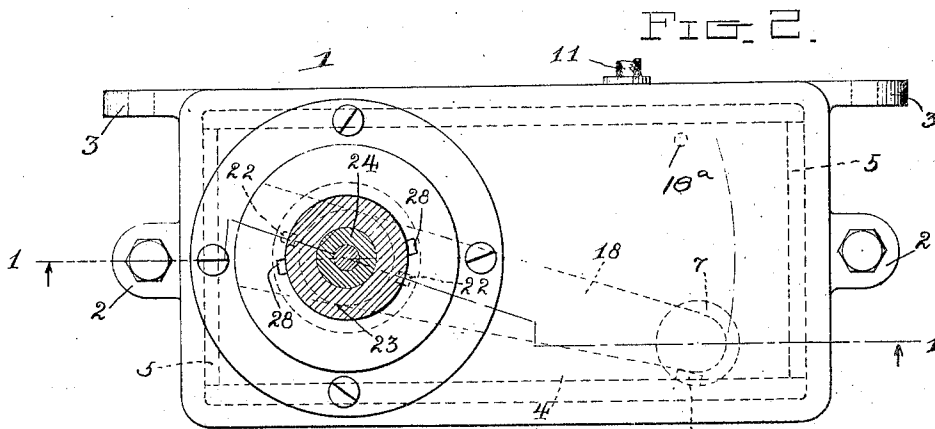
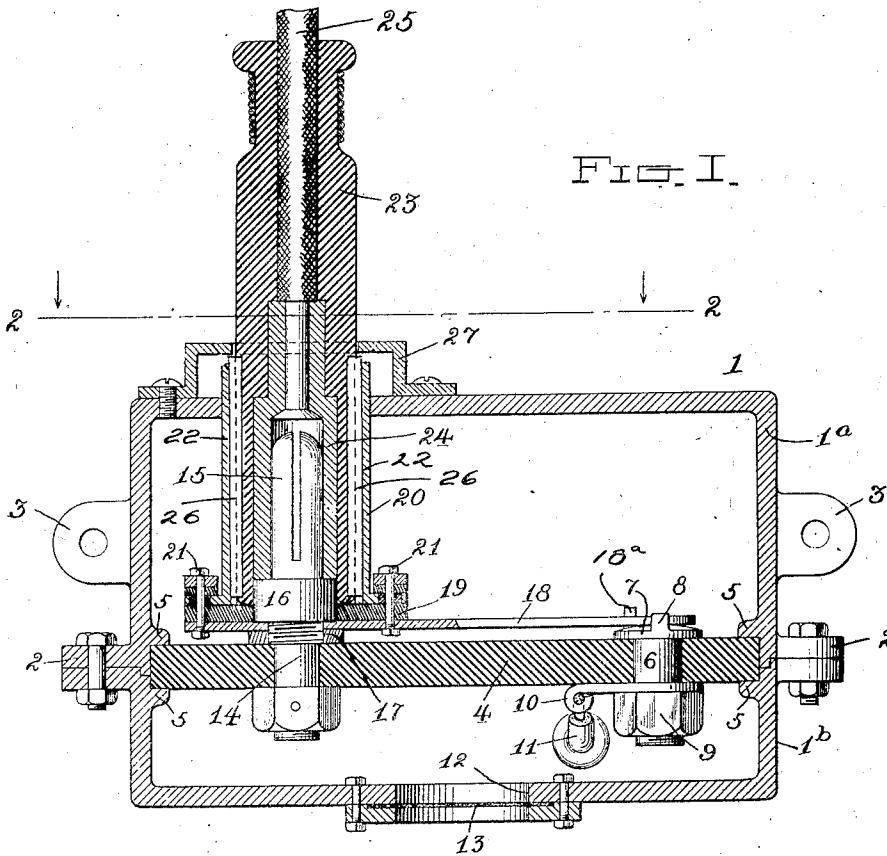


D. T. FISHER.
 CONNECTING DEVICE FOR ELECTRIC CONDUCTORS.
 APPLICATION FILED FEB. 24, 1910.

1,046,759.

Patented Dec. 10, 1912.



Witnesses

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DUDLEY T. FISHER, OF COLUMBUS, OHIO, ASSIGNOR TO THE JEFFREY MANUFACTURING COMPANY, A CORPORATION OF OHIO.

