

June 17, 1930.

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1,764,638

ARTICLE HOLDING DEVICE

Filed Dec. 21, 1928

2 Sheets-Sheet 1

Fig. 1.

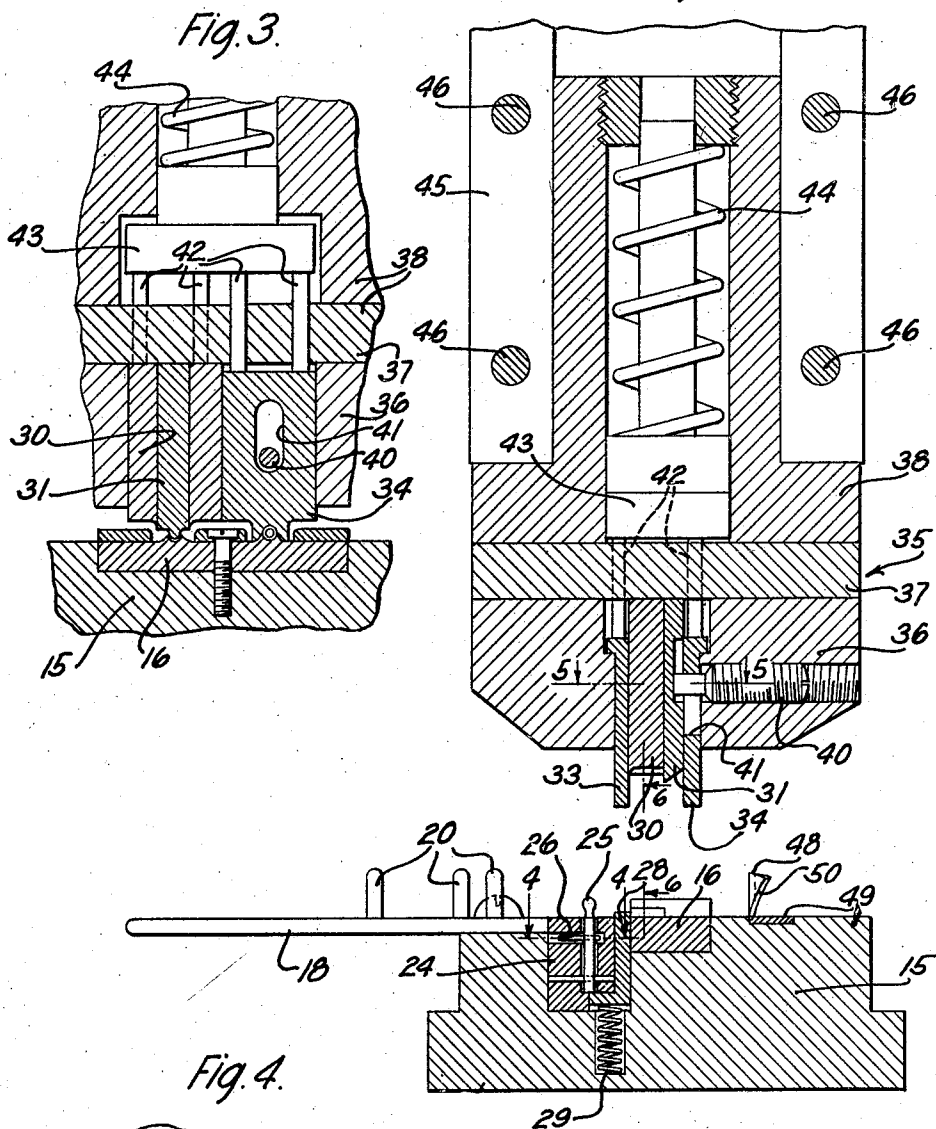
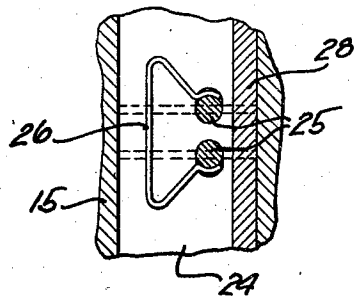


Fig. 4.



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Fig. 2.

