Sept. 7, 1965 C. A. RICKER 3,204,309

CONDUCTOR GRIP

Filed June 18, 1962 2 Sheets-Sheet 1

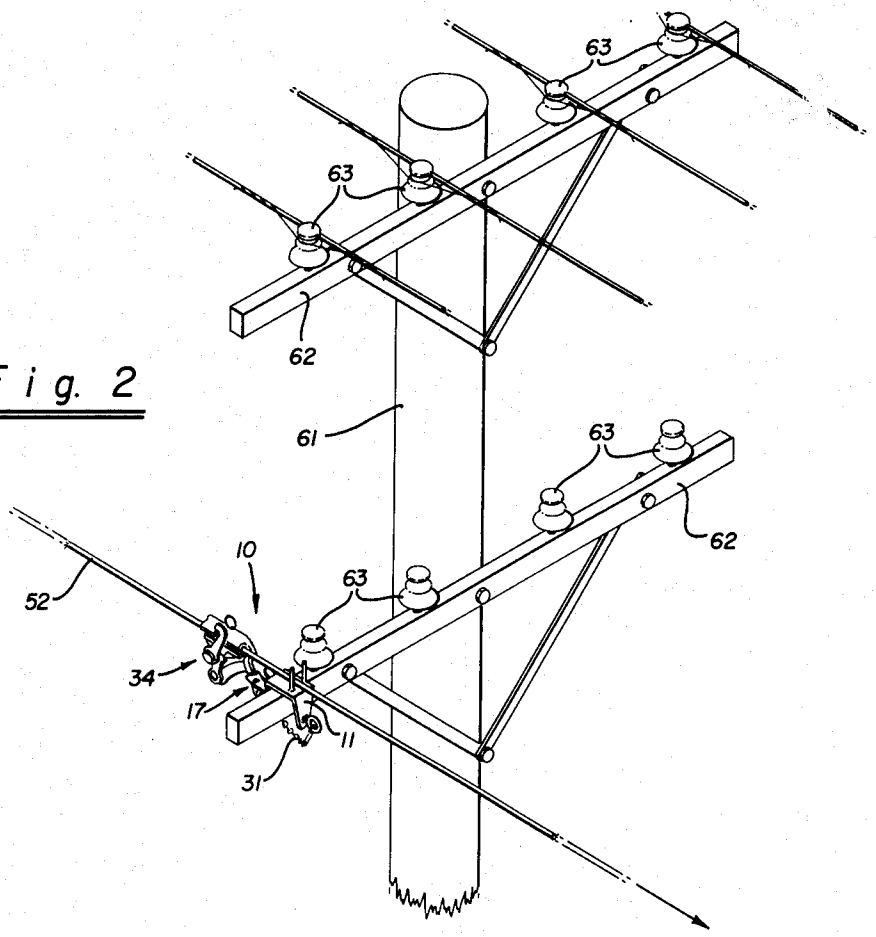

Fig. 2

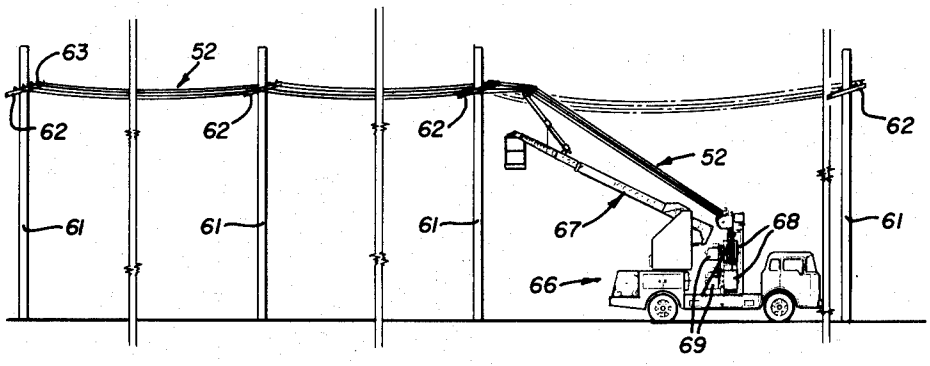

Fig. 1

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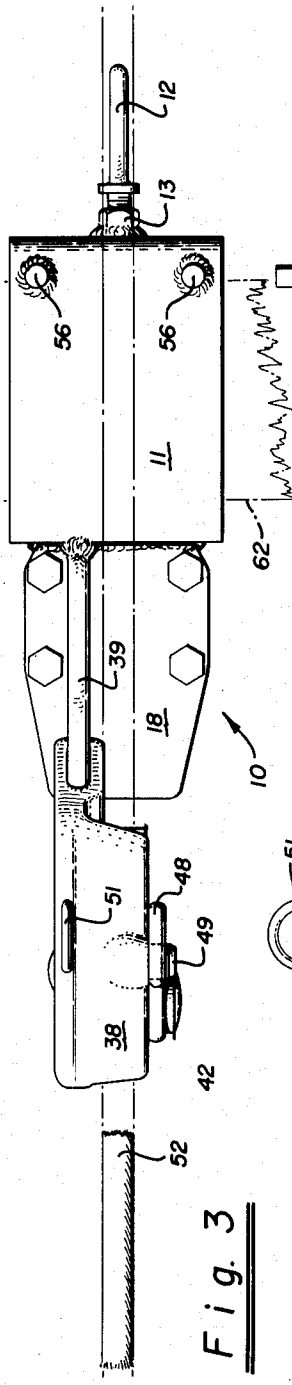

