A. O. AUSTIN.

WIRE CLAMP.

APPLICATION FILED MAY 20, 1912.

1,170,725. Patented Feb. 8, 1916.

Fig. 1.

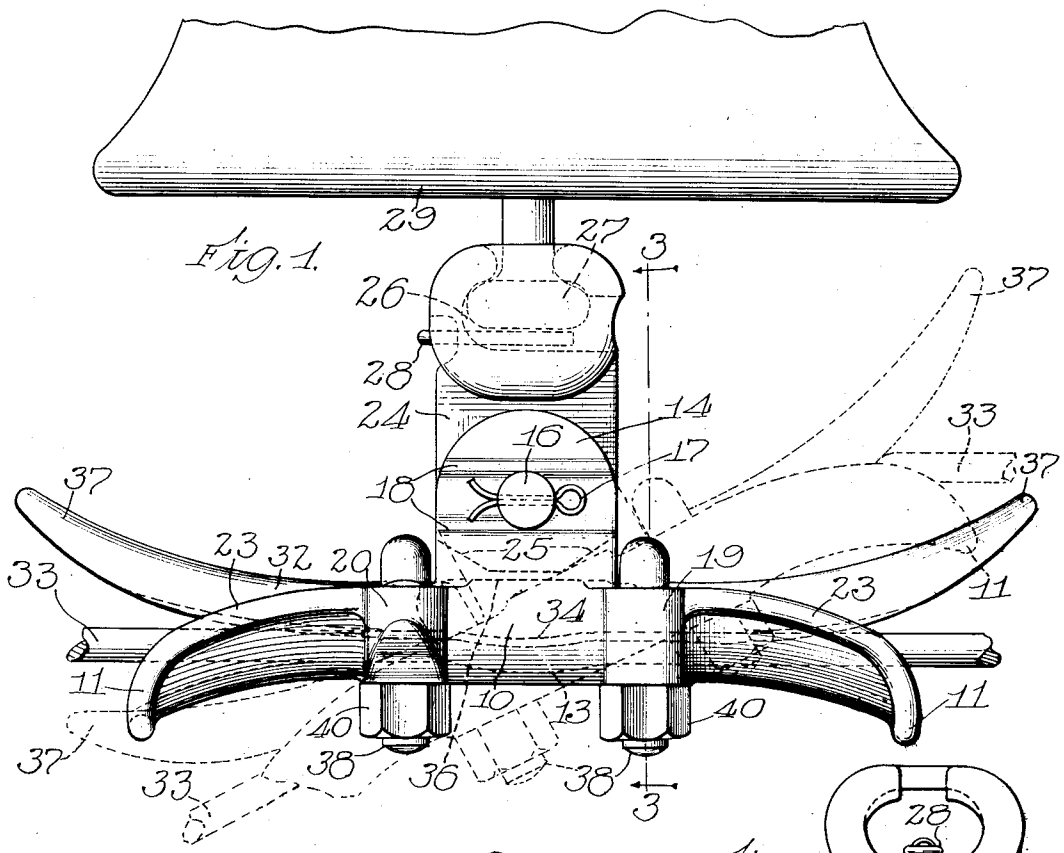


Fig. 2.

