Feb. 28, 1967 J. W. KOWALSKI 3,306,970

SERVICE DROP CLAMP FOR ELECTRIC CONDUCTOR FEEDER

Filed May 4, 1964

2 Sheets-Sheet 1

FIG. 1.

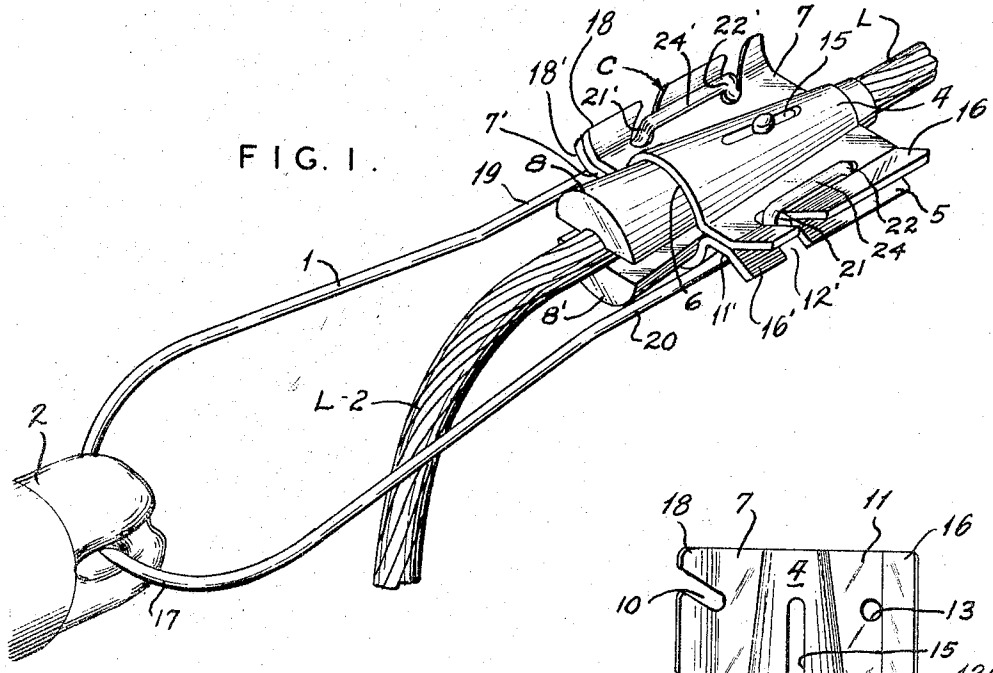


FIG. 2.

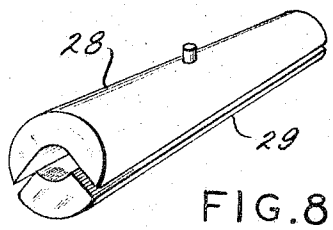


FIG. 8

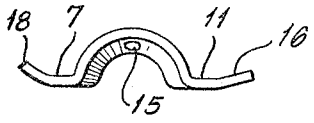


FIG. 3.

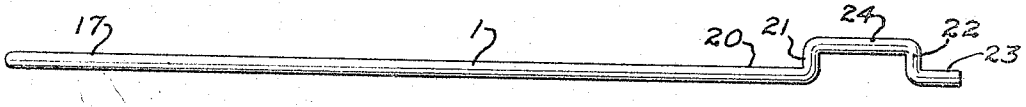


FIG. 4.

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SERVICE DROP CLAMP FOR ELECTRIC CONDUCTOR FEEDER

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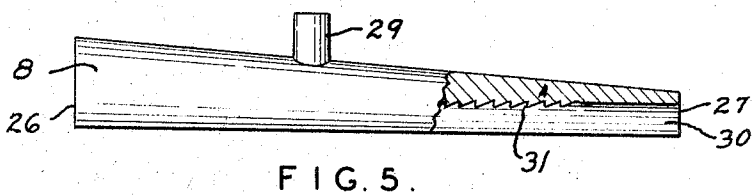


FIG. 5.

