

Jan. 17, 1961

W. H. MILLER ET AL

2,968,077

WIRING ACCESSORY

Filed May 27, 1959

2 Sheets-Sheet 1

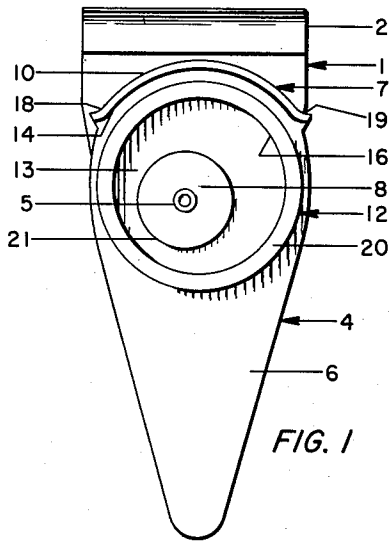


FIG. 1

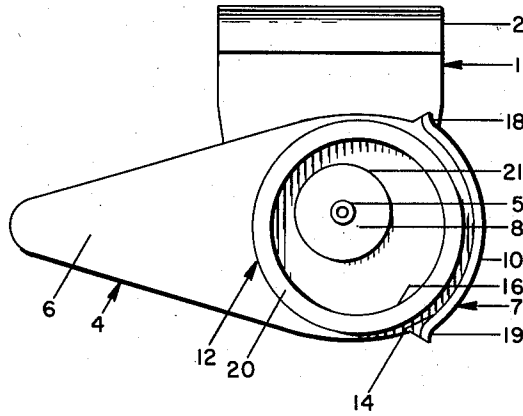


FIG. 2

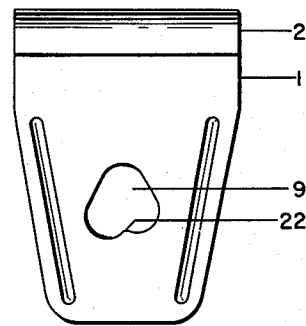


FIG. 3

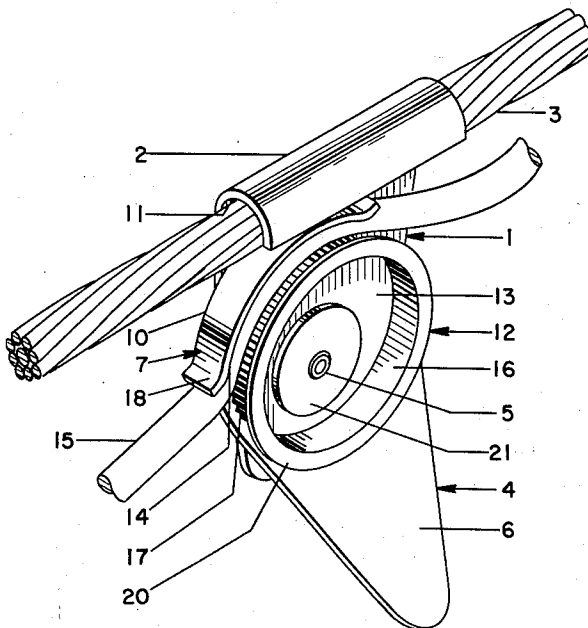


FIG. 4

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2 Sheets-Sheet 2

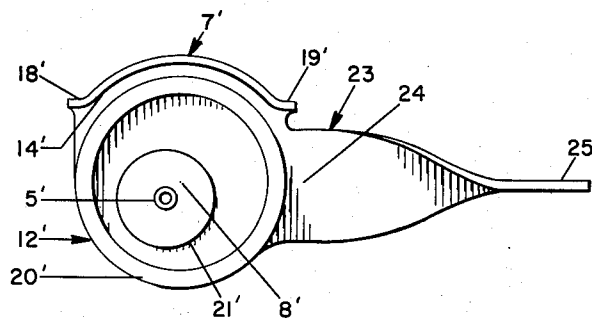


FIG. 5

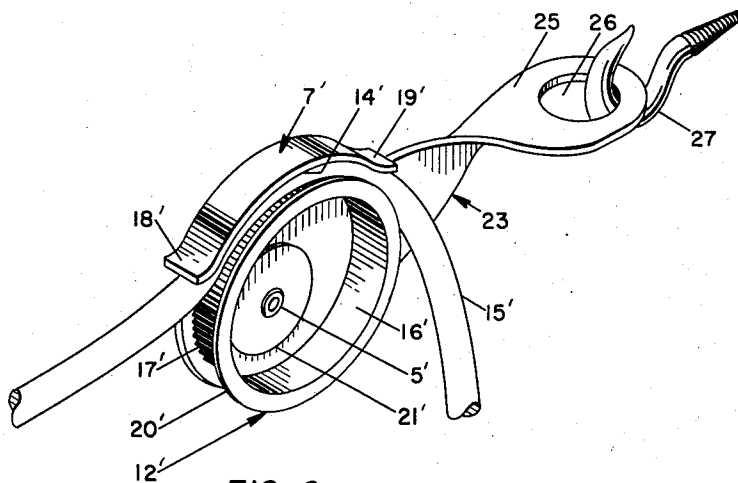


FIG. 6

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1

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WIRING ACCESSORY

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3 Claims. (Cl. 24—81)

The invention presented herein relates to a device for gripping an elongated object and, particularly to such a device which is useful for gripping and anchoring cable, wire, rope and like items.

In particular, devices in accordance with this invention are especially useful in telephone installation work for anchoring drop wires between the subscriber's premises and messenger cables. One of the common methods of carrying telephone cable is to suspend it from a messenger cable strung between the poles. The drop wire provides the connection between the telephone cable and the subscriber's telephone. It is customary to attach the drop wire to the messenger cable at a point where the span to the subscriber's premises will be within the desired limits. In some situations, however, the point of attachment is selected to avoid obstacles presented between the cable and the subscriber's premises. Heretofore, it has been common practice in the art to anchor the drop wire at each end with a clamping device having a tapering wedge. This has entailed the use of several nuts and bolts, tools and parts.

It is an object of the present invention, therefore, to provide a gripping and anchoring device useful in such installations which is installed and removed without using any tools.

It is a further object of the invention to provide such a device which is simple, reliable and quick to install.

It is an additional object of the invention to provide such a device which can be quickly released without the use of tools to allow adjustments to be made.

It is a still further object to provide a device for gripping and anchoring a drop wire which will not tear, cut or damage the insulation on the drop wire.

