

Nov. 20, 1962

W. F. BONWITT ET AL

3,065,440

SOCKET CONNECTION

Filed Aug. 13, 1959

FIG. 1

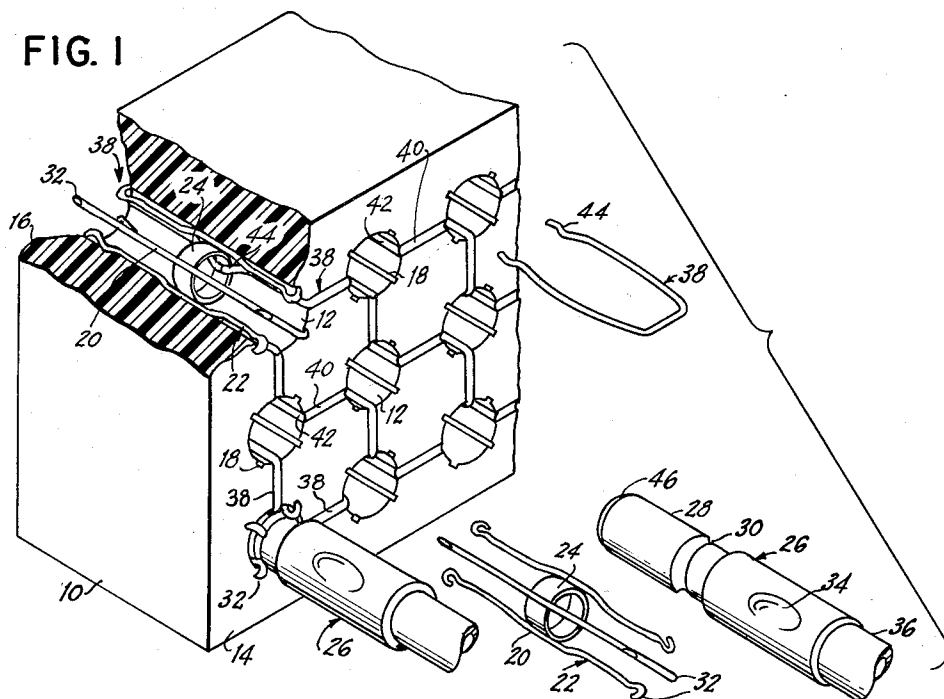


FIG. 2

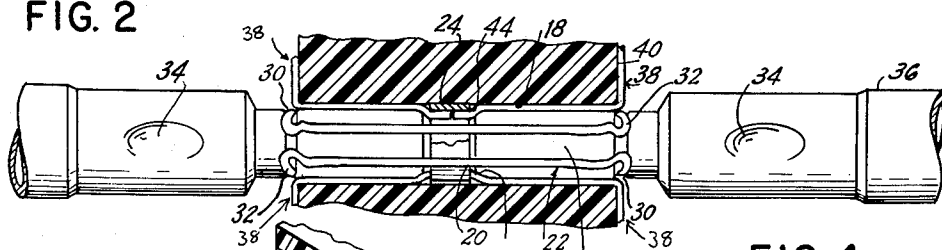


FIG. 3

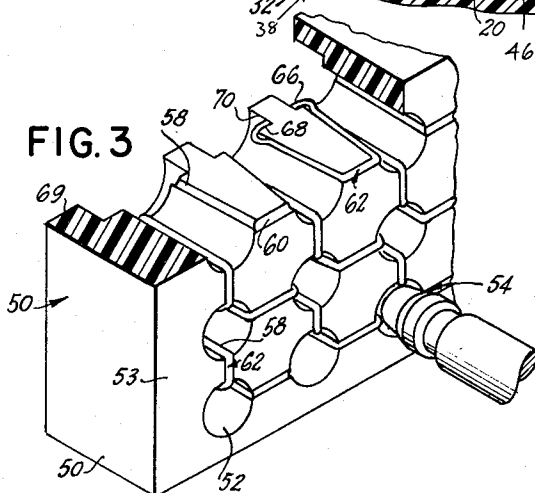
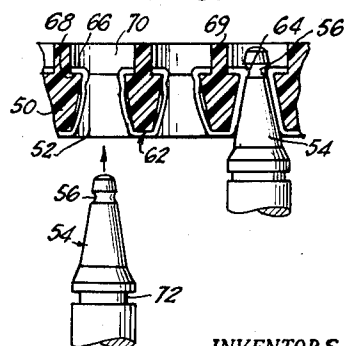


FIG. 4



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3,065,440

SOCKET CONNECTION

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Filed Aug. 13, 1959, Ser. No. 833,613

5 Claims. (Cl. 339-18)

Our invention relates to pin and socket connectors of the type used to join electrical conductors to each other, or for terminal application to a panel having a plurality of electrical circuits. More specially, our invention relates to a simplified socket connection.

Such devices hitherto have been made either on a screw machine, or by forging the parts, or by employing expensive base material such as tubing, or by rolling sheet metal into a tubular form. The principal object of the present invention is to reduce cost of a socket connection by means of a simple socket construction which may simultaneously serve to lock a pin connector to a socket, lock the socket to a panel, and transmit the current to a mating or an adjacent connector.

