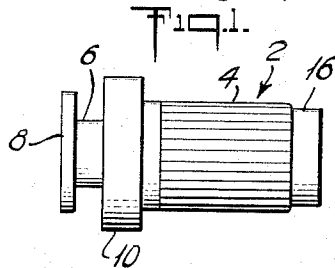
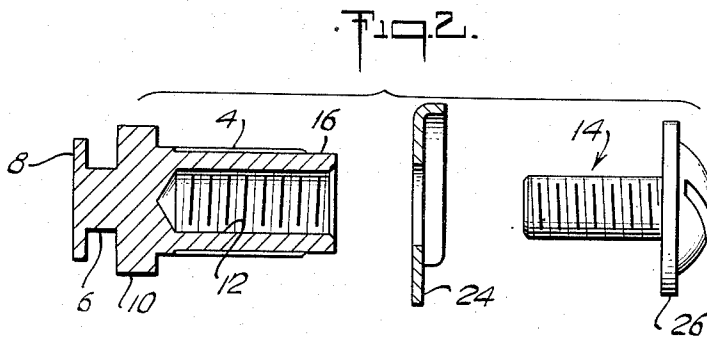
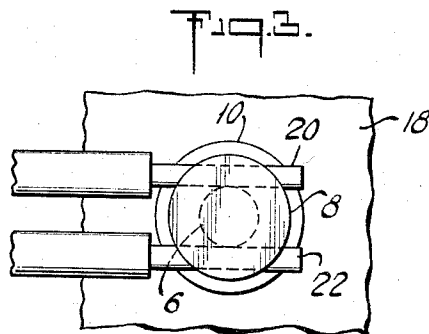
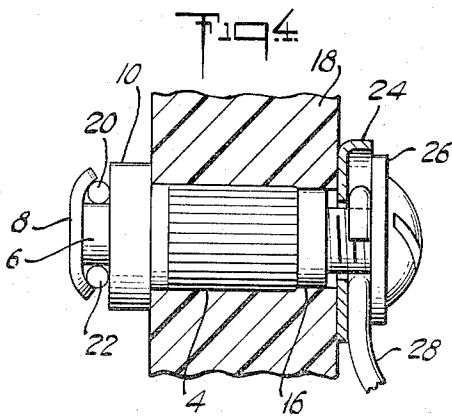
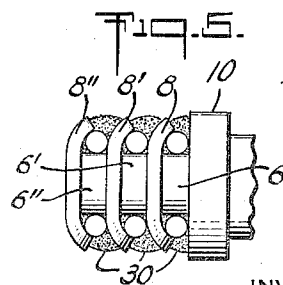


Nov. 29, 1960

I. MANDE ET AL
PANEL WIRING INSERT

2,962,691

Filed Aug. 27, 1957



INVENTORS
IRVING MANDE
DAVID H. CORDES
BY
Eyre, Mann & Lucas
ATTORNEYS

1

2,962,691

PANEL WIRING INSERT

Irving Mande, Westport, Conn., and David H. Cordes, Bronx, N.Y., assignors to Edwards Company Inc., a corporation of New York

Filed Aug. 27, 1957, Ser. No. 680,560

5 Claims. (Cl. 339—214)

The present invention relates to electrical connectors or the like and comprises a novel panel wiring insert.

The new wiring insert is provided at one end with wire engaging means that insure good mechanical and electrical connection to one or more wires without the use of solder so that initial checking of circuits may be readily effected. At its other end the insert is connected by suitable means to the circuit to be controlled. The compact and efficient construction of the new insert reduces space requirements and reduces also the labor and skill required for installation.

The new wiring insert includes a metallic body portion which may be cylindrical and which for best results has a length slightly less than the thickness of the insulating panel in which the insert is to be mounted. The wire engaging means are carried by the body portion at one end thereof and comprise one or more annular grooves dimensioned for reception of the wire or wires to be permanently connected to the insert. The spacing of the annular groove from the end of the body portion and the spacing between the grooves when more than one is provided, is such that one or more annular flanges are formed which are thin enough to be readily deformed or cupped by tapping with a hammer or the like. Thus when the end of a wire is inserted tangentially in a groove, cupping of the adjacent flange about the wire end causes the wire to be gripped sufficiently firmly to make good mechanical and electrical connection. Thus the necessity of looping a wire about a conventional binding post followed by attachment of a nut or the like is avoided by the new construction.

