Feb. 23, 1943. D. P. DYER, JR 2,312,084

LINE JACK FOR ELECTRICAL TRANSMISSION LINES

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FIG. 1.

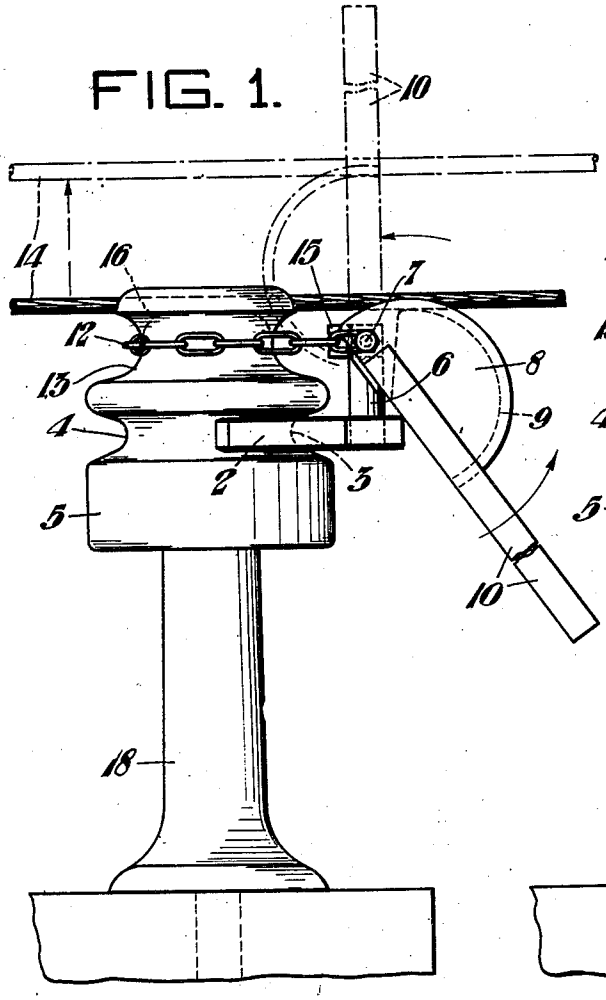


FIG. 3.

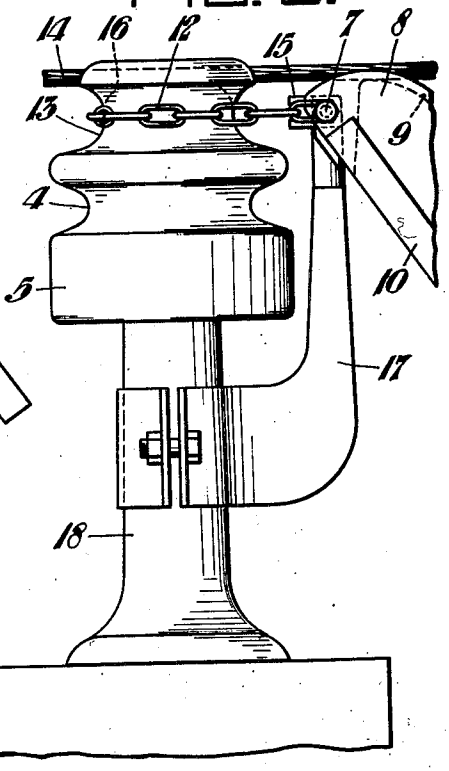
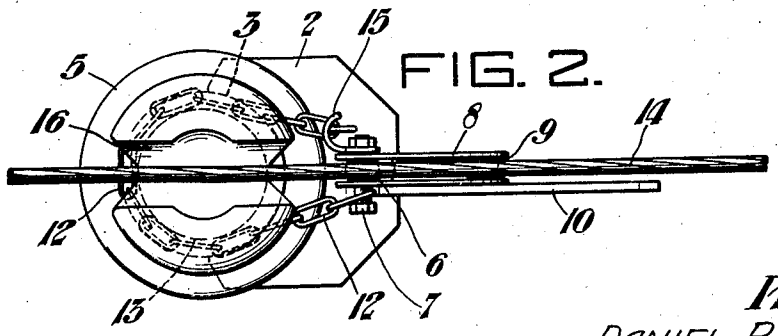


FIG. 2.



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FIG. 4.

