Aug. 25, 1942. A. A. LUDKE ET AL 2,293,754

SHEATH REMOVING MECHANISM

Filed Nov. 20, 1940 3 Sheets-Sheet 1

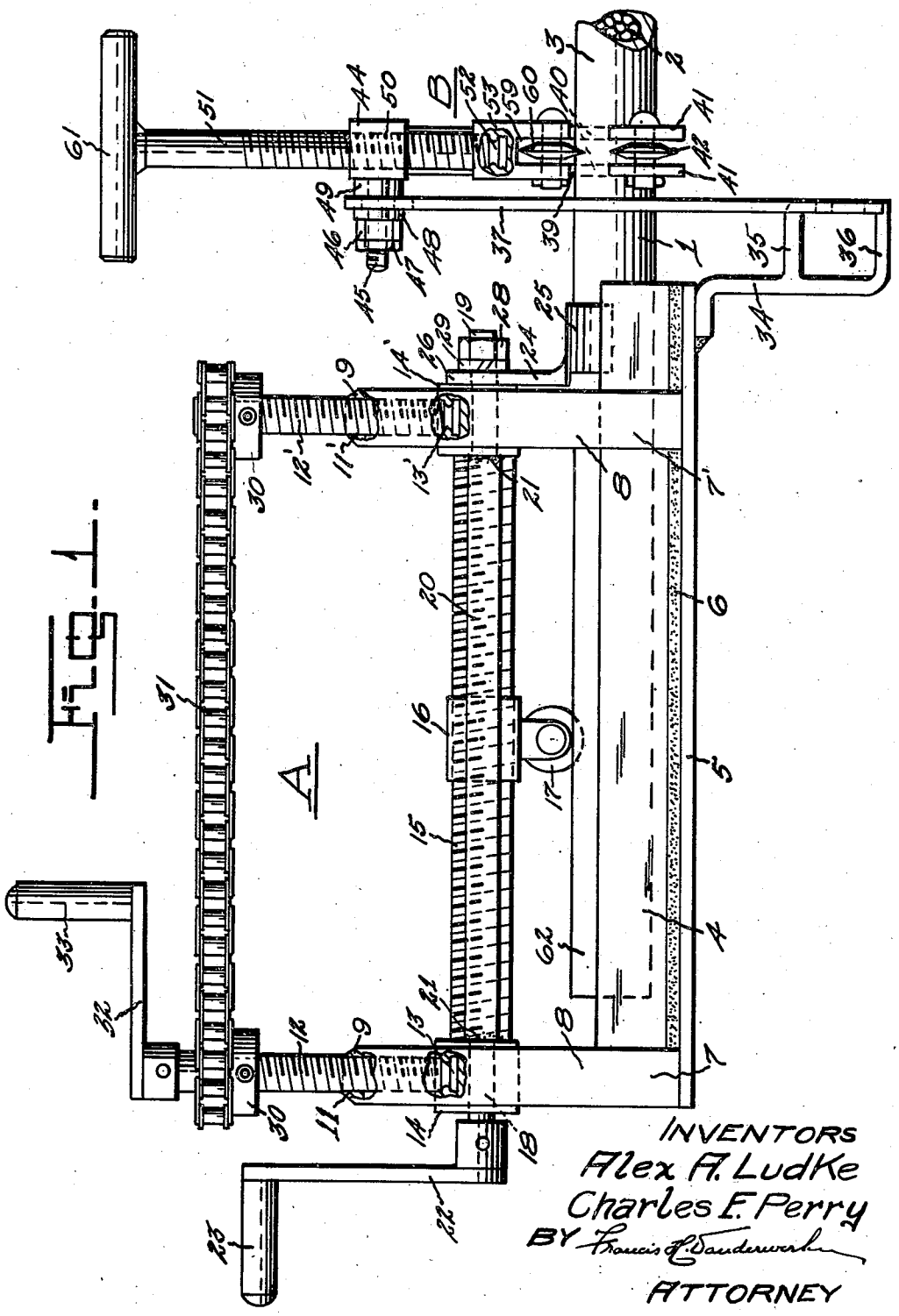


FIG. 1.

