Feb. 25, 1958 G. H. MEYER 2,825,041

ELECTRIC TERMINAL ASSEMBLY

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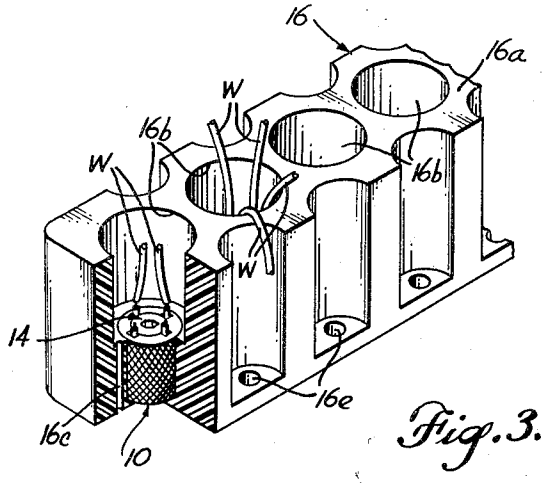


Fig. 3.

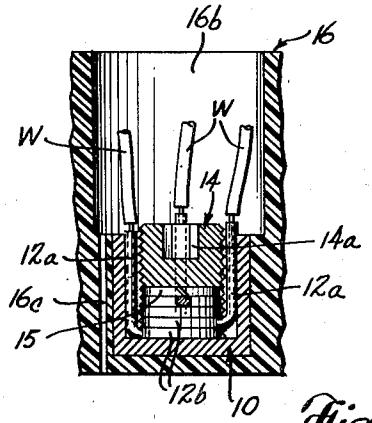


Fig. 2.

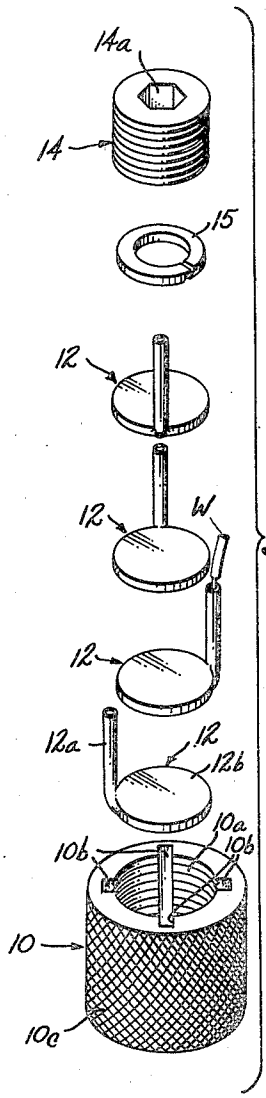


Fig. 1.

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ELECTRIC TERMINAL ASSEMBLY

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7 Claims. (Cl. 339—198)

This invention relates to improvements in electric terminal assemblies and particularly those of the terminal board type. The invention is herein illustratively described by reference to the presently preferred form; however, it will be recognized that certain modifications therein may be made with respect to details without departing from the essential features involved.

An object hereof is the provision of such a terminal assembly of reduced size and weight in relation to conventional terminal boards, for the degree of protection which it affords against voltage break-down, corona or arcing between contacts, and against shorting of exposed conductive surfaces by vibrations, moisture, foreign bodies or during assembly and disassembly thereof for test or repair purposes.

A related object is such a terminal assembly of simple and rugged construction and which may be made in a compact form of convenient proportions.

Another important object is to provide a terminal assembly wherein the conductor terminals are securely and fixedly held in predetermined positional relationship against working loose and so they may be readily identified by position. A related object is such a terminal assembly in which the conductor terminals may be placed in their intended positional relationship quickly and easily.

The invention in its illustrated form features a plurality of similar conductive receptacle members, internally threaded and longitudinally grooved, separately retained in the bases of recesses in a body of insulation, with electric conductor terminal lugs having longitudinal shanks and disk-like contact heads perpendicular thereto, said lugs being insertable in said receptacle members with the contact heads thereof arranged in stacked relationship and with the shanks thereof lodged in the separate grooves, and a threaded plug member adapted to be threaded into each receptacle member to press said contact heads together and against the base of the receptacle member.

These and other features, objects and advantages of the invention will become more fully evident from the following description thereof by reference to the accompanying drawing.

Figure 1 is an exploded perspective view of one unit of a composite terminal board assembly of the invention.

Figure 2 is a sectional assembled view of the unit of Figure 1 incorporated in a terminal board insulation block.

Figure 3 is a perspective view of a complete terminal board assembly embodying the invention, with a portion of the insulation block thereof being broken away to show certain details.

