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J. H. SIMPSON

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CABLE ENTRANCE FOR SEALED ENCLOSURES

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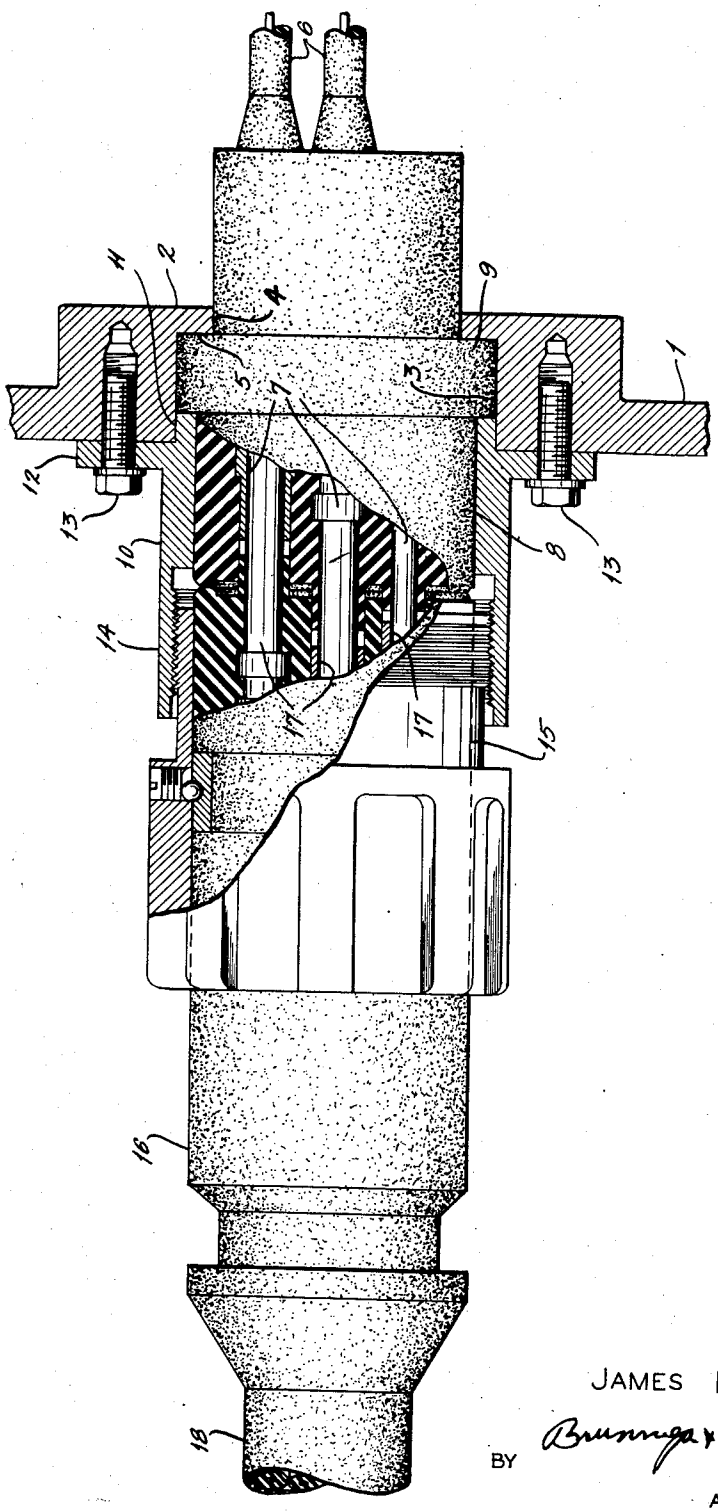

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CABLE ENTRANCE FOR SEALED ENCLOSURES

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1 Claim. (Cl. 174—77)

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This invention pertains to means for leading an electric power circuit through the wall of a sealed enclosure. In places such as mines where fumes or gases may cause danger of fire or explosion which may be set off by an electric spark, electric power apparatus is usually housed in explosion-proof enclosures and the conductors leading to or from such apparatus must be passed through the wall of such enclosure by way of an opening which may be sealed against leakage of such fumes or gases. Such apparatus with its enclosure is often made portable and the power connections thereto made by flexible cable. In such a case continued use usually subjects the cable to rough handling and consequent deterioration so that it must be replaced or repaired at intervals.

