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H. P. CHANDLER
FEEDER WIRE CONNECTOR
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2,288,680

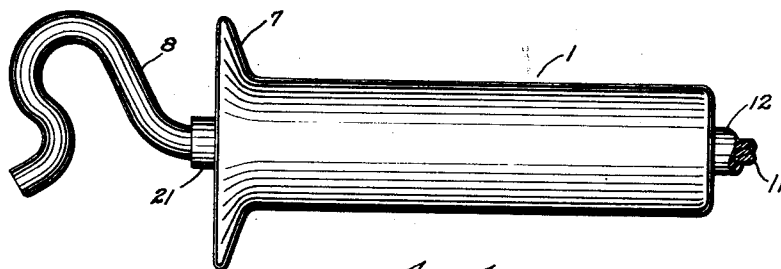


FIG. 1.

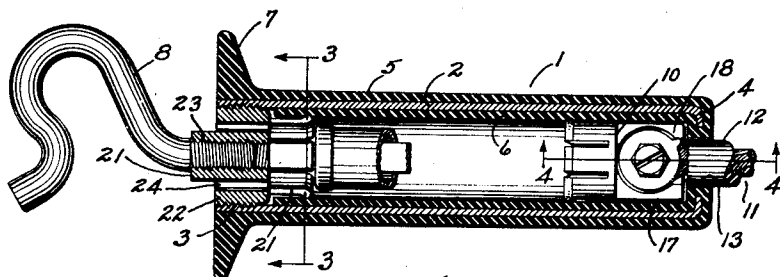


FIG. 2.

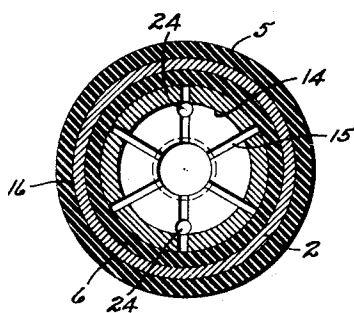


FIG. 3.

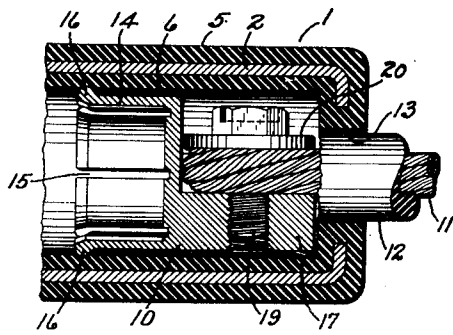


FIG. 4.

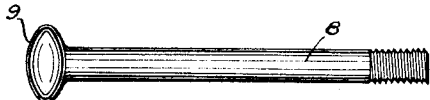


FIG. 5.

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FEEDER WIRE CONNECTOR

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Application September 26, 1941, Serial No. 412,470

13 Claims. (Cl. 200-115.5)

My invention relates to trolley taps and particularly the fused type of trolley tap for connecting a cable to the trolley wire and this device finds its greatest use in mines, where electrically operated machines are moved to different locations in the mine.

One object of my invention is to provide a device which an operator may safely handle in making a connection to the trolley wire.

Another object is to provide a device in which the handle or receptacle is constructed of other materials than wholly of electrical insulating material in order to increase the strength thereof.

Another object is to provide a device for holding a fuse, the end fuse holders of the device being arranged to grip the caps on the fuse.

Another object is to provide a trolley wire tap in which the handle or casing is of insulation with a metal core and the fuse holders are insulated from each other.

My invention resides in the new, novel and useful construction described in this specification and shown in the drawing forming a part of this specification.

In the drawing:

Fig. 1 is a side view in elevation of my invention.

Fig. 2 is a longitudinal view in partial section of my invention.

Fig. 3 is a transverse section on the line 3-3 of Fig. 2.

Fig. 4 is a view in partial section on the line 4-4 of Fig. 2.

Fig. 5 is a modified form of contactor which I may use.

In devices of the character of trolley wire taps, it is usual to construct the casing or handle of fibre, or a plastic of some nature, but such construction has not met all requirements, especially when used in mines where the device receives very rough handling.

Fibre appears to absorb moisture in mines where water is to be found. Plastics are waterproof, but are fragile as is, also, the case with hard rubber. Soft rubber is non-breakable and non-absorbent and resists shocks, but is not sufficiently rigid for the purpose. I have found that a casing of reinforced resilient rubber meets all requirements.

