Aug. 19, 1958 W. G. WAGNECZ 2,848,572

ELECTRICAL DISCONNECT PLUG

Filed March 6, 1957

FIG. 1

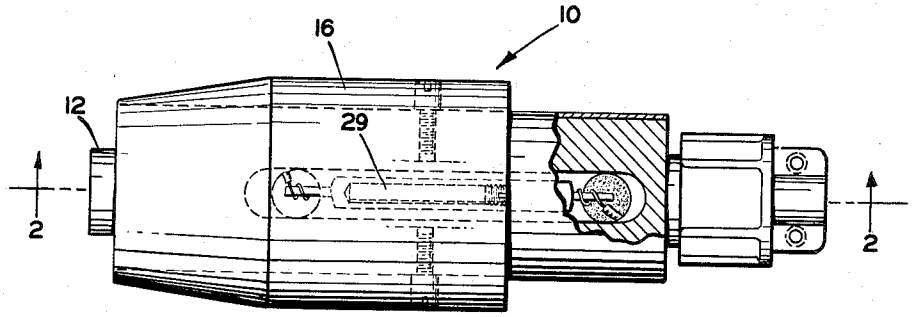


FIG. 2

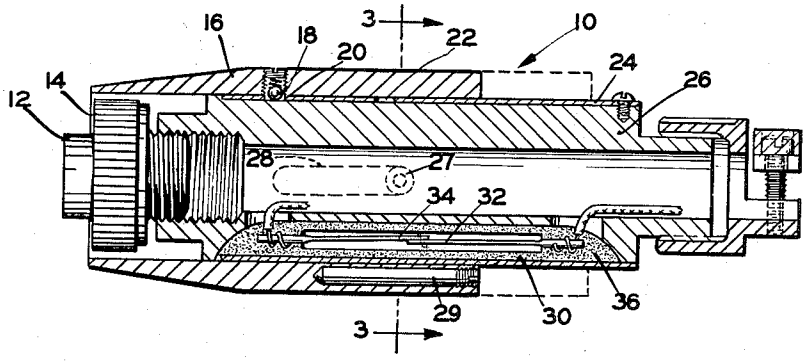


FIG. 4

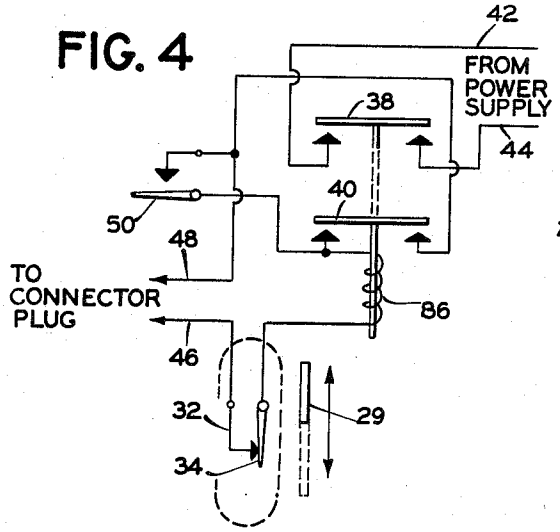
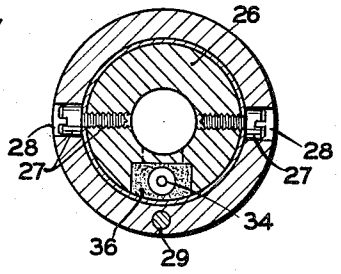


FIG. 3



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ELECTRICAL DISCONNECT PLUG

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3 Claims. (Cl. 200—50)

This invention relates to an explosion-proof electrical disconnect plug and circuit control means particularly designed for use in a hazardous area in which it is essential that the electrical power be removed from the disconnect plug contacts before separation of the plug.

An object of the invention is to provide a novel electrical plug control arrangement in which there is provided novel means to safely disconnect a power cable from electrically powered equipment in an explosive atmosphere by automatically opening the power circuit as an incident prior to either coupling or uncoupling the plug relative to the power cable.

Another object of the invention is to provide a novel electrical power connector including a mating part and a plug with a threaded collar or ring and an outer shell carried by the plug which must be moved back so as to expose a holding nut for the mating part of the connector, together with novel electrical control means carried by the plug, and means to operate the control means incident to movement of the outer shell back to expose the holding nut to effectively disconnect the electrical power from the power connector before the mating part may be either connected or disconnected relative to the plug.

Another object of the invention is to provide a novel electrical power connector of the type described in which the aforedescribed outer shell carries a magnetic means to operate the electrical control means carried by the plug.

A further object of the invention is to provide a novel electrical power connector device including a plug having a mating part and a threaded collar or ring and an outer shell which must be moved back so as to expose a holding nut of the connector before the mating part may be either removed from or attached to the plug and in which the outer shell carries a magnet to actuate an electrical switch device arranged so as to control the connection of the electrical power to the connector device.

