May 1, 1951 S. H. UNDERHILL 2,551,401

PLIER CONSTRUCTION FOR CUTTING ELECTRIC ARMORED CABLE

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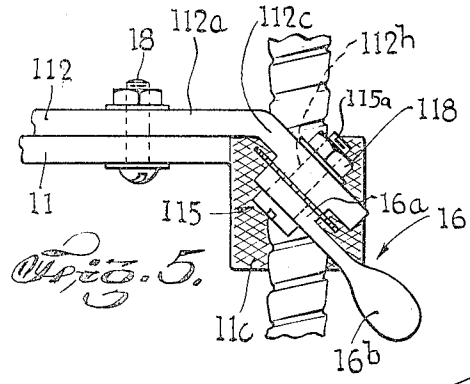


Fig. 5.

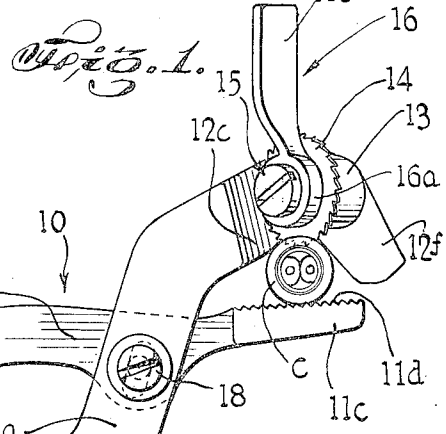


Fig. 1.

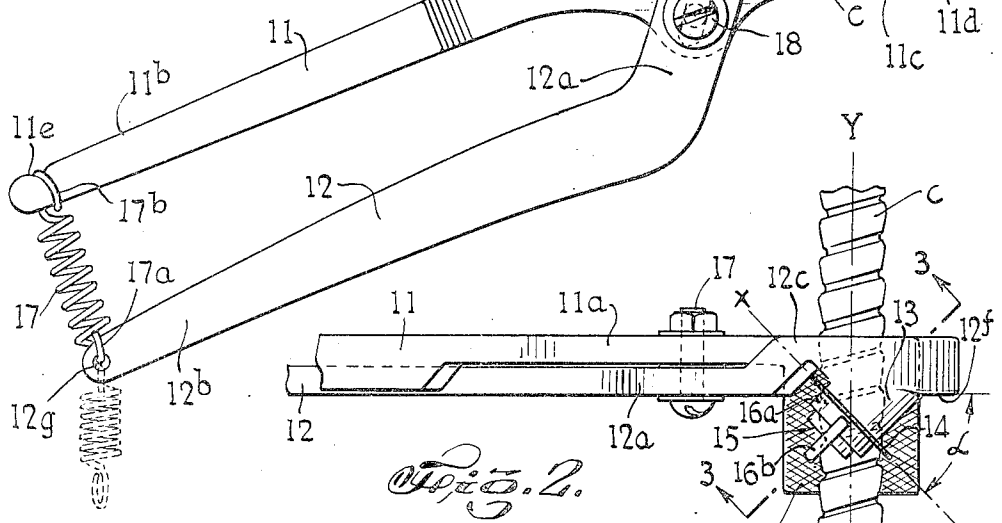


Fig. 2.

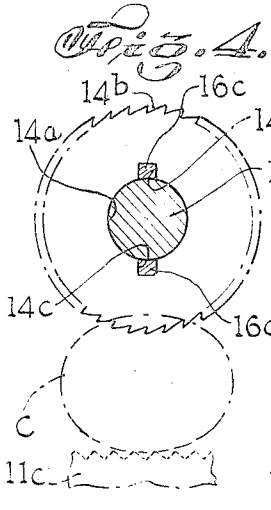


Fig. 4.

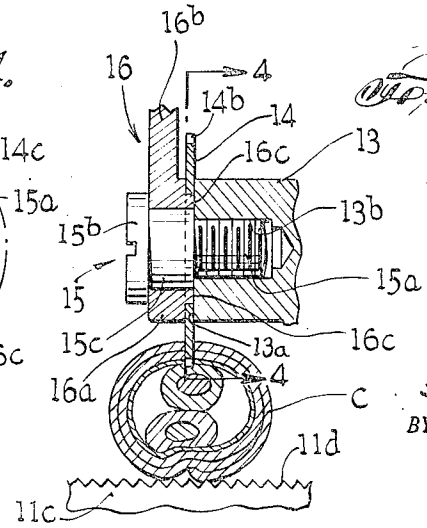


Fig. 3.

INVENTOR.
SAMUEL H. UNDERHILL
BY
Louis Barnett
ATTORNEY

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PLIER CONSTRUCTION FOR CUTTING ELECTRIC ARMORED CABLE

Samuel H. Underhill, Oyster Bay, N. Y.