Another object of the invention is to provide a device for gripping a drop wire and anchoring the drop wire to the messenger strand in a novel manner which permits the user to quickly and readily adjust the position of the device along the messenger strand without the use of tools.

Still another object of the present invention is to provide a device for gripping a drop wire and anchoring the drop wire to the messenger strand which is readily adjusted to accommodate strands of various diameters.

It is a further object of the invention to provide a gripping and anchoring device having parts that can be easily manufactured and assembled with a minimum amount of time and labor.

In general, an exemplary embodiment of this invention may comprise a flat base member having a substantially straight flange across one end; a flat gripping member having one end flanged along an arc; a flanged disc; and means for rotatively and eccentrically mounting the gripping member and disc on the base member such that their flat surfaces are contiguous and the flange of the gripping member is disposed between the flange of the disc and the base member, whereby rotation of the gripping member relative to the base member varies the gap between their flanges, and rotation of the disc relative to the gripping

2

member will vary the gap between their disc and gripping member flanges. This arrangement makes it possible to place an elongated object such as a rope or wire between the flanges of the base and gripping members and rotate these members relative to each other until the gap between their flanges becomes small enough to grip and fixedly hold the object. If the object is under tension in the direction tending to cause the same relative movement between the flanges, the tension will tend to decrease the gap still further and more fixedly grip the object between the flanges. Similarly, an object placed between the flanges of the disc and the gripping member also will be gripped and held securely when the disc and gripping members are rotated relative to each other. Any tension on the object tending to rotate the disc still further will increase the gripping action. To release elongated objects, it is necessary only to reverse the direction of relative movement between the base and gripping members, or between flanged disc and gripping member. This can be done in some cases merely by pulling on the objects being gripped in the direction needed to cause such rotation.

