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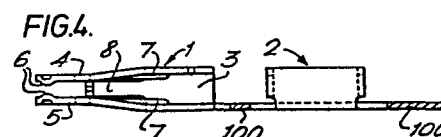
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54 **Electrical contact member with a pair of resilient cantilever contact arms.**

57 An electrical contact member comprises a pair of resilient cantilever contact arms (4, 5) which are inherently resiliently biased towards each other and supported intermediate their roots and free ends whereby a male contact (200) inserted between the contact arms (4, 5) is gripped with a contact force derived not only from deflection of the contact arms (4, 5) caused by insertion of the male contact (200) but also from the initial inherent bias of the contact arms (4, 5).



TITLE MODIFIED
see front page

Electrical Contact Member.

This invention relates to an electrical contact member, and particularly to a female electrical contact member for mating with a male contact pin.

5 In U.S. Patent Specification No. 3,915,537 there is described a female electrical contact member comprising a substantially U-shaped body portion from the sides of which extend a pair of opposed resilient cantilever contact arms between which a male contact pin can be received.

10 With this known contact member the contact arms are normally spaced from each other and are urged apart on insertion of a male contact pin between them. The contact force acting between the contact arms and the male contact pin is thus derived solely from the deflection of the
15 contact arms caused by the male contact pin, and is therefore relatively low. The contact force could be increased by reducing the initial spacing between the contact arms such that a greater deflection thereof is obtained on insertion of the male contact pin. However, such a measure
20 introduces the disadvantage that the force necessary to insert the male contact pin is considerably increased, this being a particular disadvantage when a plurality of the contact members are used in a connector where simultaneous mating of all of the contact members with associated male
25 contact pins is necessary.

According to this invention an electrical contact member as set out above is characterised in that the contact arms are inherently resiliently biased towards each other and supported at a position between their roots
30 and their free ends.

Either the contact arms can be resiliently biased directly against each other at the position of support, or the contact member can include a third, support arm extending from the body portion between the contact arms, the contact arms being resiliently biased against the support arm.

The contact member of this invention has the advantages that it provides a relatively high contact force on a male contact pin mated therewith while still allowing relatively easy insertion of the male contact pin.

In the first arrangement mentioned above the contact arms are initially bent so as to be inherently resiliently biased against each other while leaving their free ends spaced apart at a distance making insertion of the male contact pin relatively easy. When a male contact pin is inserted between the free ends of the contact arms they are deflected apart and out of contact with each other, the contact force with which the contact arms then grip the male contact pin deriving not only from the deflection of the contact arms occurring on insertion of the male contact pin, but also from the force with which the contact arms were resiliently biased against each other.

In the second arrangement mentioned above the contact arms can initially be bent to be in contact with each other, that is to a position which, if they were to be left in such position, would make insertion of a male contact pin very difficult, the support arm then being located between the contact arms to hold them apart at a distance making insertion of the male contact pin relatively easy. The contact arms are then resiliently biased against the support arm but when a male contact pin is inserted they are further deflected apart and out of contact with the support arm, the contact force with which the contact arms then grip the male contact pin deriving not only from the



further deflection of the contact arms occurring on insertion of the male contact pin but also from the force with which the contact arms were resiliently biased against the support arm.

5 Two female electrical contact members according to this invention will now be described by way of example with reference to the drawings, in which:-

Figure 1 is a plan view of a first contact member prior to a third, support arm being positioned between the
10 contact arms;

Figure 2 is a side view of the contact member of Figure 1;

Figure 3 is a view similar to Figure 1 but with the support arm moved to its final position;

15 Figure 4 is a side view of the contact member of Figure 3;

Figure 5 is a view similar to Figure 4 but showing a male contact pin mated with the first contact member;

Figure 6 is a plan view of the second contact member in an only partly formed condition;
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Figure 7 is a side view of the contact member as seen in Figure 6;

Figure 8 is a view similar to Figure 6 but with the contact member in its final form;

25 Figure 9 is a side view of the contact member of Figure 8; and

Figure 10 is a view similar to Figure 9 but showing a male contact pin mated with the second contact member.

30 The contact member shown in Figures 1 to 5 is stamped and formed from sheet metal integrally joined to a plurality of similar contact members in strip form, by means of carrier strips 100, in known manner.

The contact member comprises a contact portion 1 and a wire connection portion 2 which is of known insulation
35 displacement form and which will not therefore be described

in detail.

The contact portion 1 comprises a substantially U-shaped body portion 3 from the sides of which extend a pair of opposed resilient cantilever contact arms 4 and 5 each indented near its free end to provide a contact projection 6 directed towards that of the other contact arm. Each contact arm 4 or 5 is formed with a longitudinally extending, inwardly directed indentation 7 which serves to stiffen the contact arm across its junction with the body portion 3. Extending from the bight of the body portion 3 is a third, support arm 8 which projects in the same direction as the contact arms 4 and 5, the free end of the support arm 8 being curved towards the contact arms 4 and 5.