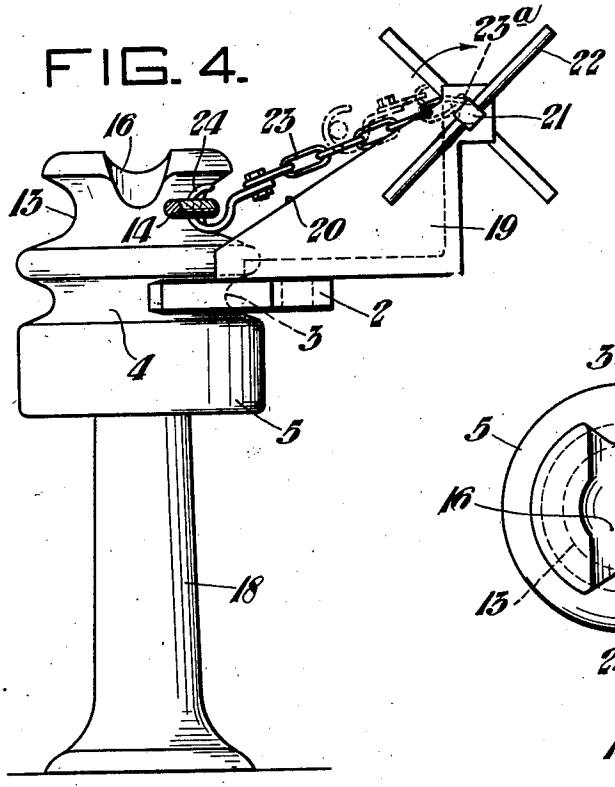


FIG. 5.

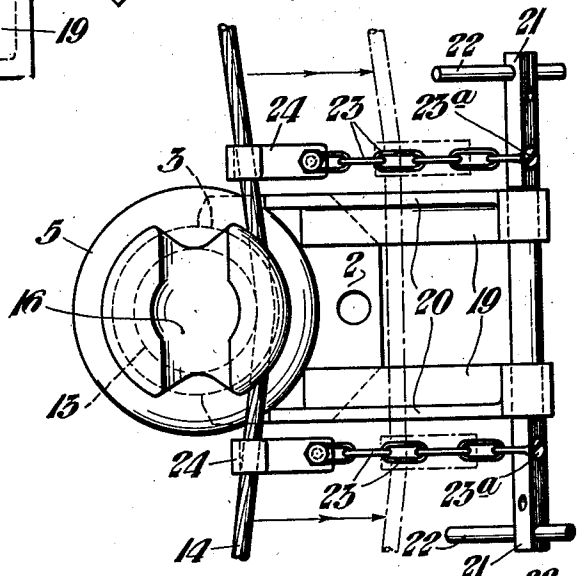


FIG. 6.

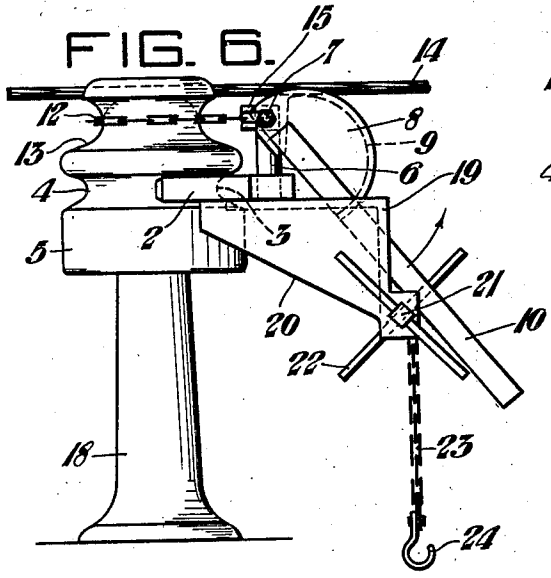
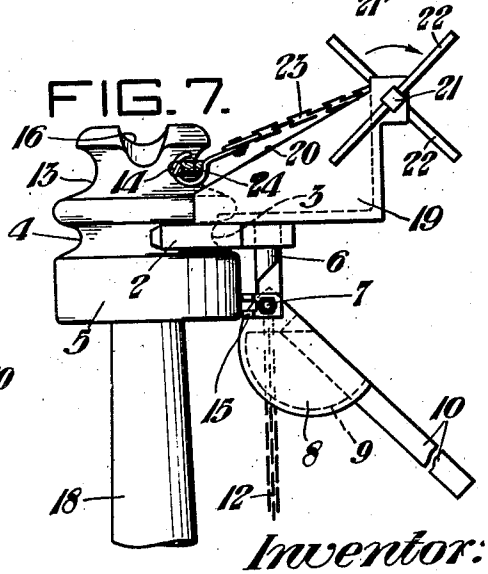


FIG. 7.



