

May 18, 1943

J. W. CONRAD

2,319,587

DEAD END TOOL

Filed Aug. 8, 1941

2 Sheets-Sheet 1

Fig. 1

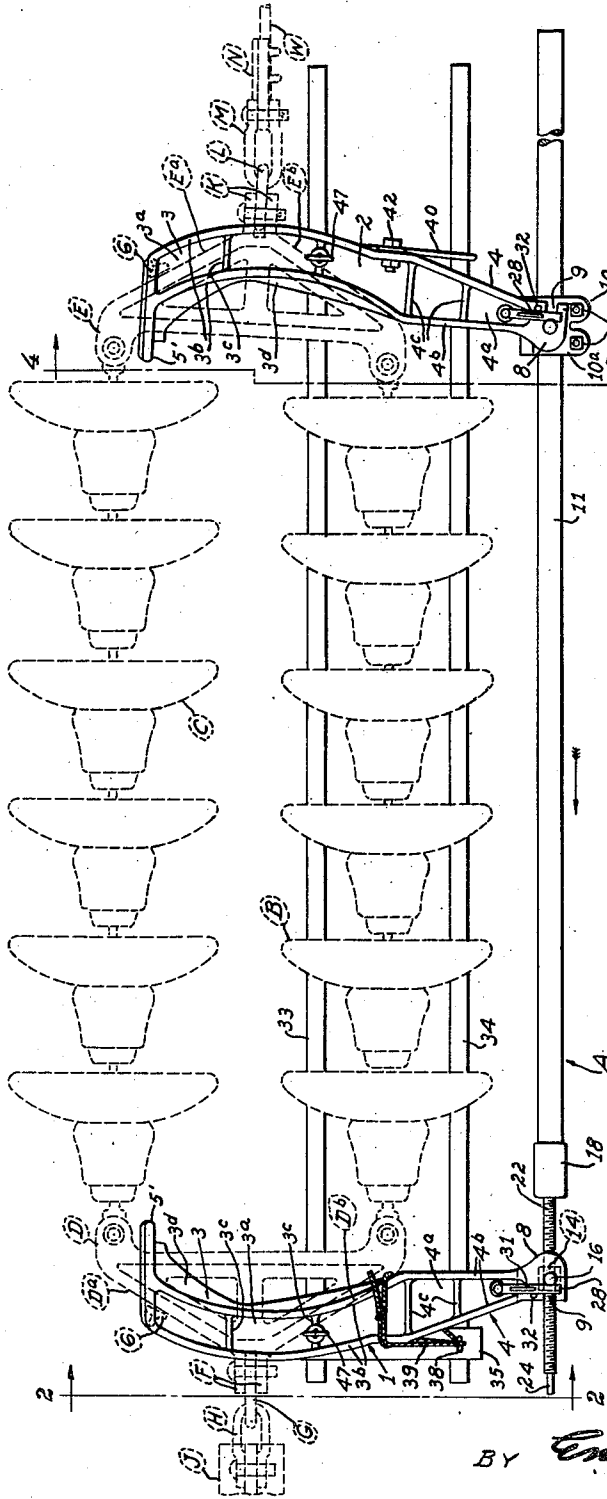
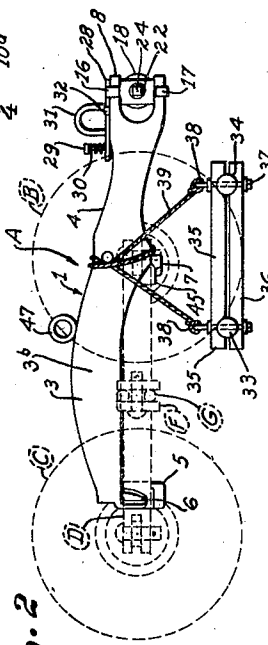