As shown in Figures 1 and 2, during manufacture of the contact member the stamped blank from which the contact member is formed is initially formed such that the contact projections 6 on the contact arms 4 and 5 are in contact with each other (Figure 2), the support arm 8 not being positioned between the contact arms 4 and 5 (Figure 1).

The contact arms 4 and 5 are then urged apart and the support arm 8 then moved to be positioned between them (Figures 3 and 4). The contact arms 4 and 5 resiliently engage the support arm 8 which then serves to hold their contact projections 6 apart (Figure 4). The contact member is then ready for use.

As shown in Figure 5, the support arm 8 holds the contact projections 6 spaced by a distance less than the relevant dimension of a male contact pin 200 to be mated with the contact member, such that on insertion of the pin 200 between the contact projections 6 the contact arms 4 and 5 are urged out of engagement with the support arm 8 and remain thus while the pin 200 is mated with the contact member.

Thus, insertion of the pin 200 between the contact

arms 4 and 5 is relatively easy due to the initial spacing between the contact projections 6, while the contact force with which the contact arms 4 and 5 finally grip the pin 200 is relatively high, since the force results not only from the deflection of the contact arms 4 and 5 caused by insertion of the pin 200 but also from the force with which the contact arms 4 and 5 initially grip the support arm 8.

Referring now to Figures 6 to 10, the second contact member here shown is somewhat similar to that shown in Figures 1 to 5 and corresponding parts have the same references.

The principle difference is that in the contact member of Figures 6 to 10 there is no support arm 8 but merely a bight portion 18 between the contact arms 4 and 5.

During manufacture of the second contact member the stamped blank from which the contact member is formed is initially formed such that the contact arms 4 and 5 each extend at a certain angle to the plane of the bight 18 and side walls of the body portion 3, this certain angle being such that when the U-shaped body portion 3 is subsequently formed the contact arms 4 and 5 become inherently resiliently biased against each other at a position 10 between their roots 9 and their free ends 6 as shown in Figure 9, the contact arms 4 and 5 being shaped such that their contact projections 6 are then spaced apart for insertion of a male contact pin (200 in Figure 10) therebetween. The contact arms 4 and 5 then each extend at an angle which is less than the initial certain angle to the plane of the associated side wall of the body portion 3.

The contact member is then ready for use.

As shown in Figure 10, the contact projections 6 are initially spaced by a distance less than the relevant dimension of a male contact pin 200 to be mated with the contact member, such that on insertion of the pin 200 between the contact projections 6, the contact arms 4 and 5

are urged out of engagement with each other and remain thus while the pin 200 is mated with the contact member.

Thus, insertion of the pin 200 between the contact arms 4 and 5 is relatively easy due to the initial spacing
5 between the contact projections 6, while the contact force with which the contact arms 4 and 5 finally grip the pin 200 is relatively high, since the force results not only from the deflection of the contact arms 4 and 5 caused by
insertion of the pin 200 but also from the force with which
10 the contact arms 4 and 5 are initially biased against each other.

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Claims:-

1. An electrical contact member comprising a substantially U-shaped body portion (3) from the sides of which extend a pair of opposed resilient cantilever contact arms (4, 5) between which a male contact pin (200) can be received, characterised in that the contact arms (4, 5) are inherently resiliently biased towards each other and supported at a position between their roots and their free ends.
- 10 2. A contact member as claimed in Claim 1, characterised in that the contact arms (4, 5) are resiliently biased directly against each other at the position of support (10).
- 15 3. A contact member as claimed in Claim 1, characterised by a third, support arm (8) extending from the body portion (3) between the contact arms (4, 5), the contact arms (4, 5) being resiliently biased against the support arm (8).
- 20 4. A contact member as claimed in any preceding claim, characterised in that each contact arm (4, 5) is formed with an indentation (7) serving to stiffen the contact arm (4 or 5) across its junction with the body portion (3).

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FIG.1.

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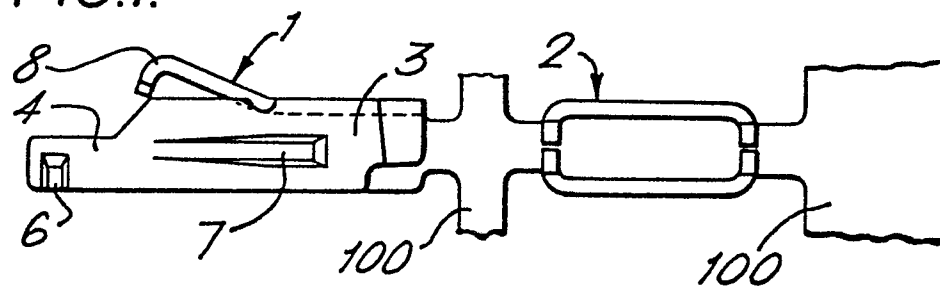


FIG.2.

