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H. P. CHANDLER

CONDUCTOR CLAMP

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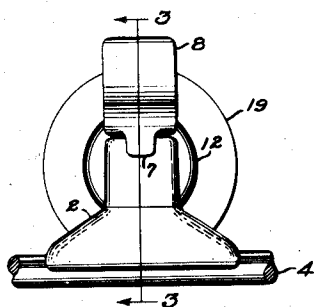


Fig. 1.

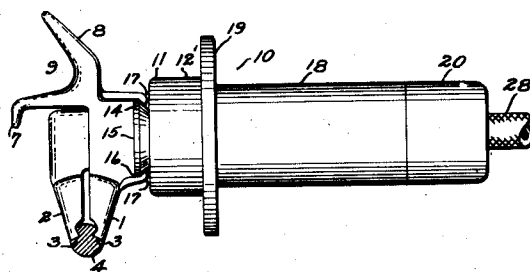


Fig. 2.

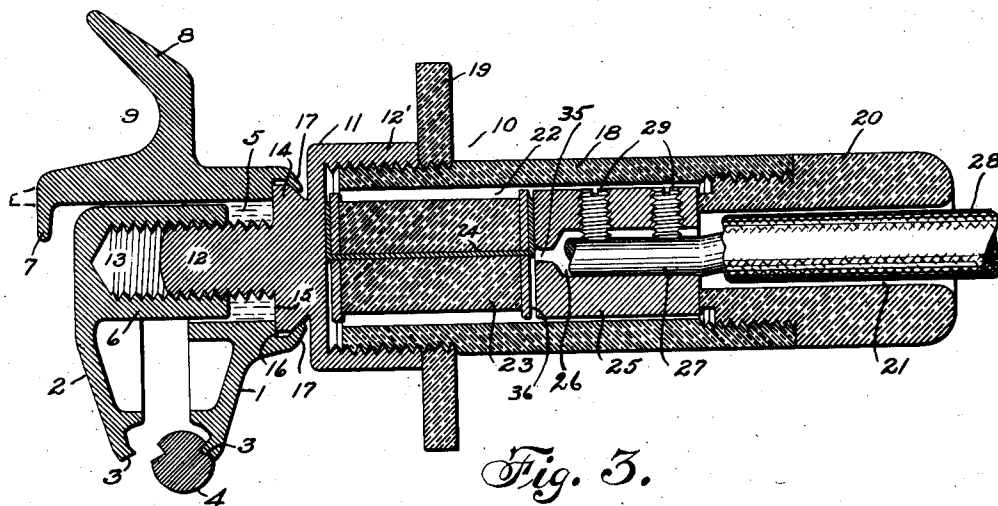


Fig. 3.

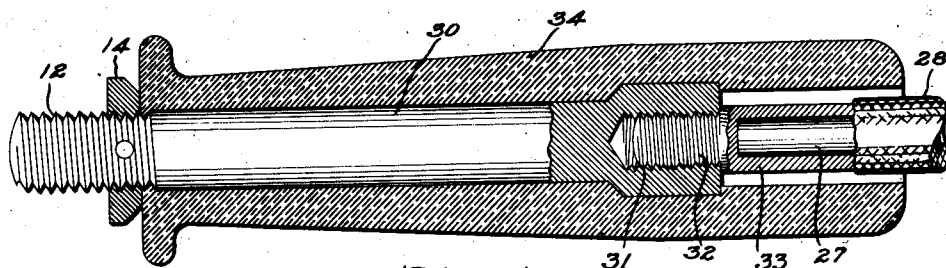


Fig. 4.

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CONDUCTOR CLAMP.

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My invention relates to a device for clamping to a conductor and having in combination therewith means for securing a cable thereto and which I term a clamping connector. It has particular use in mines where electrically operated machines are used at a distance from the source of supply of electric energy and where the location of these machines is shifted from time to time and, therefore, a connection to the electric conductor from which the current is taken is required to be temporary and movable.

In addition to the general object of my invention stated above, I also have incorporated in the device embodying my invention means for making a connection to the conductor which is made slidable with respect to the conductor.

Another object of my invention is to insert therein a fusible element to protect the apparatus from excessive current.

