

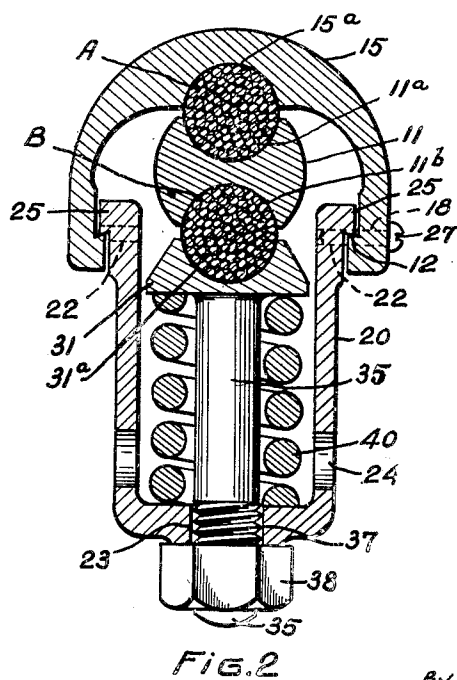
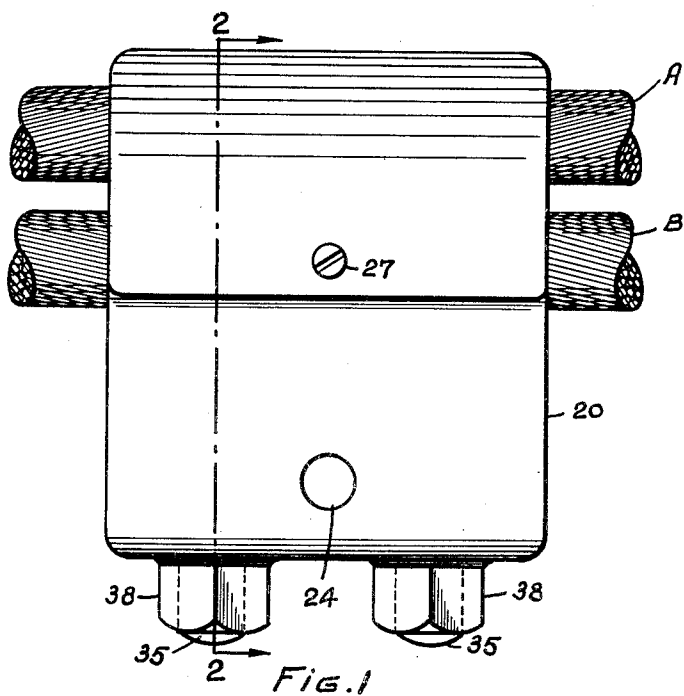
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CABLE CLAMP

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2 Sheets-Sheet 1



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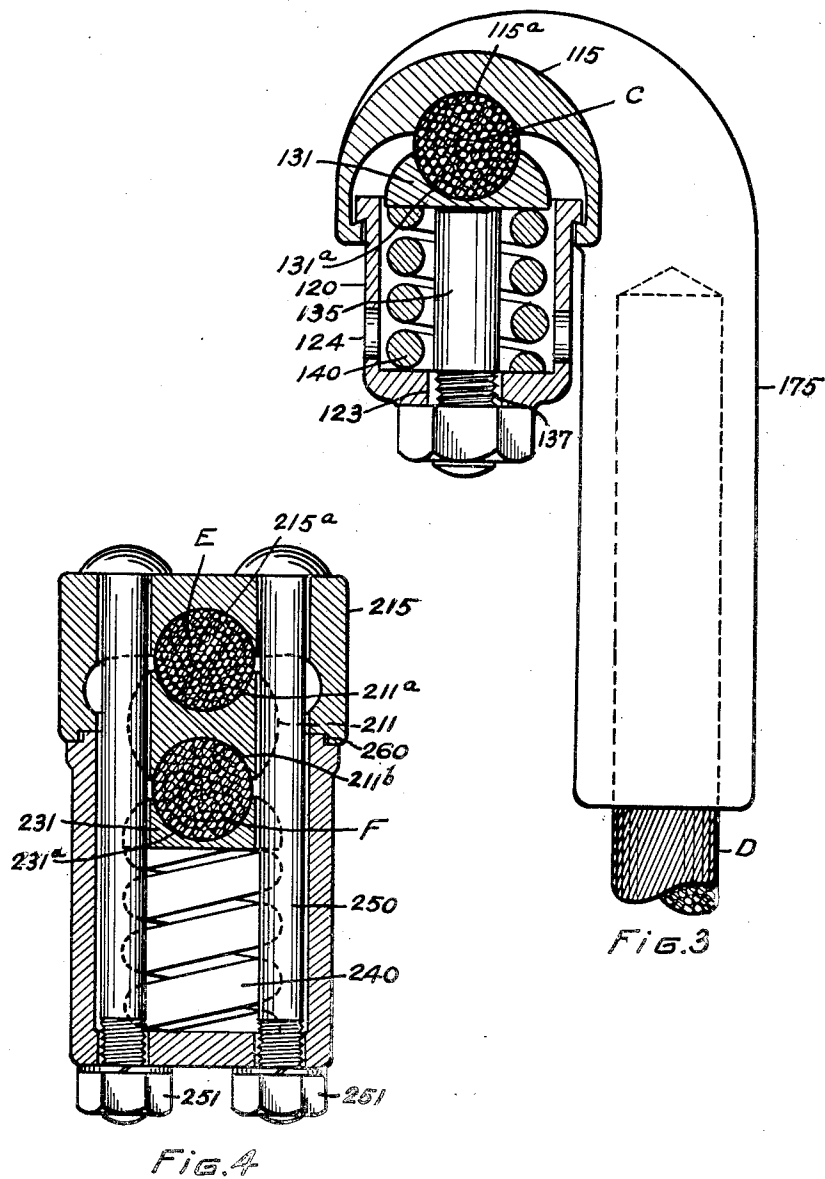
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CABLE CLAMP