Fig. 2



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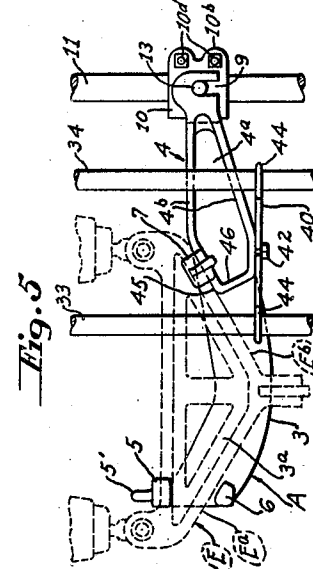
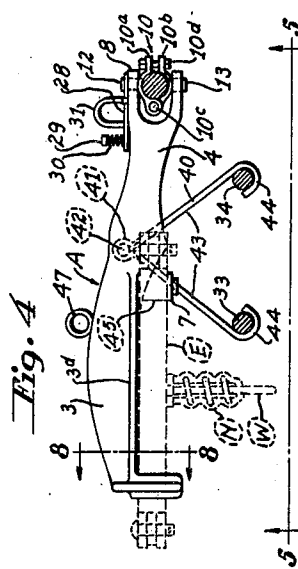
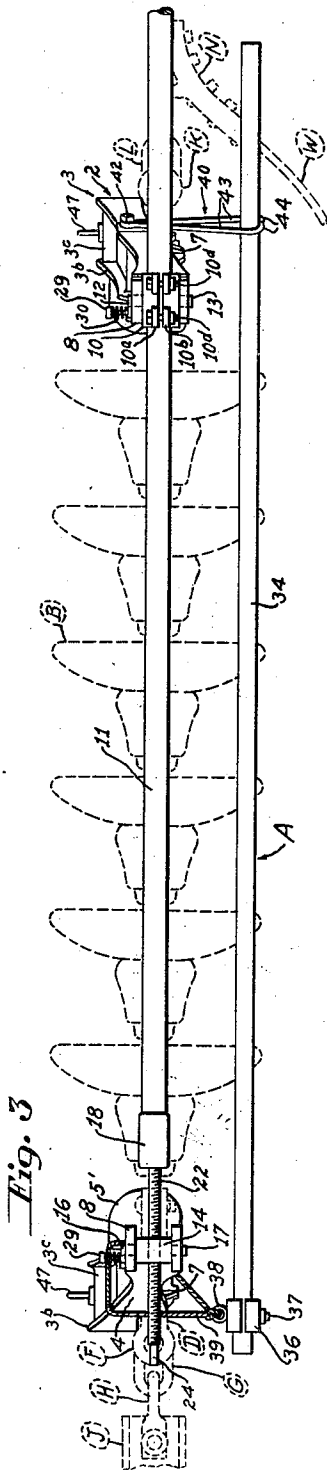
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,319,587

DEAD-END TOOL

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a corporation of Missouri

Application August 8, 1941, Serial No. 406,009

15 Claims. (Cl. 254—67)

This invention relates generally to tools adapted for use in the maintenance of overhead electrical conductors, and more specifically to tools intended for service in removing and replacing insulators of dead end assemblies of electrical conductors, the predominant object of the invention being to provide a tool of the type referred to above which is of simple construction and arrangement and is capable of performing its intended function in a highly efficient manner.

Most of the apparatus employed prior to this invention for aiding in putting slack in dead end assemblies in order to permit removal of insulators therefrom, were adapted to lift the full tension of a conductor associated with a dead end assembly being operated upon by such previously known apparatus. However, many conductors are dead ended by dead end assemblies which comprise each a pair of insulator strings arranged in spaced parallelism and attached to yoke members, and in connection with such dead end assemblies it has been discovered that it is not necessary to lift the full line tension in order to remove an insulator from one or the other of the strings of insulators of the dead end assembly.

The prime purpose of this invention, therefore, is to provide an improved tool which is so constructed and is capable of such use that one string of insulators of a dead end assembly of the double strain type is permitted to remain in tension when the improved tool is being employed to put slack in the other of the insulator strings of the dead end assembly, the result being that the insulator string of the dead end assembly that remains in tension supports one-half of the line tension, while the tool supports the other half of the line tension and puts slack in the untensioned insulator string to permit removal of insulators therefrom and replacement of insulators therein.

