March 1, 1932. E. J. DE RIGHT 1,847,473

CABLE SPLICING TOOL

Filed Aug. 10, 1928

Fig. 1

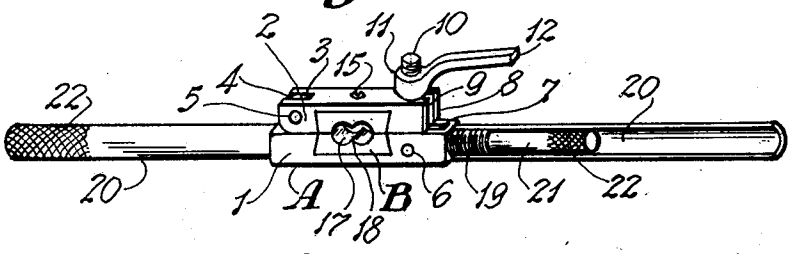



Fig. 2

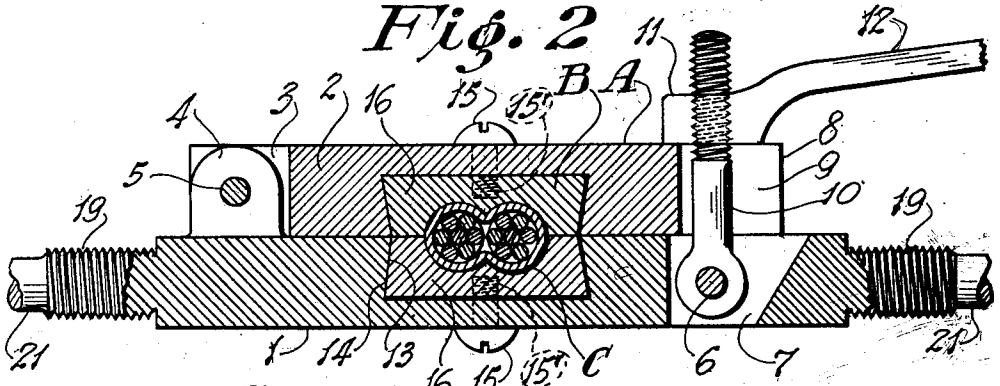



Fig. 4

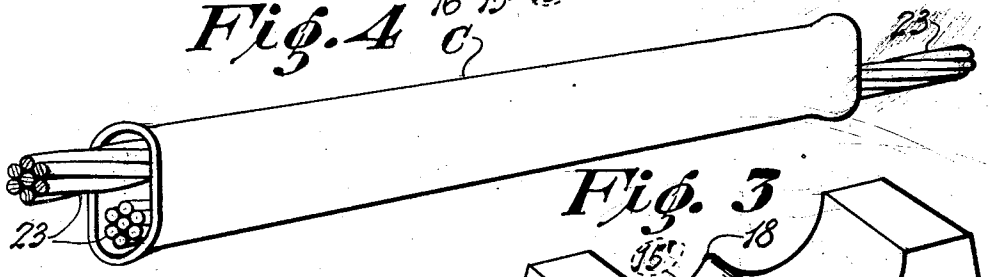



Fig. 3

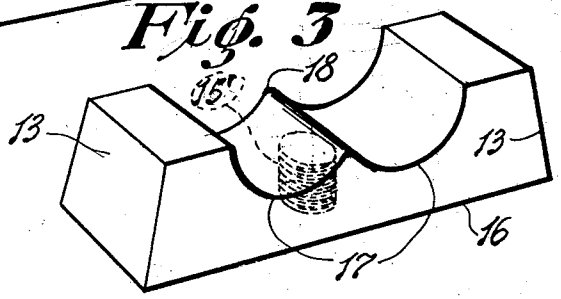



Fig. 5




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# UNITED STATES PATENT OFFICE

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## CABLE SPLICING TOOL

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This invention relates to cable splicing tools, and has particular reference to improvements in so-called "sleeve-twisters" or devices adapted for use in connection with cable-splicing sleeves, or the like.

In one commonly used form of cable-splice, the cable ends are contained in parallel adjacence in a splicing sleeve or elongated thimble, the sleeve and its contained cables being then twisted or helically wrapped to form the splice.

