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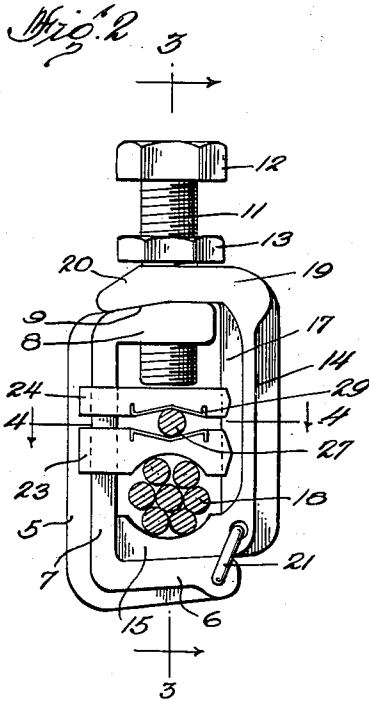
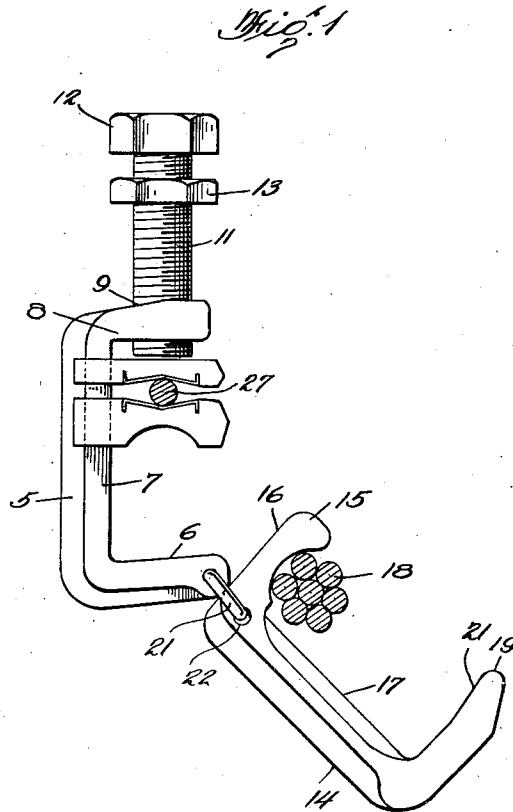
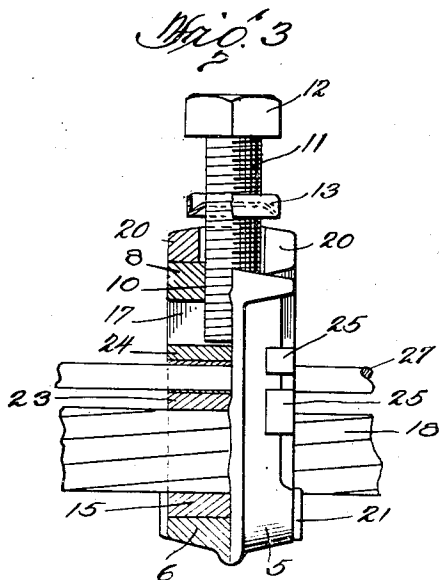
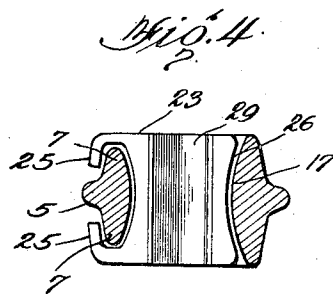
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2,219,846

