B. A. GARLINGHOUSE.

DIE FOR FORMING FENCE TIES.

APPLICATION FILED FEB. 13, 1909.

928,377. Patented July 20, 1909.

Fig. 1.

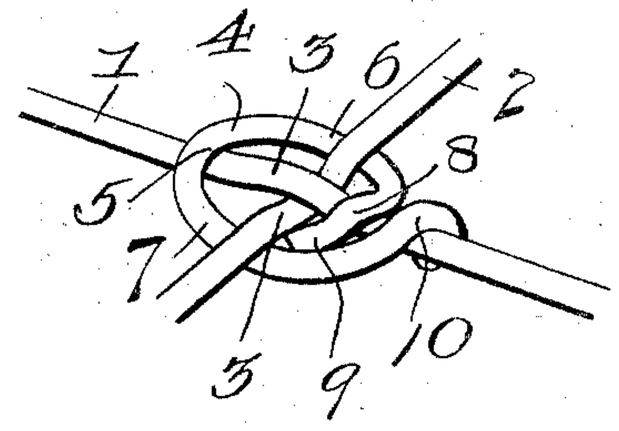


Fig. 2.

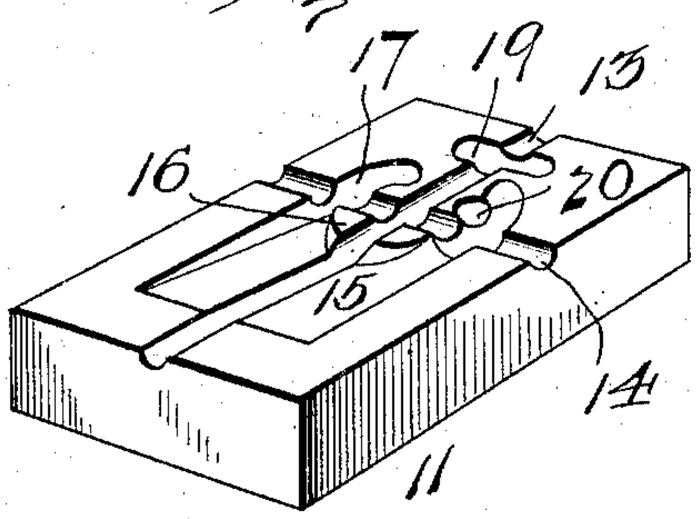


Fig. 3.

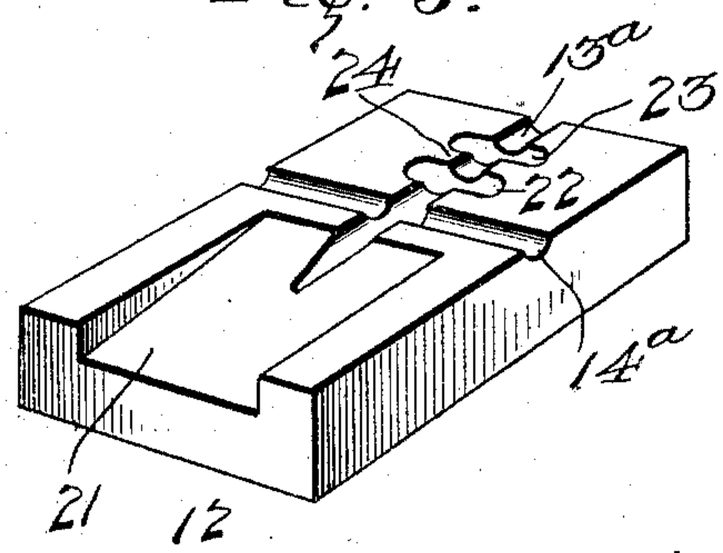


Fig. 4.

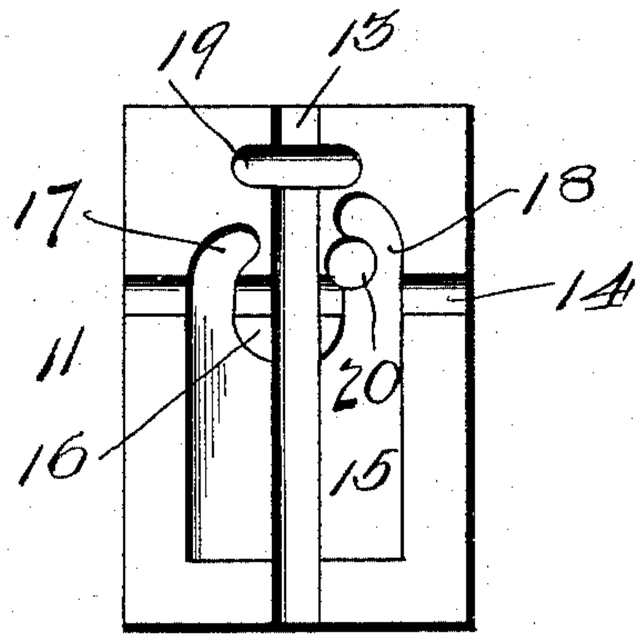


Fig. 5.

