

April 9, 1968

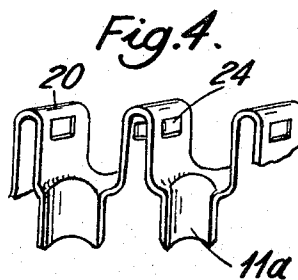
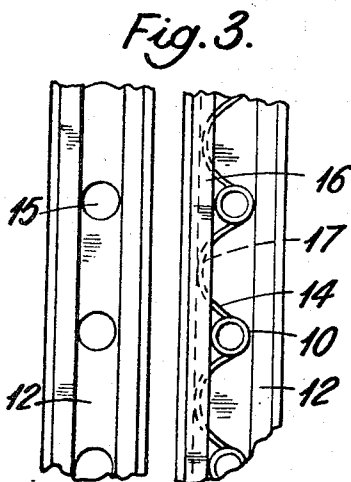
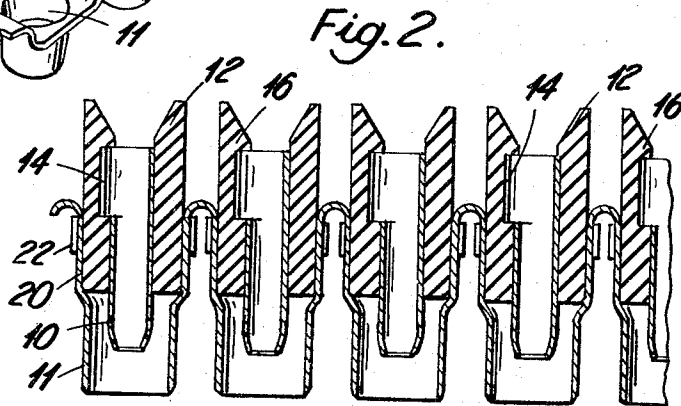
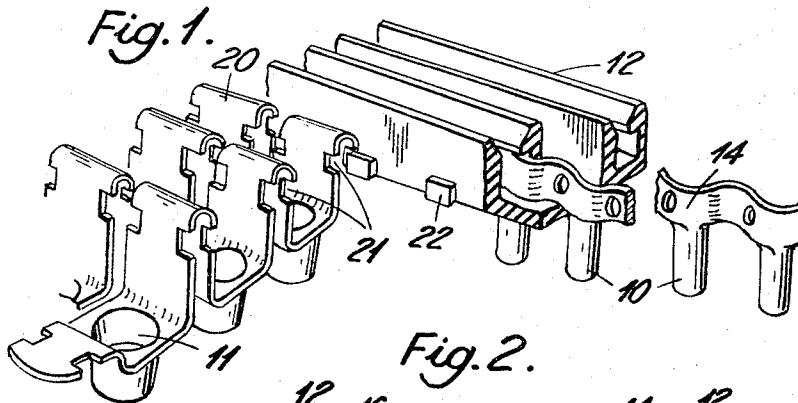
S. T. DEAKIN

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ELECTRIC CIRCUIT SELECTORS

Filed July 6, 1966

2 Sheets-Sheet 1



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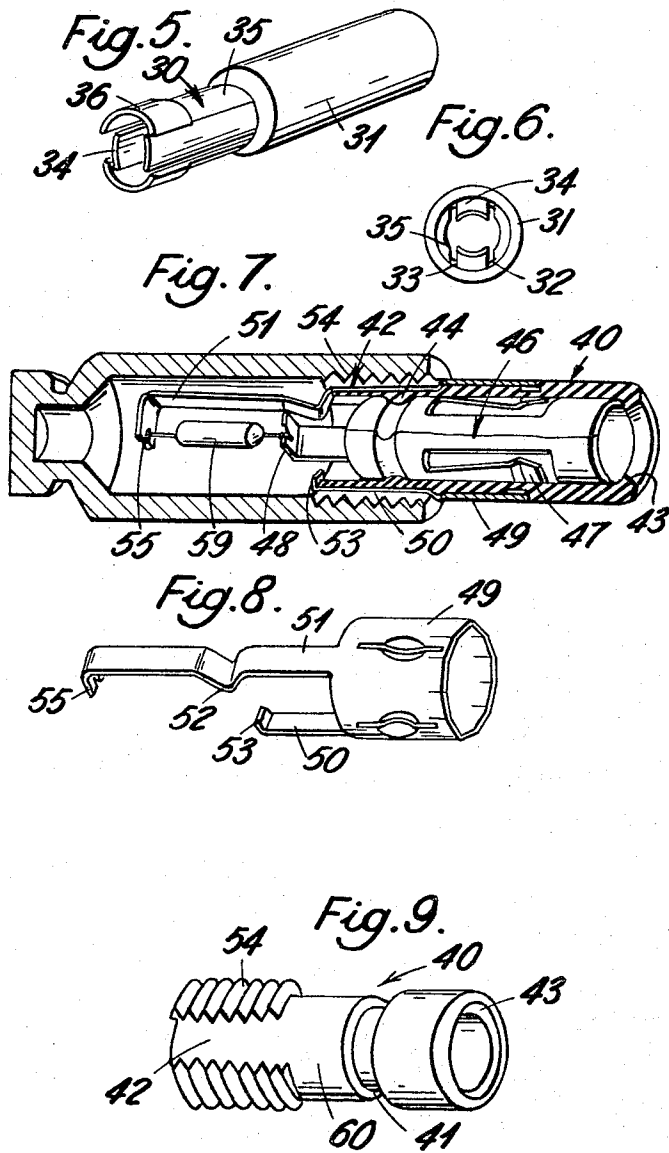
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ELECTRIC CIRCUIT SELECTORS