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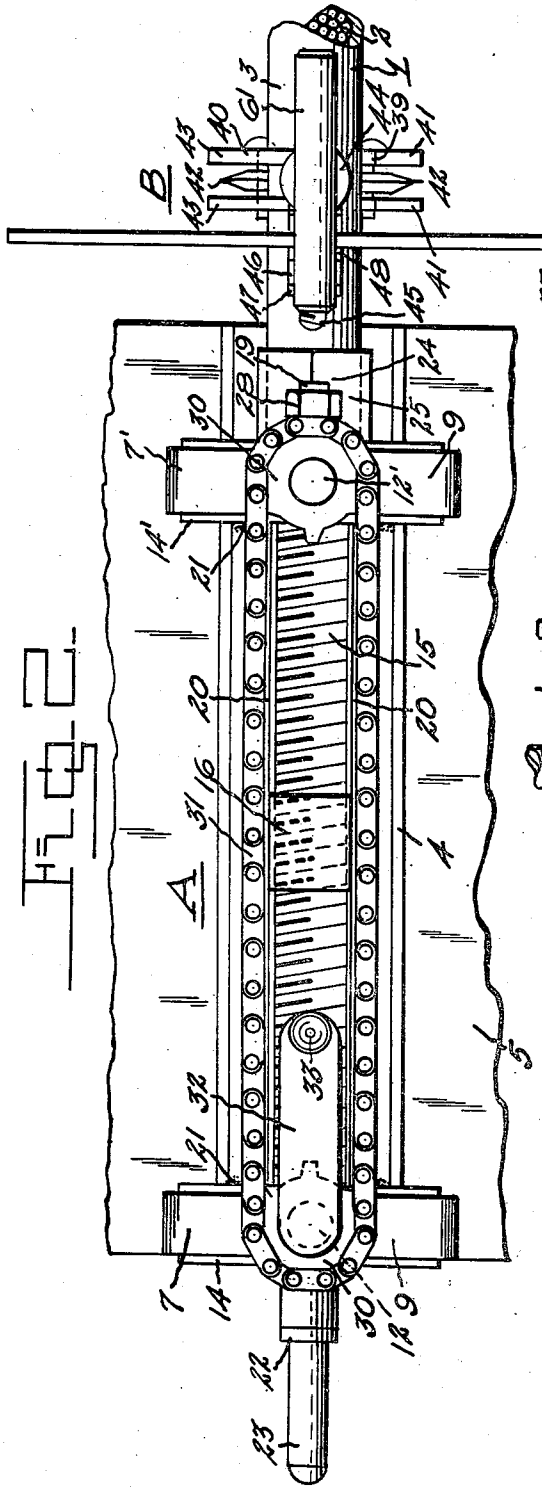