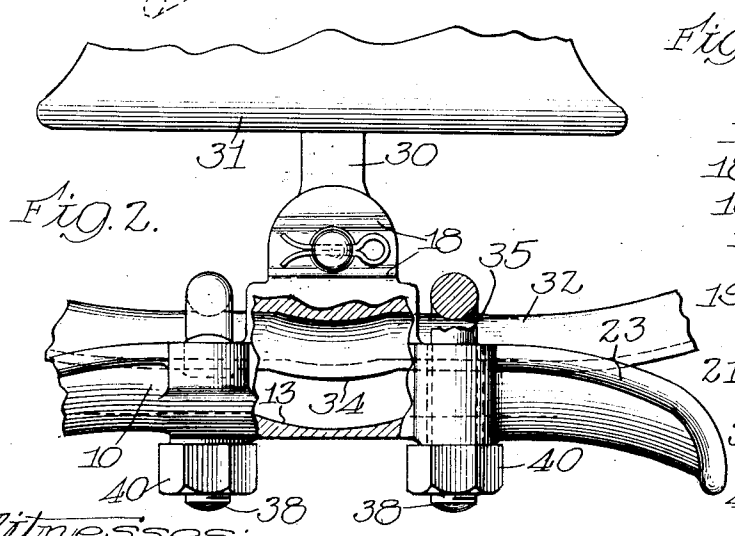
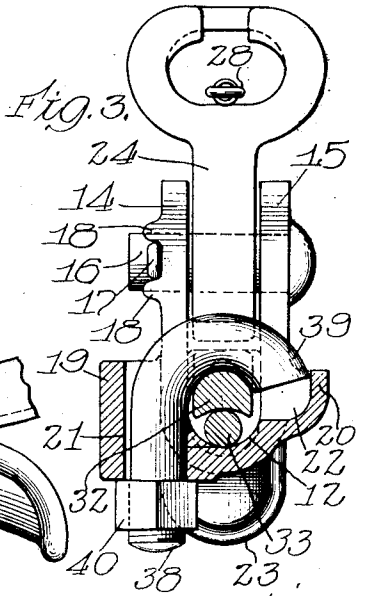


Fig. 3.



Witnesses:

H. C. Komarus Jr.

R. Burkhardt.

Inventor:

Arthur O. Austin

By: Brown Hopkins

Attys.

UNITED STATES PATENT OFFICE.

ARTHUR O. AUSTIN, OF BARBERTON, OHIO, ASSIGNOR TO THE OHIO BRASS COMPANY, OF MANSFIELD, OHIO, A CORPORATION OF OHIO.

WIRE-CLAMP.

1,170,725. Specification of Letters Patent. Patented Feb. 8, 1916.

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To all whom it may concern:

Be it known that I, ARTHUR O. AUSTIN, a citizen of the United States, residing at Barberton, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Wire-Clamps, of which the following is a specification.

This invention relates to a wire clamp for transmission line construction and the like, and in such connection is commonly employed for suspending conductors from an insulated support.

One of the principal objects of the invention is to provide an improved, simple and strong device of the class described, which is effective and efficient in operation.

Another object of the invention is to provide means for increasing the clamping pressure when the conductor held by the clamp is broken or the tension becomes slack on one side of the clamp.

A further object of the invention is to provide arcing or discharge tips as a part of the clamp to protect the conductor from discharges.

For the attainment of these ends and the accomplishment of other new and useful objects, as will appear, this invention consists in the features of novelty in the construction, combination and arrangement of the several parts generally shown in the accompanying drawing and described in the specification, but more particularly pointed out in the appended claims.

In the drawing Figure 1 is a side elevation of a clamp constructed in accordance with the principles of my invention, and suspended from an insulator, a rotated position of the clamp being shown in dotted outline; Fig. 2 is a side elevation, parts being cut away for clearness, and employing a slightly different form of suspension brake; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

When the conductor on one side of a suspension wire clamp breaks or becomes slack or loose, the clamp is drawn in the other direction, and since the strain is all on one side, there is some danger of the conductor slipping from the clamp unless additional pressure is applied. Furthermore, under such circumstances, if the slack wire were subjected to any appreciable tension, a sharp bend will be given to the wire, which will materially weaken it and, if composed of some material, may even cause it to break. These dangers are obviated by the present construction and the clamping bar is rounded upwardly, not only to distribute the bend or strain upon the conductor by preventing a sharp bend thereof, but also to constitute arcing discharge points or tips to pick up the electrical discharge from around the insulator, and thus prevent damage to it and to the conductor suspended by the clamp.

Referring now more particularly to the drawing, the reference numeral 10 designates generally a body member or casting with upturned sides forming a structure substantially U shaped, with the extremities 11 curved downwardly from the free portion of the member. The upturned sides form a groove 12 in the bottom of the member, which is provided intermediately of the ends with a depression 13, preferably disposed in the center of the body member. At the center of the body member 10 the upturned sides are formed into the projecting lugs 14 and 15, which are perforated and provide means for suspending the member 10 from any suitable support. A pivot pin 16 is provided for suspending the clamp, the pivot pin being held in place by a cotter 17, and one of the sides, as 14, is preferably formed with ridges 18, by means of which the cotter and the pivot pin 16 may be prevented from rotation.