Other objects will appear as my invention is more fully described and set forth hereafter.

My invention resides in the new and novel construction, arrangement and combination of various parts which I have more fully set forth and described and shown in the accompanying drawing.

In the drawing accompanying this specification:

Figure 1 is an end view of my invention.

Fig. 2 is a side view of my invention.

Fig. 3 is a sectional view of my invention taken on the line 3—3 of Fig. 1.

Fig. 4 is a modified form of operating handle applicable to be combined with the other elements of my invention and substituted for the operating handle shown in Fig. 3.

In the preferred form of a device embodying my invention I employ two clamping members 1 and 2 each provided with similar lips 3 which are oppositely disposed to engage a conductor 4. The clamping member 1 is provided with an orifice 5 having a transverse or laterally disposed axis relative to the clamping member 1. The clamping member 2 is provided with a projecting boss 6 positioned in the orifice 5 and having a contour coinciding with that of the walls of the orifice 5. This contour may be circular or square or of other shape as desired. The two clamping members 1 and 2 are movable relatively to each other toward and

away from each other or in a lateral or transverse direction.

The member 1 is also provided with a lip 7 arranged to be turned over from its original position shown by the dotted lines and to engage with the clamping member 2 to limit its lateral movement in one direction. The movement of the member 2 relatively to the member 1 in a lateral direction is not sufficient to permit of the disengagement of the two members on account of the position of the member 7 acting as a stop member before the members 1 and 2 can disengage.

The member 1 is also provided with a projecting member 8 forming a groove 9, the object of which will be explained later. Threadably engaging the boss 6 is a handle 10. The handle 10 is provided with a metal member 11 which has a stud 12 threaded into the recess 13 of the boss 6 and having a flange 14 provided with a shoulder 15 engaging the annular flange 16 on the member 1. The member 1 is provided with bendable lugs 17 engaging the flange 14 which prevents longitudinal movement of the handle 10 relative to the clamping member 1, but permits a rotation of the handle 10 relative to the clamping members. The member 11 is provided with an internally screw threaded socket 12' in which is threaded the tubular member 18 formed of insulating material. On the exterior surface of the insulating member 18 is mounted a protecting collar or washer 19 also of insulating material. This washer 19 prevents the operator's hand from coming in contact with the live member 11.

Secured to the member 18 at the opposite end from that secured to the member 11 is a member 20 preferably of insulating material and in threadable engagement with the member 18 and provided with a passage 21. Mounted within the cavity 22 of the member 18 is a fuse 23 having a fusible element 24 contacting at one end with the member 11 and having the other end in contact with the conducting member 25 which has a recess 26 adapted to receive the end 27 of the cable 28. The cable 28 is held in the recess 26 by means of the set screws 29. The members 23 and 25 are both removable from the member 18 upon unscrewing the member 20. When, however, the member 20 is screwed into position it forces the members 25 into engagement

with one end of the fuse 24 and the other end of the fuse 24 into engagement with the element 11 and retains them in this engaged position and an electric circuit is completed from the members 1 and 2 through the fuse and the member 25 to the cable conductor 27. This arrangement permits of readily removing and replacing the fuse 23 should the fusible element 24 be "blown" on account of excessive current. There are, of course, other arrangements than that just described by means of which the fuse 23 may be removed and replaced and electric circuit completed from the member 2 to the member 27.

In Fig. 4 is shown a modified handle by means of which electric connection is made between the member 27 and the member 2 without the use of the fuse element 24. In this arrangement there is a stud 30 having a threaded end 12 which engages with the threaded recess 13 of member 2 and is provided with a flange 14 the same in every respect to the flange 14 of Fig. 3, and also has a threaded socket 31 to receive a threaded stud 32 having a socket member 33 in which the cable conductor 27 is secured in any well known manner, as for instance, soldering. The member 30 is provided with an insulated covering 34.