FIG. 2

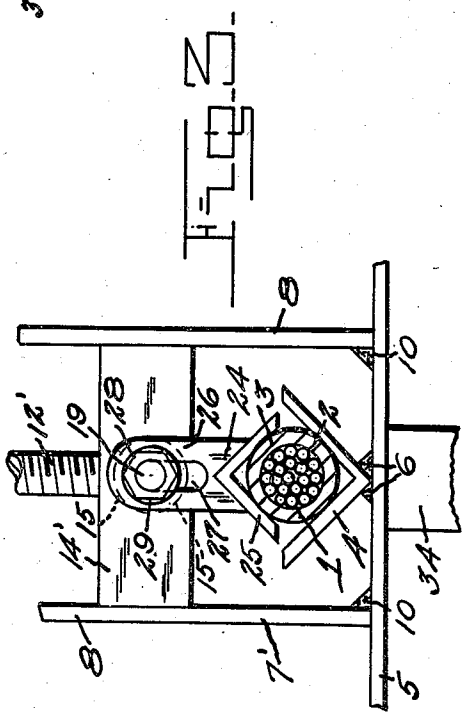


FIG. 3

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SHEATH REMOVING MECHANISM

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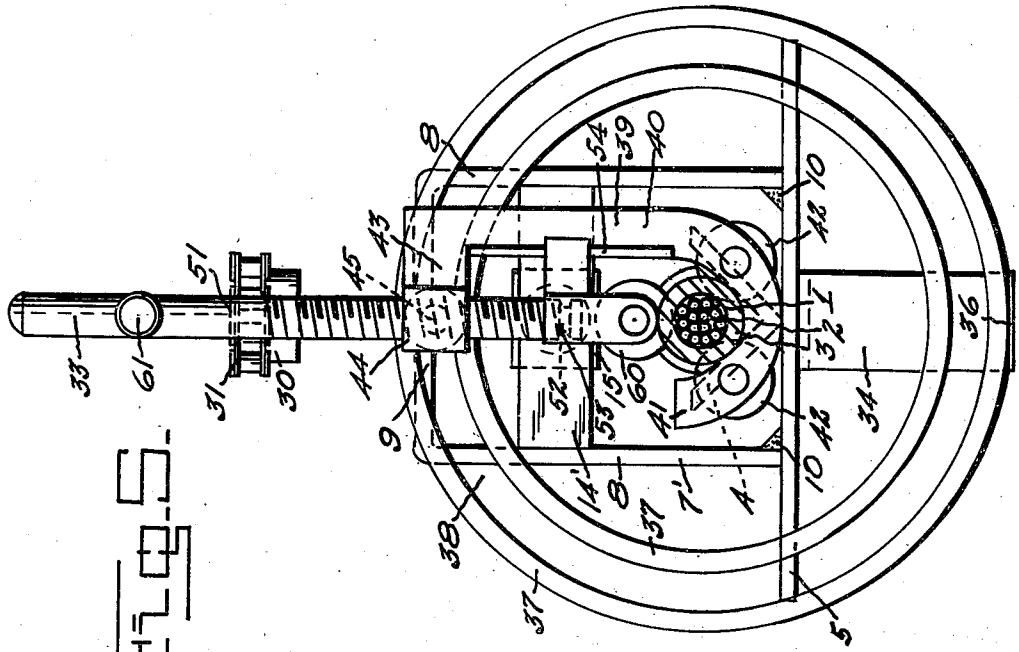


FIG. 5.

