

Sept. 26, 1967

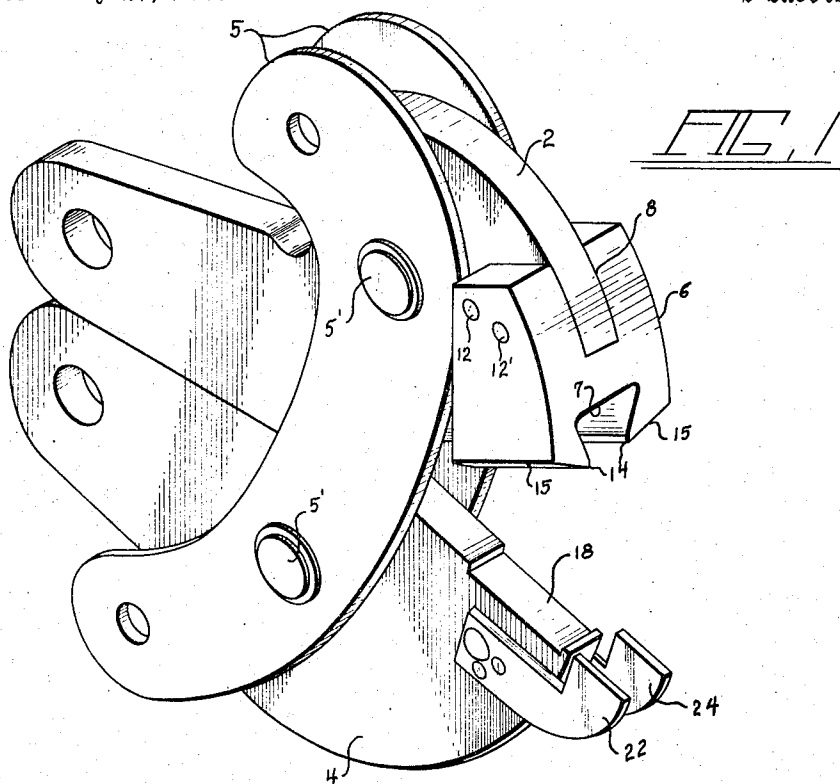
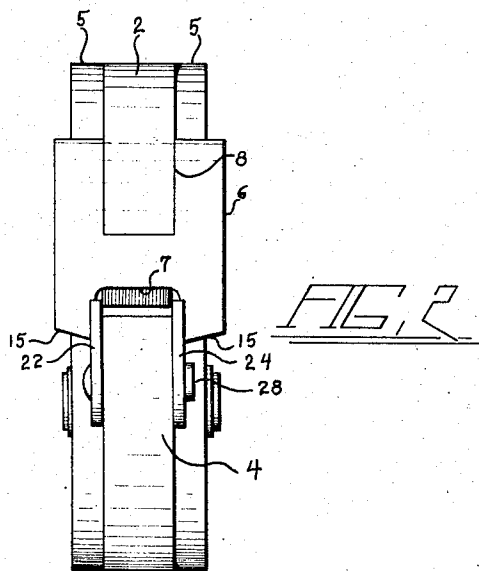
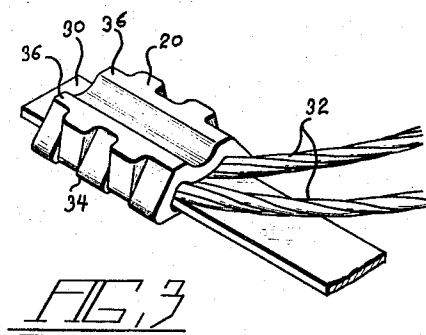
G. R. RICHARDS

