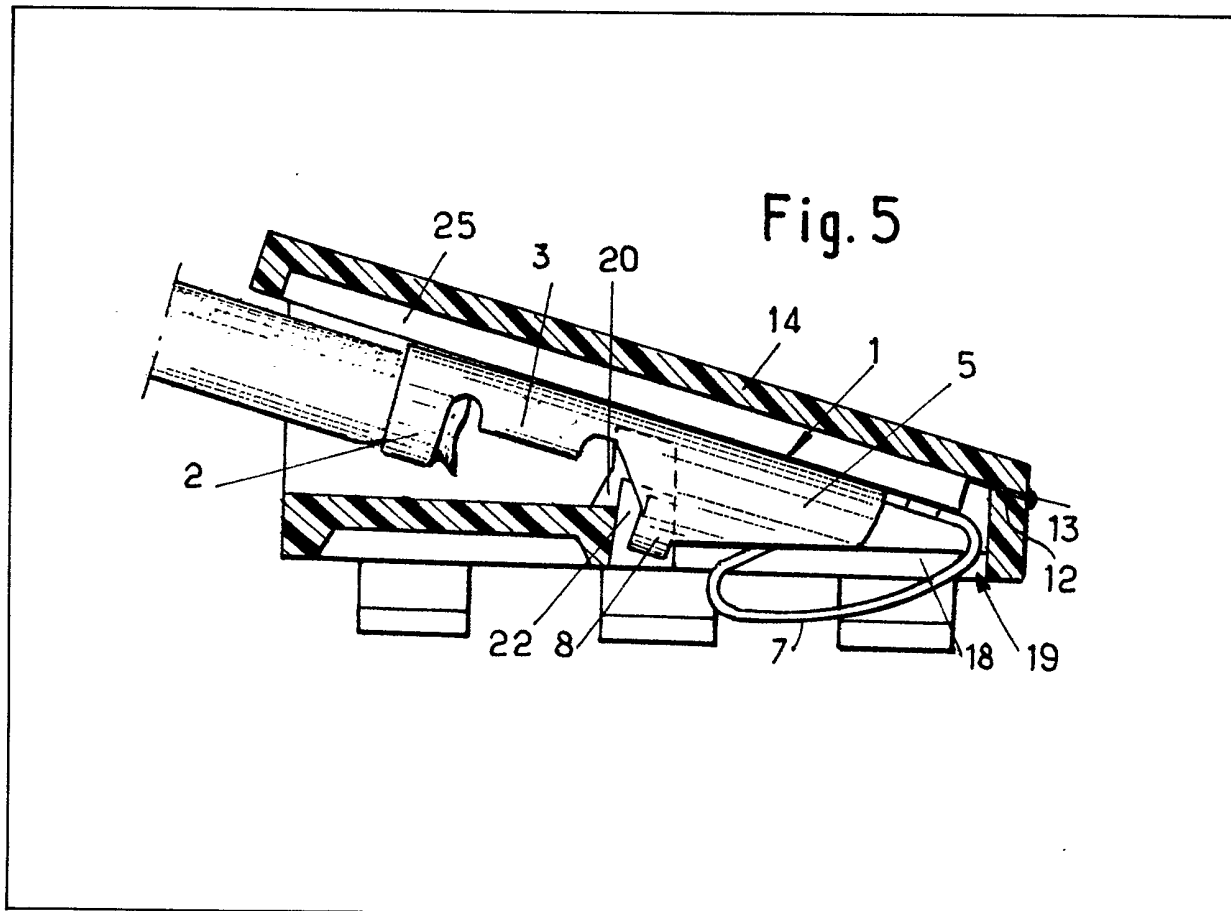
