No. 721,434. PATENTED FEB. 24, 1903.

A. N. EDEBURN.

TOOL FOR FASTENING WIRE TIES.

APPLICATION FILED APR. 21, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

FIG. 1.

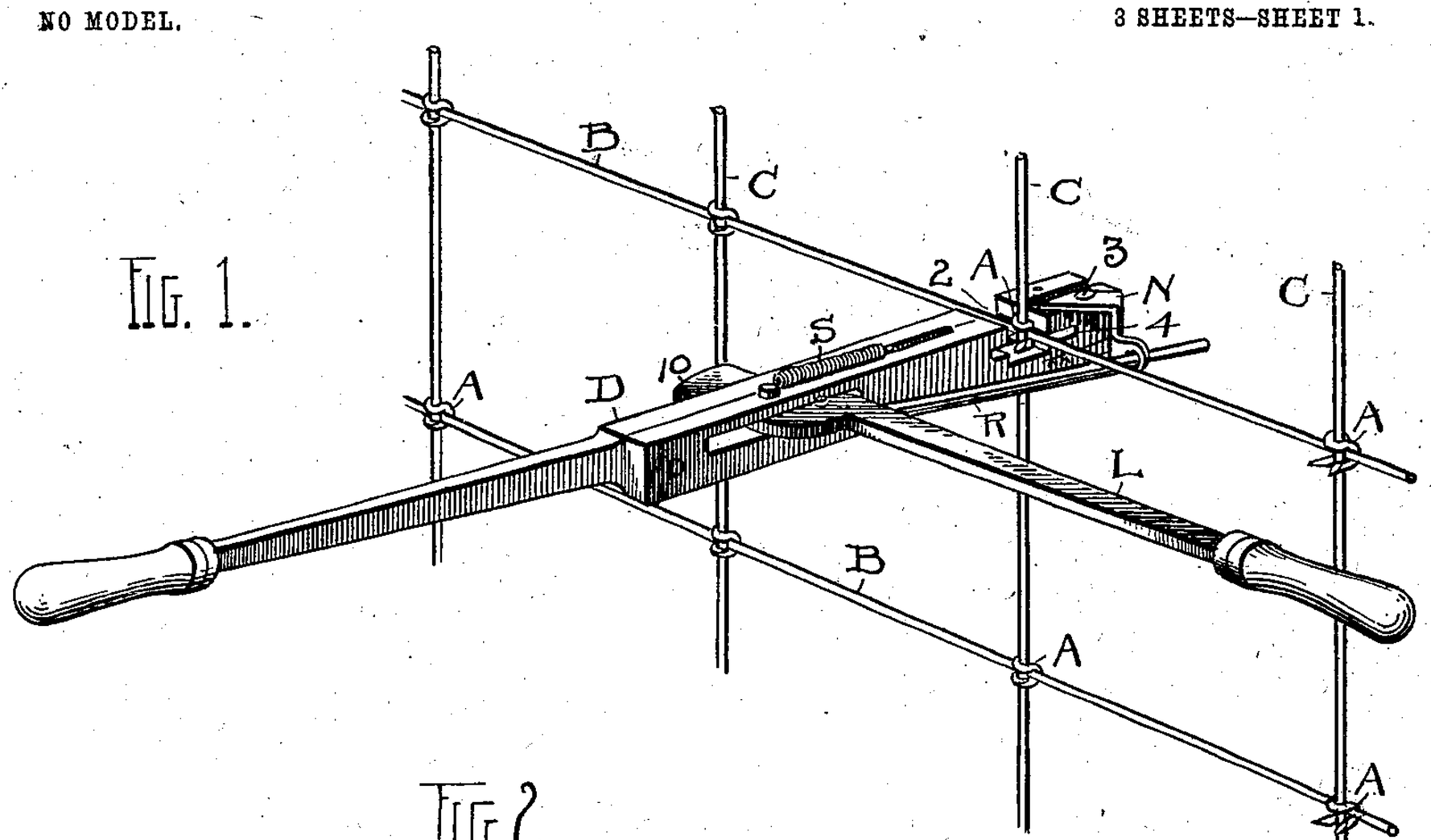

FIG. 2.