3,343,261

TERMINAL CUTTING DEVICE

Filed May 27, 1965

2 Sheets-Sheet 1



INVENTOR
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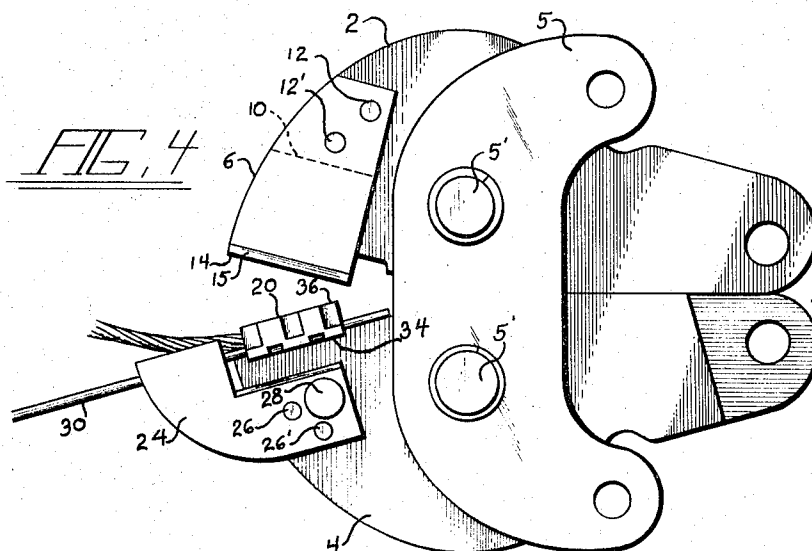
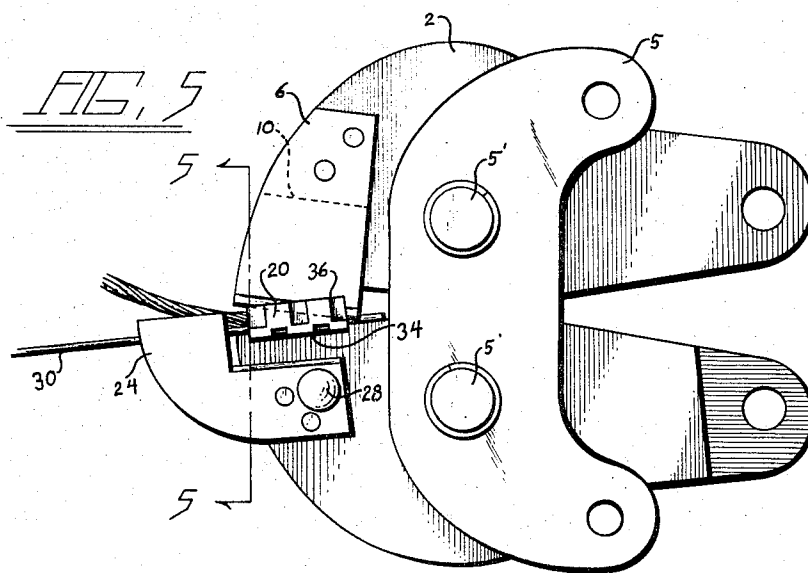
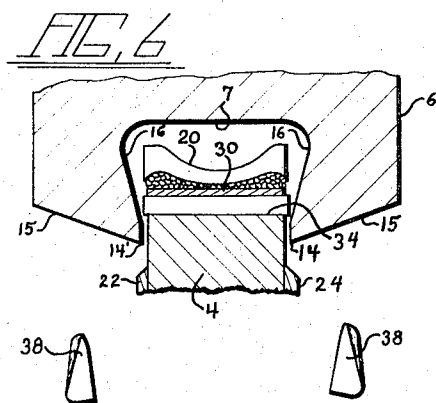
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TERMINAL CUTTING DEVICE

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4 Claims. (Cl. 30—258)

This invention relates to a device for removing a connector element from a carrier member, and more particularly to a means for cutting the connector element from the carrier without deforming the carrier member.

In an electrical connection of the type shown and described in U.S. patent application Serial No. 376,941, filed June 22, 1964, it is sometimes necessary to remove the metal ferrule which connects a conductor wire to the spring leaf carrier member so that a new electrical connection can be made onto the same spring leaf carrier member. The use of the same spring leaf carrier member on which a new electrical connection is to be applied is desirable because of the high cost of these carrier members.

It is, therefore, a primary objective of the present invention to provide cutting means that will remove a metal ferrule from a spring leaf without deforming the spring leaf.

Another object of the invention is to provide cutting means which is adaptable for use in existing tools.

Another object of the present invention is to provide means which makes spaced cuts on one surface.

Another object of the present invention is to provide durable cutting means that is simple in construction and easy to operate.

These and other objects of the invention will become apparent when the description is read in conjunction with the accompanying drawings wherein:

FIGURE 1 is a perspective view of the cutting tool means according to the present invention;

FIGURE 2 is a front elevational view of the cutting tool means in a closed position;

FIGURE 3 is a perspective view of the connection that is to be operated upon by the cutting tool means;

FIGURE 4 is a side elevational view of the cutting tool means in the open position with the connection in place thereon;

FIGURE 5 is a view similar to that of FIGURE 4 but showing the cutting tool means partially closed onto the connection; and

FIGURE 6 is a view taken along lines 5—5 of FIGURE 5 showing the connector cut from the spring carrier.

Referring now to the drawings and more particularly to FIGURES 1, 2 and 4—6, cutting means CM includes a tool head A comprising two movable jaws 2 and 4 pivotally connected to plates 5 via pins 5'.

Cutting die 6 constitutes one-half of the cutting means and is formed of a hardened steel or other suitable material adapted to enhance the cutting properties of the die. Cutting die 6 is mounted on jaw 2 by means of slot 8 which is centrally located in die 6. A recess 10 is disposed on one edge of jaw 2 and the bottom of slot 8 is mateable therewith. Die 6 is then secured to jaw 2 by means of pins 12 and 12'. Die 6 includes a U-shaped recess 7 in bottom surface 15 thereof. Two cutting blades 14, 14' are located at the outer part of each leg of recess 7. Surface 15 is angled upwardly away from cutting blades 14 and 14' to the sides of the die thereby providing a surface which will carry the metal away from the cutting blades as the cut is being made.

