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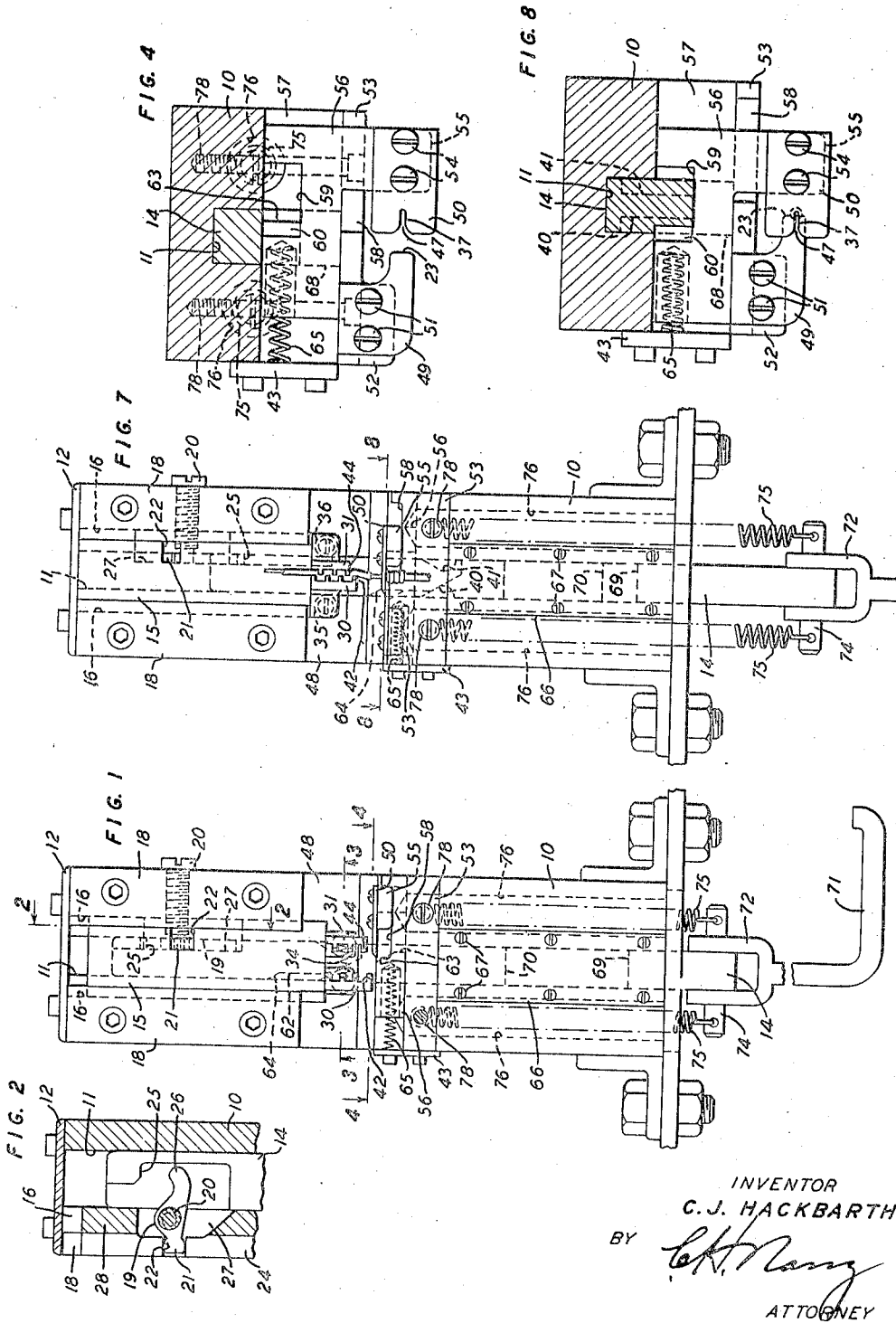
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2,338,508