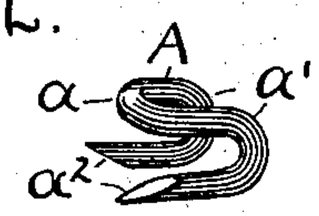

FIG. 3.

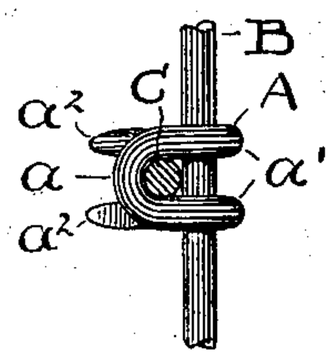

FIG. 4.

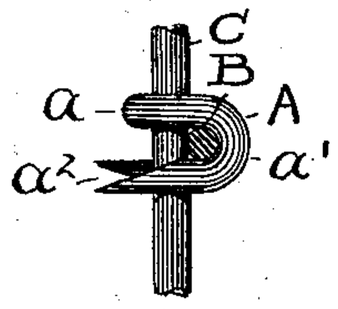

FIG. 5.

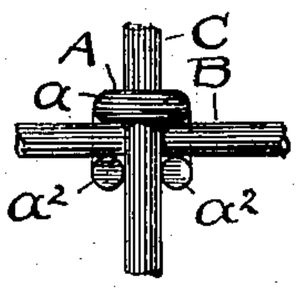

FIG. 6.

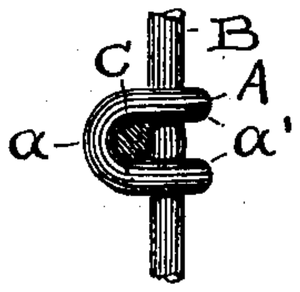

FIG. 7.

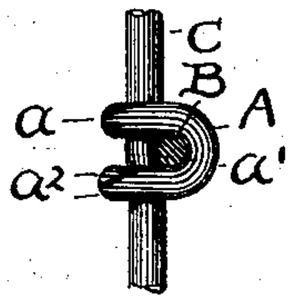

FIG. 8.

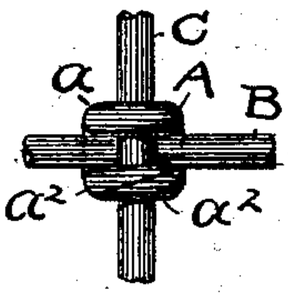

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FIG. 9.