The inner walls 16 of recess 7 are also of an angle so as to provide a relief area above cutting blades 14 and 14' greater than the distance between the two cutting blades; this prevents the metal of the ferrule and the

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spring carrier which passes between the blades from being held in the die.

Jaw 4 constitutes the other half of the cutting means and includes a locating recess 18 which serves to position the connection under cutting die 6. Aligning plates 22 and 24 are mounted on the sides of jaw 4 and are secured thereto by pins 26 and 26' and bolt 28. Plates 22 and 24 which extend outwardly and upwardly from the front surface of jaw 4 provide a locating and positioning means in the tool head for the electrical connection of ferrule 20 and spring carrier 30 (see FIGURE 3).

The connection includes a rectangular-shaped ferrule 20 having a passageway therethrough to receive wire 32 and a spring carrier 30. When crimped, ferrule 20 grips spring carrier 30 compressing wires 32 therebetween.

The spring carrier 30 is used to bias carbon armature brushes against a commutator. One surface of the ferrule presses against the brush so that current is carried from the armature through the brush to the ferrule and subsequently to the wire.

These cutting means are adaptable to the tool head of the type shown and described in U.S. Patent No. 2,684,003. While an air or hydraulic-actuated tool is preferable in this case because of the excessive cutting pressures needed, it should be noted that head A may be adapted to fit into a manually-operated tool of the type shown and described in U.S. Patent Application, Ser. No. 420,586, filed Dec. 23, 1964.

Operation

The connector is placed in the cutting tool (FIGURES 4 and 5) so that bottom surface 34 of ferrule 20 is located in recess 18 of jaw 4 with wire 32 and spring carrier 30 extending outwardly from the front of the tool and positioned between aligning plates 22 and 24. The ferrule 20 is now positioned under cutting die 6 for removal from spring carrier 30.

The tool closes onto the connection in a scissors action, during which time blades 14 and 14' of cutting die 6 come into contact with the exterior edges 36 of ferrule 20, FIGURE 5.

Further tool closure forces blades 14 and 14' through the connection, thus shearing the sides 38 from ferrule 20, FIGURE 6.

At complete tool closure, ferrule 20 has been loosened from spring carrier 30 and is positioned along with spring carrier 30 and wires 32 in recess 7 of cutting die 6, FIGURE 6.

When the tool returns to its open position, these pieces are removed from the tool exposing the undamaged spring carrier 30.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiment of the invention, which is shown and described herein, is intended as merely illustrative and not as restrictive of the invention.

What is claimed is:

1. A cutting device for removing a crimped ferrule member from a carrier member comprising jaw members pivotally connected together and having opposed surfaces, one of said jaw members having a rectilinear-shaped recess therein for receiving said crimped ferrule member, said one of said jaw members also having aligning plate means extending forwardly from said one of said jaw members for positioning of said carrier member thereby and for aligning said ferrule member in said rectilinear recess, cutting die means on the other of said jaw members for engaging and shearing two edges from said crimped ferrule member without damaging said carrier member, and means operatively connected to said jaw

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members to move them toward and away from each other.

2. A cutting device as described in claim 1 wherein said aligning plate means includes an aligning plate applied to each side of said one of said jaw members.

3. A cutting device for removing a crimped ferrule member from a carrier member comprising jaw members pivotally connected together, a cutting die means having a slot mateable with one of said jaw members, said cutting die means including at least two cutting blades, said cutting blades having a groove therebetween, sidewalls of said groove diverging toward the bottom thereof providing a relief area for said carrier member and portions of said crimped ferrule during shearing, said other jaw member having a rectilinear recess therein for receiving said crimped ferrule member, aligning plate means on said other jaw member including an aligning plate applied to each side thereof and protruding from the face of said jaw wherein said carrier member is positioned between said aligning plates for aligning said crimped ferrule within said rectilinear recess under said cutting die means thereby permitting the edges to be sheared from said crimped ferrule member without damaging said carrier member, and means operatively connected to said jaw members to move them toward and away from each other to effect the shearing operation.

4. A cutting device for cutting edges from a ferrule member secured onto a carrier member comprising jaw members, pivot means pivotally connecting said jaw mem-

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bers together, cutting die means on one of said jaw members and including a recess defining cutting blade means mateable with the other of said jaw members, positioning means on the other of said jaw members for positioning said ferrule member in alignment with said recess and said cutting blade means, aligning means on the other of said jaw members for aligning said ferrule member within said positioning means thereby permitting the edges of said ferrule member to be sheared therefrom by said cutting blade means without damaging said carrier member, and means connected to said jaw members to move them toward and away from each other to effect the shearing operation.

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