

UNITED STATES PATENT OFFICE

2,657,290

FEEDER TAP

Edward P. Smith, Mansfield, Ohio, assignor to
The Ohio Brass Company, Mansfield, Ohio, a
corporation of New Jersey

Application September 7, 1950, Serial No. 183,603

13 Claims. (Cl. 200—115.5)

1

This invention relates to feeder taps whereby a stranded cable may be electrically connected to a conductor, in particular a trolley wire connected to a source of power, and finds its principal use in electrified mines.

Prior feeder taps have been provided with casings which were to engage at one end with an insulating cap and vents were provided in the cap to relieve pressure within the casing. Manufacturing tolerances often caused imperfect positioning of the parts within the casing or left a space between the insulating cap which, under certain conditions of use, could become filled with wet mud and might then deliver a charge of electricity to an operator whose hand might come into contact with the mud. Accordingly, it is an object of this invention to provide an insulating cap which will not only accommodate manufacturing tolerances and insure predetermined relative positioning of the parts of the tap, but will also insure against an operator receiving a shock when in contact with the guard.

Another object of this invention is to provide a feeder tap in which certain features incorporated in the construction are safeguarded from becoming a source of danger to the one using the device at the time of contacting the live trolley wire.

Still another object is to provide a terminal for receiving and clamping the stranded cable in a simple and efficient manner.

While reference is made to the use of the device with a stranded cable, it may be used with a solid conductor, but its most common use is with a stranded cable.

For a more complete understanding of the nature and scope of my invention, reference may be had to the following detailed description, and the accompanying drawing, in which:

Fig. 1 is a longitudinal view in partial section of one form of feeder tap embodying the principal features of the invention.

Fig. 2 is a view of one end of the invention showing in particular the guard member but omitting the hook shaped member in full.

Figs. 3 and 4 each show a side or edge view of a quarter section of a guard of modified construction.

Fig. 5 is a fragmentary, sectional view of a feeder tap, showing still another guard embodying this invention.

Generally, a feeder tap of this invention comprises a recessed handle of insulating material, a cable terminal in the recess of the handle and near one end thereof, a removable plug in the

2

handle near the other end, these two parts being formed to receive a fuse to electrically connect them together, and a guard formed of insulating material secured to the plug and having a flanged portion surrounding a part of the handle. The cable terminal comprises in general a body having a longitudinally extending, transversely corrugated opening to receive an electrical conductor and also having an aperture communicating with this opening, and means comprising a member adjustably secured in the aperture of the body to extend into the opening and cooperate with the body to grip and hold a connector in the opening and in electrical connection to the body. The guard for the device has a disc portion having means to receive fastening means to attach the guard to a tap, and has a flanged portion projecting from the disc and forming with the disc a cup-shaped recess in which the end of the feeder tap may be received.

The feeder tap shown in Fig. 1 comprises a handle 1 composed of an insulating casing 2 of tubular formation, preferably of canvas or paper treated with a condensation product such as phenolaldehyde, or other suitable plastic. The casing 2 is preferably lined with a thin layer 3 of asbestos.

The casing 2 and lining 3 constitute the insulated handle 1. The casing is internally threaded at each end as for instance at 4 and 5. A bushing 6 of insulating material is threaded into the cable receiving end of the casing and has a through opening 7 to receive the cable, and may be made a fixed part of the casing as by the use of a cement.

The casing 2 is provided at the other end with an internally and externally threaded sleeve 8 having its outer end flush with the end face 9 of the casing 2. The threaded sleeve 8 cooperates with the threads 4 and is held permanently in place.

A metallic plug 10 is screw-threaded into the sleeve 8 and projects a small distance from the end face 9 of the casing 2. A guard 11 is secured to the end face of the plug 10.

The guard 11 is formed of insulating materials which may be formed of a resilient or elastic composition such as rubber or rubber substitutes or synthetics or plastics. A hard composition is very apt to be broken due to rough usage about a mine.

The guard 11 is provided with a disc 12 and an insert plate 13 of metal secured to the guard at the time the guard is formed in a proper mold. The guard 11 is provided with two openings 14

3
 which register with openings 15 in the plate 13, for the reception of the screws 16, the heads of which are well concealed in the openings 14, and if desired the portion of the holes 14 not occupied by the screw heads may be filled with an insulating material, such as sealing wax or a plastic, a common practice.

