May 18, 1965 D. J. CRIMMINS 3,183,584

DEVICE FOR SECURING CONNECTORS TO CONDUCTORS

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FIG. 1

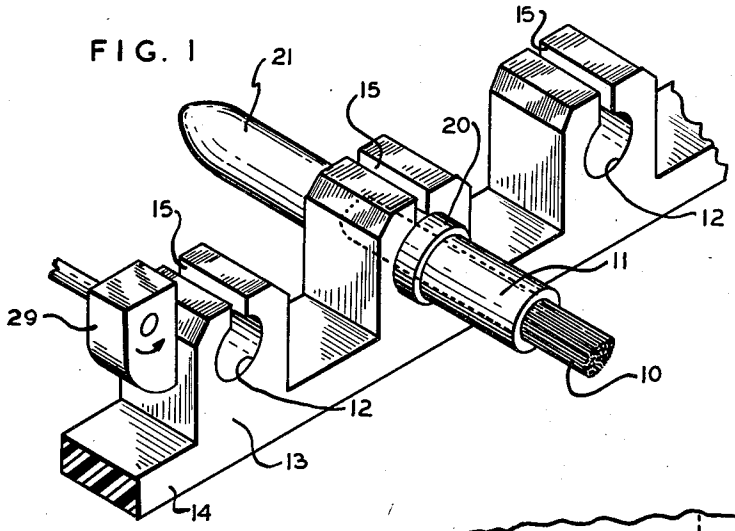


FIG. 2

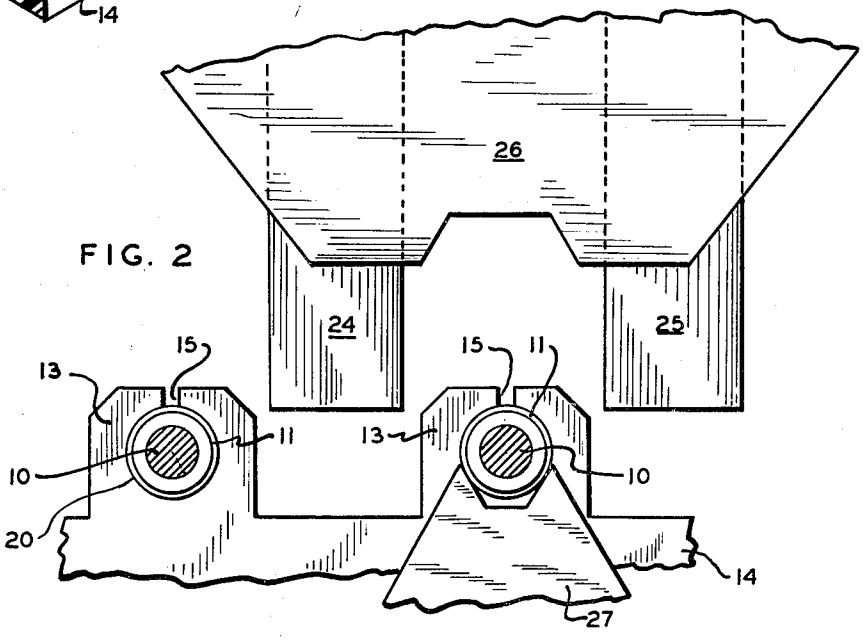
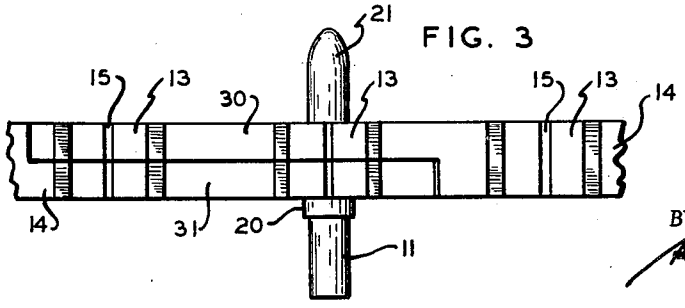


