

**No. 628,986.**

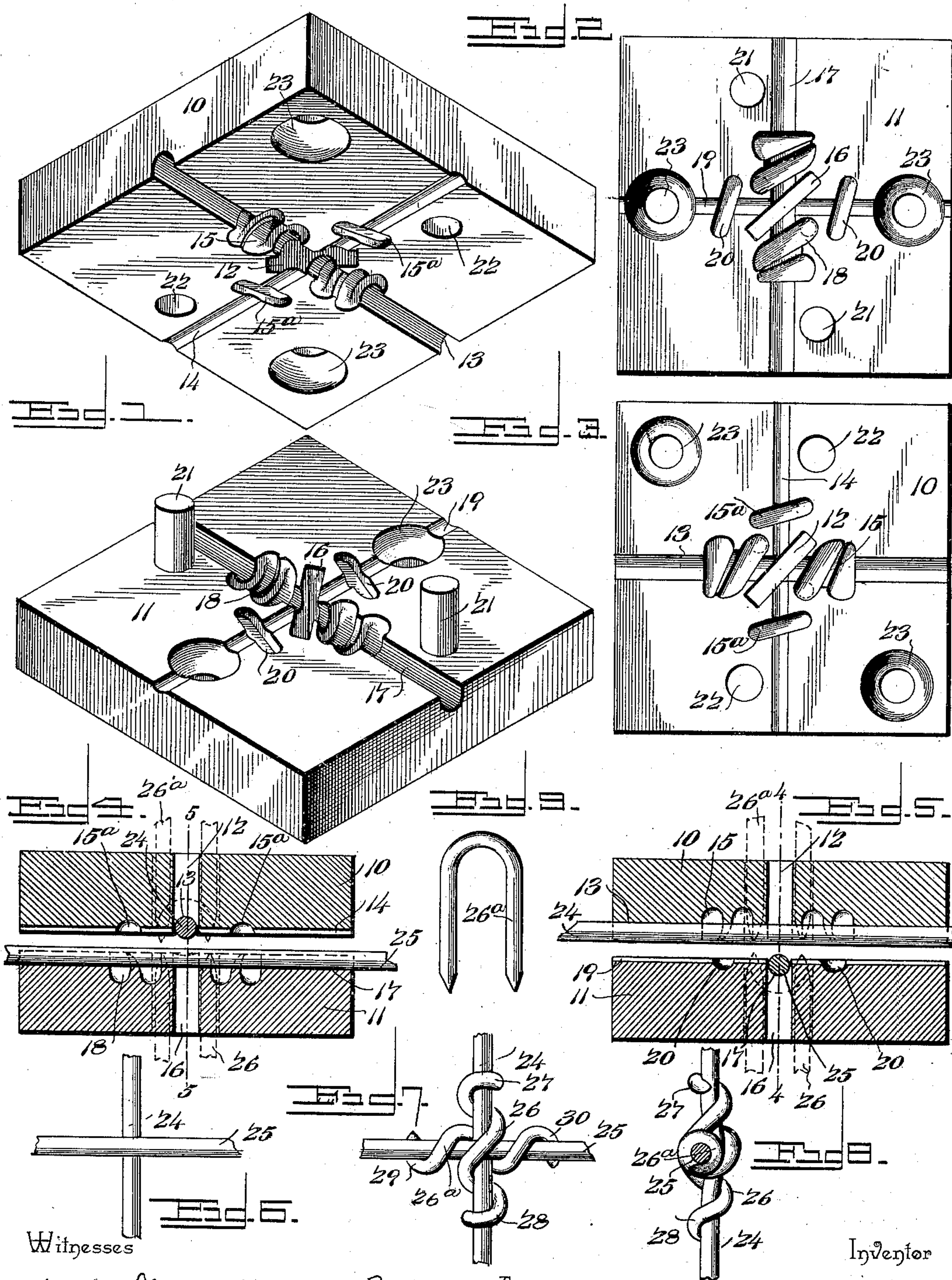
**Patented July 18, 1899.**

**H. R. LAMB.**

# DIE FOR JOINING INTERSECTING WIRES.

(Application filed Dec. 31, 1898.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

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## DIE FOR JOINING INTERSECTING WIRES.

