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A. JACKSON ET AL
MULTIPLE ELECTRIC CONNECTOR

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Fig. 1.

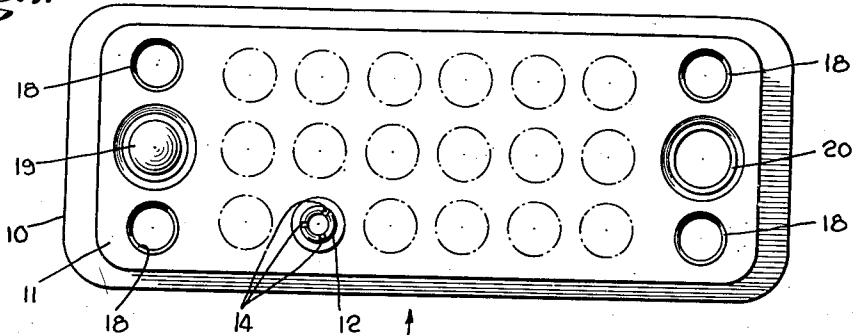


Fig. 2.

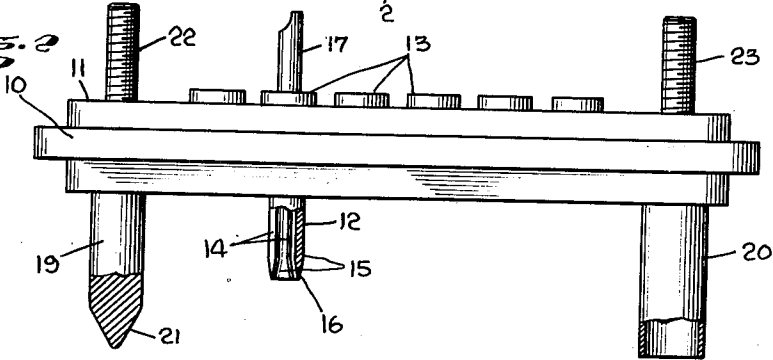


Fig. 3.

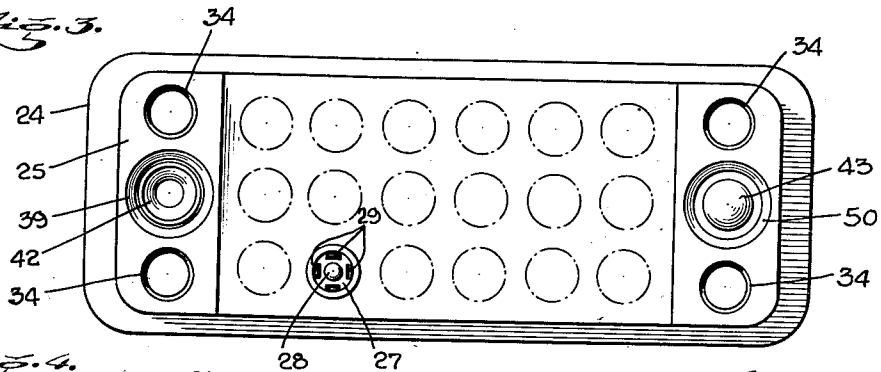


Fig. 4.

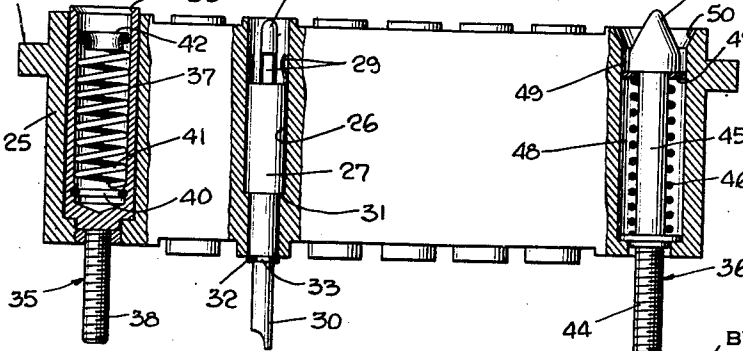
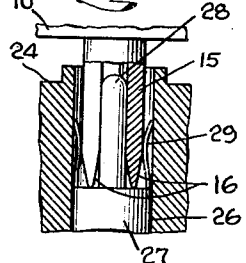


Fig. 5.