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This invention relates to cable connectors and more particularly to connectors for large electrical stranded conductors.

Large stranded conductors are commonly used for electrical circuits transmitting energy at high voltages or heavy currents. The effective joining and branching of these circuits presents mechanical and electrical problems due to the ductility of copper and, in particular, of aluminum, which metals are most commonly used as electrical conductors.

Existing types of compression clamps, where the metal of the clamp is forced under extreme pressure into the stranding so as to form one homogeneous continuous piece of metal, are, when correctly applied, highly effective connectors. For branch connections and parallel joints both the conventional T clamp and parallel groove clamps have been used. The tension on these connectors is applied by means of ordinary bolts and nuts.

These types of clamp were originally designed for copper rods and tubes, later for small copper and aluminum stranded conductors. As the need for connectors for larger and larger stranded cables became evident, the conventional design was simply enlarged upon with little thought of the characteristics of the large cable.

Accordingly, these clamp connectors have a number of disadvantages among which are the following:

- (1) The outside diameter of the cable is progressively reduced with newly applied pressure.
- (2) The cable is deformed transversely.
- (3) It is necessary to tighten the clamps periodically in order to maintain effective contact pressure.
- (4) The clamp becomes loose due to temperature changes.

It is a principal object of the present invention to provide a cable clamp which does not have the disadvantages of prior clamps. It is a further object of the invention to provide a clamp which has certain positive advantages as will become clear from the following.

Having regard to the foregoing, a preferred embodiment of my clamp includes a filler adapted to lie between a pair of cables, a cover adapted to engage one of the cables, a spring support engaging the cover, a saddle adapted to engage the other cable and a spring acting between the support and the saddle whereby the cables are held under compression between the filler and the cover and the saddle respectively. An opening in the spring support accommodates a tapped shank on the saddle and a nut on the shank enables the saddle to be retracted against the action of the spring to facilitate the application of the clamp to the cables.

The invention will now be further explained

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by reference to preferred types of connectors constructed according to it, shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a preferred connector of the parallel groove type.

Figure 2 is a vertical cross section partly in elevation along the line 2—2 of Figure 1.

Figure 3 is a cross section, partly in elevation, of a connector of the T type.

Figure 4 is a cross section, partly in elevation, through an alternate form of parallel groove connector.

Referring more particularly to Figures 1 and 2 of the drawings, A and B represent the ends of two cables clamped together with the preferred clamp. Between the cables is a filler 11 grooved as at 11a and 11b to provide elongated cable-engaging surfaces. A cover member 15 extends over the top cable and is provided with a groove 15a presenting a surface engaging the cable A as indicated. The cover constitutes a fixed jaw member. The cover includes projections 12 extending along each side thereof. Extending downwards from the cover is a support 20 substantially U-shaped in cross section and having at the upper edge of each side, projections 25 engaging the projections 12 of the cover. The cover is provided with a hole 18 and each side of the support 20 with holes 22 adapted to register with the hole 18. A set screw 27 extends through the hole 18 and engages a tapped portion of one of the holes 22.

A head 31 grooved as at 31a to engage the cable B, and a set of downwardly extending shanks 35 constitute a saddle. The head constitutes a movable jaw member. The lower end of each shank 35 is threaded as at 37 and extends through a hole 23 in the base of the support 20. A coil spring 40 encircles each shank 35 engaging the head 31 and the base of the support 20 which constitutes a seat member. A nut 38 is screwed onto the threaded portion 37 and is adapted to work against the base of the support 20 when it is desired to compress the spring. The sides of the support 20, which constitutes spacing means are provided with registering holes 24 into which an implement may be thrust to facilitate handling the clamp.

