March 9, 1943. A. H. GENTER 2,313,333

FUSED FEEDER TAP

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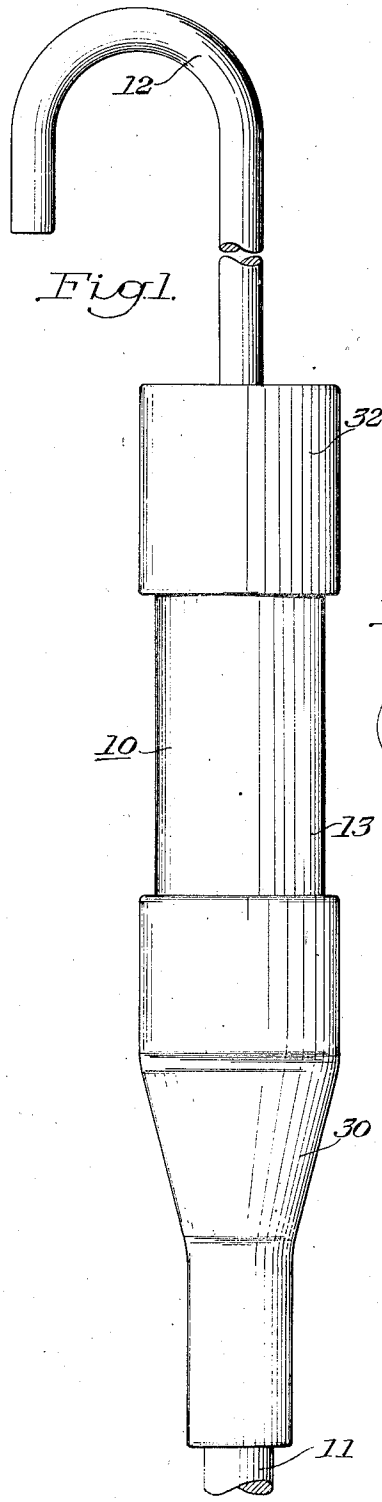


Fig. 1.

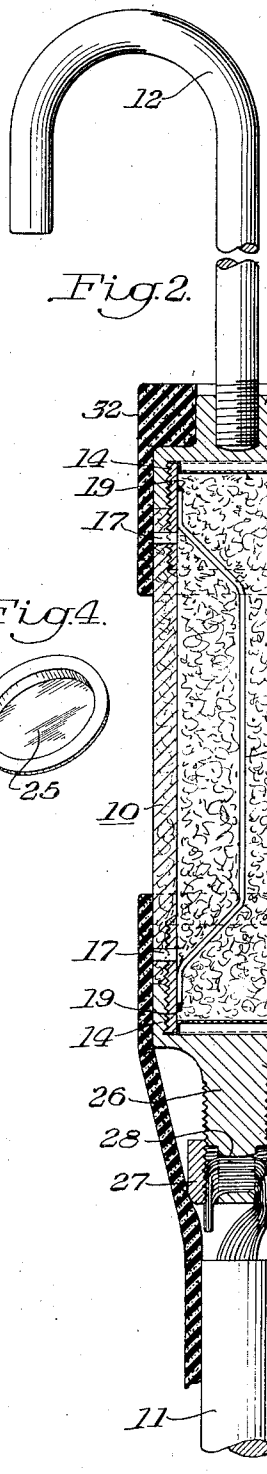


Fig. 2.

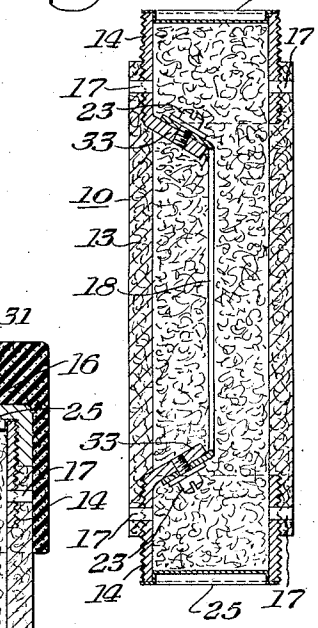


Fig. 3.