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MULTIPLE ELECTRIC CONNECTOR

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3 Claims. (Cl. 339-45)

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This invention relates to electric connectors for completing a plurality of circuits in assemblage of separate parts of the connector. More particularly, the invention deals with devices of this type and kind having means at end portions of the connector for yieldably assisting separation of the connectors as and when desired. Still more particularly, the invention deals with devices of the character described, wherein the separate contacts of the connectors have means providing a double yielding wiping engagement in completing electric circuits between said contacts.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and in which:

Fig. 1 is a plan view of one part of a connector showing one of the contacts and diagrammatically illustrating the associate contacts in dot and dash lines.

Fig. 2 is a side edge view of the connector looking in the direction of the arrow 2 of Fig. 1 with parts of the construction broken away and again showing only one of the electric contacts in full lines.

Fig. 3 is a plan view of an associate connector part showing only one of the electric contacts in full lines and diagrammatically illustrating associate contacts in dot and dash lines.

Fig. 4 is a side edge view, similar to Fig. 2 of the connector seen in Fig. 3 with parts of the construction broken away and in section; and

Fig. 5 is an enlarged sectional view showing coupling engagement between the contacts of both connectors.

In Figs. 1 and 2 of the drawing is shown at 10 one part of an electric connector, said part comprising an oblong rectangular body 11 of insulating material, in which a predetermined number of electric tubular contacts 12 are fixed, one of these contacts being shown in full lines in Figs. 1 and 2 and the relative position of the several contacts are indicated in dot and dash lines in Fig. 1 and by the raised bearing portions 13 in Fig. 2.

Each of the contacts of the connector part 10 comprise, at their lower end, a tubular body, which has a number of circumferential splits, as indicated at 14, to provide a series of spring members 15, the lower ends of which are conical in form, as seen at 16. The upper end of each

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contact 12 has a projecting tubular portion 17, with which a circuit wire is adapted to be coupled. The ends of the body 11 have, at corner portions thereof, apertures 18 for mounting of the connector part 10 in any desired manner. Said ends of the body 11 have, between said apertures, a pin 19 at one end and a projecting tube or sleeve 20 at the other end. The pin 19 has a conical lower end 21 and both the pin and sleeve have upwardly projecting threaded ends 22 and 23, respectively. The pin 19 and tube or sleeve 20 project below the lower surface of the body 11 a distance greater than the projection of the contacts 12, as clearly seen in Fig. 2.

In Figs. 3 and 4 of the drawing, I have shown at 24 the companion connector which again comprises an elongated body of insulating material 25 and, fixed in bores extending vertically through said body, as for example the bore 26 shown in Fig. 4, are pin contact elements, one of which is seen at 27. Each element has an upwardly extending contact pin portion 28 disposed within the upper surface of the bore 26 and around the base of the pin portion 28 are a plurality of spring contacts 29. The other end of each contact element 27 has a projecting tubular portion 30, with which a circuit wire is adapted to be coupled.

The elements 27 fit freely within the bores 26 and are held against movement in one direction by the shoulder portions 31 and against displacement in the other direction by spring rings 32 engaging grooved portions 33, as clearly indicated in Fig. 4. The free movement of the elements 27 may be said to be a lateral movement which prevents misalignment of the connectors one with respect to the other.

The body 25 of the connector part 24 has mounting apertures 34 at corner portions thereof, similar to the apertures 18, and at the ends of said body, between the apertures 34, are yieldable coupling members 35, 36. The member 35 comprises an elongated sleeve or tube 37 having an outwardly projecting threaded extension 38 at one end. The upper open end of the tube or sleeve 37 is flared, as seen at 39.