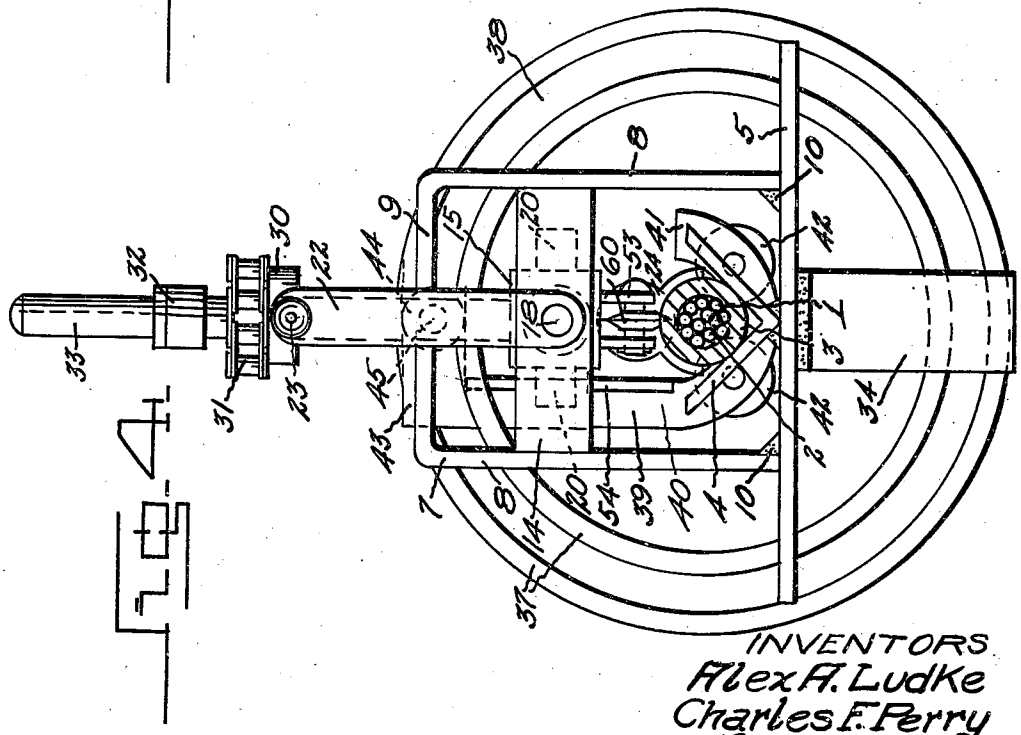


FIG. 4.

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UNITED STATES PATENT OFFICE

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SHEATH REMOVING MECHANISM

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Application November 20, 1940, Serial No. 366,508

10 Claims. (Cl. 30—96)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates to an insulation removing mechanism, more particularly it is directed to a device having for its principal object the removal of metallic sheathing from cables or other electrical conductors.

Another object of the invention is to provide a combined cable sheath ringer and splitting mechanism which is adapted to easily and quickly produce a longitudinal slit and a transverse circular cut in the metallic sheathing of cables so that the sheathing may be conveniently removed by hand without marring or injuring the cables or insulation thereof.

Another object of the invention is to provide a combined cable sheath ringer and splitting mechanism for removing metallic sheaths in which electrical conductors are enclosed, which is simple in operation, cheap in construction, efficient in use and which is not liable to become out of order.

With the above and other objects and advantages in view, the invention consists of certain features of construction and operation of parts which will hereinafter appear and in which:

Fig. 1 is a side elevation partly in section of the improved mechanism illustrating a sheath for a cable being split longitudinally and cut transversely in a circular manner by the mechanism for removing a portion of the sheath from the cable;

Fig. 2 is a fragmentary top view thereof;

Fig. 3 is a fragmentary front elevation of a portion of the mechanism including a clamp engaging a cable shown in section;

Fig. 4 is a left end view of Fig. 1, and

Fig. 5 is a right end view thereof.

Referring more particularly to the drawings 1 indicates a cable containing electrical conductors 2 surrounded by a sheath 3 or other covering in which the improved mechanism is adapted to produce a split longitudinally and a transverse circular cut for removing a portion of the sheath in order that the conductors may be spliced or for other purposes. The cable 1 is adapted to seat in a trough 4 which is V-shaped in cross-section and mounted longitudinally and centrally of a horizontally extending base plate 5 where it is held in place by being welded thereto as at 6.

The combined cable ringing and splitting mechanism comprises a longitudinal cutter assembly indicated generally by A for producing a split longitudinally in the sheath 3 of the cable 1 and a rotary cutter assembly indicated generally by B adapted to produce a transverse circular cut in the sheath 3.

