Aug. 29, 1961 A. D. LANTZ ET AL 2,997,764

STRAIN CLAMP

Filed April 25, 1957

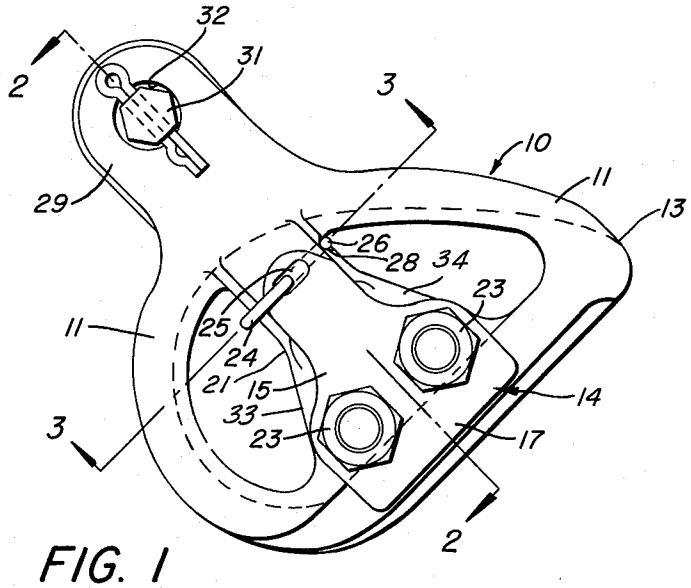


FIG. 1

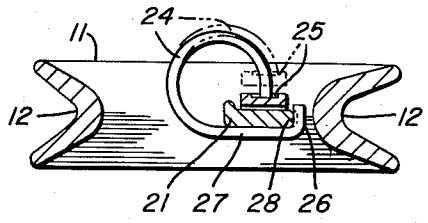


FIG. 3

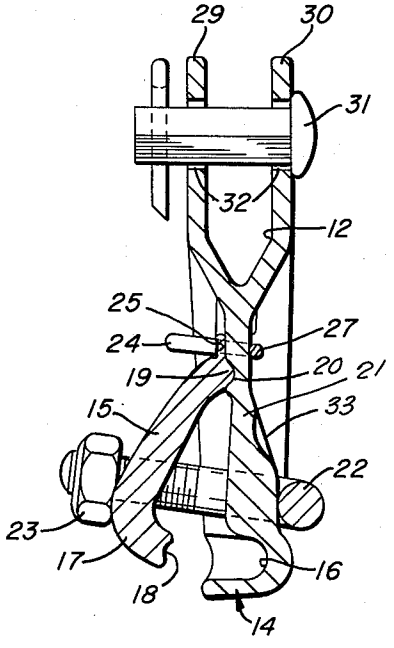


FIG. 2

INVENTORS
ALPHA D. LANTZ
ROBERT W. HARMON
BY Kenneth W. Miller
ATTORNEY

United States Patent Office 2,997,764 Patented Aug. 29, 1961

2,997,764

STRAIN CLAMP

Alpha D. Lantz, Barberton, and Robert W. Harmon, Doylestown, Ohio, assignors to The Ohio Brass Company, Mansfield, Ohio, a corporation of New Jersey

Filed Apr. 25, 1957, Ser. No. 655,063
8 Claims. (Cl. 24—135)

This invention relates to cable clamps and, more particularly, to strain or deadened clamps for transmission line conductors.

The principal object of the invention is to facilitate in stallation of cable clamps in transmission lines when the conductors thereof are energized.

Another object of the invention is to facilitate the installation of cable clamps generally.

Still another object of the invention is to provide a multiple part strain clamp which is simple and economical to manufacture, while providing functions in the clamp not heretofore provided in the cable clamps of the prior art.

In the art pertaining to cable clamps, such as are utilized in electric power transmission and distribution systems for deadening line conductors and cables, it is known to provide a strain clamp in which the seat or cable receiving groove of the clamp is formed arcuately along a curve of progressively decreasing radius for providing an increasing snubbing action. The cable is disposed along a path in which the line of the free end of the cable crosses the line of the bight of the cable and suitable clamping means are provided for securing the free end of the cable to the body of the clamp.

A clamp of the type referred to above is described in U.S. Patent 2,031,236 to J. J. Taylor, while a modified form of the clamp is shown in U.S. Patent 2,059,413 also to J. J. Taylor.

While such strain clamps are particularly adapted for their intended purpose and have been widely accepted and utilized in the electric power line art, nonetheless, a need has existed for many years for a strain clamp which could be readily installed in an electrically energized, or so-called hot-line. That is, it is desirable to be able to install or replace a strain clamp in a line while the line is energized so that the utilization of the line is not interrupted. This need has never been satisfactorily met, although some attempts have been made to provide special tools for the installation of strain clamps of the type referred to above under hot-line conditions.