SPECIFICATION forming part of Letters Patent No. 628,986, dated July 18, 1899.

Application filed December 31, 1898. Serial No. 700,783. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM R. LAMB, 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 Wires, of which the following is a specification.

This invention relates to dies for interlocking the crossing wires of a wire fabric intended, primarily, for fencing purposes, and it is designed more particularly as an improvement upon the device for joining intersecting wires patented to George M. Lamb and Hiram R. Lamb by United States Letters Patent No. 472,059, dated April 5, 1892.

The object of this invention is to facilitate the application of the locking-wires to the intersecting or crossing wires and to insure the firm union of the several wires at the joint, thereby saving time in the operation of joining the wires and effecting economy in the manufacture of the wire fabric by increasing the productive capacity and the speed of operation of the machine and turning out an increased quantity of fabric within a given period of time.

The improvement consists in coacting dies having feed-slots for the staple-like fasteners, arranged diagonally across the lines of the wire-receiving channels, the latter being provided in the working faces of the dies to have the deep wire-channel of one die cross the corresponding channel of the other die at right angles in order to properly position the wires in relation to each other and to the feed-slots for the staple-like fasteners and each die having semispiral grooves which extend in the general direction of the deep wire-receiving channel thereof, whereby the locking-fasteners may be fed simultaneously through the diagonal slots of both dies to be positioned thereby in oppositely-inclined directions across the joint between the crossed wires, and the semispiral groove of one die operates on the closing of the dies to twist the ends of the staple-like fastener fed by the other die around the wire which is contained in the said die that effects the twisting of the staple-fastener.

The invention further consists in the novel construction and arrangement of parts, which

will be hereinafter fully described and claimed.

To enable others to understand the invention, it is illustrated in the accompanying drawings, forming a part of this specification, 55 and in which—

Figure 1 is a perspective view of the coacting dies, showing one above the other and with the upper die turned out of position to illustrate its working face. Fig. 2 is a plan view of one die. Fig. 3 is a similar view of the other die. Fig. 4 is a vertical sectional elevation on the line 4 4 of Fig. 5, with the dies in registered positions. Fig. 5 is another sectional elevation on a plane at right angles to 65 Fig. 4 and indicated by the dotted line 5 5 thereon. Fig. 6 is a plan view of the crossed wires. Fig. 7 is a plan of the joint after the locking or fastening wires have been applied to the cross-wires shown by Fig. 6. Fig. 8 is 70 an edge elevation of the joint shown by Fig. 7. Fig. 9 is a detail view in elevation of one of the staple-like fasteners.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings. 75

The blocks of the coacting dies of the present invention are indicated by the numerals 10 and 11 in the drawings, and these die-blocks are mounted in a machine for movement toward and from each other simultaneously, or substantially so. The machine is not represented in the drawings because it may be made the subject-matter of a separate application, the present application being for the improvement of the dies constructed in a novel manner for the purpose of feeding and twisting the two staple-like fastening-wires simultaneously around the crossed wires, near the joint thereof. 85 90

The die-block 10 has a central diagonal feed-slot 12 formed therein to extend entirely through said block, and the working face of the block is provided with a deep wire-receiving channel 13, which extends entirely across 95 said working face at the middle portion of the block. The diagonal slot 12 lies in a plane which intersects with opposite corners of the die-block, and said slot lies at an angle across the wire-channel 13 to intersect 100