Fig. 3

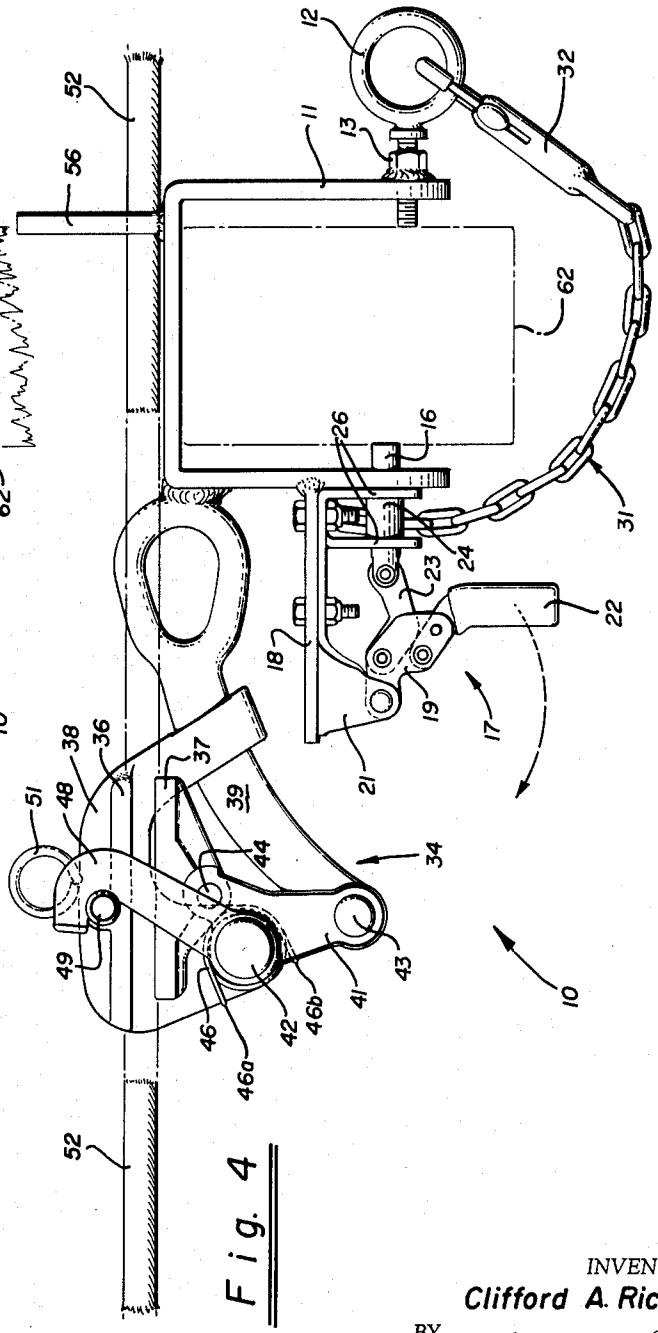

Fig. 4

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CONDUCTOR GRIP

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4 Claims. (Cl. 24—81)

This invention relates to a conductor grip and guide and method and more particularly to such a grip and guide and method which is particularly useful for the stringing of conductors on pole lines.

In the continuous efforts to reduce the time and labor required for conductor stringing operations and in particular the stringing of power line conductors, there is a need for a new and improved tool to facilitate such stringing operations and also for new and improved methods for accomplishing stringing operations.

In general it is an object of the present invention to provide a conductor grip and guide and method which is particularly adapted for use in the stringing of conductors on pole lines.

Another object of the invention is to provide a conductor grip and guide and method of the above character which can be utilized with a self-propelled vehicle having conductor carrying reels and a boom structure mounted thereon.

Another object of the invention is to provide a conductor grip and guide which can be quickly mounted and removed from the cross arms.

Another object of the invention is to provide a conductor grip and guide of the above character which can be utilized for conductor tensioning operations.

Another object of the invention is to provide a conductor grip and guide of the above character in which the conductor is guided to prevent it from slipping out of the jaws of the conductor grip.

Another object of the invention is to provide a conductor grip and guide of the above character which is relatively simple and economical to manufacture.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment of my device and of my method are set forth in detail in conjunction with the accompanying drawing.

