable die being held firmly in contact with and abutting upon the face of the stationary die. While the die members are still in this position, and immediately upon the formation of the knot or tie, the cutter carrying beam descends, driving the cutter forcibly through the passage provided therefor in the die members, and serving as previously described, to sever the tying wire and to complete the lock by forcibly striking the severed end of that portion of the wire of which the lock is composed and bending the same down upon the picket wire which has been placed in position manually or through a mechanical feeding device. As the cutter carrying beam ascends the die members separate and the crimping rolls which are to be intermittently operated by suitable mechanism now feed the fencing material the requisite distance and incidentally impart the desired bends or kinks to the line and picket wires. It will thus be seen that the feeding of the tying wire, the formation of the knot or tie, the severance of the tying wire and the completion of the lock, are accomplished by a single organized machine structure practically at a single operation.

It is desired, in conclusion, to invite special attention to the fact that the knot or tie formed by this device has its ends cut off squarely, that is to say, at right angles to the axis of the wire, thus affording a firmer and more secure tie structure than when staples having ends tapering to a point are used. It should also be noted that the crimping device which forms slight kinks or bends in the line wire and the picket wire and other points of intersection, while securely interlocking the parts effects this result without forming a distinct arch or bow in either wire. Tie structures, where the wires or either of them are thus positively bent or arched frequently result in mutilating the galvanized surface of the wire which, being thus derived of protection, will soon rust and break. My improved tie structure is entirely free from this objection, since the kinks or bends, while entirely effective for the purpose intended, are so very slight that injury to the galvanized surface of the wire never takes place.

Having thus described the invention, what is claimed is:

1. In a fence making machine, a stationary wire guide, means for positively and intermittently feeding a tying wire there-through, a die composed of a stationary and a movable member, said stationary member being provided with an aperture constituting an extension of the wire guide to admit of the passage of the wire to the working faces of the die while the members of

the latter are in contact, the meeting faces of said die members being suitably grooved for the accommodation of the tying wire, a line wire and a picket wire, and a cutting member supported for reciprocation, said cutting member being provided with a shoulder or offset constituting a hammer to bend the newly severed end of that portion of the tying wire which forms the knot or tie upon the picket wire adjacent to the body of the tie.

2. In a fence making machine, the combination with a suitable die and wire feeding mechanism, of a cutter supported for reciprocation, said cutter being provided with a shoulder or offset to strike and bend the newly severed end of that portion of the tying wire which forms a knot or tie.

3. In a fence making machine, a wire guide consisting essentially of an elongated block having a longitudinal bore and provided in the sides thereof with slots of suitable length to accommodate respectively stationary and longitudinally movable pairs of dogs, stationary dogs operating in their relatively short slot and serving to grip and hold a wire passing through the guide during the retrograde movement of the movable or feeding dogs, a slide supported for reciprocation and having a groove engaging the wire guide, and feeding dogs supported upon the reciprocatory slide and operating through the relatively long slots in the wire guide to grip the tying wire and positively feed the same through the guide and to slide freely upon the surface of the wire during the retrograde movement of the slide or carrier.

4. In a machine of the class described, a wire guiding member having a longitudinal bore and provided in the sides thereof with elongated slots communicating with said bore, a slide supported for reciprocation, a beam or cross-bar detachably connected with the slide, said beam being provided with a groove to accommodate the wire guide, and feeding dogs supported upon said beam and operating through the elongated slot in the sides of the wire guide.

5. In a machine of the class described, a die composed of a stationary and a movable member, die holders having shoulders or offsets to support the die sections, the latter being provided with dowels engaging recesses in the holders, cap plates secured upon the holders and overhanging the upper edges of the die members, a block supported upon the holder of the stationary die member, said holder and stationary die member being provided with apertures leading to the working faces of the die members, a wire guide having a longitudinal bore, said wire guide being rigidly supported upon the block mounted adjacent to the holder of the stationary die member in alinement with the

aperture extending through said holder and stationary die member which constitutes an extension of the bore of the wire guide, and means for positively and intermittently feeding a tying wire through the wire guide and its extension.

6. In a machine of the class described, a tie forming die composed of a stationary and a movable member, holders for the die members, the stationary die member and its holder being apertured for the passage of a tying wire, a wire guide, means for intermittently feeding a tying wire through the guide and the extension of said guide formed by the apertures in the stationary die member and its holder to effect the formation of a knot or tie upon intersecting line and picket wires accommodated in grooves in

the faces of the die members, means for severing the tying wire while the die members are in contacting relation and for simultaneously clenching or bending the newly severed end of that portion of the tying wire which forms the tie, and a pair of crimping rolls serving to engage and feed the finished fabric and to simultaneously impart slight kinks or bends to the line wire and the picket wire at the point of intersection.

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

JOSEPH A. RECK.

Witnesses:

A. B. HEWES,
C. A. WILSON.