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PATENTED JULY 24, 1906.

E. J. BOWERFIND.

DIES FOR TYING INTERSECTING WIRES.

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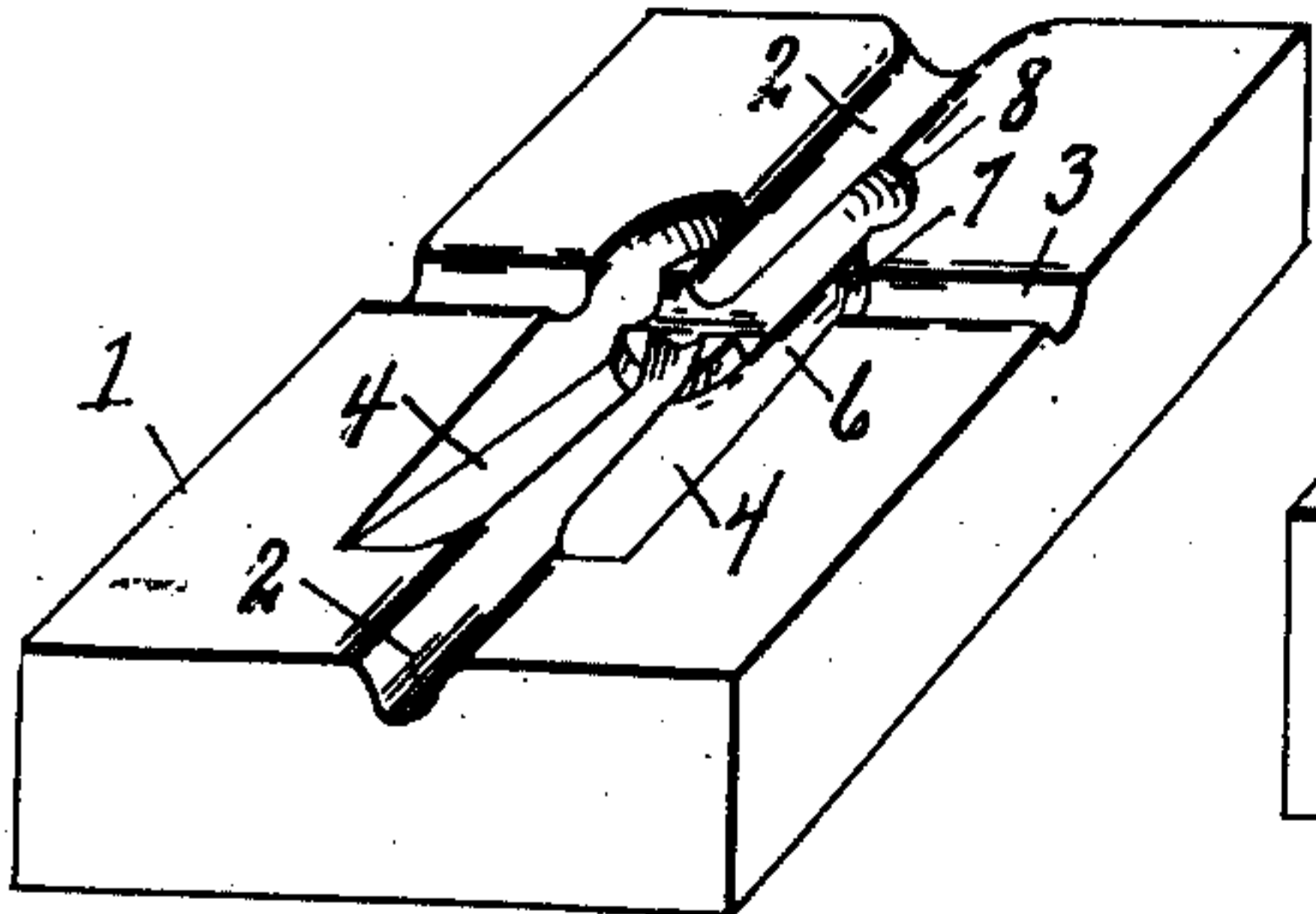


Fig. 1.

