

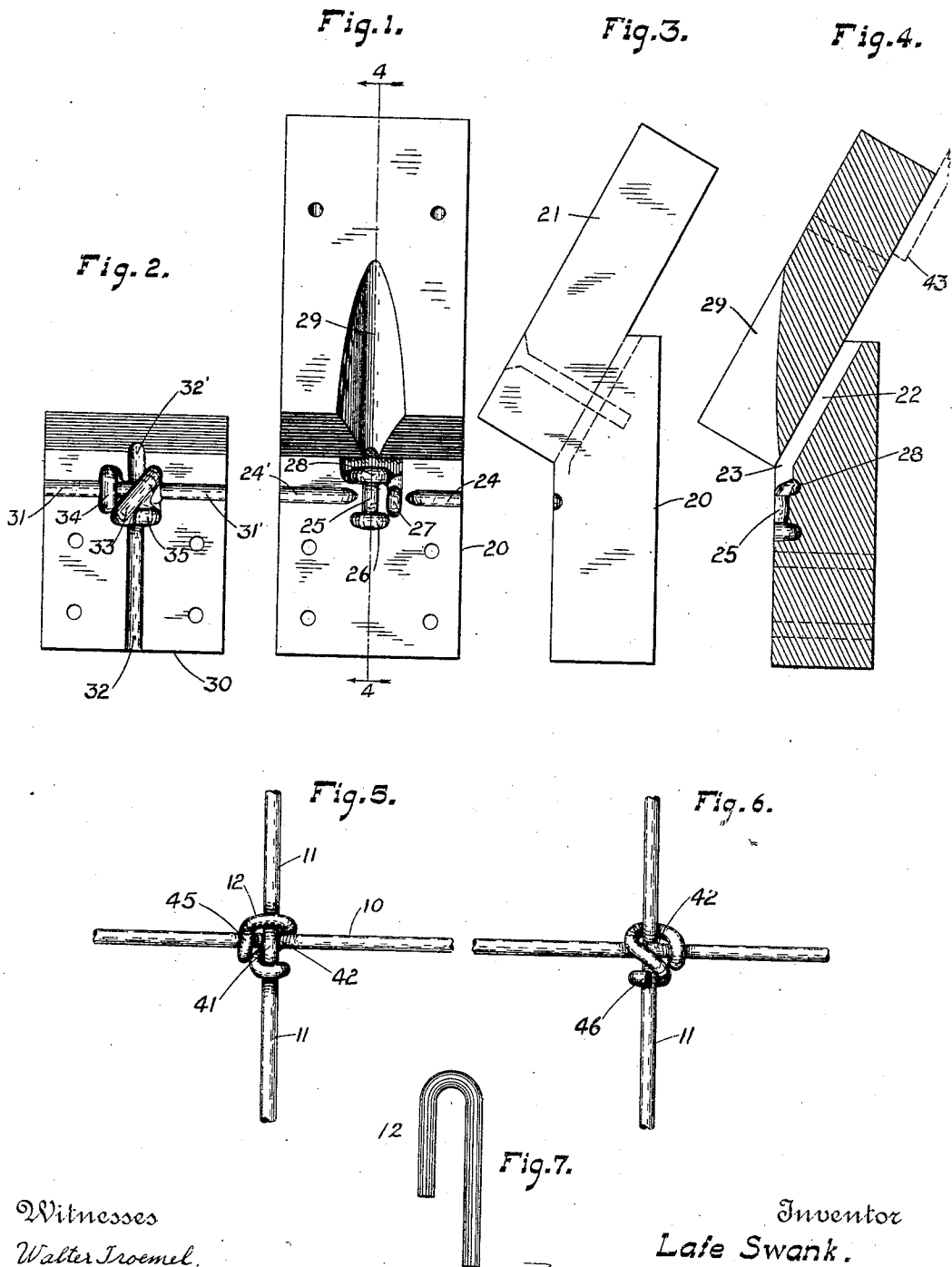
L. SWANK.

DIE.

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Patented Nov. 16, 1909.



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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, LAFE SWANK, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Dies, of which the following is a specification.

The object of my invention is to produce a die by means of which a tying staple may be applied to the crossing wires of a wire fabric in such manner that its middle will straddle one of the wires and one leg will pass thence under the other wire and around the same so as to embrace it, while the other leg will pass diagonally across the crossing wires at their intersection and thence be wrapped around the initial wire so as to embrace the same.

The accompanying drawings illustrate my invention.

Figure 1 is a plan of a face of one of the die members; Fig. 2 a plan of the face of the cooperating die member; Fig. 3 a side elevation of the die member, shown in Fig. 1; Fig. 4 a section on line 4—4 of Fig. 1; Fig. 5 an elevation of one face of the completed tie; Fig. 6 an elevation of the opposite face of the completed tie, and Fig. 7 an elevation of the tying staple in its initial condition.

In the drawings, 20 indicates one die member having a rigid extension 21 which lies at an angle to the main portion of the die 20 and may be either formed integrally therewith or separate therefrom and firmly secured thereto by any suitable means; it being preferable to form the two parts separately in order to facilitate the formation of a staple-receiving passage 22 which extends diagonally through the die member, and enters the staple forming face thereof at 23.