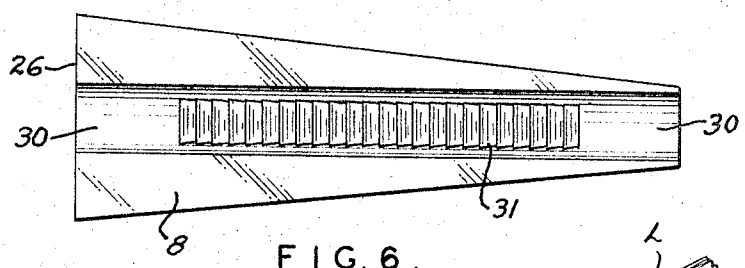


FIG. 6.

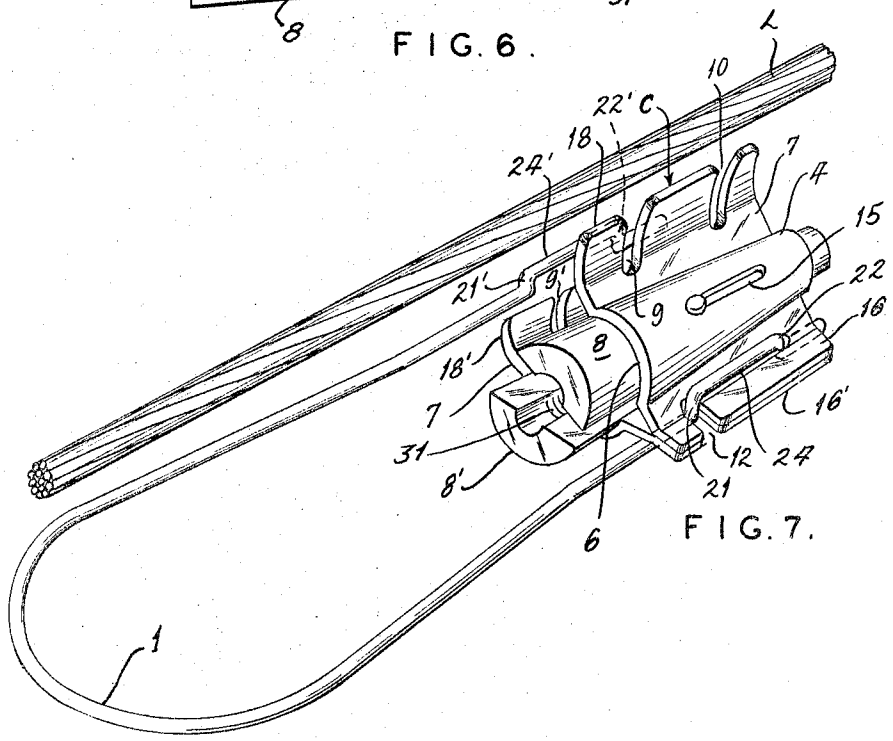


FIG. 7.

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3,306,970

SERVICE DROP CLAMP FOR ELECTRIC CONDUCTOR FEEDER

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7 Claims. (Cl. 174—79)

This invention relates to devices for mechanically connecting a cable or the like to a stationary support such as a pole or the side of a building, and more specifically, to such a device adapted to mechanically anchor one end of an overhead electric service connector at or near the service entrance of a building.

Heretofore, devices of this kind have been either unitary devices which required the conductor to be threaded thereinto or thereonto, or devices composed of separate parts which were required to be assembled in situ about a conductor. Both types were tedious to apply.

It is one of the objects of this invention to provide a service drop clamp for a conductor which is easily applied and inexpensive to make.

It is another object of this invention to provide a service drop clamp which can provide its own insulation between the conductor and the supporting structure.