APPARATUS FOR TREATING SHEATHED ARTICLES

Filed Feb. 24, 1942

4 Sheets-Sheet 1



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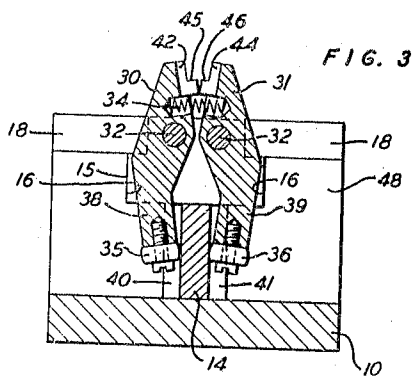
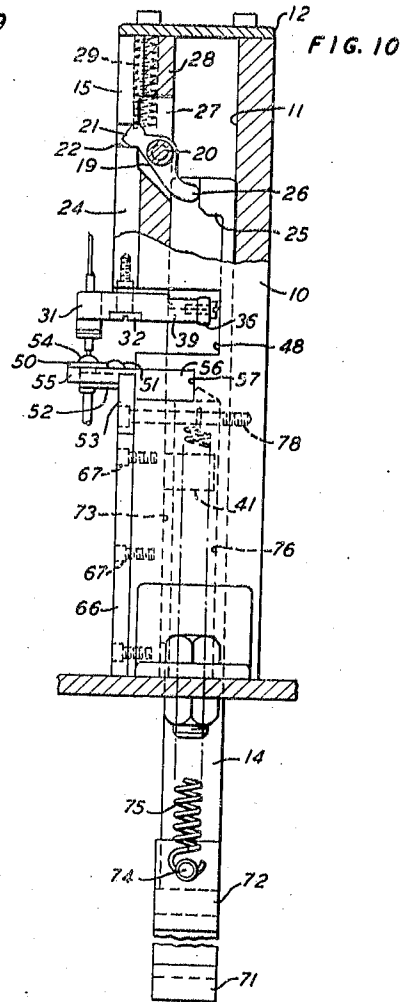
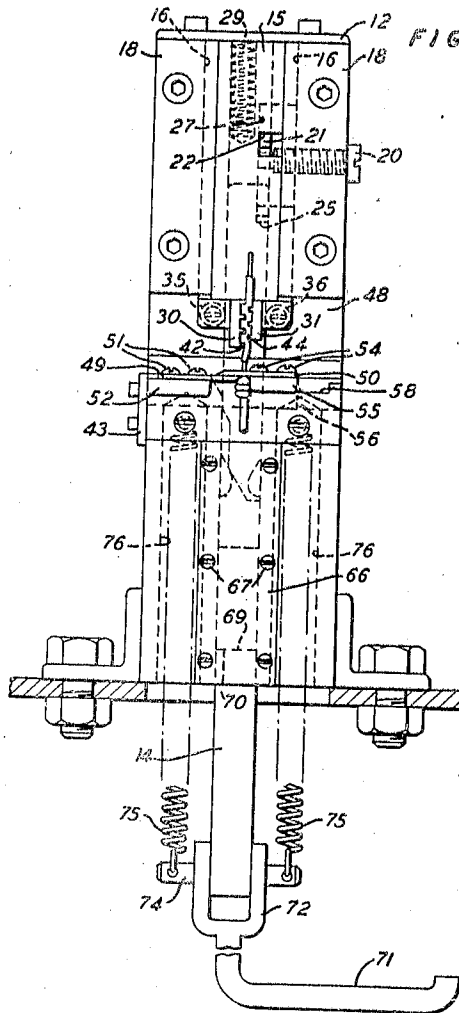
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4 Sheets-Sheet 2



