

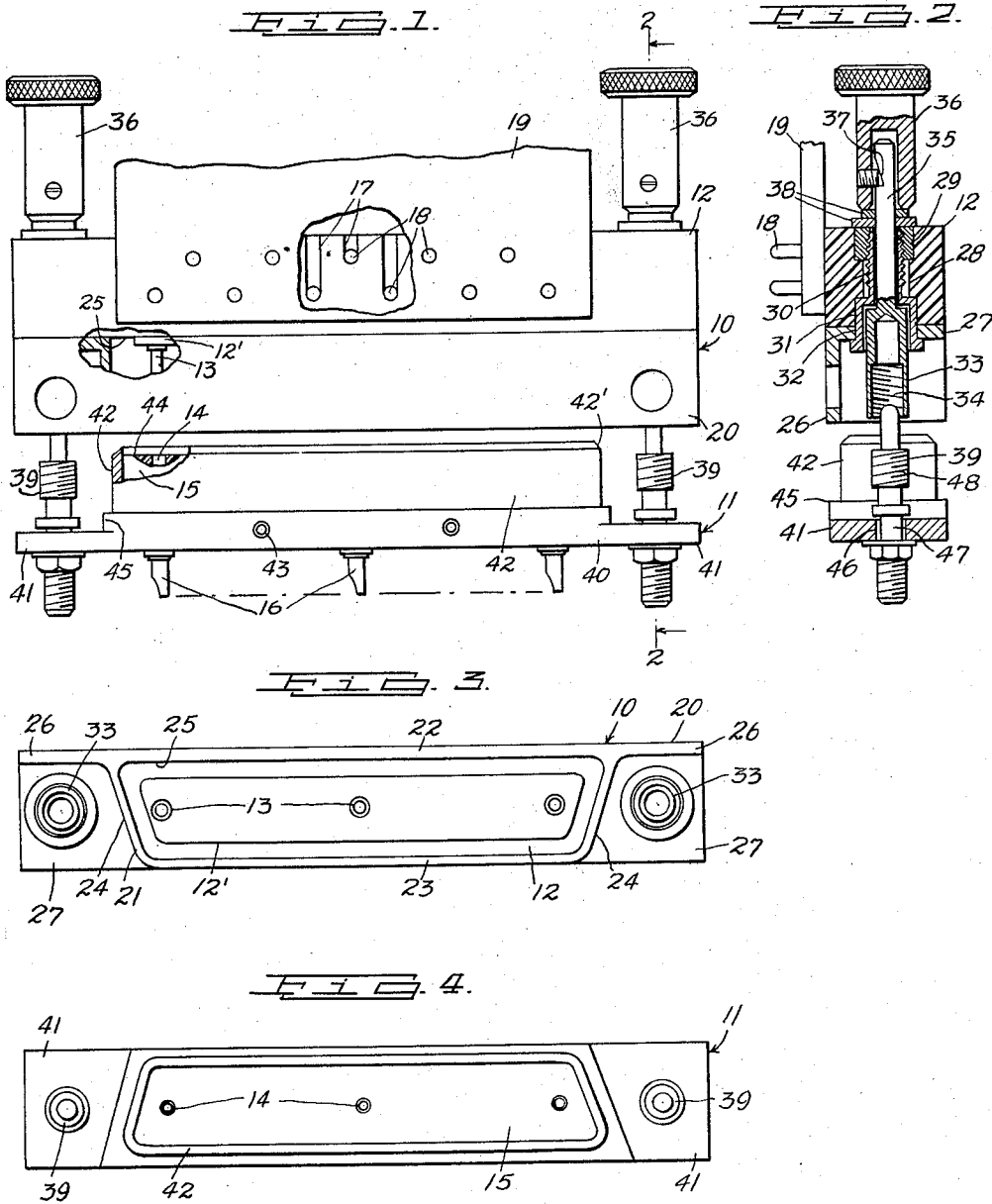
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PRINTED CIRCUIT SCREW LOCK CONNECTORS

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1

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PRINTED CIRCUIT SCREW LOCK CONNECTORS

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1 Claim. (Cl. 339—92)

This invention relates to screw lock connectors adapted for use in connection with what are known as printed circuits. More particularly, the invention deals with a connector of this type and kind, wherein the connectors are mounted in metallic frames, in which the screw lock elements are mounted in movement of the connectors into and out of engagement with each other.