The assembly A of the mechanism for splitting the sheath 3 longitudinally comprises the trough 4 and base plate 5 together with two frame members 7 and 7' of inverted substantially U-shaped formation as shown in Figs. 4 and 5, each having two suitably spaced parallel side walls 8 which extend vertically upward from the base plate 5 and integrally connected at their upper ends by an end wall 9. The frame members 7 and 7' are positioned at opposite ends of the base plate 5 transversely thereof with the side walls 8 being equally spaced on opposite sides of the trough 4 and secured to the base plate by being welded thereto, as indicated at 10 in Figs. 3, 4 and 5. The upper end walls 9 of the frame members 7 and 7' are provided with central screw-threaded openings 11 and 11' respectively, shown in Fig. 1, in which vertically extending actuating screws 12 and 12' are adjustably mounted. The lower ends 13 and 13' of the actuating screws 12 and 12' extend downwardly through the end walls 9 into the frame members 7 and 7' and are rotatably mounted in the central upper portion of guide blocks 14 and 14' respectively which are rectangular shaped in cross-section and extend transversely across the side walls 8 of the frame members 7 and 7' parallel with the upper end walls 9. The guide blocks 14 and 14' are adapted to be moved vertically within the frame members 7 and 7' and are provided for rotatably supporting a horizontally extending threaded shaft 15 having a cutter holder 16 threadably mounted thereon with a cutter wheel 17 rotatably mounted on the cutter holder 16. The opposite ends 18 and 19 of the shaft 15 are journalled centrally in the guide blocks 14 and 14' respectively, whereby the shaft is adapted to longitudinally overlie the cable 1. The cutter wheel 17 is mounted on the lower side of the cutter holder 16 and is arranged thereon in such a manner as to split the sheath 3 longitudinal in the center when in operation.

To cause the cutter holder 16 which is rectangular in cross-section to move in a forward or rearward direction on the shaft 15 and not to turn with the shaft, a pair of horizontally extending guide bars 20 rectangular in cross-section, is provided, one on each side of the shaft 15, with the inner sides thereof frictionally engaging two of the sides of the cutter holder 16. These guide bars 20 extend across the frame members 7 and 7' parallel with the shaft 15 where they are secured

at their opposite ends to the guide blocks 14 and 14' in any suitable manner such as by being welded thereto as indicated at 21. The end 18 of the shaft 15 which is journalled in the guide block 14 on the frame member 7 at the left of the mechanism has a crank 22 including a handle 23 mounted thereon for rotating the shaft 15, to actuate the cutter holder 16 carrying the cutter wheel 17 longitudinally of the cable 1 and the end 19 of the shaft 15 which is journalled in the guide block 14' on the frame member 7' has a clamp 24 adustably mounted thereon for holding the cable 1 so that the sheath 3 thereof may be longitudinally split and circularly cut by the combined splitting and ringing mechanism.

The clamp 24 has an inverted V-shaped portion 25 as more particularly illustrated in Fig. 3, for fitting over the cable and is provided with an upwardly extending portion 26 having a vertically extending elongated slot 27 provided therein through which the end 19 of the shaft 15 projects, whereby the clamp may be adjusted on the shaft for engaging various size cables. To hold the clamp 24 in an adjusted position on the shaft 15, a nut 28 and lock washer 29 are provided on the outer end 19 of the shaft.

In order to rotate the actuating screws 12 and 12' synchronously for a purpose which will hereinafter appear, sprocket wheels 30 are mounted on the upper ends thereof which sprocket wheels carry a sprocket chain 31, which is operated by means of a crank 32 including a handle 33 mounted on the upper outer end of the actuating screw 12.

The ringer assembly B of the mechanism for producing a transverse circular cut in the sheath 3 of the cable is connected to the assembly A of the mechanism by means of a bracket 34 which is secured at one end to the inner end of the base plate 5 by being welded thereto or the like. The bracket 34 extends downwardly from the base plate 5 and has two ears or tongues 35 and 36 extending horizontally outwardly therefrom. The tongues 35 and 36 are suitably secured to the lower portion of two concentric guide rings 37 arranged centrally and at right angles to the trough 4 and provide a circular space 38 therebetween in which is frictionally mounted a rotary cutter unit of the assembly B including a main frame portion 39 shown in Figs. 4 and 5 having two suitably spaced side plates 40 provided with upwardly extending curved front ends 41, forming a fixed jaw, provided with a pair of spaced cutter wheels 42 which are arranged at right angles to the cutter wheel 17 on the essembly A. The upper ends 43 of the side plates 40 are extended inwardly to engage one side of a boss 44 having a threaded stem 45 provided thereon which extends at a right angle to the upper ends of the side plates 40 and projects through the space 38 between the two concentric rings 37. The boss 44 is movably held against the guide rings 37 by means of a nut 46 and lock nut 47 which are threadably mounted on the stem 45 at the opposite side of the guide rings from the boss 44. In order to reduce friction between the boss 44 and the guide rings 37, a bushing 48 and washer 49 made of any suitable material such as bronze may be provided on the stem 45. A threaded opening 50 is formed vertically in the boss 44 for receiving a threaded rod 51, the inner end 52 of which is rotatably mounted on a cutter holder 53 which is slidably mounted upon a way 54 on the main frame portion 39, as illustrated in Figs. 4 and 5 and provided with a slotted lower end 59 in which is rotatably mounted a cutter wheel 60. The outer end of the rod 51 has an operating handle 61 rigidly secured thereto by which the rod may be turned in the boss 44 and the rotary cutter unit of the assembly B may be turned around on the guide rings 37 for causing the cutter wheels 42 and 60 to cut the sheath 3, circularly with the stem 45 of the boss 44 sliding in the space 38 between the guide rings.