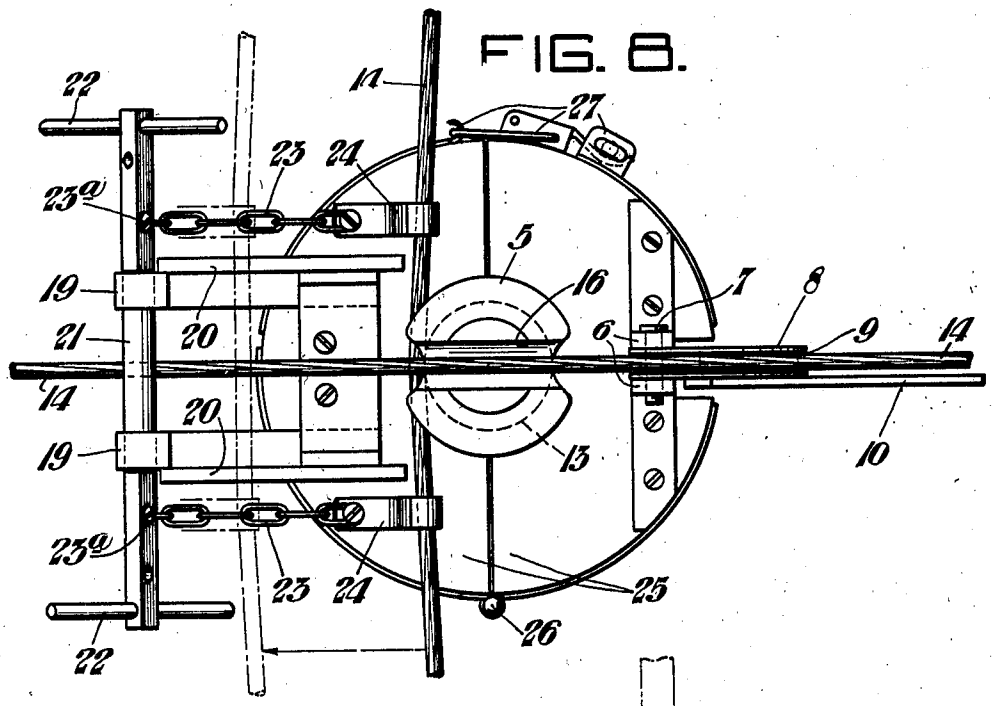
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FIG. 8.