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3 Claims. (Cl. 29—75)

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This invention relates to manually operated cutting or severing devices, and more particularly to an improved plier construction for cutting electric armored cable, such as used in wiring buildings and the like.

Among the objects of the invention is to provide a tool construction of the character described which shall facilitate the cutting of armored sheath of electric "BX" cable such as commonly used in wiring installation of buildings, particularly for use in close and inaccessible quarters, which shall comprise few and simple parts that are readily assembled, which shall be relatively inexpensive to manufacture yet rugged to withstand rough usage, which shall be easy to manipulate, and which shall be efficient and practical to a high degree in use.

Other objects of the invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists of features of construction, combination of elements and arrangements of parts which will be exemplified in the construction hereinafter disclosed, the scope of the application of which will be indicated in the claims following.

In the accompanying drawing in which one embodiment of the invention is shown,

Fig. 1 is a side elevational view of the armored cable cutting plier constructed to embody the invention showing the plier-jaws clamping a "BX" cable in cutting position.

Fig. 2 is a fragmentary top view of the improved cable cutting plier shown in Fig. 1.

Figs. 3 and 4 are enlarged cross-sectional views taken on lines 3—3 in Fig. 2 and lines 4—4 in Fig. 3, respectively, showing details of the cutter blade mounting, and

Fig. 5 is a fragmentary top view similar to Fig. 2 showing a modified construction embodying the invention.

Referring in detail to the drawings, 10 denotes cutting or severing plier of the character described for use on "BX" type of an armored cable C constructed to embody the invention. Said plier 10 is seen to comprise a pair of lever members 11 and 12 secured together for relative movement by suitable means, such as pivot bolted connection 13 at cross-over or mid-portions 11a and 12a, respectively, between hand grip portions 11b and 12b, respectively, and clamping jaws 11c and 12c, respectively.

Lever hand grip portion 11b may be substantially straight and is formed with said mid-portions 11a as an intermediate offset across which said mid-portion 12a provides a complementary intermediate offset to bring clamping jaw 12c over jaw 11c when hand grip portion 11b is over grip portion 12b, as shown in Fig. 1.

Lever mid-portion 12a may have a greater degree of offset than said mid-portion 11a, and jaw 11c which terminates lever mid-portion 11a may have a flat plate-like shape which is considerably wider than the rest of said lever member 11, preferably being greater in width than the diameter of the armored "BX" cable C to serve as a support therefor. Said jaw 11c may be provided with a knurled contact surface 11d for frictionally retaining said cable C against slipping when in effective clamping position.

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Lever intermediate or mid-portion 12a terminates in jaw 12c that may be hook-shaped, said jaw 12b lying in angular displacement with respect to intermediate mid-portion 12a so as to bring in close axial alignment lever member 12 with lever member 11, as shown in Fig. 2.

Integrally formed to project at an angle and from the plane of a side 12f of said hook-shaped jaw 12c adjacent the crook thereof to extend over jaw 11c, a boss 13 is provided against a flat side 13a of which is mounted a circular saw blade 14 having peripheral teeth 14a. Said boss 13 may have a threaded opening 13b bored into flat side 13a thereof at said angle α with respect to the plane of jaw side 12f to receive threaded end 15a of a screw stud 15. The latter has a slotted head 15b for engaging a screwdriver (not shown), and an intermediate shouldered section 15c of larger diameter than threaded stud end portion 15a.

Circular saw blade 14 may be provided with an axial opening 14a fitted to rotate on stud shoulder 15c in abutting position with boss flat side 13a. In order to manually give said blade 14 rotating or oscillating movement for causing the teeth 14b to cut the armor of cable C, a finger grip fitting 16 formed with a collar 16a having integral radially extending handle 16b may also be mounted to rotate on the shoulder 15c between stud head 15b with the blade 14. The latter is secured to turn with collar 16a and handle 16b of fitting 16 by suitable means, such as integrally formed spaced projecting keys 16c engaging in complementary slots 14c provided in opening 14a of blade 14 for rigidly holding the latter to the fitting collar 16a in assembly as shown in Fig. 3. Stud shoulder 15c is made to correspond to the combined width of the collar 16a and the blade 14 and permits their free pivotal movement thereon when shoulder stud 15a is tightened up against the boss flat side 13a as shown in Fig. 3.

If desired the free end portion of lever hand grip portions 11b and 12b may be provided with suitable clamp retention means, as for example helical tension spring 17 formed into a looped structure having one end 17a thereof anchored by loosely passing through opening 12g in said grip portion 12b and having the other or loop end 17b engaging in a notch 11e of said grip portion 11b when in effective position to retain the pliers 10 from accidental release from the cable C as is clear from Fig. 1. In the latter, dotted lines of said spring 17 are shown in position for releasing the pliers 10 from effective gripping position.