Fig. 1 is a plan view of the improved tool showing same in association with a dead end assembly of the double strain type, said dead end assembly being shown in dotted lines.

Fig. 2 is an end elevation of the improved tool, viewed from the location of the line 2—2 of Fig. 1, and showing associated therewith in dotted lines a dead end assembly of the type illustrated by dotted lines in Fig. 1.

Fig. 3 is a side elevation of the improved tool, a dead end assembly of the type illustrated in Figs. 1 and 2 being shown in dotted lines in Fig. 3 in association with the tool illustrated therein.

Fig. 4 is a cross-section taken on line 4—4 of Fig. 1, in this view also a portion of the associated

dead end assembly being shown in dotted lines.

Fig. 5 is a fragmentary inverted plan view of a portion of the improved tool with a part of an associated dead end assembly shown in dotted lines.

Fig. 6 is an enlarged, fragmentary view, partly in elevation, and partly in section, showing one of a pair of latches forming parts of the improved tool.

Fig. 7 is an enlarged, fragmentary view, partly in elevation and partly in section, showing an adjusting means forming a part of the improved tool.

Fig. 8 is a section on line 8—8 of Fig. 4.

In the drawings, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates the improved tool generally, said tool being adapted for use in association with a dead end assembly of the double strain type as shown to the best advantage by dotted lines in Fig. 1. A dead end assembly of the double strain type usually comprises a pair of strings of insulators B and C suitably assembled to connect the insulators thereof together, said strings of insulators being arranged in spaced parallelism and being attached at their opposite ends to yoke members D and E which are frequently shaped in plan as shown in Fig. 1. The yoke member D of the particular double strain dead end assembly shown in Fig. 1 includes spaced ears F between which a link G is engaged, said link in turn being engaged by a clevis H which is suitably connected to an element J extended from a tower, pole or other support. At the opposite end of the dead end assembly the yoke member E thereof is also provided with spaced ears K between which is engaged a link L, said link in turn being engaged by a clevis M which is suitably connected to a member N that engages the conductor W supported by the dead end assembly.

The improved tool A comprises a pair of opposed elements 1 and 2 which are shaped in plan as shown in Fig. 1, each of said elements including a substantially curved portion 3 and a tapered extension 4, and said elements being suitably webbed and ribbed as will be presently pointed out herein, to give them the required strength and rigidity. At an end of each of the elements 1 and 2 a hook-shaped portion 5 is provided which extends downwardly and inwardly relative to the element on which it is formed, said hook-shaped portion being provided with a rib 5' which provides said hook-shaped portion with the required strength. Also at the end of

each of the elements 1 and 2 at which the hook-shaped 5 is provided said element has formed thereon a downwardly extended lug 6 which is arranged in spaced relation with respect to the hook-shaped portion 5, the downwardly extended length of said lug 6 preferably being less than the downwardly extended dimension of said hook-shaped portion 5.

By referring particularly to Fig. 4 it will be noted that the curved portion 3 of each of the elements 1 and 2 is elevated with respect to the tapered extension 4 of the element. In other words the bottom face of the curved portion 3 of each of said elements 1 and 2 is located at the approximate vertical center of the extension 4, this bottom face being provided by a horizontal web of material 3a from which spaced upwardly projected ribs 3b are extended and these upwardly projected ribs are joined by cross ribs 3c. Also the portion 3 of each of the elements 1 and 2 is additionally strengthened by a horizontally arranged rib 3d which extends along the concave side face of the curved portion 3 of the element and joins the hook-shaped portion 5 to additionally strengthen said hook-shaped portion. Likewise the extension 4 of each of the elements 1 and 2 is produced by a horizontal web of material 4a from which upwardly and downwardly extended ribs 4b are projected, the ribs 4b at the top of the extension being continuations of the ribs 3b of the curved portion 3 of the element and being joined by cross ribs 4c and the ribs 4b at the bottom of said extension 4 being shaped as shown in Fig. 5. Each of the elements 1 and 2 has formed thereon a horizontally disposed lug 7 which is located approximately at the junction of the curved portion 3 and the extension 4, said lug being formed on and extended from a portion of the rib 4b at the bottom of the extension and at the side of the element at which the concave face of the curved portion 3 is located, and said lug 7 being provided with a rib to give the required strength thereto.