CONNECTING DEVICE FOR ELECTRIC CONDUCTORS.

1,046,759.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed February 24, 1910. Serial No. 545,744.

To all whom it may concern:

Be it known that I, DUDLEY T. FISHER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Connecting Devices for Electric Conductors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in connecting devices for electric conductors.

In many mines, especially in coal mines where electricity is commonly used, explosive gases collect in places where they may be readily fired by the sparks which are frequently caused by electrical apparatus.

The object of my invention is to provide a device by means of which a movable or temporary conductor may be connected to or disconnected from a fixed conductor without the possibility of any sparks which may be formed being communicated to the external atmosphere.

One embodiment of my invention is shown in the accompanying drawings, but my invention will be understood to include such modifications within the scope of the appended claims as may suggest themselves to those skilled in the art.

In the drawings: Figure 1 is a cross sectional view taken along the line 1—1 of Fig. 2. Fig. 2 is a cross sectional plan view taken along the line 2—2 of Fig. 1.

Referring to the drawings, 1 represents a casing consisting of two parts 1^a and 1^b which are connected by bolts passing through the ears 2—2 on the two sections. Lugs 3, 3 are preferably provided, by means of which the casing may be secured to the frame of a motor or other machine.

4 is a plate or slab formed preferably of insulating material, such as marble or slate. This plate is preferably located in the plane of the joint between the two casing sections 1^a and 1^b and is engaged by the flanges 5, 5, which serve to hold it in place. The plate 4 is preferably somewhat narrower than the casing, so that a certain clearance space is provided between its edges and the sides of the casing.

6 represents a conductor terminal bolt which is provided at its upper end with a rounded head 7 at one side of which is a vertical stop 8. The lower end of the bolt 6 carries

a nut 9 which engages a washer 10, to which is connected a conductor 11. This conductor extends outward through a suitable bushing in the wall of the casing.

In the lower wall of the casing is an aperture 12 which is covered by a wire gauze 13. The purpose of this gauze covered structure will be more fully set forth hereinafter.

14 is a terminal stud rotatably mounted in the plate 4. The upper end of this stud is split at 15 to adapt it for engagement with the conductor plug to be hereinafter described. Below the split portion is an enlargement or collar 16. Below the collar 16 and clamped against it, by means of a nut 17, is a connecting conductor arm or blade 18. This arm is adapted to be swung into or out of engagement with the head 7 of the bolt 6. Its motion in one direction is limited by the stop 8 and in the other direction by a pin 18^a mounted on the plate 4. Above the blade 18 and separated from it by means of an insulating washer 19 is a cylinder 20 concentric with the stud 14. The cylinder 20 and the blade 18 are secured together by means of suitable insulated bolts 21, 21. A suitable aperture is provided in the upper wall of the casing 1 through which the cylinder 20 extends with a gas and flame proof fit. The cylinder 20 is provided with grooves or keyways 22 which extend preferably throughout its entire length. There are preferably two of these keyways, as shown in the drawings, which are diametrically opposite to each other. The purpose of these keyways will be fully set forth hereinafter.

23 is a terminal plug provided with a socket 24 which is electrically connected to the conductor 25. The socket 24 is adapted to engage the end 15 of the stud 14, and the outer diameter of the plug is such that it will enter the cylinder 20 with a good working fit. Keys 26, 26 are provided on the plug 23 and are adapted to enter the keyways 22 of the cylinder 20. The engagement of the keys with the keyways connects the plug 23 with the cylinder 20 and the blade 18, so that the plug may serve as a handle by means of which the blade may be operated.

27 is a cap secured to the upper wall of the casing and provided with an aperture through which the plug 23 may be inserted. The edges of this aperture have notches 28, 28 through which the keys 26, 26 may pass.

The notches 28, 28 are so located that they will be in alinement with the keyways 22, 22 only when the blade 18 is swung to a position in which it is disengaged from the head

7. It is therefore impossible to insert the plug when the blade 18 and the head 7 are in engagement; and furthermore on account of the engagement between the upper ends of the keys 26 and the cap 27, it is impossible to remove the plug when the blade 18 and the head 7 are in engagement. It will be noted that it is entirely impossible to operate the arm 18 when the plug 23 is not in full engagement with the stud 14.

