Feb. 22, 1966 J. S. LOUDEN ETAL 3,236,974

COMBINED BINDING POST AND FUSE HOLDER

Filed Nov. 13, 1962

Fig. 1

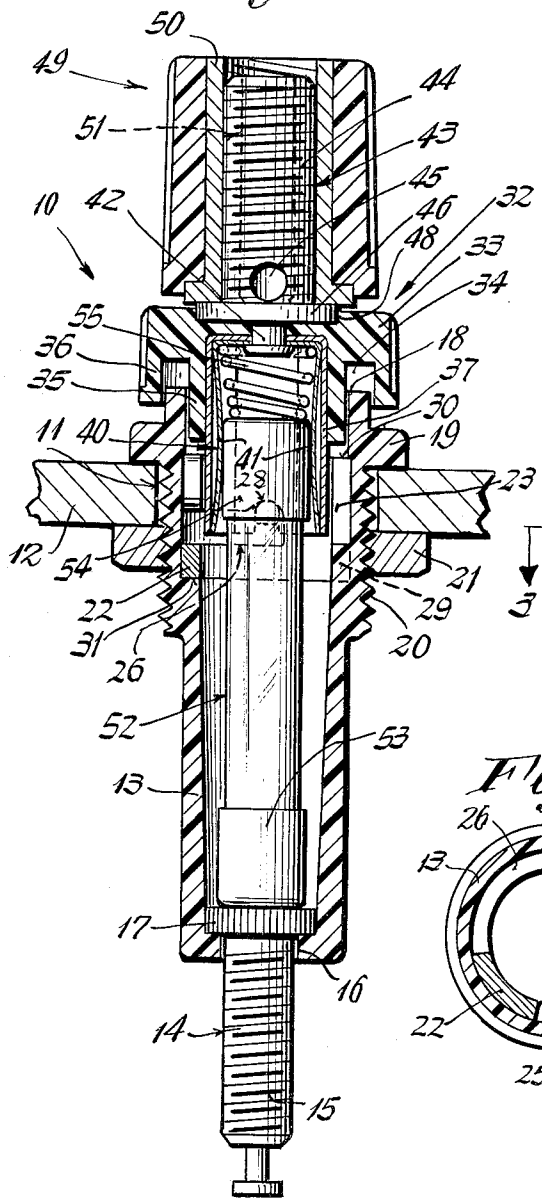



Fig. 2

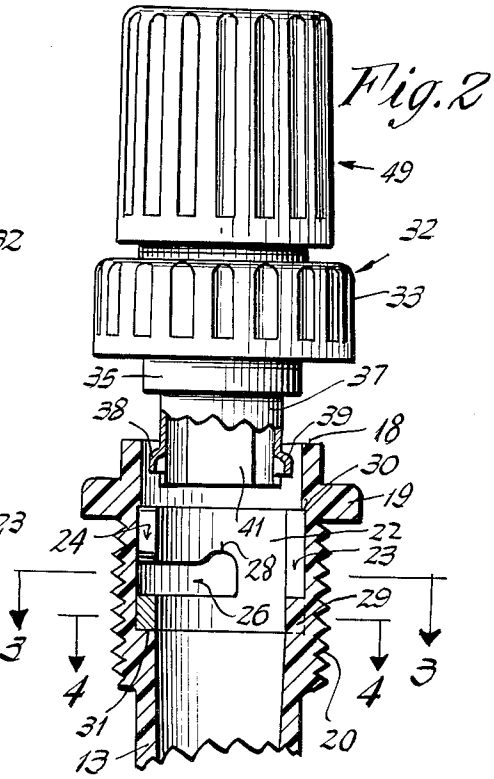



Fig. 3

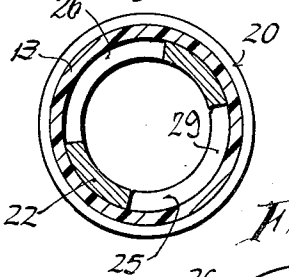



Fig. 4

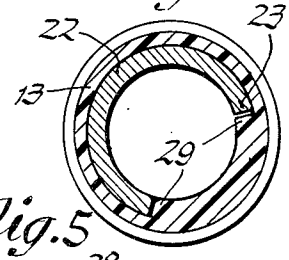
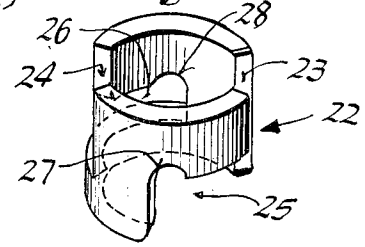



Fig. 5




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# COMBINED BINDING POST AND FUSE HOLDER

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The present invention relates to a holder for containing an electrical fuse and more particularly to such a holder which may be clamped in a panel to have electrical connections made thereto from both sides of the panel and thus function as both a binding post and a fuse holder.

In electrical equipment it is common practice to mount the electrical components within a container and to have a panel on the container wherein indicating devices and/or operable equipment may be mounted. In addition there may be mounted on the panel a fuse holder which provides for electrical connection within the container on the interior side of the panel but which is accessible from the exterior side of the panel so that a fuse may be changed and/or examined without opening the container, removing the holder or moving the panel. While these heretofore fuse holders have been found satisfactory as such, there is also generally connected to the electrical equipment input and output connections which require that terminals or other connecting devices be also mounted on the panel for exterior accessibility. When a fuse is to be replaced, it has thus required both a separate fuse holder and a separate terminal in order to achieve this result in the circuits of these connections.

It is accordingly an object of the present invention to provide a combined binding post and fuse holder which may be mounted in a panel and which provides for a connection on the exterior side of the panel and a connection on the interior side of the panel with the fuse being interposed in series circuit between the two connections.

Another object of the present invention is to enable connections to be made to the combined binding post and fuse holder without disturbing the fuse in the fuse holder and also to enable the fuse to be removed and/or replaced from the fuse holder from the exterior of the panel with a minimum disturbance, if any, of the connections.