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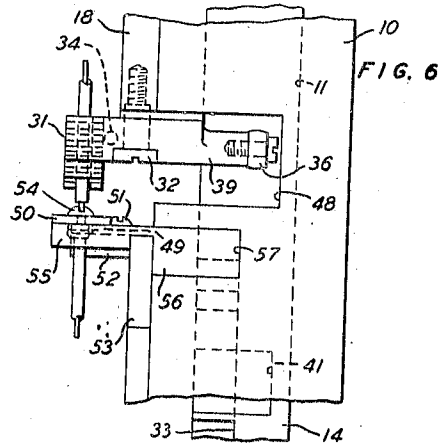
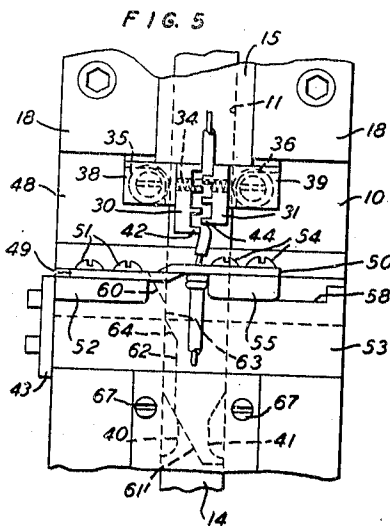
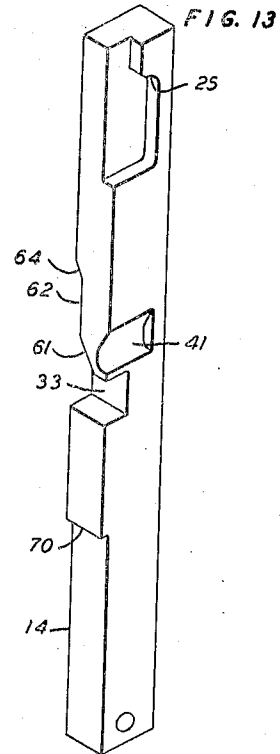
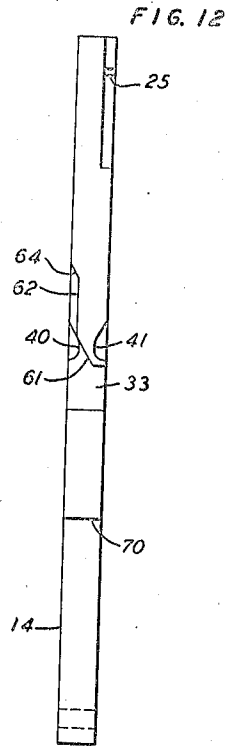
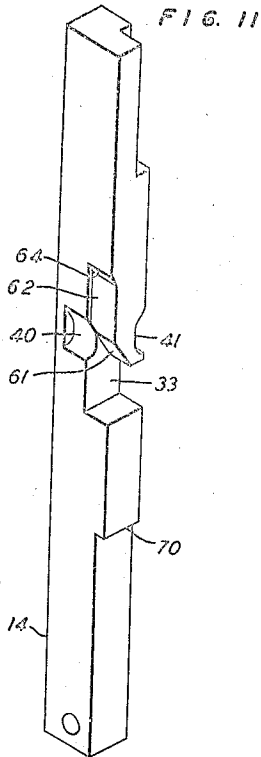
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APPARATUS FOR TREATING SHEATHED ARTICLES