FIG. 3



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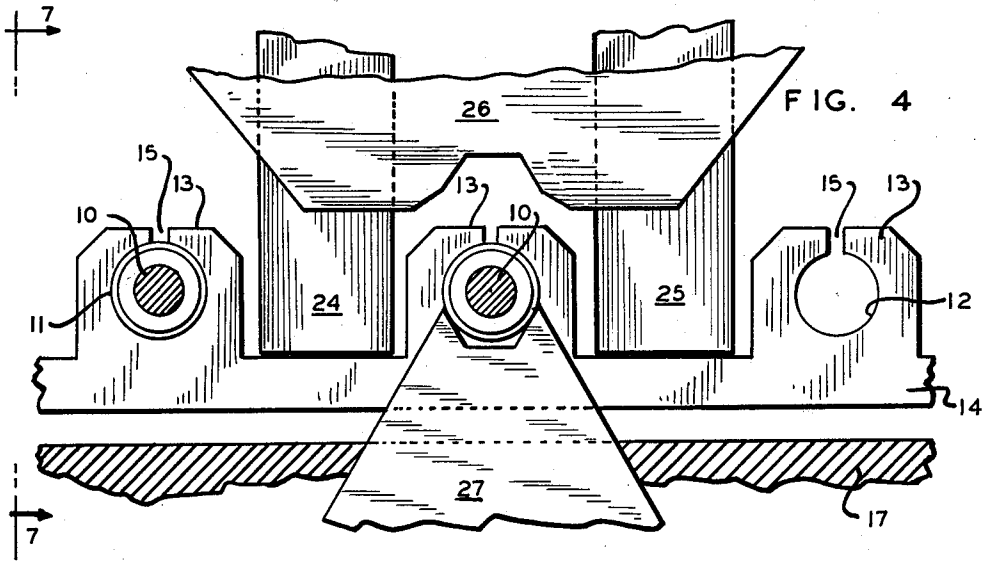