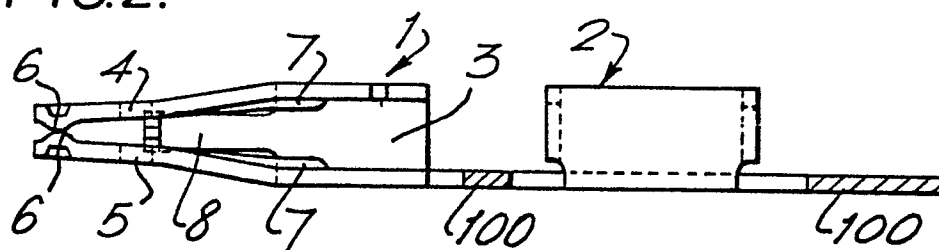


FIG.3.

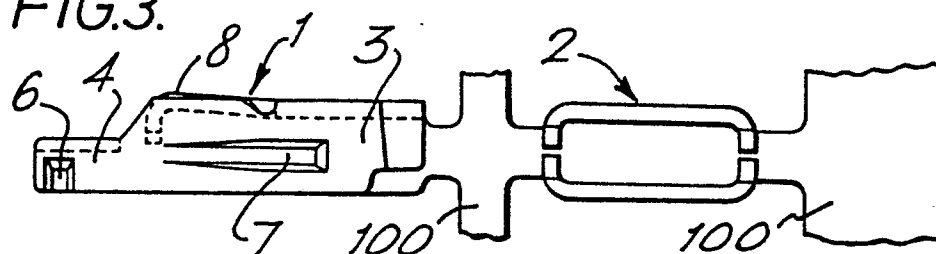


FIG.4.