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4 Sheets-Sheet 3



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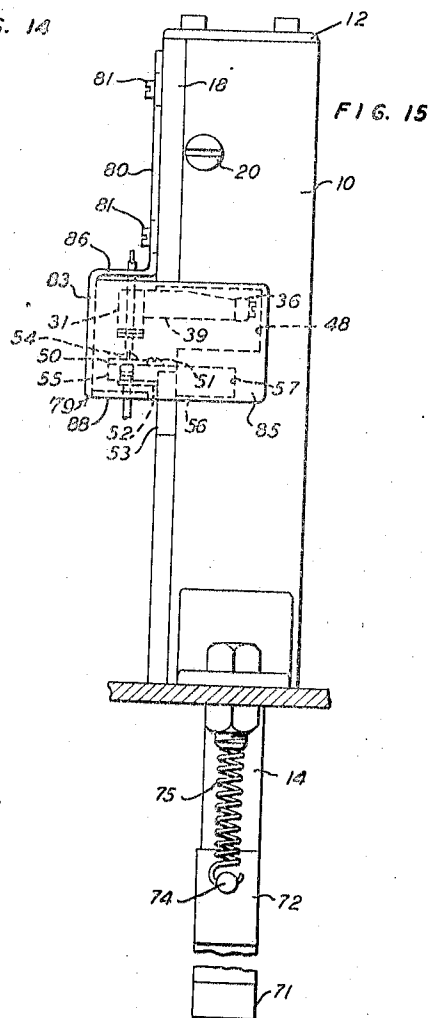
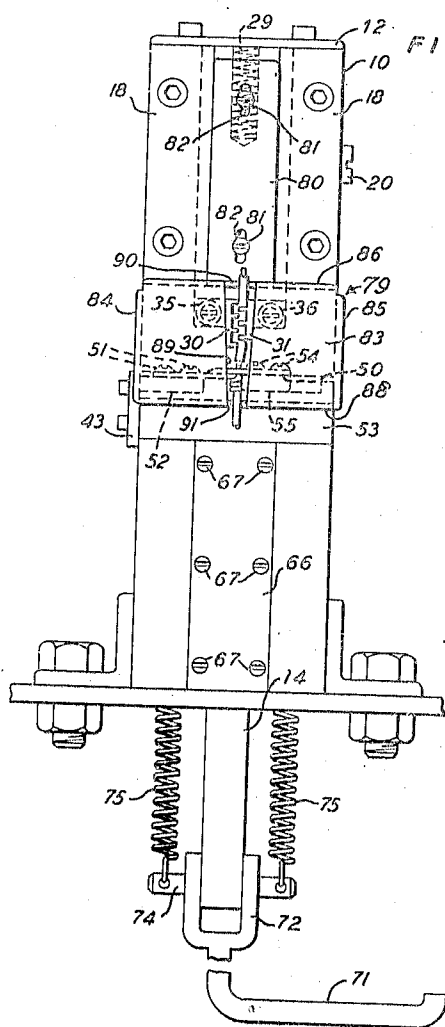
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UNITED STATES PATENT OFFICE

2,338,508

APPARATUS FOR TREATING SHEATHED ARTICLES

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6 Claims. (Cl. 81—9.51)

The invention relates to apparatus for treating sheathed articles and more particularly to apparatus for dead-ending insulated conductors.

In the manufacture of certain telephone cords having a plurality of insulated conductors enclosed within a textile or rubber sheath, it has been found advantageous to make one or more of the conductors within the sheath dummy conductors. In order to obviate any possibilities of these dummy conductors contacting any metal objects or parts of the cord and becoming grounded so as to interfere with the operation of the cord, it is necessary to insulate the tips of these conductors in some manner. This was done at first by bending the tips of the dummy conductors back over the end or the collar of the sheath at the point where the insulated conductors emerge from said sheath and securing them in place with a textile binding.

This operation consumed so much time that a different expedient was adopted, namely, that of dipping the tips of the dummy conductors in an insulating compound to form a protective globule of the compound on each tip. However, when this procedure was followed, it was necessary to allow the insulating compound time to dry before the cord could be handled further.

The desire to reduce the time required to insulate the tips of the dummy conductors lead to the practice of dead-ending these conductors, that is, retracting the insulation from the tip of a conductor, severing the conductor at a point from which the insulation has been withdrawn, and returning the retracted insulation to its former position beyond the shortened end of the conductor. Since there was no automatic device available for performing this operation and manual performance of the operation was slow and gave non-uniform results, the apparatus which constitutes the present invention was devised.

An object of this invention is to provide new and effective apparatus for operating upon sheathed articles.

In general the invention comprises an apparatus having means for gripping a sheathed article and a cutter for severing the sheath. While the gripping means grips the sheathed article, it is moved away from the cutter in such a manner as to retract the sheath from a portion of the article. The cutter is then further actuated to sever the article at a point from which the sheath has been withdrawn.

Additional features and advantages of the invention will become apparent from the following detailed description of a specific embodiment

thereof, when read in conjunction with the accompanying drawings, in which

Fig. 1 is a front elevation of a dead-ending device in its normal position;

Fig. 2 is a fragmentary sectional view of the device taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view of the device taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view of the device taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged fragmentary front elevation of the device in its final position;

Fig. 6 is an enlarged fragmentary side elevation of the device in its final position;

Fig. 7 is a front elevation of the device in an intermediate position;

Fig. 8 is an enlarged sectional view of the device taken on the line 8—8 of Fig. 7;

Fig. 9 is a front elevation of the device in its final position;

Fig. 10 is a side elevation of the device in its final position and having a portion thereof broken away;