A further object of the present invention is to provide a combined binding post and fuse holder that accomplishes the above objects and which is simple in construction, reliable in use and relatively economical to manufacture.

In carrying out the present invention, there is provided a combined binding post and fuse holder that includes a substantially cylindrical hollow body in which a fuse of the cartridge type is positioned. The body is positioned within an aperture of a panel of electrical equipment and is clamped to the adjacent edges of the panel to secure it thereto. The body is provided with a connection at one end thereof for electrical engagement with a lead from the interior side of the panel while the other end of the body member is positioned on the exterior side of the panel for electrical connection thereto from the exterior side of the body. Releasably secured on the exterior end of the body member is a cap which contains a fuse engaging member and also which is provided with a hollow and radially bored stud and a clamping nut so that many types of connections may be made to the stud. By such a construction an exterior connection may be easily made to the stud which is in electrical engagement with the fuse engaging member of the cap and yet the fuse may be removed by removal of the cap with little, if any, disturbance of the connection. Moreover, by the ease in which one of the many types of connections is made to the stud, that even if there is a disturbance of the connection, it is



easily reestablished. The exterior parts of the fuse holder are preferably molded from rigid, plastic material, such as nylon which is also electrically insulated and the exposed current carrying parts of the fuse holder are thus substantially prevented from being accidentally engaged.

Other features and advantages will hereinafter appear.

In the drawing:

FIGURE 1 is an axial section of the combined binding post and fuse holder of the present invention and shown with a cartridge type fuse positioned therein.

FIG. 2 is an elevation, partly in section, with the cap somewhat removed of the upper portion of the fuse holder.

FIG. 3 is an axial section taken along the line 3—3 of FIG. 2.

FIG. 4 is an axial section taken along the line 4—4 of FIG. 2.

