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CONNECTER

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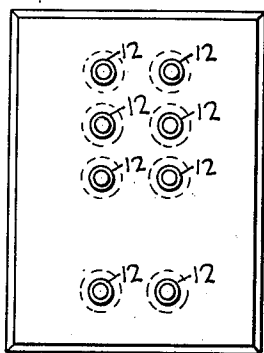


Fig. 3

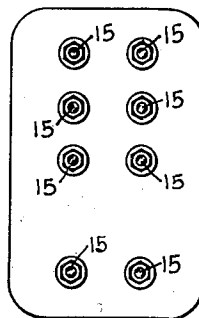


Fig. 4

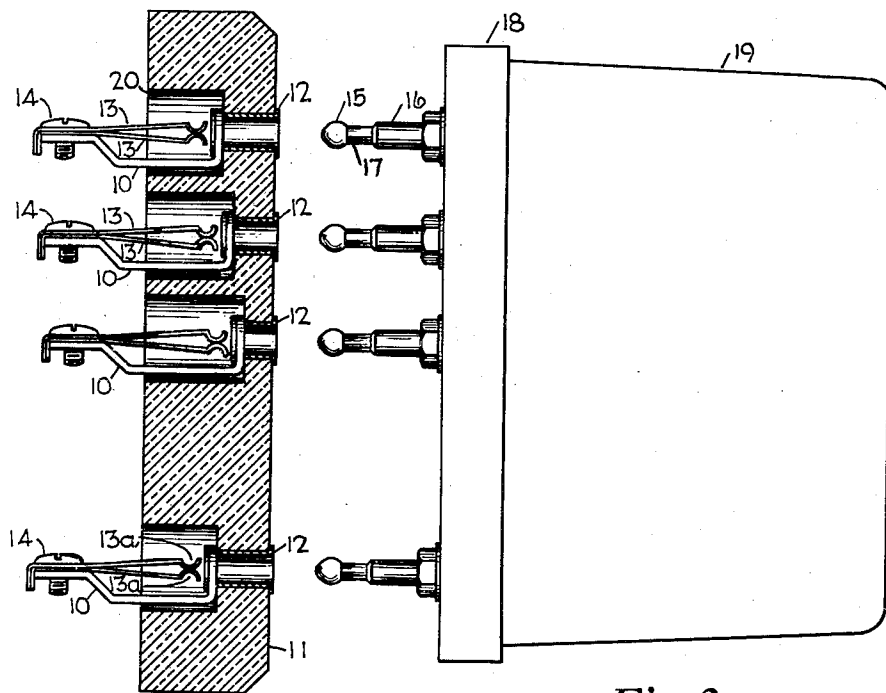


Fig. 2

Fig. 1

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UNITED STATES PATENT OFFICE

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CONNECTER

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8 Claims. (Cl. 173—328)

This invention relates to a switch employing structure akin to conventional plug and jack connectors as used in telephone and radio arts.

The feature of this invention is to provide ready means of attaching and detaching an electrical unit, such as a relay, to a panel without resorting to the use of tools, clamps, screws or the like.

Another feature of the device is the provision of a novel relation and arrangement of jack springs, and a special form of plugs arranged to reduce the effort required to effect and to interrupt the contacts and still maintain the integrity of same against existing normal forces, such as gravity and vibration.

To facilitate an understanding of the invention reference is made to the accompanying drawing which is incorporated into this specification, and in which

Figure 1 is a cross section elevation of a fixed panel carrying a series of jacks;

Fig. 2 is an elevation of a removable panel carrying an instrument and plugs bearing a fixed relation to the jacks of Fig. 1;

Fig. 3 is a reduced scale elevation of the front face of Fig. 1;

Fig. 4 is an elevation on reduced scale of the back face of Fig. 2.

The jack in a preferred form comprises an angular base member 10, one end of which is secured to panel 11 by grommet 12. At the opposite end of base member 10 dead ends of flat faced springs 13, 13 are secured by screw 14, the near end of these springs being fashioned with curved faces 13a, 13a to readily receive the head 15 of plug 16 which is made a part of same through integral reduced neck 17. A plurality of these plugs are secured to removable panel 18 which carries equipment such as relay under cover 19.

Special attention is called to the fact that the bottom of holes 20 in panel 11 are sunk to different planes in order to place the lips or lobes 13a, 13a of the jack at corresponding planes to the bottom of the holes, all in terms of the front face of the panel. It will be seen that as the plugs of the removable panel 18 are brought into engagement with the jack springs that all the springs will not be strained at the same time and consequently the effort required to effect the attachment will be minimized in terms of the effort were all of these springs to be strained at the same instant, in other words these springs are staggered so that only one or

possibly two of the plugs will enter at a given instant.

This is of particular value where a great many engagements are effected at a given cycle of operation. Attention is directed to the fact that necks 17 of the plugs are made abnormally long to admit of movement after the heads 15 of the plugs have passed the lobes 13a, 13a of the springs 13, which will cause the spring pressure on said necks to be substantially uniform. The sum total of these pressures have been found to be sufficient to hold in place a relatively heavy panel with its appurtenances. Upon removal of 18 it will follow that heads 15 will serially contact lobes 13a, 13a thereby making the removal relatively easy and substantially the same as when contacts are effected. Springs 13, 13 are identical with lobes 13a, 13a disposed on the normal central line directly in the path of travel for the plug.