By turning the handle 33 of the crank 32 of the assembly A in a counterclockwise direction the actuating screws 12 and 12' are rotated in the same direction in the end bars 9 on the frame members 7 and 7' whereby the guide blocks 14 and 14', slidably mounted in the frame members 7 and 7' respectively, are drawn upwardly in a vertical direction carrying the shaft 15, clamp 24, guide bars 20 and the cutter holder 16 including the cutter wheel 17 in an upward direction. The handle 23 of the crank 22 is then turned in a counterclockwise direction which causes the cutter holder 16 carrying the cutter wheel 17 to be actuated to the left end on the shaft 15.

The rod 51 on the rotary cutter unit of the assembly B is turned by the handle 61 in the boss 44 to draw the cutter wheel 60 on the lower end thereof, upwardly until it is high enough to permit the cable 1 to be inserted between itself and the cutter wheels 42 with the end 62 of the cable lying in the trough 4.

The crank 32 of the assembly A of the mechanism is then turned by the handle 33 in a clockwise direction to rotate the actuating screws 12 and 12' downwardly in the end bars 9 of the frame members 7 and 7' until the clamp 24 on the shaft 15 engage the upper surface of the cable.

The handle 61 on the rod 51 of the rotary cutter unit of the assembly B is then turned to move the cutter wheel 60 on the lower end of the rod into engagement with the surface of the sheath 3 of the cable and the rotary cutter unit is turned as a whole around in the circular space 38 between the guide rings 37 repeatedly and during this operation from time to time the rod 51 is turned somewhat by the handle 61 to correspondingly feed the cutter wheel 60 into the sheath 3 which forces the sheath into engagement with the cutter wheels 42 and in this manner the sheath is circularly cut. The rod 51 is then turned to draw the cutter wheel 60 upwardly from the cable and the end 62 of the cable is pulled over in the trough until the circular cut provided therein by the rotary cutter unit of the assembly B is at the inner side edge of the frame member 7'. The crank 22 on the portion A of the machine is then rotated in a clockwise direction by the handle 23 to turn the shaft 15 which actuates the cutter holder 16 to the right of the mechanism and causes the cutter wheel 17 to split the sheath longitudinally until it reaches the circular cut produced therein by the ringer assembly B of the mechanism whereupon the crank 32 is rotated by the handle 33 in counterclockwise direction to raise the clamp 24 and cutter wheel 17 upwardly from the cable in which case the severed portion of the sheath 3 may be removed by the hand.

It will thus be seen that there is herein provided a novel mechanism for removing sheaths or other insulation from cables which is well adapted for the purpose indicated. Even though there has herein been shown certain features of

construction and operation of parts, it is nevertheless to be understood that various changes may be made therein if the changes do not depart from the claims.

Having described our invention what we claim as new and wish to secure by Letters Patent is:

1. A mechanism for removing sheaths from cables comprising in combination, a supporting frame, a shaft rotatably and adjustably mounted on said frame, a cutting member adjustably mounted on said shaft, a clamp mounted on said shaft and adapted to detachably engage a cable for holding it in a fixed position, means for moving said shaft toward said cable, whereby said cutting member and clamp engages said cable and means for rotating said shaft for actuating said cutting member to produce a split longitudinally in a sheath of said cable.

