No. 678,955. Patented July 23, 1901.

V. HOXIE.

DIE FOR JOINING INTERSECTING FENCE WIRES.

(Application filed Jan. 24, 1901.)

(No Model.)

Fig. 1.

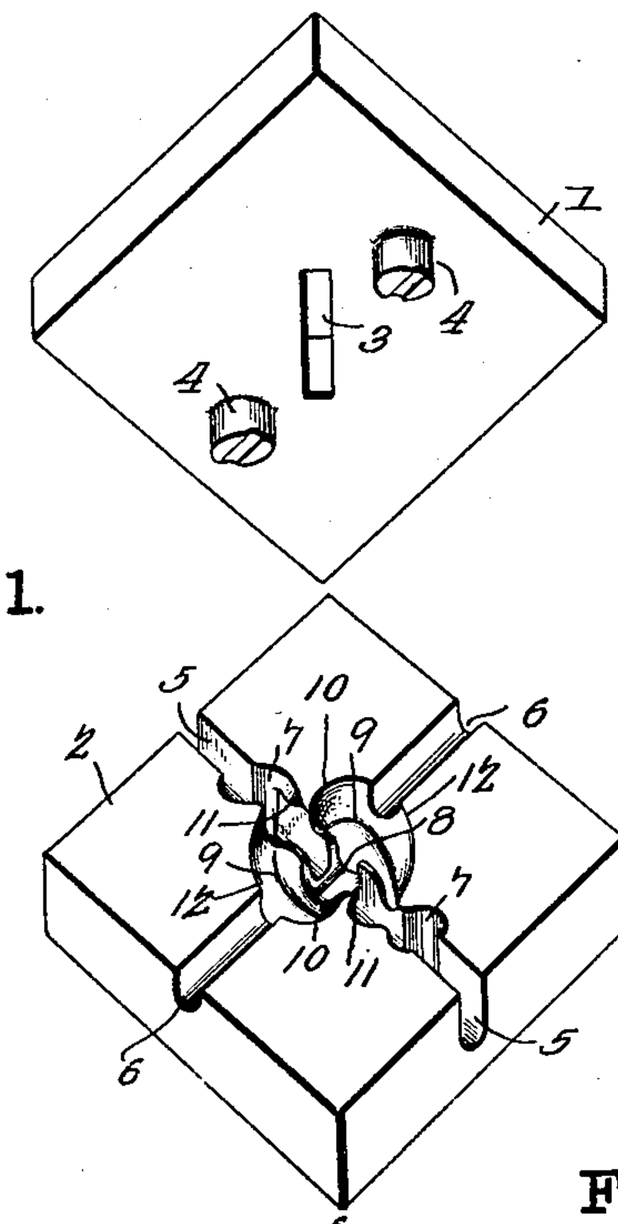


Fig. 2.

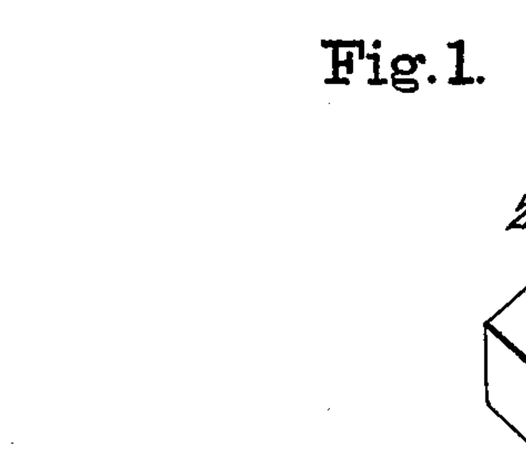


Fig. 3.

Fig. 6.

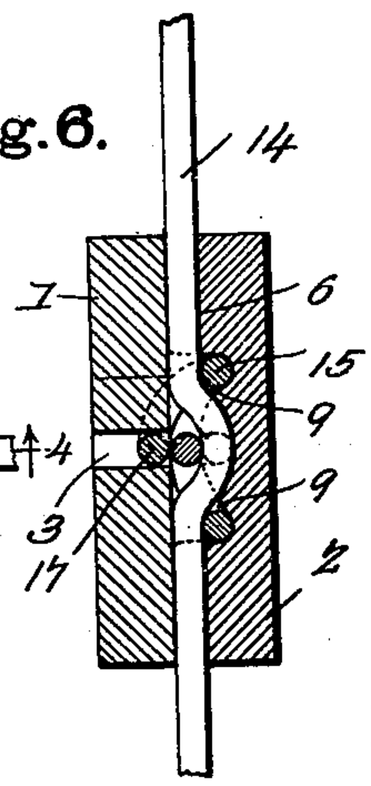


Fig. 7.

