Jan. 1, 1935. E. A. MACK 1,986,735

ELECTRICAL CONNECTER

Filed Oct. 14, 1929 2 Sheets-Sheet 1

FIG. 1.

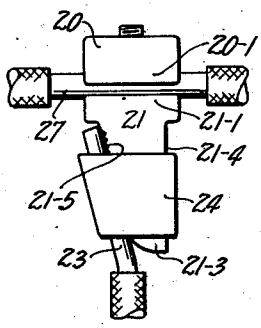


FIG. 2.

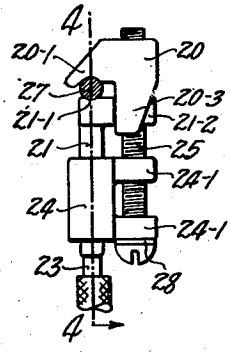


FIG. 3.

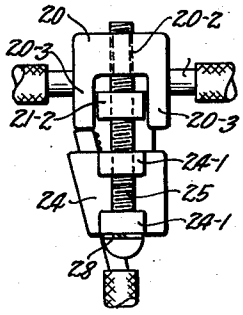


FIG. 4.

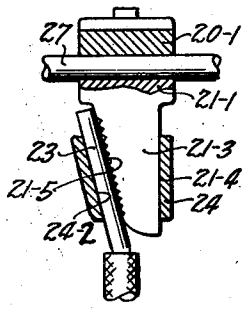


FIG. 5.

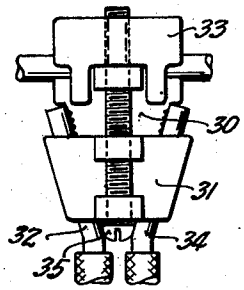


FIG. 9.

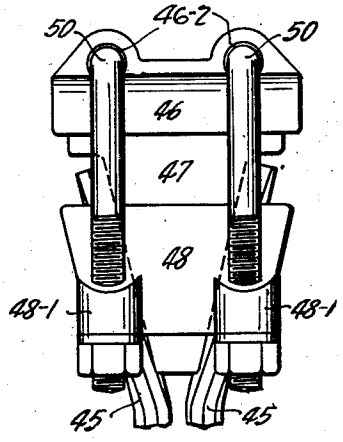


FIG. 6.

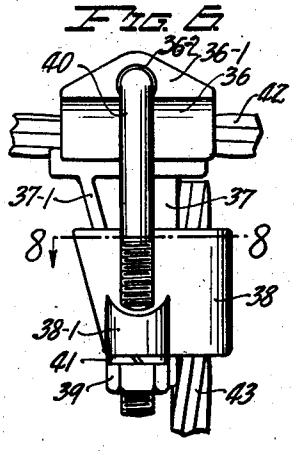


FIG. 7.

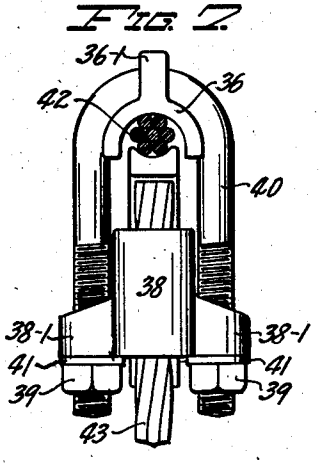
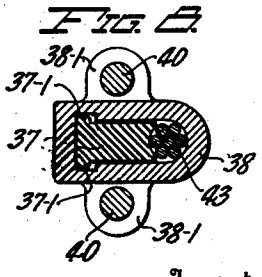


FIG. 8.



Inventor:
E. A. MACK,

By A. N. Mackinnon
Attorney

Jan. 1, 1935. E. A. MACK 1,986,735

ELECTRICAL CONNECTER

Filed Oct. 14, 1929 2 Sheets-Sheet 2

FIG. 10.