2. A mechanism for removing sheaths from cables comprising in combination, a base plate having frame members and a trough for seating a cable mounted thereon, guide blocks slidably mounted in said frame members, a threaded shaft rotatably mounted on said guide blocks, a cutter member adjustably mounted on said shaft and adapted to be actuated longitudinally of said trough for producing a split longitudinally in a sheath of said cable, a clamp adjustably mounted on said shaft and adapted to detachably engage said cable for holding it in a fixed position in said trough, means mounted on said frame members and connected to actuate said guide blocks for moving said shaft toward said trough, whereby said cutting member and clamp engages said cable and means for rotating said shaft for actuating said cutter member to longitudinally split said cable sheath.

3. A mechanism for removing sheaths from cables comprising in combination, a base plate, a longitudinally extending trough for seating a cable and frame members mounted on said base plate, guide blocks movably mounted on said frame members, a clamp and cutting member adjustably mounted on said shaft, means for holding said cutting member in a nonrotating position on said shaft, actuating screws mounted on said frame members and connected to actuate said guide blocks on said frame members, means for simultaneously actuating said screws for simultaneously actuating said guide blocks for moving said shaft toward said cable, whereby said cutting member and clamp are adapted to engage said cable and means for rotating said shaft for actuating said cutting member longitudinally of said trough for splitting a sheath of said cable longitudinally.

4. A mechanism for removing sheaths from cables, comprising in combination, a supporting frame, a member rotatably mounted on said frame, a cutter adjustably mounted on said member, means for actuating said member for actuating said cutter thereon into engagement with a cable sheath and means for rotating said member for actuating said cutter for splitting said cable sheath longitudinally.

5. A mechanism for removing a sheath from cables, comprising in combination a supporting frame, a member adjustably and rotatably mounted on said frame, a clamp and cutter mounted on said member, said cutter adjustably mounted on said member, means for adjusting said member on said frame for moving said clamp and cutter into engagement with a cable, said clamp adapted to detachably engage said cable for holding it in a fixed position and means for rotating said member for actuating said cutter for splitting a sheath of the cable longitudinally.

6. A mechanism for removing sheaths from cables, comprising a supporting frame, a threaded shaft and guide members adjustably mounted on said frame, a cutter member and a clamp mounted on said threaded shaft, said cutter member threadably adjustable on said shaft and said guide members adapted to hold said cutter member in a nonrotative position on said shaft, means for adjusting said shaft and guide members on said frame for moving said cutter member and clamp into engagement with a cable and means for rotating said shaft for adjusting said cutter member thereon for splitting a sheath of said cable longitudinally.

7. A mechanism for splitting a cable sheath, comprising in combination a supporting frame, a shaft rotatably and adjustably mounted on said frame, a cutting member adjustably mounted on said shaft, means for moving said shaft toward a cable sheath for engaging said cutting member with said sheath and means for rotating said shaft for actuating said cutting member to produce a split longitudinally in said sheath.

8. A mechanism for cutting a cable sheath, comprising a support including concentrically mounted guide rings of different diameters and a cutter member cooperating between and adjustably mounted on said guide rings for producing a cut in said cable sheath.

9. A mechanism for cutting a cable sheath, comprising a support including guide rings concentrically mounted within each other, a boss adjustably mounted between said guide rings and a cutter adjustably mounted on said boss and adapted to produce a transverse circular cut in a cable sheath.

10. A mechanism for cutting a cable sheath, comprising a support including guide rings concentrically mounted within each other, a boss adjustably mounted circularly between said guide rings, and a cutter member mounted on said boss for producing a transverse circular cut in said cable sheath, said cutter member including a fixed frame portion carrying cutter blades and a portion carrying a cutting blade adjustably mounted on said boss.

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