In the preferred embodiment of my invention, I provide a casing or handle 1 comprising a cylindrical member 2 of metal which may be steel, copper, brass, etc. This member or core 2 is provided with threads 3 at one end and is pro-

vided with an inwardly turned flange 4 at the other end.

The entire outer surface of the core 2 and the inner surface thereof up to the threads 3 are provided with a cover 5 of rubber which is preferably, resilient in nature and which is so applied as to adhere to the surface of the core 2.

The inner portion of the cover or lining 6 is continuous with the outer portion which is provided with a flange portion 7 which protects the operator's hand from contact with the trolley wire and the contact 8. The contact may be a straight bar of metal 8 with a ball-like knob 9 at one end or the bar 8 may be bent to provide a hook, as shown in Fig. 1, whereby the contact may be hooked over the trolley wire or other conductor. The ball end contact shown in Fig. 5 is for the purpose of trailing the contact along the trolley wire by hand, the ball end 9 acting as a guide.

Mounted within the casing 1 at one end is a fuse terminal or holder 10 having a cup-shaped portion at one end to receive the end cap on an enclosed fuse, and the other end of the terminal 10 having means for attaching thereto a cable conductor 11. The insulation 12 of the cable being inserted within an opening 13 of the casing thereby adding to the safety of the operator as there is no portion of the conductor 11 exposed.

The wall of the cup-shaped portion is split into segments 14 by means of slots 15 thus permitting the wall to yield to better receive the fuse cap. The wall is, also, provided with a bead 16 which embeds itself into the resilient lining 6.

The terminal 10 is of such size with respect to the inner diameter of the lining 6 that it is forcible into position through the opening at the opposite end due to the yielding property of the lining 6 and when the terminal 10 is in position as shown in Fig. 4, it will be noted that the bead 16 is slightly embedded in the lining which is constantly tending to force the wall segments 14 inwardly to reduce the diameter of the opening formed by the segments 14 thus forming an efficient contact between the terminal or holder and the fuse cap.

The constant pressure of the resilient lining 6 upon the bead 16 will hold the terminal 10 in position when there is no fuse within the casing.

The means for attaching the cable to the terminal 10 comprises a lug 17 having a flat surface formed with an upstanding wall 18 which in turn forms a socket to receive the bent end

of the conductor 11. The lug 17 is tapped to receive the bolt 19 and a washer 20 between the bolt head and conductor 11, holds the conductor in close and secure contact with the lug 19.

The fuse terminal or holder 21 at the open end of the casing is constructed in the same manner as the terminal 10 with respect to the cup-shaped portion to receive the fuse cap. The other end 22 of the terminal 21, however, is provided with an external thread to cooperate with the thread 3 on the core 2 and, also, has a threaded recess 23 to receive the threaded contact or nib 8. The terminal 21 is provided with openings 24 which form an exhaust for any gases that may be generated in the casing should the fuse blow.

The fuse is shown at 25 and constitutes any of the standard types of enclosed fuses which will properly fit the casing 1 and terminals 10 and 21. Both end caps of the fuse 25 contact with the terminals 20 and 21 to complete the circuit between the terminals.

It will be noted that the terminal 10 is insulated from the metal core 2 by the lining 6, otherwise the device would be inoperative as the holders would be electrically connected through the core 2.

I prefer to extend the lining 6 for the full length of the core 2 as far as possible to avoid any flash from a blowing fuse that might be projected from the fuse casing, contacting with the core 2. This is a safety feature that may be avoided with some types of enclosed fuses.

To assemble my invention, the terminal members 10 and 21 are removed from the casing 1 which is possible due to the yielding nature of the lining 6. The cable is next inserted in the end opening 13 of the casing and projected from the other end. The insulation is then removed from the end of the conductor 11 and the conductor formed to fit the recess in the lug 17. The conductor is then clamped into position by means of the bolt 19 and washer 20.

The terminal 10 and the cable are then in condition to be forced into the casing and into the position shown in Fig. 4.

The fuse 25 is then inserted into the casing with one terminal cap inserted into the opening formed between the wall segments 14. The constant pressure of the lining 6 will tend to retain the contact between the segments and fuse cap.

The terminal 21 is now placed in position shown in Fig. 2 through the medium of the threads 13. This positioning of the terminal 21 may be assisted, if desired, by a pronged wrench engaging the openings 24 whereby the terminal 21 may be rotated.

The terminal 21 and fuse cap will finally be seated as in the case with the terminal 10.

The flange 4 resists any severe pressure exerted thereon by the terminal 10.