Before climbing the tower or the line, the line-man assembles the two springs 40, the spring housing 20, the saddle 30 and compresses the two springs fully by means of the nuts 38. After climbing to the points of installation, the line-man lays the cover 15 over the line and slides the spring housing assembly into the cover and fastens with the small screw 27. The second cable is then introduced and finally the filler forced in between the two cables. The line-man then slackens the nuts 38, removes them, and the installation is complete.

Any reduction in the diameter of the cable by the usual shrinkage is compensated for by the spring forcing the cover 15 closer to the saddle 31 so that the cables are always kept firmly clamped between the surfaces of the grooves 15a and 11a, and 31a and 11b.

The characteristic of the spring is such that it gives sufficient per-area pressure to secure current-carrying capacity without exceeding safe temperature limits. Under consideration of the shrinkage involved in the stranded cables, the length and strength of the springs are such that they always maintain necessary pressure to insure safe temperature limits.

The connector shown in Figure 3, is a T type clamp in which parts similar to those of Figures 1 and 2 are employed in the "run" part, with the exception that only one cable C is clamped in this part. The parts are numbered similarly to Figures 1 and 2 with the exception that they are each one hundred higher. The "tap" part 175 can be any type of a conventional clamp, for instance of the compression type as shown. The operation of this clamp will be evident from the foregoing.

The type of clamp illustrated in Figure 4 is again a parallel groove type, but with a somewhat different housing assembly to that of Figures 1 and 2. The resilient spring 240 is compressed and the housing parts 225 and 220 kept together by separate bolts 250 and nuts 251. It will be evident that the principle of maintaining "floating" pressure on the cables is the same as for the above-described designs. However, in order to obtain the necessary pressure on the cables, the bolts and nuts 250 and 251 must be tightened as no threaded shanks and nuts (37 and 38 respectively, Figures 1 and 2) exist in this design.

The following are among the advantages of the invention. The connectors are quickly and easily installed. In the case of the types of connector illustrated in Figures 1 to 3, an installation can be checked by the foreman or superintendent from the ground merely by ascertaining that the two nuts are removed. The springs are powerful enough to maintain pressure between the cables sufficiently to transmit full cable current, and long enough to follow up any diminishing diameters and changes due to temperature variations. The connectors have a modern appearance and improved Corona characteristics compared to conventional clamps. The parts of the connector are preferably made of strong highly conductive light metals, for instance aluminium, copper, magnesium or alloys.

It will be understood that, without departing from the spirit of the invention or the scope of the claims, various modifications may be made in the specific expedients described.

I claim:

1. A cable connector for stranded cables, comprising an outer housing having a cover whose inner surface is adapted to provide a fixed contact bearing for a cable and a fixed spring support, a movable jaw member within the housing to provide a second contact bearing for a cable, said movable jaw member having at least two threaded shanks extending freely through and beyond the spring support, a spring on each shank between the movable jaw member and the spring support acting normally to press the movable jaw member against a cable, and a nut on each threaded shank outside the outer housing adapted

to compress the corresponding springs and release the pressure of the movable jaw member against the adjoining cable during installation, and to release said springs for normal service.

2. A clamp for large stranded cables comprising an elongated U-shaped casing, the free ends of the casing having outwardly projecting flanges, and the opposite end of the casing being adapted to serve as a spring support, a movable jaw member adapted to fit within the casing, having at least two spaced shanks with threaded ends projecting freely through holes in the said opposite end of the casing, the upper end of the movable jaw member being adapted to provide contact surface with the cable, a spring surrounding each shank adapted to act between the said opposite end of the casing and the movable jaw member, a cover having inwardly projecting flanges adapted to engage the outwardly projecting flanges of the U-shaped casing, the inner surface of the cover being adapted to provide a fixed jaw, a nut for each shank adapted to be screwed on the shanks outside the said opposite end of the casing to retract the movable jaw member against the action of the corresponding springs a sufficient distance to permit insertion of a cable, the dimensions of the various parts of the clamp in relation to the cable diameter being such that when the springs are released the movable jaw member exerts firm pressure on the cable regardless of variations of dimensions in the cable as may be encountered in service.

3. A clamp according to claim 1, including a filler block having a body and grooves positioned on each side thereof, said grooves adapted to receive a portion of the surface of a cable, said filler block being interposed between the movable jaw member and the cover, whereby said clamp is adapted to clamp together a pair of cables.

4. A clamp according to claim 1, wherein the cover has an elongated extension adapted for the securing thereto of a cable other than that held between the moveable jaw member and the cover.

5. A clamp according to claim 2, including a filler block having a body and grooves positioned on each side thereof, said grooves adapted to receive a portion of the surface of a cable, said filler block being interposed between the movable jaw member and the cover, whereby said clamp is adapted to clamp together a pair of cables.

6. A clamp according to claim 2, wherein the cover has an elongated extension adapted for the securing thereto of a cable other than that held between the movable jaw member and the cover.

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