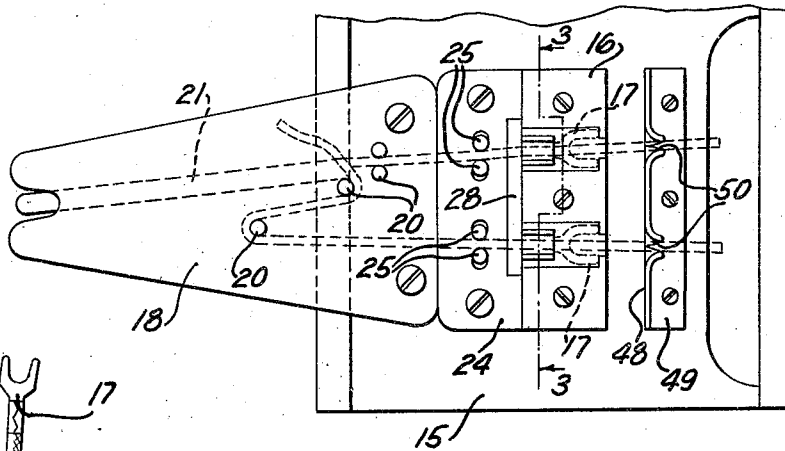


Fig. 9.

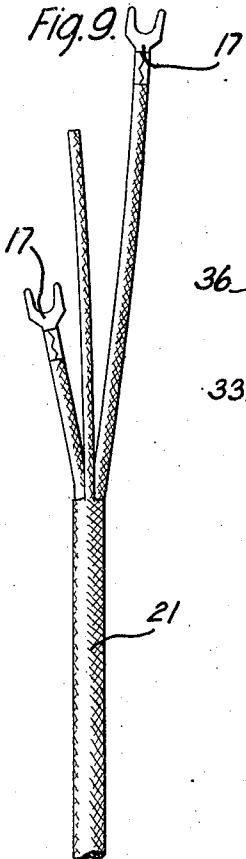


Fig. 5.

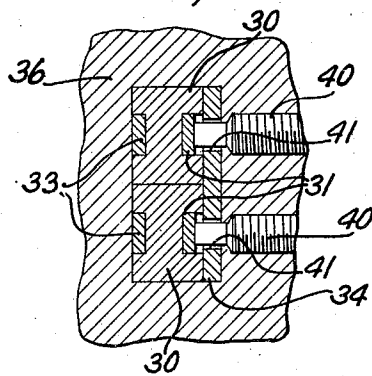


Fig. 6.

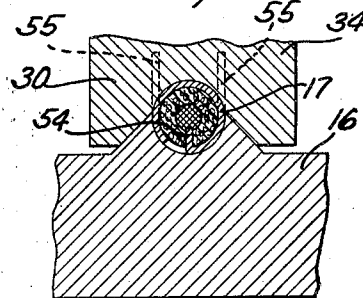


Fig. 7.

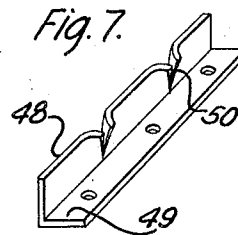
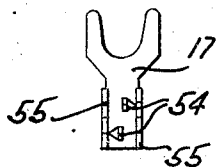


Fig. 8.



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UNITED STATES PATENT OFFICE

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ARTICLE-HOLDING DEVICE

Application filed December 21, 1928. Serial No. 327,601.

This invention relates to article holding devices, and more particularly to devices for holding cord conductors during the application of terminals thereto.

5 In telephone equipment, flexible insulated electrical conductors covered with braided textile strands are frequently employed to interconnect pieces of electrical apparatus. Metallic terminal members for connecting the conductors with the terminals of the apparatus are sometimes secured to the ends of the conductors by bands clamped over the braided covering and having prongs projecting therethrough for making electrical
15 contact with the conductors. In one method of attaching these terminals the braided conductor is placed in a partially formed terminal member with the free end of the conductor projecting beyond the end of the terminal member. The terminal member is thereafter clamped upon the conductor and simultaneously therewith the free end of the conductor is severed adjacent to the end of the terminal.

25 The primary object of this invention is to provide a simple and expedient apparatus for preventing the fraying of a strand or conductor during the attachment of an article thereto.