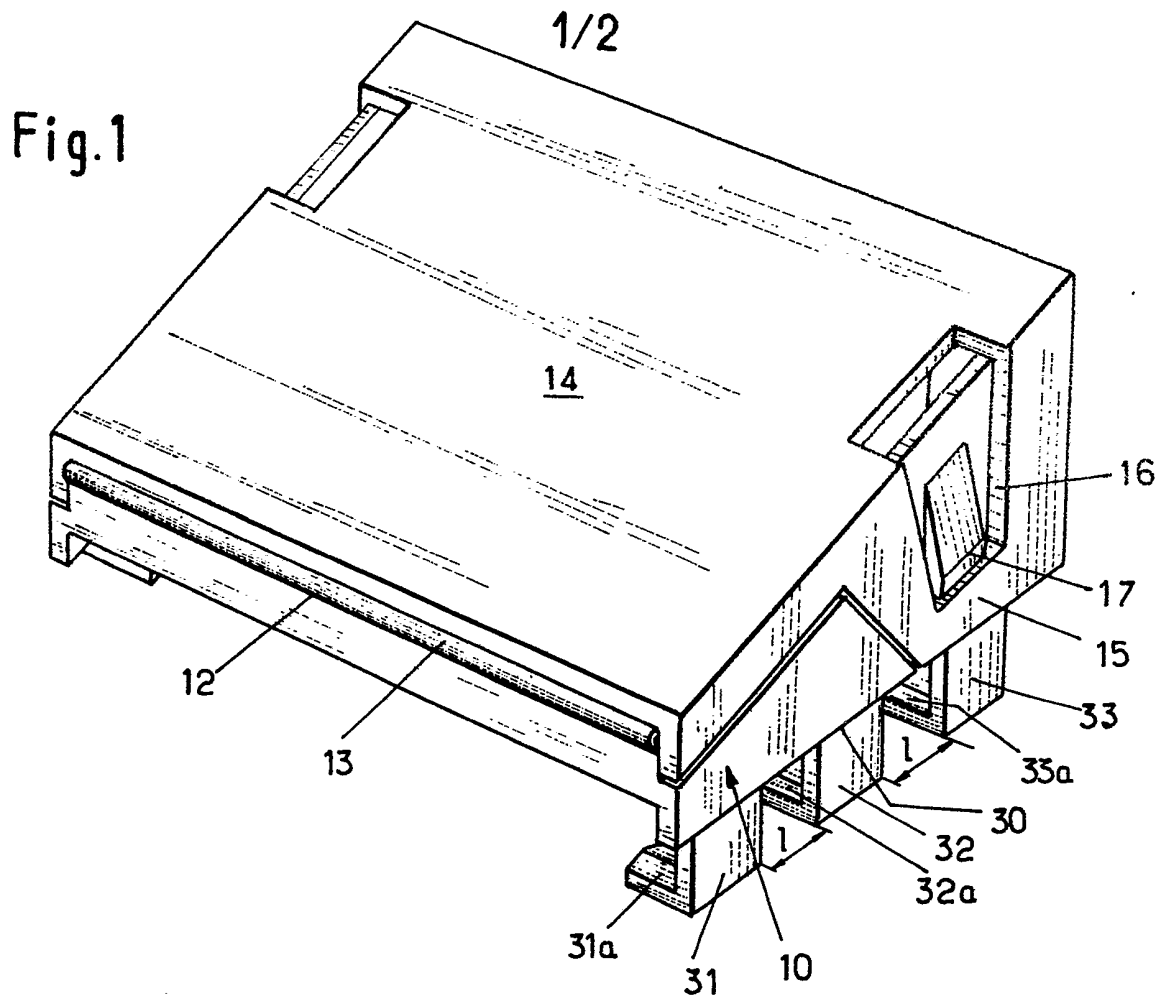