For best results the sleeve should preferably fit the cables snugly, after the twisting operation is completed, and to this end, it is one of the objects of this invention to crimp the ends of the sleeve on the adjacent cables, prior to the twisting operation, to thereafter prevent creeping or buckling of the sleeve on twisting movement thereof.

In practice, the cables commonly employed vary in size, and the lineman has heretofore found it necessary to carry a plurality of sleeve-twisters, each being adapted to accommodate only one particular size of cable.

Another object of the invention is, therefore, to provide crimping or sleeve gripping means removably associated with the sleeve-twister, said gripping means being relatively light in weight, whereby a plurality thereof for various sized cables, may be carried by the lineman, thus accomplishing a saving in weight and expense, in a simple and effective manner.

Still another object is to provide a sleeve-twister including a pair of extension handles adapted for detachable mounting on the twister for greater effectiveness in turning effort when conditions will permit, and providing for their removal when working in restricted quarters.

A further object is to provide a simple and effective means for mounting the sleeve and its contained cables in the sleeve-twister in registration with the gripping means, and to clamp said gripping means on the sleeve to hold the sleeve in the sleeve-twister.

Other objects and advantages will appear from the drawings and the following detailed description, in which:

Fig. 1 is a perspective view of one form of my invention, a portion being broken away to show the manner of attaching an extension handle; Fig. 2 is an enlarged fragmentary partly sectional view of Fig. 1, showing a sleeve and its contained cables clamped therein with the extension handles removed; Fig. 3 is an enlarged detail perspective view of one of the die-blocks; Fig. 4 is a perspective view of a sleeve and its contained cable ends; Fig. 5 is a view similar to Fig. 4, showing the sleeve and its contained cables helically twisted to form a splice therebetween.

Referring now more particularly to the drawings, wherein is shown the preferred embodiment of my improved cable-splicing tool, I show a sleeve-twister including a hingedly connected gripping jaw assembly A and a set of opposing sleeve receiving crimping dies B removably dovetailed in the respective jaws of the assembly A, the whole being adapted to be operatively applied for twisting movement to a cable-sleeve C, and its contained cables, the latter appearing as best seen in Fig. 4, prior to, and in Fig. 5, subsequent to, the twisting operation.

The gripping jaw assembly A may include a body member 1 and a swingable member 2 having one or its hinged end bifurcated to form a yoke 3 receiving a lug 4, laterally presented from the body member 1, for pivotal movement about a transverse pin 5 passed through said yoke 3 and lug 4. Pivoted on a pin 6 disposed transversely in a slot 7, in the body member 1, and in lateral adjacence to the free end 8 of the hinged member 2 for swingable movement in a slot 9 in said end 8, is a clamp bolt 10 threaded to a clamp-nut 11, handled as at 12, for releasably pressing

or clamping together the jaws 1, 2 of the jaw assembly A. Having inclined shoulders or abutments 13 adapted to contact the inclined side walls of, and replaceably slidable in, the transverse dovetailed slots 14 provided in opposing relation in the respective jaw members 1, 2 and further adapted to be secured therein by threadedly engaging as at 15′ suitable fastening elements or screws 15 mounted through the respective jaw members, is a pair of cable-sleeve-receiving co-actingly opposed crimping members or die-blocks 16, each pair of die-blocks forming one, or a set, of die assemblies B associated with the jaw assembly for the reception of different sizes of sleeves C, and their contained cables, as will presently appear.

Transversely disposed in each of the opposing faces of the die-blocks 16 for complementary registration are a plurality or preferably a pair of conjoined grooves 17, conforming to the cables contained in the sleeve C, the conjoined wall or walls 18 of adjacent grooves being preferably rounded to prevent cutting the sleeve C on crimping action of the die assembly B thereon. Endwise presented, from the opposite ends of the body member 1, for manipulation of the sleeve twister, and threaded as at 19 preferably adjacent to each body member 1 for detachable presentment thereon of extension handle sleeves 20, are handle members 21, said handles 20, 21 preferably having knurled grips as suggested at 22.