Fig. 4.

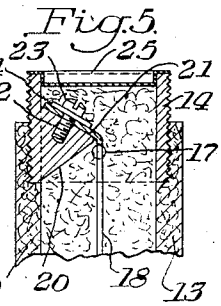


Fig. 5.

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FUSED FEEDER TAP

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7 Claims. (Cl. 200—115.5)

This invention relates generally to an electrical protective device and more particularly to a fused feeder tap arranged to connect the end of a cable to a source of supply for feeding electrical current to portable mining equipment and the like.

This class of electrical protective devices may be inserted between cable sections or adjacent the machine but it is general practice to place them at the end of the cable which is connected to the source of electrical supply, since in this position they provide protection for the cable as well as the machine and they also provide a rigid hand grip for connecting the tap to a source of electrical supply.

The present feeder taps are provided with an outer insulating tubular member having metallic connectors mounted in the bore thereof. The inner ends of these connectors are provided with expansible cups or lugs for receiving a cartridge fuse and the outer ends are provided with a threaded socket, vise or set screw for securing the tap head, hook, or cable thereto.

In each instance the cartridge fuse forms a separate and independent part which is removably inserted within the outer tubular insulating member. If the cartridge fuse has knife blades projecting from the ends thereof and are fastened to the connectors by set screws a fair electrical contact may be made. However the ordinary miner must be equipped with a screw driver or a wrench to replace this type of fuse and he is not sufficiently skilled to make a proper connection or to see that the terminals are properly cleaned.

The cup type connectors obviate the use of tools in replacing a cartridge fuse but this type of connection does not provide sufficient contact pressure for carrying the required current.

Again the use of an independent cartridge fuse within the holder limits the size of the fuse. Thus a small cartridge may have to carry an oversized fuse element to feed the required current to the machinery.

The principal object of this invention is the provision of an electrical protective device which overcomes these disadvantages.

Another object is the provision of a feeder tap wherein the cartridge of the fuse forms the sole connecting element and the hand grip. This structure is advantageous because it permits the use of a large fuse wire that may be adequately spaced from the walls of the cartridge.

Another object is the provision of a feeder tap that is light in weight and the fuse is easily replaceable by unskilled workmen without tools yet provides the proper electrical contact resistance.

Other objects and advantages appear in the following description and claims.

In the accompanying drawing a practical embodiment illustrating the principles of this invention is shown wherein:

Fig. 1 is a side elevation of a feeder tap comprising this invention.

Fig. 2 is a sectional view of the feeder tap shown in Fig. 1.

Fig. 3 is a sectional view of the renewable fuse section of the feeder tap showing the fuse element held in place by screws.

Fig. 4 is a perspective view of one of the caps which encloses the end of the cartridge fuse.

Fig. 5 is a sectional view of the renewable fuse section showing the fuse element secured by a set screw.

Referring to the drawing, the feeder tap 10 is arranged to electrically and mechanically connect the insulated cable 11 to the bare metallic head or hook member 12. The tubular body 13 of the feeder tap may be made of fiber, micarta or other suitable insulating material. The ends of the tubular body 13 are internally threaded to receive the externally threaded metallic nipples 14. The threaded nipples being longer than the internally threaded sections of the bore of the tubular member 13 permits the nipples to extend therebeyond to receive the internally threaded socket members 15 and 16.

After the nipples 14 are tightly screwed into the ends of the tubular members it is preferable to drill one or more holes through these members and drive the fiber pins 17 therethrough to prevent the nipples from coming loose.

18 represents the fuse element. The ends of the fuse element 18 shown in Fig. 2 are soldered at 19 to the inner bore of the nipples 14.