For a better understanding of the invention, attention is now directed to the following description taken in connection with the accompanying drawings in which:

Figure 1 is a front elevational view of one embodiment of the invention;

Figure 2 is a front elevational view of the device shown in Figure 1 with the device positioned for receiving an object to be gripped;

Figure 3 is a front elevational view of one part of the device of Figure 1;

Figure 4 is a perspective view of the device of Figure 1 when in use;

Figure 5 is a front elevational view of a second embodiment of the invention; and

Figure 6 is a perspective view of the device of Figure 5 when in use.

The embodiment of the invention shown in Fig. 1 comprises a flat, generally rectangular-shaped rigid base 1 from sheet metal. The base is bent at one end to form an open channel 2 for receiving an elongated object 3 to be gripped by the device. As shown in Fig. 4, base 1 presents a J-shaped configuration when viewed from an end of channel 2.

An object 3 placed in channel 2 may be wedged in place by a gripping member 4 coupled for eccentric rotation on base 1 by a rivet 5. One end of the member 4 is tapered to provide a lever or handle 6 for moving the member 4 about the axis of rivet 5 while the opposite end is provided with an arcuate flange 7.

The rivet 5 passes through the member 4 a short distance to the left of the center 8 of the arc defined by flange 7 and at a slightly greater distance from the flange 7 than the center 8. The rivet is received in an opening 9 of base 1, shown in Fig. 3 which is located so that the outer surface 10 of flange 7 passes a short distance below the inner surface 11 of channel 2 when member 4 and base 1 are rotated relative to each other. In addition, since rivet 5 is eccentrically located with respect to flange 7, in the manner indicated, the right-hand portion of surface 10 comes closer to the opening of channel 2 than the left-hand portion when flange 7 is rotated with respect to channel 2. Thus, an object 3 placed in channel 2 is effectively wedged in place between channel 2 and flange 7 when the latter is moved counterclockwise. Movement of flange 7 about the axis of rivet 5 may be accomplished easily by using the handle portion 6 of gripping member 4. This enables a user to wedge or release an object 3 placed between flange 7 and channel 2.

A flanged disc 12 with its bottom 13 positioned adjacent gripping member 4 cooperates with the inner surface

3

14 of flange 7 to grip a second object 15. The flanged disc 12 rotates eccentrically about rivet 5.

As the disc 12 is rotated counterclockwise, flange 16 of the disc moves closer to the inner surface 14 of flange 7. By rotating the disc 12 to increase the gap between flange 16 and flange 7 of the gripping member 4 sufficiently, a flexible elongated object 15 placed between flange 7 and flange 16 may be wedged in place by rotating the flanged disc 12 counterclockwise. The flange of disc 12 has a serrated or knurled outer surface 17 as shown in Fig. 4. Therefore, by pulling the object 15 to the left, the flanged disc 12 is moved counterclockwise and the object is gripped securely between surfaces 14 and 17. Similarly, by pulling the object to the right it may be quickly and easily released. Any pull to the left on the object 15 urges flange 7 to move counterclockwise, thereby tending to increase and maintain the grip thereon the object. This also tends to tighten the grip on an object in channel 2. The force exerted on the object between surfaces 14 and 17 to maintain the gripping action of surfaces 10 and 11 is magnified by the fact the force acts at a point which is a substantial distance from the axis of rotation of surface 10.

To prevent the surface of the object held between surfaces 14 and 17 from being cut by the end portions of flange 7, the end portions 18, 19 of flange 7 are flared away from the object.

The sides of the channel 2 prevent object 3 from slipping outwardly from between surfaces 11 and 10. The flanged disc 12 has lip 20 which is flared outwardly from the flange 16. The lip 20 and member 4 prevent the object from slipping outwardly from between surfaces 14 and 17.