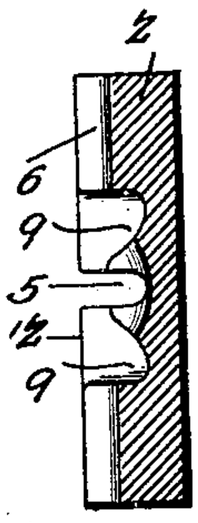


Fig. 8.

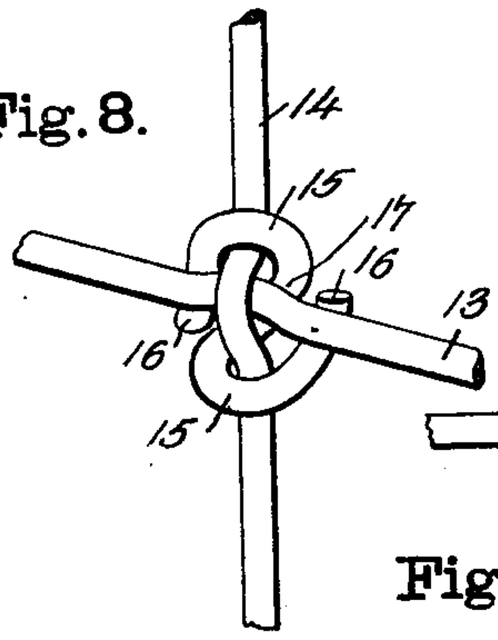


Fig. 4.

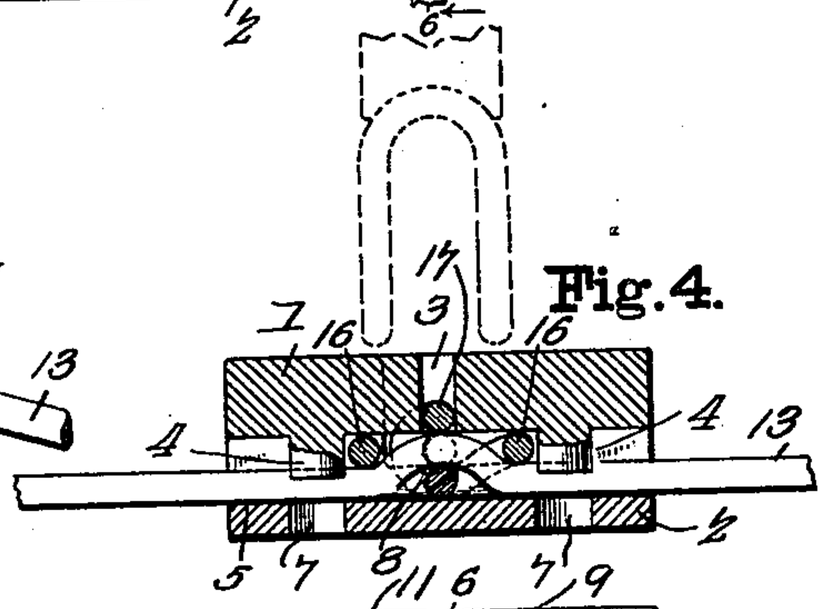
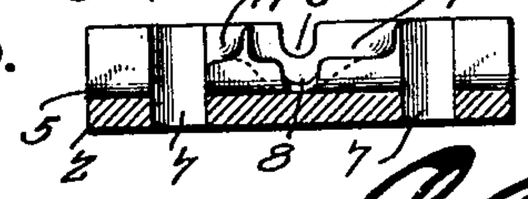


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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DIE FOR JOINING INTERSECTING FENCE-WIRES.

SPECIFICATION forming part of Letters Patent No. 678,955, dated July 23, 1901.

Application filed January 24, 1901. Serial No. 44,615. (No model.)

To all whom it may concern:

Be it known that I, VERNON HOXIE, a citizen of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented a new and useful Die for Joining Intersecting Fence-Wires, of which the following is a specification.