Referring to the drawings:

FIGURE 1 is a side elevational view of a pole line and apparatus illustrating the use of my method.

FIGURE 2 is an isometric view of one of the poles showing my conductor grip and guide in use.

FIGURE 3 is a top plan view of a conductor grip and guide incorporating my invention.

FIGURE 4 is a side elevational view of the conductor grip and guide shown in FIGURE 3.

In general the conductor grip and guide consists of a U-shaped bracket which is adapted to fit over the cross arm. Means is provided for releasably securing the bracket to the cross arm. Conductor gripping means is fixed to the bracket. The conductor gripping means includes a pair of jaws movable between conductor gripping and conductor releasing positions. The jaws in a conductor gripping position lie in a plane which is substantially parallel to the plane of the upper surface of the bracket. Guide pins are provided on the bracket to guide the conductor and to prevent the conductor from being pulled sidewise in the conductor gripping jaws. This conductor grip and guide is utilized in performing a method as hereinafter described.

The conductor grip and guide **10** is shown in detail in FIGURES 3 and 4 and consists of a U-shaped bracket **11** which is sized in such a manner that it is adapted to fit over a cross arm **62** shown in broken lines in FIGURES 3 and 4. Means is provided for releasably securing the bracket to the cross arm and consists of an eyebolt **12** which is threaded into a nut **13** secured to one leg of the U-shaped bracket **11**. As shown in FIGURE 4, the eyebolt is adapted to be adjusted inwardly or outwardly to accommodate cross arms of various sizes. A bolt **16** is provided in the leg of the bracket **11** and is adapted to be moved into and out of engagement with the cross arm **62** by a quick-acting toggle mechanism **17**.