The present invention provides an improved device in which the parts are permanently connected against separation and which may be readily opened by finger pressure to slip the device onto a conductor sidewise, and thereby eliminate the threading process typical of one piece clamps. According to this invention, a pair of cable-gripping members are hingedly connected at one side, and releasably connected together at the opposite side so that they may be separated at the latter side to admit the conductor to the center thereof. A particular feature of the invention is the provision of a bail, one end of which permanently connects the cable-gripping members at their one side, while the other end of the bail releasably connects them at the other side. A further feature of the invention resides in the insulation of the bail from the cable gripped by making an intervening part of insulating material when desired.

Other objects and advantages of this invention will appear from the following detailed description which is in such clear, concise and exact terms as will enable any person skilled in the art to make and use the same when taken in conjunction with the accompanying drawings, forming a part thereof, and in which:

FIG. 1 is a perspective view of a service drop clamp constructed in accordance with this invention showing the manner in which the clamp engages a conductor feeder to support the weight thereof;

FIG. 2 is a top plan view of one of the identical formed clamping plates shown in the assembly of FIG. 1;

FIG. 3 is an elevational view of the plate shown in FIG. 2;

FIG. 4 is a side view of the supporting bail shown in the assembly of FIG. 1;

FIG. 5 is a side view with parts broken away illustrating one of the wedges used in the assembly of FIG. 1;

FIG. 6 is a bottom plan view of the wedge shown in FIG. 5;

FIG. 7 is an operational view of the assembly shown in FIG. 1; and

FIG. 8 is a perspective view of companion cable-gripping elements of modified form.

With particular reference to FIG. 1, the service drop clamp therein shown is applied to grip a service line conductor indicated as L. This service line extends from a pole or other support to the clamp, generally indicated as C, which is in turn supported by an attached bail 1 suspended from an insulator, such as 2, anchored in a

building structure or on another pole. When the clamp is self insulating, as hereinafter described, the insulator 2 may be dispensed with and any suitable metallic hook, hasp, staple, or the like, used in its stead. The clamp C sustains the weight of the conductor L between poles, or between buildings, or between pole and building, as the case may be, and the free end L–2 of the line conductor L is connected to service entrance fixture usually below, but in any event nearby, the clamp.

The clamp C includes a pair of plates 4 and 5 arranged in complemental relationship to define a composite tapered socket, generally indicated as 6 centrally thereof. Within the socket 6 are a pair of wedges, such as 8 and 8', which grip the line conductor L and anchor it with respect to the clamping plates 4 and 5. The composite exterior surfaces of wedges 8 and 8' substantially match the interior surface of socket 6, but (in the absence of a conductor such as L) are free for limited axial movement relative thereto, and also (depending upon their relative axial position) free for limited radial movement.

With the exception hereinafter noted, clamping plate 4 is a mirror image of clamping plate 5, consequently, only one will be described. Clamping plate 4, shown in FIGS. 2 and 3, has ribs 7 and 11 extending more or less radially on opposite sides of the socket forming portion 6. Rib 7 has eyes 9 and 10 which are open ended, spaced apart, and inclined with reference to the axis of socket 6. The opposite rib 11 has spaced eyes 12 and 13, one of which 12 is open ended, and the other of which 13 is circular, or nearly so. Each of plates 4 and 5 is slotted as at 15, in its semi-socket portion. The outer marginal portion 16 of rib 11 is bent upwardly at an angle of about 30° with reference to the plane of that portion of rib 11 nearer to socket 6. Similarly, rib 7, on the opposite side of plate 4, has its outer marginal portion 18 curved upwardly (as seen in FIGURES 1 and 3) out of the plane of the portions of that rib nearer to the socket portion, and with respect to the latter, plate 5 is not the mirror image of plate 4 because rib 7' of plate 5 has its outer margin 18' curved to match the curvature of the outer margin 18 of plate 4.

