March 31, 1931. F. H. MILLER 1,799,114

CONDUCTOR CLAMP

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Fig. 1.

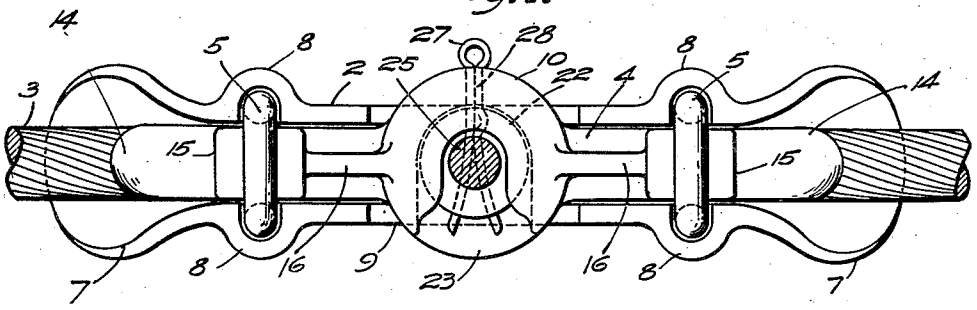


Fig. 2.

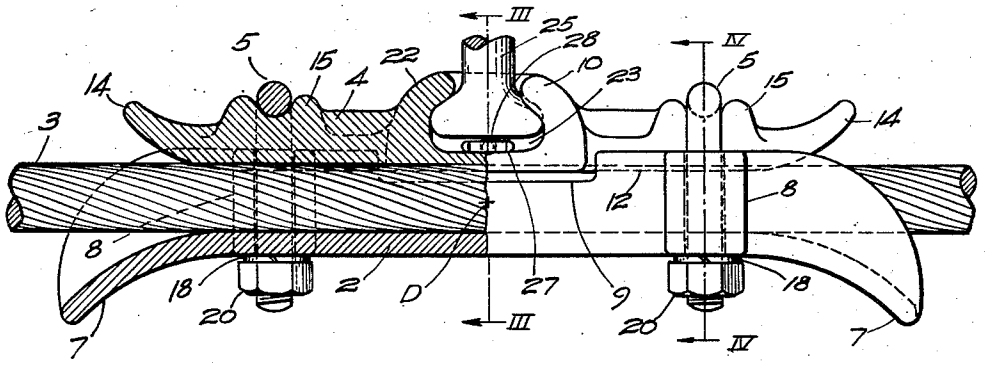


Fig. 3.

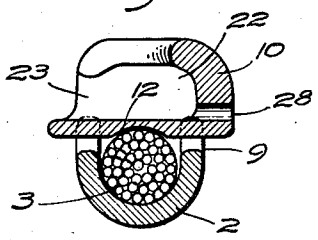
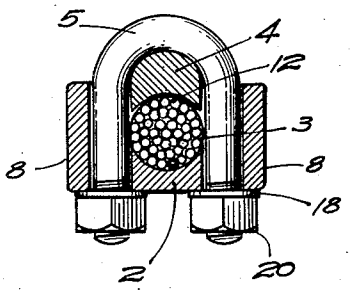


Fig. 4.



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Fig. 5.

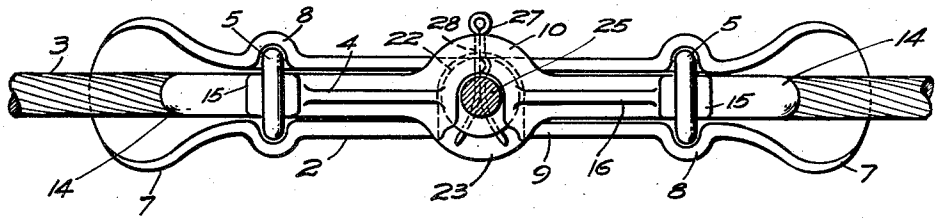


Fig. 6.