These and other objects and features of the invention are pointed out in the following description in terms of the embodiment thereof which is shown in the accompanying drawing. It is to be understood, however, that the drawing is for the purpose of illustration only and is not defined as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings:

Figure 1 is a side view of an electrical disconnect plug embodying the invention and with certain parts broken away and with other parts shown in dotted lines to illustrate the structure of the magnetically operated control switch.

Figure 2 is a sectional view of Figure 1 taken along the lines 2—2 and looking in the direction of the arrows.

Figure 3 is a sectional view of Figure 2 taken along the lines 3—3 and looking in the direction of the arrows.

Figure 4 is a diagrammatic view illustrating the control circuitry for the disconnect plug.

Referring to the drawings, there is indicated generally by the numeral 10 an explosion-proof plug of the subject invention including an AN-type plug 12 with electrical contact means of conventional type, together with a threaded collar and holding nut 14 and an outer shell 16 which may be manually moved back to the position indicated by the dotted lines in Figure 2, so as to expose the holding nut 14 of the AN-type connector for appropriate adjustment so that a suitable mating part may be removed from or attached to the plug 12. A spring-pressed detent ball 18 in the shell 16 is arranged to cooperate in openings 20 and 22 in a sleeve 24 attached to the body portion 26 of the plug so as to hold the shell 16 in one or the other of the adjusted positions. Guide screws 27 in the body portion 26 project into suitable slots 28 in the sleeve 16, as indicated by dotted lines in Figures 2 and 3, so as to prevent rotation of the shell 16 from the position shown.

The shell 16 carries a permanent magnet 29 arranged to cooperate with a switch 30 mounted in the body portion 26 of the plug and including a pair of reed-like members 32 and 34 of a magnetic soft iron-nickel alloy hermetically sealed in a glass enclosure 36 and which switch may be of a type sold under the name "Glaswitch" by the Revere Corporation of America.

Upon manual movement of the outer shell 16 to the position indicated by the dotted lines in Figure 2, the magnet 29 causes the reeds 32 and 34 to open a control circuit, shown in Figure 4, for an electromagnetic winding 86 causing, in turn, relay switch members 38 and 40 to open the main power supply lines 42 and 44 leading to input lines 46 and 48 of the connector plug 10. Upon a return manual movement of the outer shell 16 to the position shown in Figure 2, the magnet 29 releases the reeds 32 and 34 so that reed 32 may once again return to a position closing switch reed 34.

A manually operable switch 50 may also be operated to open or close the control circuit for the electromagnetic winding 36 so as to provide an independent control for the relay switch members 38 and 40 when the outer shell 16 has been adjusted to the position of Figure 2 at which the reed switches 32 and 34 are closed.

From the foregoing, it will be seen that before the mating part may be removed from or attached to the plug, the outer shell 16 must be moved back so as to expose the holding nut 14 of the AN connector. Moreover, upon the shell 16 being adjusted so as to expose the holding nut 14, the magnetically operated switch 30 causes a suitable circuit controlling energization of the relay winding 36 in an explosion-proof housing to disconnect the main power supply line from connector 10. Thus, the power line is connected to the connector 10 by the relay 36—40 only upon the shell 16 being returned to its normal position after the connection or disconnection of the mating part from the plug 12.

Although but one embodiment of the invention has been illustrated, various changes can be made in the design and arrangement of the parts without departing from the spirit and scope of the invention as the same will now be understood by those skilled in the art.

What is claimed is:

1. An electrical plug having a cylindrical body, electrical contact means in said body, a sleeve slidably mounted on said body and movable from a position covering said contact means to another position exposing said contact means for connection, an electrical switch means in the body to control an electrical relay for supplying electrical power to the plug, and magnetic means carried by the sleeve for operating the switch means and thereby the electrical relay to disconnect the power from the electrical plug upon movement of the sleeve to a position exposing said contact means.

2. The combination defined by claim 1 in which said

switch means includes a pair of reed-like switch members normally biased to a closed position upon adjustment of the slidable sleeve to a position covering said contact means, and said magnetic means including a permanent bar magnet carried by the sleeve and effective upon adjustment of the sleeve to a position exposing said contact means to bias one of said reed-like switch members out of contacting relation with the other of said members to effect operation of the electrical power control relay.

3. An electrical plug having a cylindrical body, electrical contact means in said body, an adjustable fastening member for securing a suitable mating part to said contact means, a sleeve slidably mounted on said body and movable from a position covering said member to a position exposing said fastening member for manual adjustment so as to permit connection and disconnection of the mating part relative to said contact means, switch means carried in said body and including a pair of reed-like magnetically operated switch members normally biased to a closed position, and a permanent bar magnet carried by the sleeve and effective upon adjustment of the sleeve to a position exposing said contact means to bias one of said reed-like switch members out of contacting relation with the other of said members to effect a control function.

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