Referring to Figures 1 and 2, the improved terminal assembly unit comprises a conductive body in the form of a cup-like receptacle **10** having a cylindrical recess **10***a* therein, the longitudinal wall of which is threaded and has a plurality of longitudinal grooves **10***b* spaced apart around the circumference thereof. Four such grooves are shown, but it will be understood that any suitable number greater than one may be employed. A plurality of similar conductor terminal elements or lugs **12** are provided, there being four in the example, the maximum number corresponding to the number of available grooves

10*b*. Each such terminal lug comprises an elongated shank portion **12***a* and a contact head **12***b*. The contact head **12***b* is of flat, preferably round disk form. The shank portion **12***c* is joined to the head at an edge location thereon extending substantially perpendicularly to the head. The shank portion is adapted for connection to the end of an electric wire W, as by inserting the exposed end of the wire into a longitudinal bore in the projecting end of the shank, then crimping the shank tightly on the wire to project endwise therefrom. The diameter of the contact head **12** is slightly less than the inside diameter of receptacle **10**, so as to fit loosely disposed transversely therein. Each of the shank portions **12***a* is adapted to be received slidably in one of the grooves **10***b* with the contact disks stacked together in the receptacle recess.

A threaded plug **14** is adapted to be threaded into the receptacle **10** for pressing the contact disks firmly together, hence into good electrical contact, and against the bottom of the receptacle recess as shown in Figure 2. Preferably the plug has an Allen head wrench socket **14***a* therein for turning the plug.

The offset of the lug shanks **12***a* permitting them to be lodged in the separate receptacle grooves not only permits stacking of the respective contact disks together but permits insertion of clamp plug **14**. Of particular importance, this feature of construction permits locating and maintaining the individual electric wires, joined to the terminal lugs, in predetermined positional relationship spaced apart around the receptacle for ready identification. Lock washer **15** interposed between the plug **14** and the uppermost contact head in the stack precludes the possibility of the assembly working loose under vibration. Lodging of the shanks **12***a* in the grooves **10***b*, preventing rotation of the terminal lugs about the receptacle axis precludes the possibility of the assembly working loose due to movements or stress in the connecting wires.

In a complete terminal board assembly a plurality of the receptacles **10** are embodied in a block of insulation **16** having a flat side **16***a* with a plurality of similar recesses **16***b* formed therein. Preferably the receptacles **10** are molded in the insulation material in order to be held firmly thereby at the bases of the respective recesses. Knurling **10***c* on the receptacle exterior creates a firm bond with the surrounding insulation. Preferably the block recesses above the receptacles are somewhat larger in diameter than the receptacles, commencing at a shoulder **16***d* flush with the upper edge of the receptacle, providing clearance space for the convenient insertion and removal of terminal lugs. The recesses **16***b* being materially deeper than the length of receptacles **10**, intervening insulation barriers are formed between adjacent receptacles which create relatively long ionization paths minimizing the possibility of arc-over, corona or shorting of contacts. Moreover, insertion and removal of contact lugs behind these barriers minimizes the possibility of accidental direct shorting of contacts during maintenance or test operations. Absence of sharp or projecting conductors further minimizes corona.

A drain hole **16***c* extends through the insulation from shoulder **16***d* to the bottom face of the block **16** so that moisture may not accumulate in the block.

In the example, the group of receptacle recesses **16***b* are arranged in a straight row. Other arrangements are also practical to make up terminal boards of any breadth and length and any suitable numbers of contact receptacles. Mounting screw holes **16***e* are or may be provided at the sides of the block.

I claim as my invention:

1. An electric terminal assembly comprising a con-

ductive body having a cylindrical recess therein with a threaded longitudinal wall, said wall having at least two longitudinal grooves therein spaced apart around said wall, at least two electric conductor terminal elements each comprising a generally flat contact portion adapted for insertion disposed transversely in said recess to the base thereof, one upon the other, and further comprising an elongated shank portion projecting transversely from said flat contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves with the terminal element contact portion so inserted in said recess, and an externally threaded cylindrical plug element adapted to be threaded removably into said recess to press said contact portions against each other and the base of said recess.

2. An electric terminal assembly comprising a conductive body having a recess therein with a threaded longitudinal wall, said wall having at least two longitudinal grooves therein spaced apart around said wall, at least two electric conductor terminal elements each comprising a round disk-like contact portion of a diameter slightly smaller than the diameter of said recess and adapted for insertion disposed transversely in said recess to the base thereof, one upon the other, and further comprising an elongated shank portion projecting transversely from said contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves with the terminal element contact portion so inserted in said recess, and an externally threaded cylindrical plug element adapted to be threaded removably into said recess to press said contact portions against each other and the base of said recess.