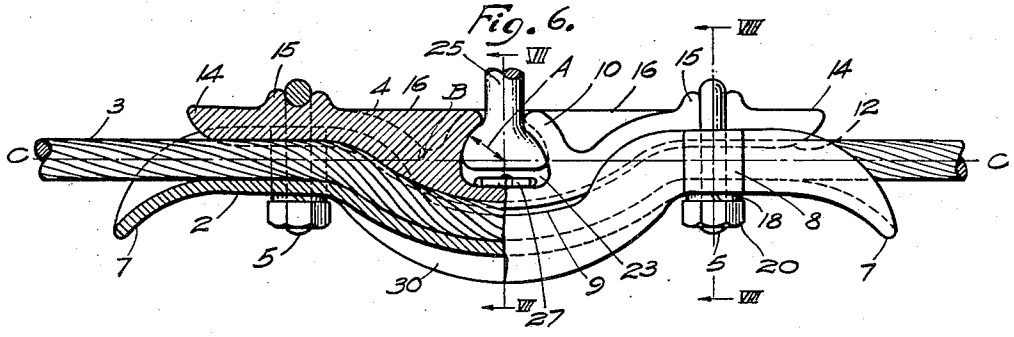


Fig. 7.

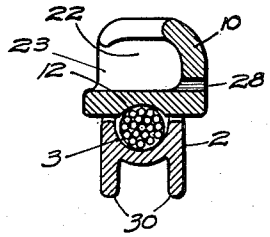


Fig. 8.

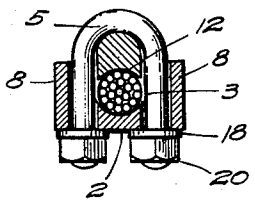
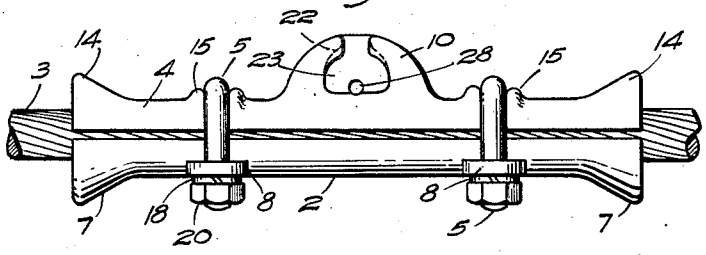


Fig. 9.



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UNITED STATES PATENT OFFICE

FREDERIC H. MILLER, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

CONDUCTOR CLAMP

Application filed August 22, 1928. Serial No. 301,282.

My invention relates to conductor clamps and particularly to clamps for suspending high-voltage transmission-line conductors.

One object of my invention is to provide a clamp, of the above-indicated character, that shall be of reduced overall height to lessen the length of a combined insulator and clamp structure of which the clamp is a part, to reduce stresses in said combination, and to obtain other advantages.

Another object of my invention is to provide a conductor-suspension clamp, of a type normally embodying upper and lower clamping members, in which the clamp shall be suspended in a novel manner by an element attached to the upper member, instead of to the lower member, as usual in clamps of this type.

Another object of my invention is to provide a conductor-suspension clamp that shall lend itself in a simple and economical manner, to the movable suspension of the clamp about a point or axis on, or laterally through, the normal longitudinal central conductor axis in clamps of this type.

A further object of my invention is to provide a conductor clamp that shall be simple and durable in construction, economical to manufacture and effective in its operation.

In conductor-suspension clamps, it has been usual to support the conductor in a channel, or other, member beneath the conductor having a clevis or other suspension portion constituting part thereof and to provide an upper clamping member or shoe that is supported by the lower member.

When a clevis is employed, the above-mentioned structure is simple and effective because the two parts of the clevis merely constitute extensions of the channel sides between which the conductor may be passed to clamping position.

However, where a socket, of a ball-and-socket device is desired in the place of the clevis, in a clamp of the above-mentioned type, the socket portion must either project from one side only of the channel member or other complicated and expensive structure must be provided.