At the sides of the groove 12, and preferably adjacent the lugs 14, 15, are projections 19, 20. The former of these projections is provided with an opening 21 which extends vertically through the body member at the side of the groove, and is adapted to receive a fastening bolt. The other projection 20 is formed with a recess 22 disposed above the bottom of the groove 12. This recess 22 is on the side of the groove opposite the opening or bolt hole 21, the bolt hole and the recess being arranged in pairs adjacent the lugs 14, 15. It will be noticed that the bolt hole 21 is disposed at the left side of the groove when the clamp is viewed from the end. This is true of both ends so that in the preferred construction there is a bolt hole on each side of the groove and a corresponding recess therefor on the opposite side of the groove.

To strengthen the tips 11 of the body member it is preferably formed with an

enlarged rim 23 along the edge of the upturned sides. This rim is preferably rounded so that there will be no danger of the conductor being cut or damaged on the sharp edges.

To suspend the body member any desired or suitable support may be provided, the preferred form, however, being shown in Fig. 1, comprising an eye-bolt 24 through which the pivot pin 16 passes. The lower end of the eye-bolt is preferably formed with inclined side portions 25. The faces of these inclined portions 25 are disposed at a greater distance from the pivot pin.

The upper portion of the eye-bolt 24 is preferably formed with a socket 26, which is adapted to receive a rounded knob 27, which is held in place by a cotter 28 inserted in the socket below the knob after it is in the socket. This rounded knob 27 may be secured to or supported by an insulator 29. Although this particular method of suspension is shown and described, it will be understood that any suitable suspending means may be provided, and in Fig. 2 it will be seen that the eye-bolt 30 is held by the insulator 31, and directly pivoted to the clamp.

A clamping bar 32, slightly less in width than the groove 12, is provided, which is adapted to be placed over a wire or conductor 33 in the groove to hold it in position. This clamping bar is preferably grooved on its lower surface to conform more nearly to the shape of the conductor, and may be provided with a rounded projection 34 which corresponds to the depression 13 in the groove 12. The top edge of the bar is preferably provided with notches 35, spaced apart so that when the bar is in position in the groove the notches will register with the bolt holes in the body member. The top side or face of the bar is preferably formed at the center with a squared shoulder portion 36, which is disposed in close proximity to the lower end of the eye bolt 24, when it is in position. The extremities of the bar are rounded upwardly and outwardly to form the arcing or discharging tips 37, and as the inclined or beveled side portions 25 of the eye bolt 24 are disposed at a greater distance from the eye bolt opening than the end of the eye bolt, it will be evident that the shoulder 36 will be engaged by the beveled sides if the clamp is rotated with respect to the eye bolt.

To bind the clamping bar 32 in position in the body member hook bolts 38 are inserted through the openings or bolt holes 21 at the side of the groove 12, and these bolts are each provided with a hooked end 39, which extends across the groove above the bar 32 and is adapted to be seated in the opposite recess 22. It will be evident that the clamping bar is securely locked in position at each side of the clamp. If for any reason the body member 10 is rotated with respect to the eye-bolt 24, so that one of the beveled surfaces 25 is brought into engagement with the shoulder 36 of the bar, an additional strain will be placed upon the bar by reason of the contact of the beveled surface with the bar, which will cause the conductor in the groove to be gripped more firmly. This condition may arise when, for example, the clamp is employed to support a suspension wire which is broken or upon which the tension is reduced on one side of the wire clamp. The clamp would then be rotated about the pivot pin 16 until the shoulder engages the beveled edge of the eye bolt, whereupon an additional strain would be placed upon the clamping bar 32 in accordance with the pull on the other side, the clamp being inclined on the side opposite to that at which the break occurs. These hook bolts 38 are so designed and proportioned that the hook will open or break and leave the pressure on the clamping bar when the bolts are pulled up to a certain strain. The object of this is to prevent the clamping bar from being drawn up against the conductor so closely as to injure the conductor. To accomplish this result the hook portion is so designed that its strength is proportional to the friction between the clamping bar and the conducting cable. It is possible to draw up the clamping bar by means of the bolt so that the conductor will not slip through the clamp and the bolts cannot be drawn up tight enough to injure the conductor.