In Fig. 3 a tongue 33 is provided on the inner end of each nipple 14. These tongues are provided with a threaded hole to receive the screws 23 which clamp the ends of the fuse 18 in place. The tongues are disposed at an angle to permit access to the set screw by a screw driver and to align the fuse element in the axial center of the cartridge. These tongues may be positioned on the same side of the fuse cartridge as illustrated, or on opposite sides. The latter structure provides a better balanced fuse and facilitates in packing the cartridge with asbestos especially when the fuse element is very wide.

In the structure illustrated in Fig. 5 a lug 20 having an inclined face 21 is secured within each

nipple 14. A tapped hole 22 is provided in the face 21 for receiving the screw 23 which clamps the end of the fuse element 18 under the washer 24.

Thus the fuse element 18 may be renewed by skilled workmen in the repair shop by either soldering the ends of the new fuse element to the inner bore of the nipples 14 as shown in Fig. 2 or by employing the clamping screws 23, as shown in Figs. 3 and 5.

After one end of the fuse element 18 has been secured to its respective nipple 14 a cap 25 is pressed into the end of the nipple, thereby enclosing the end of the tubular member. The other end of the member is then turned up and asbestos or other suitable insulating material is packed around the fuse element which is positioned in the axial center of the tubular member. The other end of the fuse element is then secured to its respective nipple and the tubular member is completely filled with insulating material and closed by pressing the second cap 25 in the end of the other nipple.

The caps 25 not only enclose the fuse element and retain the loose insulating material therein, but forms a complete fuse member which is protected from dampness and may be carried by the miner or machine operator as a spare which may be readily inserted in the feeder tap to replace a blown fuse. The blown fuse may then be returned to the shop and reloaded for use.

If the fuse is to be inserted between two cable sections then two of the socket members 15 are employed. This socket member is provided with an axially extending threaded stud 26 having the nut 27 screwed thereon and provided with a transverse hole 28 through which the bared end of the cable is threaded. The nut 27 is then screwed out against the wire to provide an electrical and mechanical connection between the cable 11 and the socket member 15.

A soft rubber sleeve 30 having one end formed to fit the cable 11 and the other end formed to fit the socket 15 and the tubular section 13 of the fuse provides adequate insulation to protect the hand of the operator and is sufficiently tight to keep dirt and water from the metal parts.

The socket 16 at the other end of the feeder tap has an outwardly open threaded bore 31 for receiving the threaded end of the hook member 12. A soft rubber sleeve 32 is also employed at this end of the feeder tap to insulate the socket 16 from the hand of the operator.

The sockets 15 and 16 are preferably made flush with the tubular insulating body. This permits the soft rubber sleeves 30 and 32 to readily slide over this joint. There is sufficient area of engagement between these sleeves and the parts of the feeder tap to prevent the sockets from accidentally becoming unscrewed. However they are readily unscrewed when it is necessary to replace the tubular member 13, and at the same time adequate contact area and pressure are provided between the electrically connected parts to carry the high amperage required to operate this class of machinery and the fuse element is provided with ample space.

I claim:

1. In a feeder tap comprising insulated terminals adapted to be connected to a feeder line, a unitary electrical protective device consisting of a relatively large diameter tube of insulating material forming a hand grip, nipples fixed to the ends of the tube and arranged to be connected by hand to the terminals, a fuse element extending lengthwise within the tube and having its ends directly connected to the nipples, granular material inserted around the surface of the fuse element and filling the tube, caps pressed in the outer ends of the nipples to completely enclose the fuse element and retain the granular material therein, the tube serving as a hand grip as well as the fuse enclosure of the feeder tap when an electric current is passing therethrough.

2. In a feeder tap the combination of a replaceable hand grip consisting of an insulating tube of relative large diameter, nipples secured to the ends of the tube, a fuse element extending lengthwise within the tube and having its ends connected to the nipples, a filler of insulating material within the tube, and caps pressed in the ends of the nipples to completely enclose the fuse element and retain the insulating material within the tube, and exteriorly insulated connecting means arranged to be attached by hand to the nipples.