At its outer end the extension 4 of each of the elements 1 and 2 is provided with a bifurcated portion 8, as shown to the best advantage in Figs. 2, 4, and 6, the vertically spaced portions of said bifurcated portions being shaped as shown to good advantage in Figs. 1 and 5. The vertically spaced portions of the bifurcated end portion 3 of each of the elements 1 and 2 are provided with vertically aligned slots 9, each of said slots being open at an end thereof at an edge of the spaced portion in which it is formed and being closed at its opposite end as shown to good advantage in Fig. 5.

Disposed between the spaced portions of the bifurcated end portion of the extension 4 of the element 2 is a clamp 10 which embraces a pole 11 formed of wood or other suitable material, said clamp comprising a pair of clamping members 10a and 10b which are pivoted together at 10c (Fig. 4) and are drawn into clamping engagement with the pole 11 by bolts 10d that extend through ears formed on the clamping members 10a and 10b. Extended upwardly from the clamping member 10a is pin 12 and extended downwardly from the clamping member 10b is a similar pin 13, said pins 12 and 13 being extended through and disposed at the bases of the slots 9 in the vertically spaced portions of the bifurcated end portion of the extension of the element 2. Likewise, disposed between the vertically spaced portions of the bifurcated end portion of the extension of the element 1 is a

block 14 through which is formed a screw-threaded opening 15. As shown in Fig. 6 the top and bottom surfaces of the block 14 contact with the inner faces of the spaced portions of the bifurcated end portions of the element 1, and extended upwardly from said block is a pin 16 and downwardly therefrom is a pin 17. The pins 16 and 17 of the block 14 are extended through the slots 9 formed in the vertically spaced portions of the bifurcated end portion of the extension 4 of the element 1 and are disposed at the bases of said slots.

The pole 11 at the end thereof which is located adjacent to the element 1 has mounted thereon a head 18 which, as shown in Fig. 7, is of generally cylindrical formation and is provided with an end wall 18' through which an opening 19 is formed. The cylindrical portion of the head embraces an end portion of the pole 11 and the end wall thereof is spaced from the end of the pole located within the head to provide a space 20, and the head is secured to the end portion of the pole by pins 21. Associated with the head 18 is a screwthreaded rod 22 which is provided at one end with an enlarged head portion 23 and at its opposite end with a tool-receiving extension 24 of noncircular cross-sectional shape. The screwthreaded rod is aligned with the pole 11, the enlarged head portion 23 thereof being disposed in the space 20 within the head 18 and said screwthreaded rod being extended through the opening 19 formed through the end wall 18' of said head 18. Also said screwthreaded rod extends through the opening 15 of the block 14 in screwthreaded engagement with the screwthreaded wall thereof. As will presently appear herein the screwthreaded rod 22 is rotated relative to the pole 11 in the use of the improved tool, and in order to facilitate such rotation of the screwthreaded rod the enlarged head portion 23 thereof has associated therewith a ball raceway 25, the balls of which contact with the inner face of the end wall 18' of the head 18.

In order to prevent unintended displacement of the pins 12 and 13 of the clamp 10 and the pins 16 and 17 of the block 14 from the slots of the spaced portions of the bifurcated end portions of the extensions of the elements 1 and 2, latching structures of like construction and arrangement are associated with the extensions 4 of said elements 1 and 2. The latching structure associated with the element 1 is shown in detail in Fig. 6 and this latching structure includes a spacer 26 which is secured to the web of the extension 4 of the element 1 by a fastening device 27. Supported by the spacer 26 is an elongated plate 28, said plate having an enlarged opening formed therethrough through which is extended the shank of a bolt 29 which is screwthreadedly seated in the spacer 26. The bolt 29 is provided with a head at its upper end which is spaced upwardly from the plate 28, and interposed between the head of said bolt and said plate 28 is a coil spring 30. The plate 28 has fixed thereto an upstanding, yoke-shaped operating element 31 and said plate rests upon the top face of the uppermost spaced portion of the bifurcated end portion of the extension of the element 1 so that one side edge of said plate contacts with the circumferential face of the pin 16 and the opposite side edge of said plate contacts with a fixed pin 32 extended upwardly from said top face of the bifurcated end portion of the extension of said element 1. Because the pin 16 is confined between the base of

the slot in which it is disposed and an edge of the plate 28, the block 14 is prevented from moving relative to the bifurcated portion with which it is associated to free the pins 16 and 17 from the slots 9. When it is desired to remove the block 14 from the bifurcated portion with which it is associated, the plate 28 may be elevated against the action of the coil spring 30 with the aid of the element 31, to a point above the upper ends of the pins 16 and 32, whereupon the plate may be swung about the bolt 29 to a displaced position to permit withdrawal of the pins 16 and 17 from their slots and removal of the block from the associated bifurcated portion.

As has been previously stated the latching structure associated with the bifurcated portion of the extension of the element 2 corresponds in construction and operation with the latching structure of the element 1 as just described; therefore the latching mechanism of said element 2 need not be described in detail herein, and corresponding parts of both latching structures are designated by like reference characters.

The improved tool of the present invention includes a pair of spaced, parallel poles 33 and 34 which are formed of wood or other suitable material and extend longitudinally of the pole 11 previously referred to herein. Corresponding end portions of the poles 33 and 34 are secured together by a pair of clamping members 35 and 36 which are suitably channeled to receive said poles and are secured together and to the poles 33 and 34 by bolts 37 that pass through the clamping members and the poles and are provided at their upper ends with eyes 38. The poles 33 and 34 provide a cradle structure which is supported in its proper position at one end by a rope 39 (Figs. 1, 2 and 3) which is turned about the element 1 and is tied at its opposite ends to the eyes of the bolts 37. At the opposite end of the cradle structure the poles 33 and 34 are supported by a supporting structure 40 (Fig. 4), said supporting structure 40 comprising an element so shaped as to provide an eye portion 41 at which said supporting structure is secured to the element 2 by a bolt 42. Also, the element that provides the supporting structure 40 includes divergent portions 43 which are extended downwardly and outwardly from the eye portion 41 and are provided at their lower ends with hook-shaped portions 44 which receive and support the poles 33 and 34.

In assembling the improved tool A with a dead end assembly of the double strain type the elements 1 and 2 are associated with the yoke members D and E as shown to the best advantage in Figs. 1 and 4; that is to say, the flat, bottom faces of the portions 3 of said elements contact with and rest upon top surfaces of said yoke members D and E. Also the hook-shaped portions 5 of said elements 1 and 2 extend around the yoke members D and E and engage lower portions thereof, and the lugs 6 engage the inclined faces Da and Ea of said yoke members D and E. Furthermore the inclined faces 45 of the portions 46 of the ribs 4b located at the bottoms of the extensions 4 of the elements 1 and 2 contact with correspondingly inclined faces Db and Eb of the yoke members D and E, and the lugs 7 of said elements 1 and 2 extend beneath and contact with lower surfaces of portions of the yoke members D and E (see Fig. 5).

With the assembly made up of the pole 11 and the screwthreaded rod 22 associated with the elements 1 and 2 as has been previously described

herein, and with the cradle structure produced by the poles 33 and 34 supported in position with respect to said elements 1 and 2, the screwthreaded rod 22 is rotated with the aid of a suitable tool (not shown) which is applied to the tool-receiving extension 24 thereof, and such rotation of said screwthreaded rod causes it to travel through the block 14 whereby the pole 11 is moved in the direction indicated by the arrow in Fig. 1 and the extension of the element 2 is drawn toward the extension of the element 1. This has the effect of canting the yoke member E from its normal position to the position in which it is shown in Fig. 1, with the result that slack will be put in the string of insulators B which will permit insulators to be removed therefrom and new insulators introduced in said string of insulators. When slack is put in the string of insulators B as has been described the cradle structure provided by the poles 33 and 34 receive and support the sagging insulator string so that work thereon will be facilitated.

It is obvious that when the screwthreaded rod 22 is rotated to provide for relative movement between the outer ends of the extensions 1 and 2, as has been pointed out herein, the canting of the yoke member E is brought about by a pushing force exerted by the face 45 of the element 2 against the face Eb of the yoke member E, and by a pulling force exerted by the hook-shaped portion 5 of the element 2 against an opposite portion of the yoke member E. There may also be some canting of the element 1 when the screwthreaded rod 22 is rotated to put slack in the string of insulators B but perhaps not as much as the canting action to which the element 2 is subjected. Also it is important to note that because the clamp 10 may be adjustable longitudinally of the pole 11 to different fixed positions thereon the tool A may be employed with dead end assemblies having insulator strings of different length. Likewise it is pointed out that each of the elements 1 and 2 is provided with an upstanding eye 47 which serves to aid in the operation of raising the tool A to an elevated position with respect to a tower or pole.

When the required work has been done on the string of insulators B, shown in Fig. 1 and it is desired to do work on the string of insulators C which requires slack to be put in said string of insulators C, the elements 1 and 2 are reversed; that is to say, the element 2 is associated with the yoke member D and the element 1 is associated with the yoke member E in the manner previously described herein, and with the extensions 4 of said elements 1 and 2 extending in the opposite direction. With the assembly made up of the pole 11 and the screwthreaded rod 22, and the cradle assembly produced by the poles 33 and 34 associated with the elements so arranged with respect to the yoke members D and E, the tool may be operated to put slack in the string of insulators C as has been already explained herein.

From the foregoing it is plain that when the tool A is in use approximately one-half of the full tension of the conductor associated with a double strain dead end assembly being operated on with the aid of the tool, is supported by the untensioned string of insulators while the other approximate one-half of said full tension of the conductor is supported by the tool. Thus a tool may be employed which is lighter and more convenient to handle and operate than would be a

tool which would be required to lift the full tension of the conductor.

I claim:

1. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, and means at one side only of the tool for engaging portions of said opposed elements at corresponding ends thereof and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith.

2. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, portions formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means at one side only of the tool for engaging portions of said opposed elements at corresponding ends thereof and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith.

3. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, parts formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the parts on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of yoke-engaging parts formed on each of said opposed elements one of which yoke-engaging parts is in the approximate form of a hook which embraces a portion of an associated yoke member.

4. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, parts formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the parts on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of yoke-engaging parts formed on each of said opposed elements one of which yoke-engaging parts is in the approximate form of a hook which embraces a portion of an associated yoke member and another of which yoke-engaging parts is in the form of an abutment which engages another remotely located portion of the associated yoke member.

5. A tool for putting slack in an insulator string of a dead end assembly of the type having

a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, portions formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the portions on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of engaging portions formed on each of said opposed elements, said plurality of engaging portions formed on each of said opposed elements comprising a hook-shaped portion which embraces a part of an associated yoke member, an adjacent lug that engages another part of the associated yoke member, and a remotely positioned abutment which engages yet another part of the associated yoke member.

6. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, portions formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the portions on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of engaging portions formed on each of said opposed elements, said plurality of engaging portions formed on each of said opposed elements comprising a hook-shaped portion formed adjacent to an end of the element and which embraces a part of an associated yoke member, an adjacent lug that engages another part of the associated yoke member, and a remotely positioned abutment which engages yet another part of the associated yoke member.

7. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, and means for drawing portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member connected to said portion of one of said opposed elements, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, and a part associated with said portion of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto.

8. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, and means for drawing portions of said opposed elements toward each

other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member, a clamp fixed to said elongated member and connected to said portion of one of said opposed elements, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, and a part associated with said portion of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto.

9. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, and means for drawing portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member, a clamp adjustably fixed to said elongated member and connected to said portion of one of said opposed elements, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, and a part associated with said portion of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto.

10. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, and having extensions provided with bifurcated end portions, and means for drawing the bifurcated end portions of the extensions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member, a clamp fixed to said elongated member, pins extended upwardly and downwardly from said clamp, spaced portions of said bifurcated portion of one of said spaced elements being provided with slots that receive the upwardly and downwardly extended pins of said clamp, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, a block supported by the bifurcated end portion of the extension of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto, spaced portions of the bifurcated end portion of the extension of said other opposed element being provided with slots, and pins extended upwardly and downwardly from said block which are disposed in the slots of the spaced portions of the bifurcated end portion of the extension of the last-mentioned opposed element.

11. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected

to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly and having extensions provided with bifurcated end portions, and means for drawing the bifurcated end portions of the extensions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member, a clamp fixed to said elongated member, pins extended upwardly and downwardly from said clamp, spaced portions of said bifurcated portion of one of said spaced elements being provided with slots that receive the upwardly and downwardly extended pins of said clamp, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, a block supported by the bifurcated end portion of the extension of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto, spaced portions of the bifurcated end portion of the extension of said other opposed element being provided with slots, pins extended upwardly and downwardly from said block which are disposed in the slots of the spaced portions of the bifurcated end portion of the extension of the last-mentioned opposed element, and releasable latching devices for retaining the pins of said clamp and said block in the slots in which they are disposed.

12. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly and having extensions provided with bifurcated end portions, and means for drawing the bifurcated end portions of the extensions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, said means comprising an elongated member, a clamp adjustably fixed to said elongated member, pins extended upwardly and downwardly from said clamp, spaced portions of said bifurcated portion of one of said spaced elements being provided with slots that receive the upwardly and downwardly extended pins of said clamp, a screwthreaded adjusting element associated with said elongated member for rotary movement with respect thereto, a block supported by the bifurcated end portion of the extension of the other of said opposed elements and having a screwthreaded opening formed therethrough through which said screwthreaded adjusting element extends for screwthreaded adjustment relative thereto, spaced portions of the bifurcated end portion of the extension of said other opposed element being provided with slots, pins extended upwardly and downwardly from said block which are disposed in the slots of the spaced portions of the bifurcated end portion of the extension of the last-mentioned opposed element, and releasable latching devices for retaining the pins of said clamp and said block in the slots in which they are disposed.

13. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected

to opposed yoke members, comprising opposed elements arranged to engage the yoke members of the dead end assembly, means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, and a pair of elongated poles supported by said opposed elements beneath the location of the slackened string of insulators of the dead end assembly and providing a cradle structure adapted to receive and support the slackened string of insulators.

14. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, portions formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the portions on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of engaging portions formed on each of said opposed elements, said plurality of engaging portions formed on each of said opposed elements comprising a hook-shaped portion which embraces a part of an associated yoke member, an adjacent lug that

engages another part of the associated yoke member, a remotely positioned abutment which engages yet another part of the associated yoke member, and an extension formed on said element which underlies a part of the associated yoke member.

15. A tool for putting slack in an insulator string of a dead end assembly of the type having a plurality of strings of insulators connected to opposed yoke members, comprising opposed elements, portions formed on said opposed elements adapted to engage the yoke members of the dead end assembly, and means engaging portions of said opposed elements and operable to draw said portions of said opposed elements toward each other so as to cant at least one of the opposed yoke members of the dead end assembly and thereby put slack in one of the strings of insulators associated therewith, the portions on said opposed elements which engage the yoke members of the dead end assembly comprising a plurality of engaging portions formed on each of said opposed elements, said plurality of engaging portions formed on each of said opposed elements comprising a hook-shaped portion which embraces a part of an associated yoke member, an adjacent lug that engages another part of the associated yoke member, a remotely positioned abutment which engages yet another part of the associated yoke member, and an extension formed on said element at the location of said abutment which underlies a part of the associated yoke member.

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