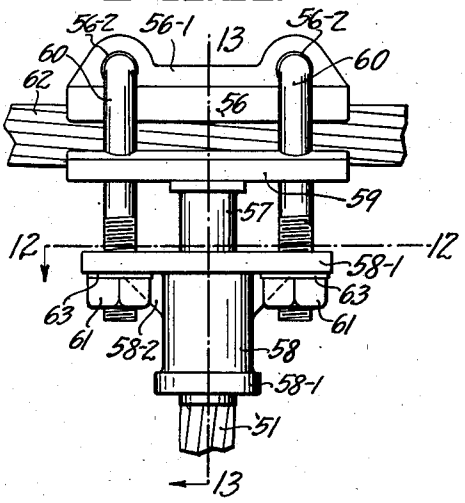


FIG. 11.

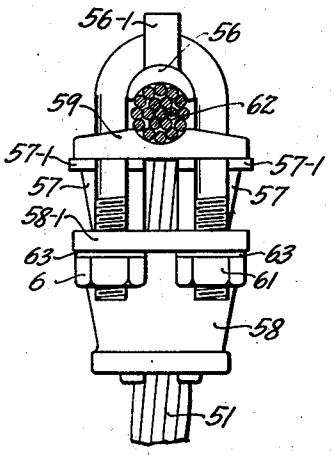


FIG. 12.

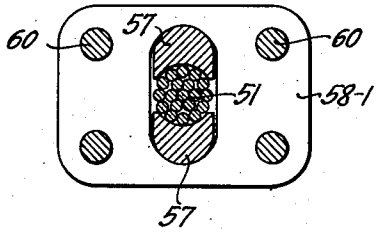


FIG. 13.

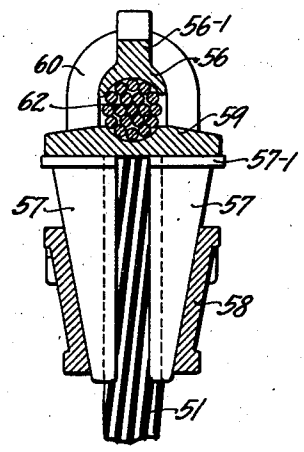
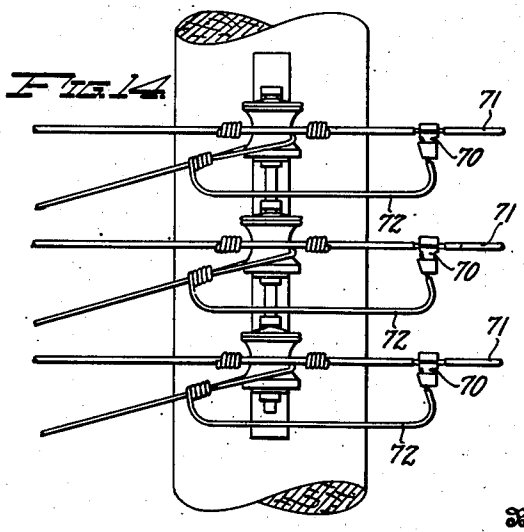


FIG. 14.



Inventor:
E. A. MACK,

By R. Mallinckrodt
Attorney

Patented Jan. 1, 1935 1,986,735

UNITED STATES PATENT OFFICE

1,986,735

ELECTRICAL CONNECTER

Edward A. Mack, Huntington, W. Va., assignor to Memco Engineering and Manufacturing Company, Inc., Long Island City, N. Y., a corporation of New York

Application October 14, 1929, Serial No. 399,560

9 Claims. (Cl. 173—273)

This invention relates to a connecter, and more particularly a T-connecter for general outdoor electrical construction. The principal objects of the invention are to provide:

First. A device where accurate and expensive machine operations in manufacture are eliminated.

Second. A device which can be easily and quickly installed without disassembling.

Third. A device for connecting run and tap conductors to each other without bending the tap conductor.

Fourth. A device effective to develop high contact pressures upon the connected parts, thereby insuring good conductivity and reducing the probability of radio interference to a minimum.

Fifth. A device which may be adjusted to varying conductor sizes, and at the same time insure the self-alignment of parts and the positive contact pressure, in a single operation.

Sixth. A device which can be modified in design so as to accommodate a plurality of tap conductors.

Seventh. A device requiring no special tools for installation.

In the field of outdoor electrical construction, a need appears to exist for an improved T-connecter incorporating self-adjusting features which shall be common to both the run and tap clamping pieces so as to permit the handling of a number of conductor sizes with one given size of connecter. It is also desirable that such a connecter should be so designed that accurate machining operations in its manufacture may be avoided. There are connecting devices of many different kinds in everyday use, but I am not aware that any of them possess the qualities just outlined.