It has also been suggested to so suspend a conductor clamp about a point substantially in the conductor axis as to substantially eliminate certain damaging forces or shocks caused by oscillations of the conductor but, in any of these suggestions of which I am aware, the suspension element has been connected to the lower clamping member.

In practicing my invention, I provide a clamp, embodying upper and lower clamping members, which is so suspended by its upper member as to give the clamp reduced height, to simplify and economize its construction and manufacture, to permit it to embody the above-mentioned shock-free feature, to cause it to be effective in operation and to render it an improvement, in general, in the class of devices to which it pertains.

Figure 1 of the accompanying drawings is a top-plan view of a clamp constructed in accordance with my invention,

Fig. 2 is a side view, partially in elevation and partially in section, of the device shown in Fig. 1,

Figs. 3 and 4 are views taken along the lines III—III and IV—IV, respectively, of Fig. 2.

Figs. 5, 6, 7 and 8 are views similar to Figs. 1, 2, 3 and 4, respectively, of a modified form of my invention, and

Fig. 9 is a side elevational view of a further modified form of the invention.

As illustrated in Figs. 1 to 4, inclusive, the device comprises a conductor-receiving or channel member 2 for the reception of a conductor or cable 3, and means for clamping the conductor relative to the channel member including a clamp-shoe 4 and bolts 5.

The channel 2, adapted to be positioned under the conductor 3, is of elongated channel shape having the flared ends 7, of usual shape, to reduce fatigue of the conductor caused by oscillations, vertically-apertured side bosses 8 for the reception of the bolts 5, and side-wall portions 9 that are of reduced height for a purpose to be hereinafter set forth.

The shoe 4, adapted to be positioned over the conductor, is elongated to extend for an appreciable distance along the conductor and has a socket portion 10, preferably cen-

trally thereof, of a type employed heretofore in other combinations.

The shoe 4 also has an under-side groove 12 to fit the conductor 3, flared ends 14, transverse seat portions 15 for the bolts 5, and reinforcing ribs 16 between the seats 15 and the socket 10.

The bolts 5 may be of any suitable character but, as shown, for purposes of illustration only, are ordinary U-bolts held in position by the seats 15, lock washers 18 and nuts 20.

In this embodiment of my invention, the socket 10 is of greater diameter than the width of the channel in the member 2 and is accommodated in a clamping position, in which the remainder of the shoe 4 is partially within the channel, by the depressed portions 9 of the channel member 2.

The socket 10 has an internal recess 22 of substantially inverted T-shape, and a side entrance 23 of similar shape for the reception of an inverted T-head suspension element or pin 25, which may be the pin of the lower unit of a series-suspension unit insulator or other supporting device.

The entrance 23 is so related to the recess 22 of the socket 10 that the pin 25 must be inserted while in a position somewhat lower than that illustrated, after which it is raised to interlocking position in the socket and prevented from accidental withdrawal by a cotter or similar pin 27 that is placed in an opening 28 in the socket 10. The latter structure is of a character usual in other apparatus and is mentioned merely for clarity.

However, the main combination, whereby the socket 10 is part of the clamping shoe 4, lends materially to the shortening of the overall height of the clamp and places the swivel position between the socket 10 and the pin 25 relatively close to the conductor. The combination is also of extreme simplicity compared to any similar clamp having such a socket connected to, or a part of, the lower channel member 2, resulting in a saving of material and other advantages.

In the modification of my invention shown in Figs. 5 to 8, inclusive, in which corresponding parts are designated by corresponding reference characters, the structure is similar, with the exception that the axis or center of movement between the socket 10 and the pin 25, indicated by an arrow A, is in a line B constituting an extension of the longitudinal central axis of C of the conductor 3 adjacent to the ends of the clamp. This feature is obtained by depressing the central portions of the shoe 4 and the channel member 2 so that the conductor portion 28 curves around the center point A.