This invention relates to dies for interlocking the cross-wires of fence fabrics or for connecting other cross or angularly-disposed wires, and is designed particularly for the introduction into the die members, in a plane at right angles thereto, of a U-shaped wire-blank and threading the same around to the wires to be connected and simultaneously produce oppositely-extending interlocking kinks or deflections in the latter, to provide an effective bond by a simple operation, which can be rapidly carried on, and economize in the manufacture of fabrics composed of wire both in time and expense.

The invention primarily contemplates two coinciding die members, which are held by suitable means in single or plural arrangement in a machine, the one member having the tie-forming cavities exclusively located therein and the other provided with a feeding-slot for arrangement directly over the said cavities and with retaining devices for holding one of the cross-wires in place and causing the kink or deflection to be formed therein at the proper point without a forming-cavity therefor and over a depression-cavity below for producing the kink or deflection in the other wire.

The invention further consists in the use of two coinciding die members for holding and kinking or oppositely deflecting two crossed wires and forcing one of the latter downwardly in such manner as to clear the tie-forming cavities in the one die member to operatively receive a tie-blank in a plane at a right angle thereto and simultaneously direct both extremities thereof over and under different portions of the crossed wires in reverse positions, the said blank being of U-shaped or staple form having legs of equal length and the arched bend connecting the latter serving to provide one of the cross connecting members of the tie without requiring a cavity for the formation and diagonal disposition of the same.

The invention further consists in the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of the improved die members shown separated. Fig. 2 is a top plan view of the recessed die member. Fig. 3 is a view similar to Fig. 2 of the same device and showing the crossed wires and tie in position. Fig. 4 is a transverse vertical section of the complete device on the line 4 4, Fig. 3, showing the wires and tie in section. Fig. 5 is a view of the lower die member similar to Fig. 4 with the wires and tie removed. Fig. 6 is a section of the complete device on the line 6 6, Fig. 3, showing the wires and tie in section therein. Fig. 7 is a view of the lower die member similar to Fig. 6 with the wires removed. Fig. 8 is a detail perspective view of the joint produced by the improved dies.

Similar characters of reference are employed to indicate corresponding parts in the several views.

The numerals 1 and 2 designate the die members, which coincide when in use, the member 1 having an inner substantially smooth or non-recessed surface, and extending therethrough is a central diagonally-disposed feed-slot 3 and diametrically-disposed dowel pins or studs 4, two of the latter being employed and provided with transverse grooves in the free ends thereof. The member 2 is formed with diametric intersecting wire-holding grooves 5 and 6, extending completely across the same and opening outwardly through opposite sides, the groove 5 being considerably deeper than the groove 6, and projecting through the member 2, on opposite sides of the center thereof, and through the said groove 5 are seat-apertures 7 to receive the pins or studs 4, to thereby cause an accurate coincidence of the die members, the pins or studs being of such length that when they are fully inserted in the member 2 the bases of the grooves in the free ends thereof will be at a distance from the base of the groove 5 equal to the cross-sectional extent of the cross or other wire located in said latter groove, whereby the said cross or other wire will be held snugly within the member 2 on opposite sides of the interlocking por-

tion thereof with the other connected wire. In the center of the member 2 in longitudinal alinement with and below the plane of the opposite portions of the groove 6 is a kink or deflection forming cavity 8 for assisting in producing the kink or deflection in the wire that occupies the said groove 6. At the center of the member 2 and on opposite sides of the plane of the groove 5 tie-wire cavities 9 are formed in reverse relation to each other, and each cavity has an abrupt end wall 10, against which the terminal of one leg of a U-shaped tie-wire blank (shown in dotted lines by Fig. 4) is first fed, the two walls being at diagonally opposite points, and from each the cavity takes a concave inward trend toward and opens into the said groove 5, through one wall of the latter, and terminates in a recess 11 in the upper portion of the opposite wall of said groove, the said recesses being located outward from the end walls 10, to which they are adjacent. The end walls 10 are in operative alinement with the end walls of the feed-slot 3 when the two members are in coincidence, and from said end walls the cavities take a dip toward the center and then upwardly or outwardly, the outer wall 12 of each cavity being regularly curved to direct the extremities of the tie-blank inward to attain the required shape of the tie and set up a proper threading action of the said parts of the tie-blank in relation to the crossed wires. This shaping of the tie-wire blank is effectively carried on through the flat or smooth portions of the inner face of the member 1, lying or extending over the said cavities, and the tie extremities are thus worked down close to the crossed wires, and the cavities being on opposite sides of the point of the kink or deflection forming means for the cross-wires will dispose the parts of the tie in bearing relation on the said wires at the opposite terminals of the kinks or deflections and form a snug bond.