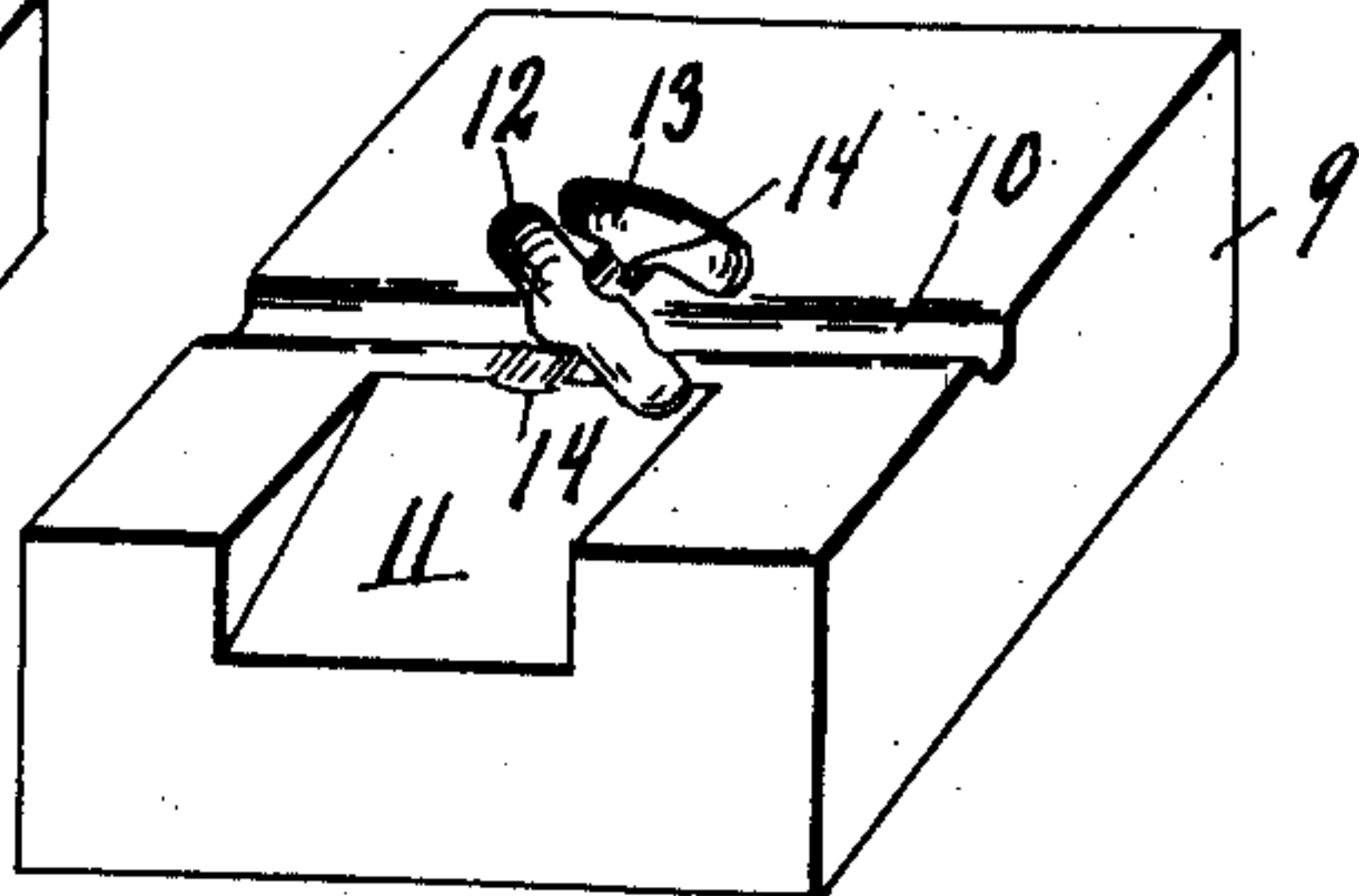


Fig. 2.

