

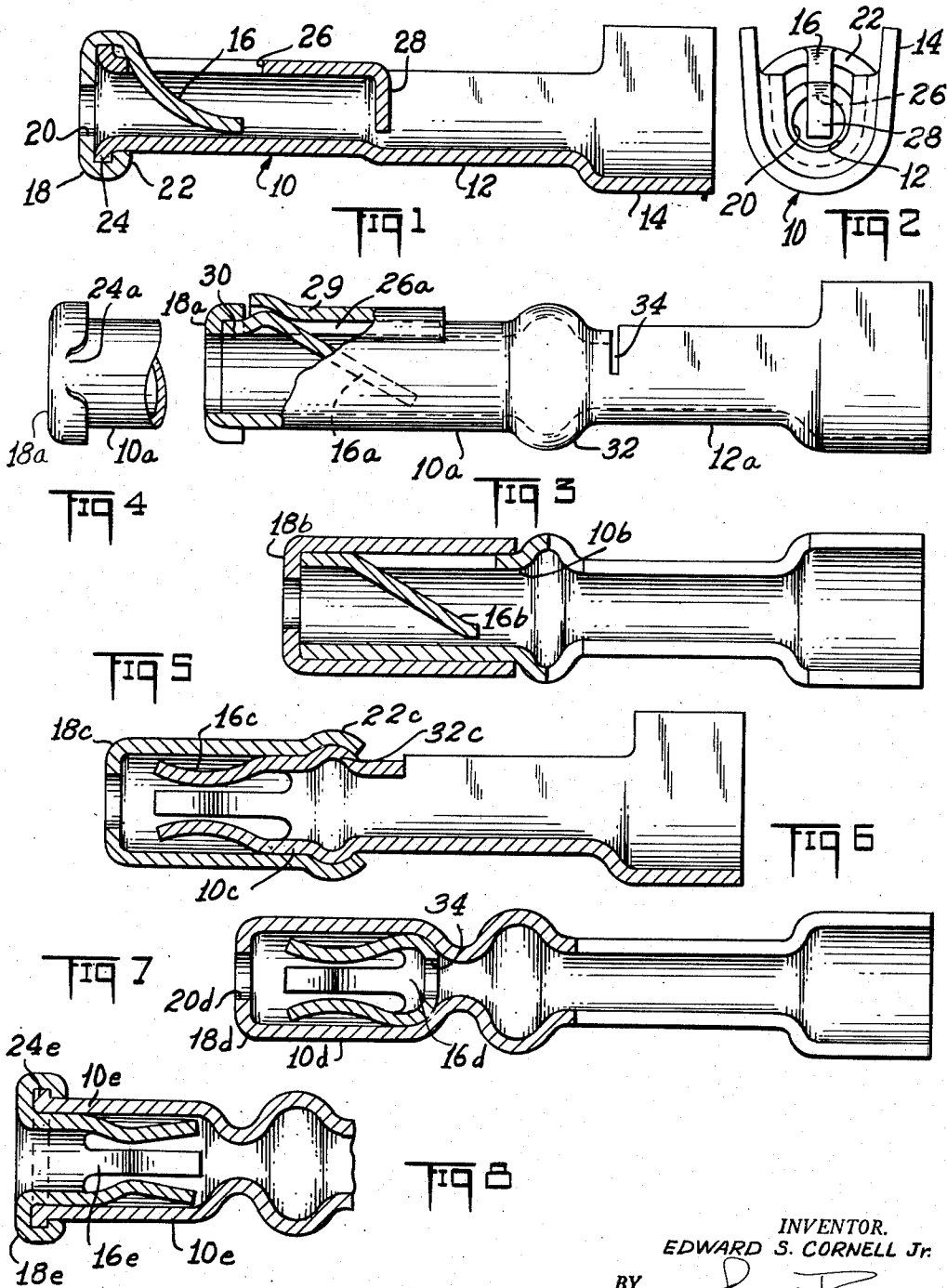
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SOCKET CONNECTOR

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SOCKET CONNECTOR

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My invention relates to socket connectors for establishing readily separable electrical connections.