TAP CONNECTOR

Filed March 15, 1939

2 Sheets-Sheet 1



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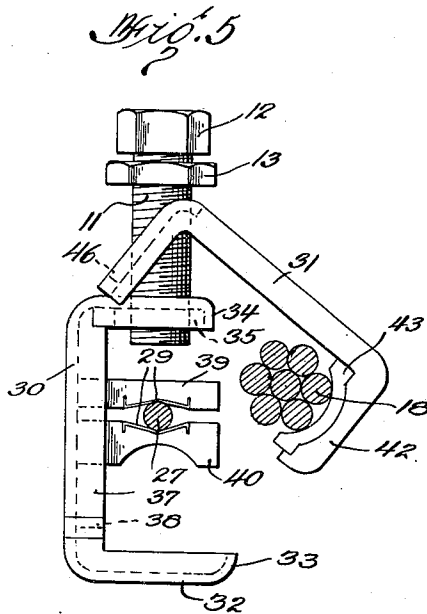
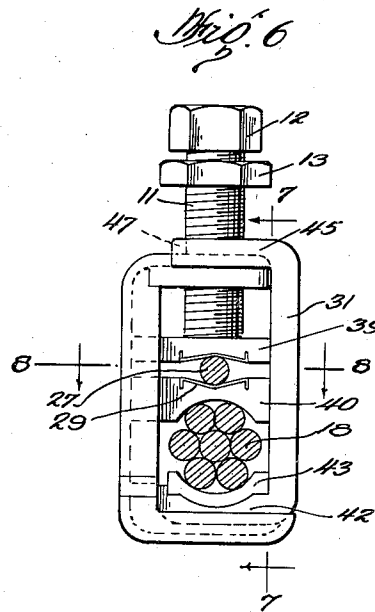
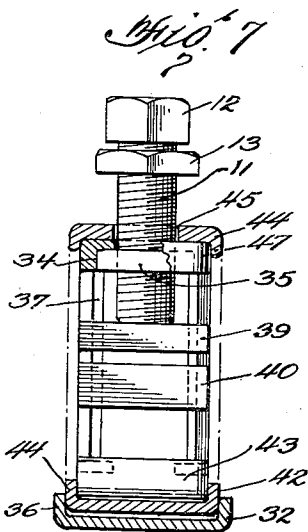
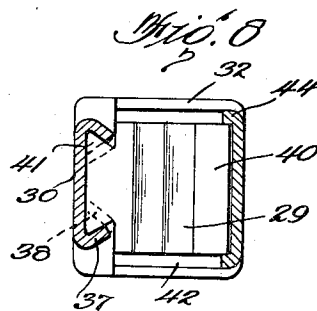
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TAP CONNECTOR

Filed March 15, 1939

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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TAP CONNECTOR

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14 Claims. (Cl. 24—125)

The description which follows relates to tap connectors of use in attaching together in electrical connection, two or more cables or wires of the same or different diameter and regardless of whether they are of the same or different materials. A principal use for such a device is where the main or line conductor such as a multiple strand cable is "tapped" for delivery of current to a branch or side line, usually through a conductor having a single strand.

One of the objects of my invention is to provide such a connector which will permit attachment between the running parts of two such conductors without necessitating the use of a free end of either of the conductors. This is accomplished through the provision of a side opening for the connector so that it will receive the running part of the cable or conductor.

A further object of the invention is to provide in such a device for the maintenance of the same degree of strength and rigidity which would be characteristic of a device in which both sides were integral parts of the same connector.

A still further object of my invention is to design the operative parts so that they may be assembled together and thus prevent loss or separation when the device is in both its open or wire-receiving position and its closed or clamped position.

It is an incidental object of my invention to provide the wire engaging jaws with means to maintain them in operative position and thus facilitate their assembly with the conductors.

A further object of my invention is to so design the device that when it is assembled with the conductors to be connected, there is an inherent tendency of the device to take the wire-holding or clamping position.

In carrying out this invention I provide a complete wire holding jaw in each of the two oppositely faced C-clamp members.

The single act of tightening the fastening means serves to apply engaging force to the clamp members at opposite ends and this increases the grip between the clamp members at the same time in which pressure is exerted upon the wire-holding jaws.

My invention also includes the use of a supplemental fastening in the form of a lock nut which not only prevents disengagement of the nearer ends of the clamp members but also maintains the firm engagement of the opposite ends of the clamp members.

Other purposes and advantages of the device will be evident from the following description

of its preferred form as illustrated in the accompanying drawings in which

Fig. 1 is a side elevation of the connector in the open or wire-receiving position;

Fig. 2 is a side elevation of the connector in the clamping position;

Fig. 3 is a vertical elevation partly in cross section on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal cross section on the line 4—4 of Fig. 2;

Fig. 5 is a side elevation of a modified form of connector;

Fig. 6 is a similar side elevation of the same in the clamping position;

Fig. 7 is a vertical section on the line 7—7 of Fig. 6 and

Fig. 8 is a horizontal cross-section on the line 8—8 of Fig. 6.