The unique features of the present invention make it possible that substantially the entire range of solid and stranded electric conductors commonly used in overhead line construction, transformer installations, services and the like, may all be practically met by three, and possibly four, different sizes of my improved device.

This is accomplished by providing a vice-like clamp consisting of a cap or saddle and an opposing head, between which the run conductor may be clamped. A wedge member may depend from the said head, and a yoke may be fitted over the wedge so as to leave space for accommodating the extremity of a tap conductor. By providing further, a member for forcibly drawing the yoke and cap together, both the conductors may simultaneously be squeezed into intimate contact with the wedge member, which latter supplies the electrical conductivity required between the two conductors.

The ability to meet all practical requirements with relatively few different sizes of connecters, is obviously a great advantage to both the manufacturer and the user, since the cost of manufacturing becomes less, and the capital tied up in carrying stocks on hand is very materially reduced.

A further advantage is secured because the design is applicable to include conductors in small power and lighting services, tap connections between primary conductors, tap connections between secondary conductors, connections necessary to the installation of distribution transformers, as for example, connections between primary conductors and cut-outs, between lighting arresters and primaries, and between transformer secondary leads and secondary conductors.

In the work of installing tap conductors, maximum ease of making secure connections is highly important, since the workman must attach the connecters while working in awkward and often precarious places, such as high up on poles or ladders. Under such conditions, the more separate parts a workman must handle, the greater the chance of dropping some of these, resulting in undue danger, inconvenience and loss of efficiency.

The features of this invention for which the protection of Letters Patent of the United States is desired, are collectively grouped in the claims concluding this specification.

In the drawings,

Figs. 1, 2 and 3 represent respectively, side, end and opposite side elevations of the device of my improved T-connecter adapted for the smaller sizes of conductors;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a side elevation of a modified construction accommodating two tap conductors;

Figs. 6 and 7 are respectively, side and end elevations of a modified design for accommodating larger conductors than those illustrated in the previous figures.

Fig. 8 is a horizontal cross-section, taken on line 8—8, Fig. 6;

Fig. 9 is a side elevation showing a modified construction accommodating two tap conductors of the larger sizes;

Figs. 10 and 11 are respectively, side and end elevations of a design for handling conductors of still larger sizes.

Fig. 12 is a cross-section on line 12—12 of Fig. 10;

Fig. 13 is a vertical center section taken on line 13—13 in Fig. 10, but with the wedges shown in elevation; and

Fig. 14 is a fragmentary elevation showing an installation of conductors using the present device, of the type shown in Fig. 1.

Referring to the drawings, Figs. 1 to 4 show my improved T-connecter in the smaller size. It consists primarily of an upper clamping member in the form of a cap or saddle 20; a lower clamping member 21 in opposition thereto; a sleeve or yoke 24, and a forcing or tightening member, such as a screw 25, for forcibly drawing the other members together. The clamping member 20 may be provided with a jaw 20—1, and the clamping member 21 with a jaw 21—1, the two jaws cooperating with each other to grip a run conductor 27. The lower jaw 21—1 may form part of a head 21—2, and the head may have the depending wedge 21—3. The wedge may have a substantially vertical end face 21—4 and a serrated inclined face 21—5. For convenience, this may be called a single wedge. The sleeve 24 may carry projecting lugs 24—1 having holes therein through which the screw 25 may pass freely. This screw may also pass freely through the head 21—2 and finally engage a threaded portion 20—2 in the cap 20. The sleeve 24 is preferably of an elongated form in cross-section, and may be fitted over the wedge so as to have a limited, substantially slidable travel longitudinally along the wedge. The sleeve has an inclined inner face 24—2 spaced apart from and following the general direction of the serrated face 21—5.