30 In order to attain this and other objects there is provided in one embodiment of the invention a punch and die combination, the die thereof being arranged to receive and hold a partially formed terminal of the solderless type. At a point beyond the positioned terminal an upstanding plate of resilient metal is provided having a plurality of V-shaped notches therein, the edges of the metal plate being turned so that the braided covered conductors may be readily drawn through the notches in one direction, but are securely held when an attempt is made to retract them. This plate serves to
45 hold the conductors under a predetermined tension within the terminals during the operation of the punch which serves to clamp the terminals on the conductors and which carries with it a severing blade for trimming the ends of the conductors closely adjacent

to the ends of the terminals, thus preventing fraying of the textile coverings.

A more complete understanding of the invention will be had from the following detailed description when taken in conjunction
55 with the accompanying drawings, wherein

Fig. 1 is a fragmentary vertical section of a punch press for attaching terminal members to conductors, showing a conductor holding device embodying the features of
60 this invention operatively associated therewith;

Fig. 2 is a fragmentary plan view of that portion of the structure shown in Fig. 1 which is carried upon the bed of the press;
65

Fig. 3 is a fragmentary vertical section taken on line 3—3 of Fig. 2 with the die and cooperating punches shown in an operating position;

Fig. 4 is an enlarged fragmentary detail
70 section taken on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary plan section taken on line 5—5 of Fig. 1;

Fig. 6 is an enlarged fragmentary section taken on line 6—6 of Fig. 1 with the cooperating punch and die shown in an operating
75 position;

Fig. 7 is a perspective view of the improved conductor holding device;

Fig. 8 is an enlarged detail view of a partially formed terminal member; and
80

Fig. 9 is a fragmentary elevational view of a telephone cord with terminal members applied to the projecting ends of the conductors thereof by an apparatus embodying
85 the features of this invention.

Referring now to the drawings in detail wherein like reference characters designate corresponding parts throughout the several views, it will be observed that the reference
90 numeral 15 designates a die block adapted to be supported upon the bed of a punch press of any usual type (not shown). Mounted within a depression formed in the die block 15 is a multi-die 16 designed to accommodate partially formed terminal members
95 of the type shown in Fig. 8. Extending to the left of the die block 15 (Fig. 2) is a gage plate 18 provided with upwardly extending gage pins 20—20, the function of which will
100

now be described. Referring to Fig. 9 which shows one end of a completed telephone cord 21, it will be noted that the two conductor ends thereof are of different lengths and are provided at their extremities with metallic terminal members 17. In the completed telephone cord it is desirable that the terminals 17 bear a predetermined spaced relation to each other within fairly close limits, that is, with respect to the longitudinal distance between them. The function of the gage pins is to insure and facilitate the correct positioning of the terminals upon the conductor ends.

Fixed in a depression formed in the upper surface of the die block 15 to the left of the die 16 (Fig. 1) is an insert 24 in the form of a block having its upper surface flush with the upper surface of the die block. Extending upwardly from the block insert 24 are two pairs of conductor clamping pins 25—25 arranged to yieldably engage opposite sides of the conductors. As shown in Fig. 1, the pins 25 are pivoted at their lower ends and their upper ends are urged toward each other by a U-shaped spring 26 (Fig. 4).

Mounted in the die block 15 so as to be vertically slidable between the die 16 and the block insert 24 is a vertical plate 28 which normally projects above the upper surface of the die block 15 and serves as a gage for facilitating the insertion of the partially formed terminal members within the die. A compression spring 29 mounted in a pocket formed in the die block 15 and bearing upwardly against the bottom edge of the plate 28 serves to hold it in its normal position.

Arranged to cooperate with the multi-die 16 are a pair of forming punches 30—30 (Figs. 1, 3 and 5) designed to clamp the partially formed terminals upon the conductors, as shown in Fig. 6. Associated with each of the forming punches 30 is a conductor shearing punch 31 which serves to sever the projecting excess end portions of the conductors adjacent to the attached terminals. Resiliently mounted pads 33 and 34 arranged on opposite sides of the forming punches serve to securely hold the conductors and the terminals during the forming and shearing operations. The forming and shearing punches 30 and 31, respectively, and the pads 33 and 34 are carried by a supporting block 35 which, for the purpose of facilitating the assembling and disassembling of the parts, is composed of three individual sections 36, 37 and 38.