It will be noticed that the hooked portion 39 of the bolts 38 extends across and above the groove 12, and above the clamping bar, and it will be noticed that the bolt holes are at the left hand side of the groove when viewed from either end, and disposed adjacent the lugs 14 and 15. The bolts 38 are provided with fastening nuts 40 upon the clamping bar. The object of this construction and arrangement is to prevent the bolts 38 from turning in the body member 10 when the fastening nuts are tightened on the bolts. In tightening a nut upon a bolt, if the nut does not work smoothly in the threads, there is a tendency of the bolt to turn in the direction in which the nut is turned. As most of the bolts and nuts are provided with what is called a right hand screw thread, the tendency of the bolt is to turn with the nut. By depressing the hook bolt at the left hand side of the groove, the hook of the bolt will engage one of the lugs 14 or 15 when the nut is tightened on the bolt, thereby preventing the bolt from turning and maintaining the hooked portion in its proper position with respect to the groove and to its recess, so that when the bolt is drawn downwardly it will engage properly in the recess.

The depression in the bottom of the groove and the corresponding projection on the clamping bar is for the purpose of obtaining a firmer grip on the conductor without kinking or damaging it, whereby it is held more securely in place. The tips of both the body member and the clamping bar are rounded outwardly so that there will be less danger of forming a sharp bend or kink in the conductor where the wire leaves the clamp, and there will be less tendency to localize the stress of vibrations at the ends of the gripping member.

Another feature of importance is that the extended tips of the clamping bar prevent the conductor from striking the insulator when the clamp is inclined because of a break or kinking of the conductor on one side of the clamp, for as shown, as the flattened or shoulder portion of the clamping bar is brought into engagement with the inclined or beveled sides 25 of the eye-bolt 24, the rotation of the clamp with respect to the eye-bolt is stopped and the tips 37 are free from contact with the insulator, from which the bolt is suspended (see dotted position in Fig. 1), so that the conductor carried by the clamp cannot contact with the edge of the insulator.

Another function of the extending or arcing tips 37 of the clamping bar is to prevent an electrical discharge from damaging the insulator or the conductor. The electrical discharge from around the insulator will jump to the point or tip 37 of the bar, and will be conducted by it to the wire or conductor. If there is a tendency to pit or burn caused by the electrical discharge, the damage will be confined to the discharge point or tip 37, and there will be no danger of disrupting the insulator by having the discharge jump through it to the eye-bolt, and by having the tips 37 curved upwardly they are in closer proximity to the extending petticoat of the insulator than the other metallic parts of the clamp or its support.

While I have thus described the preferred embodiment of this invention, it is evident that others may make various changes in the construction, combination and arrangement of the several parts without departing from the spirit and scope of the invention as defined in the appended claims.

What I claim is:

1. A suspension wire clamp, comprising a body member formed with a wire groove, and a suspension lug extending above the groove with an opening disposed at one side of the groove adjacent the lug, and a hook bolt disposed in said opening with the hook so arranged that in tightening the bolt to grip a wire in the groove the hook portion thereof will be turned against the lug to prevent the hook from being moved out of engaging position with respect to the wire.

2. In a suspension wire clamp, the combination with a body member formed with an upwardly opening groove, and a suspension lug extending above the groove with bolt openings adjacent each side of the lug on opposite sides of the groove, of hook bolts positioned in the openings each having a hook portion adapted to extend over the groove and to engage the lug for preventing the bolt from being turned out of the groove in tightening it, and a single clamping bar adapted to be positioned in the groove and to be engaged and pressed down when the bolts are tightened.