Mounted in the lower portion of the tube or sleeve 37 is a split ring 40 which provides means for retaining the lower end of a coil spring 41 against accidental displacement from the tube 37. Fixed on the upper end of the spring 41 is an eyelet 42 which forms a guide entrance throat for guiding the pin 19 into the sleeve 37. The member 36 comprises a rod or pin having

a large conical upper end 43 and an outwardly projecting threaded end 44 at the lower portion thereof. Arranged upon the reduced shank 45 of the pin is a coil spring 46, on the upper end of which seats a ring or collar 47 which is of greater diameter than the head 43. This collar serves to align the pin in the bore 48 of the body 25 and provides the annular clearance 49 around the head 43 for the reception of the tube 20. It will also be noted that the upper end of the bore 48 is flared or conical in form, as clearly seen at 50.

In coupling the two connectors to establish electric connection between the contacts 12 and 28, the pin 19 and tube 20 will operate to compress the springs 41 and 46, respectively, putting the same under tension. However, the tension of these springs is not sufficient to interfere with normal coupling engagement between the several pairs of contacts. However, when it is desired to separate the connectors, these springs 41, 46 will aid in separation thereof.

It will be understood that, when the spring members 15 of each contact 12 passes down over the pin 28, these spring members 15 are flexed outwardly to a slight extent, thus establishing a tensional wiping engagement with the pin 28 and, as the members 15 move downwardly, they then engage the spring contacts 29 which are forced outwardly into engagement with the walls of the bore 29 establishing a second tensional wiping engagement and this last tensional action also serves to increase tensional engagement of the members 15 with the pin 28 in the manner illustrated in Fig. 5 of the drawing.

It will be apparent that the pin and socket constructions comprising the pins 19, 43 and tubes 20, 37 form means aligning the various contacts of the multiple connector one with respect to the other in addition to the means for tensionally assisting separation of the connectors.

Having fully described our invention, what we claim as new and desire to secure by Letters Patents is:

1. A multiple connector of the class described, comprising two body parts of insulating material, one part having a plurality of tubular contacts spaced thereon, the other part having a plurality of contact pins correspondingly spaced thereon, said pins having free lateral movement to accommodate misalignment of the tubular contacts therewith, end portions of said parts beyond and spaced from said contacts having alignment pin and socket elements, the pin element of one part engaging the socket element of the opposed part in coupling and aligning said parts one with the other, one only of the socket elements and one only of the pin elements having tensional means providing, in the coupling of said parts, a spring loading, which aids in detachment of said parts, said pin contacts being arranged in socket portions of the second part, a plurality of spring contacts encircling and spaced from said pin contacts at the base of said sockets, said tubular contacts having split end portions forming a series of spring members thereon, and said spring members terminating in inwardly and outwardly bevelled surfaces.

2. In connectors of the type employing a plurality of pin and socket yieldable contacts,

adapted to be simultaneously brought into engagement with each other, said connectors comprising bodies of insulating material, means to assist separation of said connectors, said means comprising pin and socket elements spaced with respect to the contacts of said connectors, the socket element of one connector including an elongated coil spring arranged in the socket thereof, means at the base of the socket for retaining the spring against displacement, the pin element of said connector being arranged in a socket portion of said body and comprising a long shank having an enlarged conical head at its outer end, a coil spring mounted on said shank within said socket portion, a ring member mounted on said shank and of larger diameter than said head and fitting snugly, but freely, in said socket portion, said spring normally seating the ring member on said head, and the pin and socket elements of the other connector actuating the springs of said socket and pin elements of the first connector in loading said spring to the point of assisting separation of coupled connectors.

3. In connectors of the type employing a plurality of pin and socket yieldable contacts, adapted to be simultaneously brought into engagement with each other, said connectors comprising bodies of insulating material, means to assist separation of said connectors, said means comprising pin and socket elements spaced with respect to the contacts of said connectors, the socket element of one connector including an elongated coil spring arranged in the socket thereof, means at the base of the socket for retaining the spring against displacement, the pin element of said connector being arranged in a socket portion of said body and comprising a long shank having an enlarged conical head at its outer end, a coil spring mounted on said shank within said socket portion, a ring member mounted on said shank and of larger diameter than said head and fitting snugly, but freely, in said socket portion, said spring normally seating the ring member on said head, the pin and socket elements of the other connector actuating the springs of said socket and pin elements of the first connector in loading said spring to the point of assisting separation of coupled connectors, and said contacts of at least one of the connectors having limited lateral movement accommodating misalignment of said contacts in coupling said connectors.

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