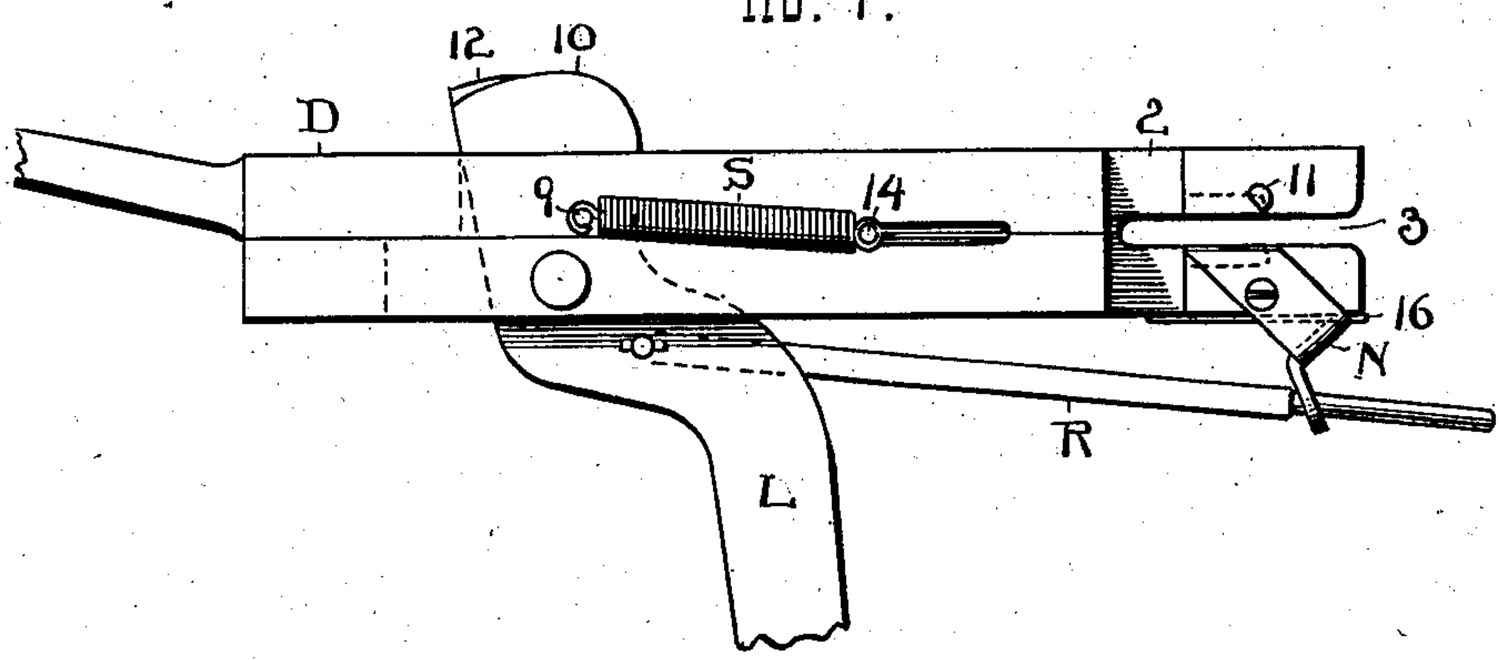


FIG. 10.

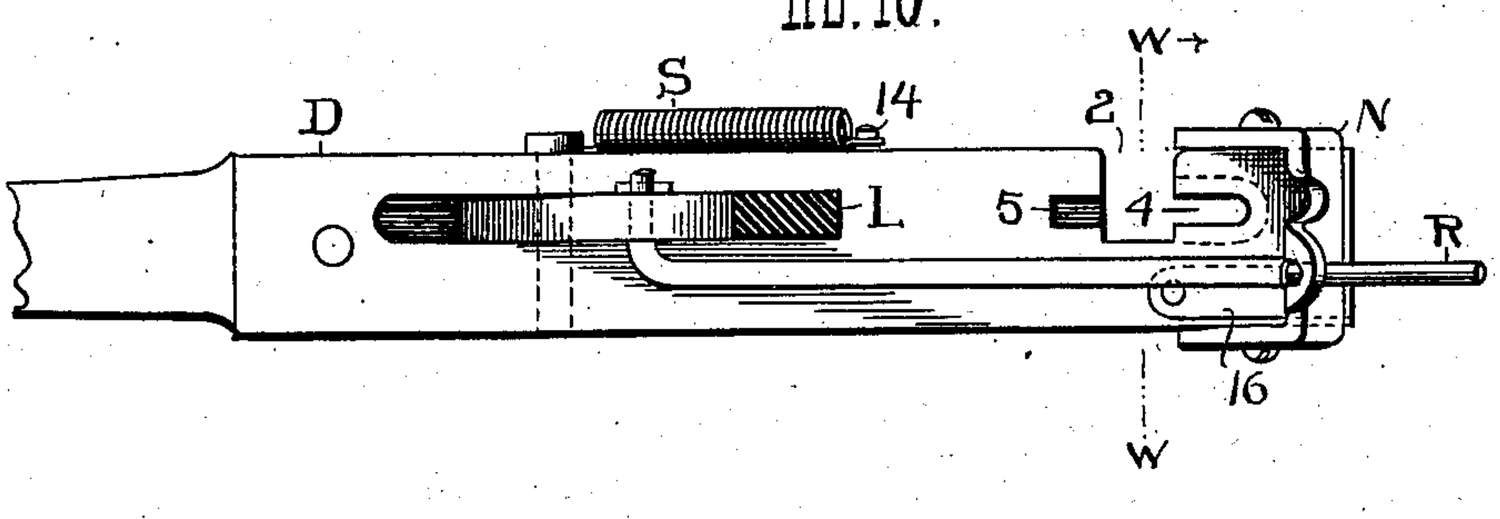


FIG. 11.