In the operation and use of my invention I have secured thereto a longitudinal cable 28 the opposite end of which is attached to an electrically operated apparatus such as in a mining machine and which may be at a considerable distance from any source of supply other than the main trolley 4. If the machine is in a permanent position for operation I then secure the device embodying my invention to the trolley wire 4 at a convenient point by rotating the handle 10 thereby moving the gripping members 1 and 2 relatively toward each other after placing the device in approximate position on the trolley wire 4 and continue the rotation of the handle 10 until the lips 3-3 are in secure engagement with the trolley wire 4. If the rotation of the handle 10 has been sufficient to produce an unreasonable amount of twist in the cable 28, this twist can be relieved by merely rotating the member 20 backward, loosening the parts slightly and then re-tightening the member 20 thereby securing the parts within the casing 18 to secure electrical engagement. If, during the operation of a mining machine, the current becomes greater than a predetermined amount, the fusible member 24 will be "blown" thereby opening the circuit. The fuse 23 can be then replaced by merely loosening up the member 20, withdrawing the member 25 and the fuse 23 and then replacing the fuse 23 with the new fuse and then replacing the parts 20 and 25. The handle 10 being insulated makes it possible for

the operator to manipulate the device off hand on to the trolley wire 24 without danger of being shocked.

It is sometimes desirable to move the mining machine from one position to another and if the mining machine is electrically driven, it will, of course, be desirable to have a connection with the trolley wire which can be moved as the machine is moved without breaking the circuit. To permit this operation the device is provided with a member 8 which forms the groove 9 and the walls of this groove 9 are placed in contact with the trolley wire or other conductor and held there by an operator who moves the device along the trolley wire as necessity requires.

In the construction shown in Fig. 3 there will undoubtedly be gases liberated at the time the fusible link 24 blows and unless provision is made for allowing the escape of these gases, there is a possibility of the member 18 being injured, therefore, I have provided means for the escape of these gases to the atmosphere and this means comprises, in the construction shown in Fig. 3, a passage 36 between the members 23 and 25, a passage 35 communicating with the passages 36 and 26 and the passage 21 communicating with the passage 26 and the atmosphere. This will permit ready escape of the gases to the atmosphere, but there are other means which may be provided, performing the same function.

The modified form of handle shown in Fig. 4 will need no explanation it is believed as to its use, as it will be clearly seen that if the handle shown in Fig. 4 is substituted for the handle shown in Fig. 3, it will only be necessary to rotate the handle shown in Fig. 4 the same as the handle 10 shown in Fig. 3, and the gripping members 1 and 2 will be engaged or disengaged with the conductor 4 depending upon the direction of rotation.

It will be noted in the construction shown in Fig. 3 that the handle does not move laterally with respect to the member 1, and that the member 2 will be positively moved either back or forth whenever the handle 10 is rotated and depending upon the direction of rotation of the handle. It will also be noted that the relative movement of the members 1 and 2 away from each other is limited by the member 7 which prevents the disassembly of the parts.

Due to the swivel engagement of the handle with the member 1 and the threaded engagement of the handle with the member 2 the members 1 and 2 will be held in relative relation to each other at all times, but this relation may be varied only by rotation of the handle and this is an advantage, in that, the members 1 and 2 cannot open or close by gravity thus requiring the device

to have a fixed relation relative to the conductor 4 in order that the conductor may be positioned between the members 1 and 2.

There are, of course, many modifications which will suggest themselves to those skilled in the art, but I do not wish to be limited otherwise than by my claims.

I claim:

1. An article of manufacture comprising a pair of movable members to grip a conductor, one of the members having means to limit the movement of the other member in a direction away from the conductor, rotatable means to move the members either toward or away from each other and maintain the members in an adjusted relation and a fusible link mounted within the rotatable means and having one end electrically connected to the members and means on the other end of the fusible link for attachment to a cable.

2. An article of manufacture comprising a pair of movable members to grip a conductor, electrically insulated rotative means to move the members either toward or away from each other, means for cooperative attachment of the rotative means to one of the members to maintain the members in a predetermined relation and a fusible link mounted within the rotative means and electrically connected to the movable members and also provided with means for the connection of a cable thereto.

3. An article of manufacture comprising a pair of movable members to grip a conductor, rotatable operating means to move the members either toward or away from each other, means on one of the members to limit the movement of the other member in a direction away from the conductor, means on one of the members to prevent lateral movement of the rotatable operating means relative to one of the members, means on the rotatable operating means to receive a cable and a fusible link electrically connecting the last said means and the movable members.