- (21) Application No 7925170
- (22) Date of filing 19 Jul 1979
- (23) Claims filed 19 Jul 1979
- (30) Priority data
- (31) 7821903
- (32) 25 Jul 1978
- (33) France (FR)
- (43) Application published 30 Jan 1980
- (51) INT CL<sup>3</sup>  
H01R 13/428
- (52) Domestic classification  
H2E 10B 22B 3A11B  
3A13 3A1 3A2 3A5 3B6  
3C2C 3C2E 3D10 3E7
- (56) Documents cited  
None
- (58) Field of search  
H2E
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(54) Electrical connectors

(57) An electrical connector for a printed circuit board comprises an electrical contact 1 having a resilient looped tongue 7, which is received in a slot 19 in the base 18 of a housing, and a U-shaped portion having a strip 8 extending from one of the sides of the U towards the base of the U, the strip 8 being received in a notch 22 of a projection 20 provided on the base 18 of the housing. The housing is provided with a cover 14 and with guides for receiving the p.c.b., the guides being interleaved with the guides of an identical connector to enable both sides of the p.c.b. to be engaged by the contacts.





**Fig. 2**

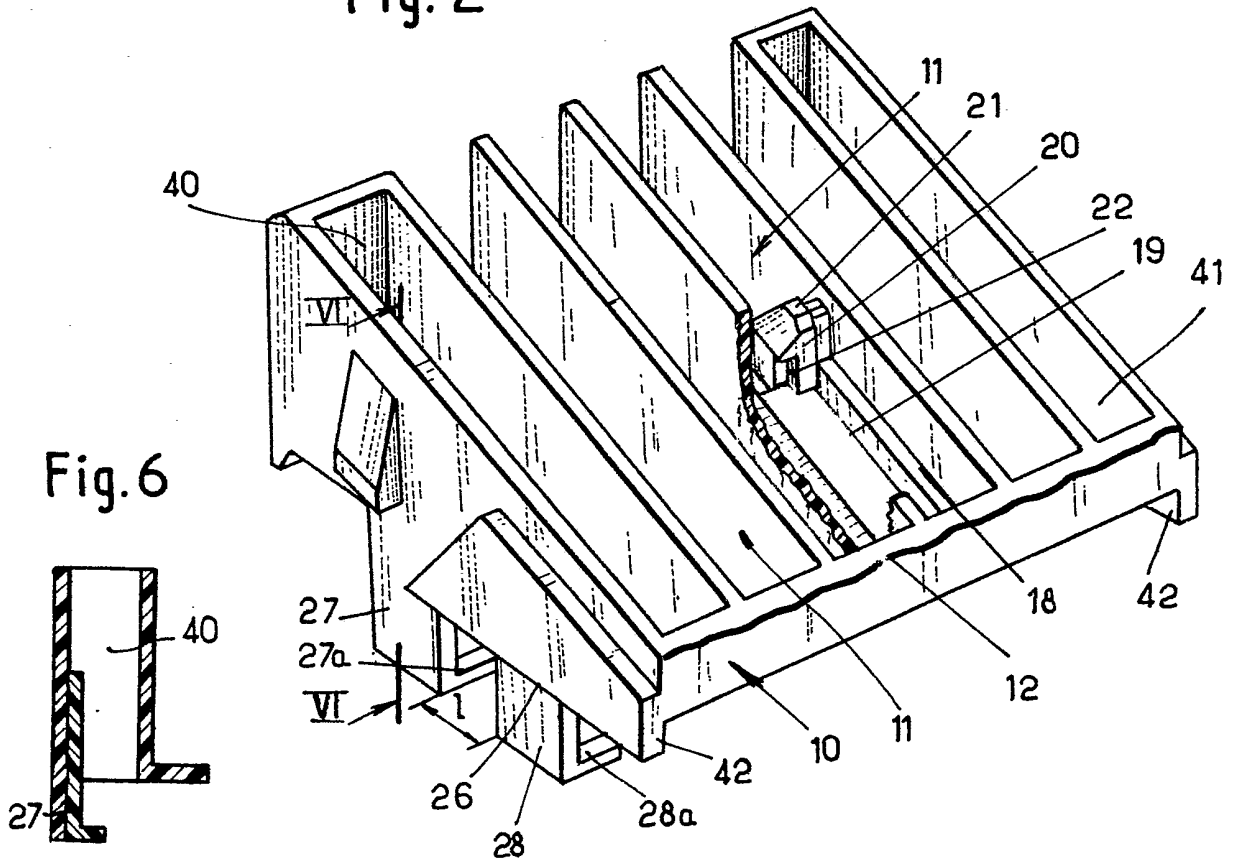


Fig. 3

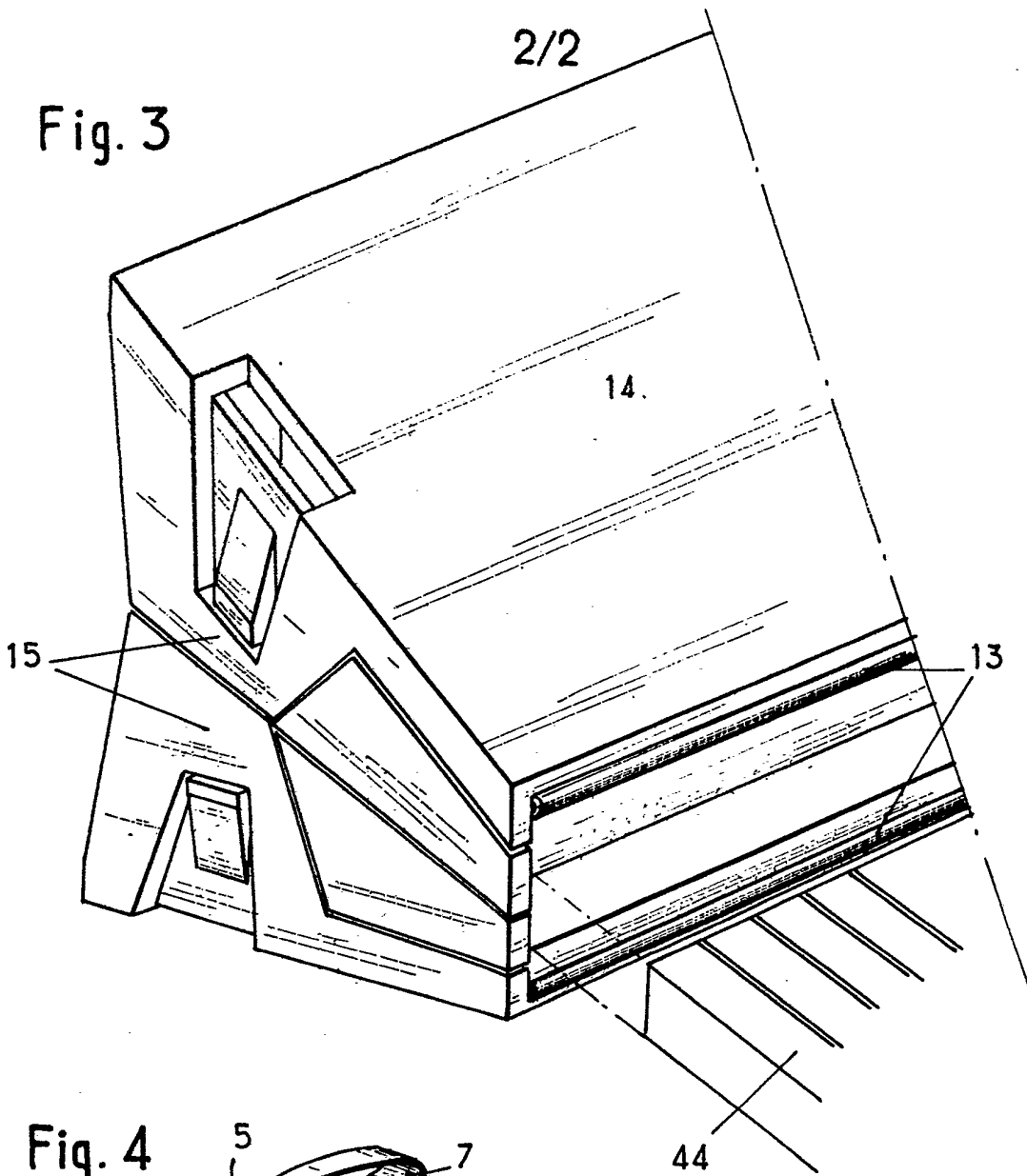


Fig. 4

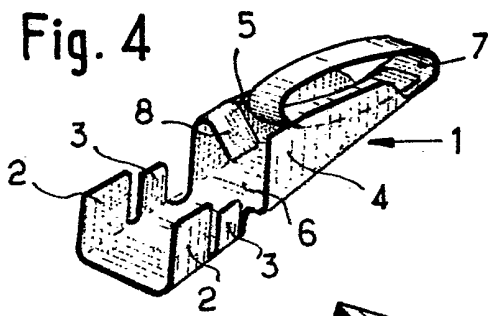
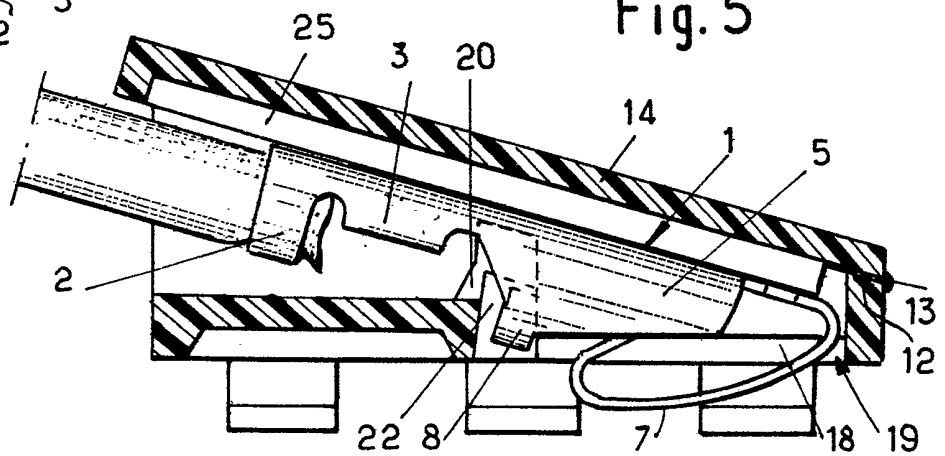


Fig. 5



## SPECIFICATION

**Electrical connecting element and housing**

5 The present invention is concerned with electrical connecting elements, such as those which are used for connecting the lead-in cables for electrical current to equipment using such current and supplied by means of electric circuits produced in the form of  
10 printed circuits. The invention is also concerned with a housing adapted to contain such connecting elements.

Such elements are known, which are made from a metal strip, which is a good conductor of electricity,  
15 which strip is suitably cut out and folded or bent so as to provide, at one end, means for its connection to an electrical conductor, the said means being extended by a part of U-section, having two sides and a web or base, the latter being extended by a  
20 tongue bent into the form of a loop so that its free end bears against the surface of the base of the U-section part.

Such elements comprise a connecting strip on the external surface of the base which is cut out and  
25 folded so as to form a projection and are positioned in housings formed by a body of insulating plastics material, of which one of the faces comprises, at its ends, guides for the engagement thereof with a plate comprising a printed circuit, the said body comprising  
30 a series of channels which are each suitable for receiving a connecting element, each channel having, on its bottom, a slot through which projects the resilient tongue, the slots opening on to the face of the body adjacent the guides and, on the opposite  
35 wall and at the bottom, a notch in which the connecting strip is adapted to be lodged by means of an elastic deformation.