Fig. 11 is a perspective view of a cam rod forming a part of the device;

Fig. 12 is a perspective view of the cam rod taken at a right angle to the view shown in Fig. 11;

Fig. 13 is a perspective view of the cam rod taken at 130° angle to the view shown in Fig. 11;

Fig. 14 is a fragmentary front elevation of a modified form of the device;

Fig. 15 is a fragmentary side elevation of the device shown in Fig. 14;

The particular embodiment of the invention disclosed in the accompanying drawings is designed to dead-end the insulated conductors of a sheathed, multi-conductor telephone cord at a point slightly beyond a collar placed over one end of the sheath.

In this embodiment, the body of the device consists of an elongated metal block 10 having a slot 11 cut through it lengthwise. The block 10 may be mounted upon any suitable support in any manner not interfering with the operation of the device. A plate 12 fastened to the top of the block 10 closes one end of the slot 11 in which a cam rod 14 (Figs. 11, 12, 13) is slightly positioned. A slide 15 is slidably held by plates 13—13 connected to the block 10 against shoulders 16—16 formed in the block 10 at the edges of the upper portion of the slot 11. A dog 19 (Fig. 2) is pivotally mounted on the tip of a bolt 20 threaded into the block 10 and has an end 21 resting within an aperture 22 formed in an ex-

tended portion 24 of the slide 15. The lowering of the cam rod 14 from its normal position as shown in Fig. 1, and consequent engagement of a cam surface 25 formed on the cam rod 14 with the other end 26 of the dog 19, raises the opposite end 21 of the dog and imparts an upward movement to the slide 15. The body 23 of the slide 15 is cut away as shown at 27 in Fig. 2 to permit the dog 19 to pivot freely. A spring 29 returns the slide 15 to its normal position as shown in Fig. 1.

A pair of jaws 30 and 31 (Fig. 3) are pivotally mounted upon the lower end of the slide 15 by means of screws 32—32. A spring 34 urges the jaws 30 and 31 apart, thus forcing rollers 35 and 36, which are rotatably attached to legs 38 and 39 of the jaws 30 and 31, respectively, into cam sockets 40 and 41 (Fig. 12) formed in the cam rod 14. When the cam rod 14 is lowered from its normal position, the rollers 35 and 36 ride out of the cam sockets 40 and 41 and cause the jaws 30 and 31 to pivot inwardly, so that teeth 42 and 44 formed on the jaws 30 and 31, respectively, will grip a rubber covered conductor positioned therebetween. It is important to prevent relative movement between those portions of the insulation and the conductor held within the jaws 30 and 31 and this is especially difficult to do when the insulation is freely movable on the conductor. The teeth 42 and 44 are offset in order to crimp an insulated conductor gripped therebetween and thus prevent longitudinal sliding of the conductor within the insulation. Lugs 45 and 46 formed on the teeth 42 and 44 respectively, prevent the operator of the device from forcing the conductor to be dead-ended against the spring 34 so as to cause the jaws to jam. A section of the block 10 is cut away to provide a space 48 in which the jaws 30 and 31 may operate freely.

The device is provided with cutting means (Figs. 4, 5, 6, and 8) which comprises a stationary blade 49 and a movable blade 50 which have sharply beveled cutting edges, 23 and 37, respectively. The blade 49 is attached by means of screws 51—51 to a lug 52 formed on a plate 53 connected to the block 10. The movable blade 50 is secured by means of screws 54—54 upon a lug 55 formed on a block 56 which is slidably mounted in a slot 57 cut in the block 10. The blade 50 has a slot 47 in its cutting edge 37, which is of a width just slightly greater than the diameter of the conductor. By advancing the movable blade 50 toward and over the stationary blade 49 as shown in Fig. 8, the insulated conductor is forced against the blade 49 causing it to sever the insulation in one direction, and the consequent forcing of this insulated conductor into the slot 47 causes the cutting edge 37 of the slot 47 to cut through the insulation of the conductor not severed by the blade 49.