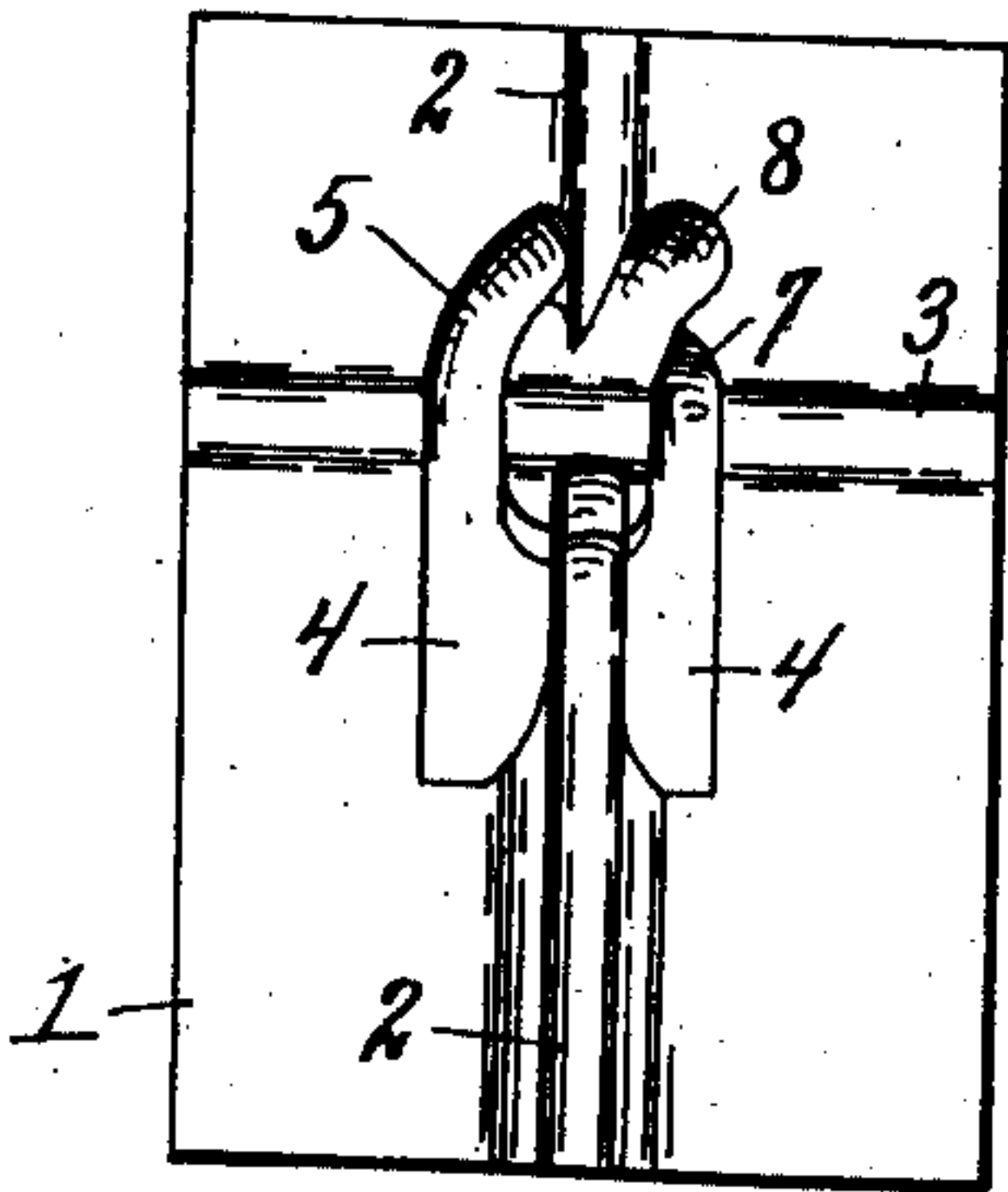


Fig. 3.