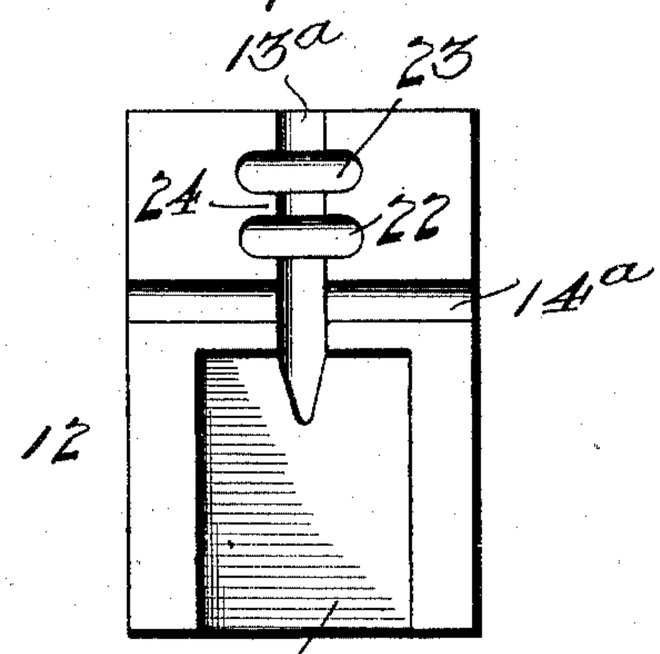
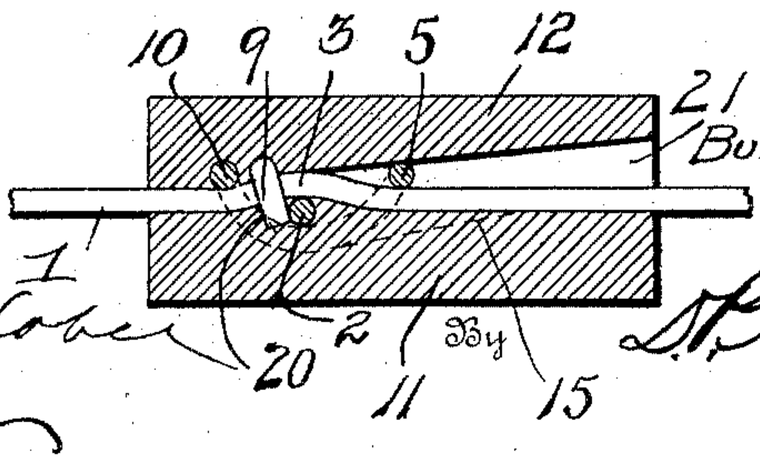


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DIE FOR FORMING FENCE-TIES.

No. 928,377. Specification of Letters Patent. Patented July 20, 1909.

Application filed February 13, 1909. Serial No. 477,694.

To all whom it may concern:

Be it known that I, BURTON A. GARLINGHOUSE, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Dies for Forming Fence-Ties, of which the following is a specification.

This invention relates to the art of manufacturing wire fencing of that type wherein fastening ties or knots are utilized for uniting intersection fence wires at their points of crossing, and particularly contemplates a novel and useful construction of shaping and clenching dies for effecting the tying of the fence wires through the direct application of the tie or knot thereto.

The special object of the invention is to provide an improved set of dies of a durable and practical construction and embodying means for shaping and clenching in place a peculiarly novel form of tie or knot which provides for securing a firm connection or fastening together of the fence wires without presenting projecting ends or obstructions at the sides of the fencing.

A further object is to provide a construction of dies which secure the formation of the tie or knot without injury to either the line or stay-wires, as is the case with some types of ties and the dies for shaping and clenching the same. Furthermore, the improved dies serve to so position the terminals of the tie-staple and apply them to the line or horizontal wire in such a manner as to secure a double bracing action, which prevents slipping in any direction and at the same time produces a definite and positive bracing support for the stay or cross-wire of the fencing.