In place of staggering the bottom of holes 20 in terms of each other, an alternative, although less desirable structure, it would be practicable to construct panel 11 with the bottom of the holes in substantially the same plane and then accomplish the staggering by changing the length of springs 13 or the length of bracket 10. The selected structure is preferable by reason of admitting uniform manufacture of the metallic parts of the well known system of punches and dies. Again the lobes of the jacks could be located in the same plane and the location of the heads 15 be fixed in different planes so as to stagger them for serially effecting contacts which would be the mechanical equivalent. Modifications and alterations in the structure shown can be indulged without departing from the spirit of my invention, therefore I wish to be limited only by the appended claims:

I claim:—

1. In a multiple connector, the combination of a plurality of plunger plugs mounted on a movable member, each fashioned with a head at the terminus of a reduced portion of said plug, a stationary member, and a plurality of jacks attached thereto, each composed of a pair of faced uniform yielding independent contact members having lips diametrically disposed for simultaneous electrical and mechanical engagement with the reduced portion of a correlated plug; said jacks being mounted at different planes parallel to the front face of said stationary member to provide means for serially effecting a contact by each pair of plugs and jacks, as the said members are engaged or disengaged.

2. In a multiple connector, the combination of a plurality of plunger plugs mounted on a movable member, each fashioned with a head at the terminus of a reduced portion of said plug, a stationary member, and a plurality of jacks attached thereto, each provided with a yielding contact member having a lip disposed for electrical and mechanical engagement with the head of a correlated plug; said jacks being mounted at different planes parallel to the front face of said stationary member to provide means for serially effecting a contact by each pair of plugs and jacks, as the said members are engaged or disengaged and out of synchronism with the contacting of the other plugs and jack.

3. In a multiple connector, the combination of a plurality of plunger plugs mounted on a movable member, each fashioned with a head at the terminus of a reduced portion of said plug, a stationary member, and a plurality of jacks attached thereto, each composed of a pair of faced uniform yielding independent contact members having lips diametrically disposed for a simultaneous electrical and mechanical engagement with the reduced portion of a correlated plug; said jacks being mounted on said stationary member at different depths with respect to the front face thereof to provide means for serially effecting a contact by each pair of plugs and jacks, as the said members are engaged or disengaged.

4. In a multiple connector, the combination of a plurality of plunger plugs mounted on a movable member, each fashioned with a head at the terminus of a reduced portion of said plug, a stationary member, and a plurality of jacks mounted thereon each provided with a yielding contact member having a lip disposed for electrical and mechanical engagement with the head of a correlated plug; said jacks being mounted at different planes parallel to the front face of said stationary member to provide means for serially effecting a contact by each pair of plugs and jacks, as the said members are engaged or disengaged out of synchronism with the contacting of the other plugs and jacks, said reduced portions being of sufficient axial length to retain contact with said lips after engagement.

5. In combination, a panel having an opening, a tubular rivet extending through the opening in said panel, a jack frame having a vertical base portion secured to said panel by said tubular rivet and a horizontal leg extending away from said base portion, the free end of said leg being offset to provide a mounting, a pair of contact springs secured to said mounting having their free ends facing said tubular rivet, and a plug adapted to pass through said tubular rivet to electrically and mechanically engage said contact springs.

6. In a multiple connector, the combination of a plurality of similar contact plugs mounted on a portable electrical instrument, each plug being fashioned with an enlarged substantially spheroidal end adjoining a cylindrical contact portion of said plug; a stationary panel, or the like, provided with a plurality of spring jacks mounted on a vertical face thereon and positioned to substantially register with the contact plugs on said instrument, each of said spring jacks being provided with a contact spring having a raised contact portion for mechanically engaging said spheroidal plug end and for electrically engaging said cylindrical contact portion, said raised contact portion of each jack spring being located at different depths with respect to the vertical face of said panel to permit progressive engagement of said spheroidal plug ends with the raised contact portion of said jack springs.

7. In a multiple connector, the combination of a plurality of similar contact plugs mounted on a portable electrical instrument, each plug being fashioned with an enlarged substantially spheroidal end and a cylindrical contact portion adjoining said end and forming a sharp circumferential edge adjacent thereto and substantially concentric therewith; and independent spring jack for each contact plug, each comprising a frame, a pair of co-acting contact springs and a tubular rivet for mounting said frame to a panel, or the like, and serving to guide its associate contact plug into engagement with a pair of contact springs, said tubular rivets being of greater inside diameter than the outside diameter of said contact plugs to permit each plug to freely engage the contact springs of its associate jack with variation in the alignment of said plugs and spring jacks.

8. In an electric contact device, a contact plug having an enlarged substantially spheroidal end, a cylindrical contact portion adjoining said end and forming a sharp circumferential edge adjacent thereto and substantially concentric therewith; a spring jack comprising a frame, a pair of co-acting springs extending longitudinally thereon and each adapted to be simultaneously operated by said contact plug, each of said springs being provided with a raised contact portion at their free end for electrically contacting the cylindrical portion of said plug and to mechanically engage the spheroidal end of said plug to prevent free withdrawal of said plug, said cylindrical contact portion being of sufficient axial length to retain contact and permit lateral movement with said springs after engagement therewith.

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