We have conceived and developed, and disclose in this application, a strain clamp which incorporates the preferred features of the strain clamps described in the patents above referred to and which is also particularly adapted for hot-line work. Specifically, we provide a cable clamp of the strain type in which a keeper piece for holding the re-entrant portion of the cable is supported from the body of the clamp by a pivoted arrangement. The bolt for accomplishing the clamping action is disposed at one side of the pivot, whereas a spring, which functions not only as a retainer for the keeper piece, but also to move the keeper piece to an open position when the bolt is loosened, is provided between the keeper piece and the body of the clamp on the opposite side of the pivot. The strain clamp of the invention has, in addition to the advantageous features useful for hot-line work, a simplicity of arrangement which particularly adapts the clamp for low cost manufacture.

The invention, together with further features, objects and advantages thereof will be more clearly understood by reference to the following detailed specification and claims taken in connection with the appended drawing, in which:

FIG. 1 is a side view of the cable clamp of the invention;

FIG. 2 is a section view taken in the direction 2—2 in FIG. 1; and

FIG. 3 is a section view taken in the direction 3—3 in FIG. 1.

The strain clamp 10 comprises a body 11 having a cable snubbing seat 12 disposed about the periphery thereof. The snubbing seat 12 is of generally V-shaped cross section to accommodate cables of different diameters and is arranged in a spiral fashion departing from a line approximately tangent to the entering cable at the entrance part 13 according to an exponential function, as is known in the art pertaining to such clamps. The bight of the cable is wound about the body of the clamp and the free end received against a lateral bearing part or clamping seat, designated generally at 14, and is held against the body by a keeper 15. The lateral bearing part 14 has an inwardly recessed groove, indicated at 16 in FIG. 2, in order to increase the gripping action upon the end of the cable although such an arrangement is not necessary to the practice of the invention.

The keeper 15 comprises an elongated metallic piece having a widened outer end portion 17 with the outer end thereof directed inwardly to form a bearing surface 18 for engaging the cable. At the remaining end of the keeper, a projection 19 spaced from the end of the keeper piece is received in a shallow recess 20 formed in the adjacent side of the cross part 21. The cross part 21 extends transversely across the member from adjacent the bearing part 14 to the opposed part of the body and is formed as an integral part of the body proper.

The keeper 15 has two openings (not shown in the drawing) for receiving the ends of a U-bolt 22 which extends about the cross part 21. Two nuts 23 are threaded on the ends of the U-bolt for drawing the keeper toward the body part and clamping the cable end between the bearing part 14 of the body and the face 18 of the keeper. The cross part 21 has reinforcing webs 33 and 34 integrally formed with the cross part and the body 11, along the bearing part 14, and the U-bolt 22 extends through openings in the webs (not shown in the drawing).

The inner end of the keeper 15 is held by a spring clip 24 which extends from about the back part of the cross part 21 outwardly and circularly back toward the keeper and has the front end thereof received in a shallow depression 25 in the front face of the keeper. The depression 25 is arranged inwardly from the projection 19 so that the clip 24 exerts a force tending to urge the keeper 15 toward an open position. The remaining end 26 of the clip 24 is bent at right angles to the back part 27 of the clip for holding the clip on the cross piece 21. A shallow groove, such as the groove 28, may be utilized to increase the mutual positioning and restraining action between the clip 24, the cross piece 21 and the keeper 15.

The clip 24 is suitably formed of spring material such as piano wire, or stainless steel or phosphor bronze wire and has sufficient rigidity to hold the keeper 15 properly in position while providing the necessary elastic force for moving the keeper to an open position. Piano wire and stainless steel are to be heat treated after the wire stock is bent to the indicated form and piano wire is provided with a corrosion preventing coating by galvanizing.

The body 11 has two clevis arms 29 and 30 integrally formed therewith and extending outwardly from the sides of the body and in alignment with the cross piece 21. A pin 31 is received in openings 32 in the clevis arms 29 and 30 and is disposed generally along the tangential line defined by the seat at the entrance portion 13 of the clamp.

In use, the strain clamp 10 may, for example, be connected to the usual support by means of a pin 31. With

the nuts 23 loosened sufficiently, the cable is then passed between the arms of the clevis and about the body of the clamp by means of a suitable hot-line tool, such as insulated pliers or a gripping wrench, and held in position with the end of the cable between the bearing part 14 and the end of the keeper 15. The nuts 23 are then tightened by means of a suitably insulated socket wrench and the installation is complete.

The keeper 15 is firmly held in the proper pivotal position because of the particular arrangement of the clip 24, even when the clamping bolt 22 is very loose. While other forms of springs may be utilized within the spirit of the invention, the clip herein disclosed and described is especially useful and desirable, not only in that large springing forces are provided, but also in the mutual restraining and positioning relationship between the clip, the body, and the keeper made possible thereby.

The projection 19 may, of course, be formed on the cross part 21 and the recess 20 formed on the keeper.