The improved connector comprises essentially two oppositely faced C-clamp members with associated wire-holding jaws, means for pivotally connecting the clamp members at one end and adjustably locking them at the other end. In Fig. 1 I have shown a clamp member 5 having one end in the form of a seat 6. This seat is given a slight slope inwardly toward the mid-portion of the clamp and downwardly as shown in the drawing. The mid-portion of the clamp has oppositely directed longitudinal guide ribs or tracks 7, 7. The upper or opposite end 8 of the clamp member also has an upper face 9 with a slope parallel to that of the seat 6. The end 8 is tapped with an internal screw-thread 10.

A fastening or locking screw 11 is held in the screw-thread 10. The head 12 of the screw permits its convenient adjustment. The lock nut 13 is also carried on the screw 11 for purposes which will later be described.

A second clamp member 14 is also provided. This has its lower end in the form of a jaw 15. The outer face 16 of this jaw has a slope conforming to that of the face 6 on the first clamp as will be noted in Fig. 2.

The inner face 17 of the mid-portion of the clamp 14 has a convexed surface clearly shown in Figs. 1, 2 and 4 to serve as an inter-lock for the travelling jaws.

The inner face of the jaw 15 is concave as shown in the drawings to receive and hold one of the conductors. In the example shown this conductor is a multiple strand cable 18.

The opposite end 19 of the second clamp is in the general form of a yoke having opposite arms 20, 20 illustrated in Fig. 3. The arms 20 of this yoke have lower sloping faces 21 conforming in

general to the slope 9 on the tapped end 8 of the first clamp. The upper or outer surface of the yoke end 19 is substantially perpendicular to the longitudinal axis of the second clamp 14 and serves as a stop for the lock nut 13.

The two clamp members 5 and 14 are pivotally connected by means of a link 21. This link is journaled in the seat end 6 of the first clamp and the junction of the jaw end 15 with the main portion of the clamp member 14. As shown in the drawings the opening 22 in which the link 21 is journaled in clamp member 14 is slightly larger than the diameter of the link 21 so that there may be relative movement between the two parts. This permits slight separation of the clamp 14 from the clamp member 5 in open position and also permits further sliding of the jaw member 15 on the seat end 6 until the former strikes the clamp 5 as shown in Fig. 2.

The track or guides 7, 7 on the first clamp 5 carry two wire-holding jaws 23 and 24. These are made from suitable ductile metal such as copper or aluminum. Jaw 23 is slidable along the track and has tongues 25, 25 by which it is maintained in substantially perpendicular relation to the track. The lower face of the jaw 23 is hollowed out to form a jaw surface conforming to that on the jaw end 15. The opposite or free end of the jaw 23 is concave to conform as shown in 26 on Fig. 4, to the convexity of the part 17 on the second clamp member 14. The concave face of the jaw 23 is thus interlocked with the guide face 17 when the parts are in wire-holding position (Fig. 2).

The upper wire-holding jaw 24 also has tongues 25 by which it is slidably mounted upon the track 7. The opposite or free end of the jaw 24 is also concave for interlocking with the convex surface 17.

The adjacent faces of the jaws 23 and 24 are hollowed out to hold a conductor such as the single wire conductor 27 and center it with respect to the adjusting screw 11 and the jaw end 15.

It frequently happens that dissimilar metals are used for the conductors 18 and 27. When such is the case operating conditions in the presence of dampness promote electrolytic or corrosive action. To prevent that shims 29 are fitted into the adjacent faces of the jaws 23 and 24. These shims are the same metal as the conductor 27. When such an arrangement is provided there will be no electrolytic action between 27 and 29 and the only dissimilar metals in contact will be the inner surfaces of the shims in contact with the jaws 23 and 24. Not being exposed to the weather these dissimilar surfaces will not corrode. This arrangement is of course based upon the premise that there will be no electrolytic or corrosive action between the cable 18 and the jaws 15 and 23 otherwise similar protection will be given these jaw faces.

In the above illustrative example it has been assumed the clamp members and jaws are made of aluminum or light metal alloy similar to the cable 18 and that the conductor 27 and the shims 29 are copper. Other metallic combinations are of course equally suitable.

In the modification shown in Figures 5 to 8 inclusive the C-clamp members 30 and 31 are of pressed sheet metal. The clamp member 30 has the lower seat end 32 with the outer lip 33 extending upwardly to provide a downward slope inwardly of the member. The upper end 34 of the clamp member extends parallel to the

seat member 32. It holds a tapped nut or sleeve 35. The end 34 has an opening coinciding with and slightly larger than the tapped opening in sleeve 35.

