Feb. 26, 1963 M. LAZAR 3,079,582

PIN AND SOCKET CONNECTORS

Original Filed March 12, 1957

Fig. 1.

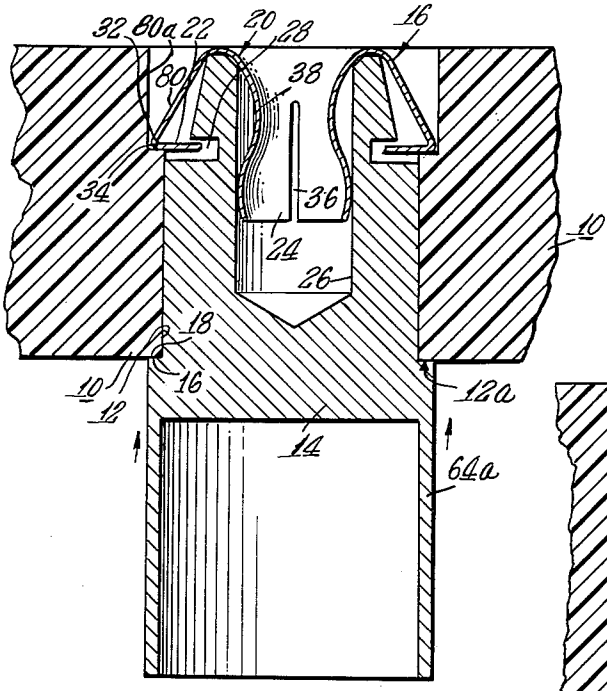


Fig. 2.

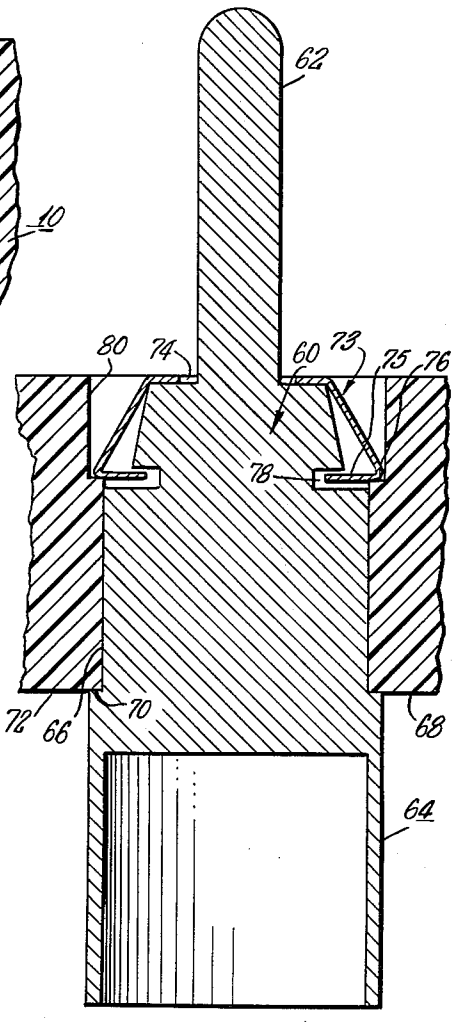


Fig. 3.

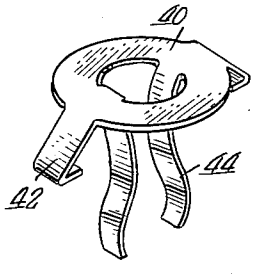
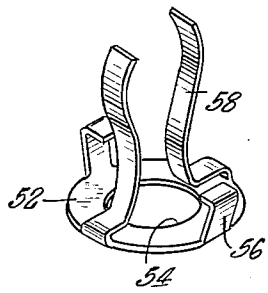


Fig. 5.



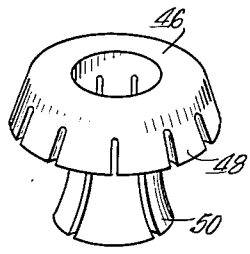


Fig. 4.

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PIN AND SOCKET CONNECTORS

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Continuation of application Ser. No. 645,591, Mar. 12, 1957. This application Apr. 12, 1961, Ser. No. 103,684
3 Claims. (Cl. 339—217)

My invention relates to pin and socket connectors and more particularly to a means for mounting the connectors to a supporting panel.

This application is a continuation of S.N. 645,591, filed March 12, 1957, now abandoned.

It is an object of my invention to provide a connector portion that cannot be sprung or misshapened should an oversized mating part be connected thereto. Further objects are to mount the connector to the panel by a separate spring which enables the connector to be disconnected from the panel to provide connectors which do not require slitting to furnish the spring action; to provide a combination of contacting spring and securing means; to provide a form of peripheral securing means into which the connector is seated; and to accomplish the foregoing in an assembly which lends itself to mass production methods.

These and other objects of the invention are accomplished and new results achieved as will be apparent from the device pointed out in the claims, and illustrated in the accompanying drawings in which:

FIG. 1 is a longitudinally sectioned view of a socket type of connector incorporating the invention, mounted to a supporting panel.

FIG. 2 is a similar view of a pin connector assembly for mating to the socket connector assembly of FIG. 1.