FIG. 5 is a perspective view of a locking ring utilized in the combined binding post and fuse holder of the present invention.

Referring to the drawing, the combined binding post and fuse holder is generally indicated by the reference numeral **10** and is shown mounted in an aperture **11** formed in a panel **12** which may be a wall of a container of electrical equipment. The fuse holder includes a body member **13** which is somewhat cylindrical, hollow and at its open lower (or interior) end is provided with a connector **14** having an exterior threaded portion **15** extending through an aperture **16** formed in the end of the body member **13** and a head portion **17** positioned within the body member **13**. The head **17** is preferably provided with peripheral grooves such that when forced within the body member **13** it becomes secured thereto by displacement of material forming the inner surface of the body member though, if desired, the same may be molded into the body member **13** to secure it in position when the body member is molded from plastic material.

The other (or exterior) end **18** of the body member **13** is also open and adjacent thereto is provided with an external flange **19** while contiguous therewith on the exterior of the body member is formed a threaded portion **20**. A backing member, specifically a nut **21**, is adapted to be threadably engaged with the threaded portion **20** and by relative rotation between the nut and the body member **13**, the portion of the panel adjacent the aperture **11** is clamped between the external flange **19** and the nut **21** to thereby secure the body member to the panel.

Positioned within the body member is a locking ring **22** having opposed axially aligned openings **23** and **24** communicating with opposed arcuate slots **25** and **26** each terminating in an arcuate cutout **27** and **28** respectively. The axially aligned opening **23** of the locking ring extends for the length of the locking ring and is used as a groove for cooperation with a tongue **29** formed on the interior of the body member to prevent rotational movement of the locking ring with respect to the body member. For preventing axial movement of the locking ring, there is provided an upper flange **30** and a lower flange **31** on the inner surface of the body member with the locking ring being forced into the body member, with the tongue **29** aligning with the opening **23**, until it reaches the position shown in FIGS. 1 and 2 wherein it snaps into the groove between the flanges **30** and **31**.

The locking ring is employed to releasably secure to the exterior end of the body member a cap, generally indicated by the reference numeral **32**. The cap includes a knob **33**, preferably formed of molded insulating material, such as nylon, and formed to have an annular groove **34** formed between an inner depending portion **35** and an outer depending portion **36** with the size of the annular groove being such as to accommodate the portion of the body member that extends above the external flange **19**. Secured within the inner depending portion **36** is a cup **37**

formed of metallic material and provided with outwardly extending lockings keys 38 and 39 that cooperate with the openings 23 and 24, the arcuate slots 25 and 26 and arcuate cutouts 27 and 28 to form a releasable securing means of the twist lock type. Within the cup 37 is a spring contact formed of electrically conducting material and of generally U-shaped construction having inwardly bowed sides 41. The cup 37 and contact 40 are secured to an axial projection 42 formed as one end of a stud 43, the stud further being provided with a threaded portion 44, an axial wire clamping aperture 45 and a peripheral flange 46. The projection 42 extends through the knob 33 and through openings formed in the cup 37 and contact 40 and by spinning over or otherwise misplacing the metal of the projection the contact and cup are firmly secured to the stud 43 in addition to preventing withdrawal of the projection from the knob 33. Preferably, the stud 43 is either molded or press fitted into an annular opening 48 formed in the top portion of the cap 33 so as to be secured thereto and may have ridges formed on its periphery preventing relative rotation between it and the knob.

For securing a connection to the stud 43, there is provided a thumb nut 49 having an exterior covering of electrically insulated material such as nylon over a metallic lining 50 that is interiorly threaded and formed of metallic material. Moreover, it is preferred that an axial recess 51 be formed in the stud to permit further kinds of connections thereto, as by a banana plug type connection.