The toggle mechanism **17** is secured to a member **18** which is fixed to one leg of the U-shaped bracket **11**. The toggle mechanism **17** is of the type well known to those skilled in the art and consists of a pair of members **19** which are pivotally mounted in a bracket **21** secured to the lower side of the member **18**. A handle **22** is pivotally secured between the members **19** and is moved as indicated by the arrow for opening and closing the toggle mechanism. A link **23** is pivotally connected to the members **19** and is also pivotally connected to the bolt **16** which is slidably mounted in a sleeve **24** mounted between a pair of ears **26** secured to the member **18**. It can readily be seen that by movement of the handle **22** to the left as indicated by the arrow in FIGURE 4, the toggle mechanism is opened to withdraw the bolt **16** and thereby release the bracket **11** from the cross arm **62**. The bolt **16** extends inwardly a predetermined distance when the toggle mechanism is closed. In order to accommodate various widths of cross arms, the eyebolt **12** is adjusted. After this has been accomplished, the bracket can be readily fastened on the cross arm for operation of the toggle mechanism **17** and also can be readily released from the cross arm by operation of the toggle mechanism **17**.

Additional safety means is provided to prevent the bracket from accidentally falling off of the cross arm and dropping to the ground and consists of a safety chain **31** which has one end secured to the member **18**. The other end is provided with a harness snap **32** which is adapted to snap into the eyebolt **12** as indicated in FIGURE 4.

A conductor grip **34** of substantially conventional construction is secured to the bracket **11** by suitable means such as welding. The grip is of a type manufactured by the Crescent Tool Company. It consists of upper and lower jaws **36** and **37** which are movable between a conductor gripping position and conductor releasing positions. The upper jaw **36** is carried by a substantially U-shaped member **38** which has one end slidably mounted on a handle **39** which is affixed to the bracket **11**. The other end is pivotally connected to a link **41** by a pin **42**. The other end of the link **41** is connected to the handle **39** by a pin **43**. The lower jaw **37** is pivotally mounted on the link **41** by a pin **44**. Means is provided for spring loading the grip toward a conductor gripping position and consists of a spring **46** which has one end **46***a* engaging the member **38** and the other end **46***b* engaging the link **41**. A safety latch **48** is pivotally mounted on the pin **42** and is adapted to engage a pin **49** provided on the member **38**. This latch is provided to prevent the device from dropping off of the conductor in the event that by some chance the bracket **11** should accidentally come loose from the cross arm **12**. An additional carrying ring **51** is provided on the member **38**.

It will be noted that the jaws **36** and **37** when they are in a conductor gripping position extend in a plane which is substantially parallel to the upper surface of the bracket **11** as shown particularly in FIGURE 4. The grip **34** has been positioned in this manner to grip the conductor **52** so that the conductor **52** can readily pass over the top of the bracket **11** as shown in FIGURE 4. Means is provided on the bracket **11** for guiding the conductor so that it cannot be pulled sidewise out of the jaws **36** and **37**

and consists of a pair of vertical spaced guide pins **56** which are mounted on the forward end of the bracket **11** as shown particularly in FIGURES 3 and 4.

This conductor grip and guide which I have hereinbefore described can be utilized in my novel method for stringing conductors on a pole line. Thus in FIGURE 1 I have shown a pole line consisting of a plurality of poles **61** which are provided with cross arms **62** upon which spaced insulators **63** have been mounted. In performing my method, a conductor stringing apparatus of the type described in my copending application, Serial No. 93,684, filed March 6, 1961, is utilized. Such an apparatus consists of a self-propelled vehicle **66** upon which is mounted a boom structure **67** and a plurality of conductor carrying reels **68**. The conductor carrying reels are provided with brakes **69** to apply predetermined braking forces to the reels which can be utilized to advantage in practicing my method.

Now let it be assumed that it is desired to string a three phase power circuit utilizing four power conductors carried by four reels **68** on the self-propelled vehicle **66**. The conductors **52** on the reels are payed out over the boom structure and are dead ended in an appropriate manner. The self-propelled vehicle **66** is then advanced and the conductors are placed on the cross arms between the insulators so that the conductors will not slide off the cross arms by use of the boom structure. This procedure continues until the next to the last pole is reached in the stringing operation. One of the conductor grip and guides **10** is then placed on the cross arm **62** for each of the conductors **52**. For the purpose of convenience, only one of the devices is shown in FIGURE 2. The device **10** is placed on the pole by first opening the toggle mechanism **17** and then slipping the bracket **11** over the cross arm as indicated in FIGURE 4 and then closing the toggle mechanism to clamp the bracket to the cross arm. Thereafter the safety link **31** is put in place.