3. In a suspension wire clamp, the combination with a body member formed with an upwardly opening groove, and suspension lugs extending above it with a bolt opening on opposite sides of the groove adjacent the lugs, of hook bolts each positioned in an opening with the hook portion extending over the groove, and a single clamping member positioned in the groove between the lugs and adapted to be engaged and pressed down by the hooks of the said bolts at a distance from the ends of the clamping member, the said bolts being tightened from the under side of the body member and the hooks being disposed so that when the bolts are tightened against the clamping bar the hooks will engage the said lugs to prevent them from turning out of the groove.

4. In a suspension wire clamp, the combination with a body member provided with upwardly extending sides to form a wire groove, and suspension lugs with an outwardly rounding recess adjacent the lugs on opposite sides of the groove and with a bolt hole across the groove from each recess, a clamping bar disposed in the groove, and hook bolts positioned in said holes, the hook of each bolt extending across the groove and adapted to engage in its recess across the groove when the hook is turned against the lug to prevent the hook from turning out of the groove, the recess holding the end of the hook from turning.

5. In a suspension wire clamp, the combination with a freely mounted suspension member having a wire receiving groove therein, of a clamping bar adapted to be positioned over a wire disposed in said groove, and hooked clamping bolts the hooks of which extend in opposite directions over the said bar to clamp the bar in the groove.

6. In a wire suspension clamp, the combination with a grooved suspension member, of a single clamping bar adapted to be positioned over a wire disposed in said groove having a grooved lower edge conforming to the wire and spaced notches in the upper edge, and hooked clamping bolts mounted in the member the hooks being adapted to engage the notches in the bar to hold the bar in place and to also assist in holding the

hooks in proper position with respect to the bar.

7. In a device of the class described, the combination with a body member having upturned sides to form a wire receiving groove and lateral suspension lugs, a wire clamping bar disposed in the groove, means to secure the bar in clamping position, and means to exert an additional clamping strain upon the bar when the body member is moved about its point of support.

8. In a suspension wire clamp, the combination with a body member of U-shaped formation, an eye member disposed between the upper ends of the U, means to pivotally connect the eye member and the body member, a clamping bar disposed in the groove of the U, the said eye member being formed with edges which engage the said bar when the body member is rocked with respect to the eye member, whereby the clamping bar is pressed downwardly.

9. In a suspension wire clamp, the combination with a body member of U-shaped formation, an eye member disposed between the upper ends of the U, a rivet to pivotally connect the body member to the eye member, a clamping bar disposed in the groove of the U and having a flattened surface substantially adjacent the lower portion of the eye member when the body member is in normal position, the lower edges of the eye member being inclined from the center, so that the outer edges are at a greater distance from the axis thereof than the lower point, and means to hold the clamping bar in wire clamping position in the groove, the said inclined edges being effective to press the clamping bar downwardly when the body member is inclined with respect to the eye member and upon the side opposite to that in which it is inclined.

10. In a suspension wire clamp, the combination with a rotatably suspended body member having an upwardly opening groove, of a clamping bar insertible in the groove having both ends rounded upwardly out of the plane of the intermediate or clamping portion to form arcing tips, and means to engage the intermediate portion of the bar to clamp it in fixed position with respect to the said body member.

11. In a device of the class described, the combination with a body member formed with a retaining groove, of an eye-bolt supporting member having a substantially straight bottom edge and sides inclined therefrom at a greater distance from the point of pivotal support, a clamping bar disposed in the groove and formed with a shoulder on the upper side, and means to secure the bar in position in the groove, the said body member being rotatable with respect to the eye-bolt until the said shoulder engages one of the inclined sides.

12. The combination with a grooved clamping member, of a support, means in connection with the support to pivot the clamping member below it, a clamping bar insertible in the groove of said member formed with arcing discharge tips which extend upwardly toward the support, and means to secure the bar in the groove.

13. The combination with a rotatably suspended body member having an upwardly opening groove rounded downwardly at both outer ends, of a clamping bar adapted to be seated in the groove having a corresponding wire groove on the lower side and curved upwardly at the ends to form arcing tips, a conductor adapted to extend entirely through the groove and to be clamped between the two grooved members and normally out of contact both with the arcing tips and with the downwardly rounded ends of the body member, and means to clamp the intermediate portion of the bar against the conductor in the body member.