To hold the base 1, gripping member 4 and flanged disc 12 on the rivet 5, the rivet 5 has a head (not shown) which will not pass through the opening 9 in frame 1. The rivet passes through a washer 21 adjacent to the bottom 13 of disc 12 and is flared to hold the rivet in place in the assembly.

The heart shaped opening 9 in base 1 permits movement of the base 1 relative to rivet 5 in a plane perpendicular to the axis of rivet 5 and provides two positions for the rivet 5 when the device is operated. As shown in Fig. 3, the opening provides one position toward the left side of base 1 which is slightly further from channel 2 than the second position provided toward the right side of frame 1. A slight projection 22 between the two positions fixes the rivet in one or the other of the two positions. It has the effect, therefore, of preventing the rivet from moving to the first position when the second position has been selected for use. The provision of the two positions permits the device to be used with a wider range of object sizes than otherwise would be possible. It is obvious that other positions could be provided in a similar manner so that the device can be made to accommodate a still wider selection of object sizes.

The device shown in Fig. 1 is useful for anchoring the drop wire 15 to the messenger strand 3 to provide telephone service to a subscriber. For convenience, operation of the device is described below when used for this purpose. Operation of the device is described with rivet 5 in only one of the two positions provided by the opening in base 1.

To facilitate positioning base 1 on the messenger strand 3, gripping member 4 is rotated clockwise until a sufficient gap exists between channel 2 and flange 7 for passage of the messenger strand 3. Fig. 2 shows the member 4 rotated approximately 90° to the position which provides the maximum gap between channel 2 and flange 7. This permits the messenger strand to be positioned easily within channel 2. Then, using the handle portion 6, gripping member 4 is rotated counterclockwise causing the flange 7 to engage the messenger strand as shown in Fig. 4.

With the device thus anchored to the messenger strand 3, flanged disc 12 is rotated until the gap between surfaces

4

17 and 14 is sufficient to permit the insertion of the drop wire 15 therebetween. As a result, the end of the drop wire 15 which is anchored to the subscriber's premises pulls from the left of the device. By rotating the flanged disc 12 counterclockwise, the gap is reduced and the drop wire 15 is wedged tightly between surfaces 14 and 17 as shown in Fig. 4. The weight of the drop wire between the device and the anchoring point at the subscriber's premises maintains a secure grip under all conditions. The same tension also urges surface 10 in a counterclockwise direction to maintain the gripping action on the messenger cable 3.

As described above, the force for maintaining the clamping action of the device acts at a point which is some distance from the axis of rivet 5 about which surfaces 10, 11, 14 and 17 rotate thus multiplying the effectiveness of the force. In operating the device, the gripping action for holding the messenger cable 3 is obtained by rotation of surfaces 10 and 11 relative each other, and the gripping action for holding the drop wire 15 is obtained by relative movement between surfaces 14 and 17 about the same axis of rotation. Although the device shown in Fig. 1 uses a common axis of rotation for all members, separate axes of rotation can be established for surfaces 10 and 11 and for surfaces 11 and 12. This variation in design may be desirable when a greater mechanical advantage is needed. In such a case, the rivet 5 of the drawing is used between gripping member 4 and flanged disc 12, and a separate rivet (not shown) is to be used at a greater distance from surface 14 to rotatively couple base 1 and gripping member 4. The irregular shaped opening 9 in base 1 as shown in Fig. 1 is then placed in base 1 or gripping member 4. Such an arrangement also provides more space between base 1 and member 4 when placing the device in contact with the messenger strand 3 prior to moving surface 10 into contact with the strand.

One feature of the device shown in Fig. 1 which provides a simple and cheap device for gripping two separate objects is use of a single element to provide a gripping surface for each object.

A second embodiment of the invention is shown in Figs. 5 and 6. This embodiment also is useful for anchoring a rope or wire to a fixed object, and is especially useful for anchoring the drop wire used in providing telephone service to a telephone subscriber's premises.