In practicing the invention, with pliers 10 con-

structed and assembled as described above and shown in the drawing, a "BX" type armor cable C may first be placed between jaw contact knurled surface 11*d* and the crook of hooked jaw 12*c* and then hand pressure applied to grip portions 11*b* and 12*b* of levers 11 and 12 thereby clamping said cable C in proper position for cutting. Axis Y—Y of said cable C will then extend substantially at angle α with respect to the plane X—X of path of rotation of blade 14 and will locate the blade teeth 14*b* in plane X—X to start the cutting in a direction substantially at right angles to the pitch of the winding strip of the armor sheathing of cable C, that is, substantially transverse the length of the strip forming said cable armor sheathing with the cable C firmly secured in the crook of said hooked-shaped jaw 12*c* providing a three point clamp with said jaw 11*c* and directing the blade cutting pressure in a direction normal to jaw surface 11*d*, as shown in Figs. 1 and 2.

Then on stropping, that is, rotating or oscillating finger grip fitting 16 by handle 16*b* while retaining the hand grip pressure on said lever portions 11*b* and 12*b*, blade 14 will be caused to cut its way through the thickness of the cable coiled armor strip transversely across the length thereof, after which complete severance of the cable C at such cut can be had in the well understood manner. The cutting of the cable armor is thus readily accomplished leaving the severed ends in best possible condition for use.

Pliers 10 is particularly useful in close or restricted space or when such cutting must be performed from uncomfortable working positions. In such circumstances clamp retention means provided in the plier construction will be found desirable, to which end tension spring 17 may be moved from the dotted line position shown in Fig. 1, stretched to engage the end 17*b* thereof in said notch 11*e* thereby preventing the detachment of pliers 10 from cable C should the hand grip on portions 11*b* and 12*b* be accidentally released.

In Fig. 5 a modified construction of the invention is shown in which clamping jaw 112*c* terminating mid-portion 112*a* of lever member 112 and corresponding to clamping jaw 12*c* of pliers 10 described above, is made by offsetting clamping jaw 112*c* with relation to said mid-portion 112*a* to eliminate the necessity of providing an angular offset boss like that shown in Figs. 1, 2 and 3 for pliers 10. The screw stud 115 may be similar to stud 15 except for an extended threaded portion 115*a* mounted in a through opening 112*h* of jaw 112*c* and secured in position by nut 118. Lever member 112 may thus be simplified and made to operate and serve in the same manner as described above.

It will thus be seen that there is provided plier constructions for cutting armored cable whereby the several objects of this invention are achieved and which are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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

1. A severing plier of the character described for use on armored cable having a wound sheathing strip comprising a pair of aligned lever members pivotally interconnected for relative movement in crossed relation to provide coacting hand grip portions and clamping jaws, the latter integrally formed with said grip portions to terminate said lever members beyond said pivotal interconnection, one of said jaws having a flat knurled surface to grippingly support said cable, the other of said jaws being hook-shaped and formed to partially surround said cable and grippingly retain the latter in partially flattened cross sectional shape between said jaws with the axis of the cable extending at substantially right angles to said lever members for severing said cable sheathing strip on said flattened cross sectional shape, a cutting blade carried by said hook-shaped jaw, means mounting said cutting blade on said hook-shaped jaw, and a stud secured in said hook-shaped jaw for rotatably supporting thereon said cutting blade for pressure on cable between the latter and said flat knurled surface in an angular relation to said axis of the gripped cable corresponding to the pitch of the wound shealthing strip thereof, and finger manipulating means to oscillate said blade on the stud for severing said sheathing strip transverse the cable axis.

2. A severing plier as defined in claim 1, in which said blade has a cutting edge positioned to move in a path in substantially parallel alignment with the longitudinal axis of said hook-shaped jaw, the latter being offset at an angle to said lever hand grip portions to bring said blade cutting edge in position effective to sever said sheath strip transverse thereof.

3. A severing plier of the character described for use on armored cable having a wound sheathing strip comprising a pair of aligned lever members pivotally interconnected for relative movement in crossed relation to provide coacting hand grip portions and clamping jaws integrally formed with said gripping portion to terminate said levers beyond said pivotal interconnection, one of said jaws having a flat knurled surface to grippingly support said cable, the other of said jaws being hook-shaped and formed to partially surround said cable and grippingly retain the latter in a partially flattened cross sectional shape between said jaws with the axis of the cable extending at substantially right angles to said lever members, a circular shaped cutting blade carried by said hook-shaped jaw, for severing said cable sheathing strip on said flattened cross sectional shape, means for mounting said cutting blade on said hook-shaped jaw including a boss integrally formed on the latter, a stud secured in a relatively fixed position with relation to said boss for rotatably supporting said cutting blade in angular relation to said axis of the gripped cable corresponding to the pitch of the wound sheathing strip thereof for transverse severing of said strip, and finger manipulating means attached to said cutting blade for oscillating same on said stud to sever said sheath.

SAMUEL H. UNDERHILL.

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