4. An article of manufacture comprising a pair of movable members to grip a conductor, rotating operating means secured to one member, means on said member to prevent lateral movement of the operating member, means on the operating member engaging means on the other member to move the other member either toward or away from the conductor when the operating means is rotated in one direction or the other respectively.

5. An article of manufacture comprising a pair of relatively movable members to grip a conductor, operating means rotatably secured to one member against lateral movement and means on the operating member engaging with means on the other member to move the other member either toward or away from the conductor depending upon

the direction of rotation of the operating member.

6. An article of manufacture comprising a pair of laterally movable members to grip a conductor, electrically insulated rotatable operating means for moving the members either toward or away from each other to engage or release the conductor respectively and having electrical engagement with said members and means on the operating member for the attachment of a cable thereto.

7. An article of manufacture comprising a pair of movable members to grip a conductor, electrically insulated operating means swivelly mounted on one member and engaging the other member whereby said members are moved either toward or away from each other to grip or release the conductor when the operating member is rotated in one direction or the other and means on the operating member for the attachment of a cable thereto.

8. An article of manufacture comprising a pair of movable members to grip a conductor, electrically insulated rotatable operating means for moving the members either into or out of engagement with the conductor, attaching means for a cable to said operating means and a fusible member interposed between said attaching means and the movable members to electrically connect the cable to the movable members and to protect the cable from an excessive flow of current.

9. The combination with a pair of clamping members to engage a conductor of a rotatable handle to operate the members into engagement with the conductor, a fusible link within the handle and electrically connected to one of the members, means to connect a cable to the fusible link and means for renewing the link when necessary.

10. An article of manufacture comprising a pair of clamping members to grip a conductor, one of the members provided with a side opening and the other member provided with a projecting member positioned in the side opening and movable laterally therein, and means engaging the two members for moving the two members toward each other, the engagement of the said means being swiveled with one of the clamping members and threadable with the projecting member.

11. An article of manufacture comprising a pair of movable clamping members to grip a conductor, a rotatable insulated fuse containing handle to operate the clamping members into engagement with the conductor and having means for electrically connecting a cable to the clamping members with the fuse interposed in the circuit.

12. An article of manufacture for attaching a cable to a conductor comprising means to grip the conductor, rotatable means to

operate the gripping means, means to maintain the cable in fixed relation to the gripping means and means combined with the last means for electrically connecting the cable to the gripping means and maintaining the connection under normal conditions but automatically opening the connection when the flow of current is abnormal.

13. The combination with a pair of clamping members to engage with a conductor of a rotatable handle to operate the members into engagement with the conductor, a fusible link within the handle and electrically connected to one of the members, a cable to make electrical connection with said link and means for connecting or disconnecting, at will, the cable to or from the link.

14. The combination with a pair of clamping members to engage a conductor of a rotatable handle to operate the members into engagement with the conductor, a fusible link within the handle and electrically connected to one of the members and communicating means extending from the interior of the handle to the exterior to permit the gases generated within the handle to escape to the atmosphere.

15. A connector comprising a pair of telescopically related but non-rotatable jaws movable relative to each other to grip a conductor, a rotatable insulated handle co-operating with the jaws to move them to-

ward or away from each other when rotated and means to electrically connect a cable to said jaws.

16. A connector comprising in combination a pair of jaws to grip a conductor, an insulated handle having a passage there-through, and operating to move the jaws into or out of engagement with the conductor when the handle is rotated about its longitudinal axis, a cable terminating within said handle and means positioned within the passage connecting the cable to one of the jaws.

17. A connector comprising a pair of jaws to engage a conductor and movable simultaneously toward or away from each other, an insulated handle, means attached to the handle and engaging the two jaws to move the jaws toward or away from each other when rotated and means for electrically connecting the jaws to a cable.

18. A connector comprising a pair of jaws movable either towards or away from each other, a rotatable handle provided with means to engage one of the jaws in swivel relation, threaded means on the handle having a threaded engagement with the other jaw, the jaws being movable towards each other to grip a conductor when the handle is rotated in one direction.

In testimony whereof I affix my signature.

HOMER P. CHANDLER.