In using this improved connecter, it may be applied to a run conductor 27 by simply opening the jaws 20—1 and 21—1, far enough to allow these to be slipped over the run conductor. The extremity of a tap conductor 23 may be inserted in the sleeve and positioned alongside the serrated face of the wedge as indicated in Figs. 1 and 4. Now, by tightening the screw 25, the yoke is drawn towards the cap, thereby squeezing the extremity of the tap conductor 23 into close contact with the serrated edge of the wedge member 21—3 and simultaneously clamping the jaws 20—1 and 21—1 into close contact with the run conductor 27. The screw 25 may be prevented from accidentally loosening by means of an ordinary lock washer 28, and the cap 20 may have the depending lugs 20—3 straddling a lug projecting from the head 21—2, thereby holding the parts in alignment with each other.

In Fig. 5 is shown a modified design, though of the same general type as the conductor just described. In this modification, the member 30 may be called a double-wedge, the yoke 31 being constructed accordingly, in order to provide two wedging pockets or recesses for accommodating two tap conductors 32 and 34. The cap 33 is somewhat wider than the cap in the preceding design, but otherwise is of similar construction to the cap shown in Figs. 1 to 3, and the clamping parts may be drawn together in a manner similar to that already described, by means of the screw 35.

In the next heavier type of T-connecter, the cap 36 may be constructed as shown in Figs. 6 and 7. In this type, the wedge member 37 may be given additional strength by ribs 37—1. The yoke 38 may be so formed in cross-section as to define an aperture accommodating the wedge member as shown in Fig. 8, and the yoke may further be provided with the external lugs 38—1.

The cap 36 may have the longitudinal rib 36—1 with a hole formed therein, through which may extend a U-bolt 40 which straddles the cap or saddle 36, as well as the body of the yoke 38, so that the legs of the U-bolt may extend through the lugs 38—1. Nuts 39 and lock washers 41 may be provided for drawing the parts together. It will be obvious, that by tightening the nuts 39, a greatly increased pressure can be brought to bear upon the run conductor 42 and the tap conductor 43, in comparison with the pressure that can be obtained in the previous construction, and naturally the parts throughout are of more rugged construction.

This type may also be adapted for accommodating two tap wires 45, as shown in Fig. 9. In this modification, the wedge member 47 is of the double-wedge design and the yoke 48 is made to correspond, being, however, provided with two pairs of lugs 48—1 so as to make possible the use of two U-bolts 50 for still greater clamping power. The cap 46 may be made to suit the double U-bolt construction as indicated in Fig. 9.

A type of the present invention that is suited for substantially the heaviest construction, is illustrated in Figs. 10 to 13 inclusive. In this construction, instead of having the body of the wedge member or members and the head thereof made integral with one another, these parts are made separately.

There are preferably two wedges 57, these being grooved as indicated in Fig. 12, to accommodate the tap conductor 51. The wedges may have a limited up-and-down movement in the yoke 58, and may bear upwardly against a head plate 59 which is grooved longitudinally to form the lower clamping jaw for receiving the run conductor cable 62.

In this type, as well as in those previously described herein, the wedges may be said to be "floating" thereby making the connecters self-adjusting.

Extending along the top of the cable is the cap 56 having the rib 56—1 through which later extend the U-bolts 60. The U-bolts extend downwardly through holes in the head plate 59 and in the flange 58—1 of the yoke 58, whereby an exceptionally strong and rigid construction is provided after the various parts have been clamped and wedged into place by the tightening of the nuts 61 against the lock washers 63. The cap 56 may be reinforced by the rib 56—1 while the wedges 57 may have the reinforcing head flanges 57—1, and the yoke, the reinforcing collar and reinforcing brackets 58—2.

The method of using my improved T-connecter is clearly shown in Fig. 14, where a group of connecters of the type described in connection with Figs. 1 to 3, is indicated at 70 along the run conductors 71, and having clamped therein the tap conductors 72.

In the larger sizes of the T-connecter, eyelets 36—2, 46—2 and 56—2 may be formed in the longitudinal ribs, constituting parts of the caps 36, 46 and 56, as shown in Figs. 6, 9 and 10, respectively. This prevents the caps and U-bolts from ordinarily becoming separated, as the bends of the bolts are in the eyelets.

