Dec. 23, 1952 F. S. SAMPSON 2,623,086

ELECTRICAL CONNECTION FOR STRIP CONDUCTORS

Filed Sept. 9, 1948

FIG. 1.

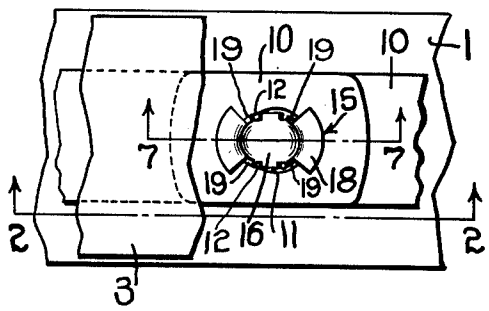


FIG. 2.

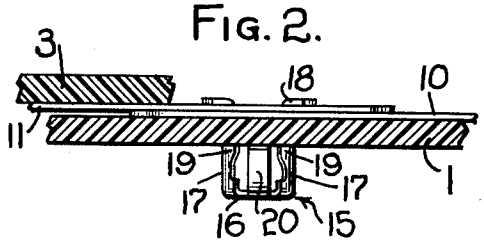


FIG. 3.

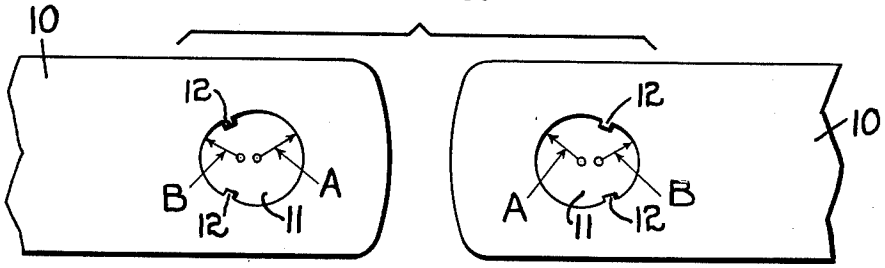


FIG. 4.

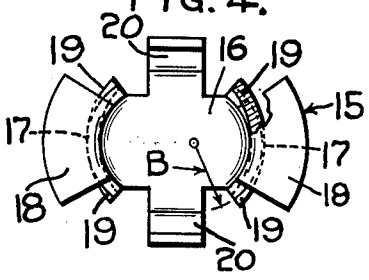


FIG. 5.

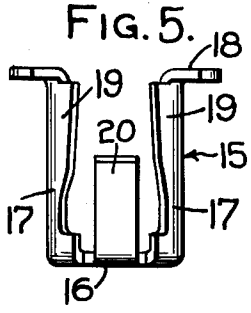


FIG. 6.

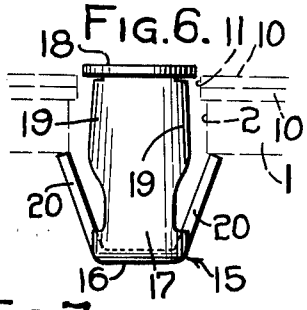


FIG. 8.

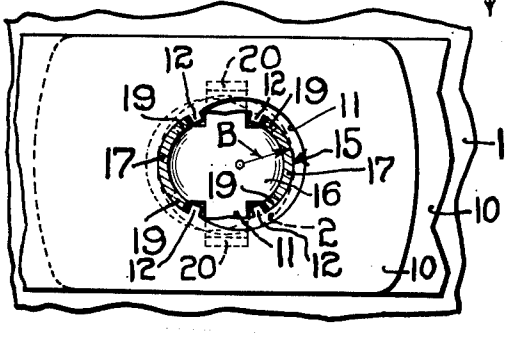
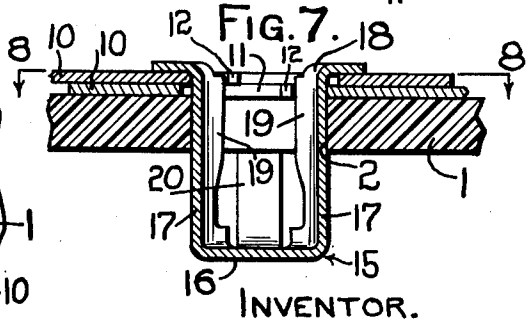


FIG. 7.