I am aware that certain devices have been proposed in which the removable plug is locked in position when the switch contacts are in their closed position. In some of these devices the plug has been inserted into the same chamber in which are located the switch contacts. Separating of the contacts almost simultaneously unlocks the plug which may therefore be blown outward by an explosion within the casing, caused by an arc from the contacts as they are separated. Should this occur, the burning gases might pass outward through the plug aperture and fire the external atmosphere. In the device embodying my invention the conductor plug is inserted into a separate chamber from that in which the contacts are located and therefore any explosion in the contact chamber can have no effect on the plug. The gauze covered aperture 12 is provided so that the pressure within the casing due to an explosion may be relieved without the possibility of the communication of flame to the external atmosphere. If preferred the gauze covered aperture 12 may be omitted and reliance placed entirely upon the gas proof casing to completely exclude explosive gases. As a practical matter, however, it has been found that it is not always feasible to construct a casing which will be absolutely gas tight. If gas should work into an approximately tight casing an explosion might occur which would result in the bursting of the casing and the destruction of the whole device. It is for this reason that I prefer to have the protected aperture which I have described. As an alternate means for protecting the contacts, aperture 12 may be omitted and the casing filled with oil to a level above that of the blade 18. In this way the formation of arcs would be entirely prevented.

It will be noted that the plug 23 entirely closes the opening in the outer end of the cylinder 20. The cylinder is thus closed before the socket 24 engages the stud 14 and remains closed until the socket is disengaged from the stud. Therefore, if for any possible reason, such as a breakage of the cap 27, the plug 23 were inserted or removed with current flowing, then this current

would be broken in the flame proof chamber formed within the cylinder 20 and any explosive gases which might be present could not be ignited.

What I claim is—

1. In a connector for electric conductors, the combination of a flame proof casing having an aperture, a cylinder rotatable in the aperture with a flame proof fit, the inner end of the cylinder being closed and the outer end being open, the said cylinder being provided with a plurality of grooves, a connecting conductor member within the casing and fastened to the cylinder, the said member having a terminal within the cylinder, a contact device within the casing adapted to be engaged by the connecting member, a conductor plug adapted to enter the cylinder and engage the terminal therein, projections on the plug adapted to enter the grooves in the end of the cylinder whereby the plug may rotate the cylinder, and a cap provided with notches adapted to align with the grooves of the cylinder when the cylinder is in position with the connecting member out of engagement with the contact device, said cap serving to prevent the removal or insertion of the plug when the cylinder is in any other position, substantially as set forth.

2. In a connector for electric conductors, the combination of a flame proof casing having an aperture, a cylinder rotatable in the aperture with a flame proof fit, the inner end of the said cylinder being closed and the outer end being open, a connecting conductor member within the casing and fastened to the cylinder, the said member having a terminal within the cylinder, a contact device within the casing adapted to be engaged by the connecting member, a conductor plug adapted to enter the cylinder and engage the terminal therein, slidably engaging means whereby the plug may rotate the cylinder, and a second means adapted to engage with the plug to prevent its insertion or removal when the connecting member is in engagement with the contact device, and also to prevent the rotation of the cylinder by the plug when the plug is not fully inserted, substantially as set forth.

3. In a connector for electric conductors, the combination of a flame proof casing, circuit making and breaking means within the casing, an inclosure having an aperture, a conductor terminal in said inclosure and connected to the circuit making and breaking means, a conductor plug adapted to be telescopically inserted into or removed from the inclosure through the aperture to close the said aperture in a flame proof manner, and to engage the terminal after the aperture is closed or to be disengaged therefrom before the aperture is opened, and means for preventing the insertion or removal of the

plug when the contact making and breaking means is in closed position, substantially as set forth.

4. In a connector for electric conductors, 5 the combination of a flame proof casing provided with an aperture in one wall, a plate within the casing and parallel to the apertured wall, a conductor stud mounted on the plate in alinement with the aperture, 10 a member mounted to oscillate about the stud and comprising a conductor arm electrically connected with the stud, a fixed contact element adapted to be engaged by the

arm when in one position, and a conductor plug adapted to enter the aperture of the 15 casing and engage the stud to establish electrical connection therewith and to engage the oscillatory member to control its movements, substantially as set forth.

In testimony whereof I affix my signature, 20 ture, in presence of two witnesses.

DUDLEY T. FISHER.

Witnesses:

W. R. YOUMANS,
N. D. LEVIN.