These connections usually comprise a pin-shaped connector which is inserted into the socket for completing the connection. The socket connector is provided with a resilient clamping spring contact for wiping the pin to insure a clean and adequate electrical contact. It is known that the spring contact may be distorted by careless handling of the parts during the making or the separation of the connection.

Accordingly, the principal object of my invention consists in providing an aligning means to my socket connector for guiding the pin connector into the socket when a connection is made, so that no injury to the parts occurs.

Other objects are to provide such a connector wherein the aligning means will reinforce the socket against opening, if made of sheet metal; to provide such a connector with the minimum number of parts; to provide a socket connector made of soft metal suitable for indentation, containing clamping contacts made of springy metal that will not readily distort; and to provide a construction that is relatively inexpensive and lends itself to mass production.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing in which:

Fig. 1 is a longitudinal sectioned view of one form of my socket connector.

Fig. 2 is an end elevation of the same.

Fig. 3 is a side elevation, partly in section of another embodiment.

Fig. 4 is a fragmentary bottom view of the same.

Fig. 5 is a top plan view partly in section of still another embodiment.

Fig. 6 is a longitudinal sectioned view of another form of my socket connector.

Fig. 7 is a top plan view partly in section of a further embodiment.

Fig. 8 is a fragmentary longitudinal section of another embodiment.

The socket connector generally comprises a tubular metal body 10 preferably made of sheet metal to reduce the cost. The rear of the body is provided with a conductor engaging portion 12, and shroud 14 for gripping the insulation of the conductor. The conductor engaging portion may be tubular, or U-shaped as illustrated.

If it is desired to crimp the conductor engaging portion to the conductor, which is an inexpensive method of securing the connector thereto, the connector body may be made of relatively soft malleable metal.

The socket connector is provided with spring contact 16 for applying pressure to the pin, not shown, which is inserted into the conductor body. When the spring contact is made separately from the tubular body, it may be made of harder stock to resist wear and permanent deformation to insure good electrical contact and support.

In the form illustrations in Fig. 1, the spring contact is part of a cup-like member 18, which is press-fitted to the end of the sheet metal connector body. The cup also serves to keep the sheet connector body in tubular form, preventing opening of the seam. By accurate location of the cup aperture 20, an alignment guide is provided for the pin, preventing a swivel movement which is damaging to the spring contact when connections are being established or disconnected.

The cup-shaped member is peened over as at 22, about the lip 24 of the connector body forming a rigid construction. The spring contact of the cup member which is integral thereto, extends inwardly of the connector body through slot 26 provided in the wall thereof. A portion of the wall may be inwardly bent to provide a stop 28 for the wire conductor.

The foregoing construction makes an ideal socket connector in that the body may be made of soft metal for crimping, and the spring contact made of hard springy metal.

By work-hardening the metal, it is possible to stamp both the connector body and the cup-shaped member in a single piece. Such a construction is shown in Figs. 3 and 4, wherein is illustrated the connector body 10a to which is integrally formed, as at 24a, the cup-shaped element 18a which caps the end of the body. A portion 29 of the sheet metal overlaps the tubular body to form a backing therefor. The portion 30 under the overlapped portion is slotted, as at 26a, to form the tongue 16a, corresponding to the spring contact 16 of Fig. 1, but now associated with the body instead of extending from the cup-shaped element. The tongue may, in this embodiment, extend from either part, since all the parts are made of the same metal. The metal of the tongue is work-hardened during manufacture to provide a spring contact of adequate resiliency and hardness. The body 10a may be beaded peripherally, as at 32, to reinforce the body against collapse, and to provide a shoulder for retaining the connector body in an insulated panel support, not shown. The conductor engaging portion 12a may be slotted, as at 34, to facilitate crimping the U-shaped portion.