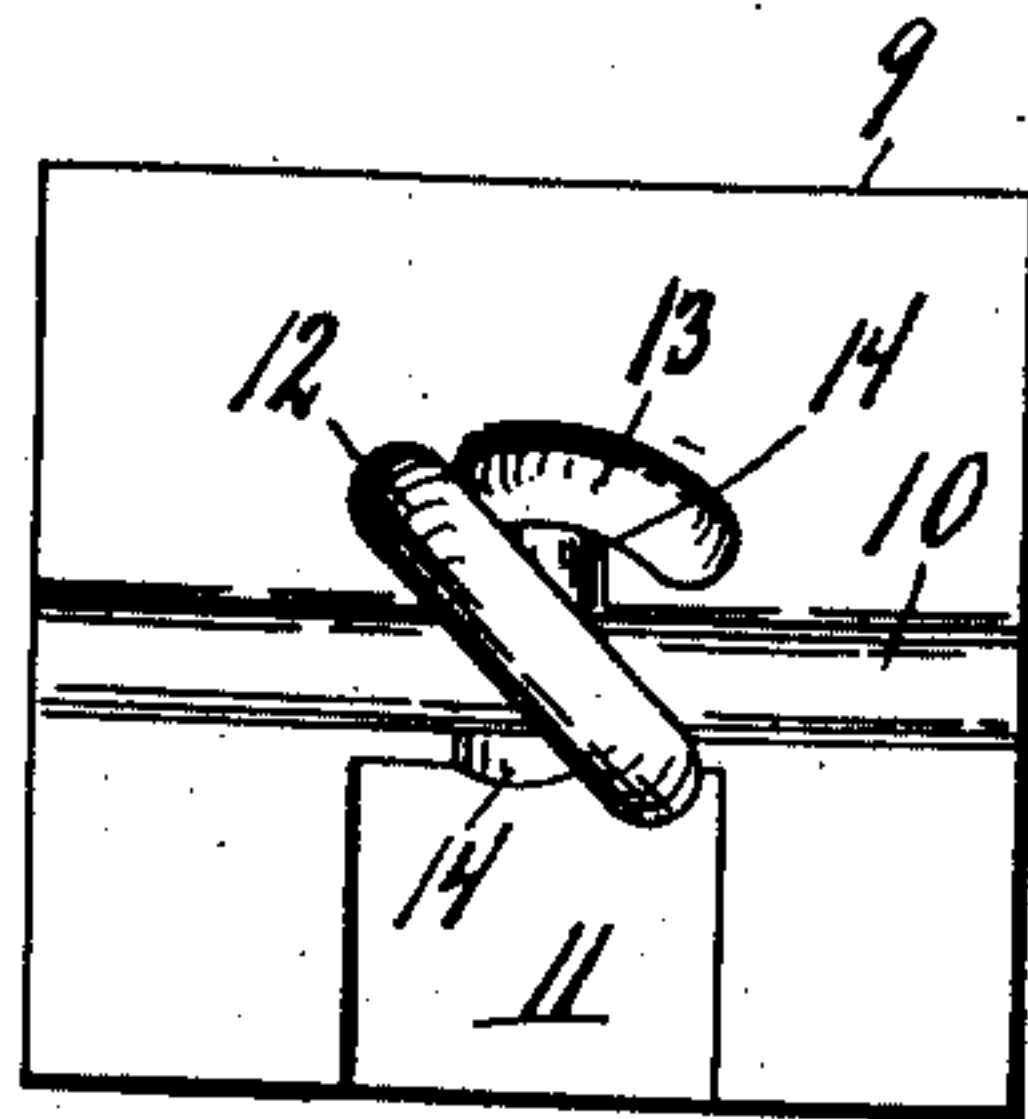


Fig. 4.