FIG. 4

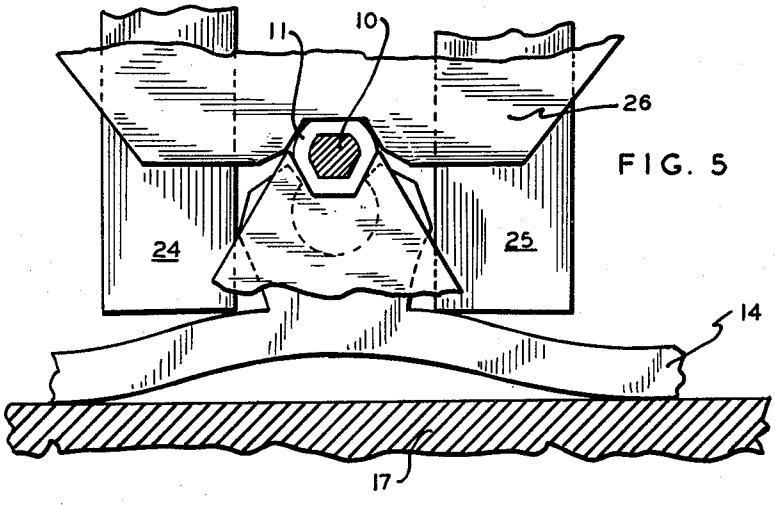


FIG. 5

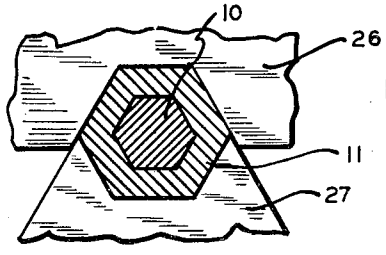


FIG. 6

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DEVICE FOR SECURING CONNECTORS TO CONDUCTORS

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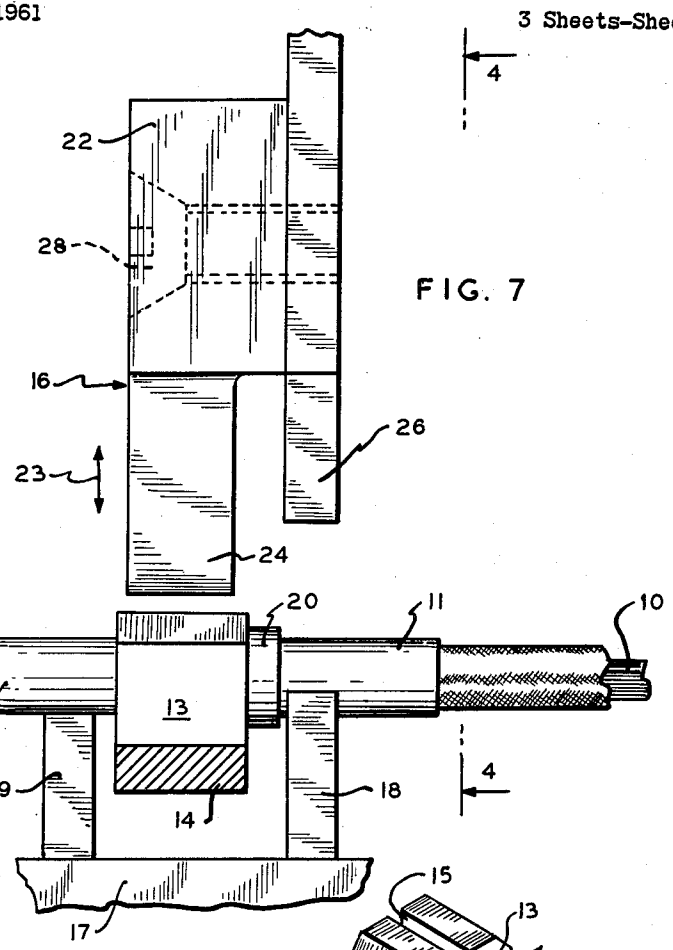


FIG. 7

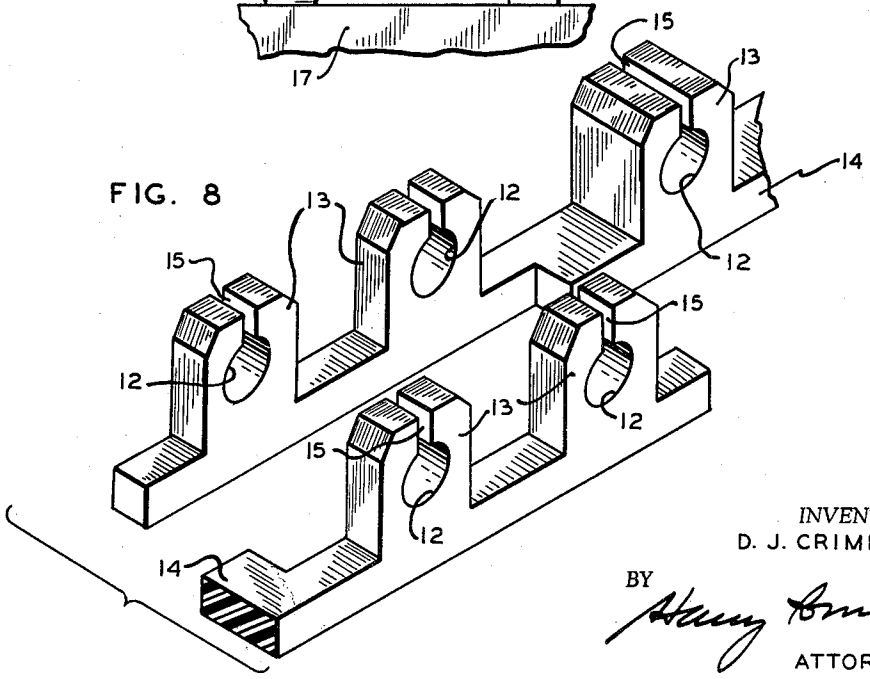


FIG. 8

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DEVICE FOR SECURING CONNECTORS TO CONDUCTORS

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Filed Dec. 26, 1961, Ser. No. 163,962
8 Claims. (Cl. 29—203)