Bail 1, shown in FIGS. 1 and 4, has a loop portion 17 connecting a pair of arms 19 and 20 which are spaced apart. Bail 1 is formed of wire, and a portion of each of the arms 19 and 20 adjacent the ends thereof is reentrantly crimped so as to form offset parts 21, 22 and 24 therein which act as clips for the clamping plates 4 and 5. Since both clips are the same, only one will be described. As shown in FIG. 4, the parts 21 and 22 are parallel with each other and substantially perpendicular to the axis of the adjacent arm 20. The offset part 24 is parallel with the arm 20 and the terminal portion 23 thereof. The part 24 is thus offset from arm 20 (and its terminal portion 23) by a distance such that the combined thickness of ribs 11 and 11' (or 7 and 7') may be snugly accommodated between 24 and 20 or 23. Hence, the length (between the approximate increments of 24 and 20 or 23) of offsets 21 and 22 is preferably twice the thickness of a rib plus about .005 inch. The corresponding offset parts on arm 19 are designated as 21, 21', 22' and 24'.

Returning now to FIG. 1, the clamping plates 4 and 5 are held in the relationship shown by part 22 on arm 20 passing through eye 13 in rib 11 and its counterpart 13' in rib 11', so that terminal part 23 is beneath rib 11' and offset part 24 is above rib 11; by offset part 21 passing through eye 12 in rib 11 and eye 12' in rib 11', so that arm 20 is beneath rib 11'; by offset 22' passing through eye 10 in rib 7 and eye 10' in rib 7'; and by offset 21' passing through eyes 9 and 9', so that the offset 24' lies above rib 7 and arm 19, together with its terminal

extension corresponding to 23, lies below rib 7'. With the construction shown, and where eyes 13 and 13' have a diameter about 135% of the diameter of the wire of which the bail is made, it is easy to insert the terminal portion 23 of the bail into, and pass it through, eyes 13 and 13', so that offset portion 22 becomes a hinge axis for plates 4 and 5. Then with plate 4 rotated out of the way about that axis, the bail may be moved so that offset portion 21 occupies eye 12' in plate 5; and thereafter plate 4 may be rotated about the aforesaid axis to bring its other eyes into registry with those of plate 5 by passing the substance of marginal portion 16 (between eyes 12 and 13) under offset portion 24. To facilitate this action, the shoulder 120 at the open end of eye 12 may be curved on a radius whose center is at the center of eye 13, and whose length is such as to cause the shoulder to rub against, and impose some strain upon, offset portion 21 of the bail as plate 4 is moved to bring its eyes 9, 10 and 12 into registry with their counterparts in plate 5 as stated above. The parts are now in the condition shown in FIG. 7 and, while plates 4 and 5 are free for limited rocking movement between a position (FIG. 7) where margins 16 and 16' make face to face engagement and a position (FIG. 1) where those margins diverge, they remain connected together unless the bail arm 20 is stained to release them. When the plates are so rocked to the position shown in FIG. 1, (i.e., with ribs 7 and 7' in substantial contiguity) the offset portions 21' and 22' may be passed into the open-ended eyes 9, 9', 10 and 10' with offset 24' above rib 7 and other portions of arm 19 below rib 7'. With the construction shown where the outer marginal portions 18 and 18' of ribs 7 and 7' are congruently curved, slight strain is imposed on the offset portions of arm 19 to get them past the edges, but after snapping over the edges, longitudinal force on the bail drives the offsets 21' and 22' into the bight of the eyes and maintains them there.

FIGS. 5 and 6 illustrate one of the wedges 8 and since they are identical, only one will be described in detail. As shown, the wedges 8 are substantially less than a semi-circle in cross-section and are tapered from a large end 26 to a small end 27 so that each segment is a frustum of a cone whose major base is preferably larger than the larger end of socket 6, and whose minor base is preferably smaller than the smaller end of socket 6. The outer surface of each wedge carries a button 29 which can be fastened (with freedom for relative longitudinal movement) into a slot 15, in the adjacent clamping plate. The wedges are not necessarily of arcuate exterior contour. So long as they are tapered longitudinally, their exterior surface may be polygonal or a combination of rectilinear and curvilinear surfaces which substantially mate with the interior of socket 6. The wedges have a substantially semi-cylindrical channel 30 in which there is located serrations or teeth 31. The teeth, or serrations, 31 are preferably no deeper than a third of the diameter of the smallest size conductor strand with which they contact, and there is enough of them to supply the degree of resistance (by friction or indentation) necessary to prevent slipping between the wedge and the conductor. For example, teeth having a depth of 0.020 to 0.030 inch, spaced fourteen to the inch, are quite adequate when the channel 30 has a radius up to 0.200 inch; channels with a radius of 0.200 inch accommodate bare conductor sizes between 0.398 and 0.325 inch in diameter; and channels with a radius of 0.165 inch accommodate bare conductors having a diameter between 0.162 and 0.324 inch in diameter. When the device is used with insulated conductors, the permissible outside diameter of the insulation can be a little greater than the outside diameter of bare conductor.