Still more particularly, the invention deals with a connector structure of the character described employing the double lead screw couplings and, wherein, the frames or casings have interesting portions assisting in alignment of the connectors one with respect to the other in the coupling engagement.

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 side view of the associated connectors slightly spaced apart and in alinement for assemblage, with parts of the construction broken away and in section and showing only part of the contacts of the socket connector.

Fig. 2 is a section on the line 2—2 of Fig. 1, with parts of the construction shown in elevation.

Fig. 3 is a bottom plan view of the upper or pin part of the connector, as seen in Fig. 1, indicating only part of the pins of the connector; and

Fig. 4 is a top plan view of the socket connector part, as seen in Fig. 1, indicating only part of the sockets.

In the accompanying drawings, only part of the pin and socket contacts of the connectors are illustrated in order to simplify the showing. However, in Fig. 1, the protruding contact pins for engagement with a printed circuit are all illustrated. It will, thus, be apparent that, in the present illustration of one adaptation and use of our invention, there will be eleven sockets in the socket connector and eleven pins in the pin connector for engagement with said sockets.

In Fig. 1 of the drawing, we have shown in slightly spaced relationship to each other and in alinement for assemblage the pin connector unit 10 and the socket connector unit 11. A bottom plan view of the unit 10 is shown in Fig. 3 and a top plan view of the unit 11 is shown in Fig. 4. The unit 10 has an insulated, preferably plastic, connector body 12 with spaced pin contacts, diagrammatically illustrated at 13, the pin contacts projecting through the lower surface of the connector 12, as indicated, in part, in Fig. 1 of the drawing. These pins are adapted to enter sockets 14 in the insulated connector body 15 of the unit 11, the sockets having projecting terminal ends, indicated, in part, at 16 in Fig. 1 of the drawing, with which circuit wires are coupled by soldering or otherwise.

The connector 12 has, at one side and upper surface thereof longitudinally spaced slots 17, in which are disposed outwardly protruding contact pin ends 18 in cir-

2

cuit with the pins 13 to establish electric contact with a printed circuit card, diagrammatically illustrated at 19 in Figs. 1 and 2. No details of the circuits on the card 19 have been shown, as this forms no part of the present invention. It will appear, from Fig. 1, that some of the pin contacts 18 are disposed in a higher plane than the other pin contacts and the grooves 17 are proportionately formed.

Mounted on the lower surface of the connector 12 is an elongated rectangular mounting or coupling frame 20, including a housing portion 21 defined by long parallel side walls 22, 23 joined at their ends in end walls 24, which are contracted in the direction of the wall 23, as noted in Fig. 3, thus forming an odd-shaped chamber within the housing 21. The lower surface of the connector 12 has a downwardly protruding portion 12', generally conforming with the contour of the socket, but spaced from the walls of the housing defining said socket to form, within the socket, an annular recess 25 around the protruding portion 12'.

Protruding beyond the ends of the walls 24 of the frame 20 are angle iron portions 26 defined partially by extensions to the wall 22 and by a wall portion 27.

Now, considering Fig. 2, it will appear that the ends of the connector 12 arranged upon the extensions 26 have apertures 28, in the upper end of which is mounted an internally threaded collar 29, with which is coupled the upper threaded end 30 of a bushing 31 seating in the lower portion of the aperture 28 and in an aperture 32 of the wall 27. The combination of the collar 29 and bushing 31 serves to secure the connector 12 to the frame 20.