As shown in Figs. 1 and 5, the forming and shearing punches are securely clamped to the lower section 36 of the supporting block 35 by means of screws 40 extending through elongated slots 41 provided in the pad 34. By referring to Fig. 5 it will be noted that the forming punches are shaped

so as to loosely straddle the pads 33. By the construction just described the pads 33 and 34 are vertically movable in the supporting plate 36. Reciprocally guided in the plate 37 are a plurality of push pins 42—42, the lower ends of which engage the upper ends of the pads 33 and 34. A knock-out block 43 vertically slidable in the upper section 38 of the supporting block 35 is normally pressed downwardly upon the upper ends of the push pins 42 by a compression spring 44 (Fig. 1). It will be observed that the supporting block 35 is securely clamped to the platen 45 of the press by means of suitable screws or bolts 46—46.

In accordance with a feature of the present invention, a simple and inexpensive device is provided for holding the conductors under the required tension during the attachment of the terminals thereto and the severing of the surplus end portions of the conductors. In the embodiment of the invention illustrated in the drawings, this device comprises a vertical plate 48 preferably composed of resilient sheet metal. The lower portion of this plate is bent substantially at right angles to provide a base portion 49 whereby the device is secured within a depression formed in the upper surface of the die block 15 to the right of the die 16, as shown in Figs. 1 and 2. Formed in the vertical portion of the resilient plate 48 are a pair of spaced V-shaped notches 50—50 for accommodating the ends of the conductors. The portions of the plate adjacent to the notches 50 are bent so that the braided covered conductors may be readily drawn through the notches in one direction but are securely held under tension when an attempt is made to retract them.

In the operation of the above described apparatus, the partially formed terminals 17 are positioned in the pockets of the die 16 with the left ends of the terminals abutting the gage plate 28, as shown in dotted outline in Fig. 2. A telephone cord 21 is then placed in position with the conductors thereof lying within the partially formed terminals, and the projecting end portions of the conductors are drawn taut through the V-shaped notches 50 of the resilient plate 48, the gage pins 20 and the clamping pins 25 serving to insure the proper positioning of the conductors with respect to the terminals. The punch press is then operated in the usual manner and upon the downward movement of the platen 45 the pads 33 and 34 yieldably engage the conductors on opposite sides of the terminals causing the prongs 54 which project upwardly from the terminals to pierce the braided covering and electrically contact with the metallic cores of the conductors. Upon a continued downward movement of the platen 45 the forming punches 30 engage upturned portions 55 of the ter-

minals and wrap them tightly around the conductors in the form of a cylinder, as shown in Fig. 6. Simultaneously with the forming operation the shearing punches 31 sever the excess end portions of the conductors adjacent to the attached terminals thus completing the assembly in one operation of the press. During the severing operation the conductors are held taut by the resilient plate 48 thus insuring a clean cut of the excess end portions of the braided covered conductors obviating any subsequent trimming of the textile strands of which the braiding is composed.

It will be understood that the embodiment of the invention herein illustrated and described is merely a convenient and useful form of the invention and is capable of various modifications without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. The combination with means for attaching a terminal to a strand, and means for simultaneously therewith shearing the free end portion of the strand, of a plate member provided with a V-shaped slot with turned edges to hold the strand under predetermined tension during the shearing operation.

2. The combination with means for attaching a terminal to a strand, and means for simultaneously therewith shearing the free end portion of the strand, of a resilient plate member having a V-shaped slot for receiving the strand, the edges of the member adjacent the slot being turned away from the terminal to hold the strand under tension during the shearing operation.

3. The combination with means for attaching terminals to electrical conductors, and means for simultaneously therewith shearing the free end portions of the conductors, of a plate member having spaced V-shaped slots for receiving the conductors, the edges of the plate member adjacent the slots being formed to securely hold the conductors under tension during the forming and shearing operations.

In witness whereof, I hereunto subscribe my name this 6th day of December, A. D. 1928.

ELISHA JAMES McKEON.