3. An electric terminal assembly comprising an insulating body having a recess therein, a conductive body held in said recess and having a cylindrical recess therein facing outwardly in relation to the first-mentioned recess, said conductive body recess having a threaded longitudinal wall, said wall having at least two longitudinal grooves therein spaced apart around said wall, at least two electric conductor terminal elements each comprising a generally flat contact portion adapted for insertion disposed transversely in said second-mentioned recess to the base thereof, one upon the other, and further comprising an elongated shank portion projecting transversely from said flat contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves with the terminal element contact portion so inserted in said second-mentioned recess, and an externally threaded cylindrical plug element adapted to be threaded removably into said second-mentioned recess to press said contact portions against each other and the base of said latter recess.

4. An electric terminal assembly comprising an insulating body having a plurality of similar recesses therein, a plurality of similar conductive bodies held in the bases of said respective recesses and each having a cylindrical recess therein facing outwardly in relation to the first-mentioned recess, said conductive body recess having a threaded longitudinal wall, said wall having at least two longitudinal grooves therein spaced apart around said wall, at least two electric conductor terminal elements for each of said conductive bodies, each such element comprising a generally flat contact portion adapted for insertion disposed transversely in said conductive body recess to the base thereof, one upon the other, and further comprising an elongated shank portion projecting transversely from said flat contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves with the terminal element contact portion so inserted in said conductive body recess, and an externally threaded cylindrical plug element adapted to be threaded removably into said conductive body recess to press said contact portions against each other and the base of said latter recess.

5. An electric terminal assembly comprising a block of insulation having a generally flat exposed side with a plurality of similar generally cylindrical recesses formed in said flat side, a plurality of similar generally cylindrical cup-like conductive receptacle members held in the bases of said recesses, respectively, and each having a threaded cylindrical inner wall with longitudinal grooves in such wall spaced apart around the circumference thereof, the depth of said recesses being materially greater than the lengths of the respective members held therein, a plurality of electric wires carrying similar terminal lugs on the respective ends thereof, each such terminal lug including an elongated shank portion connected to and projecting endwise from the associated electric wire and a generally flat and round contact head joined by its edge to the projecting end of the shank portion in substantially perpendicular relationship therewith, a plurality of said terminal lugs being inserted into each of said receptacle members to the base of the interior thereof with their respective shank portions lodged in separate grooves therein, and threaded plug members threaded into the respective receptacle members and pressing the terminal lug heads therein against each other and against the base of such members.

6. An electric terminal assembly comprising a conductive body having a generally cylindrical bore and a plurality of grooves formed therein extending generally longitudinally of and opening into said bore, a plurality of electric conductor terminal elements each comprising a generally flat contact portion adapted for insertion disposed transversely in said bore to a seat therein, said conductive body including means forming a seat for said contact portions stacked together in said bore, said terminal elements each further comprising an elongated shank portion projecting generally transversely from said contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves, said conductive body having screw threads in said bore, and a screwthreaded retainer element adapted to be threaded into engagement with said screw threads and press said contact portions together and against said seat.

7. An electric terminal assembly comprising an insulation block having an exposed face with a plurality of laterally spaced generally cylindrical recesses therein, a plurality of conductive receptacle members held in the respective recesses, each such receptacle member having a generally cylindrical bore therein and a plurality of grooves formed therein extending generally longitudinally of an opening, into said bore therein, a plurality of electric conductor terminal elements for reception in each such bore, each such terminal element comprising a generally flat contact portion adapted for insertion disposed transversely in said bore to a seat therein, said receptacle members each further including means forming a seat for said contact portions stacked together in said bore therein, said terminal elements each further comprising an elongated shank portion projecting generally transversely from said contact portion at an edge location thereon, said shank portion being adapted for connection to an electric conductor and for reception in one of said grooves, each of said receptacle members having screw threads in said bore therein, and screw-threaded retainer elements adapted to be threaded into engagement with the screw threads of the respective receptacle members and press said contact portions together and against said seat therein, said receptacle members being seated in said recesses to a sufficient depth such that the stacked terminal elements and retainer elements are recessed therein below said face.

No references cited.

U. S. DEPARTMENT OF COMMERCE

PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,825,041 February 25, 1958

George H. Meyer

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

Column 4, line 54, for "of an opening, into" read --of and opening into--.

Signed and sealed this 15th day of April 1958.

(SEAL)
Attest:
KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents