Aug. 21, 1934. C. E. SMITH 1,970,983

PLIERS

Filed Oct. 10, 1932

FIG. 3.

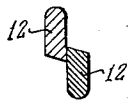


FIG. 1.

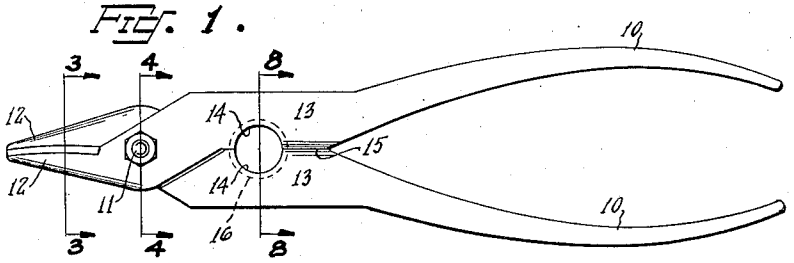


FIG. 2.

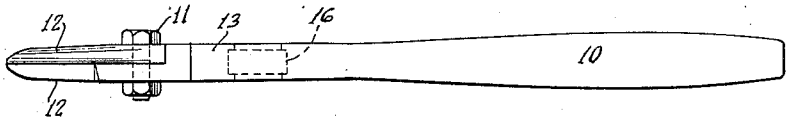


FIG. 7.

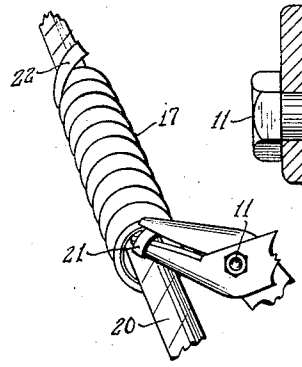


FIG. 4.

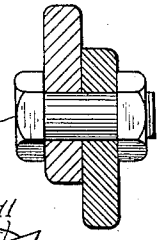


FIG. 8.

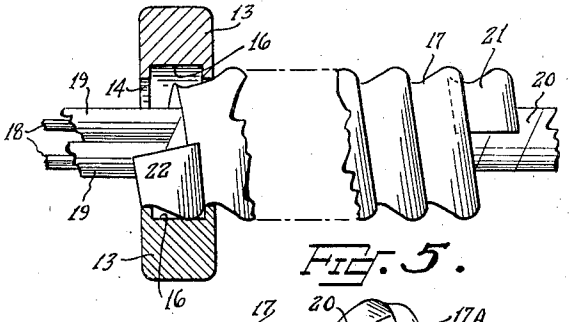


FIG. 5.

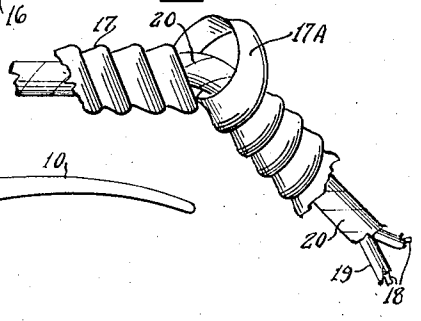
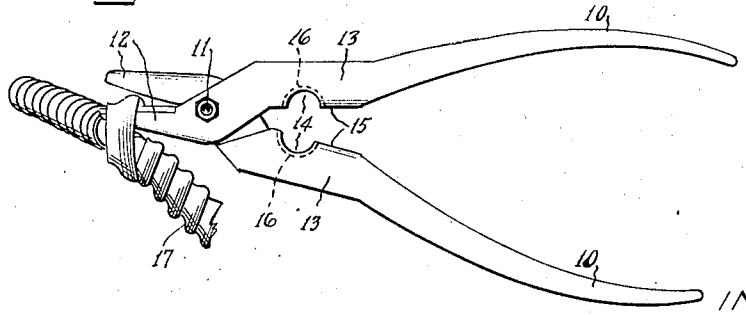


FIG. 6.



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PLIERS

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2 Claims. (Cl. 7—3)

This invention relates generally to electricians' tools, and particularly to a plier especially adapted for cutting and forming B—X conduit.

The main object of this invention is the provision of a special form of plier by means of which either end of a piece of B—X conduit can be cut and formed with the minimum amount of skill and effort in order that appropriate fittings may be properly installed at each end of the conduit.

The second object is the elimination of all danger of abrading the insulated wires contained within the conduit during the cutting operation.

The third object is to construct a plier for the purpose mentioned which will be inexpensive to manufacture, light in weight and duplicate in parts.

These, and other objects, will become more apparent from the specification following as illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevation showing the plier closed.

Fig. 2 is a plan of Fig. 1.

Fig. 3 is a section taken along the line 3—3 in Fig. 1.

Fig. 4 is a section taken along the line 4—4 in Fig. 1.

Fig. 5 is a fragmentary elevation of a section of B—X conduit, showing the manner of exposing the armor to the cutting action of the plier.

Fig. 6 is a perspective view showing the cutting operation.

Fig. 7 illustrates the cutting of the surplus armor from one end of the conduit.

Fig. 8 is a section taken through the plier along the line 8—8 in Fig. 1 showing same re-forming the outer wrap and showing the inner wrap which has been previously restored at the opposite end of the section of conduit.

Similar numbers of reference refer to similar parts throughout the several views.

Before entering into a detailed description of this invention it must be understood that B—X conduit as commonly used for protecting electrical conduits has a very serious drawback, namely the difficulty in cutting the conduit to the desired length without destroying the shape of same, and having so destroyed the shape it is exceedingly difficult to restore same to its original condition.

The common practice is to use a hack saw for the purpose. This, however, leaves a sharp tip which interferes with the insertion of the insulating bushing and encourages the omission of same, and the consequent danger of a short circuit due to the sharp point piercing the insulation around the wire. Furthermore, the use of a hack saw is not always practiced by experienced and careful hands, in many instances it being found that the saw which severs the armor also partially or entirely severs the wires contained therein, and the particles of metal coming from the saw or the direct contacting of the bared wires complete the short circuit, which is of course objectionable.

It is to overcome the objections above named and also to place within reach of every electrical operator an inexpensive efficient tool for cutting and forming B—X conduit, that the plier which I am about to describe has been constructed.

Referring in detail to the drawing, there is shown a form of plier whose handles 10 hinge about a bolt 11 and terminate in the slender shearing blades 12. Between the handle portions 10 and the bolt 11 is a somewhat enlarged forming section 13 having semi-circular recesses 14 formed in the adjacent faces 15 of the portions 13. It is desirable that the recesses 14 be somewhat less than a semi-circle in order to provide a better forming action. It will be noted that the recesses 14 are provided with the counterbored portions 16.

Referring now to the B—X cable, same will be seen to consist of a spirally wound metal strip 17 whose cross section is somewhat in the form of an S curve. Within the conduit thus formed is a pair of insulated wires 18 whose separate covering 19 is wrapped in an enclosing tape 20. This armored cable is in common use and in many localities must be employed for all forms of house wiring.

As stated, the difficulty has been in the past to cut this cable to the desired length without altering its shape. The dealer in selling this armored cable is not interested in its exact length and therefore uses a bolt cutter, or any other suitable cutting device, for severing the cable, but the electrician when installing the cable must have the ends thereof perfectly formed, as shown in Fig. 8, in order that he may properly apply the insulating bushings preparatory to the attachment of the usual fittings by means of which the cable ends are fastened to a knock-out opening at the point of attachment.

The operation of the device is as follows: When it is desired to cut off a piece of the armored cable it is first bent sharply and then twisted, in order to cause a portion 17—A to stand out away from the tape 20. It is now a simple matter to pass one of the blades 12 between the portion

17—A and the tape 20 and shear the portion 17—A in two. The same blades 12 are employed to cut the wires 18 at the desired place.

The armor 17 is further shortened, if desired to expose a sufficient amount of wires 18, and the inner wrap 21 is merely grasped between the ends of the blades 12 without exerting enough pressure to cut same and turned into position (as shown in Fig. 3). The outer wrap 22, however, is sprung away from the main helix of the armor and is restored to the shape shown in Fig. 8 by grasping same within the recesses 14 and bringing pressure to bear on the handles 10, thereby producing an end which is admirably adapted to receive the insulating bushing.

From the foregoing it will be seen that by the use of this simple and inexpensive device the problem of cutting and re-forming B—X conduit is easily and satisfactorily solved. By making the recesses 14 somewhat less than a semi-circle an improved forming action will be obtained, as can be readily understood.

It will also be noted that by rounding the backs of the blades 12 it is impossible to injure the insulation which protects the wires 18.

I claim:

1. A tool for severing the helically wound flexible metal armor of electrical cables without injuring the insulated conductors therein, consisting of two mating levers pivotally connected near one end, each lever being reduced in thickness by one-half, adjacent the fulcrum and forwardly thereof to the nose or tip to provide overlapping portions including slender tapered shearing blades, the bearing surfaces or faces of said overlapping portions being flat, said shearing blades having wide, laterally sloping cutting faces, the cutting edges of which are substantially radial with respect to the fulcrum or pivot, and the angle between the outside or back of each slender shearing blade and its cutting face being small whereby the nose or tip of one of the shearing blades can be inserted in a small radius loop of the armor and thus leave only a short end of the armor to be rebent.

2. A tool for severing the helically wound flexible metal armor of electrical cables without injuring the insulated conductors therein, consisting of two mating levers pivotally connected near one end to provide jaws on both sides of the fulcrum, said levers having handle portions merging into elongated heavy shank portions, each lever being reduced in thickness by one-half, adjacent the fulcrum and forwardly thereof to the nose or tip to provide overlapping portions including slender tapered shearing blades, the bearing surfaces or faces of said overlapping portions being flat, each shank having a full width portion roughly trapezoidiform, the smaller bases of the two trapezoids facing each other and being of sufficient length to provide space for the forming therein of a grooved die to receive the armored cable, said shearing blades having wide, laterally sloping cutting faces, the cutting edges of which are substantially radial with respect to the fulcrum or pivot, and the angle between the outside or back of each slender shearing blade and its cutting face being small whereby the nose or tip of one of the shearing blades can be inserted in a small radius loop of the armor and thus leave only a short end of the armor to be rebent.

CLINTON E. SMITH.