Freely movable axially in the bushing 31 is the socket member 33 of a screw lock connector, the lower portion having a double lead thread socket 34 and the upper end an elongated pin 35, which extends into a fingerpiece knob 36 and is keyed thereto, as indicated at 37. Disposed between the lower end of the knob in the upper surface of the collar 29 and connector 12 are washers, as at 38. The axially free mounting of the socket member 33 provides for automatic alinement of the connectors one with the other, the screw lock male or pin portions 39 having a similar mounting in the frame 40 of the connector 15, or protruding plate portions 41 of said frame.

At this time, it is pointed out that only one of the screw lock units is being specifically described, namely the one shown in section in Fig. 2. It will be understood, however, that the companion unit, at the opposed side of the connectors, as shown in Fig. 1, is of identical construction; thus, the brief description of one will apply to the other and like references will be used on like parts.

The frame 40 is elongated and rectangular in form and has, as shown in the drawing, an upwardly protruding housing portion 42, generally of the same contour as the housing 21 and, for this reason, no detail description of the wall structure of the housing is deemed to be necessary. The housing 42 is smaller than the housing 21 and is adapted to fit freely, but snugly, within the housing 21, the upper edge of the housing 42 fitting within the groove 25 of the housing 21.

It will appear, from a consideration of Fig. 1 of the drawing, that the connector 15 is mounted within the housing 42 and is retained therein by set screws or other fasteners, as indicated, in part, at 43. In this mounting, the upper surface 44 of the connector 15 is spaced below the upper edge of the housing 42, this construction providing a recess for reception of the extension 12' of the connector 12.

The lower part of the frame 40 is slightly enlarged, as seen at 45, to seat upon the lower edge of the housing 21 and, in the coupling engagement of the connectors,

3

these two surfaces are brought into abutting engagement with each other. The pins 39 or male coupling portions of the screw locks are freely disposed in, but keyed against rotation, in apertures 46 in the plate portions 41, thus providing the axial shifting for alinement, as previously stated. The keying of the pins 39 can be flat slides on the portions 47 of the pins which are disposed within the apertures 46.

The pins 39 have enlarged double lead thread portions 48 for engagement with the threaded sockets 34. By utilizing the double lead thread construction, quick coupling and uncoupling of the connectors is made possible and, further, this construction, in combination with the free mounting of the pin and socket portions, prevents jamming of the connectors in the coupling and uncoupling operation, even though one of the knobs 36 is operated to a materially greater extent than the opposed knob.

It will be apparent, from a consideration of Fig. 2 of the drawing, that alinement of the connectors is established through the sockets 33 and pins 39 prior to engagement of the housing 42 with the housing 21. The upper edge of the wall of the housing 42 is bevelled, as seen at 42', so as to be guided in the housing 21 and, after engagement of the housings one with the other, the contact pins 13 will be brought into alinement with the sockets 14, thus insuring positive engagement between the connectors. By utilizing the frames on the two connectors, a well reinforced mounting is provided which dispenses with any stresses or strains upon the plastic or other insulated bodies of the connectors 12 and 15. For purposes of description, the housings 21, 42 may be said to be dovetail in form, thus providing, in the one frame, a deep dovetail socket and, in the other frame, a shallow dovetail socket. Also, descriptively speaking, the parts 33, 39 may be said to comprise the screw lock female and male coupling elements.

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

A screw lock connector of the character described, comprising a male or pin contact connector body and a female or socket contact connector body, an elongated rectangular reinforcing frame mounted in con-

4

nection with each body, the frame of the male connector body having a substantially dovetail deep housing, the frame of the female connector body having a dovetail housing adapted to seat snugly within the housing of the male connector body, male and female screw lock elements mounted in and retained against displacement from end portions of said frames, said elements being in common alinement for moving the frames and said connector bodies into operative and inoperative engagement with each other, said elements guiding initial assembly of the connector bodies, the male connector having bushings seating on and extending through the frame thereof, said bushings extending into the male connector body and threaded to engage threaded collars seating in said male connector body, said bushings and collars serving to secure the frame to the male connector body, the screw lock elements of the male connector body seating in said bushings and having axially and radially free mountings in said bushings, and means coupled with said elements and arranged outwardly of said male connector body for retaining said elements against displacement from said bushings.

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