In use it will be appreciated that with the cap 32 separated from the body member 13, that a fuse 52 of the cartridge type may be inserted into the body member to have one conducting end 53 abut the flat surface of the head 17 and thereby be in electrical engagement with the connector 14. The other conducting end 54 of the fuse 52 is positioned within the cup 37 and engaged by the bowed sides 41 of the contact 40. In addition, a spring 55 abuts the end 54 and the contact 40 and serves to resiliently urge the end 53 against the head 17 thereby maintaining the electrical contact therebetween and restraining movement of the fuse within the holder. As shown, the spring 55 has downwardly decreasing diameter which in cooperation with the bowed sides 41 serves to retain the spring within the contact 40 when the cap is removed from the body member.

With the fuse positioned in the body member 13 and the other end 54 of the fuse positioned within the cup, the cap 32 is axially moved within the body member to have the locking keys 38 and 39 project into the openings 23 and 24 until they move inward sufficiently so that a rotative movement of the knob 33 causes the locking keys to traverse the arcuate openings 25 and 26 until they reach the end thereof wherein the spring 55 urges the keys into the arcuate slots 28 and 29 to thus releasably secure the cap to the body member and maintain electrical engagement with the fuse.

It will be appreciated that with the above-noted construction that a connection may be easily made to the end 53 of the fuse 52 by a connection to the threaded connector 14 as by nuts on the threaded portion 15 (not shown). The other or exterior side of the panel 12 may also have a connection easily made thereto by being clamped between the nut 43 and the peripheral flange 46 by relative rotation of the nut 49 or by means of a standard banana plug inserted into the axial recess 51 or by clamping a wire through the center aperture 45. Moreover, such a connection may be easily removed from the fuse holder without disturbing the fuse and in addition by operation of the knob 33 the cap may be removed from the body member without disturbing the external connection to the stud as such connections can withstand a quarter turn of the cup without becoming disturbed to thereby permit removal and/or replacement of the fuse 52.



It will accordingly be appreciated that there has been disclosed a fuse holder which is simple in construction, reliable in use, relatively economical to manufacture and composed of only a few parts. The fuse holder may be easily secured in an opening in a panel of a container of electrical equipment to have one portion thereof project from the interior side of the panel so that an interior connection may be made thereto while its other end projects from the exterior of the panel to enable an exterior connection thereto. The fuse is thus positioned in series circuit between an external connection and the internal connection and thus the fuse holder of the present invention accordingly not only provides for mounting a fuse in series circuit between the two connections but yet also serves to provide an electrical continuity between an external connection and an internal connection when the panel is employed as a wall of a container of an electrical equipment.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

We claim:

1. A fuse holder for mounting in a panel to have a connection thereto on both sides of the panel and adapted to contain an electrical fuse connected in series circuit with the two connections comprising an elongate, somewhat cylindrical body member formed of insulating material to have open ends and a fuse containing cavity, a connector secured at one open end to have a fuse contacting portion positioned within the cavity and a contact portion extending outwardly from the open end and to which a connection is adapted to be made on one side of the panel, an exterior flange formed on the body member adjacent the other end, a backing member, means for mounting the backing member on the exterior of the body member for axial movement whereby said body member may be positioned in a hole in a panel and clamped to the panel by the flange and backing member engaging the panel, slot locking means located within the body member adjacent the other end and forming a pair of arcuate slots with each slot having locking means; and a cap releasably secured on the other end, a cup secured to said cap and having a pair of oppositely disposed locking keys adapted to cooperate with the slot locking means to releasably lock the cap to the body, fuse engaging means mounted on the cap within the cup and projecting within the body member and adapted to electrically engage an end of a fuse positioned within the body member, a stud secured to the cap and having a portion extending inwardly and connected to the fuse engaging means and having a threaded portion extending outwardly beyond the cap and clamping means movably mounted on the threaded portion of the stud and adapted to secure another connection thereto on the other side of the panel with the fuse being placed in series circuit between the one and the other connections.

2. The invention as defined in claim 1 in which the fuse contacting portion constitutes a flat surface and there is a spring abutting the cap and adapted to urge the fuse against the surface, said spring also urging said keys into said locking means.


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