The conductor **52** is placed between the jaws **36** and **37** and between the vertical guide posts **56**. The safety latch **48** is also hooked over the pin **49**. As soon as each of the conductors being strung has been placed in one of the devices **10** on the cross arm **62**, the brake tension is increased on each of the brakes **69** for the reels **68** to a predetermined amount and the vehicle is advanced to pull the slack out of the conductors and to thereby properly tension the conductors. All the slack can be readily pulled out of the conductors because the grips **34** are of the type which will release as the conductors are pulled through them. As soon as the conductors are released the devices will quickly clamp the conductors between their jaws and prevent their rearward movement. Since the braking force can be readily adjusted for each of the reels, it is readily apparent that all of the conductors can be pulled up to the same tension to provide the same sag in the conductors between the poles. As soon as the conductors have been properly sagged, the brake tension is substantially reduced and the vehicle is advanced to the last pole while paying out the conductors. At the last pole, the operator places hoists or conductor pullers on the cross arm of the last pole and pulls the slack out of the last span. He then dead-ends or ties the conductors in appropriate manner. As soon as this has been accomplished, the conductors can be cut or the cable stringing can continue. The devices **10** can be removed from the cross arm as soon as the conductors are dead ended or tied. Thereafter, the conductors can be secured to the insulators in a manner well known to those skilled in the art.

From this method it can be seen that the devices **10** make it possible to pull all of the slack in unison out of the previous conductors which have been strung by the use of a self-propelled vehicle which makes possible a great saving in time. Also, with the last span being

the only one span to be tensioned manually, this can be readily accomplished by one man utilizing conventional equipment. Another advantage of the devices **10** is that in the event the brakes or for some other reason something fails on the vehicle, the conductors since they are gripped by the grips **34** cannot accidentally fall to the street or ground and cause injury or create undue safety hazards.

It is apparent from the foregoing that I have provided a new and improved conductor grip and guide which is particularly useful in performing a conductor stringing operation. The conductor grip and guide is relatively simple and economical to manufacture and can be readily placed on or removed from the cross arms.

I claim:

1. In a device of the character described for use on a cross arm mounted on a pole, a U-shaped bracket adapted to fit over said cross arm, an eyebolt threaded into one of the legs of the U-shaped bracket, a bolt slidably mounted in the other leg of the bracket, a quick acting toggle mechanism for moving said last named bolt in said leg, a conductor grip secured to said bracket, said conductor grip including a pair of jaws movable between conductor engaging and conductor releasing positions, and means associated with said jaws for moving said jaws toward an open position when the conductor is pulled in one direction and for moving the jaws to a conductor gripping position when the conductor is moved in an opposite direction.

2. In a device of the character described for use on a cross arm mounted on a pole, a U-shaped bracket adapted to be positioned over said cross arm, an eyebolt threaded into one of the legs of the U-shaped bracket, a bolt slidably mounted in the other leg of the bracket, a quick-action toggle mechanism for moving said last named bolt in said leg and into and out of engagement with the cross arm when the bracket is mounted on the cross arm, a conductor grip secured to the said bracket, said conductor grip including a pair of jaws movable between conductor engaging and conductor releasing positions, and means connected to said jaws for moving said jaws to an open position when the conductor is pulled in one direction and for moving the jaws to a conductor gripping position when the conductor is moved in an opposite direction, said jaws in a conductor gripping position lying in a plane substantially parallel with the upper surface of the U-shaped bracket.

3. A device as in claim **2** together with a pair of upwardly extending guide members mounted on the bracket serving to guide the conductor and to prevent the conductor from being pulled sideways out of the jaws.

4. A device as in claim **2** together with a safety chain secured to one leg of the bracket and means releasably securing the other end of the chain to the other end of the bracket.

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