14. The combination with a clamp member of the class described, having a retaining groove for conductors, of an eye-bolt formed with inclined edges at the bottom and providing a pivotal support for the member, a clamping bar curved upwardly at the ends, disposed in the said groove, means to support the eye-bolt, the clamping bar being provided on its upper side with a shoulder portion which contacts with the inclined edges of the eye-bolt when the body member is rotated and limits the movement in both directions so that the clamp will not strike the supporting means, and means to secure the bar in position.

15. The combination with a clamp member of the class described, having a retaining groove for conductors, of an eye-bolt formed with inclined edges at the bottom and providing a pivotal support for the member, a clamping bar curved upwardly at the ends to form a sparking tip, a support to which the eye-bolt is secured, and means to secure the clamping bar in the said member.

16. In a suspension wire clamp, the combination with a grooved member having bolt holes at the sides of the groove, a support to which the member is pivoted having angular faces at the bottom, a clamping bar adapted to be inserted in the groove with a shoulder to engage the said surfaces when the grooved member is rotated, and bolts with hooked ends disposed in the bolt holes, the hooks engaging over the said bar to clamp it in position and the hooks being of a size to open when a predetermined strain is placed upon them, the engagement of the said bar with either angular face adding a clamping strain to the bar to correspondingly relieve the said hooks.

17. In a clamping device for conductors,

the combination with a grooved member provided with a depression intermediate of the ends, a clamping bar formed with a grooved edge and having a projection corresponding with the said depression, means normally to bind the bar in the groove, and additional means to increase the pressure on the clamping bar independent of the said binding means, the said binding means comprising bolts with hooked ends, and the hook being proportioned so that it will break when a predetermined strain is placed upon it.

18. In a device of the class described, the combination with a shouldered support, of a grooved member pivoted thereon, a wire clamping bar adapted to be seated in the groove and to contact with one of the shoulders when the grooved member is rotated on its pivot for then adding an additional clamping pressure thereto, and hook-bolts fastened in the grooved member and engaging the bar to clamp it normally in position.

19. In a clamping device for conductors, the combination with a grooved suspension member, of a clamping bar disposed in the groove, hook-bolts in connection with the member to bind the bar normally in position, and a support in which the member is pivoted having shoulders adapted to engage the bar when the member is moved on its pivot for placing an additional clamping strain on the bar.

20. The combination with a support having angular abutment surfaces, of a body member pivoted in the support, a clamping bar to coöperate with the body member having a shoulder normally free from engagement with the support but adapted to engage one of the angular abutment surfaces when the body member is correspondingly rotated for producing a pressure on the clamping bar.

21. In a device of the class described, the combination with a suspension member of a grooved body member pivoted thereto, a wire clamping bar seated in the groove having spaced transverse notches in its upper edge, and hooked clamping bolts positioned in the grooved member the hooks of which engage over the bar and are seated in the notches thereof to clamp the bar firmly in position and against longitudinal movement.

22. In a wire clamping device of the class described, the combination with a freely suspended body member having downwardly curved extremities, of a clamping bar therefor provided with arcing tip rounded upwardly so that both of the extremities of the body member and the clamping bar curve out of the line of a wire clamped between them.

23. In a wire clamping device of the class described, the combination with a freely suspended body member, with a grooved wire holding portion having downwardly curved extremities and a substantially straight intermediate portion, and a clamping bar therefor adapted to be seated in the groove and formed with arcing tips rounded upwardly and away from the extremities of the body member so that the extremities of both members are out of the normal clamping line of a wire.

24. In a wire clamping device of the class described, the combination with a freely suspended grooved body member having downwardly curved extremities, of a correspondingly grooved clamping bar adapted to coöperate with the body member and having arcing tips rounded outwardly and upwardly from the extremities of the body member, both the body member and the clamping bar having a substantially straight intermediate clamping portion so that the extremities thereof are out of the horizontal clamping line of a wire inserted therebetween, and means to bind the bar in position with respect to the body member.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 11th day of May, A. D. 1912.

ARTHUR O. AUSTIN.

Witnesses:
W. A. MORTON,
G. M. MONG.