The cup-shaped member 18b may extend throughout the cylindrical portion of the connector body 10b, as shown in Fig. 5, and be press-fitted thereto, to reinforce the tubular wall against collapse and to cover the tongue 16b.

Further reinforcement can be secured by extending the peened over section 22c of cup-shaped member 18c beyond the beaded portion 32c to provide better retention of the parts in proper position, as shown in Fig. 6.

As shown in this view, instead of a single contact or tongue 16, the wall of the tubular body 10c may be slotted to provide a plurality of tongues 16c. The male or pin connector can be retained concentrically along the longitudinal axis of the connector body, instead of being pressed eccentrically against the inner surface thereof.

In each case, sufficient clearance is provided behind the tongues to provide a free clamping action without binding against other parts.

The spring contact 16d may be made separate from either the tubular body 10d, or the cup-shaped portion 18d, as is shown in Fig. 7. The connector body may thus be made of metal suitable for indentation, and the spring contact made of hard spring metal, such as beryllium copper. In the version illustrated, the spring contact is press-fitted into the tubular body, which is thereafter inwardly flanged to form the opening 20d in the cup-shaped portion. A corresponding opening 34 for the male pin connector may be formed, if desired, in the rear wall of the spring clip.

Fig. 8 illustrates a connector body 10e with the spring

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contact 16e reversed in position from that shown in Fig. 7, and outwardly flared as at 18e about the bead 24e.

In the foregoing constructions, I have illustrated and described various embodiments of my invention that are provided with an aligning guide to prevent accidental dislocation or distortion of the parts when making or disconnecting the electrical connection. The aligning guide may be used to retain the longitudinal seam in position if the tubular connector body is made of sheet metal. The connector body and aligning guide may be made from drawn sheet or tubing to form a seamless cup or tube which is thereafter pierced and slotted. While the connector body, if crimped, is advantageously made of soft copper suitable for crimping, the material may be half hard brass, or even harder, which has suitable characteristics for forming the spring contact or tongue, for making those embodiments where the connector body and tongue are one piece. In such case, work-hardening the tongue increases the spring characteristics.

I have thus described my invention, but I 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 my 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 socket connector for use with a pin connector, said socket connector comprising a tubular body portion, a spring contact contained therein for claspings and making electrical connection with the pin connector; said tubular body portion having means at the rear thereof for electrical connection to a conductor; a seamless tubular guide portion in the front thereof fitting over the end of the

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tubular body portion having an opening therein of smaller diameter than the inner diameter of the tubular body portion for aligning and supporting the pin connector in proper position for engaging the spring contact, one of said portions and said spring contact being made of a single piece of metal.

2. The connector of claim 1 wherein the tubular body portion is made of sheet metal forming a longitudinal seam and the guide portion encloses the front end of the tubular body portion to keep the seam from opening.

3. The connector of claim 1 wherein the spring contact and the guide portion are made of a single piece of metal.

4. The connector of claim 1 wherein the guide portion and the tubular body portion are made of a single piece of metal.

5. The connector of claim 1 wherein the front end of the tubular body portion is inwardly flanged to form the guide portion.

6. The connector of claim 1 wherein the guide portion comprises a tubular member extending over the tubular body portion and enclosing the spring contact.

7. The connector of claim 1 wherein the tubular body portion is provided with a peripherally extending bead, and the guide portion is tubular and extends over the bead and is secured to the tubular body portion thereby.

8. The connector of claim 1 wherein the spring contact is made of harder metal than is the tubular body portion.

9. The connector of claim 1 wherein the spring contact is separable from the connector body portion, said contact comprising a plurality of tongue-shaped portions joined together in a single piece of metal.

10. The connector of claim 9 wherein the spring contact extends from one end of the tubular body portion and outwardly flared to form the guide.

References Cited in the file of this patent

FOREIGN PATENTS

487,606	Germany	Dec. 14, 1929
730,070	Great Britain	May 18, 1955