One of the objects of this invention is to provide means for carrying an electric circuit through the wall of such a sealed enclosure such that the outside cable may be replaced without breaking the seal.

Another object is to provide such means providing within the enclosure a continuous, low-resistance circuit to the apparatus therein.

Further objects will appear from the following description, taken in connection with the accompanying drawing, in which will be set forth an illustrative embodiment of this invention. It is understood, however, that this invention is susceptible of various embodiments, within the scope of the appended claim, without departing from the principle or spirit of the invention.

In accordance with this invention, generally stated, a conductor cable leading from the apparatus within the enclosure to the entrance opening in the wall thereof is provided with a plug-socket connector permanently formed on the cable. Sealing means on said connector is then engaged with complementary means on the enclosure wall so as to seal the connector in said opening in such manner as to be engageable with a complementary plug-socket connector on a power-supply cable outside the enclosure. The conductor cable may, of course, consist of one or more conductors according to the kind of circuit involved. The term "plug-socket" connector is used herein to designate such a connector having either plug contacts or socket contacts, and many such connectors are provided with both.

The accompanying drawing illustrates one embodiment of this invention, the view showing a section of part of the wall of the sealed enclosure, the section being taken through the entrance opening therein, with a plug-socket connector

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mounted in the opening in accordance with this invention. The complementary connector on the outside supply cable is shown in engagement with the connector on the enclosure, parts of both connectors being shown in section.

In the drawing 1 designates the wall of the sealed enclosure. This wall is provided with an interior boss 2 surrounding the entrance opening, which latter has an enlarged portion 3 and a reduced portion 4 formed by a flange 5 on the interior side (right hand side in the drawing) of the boss 2. The conductor cable leading from the apparatus within the enclosure may comprise one or more conductors 6. These conductors may be connected at their inner ends (not shown) to the apparatus to be supplied with power by means of connections which are rendered secure by soldering or otherwise. This arrangement provides interior connections of a permanent nature such that there is little likelihood of trouble which would necessitate unsealing the enclosure to make repairs. A low-resistance circuit within the enclosure is also provided thereby.

The conductors 6 are provided at their outer ends with plug or socket contacts 7. The contacts 7 and the adjacent ends of the conductors 6 are assembled to form a plug-socket connector. In the embodiment shown they are embedded in a molded body 8, of resilient material such as rubber, said body being provided with a flange 9. This connector is mounted in the enclosure wall by seating the flange 9 in the recess 3 and against the flange 5, the inner portion of the body 8 passing through the opening 4.

In order to secure the connector in its mounting in the enclosure wall a ring or collar 10 is provided having an extension 11 fitting within the recess 3 to engage the flange 9, and a radial flange 12 which may be clamped to the enclosure wall by suitable means such as screws 13. The screws 13 also serve to compress the flange 9 between the extension 11 and the flange 5 so as to seal the opening in the wall 1. The collar 10 may be provided with a coupling member such as a threaded sleeve 14 adapted for engagement with a complementary coupling member 15 on a complementary plug-socket connector 16 having plug or socket contacts 17 engageable with the contacts 7. The contacts 17 are connected to conductors (not shown) in a cable 18 by which the electric power supply is brought to the enclosure. The coupling member 15 is rotatable on the connector 16 for engaging and disengaging its threads with those of the member 14.

It will be seen, therefore, that this invention

provides a simple arrangement whereby if the cable 18 should become damaged it may be removed and repaired or replaced without disturbing the enclosure seal or the interior circuits.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

A device of the character described, comprising a sealed enclosure, said sealed enclosure having an entrance opening in a wall thereof; a conductor cable provided with a plug-socket connector body having a sealing flange therearound; a boss defining a restricted inside portion of the entrance opening in said wall and providing an inwardly radially extending shoulder engaged by an outwardly radially extending inside face of said sealing flange; and a collar on said connector body, said collar having an extension at one end proportioned radially to fit slideably within the unrestricted portion of said entrance opening and axially to engage and press against an outwardly

radially extending outside face of said sealing flange, a radially extending flange clamped to the outside of said wall, and a threaded section at its end opposite said extension adapted for connection to a complementary threaded plug-socket connector.

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