For the sake of ease of description, I shall call the wire 10 of the fabric the running wire, and the wire 11, which crosses wire 10, the stay wire, although it is to be understood that wire 10 might just as well be the stay wire and wire 11 the running wire. Formed in the face of die 20 are two aligned grooves 24 and 24' which, at their outer ends, have a depth substantially equal to half the diameter of the running wire 10 and at their inner separated ends are shallowed so as to disappear at the face of the die. Formed in the face of die 20 between

the inner ends of grooves 24 and 24' and closely adjacent the disappearing end of groove 24', is a groove 25, which lies at right angles to the line of grooves 24 and 24' with a depth below the face of the die substantially equal to the diameter of the stay wire 11. At the lower end of groove 25 I form a transversely extending groove 26 which has a depth, below the bottom of groove 25, equal to the diameter of the tie wire 12, the opposite ends of groove 26 disappearing at the face of the die. Formed alongside of groove 25 and substantially parallel therewith between said groove 25 and the inner end of groove 24, is a groove 27 the lower end of which disappears at the face of the die while the opposite end merges into the inner end 23 of the staple receiving channel 22. Formed in the bottom of the inner end 23 of channel 22, and extending transversely across the adjacent end of groove 25, is a shallow groove 28 which is deeper at its middle than at its ends. Formed in the corner of die portion 21, in alinement with groove 25, is a deep groove 29, the bottom of which is nearly parallel with the face of die 20 but, at its inner end, is depressed so as to be directed downwardly toward the adjacent end of groove 25.

The mating die member 30, which mates with the die portion 20, has formed in its face a pair of aligned grooves 31 and 31' which are adapted to register with grooves 24 and 24' respectively, and at their inner separated ends these grooves are slightly deepened, the outer ends having a depth substantially equal to half the diameter of the running wire 10 while the inner ends have a depth nearly equal to the full diameter of the running wire. Also formed in the face of die 30 are two aligned grooves 32 and 32' which lie at right angles to grooves 31 and 31', groove 32' at its outer end having a depth nearly equal to the diameter of the stay wire 11 and registering with the inner end of groove 29. The groove 32 has a depth at its outer end equal to the diameter of stay wire 11 and this depth is slightly decreased toward the inner end. Extending diagonally across the grooves already mentioned, in the face of die 30, at the point of intersection of said several grooves, is a deep groove 33 which, at its middle, lies below the face of the die an amount equal to the

diameter of the running wire plus the diameter of the tie wire. One end of groove 33 registers with the left hand end of groove 28 (Fig. 1) while the opposite end of groove 33 registers with the right hand end of groove 26. Formed at the inner end of groove 31 transversely thereof, is a groove 34 the length of which is substantially equal to the diameter of the running wire plus twice the diameter of the tie wire and at its middle has a depth equal to the diameter of the tie wire below the running wire. This groove 34 registers with groove 27. Also formed in die 20, is a groove 35 which lies substantially at right angles to groove 32 between said groove and groove 33. The right hand end of groove 35 (Fig. 2) begins at the surface of the die and is adapted to register with the left hand end of groove 26 of die 20 (Fig. 1) while the left hand end of groove 35 merges into the adjacent end of groove 33 and lies beneath the surface of the die at a depth equal to the diameter of the tie wire below the stay wire.

In operation, the stay wire and running wire will be brought into conjunction with the die 20 so that the running wire will be in register with grooves 24, 24' and the stay wire will be in register with grooves 25 and 29. Thereupon die member 30 is forced onto die 20 and its grooves 32, 32' engage the stay wire while its grooves 31, 31' engage the running wire, thereby forcing the stay wire down into groove 25 so as to form the kink 41 in the stay wire; and forcing the running wire transversely between the ends of grooves 31 and 31' so as to form the kink 42 in the running wire. Thereupon the staple 12 is placed in channel 22 and driven inwardly therethrough by means of a plunger 43 of well known form. The legs of the tying staple 12 straddle the stay wire 11, one end entering the right hand end of groove 33 (Fig. 2) while the other enters the upper end of groove 34. As the staple is forced inward through channel 22 one leg of the staple is driven into groove 34 and by it caused to curl around and embrace the running wire 10, and the tip 45 of said leg entering groove 27 and being thereby clamped tightly upon the running wire. The opposite leg of the tie wire is deflected by groove

33 diagonally across and over the wires 10 and 11 at their point of intersection and thence deflected by the groove 33 toward the face of die 30 and thence into groove 26 by which it is deflected squarely across stay wire 11 and its tip 46 caused to enter groove 35 and be by it turned backward upon the stay wire 11 so as to firmly embrace the same.

I claim as my invention:—

A die comprising two mating members, one of which has formed in its mating face a pair of alined semi-cylindrical grooves 31 and 31', a pair of alined semi-cylindrical grooves 32 and 32' in substantially the same plane as grooves 31 and 31', and lying at an angle thereto and intersecting the same, a groove 33 lying diagonally relative to the lines of the previously mentioned two pairs of grooves and of a depth exceeding the depth of said grooves, a groove 34 lying substantially at right angles to groove 31 and crossing the same and of a depth exceeding the depth of said groove 31, and a groove 35 lying substantially at right angles to groove 32 and crossing the same and merging into one end of groove 33 and of a depth exceeding the depth of groove 32; and the other of which mating members has formed in its mating face a pair of separated semi-cylindrical alined grooves 24 and 24' adapted to register with the grooves 31 and 31' respectively, a groove 25 lying substantially at right angles to the line of grooves 24 and 24' and crossing the same, two grooves 26 and 28 substantially parallel with the line of grooves 24 and 24' and arranged one at each end of groove 25, and a groove 27 substantially parallel with groove 25 and extending across the line of grooves 24 and 24' and lying between groove 25 and the adjacent end of groove 24; said member having also formed therethrough a plunger slot 22 which at its inner end merges into groove 28.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this fifth day of January, A. D. one thousand nine hundred and nine.

LAFE SWANK. [L. s.]

Witnesses:

ARTHUR M. HOOD,
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