Jan. 22, 1957 P. J. H. JANSSEN 2,778,867

WIRING SUPPORT FOR USE AT HIGH VOLTAGES

Filed Jan. 12, 1952

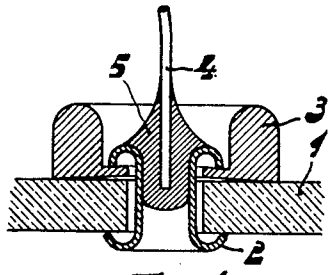


Fig. 1.

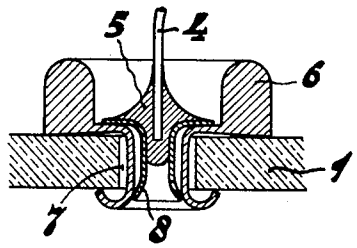


Fig. 2.

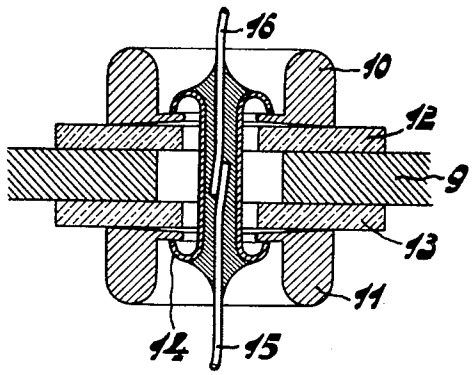


Fig. 3.

INVENTOR
Peter Johannes Hubertus Janssen
By Fred M Vogel
Agent

United States Patent Office 2,778,867 Patented Jan. 22, 1957

2,778,867

WIRING SUPPORT FOR USE AT HIGH VOLTAGES

Peter Johannes Hubertus Janssen, Eindhoven, Netherlands, assignor to Hartford National Bank and Trust Company, Hartford, Conn., as trustee

Application January 12, 1952, Serial No. 266,165

Claims priority, application Netherlands February 12, 1951

4 Claims. (Cl. 174—35)

This invention relates to improvements in or relating to wiring supports which can be used at high voltages.

This invention comprises a wiring support for use at high voltages which is constituted primarily by a solderable metal part secured to a supporting plate. This metal part has soldered to it at least one connecting wire. As an example of such a wiring support we may mention a copper flanged bushing. Such supports are frequently used for securing in position and, if necessary, leading connecting wires through a chassis plate.

However, with such wiring supports pointed extensions are liable to be formed on the solder lump during soldering and, in the case of higher voltages, these extensions may lead to a marked concentration of electric lines of force and hence to discharge phenomena and flashing-over.

It has been suggested to surround parts which carry high voltage and have sharp edges, with a substantially cup-shaped screening body having externally rounded forms.

Efforts may be made to obviate the said difficulties with soldered joints by extending the edge of the bushing flange to form a cup-shaped screening-body which electrically screens the lump of the solder, so that the latter is enclosed in a "field-free" space.

However, it has been found that such construction does not sufficiently safe-guard against undesirable phenomena, such as discharges and flashing-over because during soldering pointed particles of solder are liable to adhere to the solder-lump and to the edge or outside of the flanged bushing.

The wiring support according to the invention obviates this disadvantage by having the solderable metal part secured to the supporting plate jointly with at least one conductive, substantially cup-shaped screening body of non-solderable material with externally substantially rounded forms which electrically screens the solder drop.

According to a greatly preferred embodiment, the screening body is secured to the supporting plate by means of the metal part itself, which is preferably a seamless flanged bushing.

In order that the invention may be more clearly understood and readily carried into effect it will now be described more fully with reference to the accompanying drawing, in which:

Figures 1–3 show three preferred embodiments in section of a wiring support according to the invention, corresponding elements being designated in the figures by similar reference numerals.

The wiring support for high operating voltage comprises a seamless flanged bushing 2 of brass or another solderable metal which is secured to an insulating supporting plate 1. The latter may be made of synthetic resin or hard paper and may constitute a wall of an apparatus or may be secured thereto in known manner.

The wiring support also comprises a conductive cup-shaped screening body 3 of non-solderable material, having externally, substantially rounded forms and being secured to the insulating supporting plate 1 by means of the flanged bushing. The bottom surface of the screening body 3 is hollowed in the manner shown in the figure so as to be slightly conical and thus to ensure that the outer edge of the bottom surface rests on the insulating plate 1, even if there should be a burr round the aperture of this plate. This is desirable for the well-known reason that air layers between conductors and insulation are to be avoided at critical areas. For the same reason the said outer edge of the screening body 3 is formed so as to be as sharp as possible.