It will be noted that this T-connecter in all its types is perfectly self-adjusting, that is to say, it is adjustable and self-equalizing in two directions, so that no matter what the relative sizes of the run conductors and tap conductors may be, as long as these are within the capacities of

the respective types of T-connecters, the wedge members and the heads thereof will make perfect electrical contacts with the various conductors as soon as the bolts are completely tightened. The wedge members should have high electrical conductivity while the caps and yokes should have the requisite strength; therefore, bronze forms a satisfactory material for all these parts. The bolts may be made of metal having the proper strength and resistance to corrosion.

While specific embodiments of this invention are herein shown and described, it is to be clearly understood that all the detailed parts thereof, may or may not be shown in the preferred forms, and further, that the preferred forms may be varied from time to time as the development of this invention and the arts to which it appertains, advance. Therefore the essential and characteristic features of this invention will be readily discernible from the claims in which its spirit is generalized.

Having fully described my invention, what I claim is:

1. A connecter comprising in combination, a cap, an eyelet defined on said cap, a U-member straddling said cap, the bend of said U-member positioned in said eyelet, a yoke movably disposed between the legs of said U-member, means defining a wedge recess in said yoke, and a wedge movably disposed in said wedge recess, said wedge having a head disposed in opposition to said cap, and means for forcibly moving said yoke along said U-member.

2. A connecter comprising in combination, a wedge having a conductor-engaging face, a yoke having a wedge-shaped recess with a wedge surface in opposition to said conductor-engaging face, said yoke being movable longitudinally along said wedge, a head at the upper end of said wedge, a cap located in adjustable opposition to said head, means defining conductor clamping jaws along said head and along said cap, and a tightening bolt extending through said yoke and through said cap.

3. A connecter comprising a channelled cap member, U-bolt clamping means embracing said cap member, wedging means cooperating with said cap member to hold a conductor, and a yoke member cooperating with said clamping means and having a recess non-rotatably receiving said wedging means, said wedging means and yoke member cooperating to hold conductors as said clamping means is tightened.

4. A connecter comprising a cap member channelled to cooperate with a conductor, U-bolt clamping means embracing said cap member, a yoke member engaging with said clamping means and having a central recess therein, and wedge means having a portion received within said recess and a portion cooperating with said cap member to clamp conductors between said wedging means and said cap and yoke members respectively, said wedge means spacing said cap and yoke members from one another.

5. A connecter comprising a cap member having a jaw, wedging means having a surface cooperating with said jaw to grip a conductor, a non-rotatable yoke member having a recess for receiving a portion of said wedging means and a conductor, and clamping means engaging said yoke member and cap member to clamp them to said wedging means and to clamp said conductors in place between said wedging means and said cap and yoke members respectively, said wedging means spacing apart said yoke and cap members.

6. A connecter comprising a cap member having a jaw, wedging means cooperating with said jaw to grip a conductor, a yoke member having a recess for receiving a portion of said wedging means and a conductor, and clamping means engaging said yoke member and cap member to clamp them to said wedging means and to clamp said conductors in place between said wedging means and said cap and yoke members respectively, said wedging means spacing apart said yoke and cap members, and being nonrotatable within said recess.

7. A connecter comprising a channelled cap member, a yoke member having a recess, wedging members having portions adapted to be received in said recess and having portions cooperating with said cap member, and clamping means to clamp said yoke and cap members to said wedging members, said clamping means being non-rotatable with respect to said cap, said wedging members being adapted to grip between them conductors of various diameters, said cap and the second mentioned portions of said wedging members cooperating to hold connecters of various diameters, all said members being self adjusting to the sizes of the conductors clamped.

8. A connecter comprising a channelled cap member, a yoke member having a recess, wedging members having portions adapted to be received in said recess and having portions cooperating with said cap member, and clamping means to clamp said yoke and cap members to said wedging members, said wedging members being adapted to grip between them conductors of various diameters, said cap and the second mentioned portions of said wedging members cooperating to hold connecters of various diameters, all of the above mentioned elements being non-rotatable, with relation to one another.

9. A connecter comprising a channelled cap member, a yoke member having a recess, wedging members having portions adapted to be received in said recess and having portions cooperating with said cap member, and clamping means to clamp said yoke and cap members to said wedging members, said cap and the second mentioned portions of said wedging members cooperating to hold conductors of various diameters, said wedging members spacing apart said cap and yoke members and being adapted to grip between them conductors of various diameters.

EDWARD A. MACK.