The guard disc 12 and plate 13 are positioned on a portion of the outer end face of the metal plug 10 and secured thereto by the screws 16. 10
 The projection of the plug 10 from the end face 9 of the casing 2 provides a clearance between the plate 13 and the end face of the handle thereby assuring proper assembly will be secured with respect to the parts within the handle 1 should the several parts comprising the interior members of the handle be not machined exactly to specifications. 15

The guard 11 is provided with vent holes 17 which extend longitudinally through the guard disc 12 and the plate 13 and which holes 17 register with similar holes 17' which extend longitudinally through the plug 10 and open into the interior recess 18 of the handle 1. 20

The plug 10 is provided with a plurality of integral inwardly projecting and spaced resilient fingers 19 forming a socket 20 to receive the metal end 21 of a fuse 22. 25

Within the recess 18 at the cable end thereof is a cable terminal 23 comprising a body portion 24 seated against the plug 10 and having a plurality of integral inwardly projecting and spaced resilient fingers 25 forming a socket 26 to receive the other metallic end 27 of the fuse 22. 30

The cable terminal 23 is provided with a central longitudinally extending and elongated passage 28 with one or more socket screws 29 extending into the passage 28 from the periphery of the body portion 24 to engage and grip the cable conductor. The wall of the passage 28 is preferably roughened or corrugated as by threading to better grip the cable and the screws 29 should not project from the surface of the body 24 when the cable is gripped. 35

When a cable is to be operatively connected with the present tap device, screws 29 are turned to withdraw them at least partially from passage 28 to allow the cable to be introduced into that space. With the cable in place in the passage, the screws are turned down until they tightly clamp the cable against the opposite threaded wall portions of the passage, thereby deforming the cable and substantially filling a portion of the passage in the vicinity of the screws. In this position, the screws tightly retain the cable in the passage in electrical contact with the terminal until it is desired to disengage the cable and terminal, whereupon the screws may be adjusted again to withdraw them partially from the passage, thereby releasing the cable. 45

The corrugations in the walls of passage 28 may, in some instances, be omitted, particularly when the cable to be used with the device, is comprised of relatively small wires, some of which are apt to be injured or severed by the corrugations. 50

The inner ends of the cable terminal 23 and of the plug 10 are each threaded to receive threaded studs on the opposite ends of the fuse terminals 21—27. 55

The plug 10 is also threaded to receive the threaded end of the hook shaped member 30.

Referring to Fig. 1, the space between the plate 13 and end face 9 of the casing and designated 55

31, assures the full insertion of the fuse ends 21—27 in their respective sockets 20—26. 4

The space 31 however surrounds the plug 10 which is electrically connected to the trolley wire when the hook 30 engages the trolley wire. This means that if the space 31 is not protected or guarded in some manner, then damp coal dust and moisture may fill the space 31 and will be charged and one holding the device may receive a shock if his hand should contact the said filling in the space 31, as the trolley circuits are usually 500—600 volts grounded.

To avoid such possibility, the guard 11 is provided with the circumferential depending flange 32 surrounding the end portion of the handle 1 in spaced relation thereto. While the annular space 33 connects with the space 31 the flange 32 will tend to maintain the space 31 reasonably free of the said conducting deposit and give reasonable security against shock.

This feature of my invention however, may be improved by providing a lip 34 on the inner rim of the flange which will engage the side wall of the handle and thus close the said annular space 31 as shown in Fig. 3. In Fig. 4 is shown another method by which this may be accomplished, namely, by effecting contact between the flange 32, or some part thereof, and the handle 1. 55

This contact is preferably made at the rim of the flange next the handle such that the said annular space 33 is not eliminated but is closed to the entrance of dust and dampness to the spaces 31 and 33.

In Fig. 4, the closure is accomplished at the inner rim of the flange 32 next the face of the handle by sloping the wall 35 forming the space 33 until its peripheral edge 36 engages the surface of the handle.

The constructions shown in Figs. 3 and 4 are considered preferable to one eliminating entirely the space 33 as by contacting the length of the inner wall of the flange with the adjacent face of the handle as shown in Fig. 5. 60

If the portion 12 of the disc is formed of a hard insulating material, it is desirable to form the flange 32 of resilient or elastic insulating material formed as an integral part of the disc 12 in order that it may have slight yielding fit with the handle.