We have found that such an arrangement has a certain number of disadvantages, and, in particular,  
40 the means for locking the elements in the channel of the housing are insufficient.

The present invention seeks to overcome this disadvantage.

The electrical connecting element forming the sub-  
45 ject of the present invention is made from a metal strip which is a good conductor of electricity and which is suitably bent and cut out so as to present, at its rear end, means for connection to an electrical conductor and, at its front end, a part which is of  
50 U-section having two sides and a base, the said base being extended by a resilient tongue bent into substantially ring form between the sides so that its free end bears against the surface of the base, while the housing is formed by a body of moulded plastics material provided, on one of its faces, and at its  
55 ends, with guides for the engagement thereof with a plate carrying a printed circuit, the said body comprising a series of channels which are each adapted to receive a connecting element, each channel hav-  
60 ing in its base a slot opening on to the surface adjacent the guides and adapted to be traversed by the resilient tongue, one of the sides of the said connect-

ing element comprising a connecting strip bent in the direction towards the base, and each channel of  
65 the said housing comprising, on its base, a projection provided with a lateral seating designed to receive the free end of the connecting strip, the channels being open at their end opposite the base, and the openings being concealed by a cover.

70 Because of this arrangement, we have found that the connecting elements are preferably held in their channel and the positioning thereof is facilitated.

So that the positioning of each element in its channel is simplified and the elastic deformation of  
75 the connecting strip is effected without too great an effort, the upper end of each projection is inclined in the direction of the base.

According to a preferred feature, the cover is hinged on one of the sides of the body and com-  
80 prises members associated with corresponding members of the said body for the locking thereof on said body.

So that each connecting element is perfectly engaged in its channel, the cover preferably com-  
85 prises, on its internal face, projections which each correspond to a channel and which abut against the connecting elements when the cover is closed.

In accordance with yet another preferred feature, one of the guides of one of the ends of the cor-  
90 responding face of the body is divided into at least two sections forming between them a free space, while the other guide is formed of at least one section corresponding to the said free space, the said cor-  
95 responding face being provided with seatings for receiving the free ends of the said sections.

In this way, it becomes possible for two housings to be assembled on a single plate or wafer of printed  
100 circuits, the said housing being positioned so that the faces formed with slots are turned so as to face one another and the guide sections of one housing being inserted between the guide sections of the other housing, the plate or wafer in this case comprising printed circuits on both its surfaces. Such an arrangement is of particular interest, because it  
105 permits a very large number of electrical connections to be made within a reduced space.

The invention will now be described in greater detail by reference to one particular embodiment, which is given simply by way of example and which  
110 is shown in the accompanying drawings, wherein:

Figure 1 is a perspective view of a housing according to the invention;

Figure 2 is also a perspective view of the housing according to the invention;

115 Figure 3 shows in perspective two housings which are designed to co-operate with the two faces of a sheet carrying a printed circuit;

Figure 4 is a perspective view of a connecting element according to the invention;

120 Figure 5 is a sectional view extending through the longitudinal axis of one channel of the housing, showing the positioning of a connecting element; and

Figure 6 is a sectional view along the line VI-VI of

## Figure 3.

Illustrated in Figure 4 is a connecting element 1 which comprises lugs 2 at its front end which are designed for gripping a sheath of an electrical conductor and lugs 3 which, after being bent over, grip the suitably bared conductor itself. The element 1 has a part of U-section with two sides 4 and 5 and a base 6, this latter being extended by a resilient tongue 7 which is folded into ring form so that the free end bears against the surface of the said base 6.

The upper free edges of the sides 4 and 5 are inclined in the direction of the free end of the element and the side 5 comprises a connecting strip 8 bent in the direction of the surface of the base 6.

The housing which is shown in the various Figures 1, 2, 3 and 5 is formed of a body 10 having a series of channels 11 which are open at the rear end and at the upper end, each said channel 11 being designed for receiving a connecting element 1.