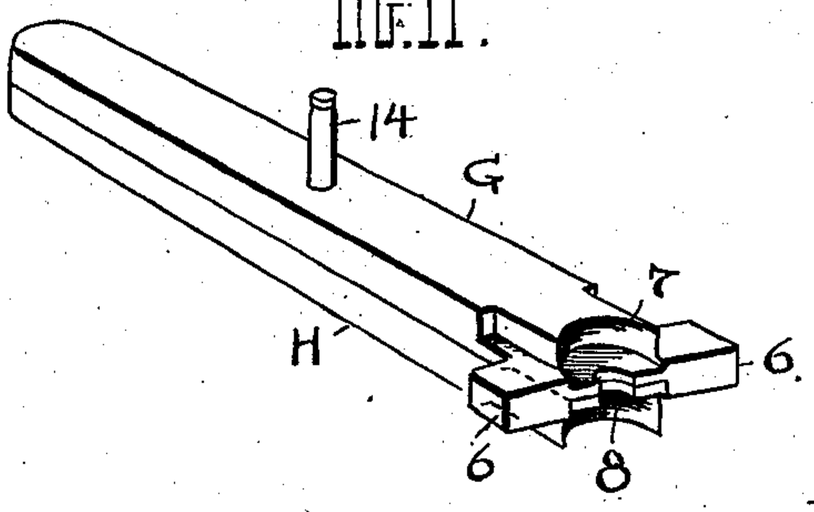


FIG. 12.

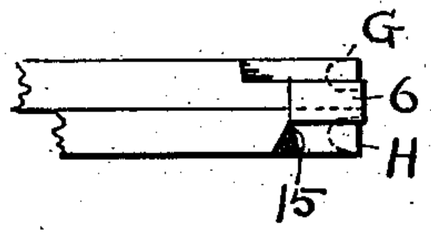
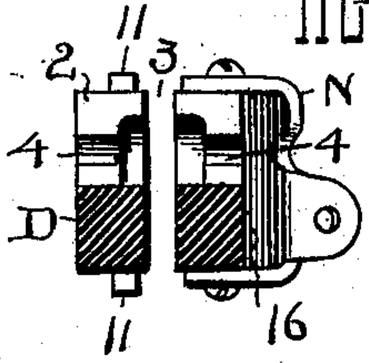


FIG. 13.



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TOOL FOR FASTENING WIRE TIES.

APPLICATION FILED APR. 21, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

FIG. 14.