The resilient and yielding cover to the core 2 may be made of other material than rubber, for instance, any of the so-called synthetic rubbers or other suitable material.

The terminal 21 may have secured thereto the conductor of a cable in place of the contact 8 in which case the device will function as a fused connector for two cables.

The insulating layers 5 and 6 are preferably moulded in place on the metal core 2 and secured thereto in many ways as well known to those manufacturing articles involving rubber or equivalent material.

Modifications will suggest themselves to those skilled in the art therefore, I wish to be limited only by my claims.

I claim:

1. A feeder tap comprising an insulating casing, metallic fuse holders at each end of the casing, means on one holder to receive a cable conductor, means on the other holder to receive a contact to engage a power conductor, a fuse device connecting the said holders and means on each member to receive an end of the fuse device, the casing comprising an elongated cylindrical metal shell with insulation covering the exposed exterior surface of the shell and substantially the entire interior surface, the insulation being continuous except at one end of the shell, the holder at one end of the casing being held in position by the insulation within the casing and the holder at the other end of the casing being screw threaded to the shell whereby the distance between the holders may be adjusted, the exterior covering of insulation being expanded into a transversely disposed flange at one end of the shell to protect the operator's hand from engaging the contact or power conductor and an opening through the casing at one end to receive the cable.

2. A feeder tap comprising in combination, a casing comprising an elongated cylindrical shell of metal having an inwardly turned flange at one end and an opening through the flange, an internal thread at the other end of the shell, a coating of insulation over the entire outer surface of the shell and extending through the said opening and along the inner surface of the shell to the thread, the outer portion of the coating expanding into a transverse flange at one end of the shell to protect the operator's hand, a terminal member at the threaded end of the casing and having threads cooperating with the threads on the shell whereby the terminal is adjustable longitudinally when rotated and thereafter held against longitudinal movement, means on the terminal to attach a contact to engage a power conductor, a second terminal member spaced from the first terminal and insulated from the shell, means on the second terminal to receive and hold a cable conductor, and means on the facing ends of each terminal to receive means for electrically connecting the terminals.

3. A feeder tap comprising in combination an elongated cylindrical metal member open at both ends, a resilient layer of insulating material covering the outer surface of the said member and a portion of the inner surface of the member, the member and insulation forming a handle, threads formed on the uncovered portion of the inner surface of the member adjacent one end, metallic terminals at each end of the handle, means to attach a cable conductor to one terminal and a contact associated with the other terminal and projecting therefrom for engagement with a power conductor, each terminal formed with a cup-shaped portion to receive the end caps of a fuse and the walls of the said portion arranged to yieldingly grip the said caps.

4. A feeder tap comprising in combination a hollow handle formed of yielding, resilient insulating material, an elongated cylindrical metal insert within the insulating material to retain the shape thereof, a metallic terminal at each end of the handle within the handle, means on one terminal to attach a cable conductor thereto, means on the other terminal to attach a con-

tact thereto to engage with a power conductor, each terminal formed with a yielding wall forming a cup-shaped receiver for the end caps of a fuse, and means on the yielding wall of each cap of each terminal to engage the insulation within the handle whereby the resilient insulating material will impose a pressure upon the yielding walls tending to press the walls inwardly and insure a secure contact between the terminals and the fuse caps.

5. The combination with a feeder tap comprising a hollow handle of yielding, resilient insulating material having an elongated insert of metal to retain the shape of the insulating material and a metal terminal at each end of the handle within the handle and each terminal provided with means for attaching thereto devices projecting into the handle from without and each terminal also provided with cup-shaped means with a yielding wall to receive the end cap of a fuse positioned within the handle, of means on the yielding wall of each terminal whereby the outer diameter of the wall is greater than the inner diameter of the handle and the said means is embedded in the surface of the inner wall of the handle and the said resilient material of the inner wall of the handle in turn exerts a constant pressure upon the yielding walls of the cup-shaped means tending to press the walls inwardly.

6. A feeder tap comprising a handle portion having a wall of resilient, yieldable rubber, a longitudinally extending elongated metal insert within the rubber wall to maintain the shape of the handle, a terminal at each end of the handle within the handle, means on each terminal for making attachments thereto, a cup-shaped portion on each terminal and having a yielding wall to receive and grip the cap of a fuse, a bead formed on the yielding wall of each terminal whereby the diameter of the terminal is greater than the interior diameter of the resilient wall and therefore pressure is brought upon the yielding wall tending to press it inwardly and also providing means to retain one terminal in position within the handle, threaded means on the other terminal engaging threads on the metal insert whereby the terminal when rotated may be moved towards and away from the other terminal and the terminal retained thereafter against longitudinal movement.