The block 56 is held in the slot 57 cut in the block 10 by the plate 53 which has a portion 58 cut away to permit the lug 55 carrying the blade 50 to move freely in a horizontal direction. The block 56 has a slot 59 formed therein in such a manner as to provide an inclined cam surface 60. Normally the block 56 rests in an indented portion 33 of the cam rod 14, but when the cam rod 14 is lowered so as to bring a cam surface 61 formed thereon into contact with the cam surface 60, the block 56 is forced toward the stationary blade 49 until the cam surface 60 has ridden past the cam surface 61 and a verti-

cal cam surface 63 formed on the block 56 contacts a dwell 62 formed on the cam rod 14.

At this point the blades 49 and 50 are in the position shown in Fig. 8 and have cut through the insulation on the conductor, but have not severed the conductor itself. Further lowering of the cam rod forces the blade 50 farther in the direction of the stationary blade 49, as the inclined cam surface 60 rides up on a cam surface 64 found on the cam rod 14. When the cam surface 60 rides past the cam surface 64, the conductor is severed. A spring 65 based against a plate 43 which closes the one end of the slot 57 returns the block 56 to its normal position when the cam rod 14 is raised until the indented portion 33 of the cam rod 14 is once more opposite the block 56.

A plate 66 is fastened to the block 10 by means of screws 67—67 (Fig. 9) and has a guide block 73 (Fig. 10) extending inwardly therefrom co-extensive with a guide block 68 formed on the plate 53, which guide blocks prevent lateral movement of the cam rod 14 within the slot 11. The downward movement of the cam rod 14 is arrested when a shoulder 70 on the cam rod 14 contacts a stop 69 formed on the plate 66.

The cam rod 14 may be operated in any one of several ways, but in the particular embodiment of the invention shown in the drawings, it is operated by a foot-treadle 71 attached to the cam rod 14 through a yoke 72 and a pin 74 which extends through a hole in the cam rod 14. Springs 75—75 are attached at their lower ends to the pin 74 and extend through holes 76—76 drilled in the block 10 to screws 78—78 to which the upper ends of the springs 75—75 are attached.

The device may be provided with a shield 79 (Figs. 14 and 15), which serves the two-fold purpose of a safety precaution and a gauge for determining the length of the dead-ended conductor. A flat rectangular arm 80 of the shield 79 is connected to the slide 15 by means of screws 81—81 which extend through elongated slots 82—82 in the arm 80. The shield has a face plate 83 which, together with sides 84 and 85 and a top 86 and a bottom 88, entirely encloses the cutting mechanism of the device. The vertical dimensions of the face plate 83 and the sides 84 and 85 are such that, when the shield is raised with the slide 15 after the insulation has been cut as described above, they still enclose the cutting means of the device. A slot 89 cut in the face plate 83 is continuous with slots 90 and 91 cut into the top 86 and the bottom 88, respectively.

When the shield 79 is used, the operator inserts an insulated conductor to be dead-ended up through the slot 91 in the bottom 88, and holds the collar of the telephone cord against the bottom 88. Since the bottom 88 of the shield 79 is always the same distance from the blades 49 and 50 when the device is in the normal position, the insulated conductor is always dead-ended at the same distance beyond the collar of the telephone cord.

When the dead-ended insulated conductor extends too far beyond the collar of the telephone cord, it hinders the installation of the telephone cord and creates added possibility of the grounding of the dead-ended conductor. If the insulated conductor is dead-ended too near the collar of the telephone cord, it may pull back within the sheath, where, by frictional contact with the other conductors, the end of the dead-ended con-

ductor may work out of its rubber insulation and interfere with the operation of the telephone cord. Thus, uniformly regulated dead-ending of the insulated conductors is highly desirable. The distance that the dead-ended insulated conductor extends beyond the collar of the telephone cord may be regulated by adjusting the vertical position of the shield 79 on the slide 15 by means of the screws 81—81 mounted in the slots 82—82 formed in the arm 82.