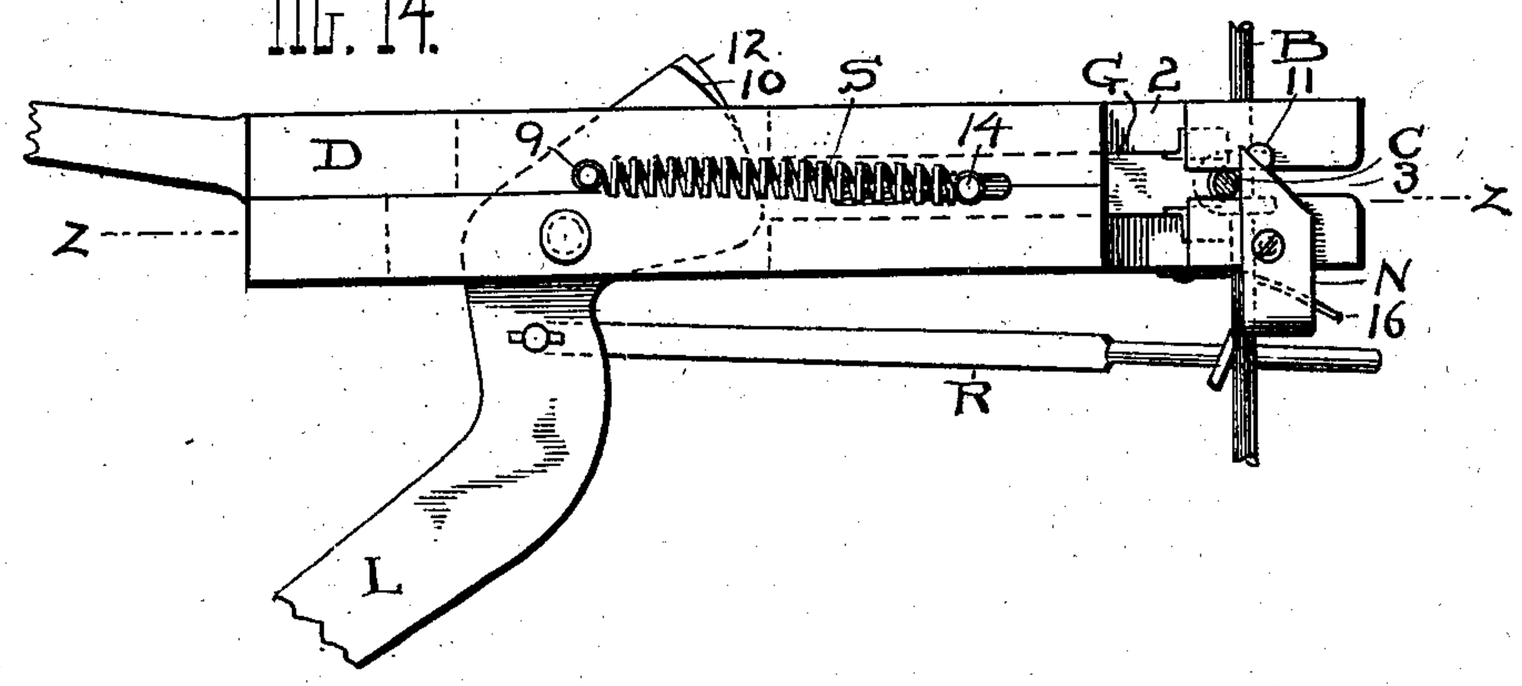


FIG. 15.

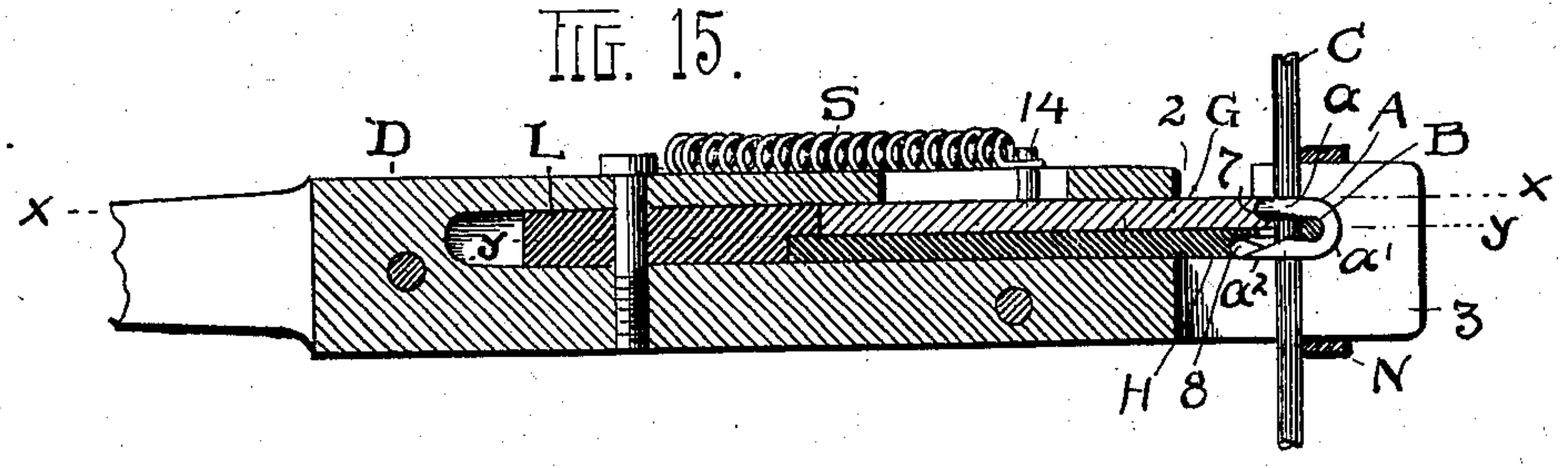


FIG. 16.