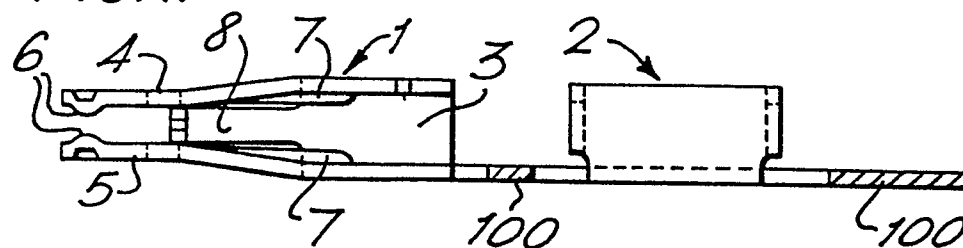
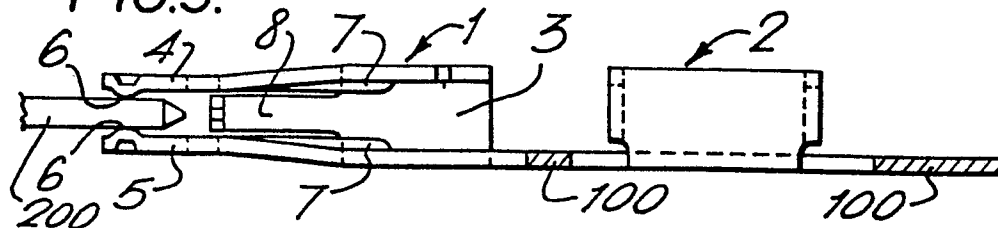
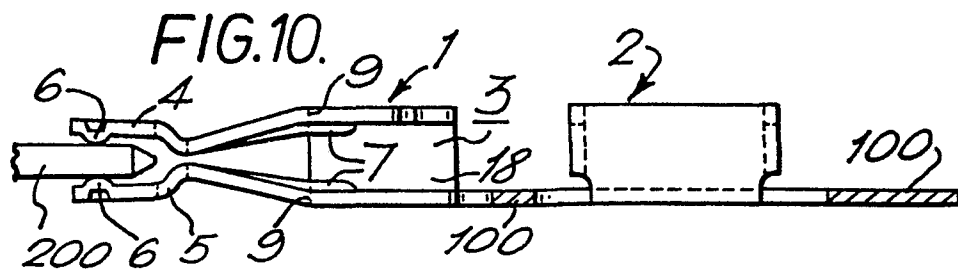
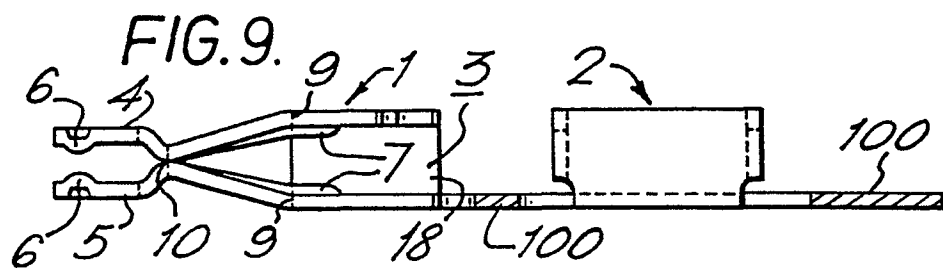
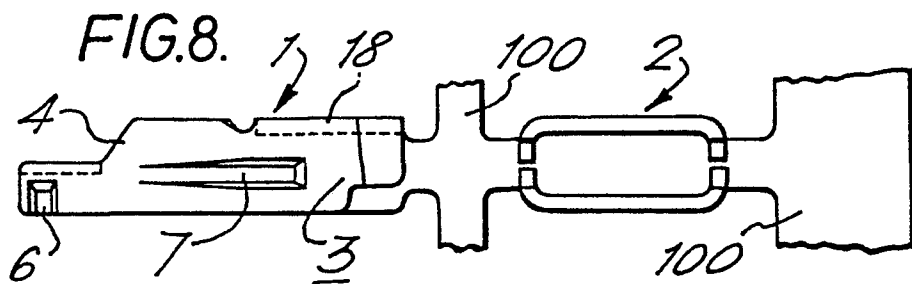
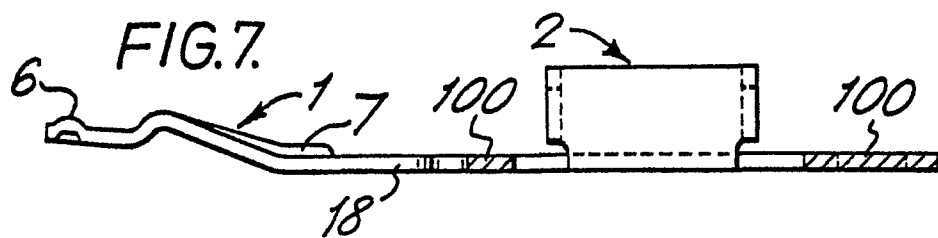
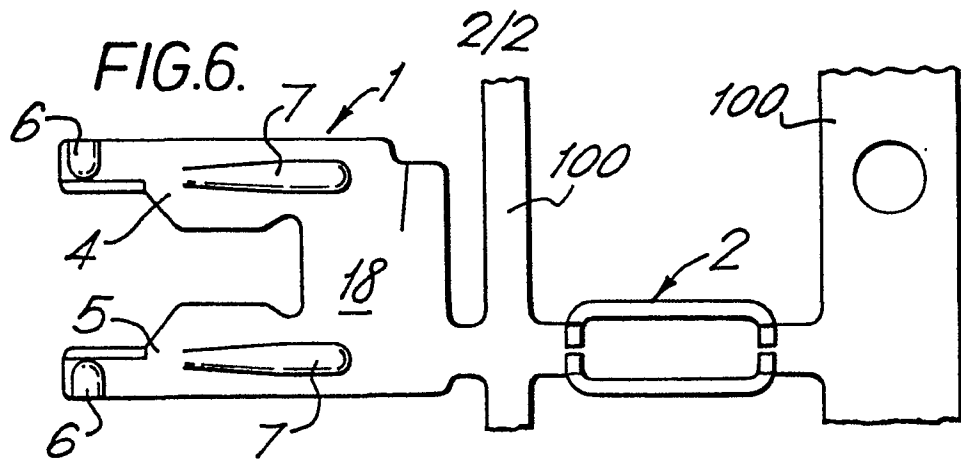


FIG.5.







European Patent
Office

EUROPEAN SEARCH REPORT

0087894

Application number

EP 83 30 0839

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 2)
A	GB-A- 622 922 (H. ROWE & CO.) * Figure 3; page 2, lines 39-94; page 2, line 103 - page 3, line 26 *	1,2	H 01 R 13/19B
A	--- US-A-2 711 523 (TELEREGISTER CORP) * Figures 2,3; column 2, lines 15-45; column 2, line 70 - column 3, line 12 *	1,3	
A	--- US-A-3 838 388 (BUNKER RAMO CORP) * Figures 1,2; column 2, lines 39-66; column 3, lines 45-55 *	1,3,4	
A	--- US-A-4 047 791 (AMP INCORPORATED) * Figure 2; column 2, lines 48-61; column 3, lines 24-30 *	1,4	TECHNICAL FIELDS SEARCHED (Int. Cl. 2) H 01 R 13/00
A	--- US-A-2 209 242 (GENERAL ELECTRIC CO) * Figures 2,3,4; page 1, column 2, lines 15-41; page 2, column 1, lines 16-21 *	1,3	

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-06-1983	Examiner WAERN G.M.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			