Thus, the engaging pivotal or substantially universal-joint surfaces of the socket 10 and the pin 25 are drawn about the point A which corresponds to a point D on the axis of the conductor in the device of Fig. 2.

By the above-described construction, the socket 10 and the pin 25 may have either ordinary pivotal relative movement or ball-and-socket movement.

When the conductor oscillates along its length, that is, when the conductor moves in waves in the direction of its axis, the clamp has ordinary pivotal movement relative to the pin 25 about an axis transverse to, and substantially through, the axis C of the conductor.

When torsional or twisting movement of the conductor occurs, the clamp moves about the point A on an axis coincident with the conductor axis C.

With a combination of the above-mentioned oscillating and twisting movements, the clamp moves substantially universally relative to the pin 25.

As shown more clearly in Figs. 6 and 7, the channel member 2 is provided with depending side flanges 30 to compensate for the upper cut-away channel-side portions 9 by reinforcing the center of the member 2.

In the modification of my invention, illustrated in Fig. 9, the channel and shoe members 2 and 4, respectively, are formed more nearly alike, the channel member 2 having portions of its side-walls lowered and the shoe 4, instead of fitting inside the channel, as in the other figures, being itself of substantially channel shape.

While I have shown and described particular forms of my invention, changes may be effected therein without departing from the spirit and scope thereof, as set forth in the appended claims.

I claim as my invention:—

1. A conductor-suspension clamp comprising a conductor-receiving channel member, and means for clamping the conductor relative to said receiving member including a single integral member embodying a socket portion for the reception of a suspension element and a shoe portion extending along the conductor in the channel.

2. A conductor clamp comprising a conductor-receiving channel member having recessed side walls, and means for clamping the conductor in said channel member including a single integral elongated clamping shoe having a portion in the channel and a portion wider than said portion in the recessed portions of said side walls for supporting the clamp.

3. A conductor-suspension clamp comprising means including upper and lower members cooperating to clamp the conductor between them, the upper member embodying a clamping portion shaped to conform to a portion of the conductor and a socket portion homogeneously united to said portion for the reception of the head of a ball-headed element for movably supporting the clamp.

4. A suspension clamp comprising a

cable-receiving channel member, a single integral member embodying a socket portion for the reception of a suspension element and a shoe portion extending along the conductor position in the channel, and means at each side of the socket for holding the channel and said single member in clamped relation to the conductor, the bottom of said socket being below the top portion of said holding means.

5. A suspension clamp comprising a lower cable-receiving channel member having downwardly-flared ends and an upper clamping shoe extending along the channel embodying a homogeneous upwardly-extending socket portion for the reception of a suspension element, the clamp having comparable upper and lower limits of extent from the conductor-axis position.

6. In a cable support, a cable-receiving lower channel member, means for clamping the cable therein including a single integral elongated upper clamping shoe for extension along the cable and embodying a bearing portion intermediate the ends of the shoe centered about a point in the support below the position of the top of the cable, and a suspension element for relatively movable connection to the shoe and having a cooperating bearing portion.

7. In a cable support, a cable-receiving channel member having laterally-opposite recessed side-wall portions open at the top adjacent to the longitudinal center of the clamp, means for clamping the cable in said channel including a single integral elongated clamping shoe for extension along the cable and embodying a supporting portion having side elements in said side-wall recesses projecting laterally therefrom, said clamping means including portions spaced oppositely along the clamp from said supporting portion for holding the channel member and the shoe together, and a suspension element connected in movable relation to said supporting portion.

8. In a cable support, a cable-receiving lower channel member, means for clamping the cable therein including a single integral elongated upper clamping shoe for extension along the cable and embodying a bearing portion between the ends of the shoe centered about a point in the support below the top of the shoe, and a suspension element for relatively movable connection to the shoe and having a cooperating bearing portion.

In testimony whereof, I have hereunto subscribed my name this 8th day of August, 1928.

FREDERIC H. MILLER.