Returning again to FIG. 1, it will be observed that the pull of the weight of conductor L is toward the right, as depicted in FIG. 1. When the serration 31 of the wedges 8 and 8' engage the sides of the conductor L, the wedges 8 and 8' will be pulled into the socket 6 toward the small end thereof thereby producing the wedging action which squeezes opposite sides of the conductor L. The tension in the conductor L is resisted by the bail 1 anchored on the hook 2. The force resisted by the bail 1 seats the clips on arms 19 and 20 snugly in the registering eyes of the plates 4 and 5.

The bail may be formed of any wire whose tensile strength is sufficient to sustain the strain which the pull of the suspended conductor imposes upon it, plus a reasonable factor of safety; and whose resistance to bending is sufficient to prevent its being pulled through the eyes of the device while in use. For use on electrical service lines, the bail is preferably made of quarter-hard stainless steel ASTM type 302 at least about 0.075 inch in diameter.

The manner in which the clamp is placed on the conductor L is illustrated in FIG. 7. The arm 19 is disengaged from the registered eyes 9, 9' and 10, 10' of the respective plates. This is acomplished by forcing the bail 1 longtiudinally toward the plates which slips the parts 21' and 22' out of the registered slots 9, 9' and 10, 10'. This frees plates 4 and 5 for the rocking movement above-mentioned, which is accomplished by squeezing the marginal portions 16 and 16' together to the position shown in FIG. 5 from their divergent position, shown in FIG. 1. Thus, the plates 4 and 5, as well as their adjunct wedges 8 and 8', are opened like jaws, wide enough at the side remote from margins 16 and 16' to permit movement of the clamp transversely onto the conductor L. With the wedges 8 and 8' disposed on opposite sides of the conductor L, plates 4 and 5 are pressed together at their opposite edges so as to close the socket 6. Bail 1 is then swung into the position so that the offset portions 21' and 22', respectively, enter the registering eyes 9 and 9' and 10 and 10'. This places the offset portion 24' on the upper side of rib 7 and other portions of arm 20 on the under side of rib 7' thereby clipping the plates together at this edge. Meantime, before connecting arm 19 with the eyes in ribs 7 and 7', the free end of the bail may have been threaded through insulator 2, if such be used; or if a hook is provided on the insulator, the connecting of the bail thereto may be delayed until after arm 19 is connected with the eyes in ribs 7 and 7'. Tension on the bail 1 against the pull of the conductor L anchors the wedges firmly on opposite sides of the conductor.

As indicated hereinbefore, the wedges 8 and 8' may be made of either metal or insulating material. When it is desired to make the wedges of insulating material, any moldable synthetic resin having the requisite physical properties, particularly sufficient strength in shear and compression, to withstand the load imposed in use may be employed. Among the moldable synthetic resins which are practical are acrylic molding resins, as, for example, that known as "Plexiglas," and polycarbonate molding material, as, for example, that known as "Merlon."

A modified form of wedge is shown in FIG. 8. In the form shown in FIG. 8, the wedge components 28 and 29 are tapered longitudinally in like manner to wedges 8 and 8', but instead of being segments of a circle, they are sectors of a circle in exterior cross-section. This form of wedge construction has the advantage of reducing the size of the open gap between opposite wedges when the larger of the sizes of conductor which it is adapted to handle are engaged thereby.