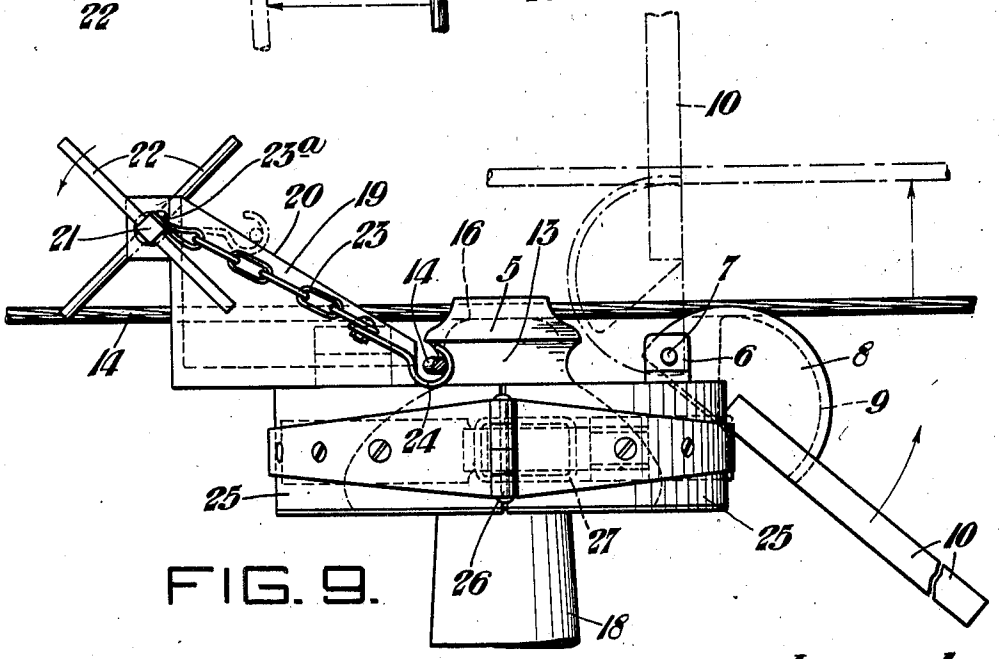


FIG. 9.

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UNITED STATES PATENT OFFICE

2,312,084

LINE JACK FOR ELECTRICAL TRANSMISSION LINES

Daniel P. Dyer, Jr., Chagrin Falls, Ohio, assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey

Application December 26, 1940, Serial No. 371,734

11 Claims. (Cl. 254—131)

This invention relates to line jacks and particularly to an improved line jack or tool for use in applying conductor ties to insulators of the pin type in electrical transmission lines.

It is one of the objects of the present invention to provide an improved line jack or tool for use in applying conductor ties to pin type insulators in electrical transmission lines which is simple and inexpensive in its construction and, at the same time, one which is efficient and effective in its use.

It is another object of the invention to provide an improved line jack or tool for use in applying conductor ties to pin type insulators which is strong and rugged in its construction and a line jack or tool which is easy and convenient to use.

It is a further object of this invention to provide an improved combination line jack or tool which can be used for applying either a side conductor tie or a top conductor tie to pin type insulators in electrical transmission lines.

Various other objects and advantages of this invention will become more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings there is shown for the purpose of illustration one embodiment and several modifications thereof which my invention may assume in practice.

In these drawings:

Figure 1 is a side elevation of the improved line jack or tool of my invention of the type for applying a conductor top tie to a pin type insulator showing the application and use thereof;

Figure 2 is a plan view thereof;

Figure 3 is a view similar to Figure 1 showing a slightly modified construction of my improved line jack or tool;

Figure 4 is a side elevation of the improved line jack or tool of my invention for applying a conductor side tie to a pin type insulator showing the application and use thereof;

Figure 5 is a plan view thereof;

Figure 6 is a side elevation of the combination line jack or tool of my invention for applying either a side or top conductor tie showing its use in the application of a top tie;

Figure 7 is a side elevation of the combination side and top conductor tie line jack similar to Figure 6 showing its use in the application of a side tie;

Figure 8 is a plan view showing a slightly modified construction of the combination line jack or tool of my invention for applying either a top or side conductor tie to a pin type insulator showing its application and use in an electrical transmission line; and

Figure 9 is a side elevation of Figure 8.

It will be understood that the improved line jack or tool of my invention is adapted to be used with a pin type insulator which consists generally of a cylindrical-shaped body member having a groove arranged across the top thereof in which the conductor is adapted to lie for a top tie application and a groove arranged thereabout adjacent the top thereof in which the conductor is adapted to lie for a side tie application with either tie being made by a separate tie wire as desired in a manner well known to those skilled in the art.

Referring more particularly to the drawings, the improved line jack or tool of my invention for use in applying conductor top ties to insulators of the pin type, as shown in Figures 1 and 2 of the drawings, comprises a U-shaped plate-like member 2 having an arcuate-shaped edge 3 on the inner side thereof which is adapted to fit in the groove 4 disposed around the insulator 5. There is securely mounted on the top side of the plate-like member 2, an upwardly extending stud-like member 6 having a pin or bolt 7 disposed in a hole arranged through the upper end thereof to which there is pivotally attached a semi-circular-shaped cam-like member 8 at one end thereof having a groove 9 arranged around its periphery. There is securely attached to the cam-like member 8 preferably to one side thereof and extending outwardly therefrom opposite its pivotal connection a handle 10 for actuating the same in a manner hereinafter to be described. The plate-like member 2 is adapted to be held in position on the insulator 5 preferably by means of a chain 12 or any other suitable flexible member which is disposed in a groove 13 arranged around the top portion of the insulator 5 for receiving the conductor 14 in the case of a side tie with the bolt 7 passing through one end of the chain on one side of the cam-like member 8 so that the same is securely attached thereto, the opposite end of the chain adapted to be removably attached to a slotted hook-like member 15 carried by the bolt 7 on the opposite side of the cam-like member 8.

