May 9, 1939. A. A. BERNDT 2,157,846

TAP CONNECTER

Filed Feb. 21, 1936

Fig. 1.

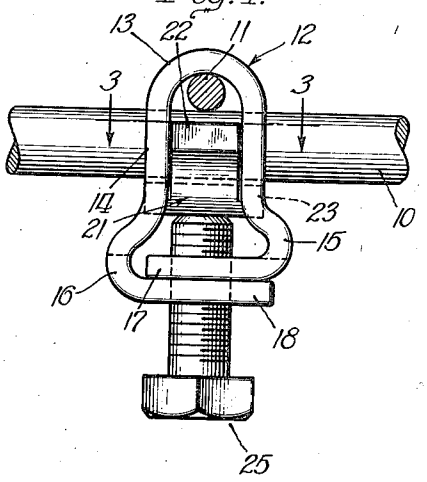


Fig. 2.

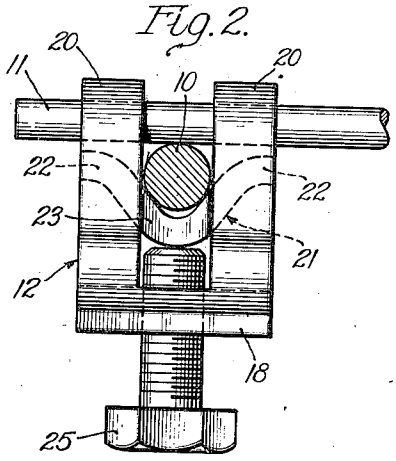


Fig. 3.

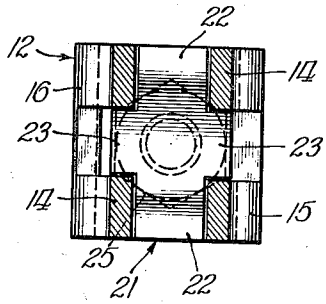
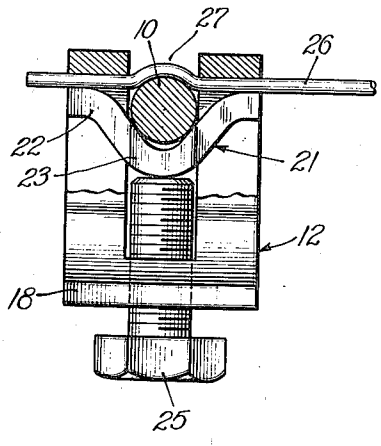


Fig. 4.



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Patented May 9, 1939 2,157,846

UNITED STATES PATENT OFFICE

2,157,846

TAP CONNECTER

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Application February 21, 1936, Serial No. 65,055

6 Claims. (Cl. 24—243)

The invention relates to connecters and more particularly to a connecter for electrically joining a tap conductor to a line conductor.

An object of the invention is to provide a simple, reliable and efficient connecter for connecting electrical conductors; to provide a device of this kind which can be used over and over again in different installations; and to provide a connecter which will retain its mechanical and electrical efficiency for a relatively long period of time.

Another object is to provide a connecter for connecting a tap conductor with a line conductor, which will not require the use of solder and which will make a joint of high conductivity.

A further object is to provide a tap connecter of simple construction that will not have any loose parts to become lost and which can be easily applied and disconnected without the use of special tools.

A further object is to provide a tap connecter that will apply a direct compression force to the conductors joined thereby to firmly and securely hold the same together and which joint will not be disturbed by the movement of the conductors.

With these and various other objects in view the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawing and claims appended hereto.

In the drawing which illustrates an embodiment of the invention and wherein like reference characters are used to designate like parts—

Figure 1 is an elevational view of a tap connecter constructed in accordance with the invention;

Figure 2 is a side elevational view of the connecter shown in Figure 1;

Figure 3 is a horizontal sectional view taken substantially along line 3—3 of Figure 1; and

Figure 4 is a side elevational view, parts being broken away to show the action of the clamping member when joining a tap wire of small diameter to a line conductor.

Referring to the drawing, it will be noted that the invention is illustrated in connection with two electrical conductors, one of which may be called a line wire or conductor 10, and the other a tap conductor designated by numeral 11. The line conductor is continuous, whereas, the tap conductor has a free end which is electrically joined or connected to the line 10 by the device of the invention. In actual practice the line conductor has a larger diameter than the tap conductor and when the wires are joined by the present device they are in contact with each other, as clearly shown in the drawing, and the tap conductor is disposed at substantially right angles with the line wire. The tap wire or conductor 11 may lead to a transformer or to a house or other building for furnishing power and light.