Side flanges 36 are provided on the member 30. As part of the upper end 34 these flanges surround the sleeve 35 and prevent its rotation. The mid-portions 37 of the flanges are bent inwardly as shown in Figs. 7 and 8 to form guide tracks. The flange 36 as shown in Fig. 7 extends beyond the mid-portion 37.

Between the lower end of the mid-portion 37 and the bottom flange 36 a tongue 38 is provided on each side. This tongue is folded in to form a retainer and stop for the wire holding jaws.

The guide portions of the flange 37 carry two wire holding jaws 39 and 40. Both jaws have dove-tailed ends 41 which are confined between the guide flanges 37, 37 (Fig. 8).

The second clamp member 31 is also made of pressed sheet steel. It has the lower jaw end 42 with a curved bottom conforming to the inner surface of the seat end 32 of the first clamp member. A jaw plate 43 is swaged in place between the outer flanges 44 of the jaw end 42.

The upper end 45 of this clamp member is apertured as shown in dotted lines at 46 in Fig. 5 to permit loose movement around the screw 11. A retaining bar 47 prevents the complete removal of the second clamp member 31 from the screw 11 and limits its opening to the position indicated in Fig. 5. The flange 44 extends around the upper end 45 and the mid-portion of the clamp member. In this way the clamp member is constrained to fit over the upper end 34 of the first clamp member and to provide retaining means for the jaws 39 and 40 as shown in Fig. 8.

This connector possesses the characteristic advantages of side opening devices. As shown the cable 18 is engaged by the jaw 15 and the latter brought down against the seat. In this operation the yoke 19 straddles the adjustment screw 11. The lower face of the yoke rests upon the slope 9 of the first clamp and any pressure between the jaw 15 and the seat 6 will tend to draw the yoke 19 closer against the tapped end 8. At the same time due to the loose connection of the link 21 in the hole 22 the jaw 15 will travel down the slope until it strikes the main part of the clamp member 5.

The conductor 27 is placed between the jaws 23 and 24 before the second clamp 14 is engaged with the first clamp 5. It will not be necessary to have a free end of the conductor 27 but any suitable mid-portion can be used. With the conductors in place the jaws 23 and 24 are brought down against the conductor 18. This compression is accomplished by means of the adjusting or locking screw 11. It will be evident that as the screw begins to exert compressive stress the resultant reaction is such as to cause the clamp members to press even more tightly against one another thus opposing any tendency to separate. This condition is obtained because the main axis of the screw and the resulting compressing stress is at the left of the hinge axis of the link and the jaw 15 tends to turn the clamp body 14 in a counterclockwise direction and press it more firmly than ever against clamp body 5.

The sloping surfaces of the ends further resist any tendency of the clamp members to separate.

The thrust exerted by the locking screw is transmitted through the end 8 upwardly against

the yoke 19 and also through the intermediate parts to the jaw end 15 downwardly against the seat end 6. Thus the two clamp body members when in interlocking position tend to reinforce one another and the resulting reaction to the compressive stresses imposed upon the sliding jaws and conductors is of the same magnitude as if the entire body assembly were one integral piece. In this way we obtain the same strength without the customary sacrifice caused by a side opening construction.

The lock nut 13 is peculiarly advantageous in exerting pressure downwardly against the yoke end 19. Consequently the fastening between the tapped end 8 and the yoke end 19 will thus keep the clamp members in operative tight position regardless of whether or not the end of the screw applies any compressive force through the traveling jaws and conductors.

The same general operation is carried out with a modified form shown in Figs. 5 to 8 inclusive. In the assembly of the device the jaws 39 and 40 are successively inserted between the opened stops 38 and raised above them into the space between the tracks 37, 37. The stops 38 are then bent inwardly. Thus they prevent jaw 40 from being lowered to a point where it would interfere with the closing of clamp 31. While in their upper positions jaws 39 and 40 receive the conductor 27. The cable 18 is placed upon the jaw face 43 of the opened clamp member 31 and the latter then swung around the screw 11 until the clamp members take the position shown in Fig. 6.