In order to replace the fuse 22 should the link 37 blow or to connect or disconnect a cable from the terminal 23, the plug 10 is unscrewed from the bushing 3 which permits removal of the fuse and terminal 23 which may come out with the plug since all parts are screw connected together. 65

It will be noted that the assembled parts of this invention afford increased venting capacity and part of the space provided for accommodation of manufacturing tolerances may also serve as part of the venting system. The spacing between plate 13 and the adjacent end of the handle 1 may serve to relieve internal pressure in the handle and also to insure predetermined positioning of the parts of the device in spite of variation in dimensions due to manufacturing tolerances.

Since certain changes may be made in the above description and different embodiment of the invention made without departing from the spirit thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be considered illustrative and not in a limiting sense.

Having thus described the present invention so that those skilled in the art may be able to gain 75

5

a better understanding and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

I claim as my invention:

1. In a feeder tap comprising a recessed handle of insulating material and a cable terminal in the recess adjacent one end thereof with means to receive a cable conductor and means to prevent displacement of said cable terminal in one direction and a metal plug at the other end of the recess and a fuse connecting the plug and terminal, the combination with the plug of a guard formed of resilient insulating material and having a disc portion attached to the outer end of the plug for movement with the plug and a flange projecting from the disc portion and surrounding a portion of the handle at the said other end of the handle, the plug provided with means to receive other means connectable to a source of power.

2. In a feeder tap comprising a tubular handle of insulating material with a cable terminal in the handle recess adjacent one end thereof and a metal plug at the other end of the handle and removably attached thereto, and an insulating bushing secured to the handle at said one end and a fuse in said handle recess connecting the metal plug and terminal, the combination with the metal plug of a guard formed of elastic insulating material and having a disc portion attached to the outer end of the plug for movement with the plug and disposed in spaced relation to the adjacent end face of the handle and also having a flange portion surrounding a portion of the outer face of the handle to protect the space formed between the disc portion and the end face of the handle from the entrance of foreign matter into said space, and means to connect the plug to a source of power.

3. A feeder tap comprising a tubular handle member formed of insulating material, a cable terminal at one end, a plug at the other end and a fuse connecting the terminal and plug, the cable terminal comprising a body member provided with a longitudinal passage to receive a cable conductor, the terminal also provided with a plurality of socket type screws to engage and secure the conductor in the passage, the screws being so proportioned they will not project outwardly from the surface of the body when gripping the cable conductor, the terminal also having a recess at one end formed by a plurality of resilient fingers to receive the other end of the fuse, the plug also provided with a member connectable to a source of power, a guard secured to the outer portion of the plug and provided with a plate spaced from the adjacent end face of the handle and the guard provided with a projecting flange surrounding a longitudinal portion of the side face of the handle but in spaced relation thereto, the first said space and the second said space intersecting to form a continuous passage from the plug to the outer face of the said flange.

4. In a feeder tap comprising a tubular handle of insulating material and terminal means within the handle to receive the conductor of a cable and other means at one end of the handle to connect the tap to a source of power, the combination with the last said means of a guard of insulating material secured to the tap at the live end thereof, the guard provided with a circular disc portion and an annular flange portion projecting from the disc and forming a cup-shaped recess into which an end of the handle projects, the flange extending longitudinally of a portion

6

of the handle and forming therewith an annular space, and the said terminal means and the said other means each provided with means to receive conducting means to electrically connect the said means, the said other means provided with means to receive means to engage a source of power; and the said terminal means comprising a body member provided with a longitudinal passage to receive a cable conductor; corrugations in the walls of the passage and a plurality of socket-type screws to engage and secure the conductor in the passage.

5. A feeder tap as described in claim 4 characterized by the guard being formed of an elastic insulating material and the rim of said flange provided with means to engage the adjacent surface of the handle to prevent entrance of dirt and moisture to said annular space.

6. A feeder tap comprising, a tubular handle formed of insulating material, a cable terminal at one end and a removable plug at the other end, the plug and the terminal each provided with means to receive fusible means to electrically connect the plug and terminal, means connected to the plug to connect to a source of power, the terminal provided with a longitudinal passage to receive the conductor of a cable and the terminal also provided with screw threaded means to engage the conductor, the plug projecting from the adjacent end face of the handle and a guard secured to the projecting portion of the plug for movement with the plug, the guard formed of insulating material with a disc portion in spaced relation to the said end face of the handle and a projecting flange portion extending along the side wall of the handle in spaced relation thereto, the spaces formed by the guard and the handle intersecting and the said flange offering protection to the space formed by the guard disc and adjacent end face of the handle.