The operation of the device is as follows:

The operator inserts an insulated conductor to be dead-ended up through the slot 91 in the bottom 88 of the shield 79 and between the jaws 30 and 31 until the collar of the telephone cord presses against the bottom 88. By stepping upon the treadle 71, the operator moves the cam rod 14 downwardly, causing the rollers 35 and 36 to ride out of the cam sockets 40 and 41, respectively, and causing the jaws 30 and 31 to pivot inwardly so as to grip the insulated conductor positioned therebetween. Immediately after the jaws have closed, the cam surface 61 contacts the cam surface 60 and further downward movement of the cam rod causes the block 56 carrying the movable blade 50, to move toward the stationary blade 49 until the cam surface 60 of the slot 59 in the block 56 rides up the cam surface 61 to the dwell 62. As the movable blade 50 moves toward the blade 49, it forces the conductor against the stationary blade 49 causing the blade 49 to cut through a part of the insulation, while the movable blade 50, having the slot 47 in its cutting surface, cuts through the rest of the insulation on the conductor as above described. When the cam surface 60 has reached the dwell 62, the blades 49 and 50 have completely severed the insulation on the conductor, but the conductor itself is intact.

At approximately the same moment that the downward movement of the cam rod 14 causes the vertical cam surface 63 to ride onto the dwell 62, the cam surface 25 formed on the cam rod 14 near its upper extremity contacts the end 26 of the dog 19. During further downward movement of the cam rod 14, the slide 15 carrying the jaws 30 and 31 and the shield 79, is moved upwardly by the pivoting motion of the dog 19 resulting from the downward pull of the cam surface 25 on the end 26 of the dog 19.

As the jaws gripping the insulated conductor are moved upwardly, they carry with them the conductor and the insulation above the cutting blades. Meanwhile, the vertical cam surface 63 rides along the dwell 62, so that the blades 49 and 50 remain stationary. Because the aperture formed by said blades is slightly greater than the diameter of the conductor, the conductor is enabled to move upwardly therebetween, while the blades 49 and 50 prevent the upward movement of the insulation below them. The result is that as the jaws 30 and 31 draw the conductor upwardly between the blades 49 and 50, the insulation is piled up below the blades as shown in Fig. 7.

When the cam bar 14 is moved further downwardly so that the cam surface 60 rides up the cam surface 64, the movable blade 50 is moved toward the stationary blade 49 so as to sever the conductor (Figs. 9 and 10). Immediately upon the severance of the conductor, the lower dead-ended portion of the conductor is released and the operator then smooths the wrinkled insulation back over the shortened end of the conductor. When the operator removes his foot from

the foot-treadle 71, the cam rod 14 returns to its normal position by the action of the springs 75—75, and the movable blade 50 is forced back to the right by the spring 65 and into the indentation 33 formed in the cam rod 14. The slide 15 is forced downwardly by the spring 29 to its normal position and the jaws 30 and 31 are re-opened by the spring 34 when the rollers 35 and 36 return to the cam sockets 40 and 41. The opening of the jaws 30 and 31 releases the severed portion of the insulated conductor, which is then discarded.

What is claimed is:

1. In an apparatus for operating upon an insulated conductor, a slidably mounted member, a plurality of cam actuated jaws mounted on said member, a cam member having a plurality of cam surfaces, some of said cam surfaces actuating said jaws to cause them to grip an insulated conductor positioned therebetween, a cam actuated knife, a cam surface on said cam member for actuating the knife to cause it to cut through the insulation of the conductor, a lever one end of which engages the slidable member, a cam surface on said cam member for engaging the lever at the other end and actuating the slidable member to cause displacement between the knife and the jaws, said last-mentioned operation causing the insulation to be withdrawn from a portion of the conductor, and a cam surface on said cam member for actuating said knife to cause it to sever the conductor at a point from which the insulation has been withdrawn.

2. In an apparatus for operating upon a sheathed article, a slidably mounted member having a hole therethrough, a pair of jaws mounted on the slidable member, each of which jaws has an extending portion, a vertically mounted cam member having a plurality of cam surfaces, two of which cam surfaces engage the extending portions of said jaws when the cam member is moved downwardly and cause the jaws to grip an insulated conductor positioned therebetween, cutting means comprising a stationary knife and a horizontally movable knife, a cam surface on the cam member which engages a portion of the movable knife when said cam member is moved downwardly from its last mentioned position and imparts horizontal movement to the movable knife thereby causing the knife to cut through the insulation, a lever having one end in engagement with the hole in the slidable member, a cam surface on the cam member engaging the other end of the lever when said cam member is moved downwardly from its last mentioned position to move the slidable member and the jaws carried thereby away from the cutting means, thus causing the insulation to be withdrawn from a portion of the conductor, and a cam surface on the cam member which causes further horizontal movement of the movable knife in order to sever the conductor at a point from which the insulation has been withdrawn when the cam member is moved downwardly from its last mentioned position.