To illustrate one use of my invention, I show a cable-sleeve C of preferably ductile material, as copper or aluminum, adapted to receive in lapped adjacence, for example, a pair of wires or cable ends, or like spliceable members 23, as suggested in Fig. 4; the sleeve C and its contained cables 23 being then twisted or over laid to form a helically wrapped splice therebetween, best seen in Fig. 5.

In the use of my invention, the nut 11 is backed off the bolt 10 suitably to permit swinging movement thereof to clear the seat 9 in the hinged member 2 of the jaw assembly A, for pivotal movement of the same about the pin 5 to open the jaws for the registrative reception of the sleeve C and its contained cables between the die blocks 16.

Thus disposed, the sleeve C and its contained cables 23 are clamped between the jaws 1, 2, by suitable manipulation of the handled nut 11 on the bolt 10, the edges 18 of the respective die-blocks 16 at the same time crimping or embedding the sleeve material around and between the cables 23, as suggested at 24 in Fig. 5.

Preferably, the sleeve-twisters are used in pairs, one of my improved sleeve-twisters being disposed or clamped on each of the opposite ends of the sleeve C, thereafter the respective sleeve-twisters may be turned in opposite directions to twist the sleeve and wind its contained cables in a helix, as suggested at 25 (Fig. 5), thus firmly splicing the cables, in the sleeve.

For greater effectiveness and least effort in performing the twisting operation, I prefer to employ the handle extensions 20 mounted on the handles 21, but in restricted quarters or for other like reasons, it may be preferable to remove the extensions 20 and manipulate the device by means of the shorter handles 21.

The grooves 17 may have any desired contour or shape in cross-section, such as square or rectangularly oblong or semi-circular, although I prefer to employ, and have shown, conjoined grooves having a semi-circular cross-sectional outline, and the die-blocks may be made of aluminum, copper or other suitable material, although I prefer to employ aluminum dies for the larger sizes, and copper dies for the smaller sizes, of cable to be spliced.

The cables 23 may have varying shapes and diameters, and may be single or stranded wires. The size and shape of the sleeve C, therefore, is accommodated to the size and shape of its contained cable elements 23, thus the sleeve C may have the so-called "double-barrel" shape, or it may have an oval cross-section, which latter is suggested in the drawings to illustrate one commercial type of such a sleeve.

In actual practice, I have found that best results and the most effective splices are obtained when the sleeve C is properly and firmly gripped and crimped on its contained cables or wires 23 prior to the twisting operation. I, therefore, provide the die-blocks 16 in pairs or sets B, as described, and sets of different sizes may be used, one at a time, in the same jaw assembly, the sets of die blocks being adapted to be readily inserted or removed from the jaw assembly A as conditions may require; each of the several sets B preferably embodying grooves 17 having a shape and disposition suitable to the form and dimension of the several sleeves and contained cables intended from time to time to be spliced. Thus the operator or operators may carry, for example, only two jaw assemblies A, but several sets of dies B, of different sizes, with resulting economies in weight and expense, over the practice heretofore prevailing.

It will be understood that the preferred embodiment hereinbefore described, represents only a single example, and is submitted in compliance with statutory requirements. The preceding description will be understood in a descriptive and not in a limiting sense, except as defined by the appended claims.

I claim as my invention:

1. In a cable-splicing tool, a clamping means, a cable gripping means forming seats

for a plurality of laterally adjacent cables, extending crosswise of the tool, means for removably mounting said gripping means in said clamping means, including a mortise connection adapted relatively to position the gripping and clamping means.

2. In a cable-splicing tool, a pair of clampingly swingable jaw-members, a pair of coactingly opposed cable-sleeve-receiving die blocks removably mounted in the respective jaw-members, a threaded holding member for detachably securing each die block in its associated jaw member, and means constituted by the jaw members and blocks, for positioning the blocks in the jaw members independently of said holding members.

3. In a cable-splicing tool, a cable-containing sleeve receiving die assembly, a clamping means supporting said die assembly for gripping movement on said sleeve, said clamping means including a pair of jaws, oppositely extended handles on one jaw, a pivot on said jaw for hingedly relating the paired jaws, a screw clamp swingably carried by the handled jaw, and means on said die-assembly for crimping said sleeve to its contained cables on said gripping movement.