This invention relates to a device for securing conductors to connectors wherein a plurality of connectors are positioned transversely in holders and conductors are inserted therein and then the assembly is automatically moved to a station wherein the connectors are compressed and interlocked with the conductors and released from the holders.

The device incorporates novel means for compressing the connector onto the conductor and into interlocked relationship therewith, in a continuous and automatic procedure for thus forming connector ends on conductors.

The drawings, illustrating procedures and devices useful in carrying out the invention, and the description below, are exemplary only of the invention, which shall be deemed to cover all other devices and procedures coming within the scope and purview of the appended claims.

In the drawings, wherein similar reference characters indicate like parts:

FIG. 1 is a fragmentary, perspective view of a holder strip with a connector positioned therein prior to the connector being compressed on the conductor.

FIG. 2 is a schematic, partly fragmentary, elevational view of parts of the device embodying the invention,

FIG. 3 is a top plan view of holder strip ends connected by the connector inserted therein,

FIG. 4 is a fragmentary elevational view similar to FIG. 2 but showing the parts in the further advanced position wherein the slit holders are about to be opened,

FIG. 5 is a similar view of the parts further advanced and the connector shown initially compressed against the anvil bar,

FIG. 6 is a fragmentary, elevational view of the anvil and compression plate with the connector in a further advanced position wherein it is fully compressed,

FIG. 7 is a side elevational view taken at line 7—7 of FIG. 4, and

FIG. 8 is a fragmentary perspective view of ends of connector strips which may be secured together, as shown in FIG. 3.

This invention is concerned with the securing of conductors **10** to connectors **11** in an essentially automatic, rapid and highly effective, accurate and efficient manner. The connectors **11** are (FIG. 1) initially positioned through the transverse openings **12** in the holders **13**, which are preferably formed on a continuous strip **14** and upwardly transversely slitted as at **15**. The connectors **11** desired to be used are initially positioned in the holders **13** automatically or manually; said connectors **11** may be furnished assembled in continuous strips **14** in any desired multiple units, for assembly with conductors of the particular type desired to be assembled therewith. The strip **14** is positioned in the assembly station of the device **16** (FIG. 7) said device comprising a base **17** having first and second upstanding fingers **18, 19** on which the protruding ends **20, 21** of the connector **11** are positioned, the parts being so proportioned that the strip **14** will then be disposed in suspended spaced relation to the base **17**. Means are provided on the device movable relative to the connector for compressing the connector and conductor in interlocking relation, uniting them essentially homogeneously, and engaging the strip at spaced points straddling the holder, opening the latter and

releasing the connector therefrom, exemplified in FIGS. 2–6 as bracket **22** vertically reciprocated (by any timing and reciprocating means well known in the art) as indicated by the double headed arrow **23** in FIG. 7, perpendicularly to the longitudinal axis of the strip **14**. Bracket **22** is preferably provided (FIG. 2) with depending spaced elongated bar portion ends **24, 25** for so engaging the strip **14** at spaced points in straddling relation to the holder **13**, thereby, on continued downward movement of the bracket **22** (FIG. 5) opening said holder and releasing the connector **11** therefrom. Moving immediately behind the bar portions **24, 25** of the bracket **22** is compression plate **26** which may be reciprocated in the same plane **23** as the bracket **22** but at a slightly later time interval, as, for example, by securing the bracket **22** and plate **26** together as at **28** (FIG. 7). The anvil **27** may be formed as part of the upstanding finger **18** of the base at the assembly station **16**. The anvil **27** and the compression plate **26** preferably have complementary deforming faces non-conforming to the circumference or perimeter of connectors **11** so that, when the plate **26** presses the connector between the plate and the anvil **27** (FIG. 8) the connector and the contained conductor **10** will thus be compressed essentially into unitary, permanent interlocking relation in the cross-section thus defined.