7. In a feeder tap comprising, a recessed handle formed of insulating material adapted to receive a fuse and a cable terminal in the recess to receive a cable conductor and means to prevent displacement of the terminal in one direction, and a metal member at the other end of the handle, the cable terminal and the metal member each provided with means adapted to receive an end of a fuse whereby the member and the terminal may be electrically connected, the combination with the said metal member of a guard formed of elastic insulating material, the guard having a disc portion and also a projecting flange surrounding an adjacent longitudinal portion of the handle in spaced relation to the said handle, and means at the free inner edge of the flange to engage the handle to prevent access of foreign matter to the space between the handle and flange.

8. In a feeder tap comprising a recessed handle formed of insulating material, and fuse holding means in said handle, the combination of a terminal in said handle for electrical connection to a source of power and comprising a cylindrical body having a longitudinally extending, transversely corrugated opening to receive an electrical conductor and an aperture communicating with said opening, and means comprising a member adjustably secured in said aperture to extend into said opening and cooperate with the body and to grip and hold the conductor in said opening in electrically conducting relation to the body.

9. In a feeder tap comprising a recessed handle formed of insulating material, and fuse holding

7

means in said handle, the combination of a terminal in said handle for electrical connection to a source of power and comprising a cylindrical body having a longitudinally extending, generally cylindrical, transversely corrugated opening to receive an electrical conductor and a screw-threaded aperture communicating with said opening, and screw-threaded means to be screwed into said aperture and to extend into said opening and cooperate with the body to grip and hold the conductor in said opening in electrically conducting relation to the body.

10. A feeder tap comprising an insulating casing, a fuse in the casing, a cable terminal in the casing and engaging one end of said fuse, an insulating bushing secured in the end of said casing and engageable with said terminal, a plug screw-threaded in the other end of the casing, engaging the other end of said fuse and having means to engage with a source of power, and an insulating guard attached to the outer end of said plug and having a cup-shaped recess into which the adjacent end of said casing projects, said recess having inner end and inner side walls spaced from the outer end surface and outer side surface of said casing.

11. A feeder tap comprising an insulating casing, a fuse in the casing, said fuse having threaded studs projecting axially from opposite ends thereof, a cable terminal in the casing and having an axial threaded opening to receive the adjacent stud of the fuse, an insulating bushing secured in the end of said casing and engageable with said terminal, a plug screw-threaded in the other end of the casing and having an axial threaded opening to receive the other said stud of said fuse and having means to engage with a source of power, and an insulating guard attached to the outer end of said plug and having a cup-shaped recess into which the adjacent end of said casing projects, said recess having inner end and inner side walls spaced from the outer end surface and outer side surface of said casing.

12. A feeder tap comprising an insulating casing including a tube and a liner therefor, an insulating bushing screw-threaded in one end of

8

the tube and engaging the adjacent end of the liner, a sleeve secured in the other end of the tube and engaging the end of the liner adjacent thereto, a fuse assembly in said casing and including a cable terminal engaging the said insulating bushing, a plug screw-threaded in said sleeve and a fuse connecting said terminal and plug, said plug having vent holes extending there-through, and an insulating guard attached to the outer end of said plug and having a cup-shaped recess into which the adjacent end of said casing projects, said recess having end and side walls spaced from the end surface and outer side surface of said casing and communicating with the interior of the casing through said vent holes.

13. A feeder tap comprising an insulating casing, a cable terminal in the casing, a sleeve screw-threaded in one end of the casing and a power source engaging plug screw-threaded in said sleeve, a fuse having frictional and screw-threaded engagement with said terminal and plug, and an insulating guard engaging the outer end of said plug, and spaced from the ends of said sleeve and casing, said guard having a cup-shaped recess to receive the adjacent end of said casing and having an inner cylindrical side wall spaced from the outer side of the casing.

EDWARD P. SMITH.

References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
1,594,925	Chandler	Aug. 3, 1926
1,654,475	Wyman	Dec. 27, 1927
1,679,142	Wyman	July 31, 1928
1,822,883	Chandler	Sept. 15, 1931
1,929,920	Fullman	Oct. 10, 1933
2,037,630	Hudson	Apr. 14, 1936
2,068,152	Rowe	Jan. 19, 1937
2,083,923	Rowe	June 15, 1937
2,288,680	Chandler	July 7, 1942
2,313,333	Center	Mar. 9, 1943
2,419,152	Mosebach	Apr. 15, 1947
2,436,712	Burrell	Feb. 24, 1948
2,625,579	Frazer	Jan. 13, 1953