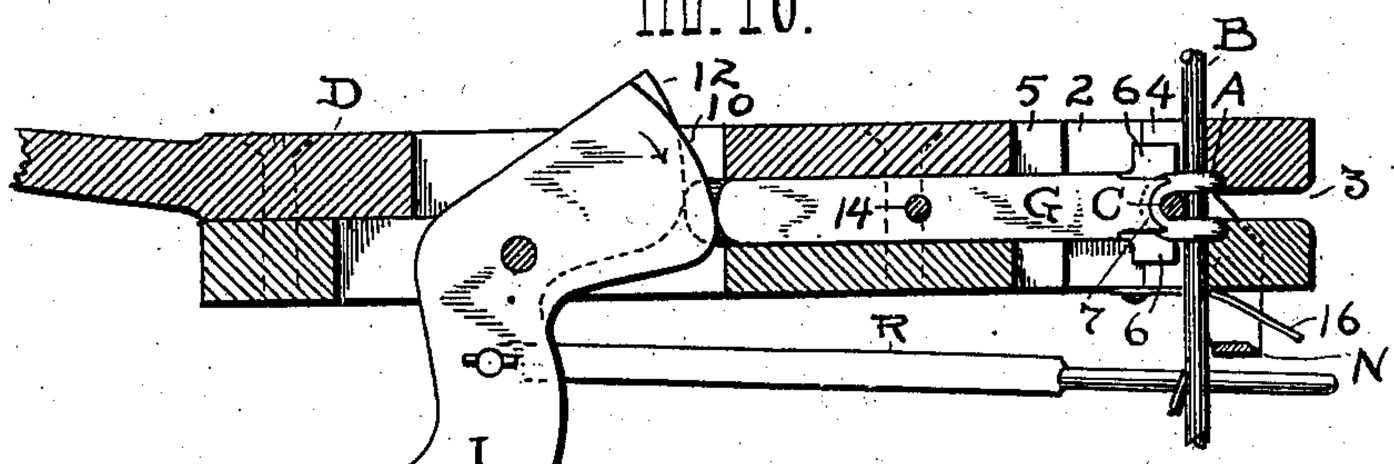
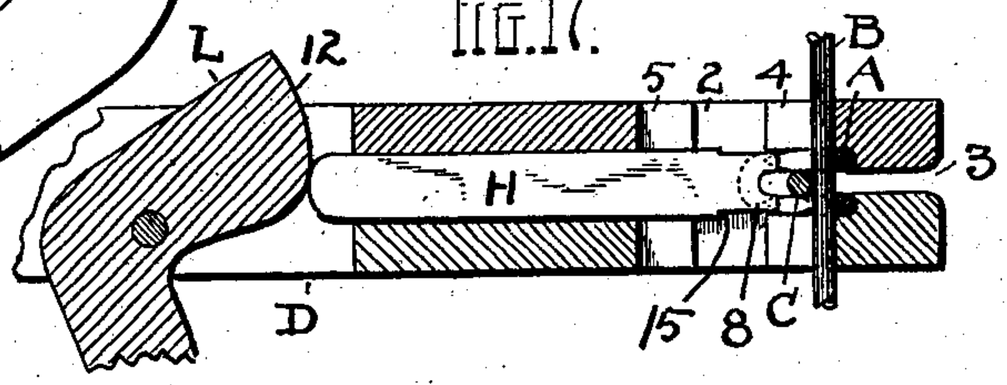


FIG. 17.



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BY H. T. Fisher ATTY

UNITED STATES PATENT OFFICE.

ALFRED N. EDEBURN, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO H. H. HODELL, OF CLEVELAND, OHIO.

TOOL FOR FASTENING WIRE TIES.

SPECIFICATION forming part of Letters Patent No. 721,434, dated February 24, 1903.

Application filed April 21, 1902. Serial No. 103,905. (No model.)

To all whom it may concern:

Be it known that I, ALFRED N. EDEBURN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tools for Fastening Wire Ties; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to tools for fastening wire ties; and the invention consists in a tool constructed especially to fasten or clamp the style of tie shown herein and hereinafter more fully described.