therewith at the center of the die-block. The working face of the die is furthermore provided with a shallow wire-channel 14, which extends at right angles to the deep channel 13, and said die is also provided with a semi-spiral twisting-groove 15, which extends in the general direction of the deep wire-channel 13. This semispiral groove 15 has its sections or lengths disposed on opposite sides of the diagonal feed-slot 12, and the respective sections are inclined in opposite and parallel directions to each other for the purpose of twisting the respective ends of one staple-like fastener, which is fed by the other die 11 in opposite directions around the same length of one of the intersecting wires, said oppositely-twisted ends of the staple-like fastener being disposed on opposite sides of the intersecting or crossing point of the two wires, as will hereinafter appear. Finally, the working face of the die-block 10 is provided with shallow recesses 15<sup>a</sup>, which lie obliquely to the axis of the deep wire-channel 13 and are disposed on opposite sides of the semispiral groove 15 and the diagonal feed-slot 12. The other die-block 11 is constructed in an analogous manner, and it is provided with a central diagonal feed-slot 16, the deep wire-channel 17, which intersects with the diagonal feed-slot, the semispiral groove 18, arranged to extend in the general direction of the channel 17, so as to intersect therewith, and having its respective sections which lie on opposite sides of the feed-slot 16 inclined in reverse and parallel directions to each other, the shallow wire-channel 19, lying at right angles to the deep channel 17 and intersecting therewith and with the feed-slot, and the shallow inclined recesses 20. The die 11, however, is arranged to present its working face in a position for its channels, grooves, and recesses to lie in planes at right angles to the planes of the channels, grooves, and recesses of the die-block 10, and proper registration of the two dies in relation to each other is insured by the provision of guide-pins 21, which are secured to one die-block and are adapted to fit in openings 22 in the other die-block, said pins and openings being disposed entirely out of the way of the depressions in the working faces of the dies. These die-blocks are also provided with transverse screw-holes 23, adapted for the reception of screws, which are designed to be countersunk within the working faces of the dies and which serve to rigidly fasten the dies to the moving elements of the machine for operation therewith.

In the working or operative position of the two die-blocks the guide-pins direct one die in such relation to the other die that the deep channel 13 crosses the deep channel 17 at right angles, and this channel 17 of one block coincides with the shallow channel 14 of the other block, while the deep channel 13 of the last-named block coincides with the channel 19 of the first-named block. The diagonal

slots 12 16 of the two blocks lie at right angles to each other, so that the feed-slots of the two blocks will present the staple-like fasteners in oppositely-inclined directions across the intersection or joint between the two wires which are contained within the deep channels 13 17 of the blocks. The semispiral grooves in the working faces of the blocks will lie at right angles to each other and in positions to receive the ends of the staple-like fasteners, which are fed in opposite directions through the diagonal slots of the two blocks, and the shallow recesses 15<sup>a</sup> of the die-block 10 will be presented opposite to certain portions of the semispiral groove 18 in the die-block 11, while the inclined recesses 20 in said die-block 11 are coincident with certain portions of the semispiral groove 15 in the die-block 10. Assuming that the dies are in proper registration and the machine in which the dies are mounted is in operation, the wire fabric is advanced to present one wire 24 in the deep channel 13 of the die-block 10 and another wire 25 in the deep channel 17 of the other die 11. Staple-like fasteners 26<sup>a</sup> 26 are passed in opposite directions through the diagonal feed-slots 12 16 of the dies 10 11, respectively, so that the staple-fasteners will lie at right angles to each other and diagonally across the intersection or joint between the crossed wires 24 25. The staple-fastener 26<sup>a</sup> has its ends presented to the oppositely-inclined sections of the semispiral groove 18 in the die 11; but the other staple-fastener 26, which is contained in the die 11, is in a position for its ends to be presented to the semispiral groove 15 of the die 10. (See Figs. 4 and 5.) As the dies are advanced or brought together the ends of the staple-fastener 26 of the die-block 11 are received within the ends of the semispiral groove 15 of the die-block 10, while the ends of the staple-fastener 26<sup>a</sup> in the die-block 10 are received within the ends of the semispiral groove 18 of the die-block 11. The dies lock or hold the two crossed wires in their proper relative positions, and they guide or direct the staples to proper positions diagonally across the intersection of the wires. The staples are forced into the grooved dies by a plunger or plungers, which enter the diagonal slots on an angle at the crossing-point of the intersecting wires, and these plungers carry the staples with them. The grooves 15 18 of the two die-blocks deflect or turn the wires 26 26<sup>a</sup> around the crossed wires 24 25, and each staple-like fastener has its ends twisted in opposite directions around its proper wire. The fastener-wire 26 has its ends 27 28 twisted in opposite directions around the wire 24 on opposite sides of the crossing or intersecting point of the wires 24 25, while the other staple-like fastener 26<sup>a</sup> has its ends 29 30-twisted in opposite directions around the wire 25 on opposite sides of the intersection of said wires 24 25.