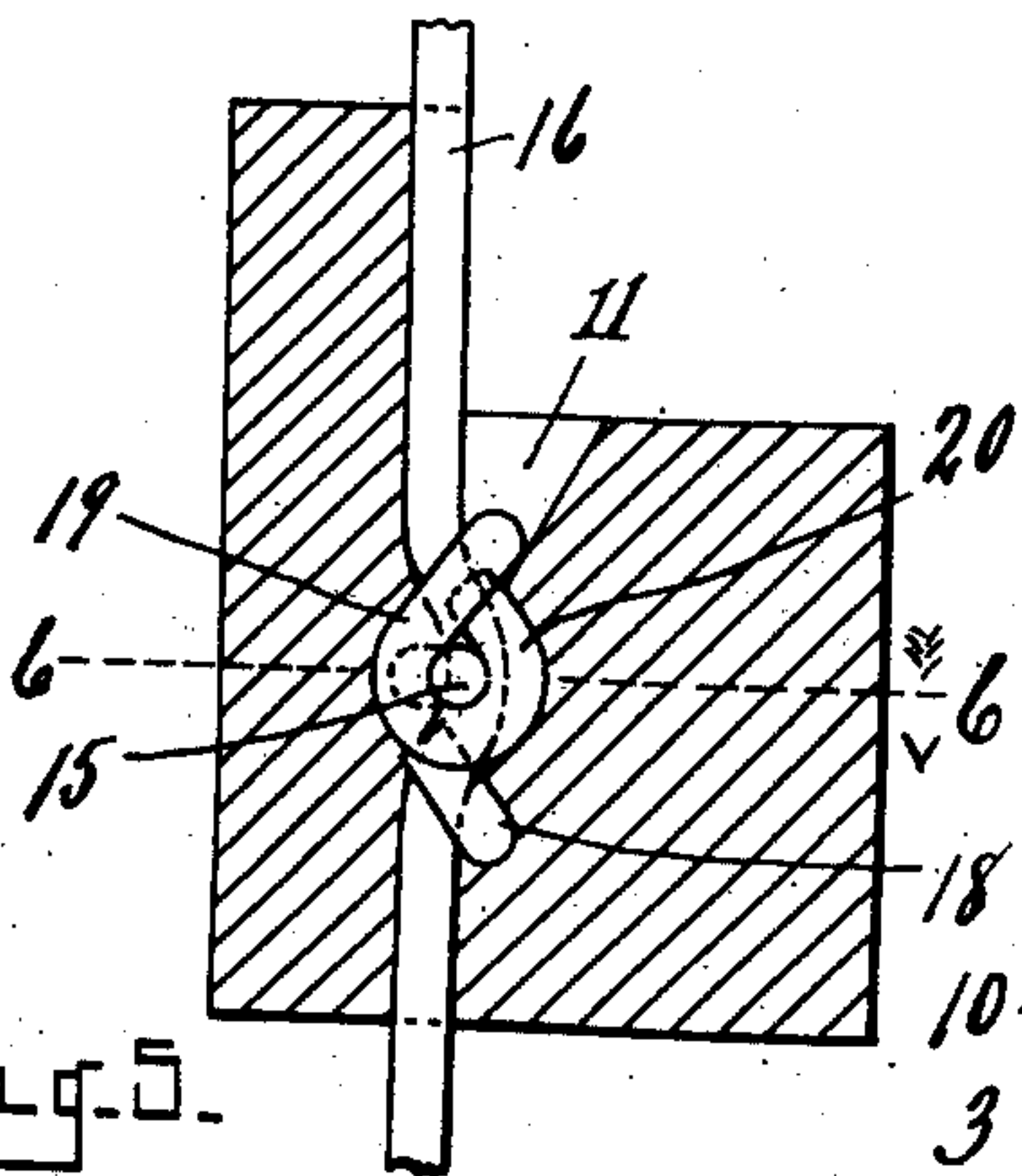


Fig. 5.

Witnesses.