The present connecter is preferably formed of copper although other material having good electrical conductivity can be used. Said connecter essentially consists of a body member or housing indicated in its entirety by 12, which may be formed from a flat elongated strip of metal in any suitable manner to provide a rounded or arcuate top portion 13, substantially vertical side portions 14, which are directed outwardly at their base, forming bulbous portions 15 and 16, respectively. It will be noted that the bulbous portion 15 has a more decided arcuate contour than portion 16. This is due to the fact that the base portions 17 and 18 have overlapping relation with each other. As shown in Figure 2, the housing 12 is slotted vertically and substantially centrally thereof, forming spaced housing members 20. The slot extends to the base portion 17 and is substantially one-third the width of the housing. The opening between members 20 determines the maximum size of the line conductor to which the particular connecter may be applied, it being understood, of course, that the device of the invention may be manufactured in many sizes and therefore the connecter must be selected with reference to the particular size of the line wire with which it is to be associated.

The clamping member 21, Figure 3, is located within the housing 12 and has a formation so as to slidably fit the central portion of the housing, particularly the straight walls 14. By reason of the slot in the housing, four of these straight wall portions are formed and the clamping member accordingly includes ears 22 which fit between and have slidable movement with respect to the spaced walls of each pair. The clamping member in plan, Figure 3, has substantially the form of a Greek cross, the ears 22 extending in an opposite direction and having a length somewhat longer than the portions 23 which are likewise opposite each other. Said portions 23 fit within their respective slots and have contact with the sides of the walls 14. The ears 22 and portions 23 are disposed in different horizontal planes as will be evident from Figure 2. This results from the arcuate contour of the clamping member centrally thereof which is con-

cave to provide a trough for receiving the line conductor 10. Thus the clamping member, or more particularly the section of the clamping member lying within the slot or between the members 20, has a contour closely approximating the exterior of the line conductor 10.

The clamping member is actuated for clamping purposes by a screw or stud 25 which is threaded through the overlapping base portions 17 and 18 of the housing. By rotating the stud 25 in one direction the clamping member will be forced into clamping position for electrically connecting the conductors or wires and when rotated in an opposite direction it will be apparent that the action of the stud is to release the clamping member for permitting a ready disconnection of the conductors. The base portions 17 and 18 overlap and thus said portions act as a lock nut in holding the stud in adjusted position since there is a tendency for the base portions to spread away from each other when the clamping member is forced into contact with a conductor for joining the same to another conductor.

In the operation of electrically connecting a line conductor with a tap conductor the device of the invention is associated with the line conductor, the same being located within the slot, that is, between the members 20, and in contact with the arcuate or concave intermediate portion of the clamping member 21. The tap conductor 11 is then passed through the housing and is disposed above the line conductor 10 so as to bring the tap conductor into contact with the top portions 13 of the housing. The stud 25 is now rotated to force the clamping member against the line conductor 10 which will presently clamp said conductor and the tap conductor 11 between the clamping member and the housing. Action of the stud 25 is in direct compression against the clamping member and therefore the conductors are firmly and securely joined together. The present form of tap connecter results in a joint of high conductivity. The clamping member is in full contact with conductor 10 and the tap conductor 11 is in full contact with the upper arcuate portions 13 of the housing. Also the conductors 10 and 11 contact each other.

In joining a tap conductor of relatively small diameter to a line wire that portion of the tap wire between members 20 is deformed or bent out of a horizontal plane by the pressure of the clamping action. Thus, as shown in Figure 4, the tap conductor 26 of relatively light wire is deformed at 27. This has the effect of increasing the surface contact of the tap conductor with the line wire. The action also permits the clamping member to travel further in a clamping direction than would otherwise be the case and therefore the ears 22 are brought into contact with the tap conductor. The action of the ears is to further increase the strength of the joint as the conductor is clamped between the ears and the arcuate portion of the members 20.

The present tap connecter can be readily applied and a strong joint of high conductivity results. Special tools are not required and the connecter can be used over and over again in different installations. The screw 25 can be turned after the clamping member is tight against the conductor without damage to any of the parts and the action will merely increase the security of the joint. Forcing the clamping member in this manner has the effect of spreading the base portions 17 and 18 to a very slight degree but sufficient to form a lock nut, holding the stud in adjusted position. Normal movement of the conductors or even excessive vibration will not loosen or adversely affect the present joint in any manner.

The clamping member 21 has a concave central portion to provide a trough for receiving the line conductor 10 and in this manner materially increases the surface contact between the clamping member and the conductor. In addition the particular formation of the clamping member functions to maintain the member within the body or housing 12 as the ears 22 are located within the guiding walls even when the screw 25 is removed from the housing. Also the clamping member and particularly the ears 22 thereof has the effect of limiting distortion of both conductors. When the conductors are clamped together by the present connecter one conductor embeds itself in the other to a certain extent which allows the clamping member to move up until the ears 22 are solid against the tap conductor. Further distortion of the conductors is accordingly prevented and the ears by reason of their contact with the tap conductor further increase the conductivity and strength of the joint.

The automatic locking of the present tap connecter to the main wire is another important feature of the present device. By the insertion of the tap wire through the housing 12 the device of the invention is effectively locked to the line wire and the locking action is effective as long as the tap wire is in operative position for clamping by the present device. This locking action is a natural result of the construction of the present connecter and arises by reason of the fact that the wires when in clamping relation are at right angles to each other and one wire is located over the other.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawing, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. A connecter for connecting electrical conductors comprising a housing having straight side portions and overlapping base portions, said housing being slotted longitudinally to provide spaced housing members, a clamping member located within the housing and having slidable movement in the direction of the slots, said member having a shape to provide a trough transversely of the member for receiving a main conductor located between the spaced housing members, and said member having oppositely disposed ears extending between the straight side portions of the housing members respectively for engaging a tap conductor extending through the spaced housing members, portions extending from said clamping member adapted to fit within said slots and guide the member in its movement, and a stud having threaded engagement with the overlapping base portions for actuating said clamping member.

2. A connecter for connecting electrical conductors comprising a housing including spaced substantially straight walls joined by an arcuate portion on their top and having overlapping base portions, said arcuate portion and straight walls being slotted longitudinally of the housing to form spaced housing members, a clamping mem-

ber located within the housing and having slidable movement therein, said memebr having a concave intermediate portion for engaging the conductor located within the slots, said member having oppositely disposed ears adapted to extend between the straight walls of the housing members respectively, and portions extending from the clamping member adapted to fit within the slots to guide the member in its movement, said portions and said oppositely disposed ears lying in different horizontal planes, and a stud having threaded engagement with the overlapping base portions for actuating said clamping member.

3. An electrical tap connecter comprising spaced housing members, the respective side walls of said housing members being integrally joined by base portions having overlapping relation, each side wall of the housing members providing guiding surfaces forming an angle with respect to each other, a movable clamping member located within said spaced housing members, oppositely directed laterally extending portions on said clamping member co-operating with said guiding surfaces for guiding the member in its movements, said clamping member being adapted to have contact with an electrical wire located between the spaced housing members, and means threaded in the overlapping base portions for exerting a pressure on said clamping member to force the said electrical wire into firm contact with a tap wire extending through the spaced housing members, certain of said laterally extneding portions being adapted to engage the tap wire when said wires are securely held in connected relation.

4. An electrical tap connecter comprising spaced housing members, the respective side walls of said housing members being integrally joined by base portions having overlapping relation, each side wall of the housing members providing guiding surfaces forming an angle with respect to each other, a movable clamping member located within said spaced housing members, oppositely directed laterally extending portions on said clamping member co-operating with said guiding surfaces for guiding the member in its movements, said clamping member being adapted to have contact with an electrical wire located between the spaced housing members, one pair of said laterally extending portions lying in a different horizontal plane with respect to the other pair whereby said clamping member is provided with a trough extending transversely and engaging the electrical wire, thereby increasing the conductivity between said wire and clamping member, and means threaded in the overlapping base portions for exerting a pressure on said clamping member whereby said electrical wire is forced into firm contact with a tap conductor extending through the spaced housing members and at right angles to said electrical wire.

5. A connecter for securing a main conductor and a tap conductor in connected relation, comprising a housing having spaced substantially straight walls joined by an arcuate portion and having overlapping base portions, said arcuate portion and straight walls being slotted longitudinally of the housing to form spaced housing members, a movable clamping member disposed within the same and adapted to contact said main conductor which has location within the slots and is thereby positioned between the spaced housing members, oppositely disposed portions projecting laterally from said clamping member and fitting within the slots whereby said clamping member is guided in its movements, the center portion of said clamping member being dished to form a trough having an axis extending parallel to the axis of the main conductor and which receives said main conductor, and means exerting a pressure on said clamping member whereby said main conductor is forced into firm contact with a tap conductor extending through the spaced housing members and which is thereby forced into contact with the arcuate portions thereof.

6. A connecter for securing a main conductor and a tap conductor in connected relation at right angles to each other, comprising a housing having spaced substantially straight walls joined by an arcuate portion at their top and having overlapping base portions, said arcuate portion and straight walls being slotted longitudinally of the housing to form spaced housing members, a movable clamping member disposed within the same and adapted to contact said main conductor which has location within the slots and is thereby positioned between the spaced housing members, oppositely disposed portions projecting laterally from said clamping member and fitting within the slots whereby said clamping member is guided in its movements, the center portion of said clamping member being dished to form a trough having an axis extending parallel to the axis of the main conductor and which receives said main conductor, the ends of the clamping member having location between the straight walls of the spaced housing members respectively, said ends lying in a different horizontal plane from said laterally projecting portions whereby said ends of the clamping member have engagement with the tap conductor extending through the spaced housing members, and means threaded in said overlapping base portions for exerting a pressure on said clamping member.

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