We accomplish these and other objects and obtain our new results as will be apparent from the devices described in the following specification, particularly pointed out in the claims and illustrated in the accompanying drawings in which:

FIG. 1 is an exploded perspective fragmentary view of a form of our invention;

FIG. 2 is a longitudinal sectional view through a panel socket;

FIG. 3 is a perspective fragmentary view of a single face panel modification; and

FIG. 4 is an exploded transverse sectional fragmentary view through the panel sockets of the same.

More specifically, in FIG. 1 of the drawing, the panel 10 contains a group of socket openings 12 extending through the panel from the front face 14 to the rear face 16. Each socket opening is provided with four longitudinally extending grooves 18 for seating for the corresponding prongs 20 of a socket 22.

The four prongs are symmetrically brazed to the outer circumference of a metal ring 24 to form the socket for a contact pin 26. About the circumference of the ferrule 28 of the pin is formed a groove 30 for receiving curled ends 32 of the prongs 20 to secure the pin 26 in the socket. The prongs are sinuously formed of wire or other suitable construction to provide sufficient spring to permit the ferrule to cam past the curled ends of the prongs and snap into the grooves of the pins. The curled ends 32 are sufficiently large in diameter to extend from the grooves 30 and engage the outside surfaces 14 and 16 of the panel, as is shown in FIGS. 1 and 2 to secure the sockets to the panel.

Thus with the wire socket locked in position on the panel the pin connector may be inserted into the socket and secured therein. The pin connector may be indented as at 34 to the bared end of the conductor 36 to complete the connection.

A U-shaped clip made of wire or suitable material 38 may be employed to transmit current from any pin connector to an adjacent connector. The panel face 14 and a portion of the socket openings are grooved, as at 40 and 42, to receive and position the U-shaped clip 38. The

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tips 44 of the clips are bowed to pass under the ring 24 of the receptacle 22 and make contact therewith. The ends 46 of the pin ferrules 28 are rounded to provide space for the connecting clip to engage the ring.

In the single face panel modification of FIG. 3, the panel 50 is provided with socket openings 52 which are conical in construction, to receive a tapered pin connector 54, having a peripheral groove 56 near the apex of the pin. The socket openings 52 are grooved longitudinally as at 58, and the face 53 similarly grooved as at 60 to receive a wire U-shaped connecting clip 62 having bulges 64 near the ends of the clips to engage the grooves 56 of the tapered connector 54. The ends 66 of the clip are inwardly bent to engage the shoulder 68 of the panel, which may be the rear face 69 of the panel or, as shown, the bottom of a rear opening 70 in the panel, to permit the apex of the connector to be contained therein.

The tapered pin connector 54 is preferably provided with a shoulder 72 for engaging an impact tool sometimes used for driving the pin into the socket. The connecting clip in the foregoing construction not only serves to electrically join adjacent connectors but also locks the connectors to the panel.

In the foregoing we have illustrated a novel form of wire socket and connecting clip which is useful for obtaining inexpensive panel connections. By our construction we provide a socket which can be simultaneously locked to the pin connector and to the panel, and easily joined to adjacent connectors in the panel.

We have thus described our invention but we desire it understood that it is not confined to the particular forms or uses shown and 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, we claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, by means of which objects of our 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.

We claim:

1. A socket connector assembly comprising,
 - a panel composed of insulating material and having a plurality of bores, each of said bores including a plurality of grooves therein;
 - a removable socket contact means disposed in each of said bores and having a plurality of resilient wire elements, each element disposed substantially parallel to the axis of said bore and located in part in one of said grooves;
 - said socket contact means adapted to receive and make electrical contact with a mating pin contact inserted therein;
 - each of said wire elements including means to interlock with said inserted pin contact to secure said pin contact to said socket contact means and
 - each of said wire elements including means securing said socket contact means resiliently to said panel.
2. A socket connector assembly according to claim 1 further includes
 - a generally U-shaped wire element having each leg of said U-shaped wire element disposed in a groove of

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different adjacent bores and adapted to make electrical contact between pin contacts inserted in each of said adjacent bores.

3. A socket connector assembly according to claim 1 wherein said bores extend through said panel from one side to the other side and said resilient wire elements are secured together by a medial annular element to form two sockets in said bore, each adjacent one of said panel surfaces.

4. A socket connector assembly according to claim 1 wherein each of said resilient wire elements comprises a U-shaped member, each of said U-shaped members having each leg of said U disposed in a groove of different adjacent bores and adapted to make electrical contact between pin contacts inserted in each of said adjacent bores.

5. A connector assembly according to claim 4 wherein each said bores includes a cone shaped portion, the larger diameter of said cone shaped portion being adjacent said panel face, the smaller diameter of said cone shaped portion being abruptly relieved to provide a shoulder; said U-shaped member being made of resilient material and having a portion passing over said panel face between said bores and means to engage said shoulder in each said bore; each said pin contact being cone shaped to mate with said

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bore cone shaped portion; said pin contact and contact element having mutual interlocking means comprising an annular groove on said pin contact and a mating resilient bend in said contact element.

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