Figure 1 is a perspective elevation of a section of wire fence, showing a series of intersecting wires secured together by my improved tie and in which the ties at the left have been fastened by the fastening-tool, which is also shown in perspective view thereon, while the ties at the extreme right of the fence are ready to be fastened. Fig. 2 is a perspective view of the tie in the form it is sold to the consumer and placed on the fence, as seen in Fig. 1 and Figs. 3 to 8, inclusive. Figs. 3 to 8, inclusive, show intersecting wires and my new improved tie thereon. In Figs. 3, 4, and 5 the tie is seen from three different points of view, but only as placed on the fence by hand and left to be fastened. Figs. 6, 7, and 8 show the tie in corresponding views to Figs. 3, 4, and 5 and as it appears after it has been fastened. Fig. 9 is a plan view of my improved tool in open relation, and Fig. 10 is a side elevation thereof and likewise open. Fig. 11 is a perspective view of the plunger jaws or dies, and Fig. 12 is a side view of the front end of said plunger. Fig. 13 is a cross-section of the device on line $w\ w$, Fig. 10. Fig. 14 is a plan view corresponding to Fig. 9, but with the plunger-jaws partially closed; and Fig. 15 is a longitudinal sectional elevation on lines $z\ z$, Fig. 14, showing the relations of parts in acting position upon the tie. Fig. 16 is a plan view on line $x\ x$, Fig. 15; and Fig. 17 is a plan view on line $y\ y$, Fig. 15.

The invention as thus shown is to be understood as being confined to the tool itself, and the construction of the tool is of course such as adapts it particularly to the style of wire tie shown in the drawings.

As thus shown, the tie A is fashioned out of a piece of wire, with two substantially U-shaped portions or bends a and a' at right angles to each other and spaced apart just wide enough to receive one of the wires of the fence. The extremities of the wire a^2 are preferably beveled and projected in parallel vertical and horizontal lines and in a plane with the bend a. The bend a' is practically double, there being two bends in the tie in the continuance of the wire from the bend a. It will be seen that according to this construction of tie and as it further appears upon the wires B and C in Figs. 3, 4, and 5 when in the position shown in a fence and at the right, Fig. 1, the wires and the tie also are inseparably connected, although not yet clamped—that is, the tie cannot be removed and nothing can separate the wires unless they be withdrawn endwise. This leaves nothing to be done by the tool but to bend and clamp the extremities a^2 of the wire, Figs. 7 and 8, and in which operation the bending or clamping of the tie is accomplished with such force that the wires themselves, and especially the vertical wire, are more or less bent at the point of union, thus interlocking them and making the tie most effectual for all purposes. Included in this clamping or fastening operation there is therefore not only the bending of the extremities a^2 together, but also the forcing together of all portions of the tie and the intersecting wires to the form seen in Figs. 6, 7, and 8, and wherein all slack has been taken up by the extremities a^2.

Now referring to the tool itself it will be seen that it comprises, first of all, a single-handled body portion D, which may be built of several pieces or wholly in a single piece; but for convenience in manufacturing it is constructed in two or more pieces, which are united by screws or otherwise to fasten them firmly together. As thus shown, the said body is seen to have several individual features, comprising a horizontal recess 2, about half its depth from the top downward, and a central vertical slot 3, traversing said recess from the outer end of the body and adapted to receive

the vertical wire of the fence, Fig. 1, the wire being entered with the tool below the tie and the tool then being raised to bring the tie into recess 2, as shown, or, for that matter, the tool might be reversed; but then the tie should be in reversed position also, or the tie might be placed so as to work with the line-wire in slot 3, and thus go from joint to joint horizontally of the fence instead of following one of the tie-wires up and down. This would require a quarter-turn of the tool; but for the purpose of this description the tool will be regarded as working as here shown. At the base of recess 2 there is a side slot 4, adapted to receive the line-wire, and an opposite slot 5 receives the head of plunger G, which has wings 6, adapted to enter between the sides of the tie and bear against the line-wire directly at the sides of the vertical wire, Fig. 16.

The fixed jaw of the tool in the front end of body D is made to conform to the shape of the tie in the angle of slots 3 and 4, Figs. 15 and 16, and is recessed on curved lines on each side of slot 3 just deep enough to accommodate one side or bend of the tie from the middle of bend a to the extremities a^2.