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9 Claims. (Cl. 339—18)

The invention relates to electric circuit selectors and to connectors for use therewith.

According to the invention, an electric circuit selector of the kind having two sets of contacts arranged in parallel rows of electrically connected contacts, the rows of one set of contacts crossing the rows of the other set, there being at each crossing of the rows a pair of contacts one from each set and each pair being arranged for engagement by an electrical connector whereby selected contacts of one set may be electrically connected with the contacts of the other set pairing therewith is characterized in that the contacts of each pair (or each of at least some of the pairs) are one within the other and spaced apart. Usually each row of a connector of the above kind has a means of connection to an external circuit arrangement. Also, with such an arrangement, the engagement of a connector with a selected pair of contacts provides an electrical connection between two external circuit arrangements to which the two rows containing the contact pair are respectively connected. One example of a selector of the above kind is disclosed in United States patent specification No. 3,027,534.

In one form of the invention the contacts of each pair are a plug and a socket, one within the other with a space between them and, preferably, both of substantially circular cross-section.

In another form of the invention the contacts of each pair are a plug and a socket respectively coaxial with one another.

One construction according to the invention has the rows of contacts of one set lying along and attached to parallel bars of insulating material and the rows of contacts of the other set transverse to the bars and attached thereto. The bars may be of channel shape with the contacts of one set projecting through the bottoms of the channels and the electrical connections lying along and within the channels. The contacts of the other set may be formed on, or carried by, strips of corrugated or castellated formation, the bars being received and held within the corrugations.

The invention also provides a connector for use with a selector as above described and comprising a contact member of generally tubular form for insertion into the space between the contacts, the tube having longitudinal resilient tongues which are set inwardly and outwardly relative to one another to make contact with the contacts.

The connector may, alternatively, comprise an insulating sleeve with inner and outer contact sleeves thereon for making contact respectively with the plug and socket contacts on the selector.

Some specific embodiments of selectors and connectors according to the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view of a portion of a selector, partly cut away and partly in section;

FIGURE 2 is a section of part of the selector;

FIGURE 3 is a plan view of two of the channel bars seen in FIGURE 2, one being with a strip of connectors and the other without;

FIGURE 4 is a perspective view of part of an alternative form of socket connector strip;

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FIGURE 5 is a perspective view of one form of connector;

FIGURE 6 is one end view of the connector shown in FIGURE 5;

FIGURE 7 is a perspective view, partly in section, of another connector;

FIGURE 8 is a view of the outer contact sleeve of the connector shown in FIGURE 7; and

FIGURE 9 is a view of an insulating sleeve used in the connector shown in FIGURE 7.

The selector shown in FIGURES 1-3 comprises rows of coaxial plug and socket contacts 10, 11 carried by bars 12 moulded of resilient insulating material.

The plug contacts 10 of each row are integral with a connector strip 14. The contacts are formed by cutting and rolling portions of the strip to cylindrical form. The strips are bent to wave form. The contacts pass through and fit closely within holes 15 in the bottoms of the bars 12 and are held in place by lips 16 on the bars which engage over the waves 17 of the strips. The operative portions of the contact plugs 10 project downwardly (as viewed in the drawings) from the bottoms of the bars 12.