While a full disclosure is hereinbefore made of the embodiment of the invention which is adapted for use in connection with electric power service lines, in connection with which it is rather uniformly specified by the utility companies that such devices be able to withstand a pull of 700 pounds, it will be understood that in other applications of the device, the structure can be weaker or stronger, depending upon the circumstances of its in-

tended use. For example, for use on telephone lines, such a device need withstand only about 100 pounds' pull, while for guy wires, the pull may be several thousand pounds. Moreover, the device is susceptible of numerous and varied uses in the nonelectrical art, as, for example, the connection of clothes lines, hammocks, swings, tree guys, ski pulls, water gate cables, and rope or wire stretchers, to which the principles of the invention may be applied with advantage. Depending upon the particular use for which the device is intended, it will be obvious to those skilled in the art that various changes and modifications can and will be made in detail, without departing from the principles of the invention.

Changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A service drop clamp for anchoring an end of an overhead electric conductor comprising,

(a) a pair of complementary shaped clamping plates having opposed spaced edges on each plate disposed in face to face relation and central portions in each plate spaced intermediate their edges from one another to form a tapered socket,

(b) a bail having spaced arms and a loop connecting said arms projecting from said clamping plates at the larger end of said tapered socket,

(c) conductor gripping wedge means slidable in said tapered socket and adapted to move in said socket in a direction away from said bail to squeeze said conductor along opposite sides,

(d) registering pairs of eyes, one in each of said plates forming a pair, with a plurality of said pairs of registering eyes along each of said spaced edges of each of said plates, said plurality of pairs of eyes along each of said edges being offset axially one pair with respect to an adjacent pair, and

(e) a crimped section in each of said arms forming offset parts in each said arm received in axially offset pairs of eyes along each of said edges of each of said clamping plates to anchor said arms to said plates and said plates in face to face relation.

2. The combination as defined in claim 1 in which said registering pairs of eyes along one edge of said clamping plates are open ended slots from which one of said arms is releasable and some of said registering pairs of eyes along the other of said spaced edges form a hinge connection with the other of said arms.

3. The combination as defined in claim 1 in which said registering pairs of eyes along one edge of said clamping plates are open ended slots from which one of said arms

is releasable, and some of said registering pairs of eyes along the other of said edges of said plates form a hinge connection between said plates, and divergent portions on the one edge of said plates adjacent said hinge which when squeezed together hinge said plates apart.

4. The combination as defined in claim 1 in which said registering pairs of eyes along one edge of said clamping plates open inwardly from the one edge of said clamping plates and one of said arms is crimped into a clip with parts received in said pairs of registering eyes and other parts straddling the one edge on opposite sides of said plates.

5. The combination as defined in claim 1 in which said registering pairs of eyes along one edge of said clamping plates open inwardly from the one edge of said clamping plates, and one of said arms is crimped into a clip with parts received in said pair of eyes and other parts straddling the one edge on opposite sides of said plates, and some of said registering pairs of eyes along the other of said edges of said plates form a hinge connection between said plates.

6. The combination as defined in claim 1 in which said registering pairs of eyes along one edge of said clamping plates open inwardly from the one edge of said clamping plates, and one of said arms is crimped into a clip with parts received in said pair of eyes and other parts straddling the one edge on opposite sides of said plates, and some of said registering pairs of eyes along the other of said edges of said plates form a hinge connection between said plates and said other arm and have divergent portions which when squeezed together hinge said plates apart.

7. A service drop clamp for anchoring an end of an overhead electric conductor comprising, a conductor grip having relatively movable parts, two of said parts having eyes at opposite sides thereof, the eyes in one of said parts being registrable with eyes in the other of said parts, and a bail having portions interlockable with the registered eyes to bias said parts together about the conductor.

References Cited by the Examiner

FOREIGN PATENTS

1,103,354	5/1955	France.
1,374,642	8/1964	France.
900,667	7/1962	Great Britain.

OTHER REFERENCES

Schuldei, German printed application No. 1,133,000, published July 12, 1962, Kl 21c, 21/02.

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