O. B. Baenziger

J. M. Hawlett.

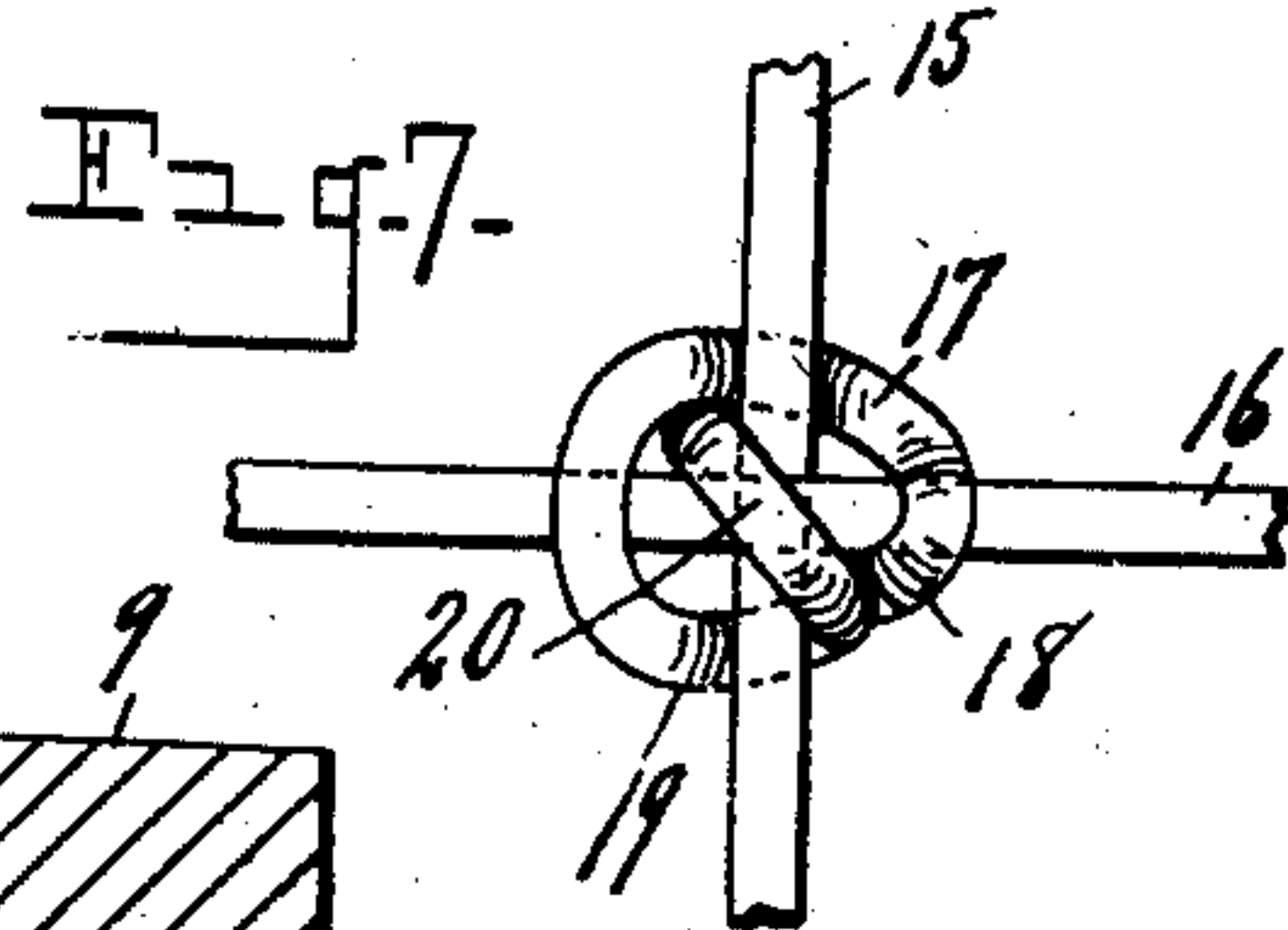
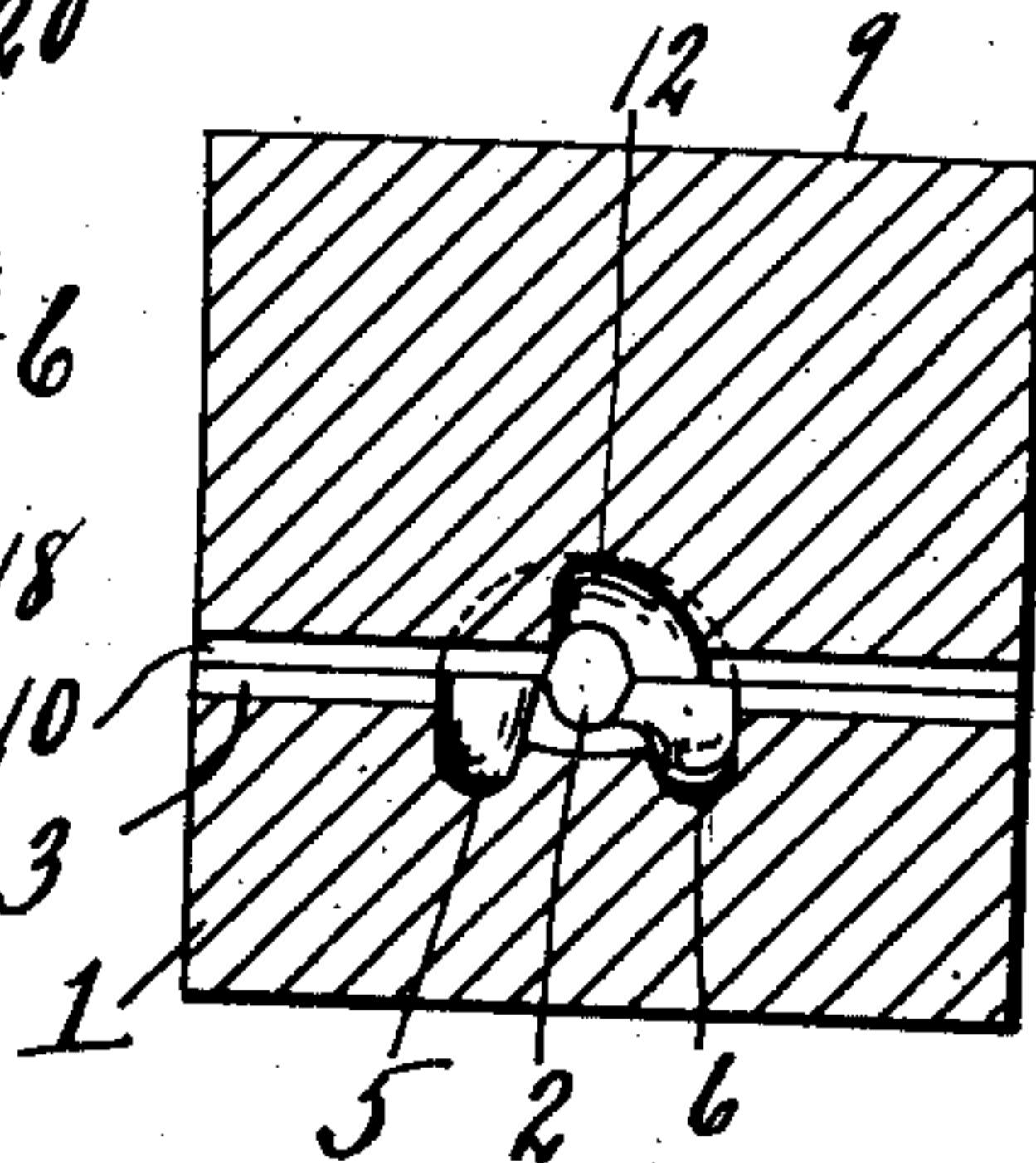