The connectors **21** may be pre-assembled in the continuous strips **14** so that the end user would insert his conductors **10** into the connector manually or automatically and then the assembly of conductor and contained connector advanced (as by any suitable intermittent advance mechanism **29** which will move the strip a given distance and then be elevated therebeyond or stopped and will then move the strip again to repeat the operation) the strip moving a holder to the station **26** during each cycle of operation of the advance mechanism. In FIG. 1 a rotating advance mechanism is shown for engaging the holder **13** during a part of each complete cycle of rotation and then passes clear of the plane of the holder for the remainder of the cycle and then engages the next holder to repeat the operation. Any other means may be used for the purpose, including mechanism engaging the lower portions of the strip instead of the holder, if desired. The strip **14** may be formed with the holders **13** extending upwardly therefrom as above described as essentially one piece preferably of plastic or other flexible material and may be made of any desired or convenient length suitable for winding onto reels, for example, if desired for convenience of storage and use. Ends of finite strips may be secured together by any suitable means, as for example by forming said ends of less than their normal width (the reduced end sections **30, 31**, FIG. 3) which interfit to form the width of the strip and holders thereon, and are held in interfitted position by the connectors passed therethrough.

On completion of the compression step (FIG. 6) the bracket **22** and plate **26** move away from the anvil **27** and the connector and conductor therein (previously moved out of the holder on opening of the latter in the FIG. 5 downstroke position of the parts **22** and **26**) are carried with the strip on its next advance movement (by means such as **29**, FIG. 1) and may be readily separated or lifted by automatic or mechanical means.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device for securing a connector disposed in the holder of an elongated strip to a conductor placed therein, comprising a base member, an upstanding finger thereon, supporting the connector and the holder strip in spaced relation to the base, means movable relative to and engaging the strip at spaced points straddling the holder, moving the strip downwardly toward the base and releasing the connector therefrom, and means movable against the

connector, compressing the connector on the conductor therein simultaneously with said releasing.

2. In a device as set forth in claim 1, said means in said device so movable relative to said strip and so engaging said strip at spaced points straddling the holder comprising a plate vertically reciprocated relative to the longitudinal axis of said strip, said plate having depending spaced elongated bar portions so engaging said strip.

3. In a device as set forth in claim 1, a second upstanding finger on said base member, parallel to and spaced from the first mentioned finger, said connector having a second end extending through the holder and positioned on the second upstanding finger of the base member.

4. In a device as set forth in claim 1, said means movable against the connector comprising a plate having a portion of an outline non-conforming to that of the connector so movable against the connector to so compress the latter.

5. In a device as set forth in claim 1, an anvil bar in said device, and means for compressing the connector against the anvil bar to thereby compress the conductor therein.

6. In a device as set forth in claim 5, said means for compressing the connector and means movable against

the connector comprising a plate having a portion of an outline non-conforming to that of the connector so movable against the connector to so compress the latter.

7. A device for compressing a connector on a conductor comprising an elongated flexible strip having holders upwardly extending therefrom and transversely slitted to receive conductor-holding connectors therein, a base member, means for suspending the strip and holders relative to said base member, means for moving said so suspended strip relative to said base member to a station of said device, and means at said station movable relative to the base and pressing the strip in straddling relation to the holder to free the connector therefrom and simultaneously to compress the connector onto said conductor.

8. In a device as set forth in claim 7, means at said station of the device compressing the connector and conductor therein.

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