4. In a cable-splicing tool, a pair of die blocks adapted to be grippingly mounted on one end of a cable splice, a pair of clamping jaws having outwardly flared apertures for receiving and operatively engaging said die-blocks for twisting action thereof, said clamping jaws including a pair of opposite endwise presented handles formed integrally with one of said jaws in alignment therewith, and a threaded handle extension for each of said handles.

5. In a cable-splicing tool adapted to grip a cable-splicing sleeve and its contained cables, a die-assembly including a pair of coactingly opposed die-blocks, each being tapered from its rear side to the face, and each having on its face portion a pair of parallel grooves conforming to the cables in the sleeve, and a portion presentable into the sleeve between the cables for crimping action thereon.

6. In a cable-splicing tool, a pair of separable clamping jaws, provided with registrable slotted portions, a swingable member carried by one of said jaws, and arranged for movement in the slotted portions of both jaws, and a pressing member coacting with said swingable member for engagement with the other of said jaws when said slotted portions are substantially in registering relation.

7. In a cable-splicing tool, a pair of clamping jaws including a body member and a hinged member pivoted to the body member, said hinged member having its free end bifurcated, said body member having a recess adjacent to the free end of the hinged member, a swingable member mounted in said recess for receptive movement in said bifurcated end, and a handled member threaded to said swingable member for pressing engagement with said hinged member.

8. In a cable-splicing tool, a pair of swingable jaws, a cable-containing-sleeve receiving die assembly removably inserted in said jaws, said die assembly including a pair of coactingly opposed die-blocks dovetailed in self-supporting relation in the respective jaws, and having conjoined grooves conforming to the cables contained in said sleeve, the conjoined wall of adjacent grooves being adapted to crimp said sleeve on its contained cables, and clamping means associated with said jaws for gripping said sleeve in said die-assembly, and maintaining the jaws in gripping relation about the sleeve.

9. In a cable-splicing tool, a pair of clamping jaws including a body member and a hinged member pivoted to the body member, a clamping device swingable relative to the body member for releasable clamping engagement with said hinged member, oppositely disposed handle members formed on and endwise presented from said body member in substantial alignment therewith, a handle extension member threadedly sleeved on each of said handle members, and a cable-containing sleeve-receiving die-assembly removably associated with said clamping jaws, the jaws and die assembly being formed to position the die assembly in self-supporting relation in the said jaws.

10. In a cable-splicing tool adapted for engagement with a cable-splicing sleeve and its contained cables, a sleeve receiving die-assembly including a body member having handles formed on its opposite ends, a jaw portion between said handles, a second jaw portion mounted for swinging movement on said body member, a pair of die-blocks carried by said jaw portions and arranged so as to be registerable for coacting opposition on said sleeve, each of said die-blocks having a pair of conjoined grooves conforming to the cables contained in said sleeve, the conjoined wall of adjacent grooves being adapted to contact the adjacent wall of said sleeve for crimping action thereupon, and pressing means, including said jaw portions, removably receiving said die-assembly for clamping action thereupon.

11. In a cable-splicing tool adapted for engagement with a cable-splicing sleeve and its contained cables, a sleeve receiving die-assembly including a pair of die-blocks registerable for coacting opposition on said sleeve, each of said die-blocks having a pair of conjoined grooves conforming to the cables contained in said sleeve, the conjoined wall of adjacent grooves being adapted to contact the adjacent wall of said sleeve for crimping action thereupon, and pressing means removably receiving said die-assembly for clamping action thereupon, said pressing means

comprising a pair of clamping jaws including a body member and a hinged member pivoted to the body member, a clamping device swingable relative to the body member for releasable clamping engagement with said hinged member, oppositely disposed handle members endwise presented from said body member, a handle extension member threadedly sleeved on each of said handle members, said clamping jaws having in each of their opposing faces a transverse dovetailed slot, said die-blocks each having included shoulders adapted for slidable insertion in said slots, and fastening elements passed through each of said clamping jaws and threaded to the respective die-blocks.

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