As shown by Fig. 4, the U-shaped tie-wire blank is fed into the coinciding die members 1 and 2 through the feed-slot 3 in the center of the member 1 and in a plane at a right angle to the face of the member 2, having the tie-wire former and wire-holding grooves therein. Previous to this feeding operation pertaining to the tie-wire blank the crossed wires 13 and 14 are placed in the grooves 5 and 6 of the member 2, and the member 1 is firmly closed thereagainst to primarily produce the kinks or deflections, as shown, and as the main portions of the cavities 9 are deeper than the groove 6 a distance equal to the cross-sectional extent of the wire used for the tie the inward feed of the extremities of the tie-blank by a suitable plunger will cause the free ends of said extremities to be forced under or in rear of the wire 14, and as the outlet portions of said cavities adjacent the recesses 11 are above or outward beyond the plane of the wire 13 in the groove 5 the extremities of the tie-wire blank will be forced over the outer portions of the said wire 13 and engage the recesses 11 when a full insertion of the tie-wire blank has been effected. After the tie-wire has been fully inserted and the tie completed the cross-wire 14 will be surrounded by opposite loops 15 and the wire 13 engaged by oppositely-directed extremities 16, extending across the same, the loops being connected by a diagonal member 17 across the plane of both kinks or deflections and establishing three points of bearing on the wire 13 and two on the wire 14. After the operation just set forth is complete the die members are separated and the connected wires removed.

Owing to the inner non-recessed face of the member 1, the tie when applied is caused to hug the cross-wires very close, and the joint is comparatively flat or without material projection, and though the cross-wires will be prevented from having longitudinal movement the lateral wire 13 will be permitted to have vertical or vibratory movement on the wire 14 above and below a horizontal plane to permit the fabric to be accommodated to unevenness in the ground surface or applicable to inclines without disturbing the upright position of the wires 14. The dies are simple in their construction, and the operation of introducing a tie-wire thereinto and threading the same around the cross-wires can be expeditiously carried on, and the expense of manufacture of fence fabrics or of connecting other cross-wires is materially reduced.

Such changes in the proportions, size, and minor details as fairly fall within the scope of the invention will be resorted to when found necessary.

Having thus described the invention, what is claimed as new is—

1. A die member for the purpose set forth having grooves for holding cross-wires and tie-forming cavities completely and exclusively located therein, and a second die member to coincide with the first and having an inner smooth face and projections to extend into said first-named die member.

2. A die member for the purpose set forth having means exclusively located therein for holding cross-wires and threading a tie-wire around the latter, and a second die member to coincide with the first and provided with a tie-wire-blank-feeding slot in the center thereof to deliver the said blank in a plane at a right angle to tie-wire-threading means in the first-named die member.

3. A die member for the purpose set forth having means for holding cross-wires and intersecting central tie-forming cavities exclusively located therein, and a second die member to coincide with the first provided with a central diagonally-disposed feed-slot to aline with opposite portions of the said cavities.

4. A die member having means for holding cross-wires and for threading a tie-wire exclusively located therein, and a second die

member having a slot therethrough for feeding a tie-wire blank in a plane at a right angle to the first-named member.

5. A die member for the purpose set forth having means for threading and shaping a tie-wire and grooves intersecting said means for receiving and holding cross-wires, one of said grooves being deeper than the other, and a second die member having projecting devices on the inner side at opposite sides of the center thereof to extend into the deeper groove in the first-named die member and hold one of the cross-wires, the said second die member also having means for feeding a tie-wire blank to the first-named die member.

6. A die member for the purpose set forth having means for receiving and holding cross-wires and tie-wire-forming cavities at the center, the said grooves and cavities being exclusively and completely located in the said member and the cavities reversely directed from beginning end walls inwardly toward one of the said grooves, and a second die member having an inner smooth face to close over the said grooves and cavities in the first-named die member and also provided with a diagonally-disposed central tie-wire-blank-feeding slot and projections to extend into one of the grooves.

7. Coinciding dies having means for holding cross-wires and for receiving and shaping a tie-wire exclusively located in one of said dies and a feeding-slot in the other, and means for feeding a U-shaped tie-wire blank through the said slot in a plane at a right angle to the face of the die having the tie-wire receiving and shaping means.

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

VERNON HOXIE.

Witnesses:

CLARKE E. BALDWIN,

JOHN F. WILCOX.