From the foregoing description, taken in



connection with the drawings, it will be seen that the dies are constructed for the simultaneous feeding and proper positioning of the two staple-like fasteners, which, after the dies are closed or brought together, are bent or twisted around the crossed wires on opposite sides of the intersection thereof by means of plungers forced from opposite directions, thus providing at one operation for the secure union of the crossed wires by the two staple-like fasteners.

Changes may be made in the form of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence it is not desired to limit the invention to the precise form of all the parts as shown, reserving the right to vary therefrom.

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

1. Coacting dies for joining intersecting wires having diagonal feed-slots intersecting wire-receiving channels and arranged for the feed-slot and channel of one die to lie in planes at right angles to the feed-slot and channel, respectively, of the other die, each die having twist-forming grooves, whereby locking-wires may be fed through both dies, substantially as described.

2. Coacting dies for joining intersecting wires each having a diagonal feed-slot, a wire-channel which intersects the feed-slot, and a semispiral groove extending in the general direction of the wire-channel and intersecting therewith, one of the dies arranged to present its several parts at right angles to the plane of the corresponding parts in the companion die, substantially as described.

3. Coacting dies for joining intersecting wires each having a diagonal central feed-slot, a wire-channel intersecting with the feed-slot, and the semispiral groove intersecting with the wire-channel and having its parts or sections on opposite sides of the feed-slot inclined in reverse directions, one die arranged to present its parts at right angles to the plane of the corresponding parts in the companion die, substantially as described.

4. Coacting dies for joining intersecting wires each having the semispiral twisting groove intersecting with a wire-channel and the oblique recesses on opposite sides of such twisting-channel, and means to insure registration of the companion dies for the shallow recesses in each die to register with certain portions of the twisting-groove in the other die, substantially as described.

5. Coacting dies for joining intersecting wires each having a diagonal feed-slot, the deep and shallow wire-channels intersecting

with the diagonal slot at right angles to each other and the semispiral twisting-groove intersecting with the deep wire-channel, combined with guide devices to insure registration of the companion dies for the shallow channels of each die to coincide with the deep channel of the other die and for the feed-slot and deep channel of each die to lie in planes at right angles to the corresponding parts of the other die, substantially as described.

6. Coacting dies for joining intersecting wires, each die provided with a wire-channel, a feed-slot across said channel, and means for twisting a fastener for the intersecting wire, combined with guide devices by which the dies are brought into registration for the channel and twisting means of one die to cross the channel and twisting means of the companion die, the feed-slots of the two dies being in reversed positions, substantially as described.

7. Coacting dies for joining intersecting wires, comprising a lower die having in the upper face thereof oblong grooves or channels placed some distance apart and provided with rounded bottoms, the upper die having oblong grooves or channels in its under face and arranged to register with the grooves of the lower die, and each die provided with a transverse feed-slot which intersects with the twisting grooves or channels therein.

8. Coacting dies for joining intersecting wires comprising a lower die having a groove therein and transverse channels crossing its face at right angles, the upper die having a groove in its under face and transverse channels crossing its under face and said groove at right angles, said groove in the die being formed to twist a fastener, one of said dies having a slot which intersects with the groove therein.

9. Coacting dies for joining intersecting wires, consisting of the opposed dies having in their meeting faces right-angled channels adapted to register one with the other, one of said channels in the face of each die being of lesser depth than the other channel, whereby said dies are adapted to embrace and crimp cross-wires lying between them at their point of crossing, said dies having recesses in their opposing faces through which said channels pass adapted to receive and direct a fastener around said wires.

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

HIRAM R. LAMB.

Witnesses:

G. M. LAMB,

W. H. BURNHAM.