It will be understood that the simplicity of operation makes the strain clamp advantageously useful for all ordinary purposes and the invention is not intended to be limited to hot-line use.

It is to be understood that the foregoing description is not intended to restrict the scope of the invention and that various rearrangements of the parts and modifications of the design may be resorted to. The following claims are directed to combinations of elements which embody the invention or inventions of this application.

We claim:

1. A strain clamp for use with a cable, comprising an integral body with a snubbing seat extending about the periphery thereof from a line tangential to the cable arcuately downward and back toward the cable, a lateral bearing part on the part of the body which extends back toward the cable aligned with the bottom of the snubbing seat, two clevis arms extending from the said body on opposite sides of the snubbing seat and oppositely from the said lateral bearing part, and a cross part extending inwardly from the said lateral bearing part toward that portion of the body adjacent the clevis arms, a keeper having a lateral bearing part at one end thereof directed toward the lateral bearing part of the body, interengaging pivot means on the keeper and cross part spaced from the opposite end of the keeper, spring means operatively connected to the cross part and to the keeper beyond the interengaging means from the said one end for elastically urging the said one end of the keeper away from the bearing part of the body, and screw means positioned adjacent the said one end of the keeper operatively connecting the keeper to the cross part for drawing the said one end of the keeper toward the bearing part of the body to clamp the cable between the keeper and the body.

2. The invention in accordance with claim 1 in which the cross part is integrally joined with the body away from the lateral bearing part of the body.

3. The invention in accordance with claim 1, in which the spring means comprises a clip engaged with the outward sides of the cross part and of the keeper beyond the pivot and for moving the keeper outward and away from the body at the bearing end thereof when the screw means is loosened.

4. The invention in accordance with claim 3, in which the clip passes around and back of the cross part at the one end thereof and circumferentially toward the keeper and into a recess therein at the remaining end thereof for mutual restraint and positioning of the clip and the keeper.

5. A strain clamp for use with a cable, comprising a body having an arcuate snubbing seat extending about the periphery of the body portion from a line tangential to the cable and back toward the cable, a lateral bearing part on the part of the body which extends back toward the cable, two clevis arms extending from the said body on opposite sides of the snubbing seat generally opposite the lateral bearing part of the body and aligned with the cable, a cross part extending from the lateral bearing part to the body of the clamp adjacent the clevis arms and integral therewith, a keeper having a lateral bearing part at one end thereof directed toward the lateral bearing part of the body, interengaging pivot means on the keeper and cross part adjacent the opposite end of the keeper and spaced therefrom, a spring member disposed about the cross part of the body and the said opposite end of the keeper and beyond the pivot means from the said one end of the keeper for elastically urging the said one end of the keeper away from the bearing portion of the body, and a U-bolt disposed about the cross part of the body and the keeper with outwardly directed ends and nuts thereon for drawing the said one end of the keeper toward the said bearing part of the body to clamp the cable between the keeper and the body.

6. A strain clamp for use with a cable, comprising an integral body portion with a snubbing seat extending about the periphery thereof from a line tangential to the cable arcuately downward, and back toward the cable to constitute a re-entrant part of the body, a lateral bearing part of the said re-entrant part and comprising a clamping seat aligned with the bottom of the snubbing seat, two clevis arms extending from the said body on opposite sides of the snubbing seat disposed oppositely from the said re-entrant part, and a cross part extending from the re-entrant part to the body of the clamp adjacent the clevis arms, a keper having a lateral bearing part at one end thereof directed toward the clamping seat, and an inward projection spaced from the opposite end thereof and engaged with the cross part to pivot thereon, a spring member disposed about the cross part and the said opposite end of the keeper and engaged with the outward sides thereof for normally urging the said one end of the keeper away from the bearing portion of the body, and a U-bolt disposed about the cross part of the body and received in openings in the keeper and nuts on the ends thereof for clamping the loose end of a cable between the keeper and the bearing part of the body.

7. The invention in accordance with claim 6, the body having a recess on the cross part with the projection of the keeper received therein for longitudinally positioning the keeper.

8. The invention in accordance with claim 6, the said spring member comprising a clip having a straight part engaged with the cross part on the outward side thereof and a circumferential part with the end thereof engaged with the keeper on the outward side thereof.

9. The invention in accordance with claim 8, the keeper having a depression on the outward side thereof for receiving the said end of the clip and an inwardly directed piece on the remaining end of the clip for mutually positioning and restraining the clip and keeper with respect to the cross part.

References Cited in the file of this patent

UNITED STATES PATENTS

698,572	Smith	Apr. 29, 1902
882,408	Mullin	Nov. 17, 1908
2,031,236	Taylor	Feb. 18, 1936
2,043,555	Preston	June 9, 1936
2,059,413	Taylor	Nov. 3, 1936
2,309,851	Kuhne	Feb. 2, 1943
2,697,262	Olsen	Dec. 21, 1954

FOREIGN PATENTS

962,610	France	Dec. 12, 1949