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ELECTRICAL CONNECTION FOR STRIP CONDUCTORS

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5 Claims. (Cl. 173—324)

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The present invention relates to electrical installations of the type in which a plurality of bare strip conductors are secured to a supporting member or panel, and aims generally to improve and simplify the construction of the installation as well as the connectors therefor.

One of the primary objects of the invention is the provision of improved means for quickly and effectively connecting a plurality of strip conductors together or to a supporting member or panel.

A further object of the invention is the provision of an improved construction of installation embodying a plurality of ribbon-like conductors and a connector therefor insuring a good electrical but solderless contact between the conductors.

A further object of the invention is the provision of an improved solderless connector for strip conductors.

The above and other objects of the invention will be apparent to persons skilled in the art to which the invention relates from a consideration of the accompanying drawings and annexed specification illustrating and describing a preferred form of the invention.

In the drawings:

Fig. 1 is a plan view of a pair of conductors connected together by means of a connector embodying the invention, the assembly being mounted on an insulating support;

Fig. 2 is a side elevation of the assembly of conductors and connectors shown in Fig. 1, the support being shown in section and the view generally as being taken on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of two conductor ends shown disassembled and suitably apertured to receive a connector of the present invention;

Fig. 4 is a detail plan view of the connector;

Fig. 5 is a side elevation thereof;

Fig. 6 is an end elevation thereof;

Fig. 7 is an enlarged vertical sectional view of the assembly as taken on the line 7—7 of Fig. 1; and

Fig. 8 is an enlarged horizontal sectional view taken on the line 8—8 of Fig. 7.

The invention provides an improved connector or fastener device for securing together, in electrical contact, two or more apertured ribbon-like conductors, and in the preferred form of the invention the fastener serves to secure the connected conductors to an apertured supporting panel, for example a sheet of insulating material.

The particular embodiment of the invention

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illustrated in the drawings includes an installation comprising a supporting body or panel 1, which may be a sheet of insulating material, provided with apertures 2, and upon which a plurality of ribbon-like strip conductors 10, to be electrically connected, are laid. Such ribbon-like strip conductors 10 are conveniently formed of spring brass strips approximately one quarter (¼) inch wide and approximately 0.010 inch in thickness. A plurality of such strip conductors are conveniently secured to or sandwiched between insulating panels 1 and 3, and provide a simple inexpensive construction which will not be subject to wear or short-circuiting as in the case of other systems employing individually insulated conductors.

The strip conductors 10 to be electrically connected together are designed to be overlapped and each is provided with a substantially circular aperture 11 designed to coincide substantially with the aperture 2 in the support 1.

Preferably the apertures 11 of the strip conductors 10 are of slightly elongated circular form, and advantageously have arcuate edges of different radii circumscribed about spaced centers, as is illustrated in Fig. 3. The arcuate edges of each radius are preferably separated by laterally projecting elements 12 as shown in Fig. 3. Preferably, the arcuate edge of the greater radius A is adjacent a terminal end of the strip conductor 10 and the arc of lesser radius B is opposite. Whatever the location of the apertures in the strip conductors, the apertures of the overlapping conductors are reversed so that an aperture area of larger radius of one conductor will overlie an aperture area of lesser radius of another conductor.

The apertured strip conductors may be electrically connected together and advantageously to a supporting panel or member 1 by means of a connector or fastening device such as is illustrated in the drawings, particularly in Figs. 4 to 7 thereof.

According to the invention, the connector 15 is advantageously formed of thin resilient metal, for example spring sheet brass of 0.010 inch thickness, and may be of general U-shaped form providing a bottom bight portion 16, resilient legs 17 and an outwardly flanged head 18, the latter preferably being formed on the terminal ends of the leg portions 17. The leg portions 17 are preferably formed with lateral wings 19 so as to present arcuate surfaces of substantial extent and preferably the radius of curvature of said arcuate wings corresponds to the lesser radius of curva-

ture B of the aperture 11. The ends of the wings normally may be distorted radially outward Fig. 4 so as to be forced inwardly as the connector is forced through the aligned apertures 11 Fig. 8 and thus cause the arcuate leg portion to engage under tension the lesser radius edge of the strip aperture 11 throughout a substantial extent. Rotation of the leg portions relative to the lesser radius edge is prevented by the elements 12, which as shown in Fig. 8, position the leg portions in engagement with the respective lesser radius edges of the apertures 11.