A distinctive object of the invention is to provide a reinforcing coil-separating bridge between the coil forming grooves of one die member, and to provide means for positively deflecting the terminal of one leg of the staple to a position at one side of and below the crimp or bend in the stay-wire, thus securing a bracing support for the latter.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel combination, construction, and arrangement of parts, which will be hereinafter more fully described, illustrated, and claimed. The essential features of the invention, above indicated, are susceptible to some modification without departing from the spirit of the invention, but a preferred embodiment of the latter is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a fence tie or knot in its completed form as applied to the fence-wires by the dies contemplated by the present invention; Fig. 2 is a perspective view of one of the die members; Fig. 3 is a similar view of the other die member; Figs. 4 and 5 are plan views of the two complemental die members exposing the registering working faces thereof; Fig. 6 is a longitudinal sectional view through the dies in working position, illustrating the crossing fence wires therein and the tie-staple or wire in its final clenched condition about the wires.

Like reference numerals designate corresponding parts in the several figures of the drawings.

The improvements in the shaping and clenching dies claimed herein possess special utility in connection with the formation of the improved fence tie or knot illustrated in Figs. 1 and 6 of the drawings, so in order that the structural formation and function of the complemental dies may be readily understood, reference is made, in the first instance, to the peculiar and advantageous formation of the said fence tie.

Referring to the tie as shown in Fig. 1 of the drawings, the numerals 1 and 2 designate respectively the horizontal or line wire and the transverse stay or cross wire of a wire fencing, said intersecting wires being provided at their points of crossing with crimps or bends 3 arranged in complemental relation and producing shoulders to prevent relative lateral displacement of the wires.

The improved tie which is utilized for fastening or locking together the intersecting fence wires 1 and 2, essentially comprises a wire-staple, designated in its entirety by the numeral 4, with its bight 5 engaging over one side of the line wire 1. The opposite side legs 6 and 7 of the tie-staple 4 are passed beneath the stay or cross wire 2 respectively above and below the place of the crimp therein, and also above and below the plane of the line wire 1, clearly indicated in said Fig. 1 of the drawings.

One of the side legs of the tie-staple, designated by the numeral 6, is provided at its end with a clenching hook 8 partly, though tightly, coiled about the line wire in rather close relation to the stay wire and provided with a laterally deflected supporting terminal 9 which engages against and beneath the shoulder produced at one side of the crimp or bend of the stay wire 2, thus forming a definite supporting brace for such stay wire, while also serving to hold the latter and the line wire closely engaged. The other side leg 7 of the tie-staple is also provided at its end with a clenching hook 10 extending over the same side of the line wire as the other clenching hook 8, but coiled in a reverse direction thereto on said wire. The said outermost clenching hook 10 is relatively remote from the stay or cross-wire 2 and there is a separation or space between the two clenching hooks whereby they individually and separately exert a bracing action to produce what might be termed a double brace, which resists the tendency of the tie to slip in either direction upon the line wire.

The tie, as above described, is designed to be shaped and clenched (from the form of a staple) upon the intersecting fence wires through the medium of the complemental die members 11 and 12. These complemental die members are designed to be employed in a way well known in the art and are operated in connection with a plunger or equivalent device for driving the tie into the dies in the form of a staple, after which the dies are separated by any of the usual expedients, allowing the removal of the fastened strands and the carrying of the fabric along for a succeeding operation. These features are well-known in the art and need no further description or illustration, as the improvements claimed herein reside in the peculiar formation of the die members to effect a tying of a tie or knot of the construction described.

The die members 11 and 12 are employed as complements of each other and when in operative relation, the working faces of said dies are placed in registration to completely house or close in the paths followed by legs of the staple when forced into place.

Referring first to the die member 11, the same consists of a die body or block provided in the working face thereof with the right angularly crossing fence wire grooves 13 and 14 respectively. The wire groove 13 extends longitudinally from end to end of the die member 11, and is designed to receive therein the horizontal or line wire 1 of the fencing, while the shorter transverse groove 14 is designed to accommodate therein a stay or cross-wire 2 when the die members are closed upon the crossing wires.

In addition to the right angularly crossing fence wire grooves 13 and 14, the die member 11 is provided in its working face with a sloping guiding recess 15, which increases in depth as it recedes from the plane of the working face of the die member until it passes below the plane of the transverse wire receiving groove 14 for the stay wire 2 of the fencing. At or about the point where the inwardly deepening or sloping guiding recess 15 passes below the plane of the transverse wire receiving groove 14, the die member or body 11 has formed centrally therein a raised holding boss 16 which serves to hold the fence wires at their point of intersection and produces the crimps or bends 3 when the die members are brought together. The grooves 13 and 14 intersect each other in the face of the said boss 16.