It will be understood that this type of line jack is to be used solely for applying a top conductor tie to the insulator and is operated in the following manner. The tool or device is assembled on the insulator to which it is desired to make the conductor tie, as shown in Figures 1 and 2 of the drawings, with the groove 9 in

the periphery of the cam 8 disposed beneath and directly opposite the conductor 14 in which the same is adapted to be seated. The cam-like member 8 is then rotated upwardly about its pivotal connection by means of the handle 10 associated therewith, whereby the conductor 14 is moved to position above and away from the insulator by the action of the cam-like member 8 to the position shown in the broken lines of Figure 1 so that the tie wires for fastening the conductor to the insulator can be easily and conveniently positioned on that portion of the conductor which is adapted to be positioned in the top groove 16 of the insulator after the tie has been completed. After the tie wires have been properly wrapped or assembled on the conductor 14, the cam-like member is moved downwardly about its pivotal connection by the handle 10 so that the conductor 14 together with the tie wires arranged thereon will be seated in the transverse groove 16 arranged across the top of the insulator. The conductor tie is then completed by arranging the tie wires around the insulator in any desired manner.

In Figure 3 there is shown a slight modification of the line jack or tool of my invention for applying a top tie. This construction is substantially the same as that shown in Figures 1 and 2 but differs in that the cam-like member 8 is pivotally supported to the upper end of a post-like or bracket member 17 which is suitably attached to the post 18 below the insulator 5 in any suitable manner. That is, the plate-like member 2 has been eliminated in this construction and the post-like member 17 substituted therefor. In this construction it will be seen that the jack is supported primarily by the bracket or post 18 and that the chain 12 or other flexible member may be dispensed with entirely, if desired, thereby eliminating any attachment whatsoever to the insulator proper. This type of jack or tool is especially adaptable for supporting the conductor while a broken insulator is replaced as well as for making an initial tie. The line jack of this modified construction operates in the same manner as the type disclosed in Figures 1 and 2 of the drawings.

In Figures 4 and 5 of the drawings there is shown the line jack or tool of my invention for applying a side conductor tie to pin type insulators in electrical transmission lines. In this construction, as before, there is provided a similar plate-like member 2 having an arcuate-shaped edge 3 arranged on the inner side thereof which is adapted to fit in the groove 4 of the insulator 5. There is securely mounted on the top side of the plate-like member 2 a wedge-like bracket member 19 having an inclined upper surface 20 which is adapted to guide the conductor 14 to position away from the insulator. There is positioned in the bracket 19 adjacent the top at the outer side thereof, a horizontally disposed rotatable shaft 21 which is adapted to be disposed substantially parallel to the conductor 14 when the line jack is in use and has a handle or manipulating member 22 arranged on each end thereof for rotating the same. There is arranged on the shaft 21 preferably a pair of chains 23 or other suitable flexible members with one disposed to either side of the bracket 19 having one end thereof secured to the shaft, as at 23a, and which are adapted to be wound therearound. On the opposite free end of each of the chains 23 there is mounted a hook-like member 24 which is adapted to engage the conductor 14 with one hook-like member disposed to each side of the insulator 5, as shown in Figure 5 of the drawings. It will be seen that there is not provided any means for holding the plate-like member 2 in engagement with the insulator 5 such as the chain 12 in the top tie line jack construction shown in Figures 1 and 2. However, it will be understood that the plate-like member 2 is held in engagement with the insulator due to the opposed force transmitted to the plate-like member and against the insulator which is set up by the action of the chains 23 in pulling the conductor away from the insulator in a manner hereinafter to be described.

The line jack of this latter construction is operated in the following manner. The plate-like member 2 is positioned in contact with the insulator 5 on that side of the insulator at which the conductor 14 is disposed with the hook-like members 24 on the free ends of the chains 23 engaging the conductor 14 with one hook-like member attached to each side of the insulator, as shown in Figure 5. The shaft 21 is then rotated preferably in a clockwise direction by means of the handles 22 and the chains through the rotation of the shaft are wound therearound, thus moving the conductor 14 up the upper inclined surface 20 of the bracket 19 to position away from the insulator 5, as shown in the broken lines of Figures 4 and 5. The tie wires are then wrapped around the conductor as desired, as before, and after this has been done the conductor is permitted to move back to position into the groove 13 in which it is seated in contact with the insulator so that the tie can be completed. The tool or line jack is then removed from its operable position on the insulator and assembled on the next insulator to which a conductor tie is to be made.