This embodiment is similar to the first embodiment in that a flange 7' with a surface 14' cooperates with the outer knurled surface 17' of the flange 16' of the disc 12' to grip the drop wire 15'. The arcuate flange 7' is a part of a base or support member 23 which has a flat portion 24 for eccentrically mounting the flanged disc 12' by use of rivet 5' and washer 21'. The rivet 5' does not pass through the center 8' of the arc defined by flange 7', but is positioned at a greater distance from the inner surface 14' of flange 7' and slightly to the left. Operation of this embodiment for gripping an object such as drop wire 15' between surfaces 14' and 17' is identical to the first embodiment.

The support member 23 provides a means for anchoring the device to a structure. The anchoring means includes the arm 25 which extends in the general direction of a line defined by the upwardly turned end portions 18', 19' of flange 7'. The end portion of the arm 25 is twisted approximately 90° so that it is in a plane that is normal to the flat portion 24 and has a hole 26 for receiving a hook 27 of type shown in Fig. 6 for attaching the device to a structure.

General freedom of movement of the device about the hook 27 allows the device to orient itself in response to the tension exerted by the suspended drop wire 15'. There is no tendency then for the drop wire to be pulled outwardly from between the surface 14' and 17'. Any movement in this direction is, of course, curbed by the lip 20' on flanged disc 12' and support 23.

5

The end portions 18', 19' of flange 7' are flared outwardly from the object 15' being gripped to prevent damage to the surface of the object by the ends of the flange.

The devices of both embodiments can be made very cheaply since all parts with the exception of the rivets 5, 5' are stamped out and are made from metal sheet material. Where the devices are to be used in telephone installations, they may be made of stainless steel to withstand weather conditions.

Though the embodiments described are especially effective with certain configurations for the various gripping surfaces, other devices having the same general function may be constructed with surfaces of different configurations. Many other modifications may be made in this invention as exemplified in the above described embodiments and defined in the appended claims.

We claim:

1. A device for gripping an elongate object comprising a cylindrical member having an eccentric axis of rotation; a support member movable with respect to said cylindrical member about said axis and having a portion of a cylindrical flange eccentrically spaced from said axis and spaced outwardly from said cylindrical member, said cylindrical portion and cylindrical surface moving closer together when rotated relative to each other in one direction to cause a first object placed between said cylindrical member and said flange to be wedged therebetween; a base member being rotatable with respect to said support member about said axis of rotation and having a flange spaced outwardly from said cylindrical flange, said flanges coming closer together in one direction to cause a second object placed between said flanges to be wedged therebetween; and means rotatively connecting said cylindrical, support and base members and constituting said axis of rotation.

2. A device for gripping an elongate object comprising a cylindrical member having an eccentric axis of rotation; a support member movable with respect to said cylindrical member about said axis and having a portion of a cylindrical flange eccentrically spaced from said axis and spaced outwardly from said cylindrical member, said cylindrical portion and cylindrical surface moving closer together when rotated relative to each other in one direc-

6

tion to cause a first object placed between said cylindrical member and said flange to be wedged therebetween; a base member having an opening therein, said base member being rotatable with respect to said support member about said axis of rotation and having a flange spaced outwardly from said cylindrical flange, said flanges coming closer together in one direction to cause a second object placed between said flanges to be wedged therebetween; means rotatively connecting said cylindrical, support and base members and constituting said axis of rotation; said opening in said base member being larger than said connecting means to allow movement of said base in a plane perpendicular to said connecting means.

3. A device for gripping elongate objects, said device comprising a first curved cam member having an eccentric axis of rotation, a second member movable about said axis of rotation with respect to said first cam member and having a curved flange portion eccentrically spaced from said axis and spaced outwardly from said first cam member, said curved flange portion and said cam member moving closer together when rotated relative to each other in one direction to cause a first object placed between said cam member and said flange portion to be wedged therebetween, a third member movable about said axis of rotation with respect to said second member and having an additional flange portion spaced outwardly from said first mentioned flange portion, said flange portions coming closer together when rotated relative to each other in one direction to cause a second object placed between said flange portions to be wedged therebetween, and means pivotally connecting said first, second and third members and constituting said axis of rotation.

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