3. In a feeder tap structure, the combination of a unitary fuse comprising a tubular body of insulating material, metallic nipples inserted into the ends of the body and projecting therefrom, and a fuse element extending lengthwise within the body and having its ends electrically connected to the nipples, metallic socket members fitting over and removably secured by hand to the projecting ends of the nipples, said socket members arranged for connection to electrical conductors; and sleeves of insulating material enveloping the socket members and overlapping the adjacent portions of hte body, the body serving as the hand grip as well as the fuse enclosure of the feeder tap when an electric current is passing therethrough.

4. A feeder tap structure, comprising the combination of a unitary fuse consisting of a tubular body of insulating material, metallic nipples inserted into the ends of the body and projecting therefrom, a fuse element extending lengthwise within the body and having its ends electrically connected to the nipples, a filling of granular insulating material for the body, and caps pressed in the ends of the nipples for completely enclosing the fuse element and preventing the escape of such granular material; metallic socket members fitting over and removably secured by hand to the projecting ends of the nipples, said socket members arranged for connection to electrical conductors; and sleeves of insulating material enveloping the socket members and overlapping the adjacent portions of the body, the body serving as the hand grip as well as the fuse enclosure of the feeder tap when an electric current is passing therethrough.

5. In a feeder tap structure comprising a pair of terminal members, electrical insulating means covering the exterior of said terminal members, a bare conductor connected to one terminal member and arranged to engage an exposed line which is electrically energized, means on the other terminal member for securing a feeder line thereto, a unitary fuse member consisting of a tube of enlarged diameter made of electrical insulating material, nipples secured to the ends of the tube, a fuse element extending lengthwise within the tube and having its ends electrically connected to said nipples, caps pressed into the ends of the nipples to completely enclose the fuse element within the tube, and means on the nipples of the unitary fuse member for removably securing the terminal members thereto by hand to form a

rigid handle, with the spaced insulated terminals, which can be grasped and directed for electrically connecting and disconnecting the bare conductor of the feeder tap to an electrically energized line.

6. In a feeder tap structure, the combination of a unitary fuse comprising a tubular body of insulating material, metallic nipples inserted into the ends of the body and projecting therefrom, and a fuse element extending lengthwise within the body and having its ends electrically connected to the nipples, metallic socket members fitting over and removably secured by hand to the projecting ends of the nipples, one of said socket members arranged for connection with a bare electrical conductor, a threaded stud extending from the other of said socket members, the stud having a hole cut transversely therethrough, a feeder line with a bare end portion extending through the hole, a nut on the inner portion of the threaded stud turned tightly against the bare end portion of the feeder line to provide electrical and mechanical connection therewith, and sleeves of insulating material enveloping the socket members and overlapping the adjacent portions of the body, the sleeves and the body serving as the hand grip as well as the fuse enclosure of the feeder tap when an electric current is passing therethrough.

7. In a feeder tap structure, the combination of a unitary fuse comprising a tubular body of insulating material, metallic nipples inserted into the ends of the body and projecting therefrom, and a fuse element extending lengthwise within the body and having its ends electrically connected to the nipples, metallic socket members fitting over and removably secured by hand to the projecting ends of the nipples, one of said socket members arranged for connection with an electrical conductor, a threaded stud extending from the other of said socket members, the stud having a hole cut transversely therethrough, a feeder line with a bare end portion extending through the hole, opposite sides of the stud being cut away in planes normal to the axis of the hole to receive the bare end portion of the feeder line, a nut on the inner portion of the threaded stud screwed partially over the bare end portion of the feeder line to provide electrical and mechanical connection therewith, and sleeves of insulating material enveloping the socket members and overlapping the adjacent portions of the body, the sleeves and the body serving as the hand grip as well as the fuse enclosure of the feeder tap when an electric current is passing therethrough.

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