It will be understood that the line jack shown in Figures 1, 2 and 3 of the drawings is used for the purpose of applying a top tie to conductors and that the line jack disclosed in Figures 4 and 5 of the drawings is used solely for the purpose of applying a side conductor tie.

In Figures 6 and 7 of the drawings there is shown a combination tool which may be used for applying either a conductor side or top tie, as desired, thus eliminating the need for two separate line jacks or tools; that is, one for applying a side tie and another for applying a top tie. This construction is actually a combination of the features and parts of the line jack or tool shown in Figures 1 and 2 of the drawings and that shown in Figures 4 and 5. In this construction, there is provided a plate-like member 2, as before, the cam-like member 8 together with its associated parts as heretofore described being securely arranged on one side thereof for use in applying a top conductor tie and the bracket member 19 and chains 23 together with their associated parts as heretofore described being arranged on the opposite side of the plate-like member 2 for use in applying a conductor side tie. This combination tool is used in substantially the same manner as the respective line jack for applying a top tie and that for applying a side tie, and any further description of the construction and operation thereof is deemed unnecessary.

The line jack of the construction shown in Figures 8 and 9 of the drawings is also a line jack having the combined features of the line

jack for applying a top tie, as shown in Figures 1 and 2 of the drawings, and the line jack for applying a side tie, as shown in Figures 4 and 5. In this construction the bracket member 19 and chains 23 and their associated parts as hereinbefore described for applying a side tie are assembled on one side of a split collar member 25 and the cam-like member 8 together with its associated parts as heretofore described are assembled on the split collar preferably diametrically opposite therefrom on the same side of the split collar member for applying a top conductor tie. The split collar 25 is preferably hinged, as at 26, and may be attached to the insulator 5 in any convenient manner and at any desired position thereon, and it is preferably locked in position thereon by means of a suitable latch arrangement 27. Both the cam-like member 8 for applying a top tie and the bracket member 19 together with the shaft 21 for applying a side tie are operated in the same manner as the respective individual line jacks or tools heretofore described for applying such ties and any further discussion of the construction and operation of this latter type combination line jack is deemed unnecessary.

As a result of my invention it will be seen that there is provided an improved portable line jack which is simple and compact in its construction and one that can be readily mounted in position for use and dismantled for transportation, as desired, from one point to another.

While I have shown and described one embodiment and several modifications of the present invention, it will be seen that I do not wish to be limited exactly thereto, since various other modifications may be made without departing from the scope of the invention, as defined by the following claims.

I claim:

1. A device of the class described for use in applying conductor ties to pin type insulators and the like in electrical transmission lines including, a plate-like member having an arcuate-shaped surface arranged on the inner edge thereof, means for removably attaching said plate-like member to the insulator so that the arcuate-shaped edge fits therearound, and means carried by said plate-like member for moving the conductor to position away from the insulator.

2. A device of the class described for use in applying conductor ties to pin type insulators and the like in electrical transmission lines including, a plate-like member having an arcuate-shaped surface arranged on the inner edge thereof, means for removably attaching said plate-like member to the insulator so that the arcuate-shaped edge fits therearound, a cam-like member having a groove arranged around the periphery thereof, means carried by said plate-like member for pivotally supporting said cam-like member, and means for moving said cam-like member about its pivoted connection whereby the same is adapted to move said conductor to position away from the insulator upon rotative movement of said cam-like member.

3. A device of the class described for use in applying conductor ties to pin type insulators and the like in electrical transmission lines including, a plate-like member having an arcuate-shaped surface arranged on the inner edge thereof which is adapted to fit around the insulator for supporting the device, a bracket member carried by said plate-like member having an inclined upper surface, a shaft carried by said bracket member adjacent the outer side thereof which is adapted to be disposed substantially parallel to the conductor, a pair of flexible members having one end thereof secured to said shaft, an attaching member arranged on the opposite free end of each of said flexible members which is adapted to be connected to the conductor, and means for rotating said shaft whereby the flexible members are wrapped therearound upon rotation thereof, said flexible members adapted to pull the conductor up the inclined surface of the bracket member to position away from the insulator upon rotative movement of said shaft and the wrapping of the flexible members therearound.