The panel wiring insert may be connected to a circuit or other electrical component that is to be controlled by any suitable connecting means and if desired the connecting means may also be used to assist in anchoring the insert in the panel. Any form of conventional connecting means may be employed and we have found it convenient to use a machine screw as a terminal which may be held in threaded engagement in an axial passage of the body of the insert.

For a better understanding of the invention and of the advantages thereof reference may be had to the accompanying drawings of which:

Fig. 1 is a side view of a single grooved wiring insert embodying the invention;

Fig. 2 is a longitudinal sectional view of the insert of Fig. 1 showing also a sectional view of elements attachable thereto;

Fig. 3 is an end view of the insert of Fig. 1 showing the insert mounted in a panel and wires connected thereto;

Fig. 4 is a side view of the insert of Fig. 3 the panel being shown in section; and

Fig. 5 is a fragmentary side view of a three-grooved insert shown with wires permanently connected thereto.

The particular insert illustrated in Figs. 1 and 2 comprises an element 2 of brass or the like having a generally

2

cylindrical body portion 4. The outer surface of the cylindrical body portion 4 is preferably knurled or otherwise roughened to insure good frictional fit when mounted in a panel. At one end of the element 2, that which extends to the rear of a wiring panel when the insert is installed, there is an annular groove 6 which is spaced from the adjacent end of the element by an annular flange 8. Between the groove 6 and the cylindrical body portion 4 is an enlarged section 10 which engages the rear of a panel and provides a stop when the insert is mounted. As shown in the drawings the axial length of the flange or anvil 10 is greater than the axial length of the deformable flange 8 so that the flange 10 is rigid and will not deform under the force of the blow required for deformation of flange 8 and will distribute such force over a relatively large surface area of the panel. In the preferred form of structure shown in the drawings the diameter of anvil 10 is larger than the diameter of the deformable flanges so that a tool having a hollow cylindrical end portion may be slipped over the deformable flange to bear against the relatively rigid anvil to drive the insert into a panel by impact without deforming the flange. The optimum thickness of the flange 8 depends upon the particular metal employed for the insert. In the case of brass, for example, and for small inserts, the thickness may be about $\frac{1}{32}$ " or less. The spacing of the flange from the section 10, that is the longitudinal length of the groove 6, depends upon the size of wire to be coupled to the insert. For No. 14 wire, for example, this dimension may be about $\frac{1}{16}$ ". In the preferred form of invention illustrated in the drawings the connecting means for element 2 may include an axial threaded passage 12 adapted to receive a machine screw or the like as indicated at 14 in Fig. 2. The cylindrical knurled body portion 4 terminates in a smooth cylindrical rim 16 of slightly lesser diameter which facilitates insertion of the knurled portion in the panel.

To mount the above described wiring insert in a wiring panel such as the insulating panel 18 of Figs. 3 and 4 the knurled portion 4 is inserted from the rear into a suitable hole in the panel and the surface of section 10 brought into engagement with the rear surface of the panel. The back of the panel is wired by removing insulation from the end of a wire 20 which is then inserted tangentially into the groove 6. A second wire 22 may likewise be inserted into the groove 6 as shown. The flange 8 is then tapped with a hammer or other suitable impact device to cause the metal of the flange to cup about the wire or wires and thereby hold them firmly in the groove. The front of the panel is wired by threading screw 14 into the hole 12 at the front of the panel. A washer 24 is preferably provided between the head 26 of the screw and the panel. An end of a wire 28 of the circuit to be controlled may then be looped around the screw between the washer and head and held in place by tightening of the screw in the hole 12.

Washer 24 is not essential and if desired electrical components to be mounted on the front of the panel can be connected directly to the front end of the insert by use of a suitable connecting means, such as a machine screw. The screw mechanically holds the component in position and provides the electrical connection between the insert and the component.

At this stage of the installation there is sufficient mechanical and electrical connection between wires 20 and 22 and the insert to permit checking of circuit connections. After checking solder may be applied about the wires in the groove 6 to insure permanent connection of the wires to the insert. Instead of manually tapping the flange 8 to cup it about the wires 20 and 22, a spring loaded or pneumatic tool may be em-

played for deformation of the flange. In such case solder is not necessary to insure a good electrical connection.

The particular wiring insert so far described can accommodate two wires as above indicated. Where more than two wires are to be attached to the same panel insert the element may be formed with a plurality of grooves separated by relatively thin flanges. Such an insert, provided with three grooves for reception of a total of six wires is shown in Fig. 5, the additional grooves being indicated at 6' and 6'' and the flanges 8' and 8'' being shown cupped about the wires in the adjacent grooves. In Fig. 5 the wires are represented as having been permanently connected to the insert by application of solder 30.

It will be apparent from the foregoing description that the new panel wiring insert has a number of advantages as compared to panel inserts heretofore in use. The means whereby wires may be gripped without looping speeds up installation and minimizes the possibility of poor electrical contact. The provision of the deformable flange or flanges insures firm mechanical connection and reduces the amount of manipulation required for attachment of wires. The means directly mounted on the front end of the insert for detachable connection to wires of the circuit to be controlled keeps to a minimum the number of parts involved in installation and conserves panel space.

The invention has now been described with respect to a particular and preferred construction of the new wiring insert. Obviously various changes could be made in the specific construction illustrated without departing from the spirit of the invention or the scope of the accompanying claims. For example, although the portion 4 of the insert which in use lies within a panel aperture has been illustrated as being cylindrical and as being knurled, smooth surfaced inserts and inserts of other cross sectional form could be employed. Also, although the threaded axial passage has been shown as terminating between the enlarged section 10 and the cylindrical portion 4, the passage could extend entirely through the insert or could terminate at any point within it. Other conventional connecting means may be used in place of screw 14 such as an axial stud, a tapered pin and corresponding receptacle, etc. Other variations will occur to those skilled in the art.

The following is claimed:

1. A panel wiring insert comprising a metallic element

having an integral annular anvil positioned on the body of the element at one end portion thereof, said element being adapted to be mounted in a panel with one side of the said anvil positioned against the surface of such panel, a separate integral annular flange positioned on the element in spaced relationship to the exposed second side of said anvil to form a groove between such flange and anvil, said groove being adapted to receive a conductor therein, the body of said flange being deformable under impact about a conductor positioned in said groove to form a mechanical and electrical connection between the conductor and element and said annular anvil being of greater axial length than the said deformable flange to provide the anvil with rigidity to withstand the force of the blow required for the deformation of the said flange without deformation of the anvil and to distribute the force of the blow over the surface of the panel, the second end portion of said element being provided with means for connecting the insert to an electrical circuit.

2. A structure as specified in claim 1 which includes at least one additional deformable integral annular flange positioned in spaced relationship on the body of the said end portion of the element to form a groove between said two annular flanges adapted to receive a conductor therein.

3. A structure as specified in claim 1 in which the second end portion of the insert is positioned within the confines of the panel so that it does not project out from the exposed surface thereof.

4. The panel wiring insert according to claim 1 wherein said element has a generally cylindrical portion adapted to fit within a panel aperture and wherein said last mentioned means comprises an axial threaded aperture in said element open at least at the end of the element remote from said annular groove.

5. The panel wiring insert according to claim 1 wherein said generally cylindrical portion is knurled.

References Cited in the file of this patent

UNITED STATES PATENTS

446,871	Lieb	Feb. 24, 1891
941,893	Steinberger	Nov. 30, 1909
1,848,759	Wiegand	Mar. 8, 1932

FOREIGN PATENTS

97,730	Switzerland	Feb. 16, 1923
690,252	Great Britain	Apr. 15, 1953

UNITED STATES PATENT OFFICE
CERTIFICATION OF CORRECTION

Patent No. 2,962,691

November 29, 1960

Irving Mande et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 37, for the claim reference numeral
"1" read -- 4 --.

Signed and sealed this 30th day of May 1961.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

DAVID L. LADD

Commissioner of Patents