FIGS. 3, 4 and 5 are perspective views of various forms of the mounting and contacting spring that can be used.

Referring more in detail to the drawing, reference numeral 10 designates a mounting panel or housing having apertures 12 into which a connector 14 may be inserted. The connector illustrated is of the socket type to which the mating pin connector of FIG. 2 may be telescopically connected. The mounting of the contact in the panel aperture may be accomplished by providing a shoulder 16 on the side wall of the connector, so that when inserted into the aperture 12, the connector will be properly seated against wall 18, and positioned ready for use in the panel. A combined locking and contact spring 20 having radially extending locking fingers 22, and contact fingers 24, is positioned over the connector 14, with the contact fingers positioned in socket 26 of the connector, and the locking fingers engaged in peripheral slot 28 formed externally around the neck of the connector. The locking fingers are tapered as at 30 so that the assembly of spring and connector may be inserted through aperture 12 as a unit, the tapered portion camming past the mouth of wall 18, compressing the locking fingers 22 inwardly in the slot 28 and allowing the shoulders 32 to spring back when free of the aperture to lock against step 34 formed in the wall of the aperture.

The contact fingers 24 are slotted as at 36 to give the fingers greater flexibility in gripping the inserted mating connector at the reduced neck portion 38.

The panel may be of suitable insulating plastic material such as Bakelite. The socket connector may be of good conducting metal such as brass or copper. The dual purpose spring may be made of beryllium copper from a deep drawn cup 40 shown in FIG. 3, provided with locking and contact fingers 42 and 44 respectively, or made from sheet metal 46 and rolled and slotted to form the locking and contact fingers 48 and 50 respectively, or made from sheet metal 52 and punched out to form the

opening 54, with fingers 56 and 58 extending from the outer edge as locking and contact fingers respectively.

In FIG. 2, I have illustrated an arrangement for supporting a pin connector 60, comprising the pin 62 at one end, and a conductor engaging portion 64 at the other end. The connector is inserted into an aperture 66 of a panel 68, as previously described for the socket connector, the formed shoulder 70 engaging wall 72 to form the positioning stop while spring 73 with pin 62 seated in aperture 74 locks the connector to the panel by means of locking finger 75 engaging the step 76 and extending into slot 78. No contact fingers are provided for the pin connector as the current flow is directly from the contact fingers 24 of the spring 20 in the socket connector of FIG. 1 to the pin 62.

The wires or conductors may be inserted to the conductor engaging portion 64 of the connector 60 of FIG. 2, and the conductor engaging portion 64*a* of the connector 14 of FIG. 1, by any well known means, such as crimping or soldering, prior to the installation of the connectors in their respective panels. A tool may be inserted into opening 80 and 80*a* of the panels of FIG. 2 and FIG. 1 respectively which will cam the respective locking fingers further into the respective slots 78 and 28 to free the connectors from the panels and permit quick removal through the respective apertures.

The foregoing device permits use of a "closed entry" connector, thereby preventing misshapened or sprung connectors. A single spring may thus be used to detachably lock the connector to the panel and to grip the mating connector. A somewhat similar spring may be used for the mating connector.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown or described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of the invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which objects of my invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

I claim:

1. A contact assembly for use in a supporting insulating housing having a bore therein, the bore including a constriction forming two shoulders, comprising: a removable socket type contact for insertion into the bore having a body portion, a conductor engaging portion at one end of said body portion, a socket portion for receiving a mating pin contact at the other end of said body portion; said contact having a portion of its outer surface of reduced diameter, means to engage one of the bore shoulders to prevent overinsertion of said contact into the bore; separate spring means secured to said contact surface reduced diameter and including a first portion disposed outside of the outer periphery of said contact and spaced from said contact to engage the other of the bore shoulders; said spring means first portion and said means to engage one of the bore shoulders to prevent overinsertion serving, by said cooperation with the bore shoulders, to prevent removal of said contact from the bore; said spring means first portion adapted to be deflected away from the other bore shoulder to permit the removal of said contact and said spring from the bore; and said spring means including a second portion disposed within said socket portion to resiliently engage a therein inserted pin contact.

2. A contact assembly for use in a supporting insulating housing having a bore therein, the bore including a con-

striction forming two shoulders, comprising: a removable socket type contact for insertion into the bore having a body portion, a conductor engaging portion at one end of said body portion, a socket portion for receiving a mating pin contact at the other end of said body portion, said contact having a portion of its outer surface of reduced diameter; a shoulder to engage one of the bore shoulders to prevent overinsertion of said contact into the bore; separate spring means secured to said contact surface reduced diameter to secure said spring against longitudinal movement relative to said contact, including a locking finger to engage the other of the bore shoulders; said locking finger and said contact shoulder serving, by said cooperation with the bore shoulders, to prevent removal of said contact from the bore; a space in the outer surface of said contact; a camming surface on said locking finger, having a mode of operation whereby a force on said camming surface moves said locking finger from the other bore shoulder into said space to permit the removal of said contact from the bore; and said spring means including a second portion disposed within said socket portion to resiliently engage a therein inserted pin contact.

3. The contact assembly of claim 2 wherein said spring means further includes a solid annulus portion coaxial with said socket.

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