The socket contacts 11 of each row are integral with a connector strip 20 and are formed, like eyelets, by pressing out the material of the strip. The strips are bent to corrugated or castellated form and embrace the bars 12 within the corrugations, over the sockets. The sides of the corrugations have notches 21 which make holding and locating engagement with projections 22 on the bars. The sockets 11 surround and are coaxial with the plugs 10.

If necessary or desirable to obtain rigidity the ends of the bars 12 may be attached to a support frame or they may be bolted or riveted together.

FIGURE 4 shows a modified form of socket contacts and connector strip 20 in which the contacts 11a are approximately semi-circular in section and the notches 21 are replaced by slots 24. The projections 22 for this modification will be positioned on the centre lines of the socket contact strips.

FIGURES 5 and 6 show one form of connector for use with either form of selector described above. The connector comprises a metallic tube 30 of which one end is held in an insulating sleeve or finger grip 31. The tube is slit along two chords 32, 33 to form two pairs of opposed resilient tongues 34, 35. The tongues 34 are set inwardly as seen in FIGURE 6. The tube also has a slightly enlarged nose 36. In use the tube is inserted into the space between a pair of contacts 10 and 11. The tongues 34 grip and make contact with the plug contact 10 and the nose 36 makes contact with the socket contact 11.

The connector shown in FIGURES 7 to 9 is primarily intended for use when a device such as a diode rectifier is to be connected between a pair of the contacts 10 and 11. The connector comprises an insulating sleeve 40 (FIGURE 9) having an external screw thread 54, a circumferential groove 41 and a pair of opposed axial grooves 42. The sleeve 40 also has an internal lip 43 and an internal rib 44. Held within the sleeve by the lip 43 and the rib 44 there is an inner tubular contact 46 rolled from a sheet metal blank. The contact has inwardly set contact tongues 47 for contacting the plug 10. The contact also has a tag 48 on the axis of the connector for attachment to one contact of a diode 59 or other device.

On the outside of the portion 60 of the sleeve 40 there is a tubular contact 49 with two tags 50, 51, the portion 60 being of suitably reduced diameter to house the thickness of the contact 49. The tags lie in the grooves 42 and are provided with hooks 52, 53 which engage over the end of the sleeve to hold the contact in place. The tag 51 also has a hooked end 55 for making connection to the other contact of the diode 59. The con-

tact portion 49 is not truly circular, to provide for resilient engagement within a socket 11.

An advantage of the above construction is that the wave or castellated form of the connector strips 14, 20 provides the strips with the necessary longitudinal resilience to allow for manufacturing tolerances.

It is also to be appreciated that the invention is not restricted to the specific details of selector described above. For example, although the selector is described as having plug and socket contacts, the selector may be provided with plug contacts or socket contacts only.

I claim:

1. An electric circuit selector of the kind having two sets of contacts arranged in parallel rows of electrically connected contacts, the rows of one set of contacts crossing the rows of the other set, there being at each crossing of the rows a pair of contacts one from each set and each pair being arranged for engagement by an electrical connector whereby selected contacts of one set may be electrically connected with the contacts of the other set pairing therewith characterised in that the contacts of each of at least some of the pairs are one within the other and spaced apart.

2. A selector as claimed in claim 1 in which the contacts of each pair are a plug and a socket, one within the other with a space between them.

3. A selector as claimed in claim 2 in which both the plug and the socket are of substantially circular cross-section.

4. A selector as claimed in claim 1 in which the contacts of each pair are a plug and a socket respectively co-axial with one another.

5. A selector as claimed in claim 1 in which the rows

of contacts of one set lie along and are attached to parallel bars of insulating material and the rows of contacts of the other set are transverse to the bars and attached thereto.

6. A selector as claimed in claim 5 in which the bars are of channel shape with the contacts of one set projecting through the bottoms of the channels and the electrical connections lying along and within the channels.

7. A selector as claimed in claim 5 in which the contacts of the other set are formed on strips of corrugated or castellated formation, the bars being received and held within the corrugations.

8. A connector for use with a selector as claimed in claim 1 which connector comprises a contact member of generally tubular form for insertion into the space between the contacts, the tube having longitudinal resilient tongues which are set inwardly and outwardly relative to one another to make contact with the contacts.

9. A connector for use with a selector as claimed in claim 2 which connector comprises an insulating sleeve with inner and outer contact sleeves thereon for making contact respectively with the plug and socket contacts on the selector.

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