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## DIES FOR TYING INTERSECTING WIRES.

No. 826,829.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed February 9, 1905. Renewed January 2, 1906. Serial No. 294,154.

*To all whom it may concern:*

Be it known that I, EDWARD J. BOWERFIND, a citizen of the United States, residing at Adrian, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Dies for Tying Intersecting Wires; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to dies for tying intersecting wires especially designed for use in connection with the manufacture of wire-fencing; and it consists in the construction and arrangement hereinafter fully set forth, and pointed out in the claims.

The object of the invention is to provide a set of dies in the meeting-faces of which are formed channels, grooves, and concavities of such shape and having such relation as to embrace the crossed strands of wire and cause the tie-wire when driven into said dies in the form of a staple to shape itself around the crossed wires in the desired manner. The above object is attained by the formation and arrangement illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the working face of one of the dies. Fig. 2 is a perspective view of the working face of the other of the dies. Fig. 3 is a plan view of Fig. 1. Fig. 4 is a plan view of Fig. 2. Fig. 5 is a longitudinal section through the dies placed together, showing in elevation therebetween the crossed strands and the tie-wire formed therearound. Fig. 6 is a transverse section through the dies with their working faces together, as on line 6-6 of Fig. 5. Fig. 7 is a perspective view of the tie formed by the dies.

Referring to the characters of reference, 1 designates a die having formed in the face thereof a central longitudinal channel 2, adapted to receive the strand-wire, and the transverse channel 3, adapted to receive the stay or cross wire. Also formed in the face of die 1 is an inclined depression 4, which is bisected by the longitudinal channel 2 and from the base of which lead the branches 5 and 6. These branches cross the transverse

channel 3 below the plane of the bottom thereof, and the longer branch 5 curves inwardly after crossing channel 3 until its terminal communicates with the margin of the longitudinal channel 2. The branch 6 is short and terminates in an upwardly-curved wall 7 just after crossing the channel 3. Located between the terminals of said branches and entering obliquely the channel 2 is an interposed concavity 8, which declines inwardly and terminates at the cross-channel 3 somewhat below the plane of the channel 2.

The die 9 has in the face thereof a transverse channel 10, adapted to register with channel 3 in die 1 and is provided with an inclined opening 11 for the entrance of the plunger, (not shown,) through the medium of which the tie is driven. Also formed in the face of the die 9 is an oblique concavity 12, which crosses the channel 10 below the plane of the bottom thereof, being deepest at its central portion and curving upwardly at its ends. There is also formed in the face of die 9 slightly remote from the channel 10 and communicating at one end with the concavity 12 a curved concavity 13, which is intersected by a short longitudinal channel 14, formed in the face of the die at right angles to channel 10 and crossing it and the oblique concavity 12.

When the dies are placed with their working faces together, the channels 3 and 10 in their respective faces are caused to register and to embrace and confine the transverse wire 15, while the longitudinal wire 16 lies in the channel 2 of die 1 and in the short registering channel 14 of die 9. With the working faces of the dies in operative relation the terminal of the curved branch 5 registers with one terminal of the concavity 13, so that the leg 17 of the tie (shown in Fig. 7) may be directed across the longitudinal wire, its extreme end portion, after crossing said wire, being directed by the opposite terminal of said concavity 13 into the interposed concavity 8 in die 1, wherein it is formed into an embracing hook 18 around the strand-wire 16. During the operation of forming the leg 17 of the tie into said hooked formation around the strand-wire 16 the leg 19 of the tie is caused to bend upwardly or outwardly from the branch 7 in die 1 into one end of the registering oblique concavity 12 in die 9, wherein said leg is directed rearwardly across



the transverse wire 15, as shown at 20 in Fig. 7.

In the application of this invention the dies are mounted in pairs in a suitable machine and are automatically brought together and separated during the operation of manufacturing the fencing. When the working faces of the dies are brought together upon the crossed wires of the fencing, a driving-plunger forces the tying-staple between them to complete the knot or tie. (Shown in Fig. 7.)

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Dies for tying intersecting wires, one of which is provided with a longitudinal and a transverse channel adapted to receive the crossed wires of the fabric, and with an inclined depression having branches leading from the base thereof, each of said branches crossing the transverse channel below the plane of the bottom, one branch curving inwardly to meet the margin of the longitudinal channel beyond the transverse channel, the other branch terminating abruptly after crossing the transverse channel, there being between the terminals of said branches an oblique concavity declining toward and intersecting the longitudinal and transverse channels at their junction, the other die having an oblique concavity in its face which crosses a transverse channel below the plane of the bottom thereof, there being in the face of said second die a curved concavity adjacent one terminal of the oblique concavity

and slightly remote from the transverse channel.

2. Dies for tying intersecting wires, one of which is provided with a longitudinal and a transverse channel adapted to receive the crossed wires of the fabric, and with an inclined depression having branches leading from the base thereof, each of said branches crossing the transverse channel below the plane of the bottom, one branch curving inwardly to meet the margin of the longitudinal channel beyond the transverse channel, the other branch terminating abruptly after crossing the transverse channel, there being between the terminals of said branches an oblique concavity declining toward and intersecting the longitudinal and transverse channels at their junction, the other die having an oblique concavity in its face which crosses a transverse channel below the plane of the bottom thereof, there being in the face of said second die a curved concavity adjacent one terminal of the oblique concavity and slightly remote from the transverse channel, and there being a short longitudinal channel in said die crossing the transverse channel and oblique concavity and intersecting the curved concavity.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD J. BOWERFIND.

Witnesses:

E. N. SMITH,  
P. J. DUNN.