Assuming now that the tool has been entered for work, as in Fig. 1, with the unclenched tie in recess 2, the next operation is to clamp the tie in place. This is done by holding the tool with one hand and operating lever L with the other. This lever actuates two plungers G and H successively. Plunger G acts first and bears against middle bend a, crowding the stock therein and the vertical wire against which it presses inward with great power upon line-wire B. Then as said plunger has done this work the plunger H below comes into action and completes the clamping. Plunger G has a cavity 7, conforming to bend a, and wings 6, which bear against the line-wire in slot 4 at each side of vertical wire C. Plunger H lies directly beneath plunger G, Fig. 15, and has a semicircular recess or cavity 8 closed across its top by a lip and serving as a shaping and clamping space for the beveled ends a^2 of the tie. These ends being small and thin at their points are easily deflected inward toward each other on the sides of said cavity as the plunger closes, and what is thus definitely begun must also be brought to a finish on the same lines as lever L is drawn back to the end of its stroke. Thus the ends a^2 are bent and clamped and the tie is forcibly locked on the wires. Practically, therefore, the device comprises a fixed jaw in the head of part D and a movable jaw comprising the plungers G and H. These practically constitute one jaw and are so regarded, though they are separate parts, and their action is practically simultaneous, although successive in time. Now in order to operate the said plungers I employ the single lever L, which has two cam-surfaces 10 and 12 at its end, the surface 10 engaging plunger G and surface 12 engaging plunger H, and one plunger is slidable on the other, and the two are confined together within the body of the tool. When lever L is reversed after an action, the plungers are withdrawn by spring S, which is engaged at 9 to body D and at the other end to pin 14 on the plunger G, projecting through a slot in the tool-body. Lip 15 on the lower plunger comes against projection 6 on the upper plunger, and thus the lower plunger is drawn back also with the upper one. As the wires and tie engage snugly in the fixed jaw of the tool after being locked together, it is necessary that some means be provided to dislodge them, and to this end I employ a releasing mechanism, consisting in this instance of a so-called "yoke" N, pivoted at its sides on body D and so arranged as to be open, Fig. 9, when the tool is open and to close behind the wire that comes in slot 3 when the parts are more or less closed, Fig. 14, pins 11 serving as stops to its rearward movement. A push-rod R, connected with lever L, engages said yoke to open it, and the yoke might also be closed from this lever; but as it is here shown a spring 16 tilts it back to closed or closing position when pressure by rod R is withdrawn, and then the vertical wire bears against it, Fig. 14.

Obviously some or all of the details of the construction thus shown and described may be substituted by equivalent constructions and parts and keep within my invention, and such changes are understood to be within the scope of my invention and claims.

Respecting cam-surfaces 10 and 12, operating on plungers G and H, respectively, it will be seen that cam 10 comes into operation first and drives plunger G forward its full depth practically before cam 12 begins to work and that cam 12 completes its work with the end of stroke of lever L, while cam 10 completes its work on about the half-stroke of said lever; but as it is only an instant from one end of said stroke to the other the two plungers act at the same time substantially.

What I claim is—

1. The tool having a head with fixed jaw and slots at right angles therein and a recess for the tie, a set of plungers, and a lever and mechanism constructed to drive one plunger forward in advance of the other toward the fixed jaw, substantially as described.

2. The tool for clamping wire ties having a body portion with a fixed handle and a fixed jaw in its outer end, in combination with a set of plungers constructed each with a portion of a movable jaw to work with said fixed jaw and a lever provided with cam-surfaces of different pitch for said plungers, substantially as described.

3. The body of the tool having an opening therein from side to side lengthwise and a fixed jaw at its front end, in combination with a movable jaw comprising a set of plungers located in said opening and a lever engaging

said plungers and pivoted in said opening and constructed to actuate said plungers different distances, substantially as described.

4. The tool having a fixed jaw, a set of plungers together constituting a movable jaw and having each a semicircular cavity in its working end and a lever constructed to actuate said plungers successively, substantially as described.

5. The tool having a fixed jaw and a movable jaw consisting of two plungers, said plungers each having a cavity in its working end and a lip on one of said plungers between said cavities, substantially as described.

6. The tool having a fixed jaw, in combination with a set of plungers having each a cavity in its outer end and lateral wings on the lower plunger at its outer end, substantially as described.

7. The tool-body, a set of plungers one over the other therein, and means to withdraw both plungers at the same time after an action comprising a retracting-spring and a pin on the upper plunger engaged by said spring and a projection on the lower plunger engaging the upper one, substantially as described.

8. A tool for fastening ties on intersecting wires having a fixed and a movable jaw, and a device to release the wires and tie comprising a yoke pivoted on the head of the tool, the operating-lever and a push-rod connected therewith and engaging said yoke, substantially as described.

Witness my hand to the foregoing specification this 14th day of April, 1902.

ALFRED N. EDEBURN.

Witnesses:
R. B. MOSER,
T. M. MADDEN.