7. A fused trolley tap comprising a hollow member of metal forming an elongated rigid frame inwardly flanged at one end and open at both ends, the inner surface at one end formed with means to cooperate with and secure a terminal in place, a terminal provided with means to cooperate with the aforesaid means whereby the terminal is held in position within the hollow member, a layer of resilient insulation moulded to the inner and outer surfaces of the hollow member and continuous through the opening in the flange, a protecting flange at one end of the handle and formed of moulded insulating material continuous with that forming the outer layer on the hollow member, and a terminal held in position within the hollow member by the flange at the other end thereof, means on the first terminal to receive a contact and means on the other terminal to receive a conductor, resilient means on each terminal, a fuse having its terminals associated in said resilient means whereby both terminals are electrically connected and means on the resilient means in engagement with the inner lining tending to constantly press

the resilient means into contact with the ends of the fuse.

8. A fused feeder tap comprising a hollow handle formed of a supporting member of metal open at both ends and provided with a layer of resilient insulating material moulded to its outer surface and expanded at one end into a transverse protecting flange, a terminal member at each end of the handle, one terminal positioned within the handle and insulating means interposed between the terminal and the supporting member, the other terminal spaced from the first terminal and attached to the supporting member of metal, resilient means on each terminal, a fuse having its terminals associated with the resilient means to electrically connect the terminals and means on each terminal to receive an electric conductor, each resilient means engaging the said insulating means whereby the resilient means is held in engagement with the fused ends.

9. A feeder tap comprising a hollow handle open at both ends and formed of a metal supporting member provided with a yieldable, resilient insulating lining on the inner surface thereof, a terminal at each end of the handle and one terminal having a portion of greater diameter than the inner diameter of the lining, the last said terminal being insulated and removable through the opposite end of the handle due to the yieldable character of the lining as the terminal is moved longitudinally of the handle, friction between the parts holding the terminal at any desired position within the handle, the other terminal being positioned at the said opposite end of the handle and provided with means to cooperate with means on the supporting member to hold the member in position, means on each terminal to receive the ends of a fuse and a layer of insulating material secured to the outside of the supporting member to protect an operator holding the tap.

10. A feeder tap comprising a hollow handle formed of a supporting metal member having moulded thereon a yieldable and resilient insulating material attached to the inner and outer faces of the supporting member, a terminal at each end of the handle, means on each terminal whereby a conductor may be attached thereto, each terminal provided with a yieldable wall forming a cup to receive the end of a fuse, means on each wall to engage with the resilient lining to the supporting member whereby the said lining is constantly pressing against the last said means and tending to press the yieldable wall inwardly to insure engagement between the terminal and the fuse end and a conductor attached to one of the terminals by means of the first said means.

11. A feeder tap comprising a hollow handle provided with an inner layer of resilient insulating material, a terminal at each end of the handle, means on each terminal whereby attachment of conductors thereto may be made, each terminal is also provided with a yieldable wall forming a receptacle for the end of a fuse, means on each wall whereby the outer diameter of the wall is made greater than the inner diameter of the layer of resilient insulating material whereby the wall and resilient layer are yieldingly interlocked.

12. A feeder tap comprising a hollow handle provided with an inner member of resilient insulating material, a terminal member at each end of the handle, means on each terminal member whereby attachment of conductors thereto may be made, each terminal member is also provided

with a yieldable wall forming a receptacle for the end of a fuse, means on the said members whereby the inner member engages the yieldable walls of the terminal members and tending to press the said walls inwardly.

13. A feeder tap comprising in combination, a casing comprising an elongated cylindrical shell of metal having an inwardly turned flange at one end and an opening through the flange, an internal thread at the other end of the shell, a covering of resilient insulation over the entire outer surface of the shell and a lining of insulation extending along the inner surface of the shell to the thread, the outer portion of the covering expanding into a transverse flange at one end of the shell to protect the operator's

hand, a terminal member at the threaded end of the casing and having threads cooperating with the threads on the shell whereby the terminal is adjustable longitudinally when rotated and thereafter held against longitudinal movement, means on the terminal to attach a contact to engage a power conductor, a second terminal member spaced from the first terminal and insulated from the shell, means on the second terminal to receive and hold a cable conductor, and means on the facing ends of each terminal to receive means for electrically connecting the terminals.

LILLIAN C. CHANDLER.

15 *Administratrix of the Estate of Homer P. Chandler, Deceased.*