The connector 15 is preferably provided with support-engaging and locking means for locking the connector and connected conductors in assembled relation with the support 1. Advantageously, the support-locking means is in the form of one or more resilient tongues 20 connected to the bottom bight portion 16 extending outwardly therefrom, between the opposed legs 17 a distance substantially less than the length of the legs 17, equal substantially to the combined thickness of the support 1 and the overlapping conductors 10. Thus when the connector is forced through the support aperture 2, the tongues 20 will expand radially outwardly and snap under the face of the support 1 opposite the face on which the conductors are mounted. It will be apparent that the length of the tongues 20 will be so proportioned to the length of the legs 17 and the combined thickness of the support 1 and conductors 10, that when the connector is locked in the support 1, the flanged head will overlie and engage the outermost conductor to hold the parts in assembled relation as well as in good electrical contact.

From the above description it will be apparent that the invention provides a simple, economical yet efficient solderless connector for strip conductors. It also provides a simple and convenient means of securing said connected conductors to an apertured supporting panel, permitting ready assembly of the conductors on the panels to complete the desired circuit prior to superimposing the second insulating panel 3.

Furthermore, as will be apparent, the elongated circular form of the conductor aperture and the resilience of the leg portions 17 of the connector combine to maintain a good electrical contact between the aperture walls of the conductors and the arcuate contact wings 19 even though some shifting of one conductor relative to another is required.

Although I have illustrated and described a preferred embodiment of the invention it will be understood that I do not intend to be limited thereto as the scope of the invention is best defined in the appended claims.

I claim:

1. In an electrical installation, a pair of strip-like conductors each provided with an elongated circular aperture of varying radii adapted to be assembled in overlapping relation with their apertures in substantial alignment, and an elongated sheet metal connector fitted in said apertures and having spaced resilient arcuate sections adapted for tensioned electrical line contact engagement with an arcuate portion of lesser radii of the aperture wall of each conductor, said portion of one conductor being disposed opposite said portion of the other.

2. In an electrical installation, a pair of relatively flat ribbon-like strip conductors adapted to be connected in overlapping relation, each of said strips provided with an elongated circular opening of varying radii, a substantially U-shaped connector fitted in said apertures, the legs of said U-shaped connector being of arcuate cross section for tensioned electrical line contact engagement with an arcuate portion of lesser radii of the aperture wall of each conductor, said portion of one conductor being disposed opposite said portion of the other.

3. In an electrical installation, a pair of ribbon-like sheet metal conductors arranged with portions thereof in overlapping relation, the coinciding portions of said conductors being provided with connector-receiving apertures each having arcuate wall portions of varying radii, and a substantially U-shaped connector inserted through said coinciding apertures and having opposed arcuate resilient leg portions each adapted to make substantially an electrical line contact with the portion of the arcuate aperture wall of lesser radii of one of said conductors.

4. In an electrical installation, a pair of relatively flat ribbon-like conductors adapted to be connected in overlapping relation, each of said strips provided with an elongated circular opening having side edges of two different radii, positioning elements extending into said openings adjacent the intersection of the side edges of different radii, a substantially U-shaped connector fitted in said openings, the legs of said U-shaped connector being of arcuate cross-section for tensioned electrical line contact engagement each with the strip aperture edge of lesser radii of one of the conductors and secured in tensioned engagement each with the positioning elements defining the corresponding strip aperture edge of lesser radii.

5. An electrical connector for apertured strip conductors comprising a substantially U-shaped member having a bight portion, opposed leg portions, laterally extending wings on said leg portions, said wings and said leg portions having arcuate cross-section in planes normal thereto, said wings and said leg portions being radially resilient and providing radially resilient conductor aperture-edge-contacting portions, opposed outwardly extending oppositely directed lateral flanges on the free ends of said leg portions, and laterally resilient support-engaging means extending angularly outwardly toward the plane of said flanges from the opposite side edges of said bight portion.

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