If a connecting wire 4 is required to be soldered to the wiring support, there is formed between this wire and the solderable flanged bushing 2 a solder drop or lump 5 which is electrically screened by the screening body 3. Screening body 3 is preferably composed of aluminum. However, if desired, other non-solderable metals of suitable conductive materials may be used, for example conductive synthetic resin or a non-conductive substance having a conductive coating. Due to the rounded form of the outer surface of the screening body 3 and also of the seamless flanged bushing 2, the occurrence of discharge phenomena is avoided. Since the screening body is made of non-solderable material, solder lumps are prevented from being formed on the screening body 3 during the soldering operation. Thus, the construction described ensures that sharp parts are prevented from settling on the edge at the outer surface of the screening body 3 and thus from giving rise to unwanted discharge and flashing-over phenomena.

It is well to note that as an alternative, two or more connecting wires may be soldered to the wiring support, said wires extending, for example, on either side of the insulating supporting plate, the aperture in the support serving also for leading through.

Fig. 2 shows a second embodiment of the invention in which, however, the wiring support is secured to the insulating supporting plate 1 with the use of a screening body 6 of slightly different form. The screening body 6 which is made, for example, of aluminium and which is also substantially cup-shaped comprises a part which is adapted to be used as a flanged bushing and is passed through a fitting aperture 7 in the insulating supporting plate 1, by which it is secured in position by flanging. In this case, the part of the screening body which passes through the insulating plate 1, has coaxially arranged in it a copper sleeve 8 in which the connecting wire 4 is soldered in position. The copper sleeve 8, by means of its upper edge which is bent over at right angles, bears on the bottom of the cup-shaped screening member, whereas the lower edge of the sleeve is clamped in position in the neck of the screening body by flaring.

Fig. 3 shows a third embodiment of the wiring support according to the invention. Screening bodies 10 and 11 are respectively arranged on either side of a metal mounting plate 9 which is preferably made of aluminum. On either side of the metal plate 9 there is a flat insulating ring 12 and 13 respectively, on which bear the bottom surfaces of the screening bodies 10 and 11. The assembled screening bodies 10, 11 and insulating rings 12, 13 are secured to the mounting plate 9 by means of a single copper flanged bushing 14, which for this purpose is passed through apertures in the insulating rings 12, 13 and a wide aperture in the mounting plate.

In order to avoid contact between the wiring support and the metal mounting plate 9, the inner edges of the insulating rings 12, 13 extend in an inward direction over the edge of the aperture in the metal mounting plate 9. In the embodiment shown, a connecting wire 15 and 16,

respectively is soldered to a copper flanging bushing 14 on either side of the mounting plate 9.

What I claim is:

1. A wiring support for use at high voltages comprising an insulating, apertured supporting plate, a solderable metal member secured in said aperture of said plate, a wire soldered to said metal member by a solder drop, a conductive, substantially cup-shaped screening body of non-solderable material secured by said metal member to said supporting plate, said screening body having external rounded forms which electrically screen the solder drop, said screening body also having its bottom, which rests on said plate, hollowed by being slightly conical so that the outer edge rests on said plate.

2. A wiring support for use at high voltages comprising an insulating supporting plate, a solderable flanged bushing of copper secured to said plate, a connecting wire soldered to said bushing by a solder drop, a conductive, substantially cup-shaped screening body of aluminum material jointly secured with said bushing to said supporting plate, said screening body having external rounded forms which electrically screen the solder drop, said screening body also having its bottom, which rests on said plate, hollowed by being slightly conical so that the outer edge rests on said plate.

3. A wiring support for use at high voltages comprising a metal supporting plate, a flat insulating ring on each side of said plate, a screening body arranged on each insulating ring on the side remote from said plate, a single flanged bushing of solderable material securing said rings and screening bodies to said plate, a wire soldered to said flanged bushing by a solder drop, said bushing extending through apertures in said rings, screening bodies and plate, said screening bodies and rings having apertures of smaller diameter than the aperture in said plate, said screening bodies having external rounded forms which electrically screen the solder drop, each of said screening bodies also having its bottom which rests on said plate, hollowed by being slightly conical so that the outer edge rests on said plate.

4. A wiring support for use at high voltages comprising an insulated supporting plate, a solderable metal member secured to said plate, a wire soldered to said metal member by a solder drop, a conductive, substantially cup-shaped screening body of non-solderable material jointly secured with said metal member to said supporting plate, said screening body having an external rounded form which electrically screens the solder drop, said screening body also having its bottom, which rests on said plate, hollowed by being slightly conical so that the outer edge rests on one surface of said plate, said screening body being provided with an integral sleeve-like extension having the free end thereof engaging a surface of said plate opposite said one surface of said plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,483,122	Schroeder	Feb. 12, 1924
2,341,001	Vogel	Feb. 8, 1944
2,476,404	Del Camp	July 19, 1949

FOREIGN PATENTS

631,402	Great Britain	Nov. 2, 1949

OTHER REFERENCES

"Hermetic Sealing of Capacitors," by Coursey, from the "Proceedings of the Institute of Electrical Engineers," vol. 97, part 3, pages 56–64 January 1950.