4. A device of the class described for use in applying conductor ties to pin type insulators and the like in electrical transmission lines including, means for removably supporting the device at a point adjacent the insulator, a bracket member carried by said last mentioned means having an inclined upper surface, a shaft carried by said bracket member adjacent the outer side thereof which is adapted to be disposed substantially parallel to the conductor, a pair of flexible members having one end thereof secured to said shaft, a hook-like member arranged on the opposite free end of each of said flexible members which is adapted to be connected to the conductor, and means for rotating said shaft whereby the flexible members are wrapped therearound upon rotation thereof, said flexible members adapted to pull the conductor up the inclined surface of the bracket member to position away from the insulator upon rotative movement of said shaft and the wrapping of the flexible members therearound.

5. A device of the class described for use in applying conductor ties to pin type insulators and the like in electrical transmission lines including, in combination, a plate-like member having an arcuate-shaped surface arranged on the inner edge thereof, means for removably attaching said plate-like member to the insulator so that the arcuate-shaped edge fits therearound, means arranged on one side of said plate-like member for moving the conductor to position away from the insulator for applying a top tie, said last mentioned means consisting of a pivotally arranged cam-like member having a groove arranged around the periphery thereof, with said cam-like member adapted to engage with the conductor with the conductor lying in the groove thereof whereby the same is moved to position away from the insulator upon rotative movement of the cam-like member, means carried by the opposite side of said plate-like member for moving the conductor to position away from the insulator for applying a side tie, said last mentioned means consisting of a bracket member attached to said plate-like member having an inclined upper surface, a shaft carried by said bracket member adjacent the outer side thereof which is adapted to be disposed substantially parallel to the conductor, a pair of flexible members having one end thereof secured to said shaft, a hook-like member arranged on the opposite free end of each of said flexible members which is adapted to be connected to the conductor, and means for rotating said shaft whereby the flexible members are wrapped therearound upon rotation thereof, said flexible members adapted to pull the conductor up the inclined surface of the bracket member to position away from the insulator upon rotative movement of said shaft and the wrapping of the flexible members therearound.

6. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means for supporting the jack adjacent an insulator, flexible means for holding the jack in engagement with the insulator, and means for moving the conductor to position away from the insulator, said last mentioned means adapted to tension said flexible means when the conductor is moved away from the insulator.

7. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means adapted to fit around an insulator for supporting the jack, flexible means for holding the jack in engagement with the insulator, and means for moving the conductor to position away from the insulator, said last mentioned means adapted to tension said flexible means when the conductor is moved away from the insulator.

8. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means adapted to fit around an insulator for supporting the jack, flexible means for holding the jack in engagement with the insulator, and eccentrically pivoted cam means for moving the conductor by a camming action to position away from the insulator, said cam means adapted to tension said flexible means when the conductor is moved away from the insulator.

9. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means for supporting the jack adjacent an insulator, flexible means for holding the jack in engagement with the insulator, and a cam-like member eccentrically pivoted on said supporting means which is adapted to cooperate with the conductor to move the same to position away from the insulator upon rotative movement of said cam-like member, said cam-like member adapted to tension said flexible means upon such movement.

10. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means for supporting the jack adjacent an insulator, flexible means for holding the jack in engagement with the insulator, and a cam-like member having a groove arranged around the periphery thereof eccentrically pivoted on said supporting means, said cam-like member adapted to engage the conductor with the conductor lying in the groove thereof whereby the same is moved to position away from the insulator upon rotative movement of said cam-like member and to tension said flexible means upon such movement.

11. A line jack of the class described for use with insulators of electrical transmission lines and the like, including, in combination, means for supporting the jack adjacent an insulator, flexible means for holding the jack in engagement with the insulator, means arranged on one end of said flexible means for attaching the same to a conductor, and a rotatable member to which the opposite end of said flexible means is attached and which is adapted to be spaced from and disposed substantially parallel to the conductor, said rotatable member adapted to tension said flexible means with the same adapted to be wrapped therearound upon rotation thereof whereby the conductor is moved away from the insulator.

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