At one side of the central holding boss 16 the sloping guiding recess 15 has extended from one corner thereof a deflecting branch channel 17 which extends about one side of the boss 16, crosses the plane of the transverse wire receiving groove 14, and is curved inwardly toward the longitudinal wire receiving groove 13, but does not cross the latter. At the directly opposite side of the boss 16 the said guiding recess 15 has likewise extended from one corner thereof a second deflecting branch channel 18, which crosses the plane of the transverse groove 14, and is curved inwardly toward the longitudinal wire receiving groove 13 but does not cross the latter. Also, the said branch channel 18 is of greater length than the opposite corresponding channel 17 for a purpose to be presently explained.

Beyond the inturned point or nose of the branch channel 18, the die member 11 has formed in its working face a transversely disposed curved coil-forming groove 19, and directly at the point of intersection between the channel 18 and the groove 14, the die member of body 11 is provided therein with a slightly inclined or oblique terminal deflecting cavity 20. (See Figs. 2, 4 and 6).

The die member or body 12, which is a complement to the die member or body 11, is provided in its working face with right angularly crossing face wire grooves 13^a and 14^a, which register with and are complements of the grooves 13 and 14 of the said die member 11. The die member 12 is furthermore provided at one-end portion thereof, wholly at one side of the plane of the transverse groove 14^a, with a tapering receiving throat or recess 21, and at the directly opposite side of the plane of the transverse groove 14^a, the die member 12 is provided in its working face with a pair of substantially parallel curved coil-forming grooves 22 and 23, respectively, which intersect and are arranged transversely to the longitudinal wire receiving groove 13^a. The said coil-forming grooves 22 and 23 are separated by a rib or ridge 24 constituting a well-defined and substantial coil-separat-

ing bridge which secures the spaced relation of the coils or hooks 8 and 10 of the tie, while at the same time reinforcing the die where it is usually subjected to the greatest strain and wear.

With the dies in matching and registering relation the coil-forming groove 22 comes into communicating relation with the branch channel 17 and the terminal deflecting cavity 20, while the coil-forming groove 23 comes into communicating relation with the branch channel 18 and the coil-forming groove 19. With the parts thus related, it will be obvious that when a tie wire, in the form of a staple, is forced into the entrance throat 21, one leg of the staple, designated by the numeral 6, passes downward through the recess 15 beneath the stay wire, and entering the branch channel 17, is deflected thereby toward the line wire 1 and into the coil-forming groove 22, which takes the end of the leg 6 and causes the same to pass over the line wire in a tight partial coil thereon, while the extreme terminal 9 of the leg 6 passes into the terminal deflecting cavity 20 and is thereby caused to be positioned against and behind the crimp in the stay wire 2, as plainly shown in Fig. 1 of the drawings. The opposite leg 7 of the staple is carried beneath the stay wire 2 at the opposite side of the line wire from the leg 6, and entering the branch channel 18 is directed by the latter up into one end of the outermost coil forming groove 23 which causes the end of the staple leg 7 to coil over the line wire at the same side of the latter as the coil hook 8 of the leg 6, but in a reverse direction to the latter, and the extreme end of the coil or hook 10 produced at the end of the leg 7 passes into the coil-forming groove 19, which exerts a final clenching effect upon the coil or hook 10.

From the foregoing, it is thought that the construction, action and advantages of the hereindescribed dies will be readily apparent without further description.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent, is:—

A set of tying dies for fence wires, comprising a pair of complemental die members having crossing wire receiving grooves in their working faces, one of said die members being further provided with a sloping guiding recess having at the deep end thereof oppositely arranged deflecting branch channels of different lengths and both inwardly curved toward the longitudinal wire receiving groove but not crossing the latter, said die member being further provided beyond the end of one of said branch channels with a transverse coil-forming groove crossing the longitudinal wire receiving grooves, and at the juncture of the longer branch channel and the transverse wire receiving groove with an inclined terminal deflecting cavity; the other die member being further provided at one side of its transverse groove with an entrance throat and at the other side of said groove with a pair of transverse coil-forming grooves and an integral separating bridge between the same, one of the coil-forming grooves of the latter die member registering with the shorter deflecting branch channel of the other die member and with said terminal deflecting cavity, and the other of said pair of coil-forming grooves registering with one end of the longer deflecting branch channel and the adjacent coil-forming groove of the same die member.

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

BURTON A. GARLINGHOUSE.

Witnesses:
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