In this position jaws 39 and 40 are dropped down upon the cable 18. Screw 11 is then tightened in the sleeve 35 and against the upper face of jaw 39. In this way there is the desired reaction obtained between the jaw end of the second clamping member and the seat end of the first clamping member and also between the tapped end of the first member and the closed yoke end of the second member.

Application of the lock nut 13 has the same effect as above described for the modification shown in Fig. 1.

While the above description of my preferred form has been given for purposes of illustration, various changes in minor details, proportions and materials are possible without departing from the scope of the invention as defined in the following claims.

What I claim is:

1. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means for pivotally and permanently connecting the seat end of the first clamp member and the jaw end of the second clamp member, and means for separably connecting the opposite ends of the clamp members and for moving the jaw toward the jaw end of the second clamp member.

2. A connector comprising a clamp member having a seat end and a tapped end, a pair of wire-holding jaws slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means for pivotally and permanently connecting the seat end of the first clamp member and the jaw end of the second clamp member, and means for separably connecting the opposite ends of the clamp members, said last named means exerting pressure

upon one of said jaws lengthwise of the clamp members.

3. A connector comprising a clamp member having a seat end and a tapped end, guide ribs on the opposite sides of the clamp member and extending lengthwise thereof, a wire-holding jaw slidably mounted on the said guide ribs, a second clamp member having a jaw end and a yoke end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member and means for separably connecting the opposite ends of the clamp members.

4. A connector comprising a clamp member having a seat end and a tapped end, guide means on the clamp member, a wire-holding jaw slidably mounted on the said guide means, a second clamp member having a jaw end and a yoke end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, means for separably connecting the opposite ends of the clamp members and means on the second clamp member interlocking with the sliding wire-holding jaw.

5. A connector comprising a clamp member having a seat end and a tapped end, a pair of wire-holding jaws slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means for pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, means for separably connecting the opposite ends of the clamp members, said last named means exerting pressure upon one of said jaws lengthwise of the clamps, and means on the second clamp member interlocking with the sliding wire-holding jaw.

6. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw at one end and a yoke at the opposite end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, and a screw held in the said tapped end of the first clamp member, said yoke being transversely removable from the screw outside of the said tapped end.

7. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw at one end and a yoke at the opposite end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, a screw held in the said tapped end of the first clamp member, said yoke being transversely removable from the screw outside the said tapped end and a lock nut on the screw and engaging said yoke.

8. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, the said jaw end completely overlying and being supported on said seat end when the yoke end of the second clamp member fits over the tapped end of the first clamp member, and means for tightening the engagement of said pairs of ends.

9. A connector comprising a clamp member having an inwardly sloping seat end and a tapped

end with an outer face of the same general slope, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, the said jaw end completely overlying the sloping seat end when the yoke end of the second clamp member fits over the sloping outer face of the tapped end, and means for applying pressure on the ends of the second clamp member.

10. A connector comprising a clamp member having an inwardly sloping seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and a yoke end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, the said jaw end completely overlying the sloping seat end when the yoke end of the second clamp member fits over the outer face of the tapped end, and means for applying pressure on the ends of the second clamp member.

11. A connector comprising a clamp member having a seat end and a tapped end with an outer face sloping inwardly toward the member, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a yoke end sloping in the same general direction as the said tapped end and also having a jaw end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, the said jaw end being received on the seat end when the yoke end of the second clamp member fits over the sloping outer face of the tapped end, and means for applying pressure on the end of the second clamp member.

12. A connector comprising a clamp member having a seat end and a tapped end with an outer face sloping inwardly toward the member, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a yoke end sloping in the same general direction as the said tapped end and also having a jaw end, means pivotally connecting the seat end of the first clamp member and the jaw end of the second clamp member, a screw held in the said tapped end of the first clamp member, and a lock nut on the screw and engaging the yoke end of the second clamp.

13. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and an apertured end, said jaw end being received on the seat end when the apertured end of the second clamp member fits over the outer face of the tapped end, and means for applying pressure directly on both ends of the second clamp member.

14. A connector comprising a clamp member having a seat end and a tapped end, a wire-holding jaw slidably mounted on the clamp member, a second clamp member having a jaw end and an apertured end, said jaw end being received on the seat end when the apertured end of the second clamp member fits over the outer face of the tapped end, means for pivotally and permanently connecting the said jaw end with the said seat end, and means for applying pressure on the clamping members.

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