3. In an apparatus for dead-ending insulated conductors, a movable member, a pair of jaws pivotally mounted upon the movable member, cam-engaging members on the jaws, a movable support having a cam surface formed thereon, a knife secured to the support, a pivotally mounted lever engaging the movable member, and an elongated, reciprocable rod having a plurality of spaced cam surfaces formed thereon, the rod being so positioned with respect to the other ele-

ments that the cam surfaces thereon may successively engage and actuate the cam-engaging members on the jaws, the cam surface on the knife-support, the lever and the cam surface on the knife-support, whereby, when the elongated rod is actuated the jaws are caused to grip an insulated conductor positioned therebetween, the knife is first advanced a distance sufficient to sever only the insulation on the conductor, the jaws are displaced from the knife to withdraw a portion of the conductor from the insulation, and the knife is then further advanced to sever the conductor at a point from which the insulation has been withdrawn.

4. In an apparatus for dead-ending insulated conductors, a plurality of movable jaws, a cam follower mounted on each of the jaws, a knife, a cam-actuated movable knife-support to which the knife is secured, a movable member upon which the jaws are mounted, a cam-actuated lever associated with the movable member for moving the member and the jaws with respect to the knife, and a reciprocable, elongated rod having a plurality of cam surfaces formed at spaced intervals thereon, the cam followers, the knife-support and one end of the lever being so positioned with respect to the rod that when the rod is actuated, the cam surfaces thereon successively engage and actuate the cam followers to cause the jaws to grip an insulated conductor positioned therebetween, the knife-support to move the knife a distance sufficient to sever only the insulation on the conductor, the lever to displace the movable member and the jaws from the knife to withdraw a portion of the conductor from the insulation, and the knife-support to further advance the knife to sever the conductor at a point from which the insulation has been withdrawn.

5. In an apparatus for dead-ending insulated conductors, a pair of horizontally pivoted jaws having gripping members formed at one end thereof, cam followers secured to the opposite ends of the jaws, a horizontally movable knife-support having a cam surface thereon, a knife secured to the support, a vertically movable member upon which the jaws are mounted, a lever having one end thereof in engagement with the

movable member, and a vertically movable, elongated rod having a plurality of cam surfaces formed therein, the rod being so disposed and the cam surfaces thereon being so spaced that

5 when the rod is actuated, two of the cam surfaces on the rod engage the cam followers to cause the jaws to grip an insulated conductor positioned vertically therebetween, a third cam surface on the rod engages the cam surface on the knife-support to advance the knife horizontally a predetermined distance to sever only the insulation on the conductor and retains the knife in the incision made thereby in the insulation, a fourth cam surface on the rod engages the free end of the lever to displace the movable member, the jaws and the insulated conductor gripped therein vertically with respect to the knife whereby a portion of the insulation adjacent to the incision made therein by the knife is withdrawn from the insulated conductor, and a fifth cam surface on the rod engages the cam surface on the knife-support to further advance the knife horizontally to sever the conductor at a point from which the insulation has been withdrawn.

6. In an apparatus for dead ending insulated conductors, a slidably mounted support, a plurality of movable jaws mounted on the support, a reciprocable actuating member, means on said actuating member for actuating the jaws to cause them to grip an insulated conductor positioned therebetween, a movable knife, means actuated by the actuating member for advancing the knife through a predetermined distance to cause it to cut through only the insulation on the conductor, a lever having one end thereof in engagement with the slidable support, means on the actuating member for engaging the other end of the lever to move the support and thereby cause displacement between the jaws and the knife, said last mentioned operation causing the insulation to be retracted from a portion of the conductor, and means actuated by the reciprocable member for further advancing the knife to cause it to sever the conductor at a point from which the insulation has been retracted.

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