A cover 14 is hinged on one edge 12 of the body 1 by means of a thinned-down strip 13, the said cover 14 comprising two lateral resilient lugs 15 which are each formed with an opening 16 which is intended, in co-operation with projections 17 of the body 10, to assure that the cover is locked in the closed position.

Each channel (see Figure 2) comprises a central longitudinal slot 19 in its bottom wall 18, said slot extending from the end adjacent the edge or wall 12 as far as a projection 20.

The projection 20 comprises, laterally, a notch 22 adapted to receive the end of the lug 8, while the upper part 21 of the said projection forms a bearing surface for the base 6 of the element 1.

The elements 1 are engaged in each channel 11, with the cover open, and the connecting strips 8 are adapted to be locked in the notches 22 by means of an elastic deformation.

On its internal surface, the cover comprises projections 25 which are adapted, when the said cover is closed and when the elements 1 are in position, to secure them against the bearing surface 21 and their sides 4 and 5 by their extreme edges against the bottom wall 18.

The bottom wall 18, close to one end 26, comprises two lugs 27 and 28 with a part 27a, 28a respectively bent at a right-angle, which lugs form guides, these latter being separated by a distance *l* which corresponds to the width of a lug.

Provided on the side 30 are three lugs, 31, 32 and 33, each having a part 31a, 32a and 33a bent at a right-angle, and which have a width identical with that of the lugs 27 and 28, the said lugs 31, 32 and 33 being separated by intervals of a width *l* corresponding to the width of the lugs 27 and 28.

The lugs 27 and 28 are formed projecting from a tubular part 40 of the body 1, the lugs 31, 32 and 33 being formed in a corresponding tubular part 41.

Because of this arrangement, two identical housings can be assembled one against the other (see Figure 3) in such a way that the faces provided with slots 19 come opposite one another, the lugs 27 and 28 of each of the housings being adapted to be respectively inserted between the lugs 31-32 and 32-33.

The bodies of the housings have flanges 42, the height of which corresponds to the thickness of the

parts 27a, 28a, 31a, 32a and 33a so that when two housings are assembled, the said parts 27a, 28a, 31a, 32a and 33a are adapted to be fitted in the corresponding tubular parts.

It is possible to insert, between the housings (Figure 3), a sheet or wafer 44 which comprises, on each face, printed circuits designed for co-operating with the tongues 7 of the elements 1. It is understood that, by means of such an arrangement, it is possible to produce a large number of electrical connections within a reduced volume.

It is obvious that the invention is not limited to the constructional form which has just been described and which has been illustrated, and that it will be possible to incorporate numerous modifications as regards details without thereby departing from the scope of the invention.

## CLAIMS

1. Electrical connecting element and a housing adapted to contain such an element, the element being made from a metal strip which is a good conductor of electricity and which is suitably bent and cut-out so as to provide means for connection to an electrical conductor at its rear end and a part of U-section having two sides and a base at the front end, the said base being extended by a resilient tongue bent into substantially ring form between the sides so that its free end bears against the surface of the base, while the housing is formed of a body of moulded plastics material provided, on one of its faces and at its ends, with guides for making engagement with a plate carrying a printed circuit, the said body comprising a series of channels which are each adapted to receive a connecting element, each channel having on its base a slot opening on to the face adjacent the guides and adapted to be traversed by the resilient tongue, one of the sides of the connecting element comprising a connecting strip bent down in the direction towards the base, while each channel comprises, on its base, a projection provided with a lateral seating suitable for receiving the free end of the connecting strip, the channels being open at their end opposite to the base, and the openings being concealed by a cover.

2. Electrical connecting element and a housing adapted to contain such an element according to claim 1, wherein the upper end of each projection is inclined in the direction of the base.

3. Electrical connecting element and housing adapted to contain such an element according to claim 1 or 2, wherein the cover is hinged on one of the sides of the body and comprises members associated with corresponding members of the said body for the locking thereof on the latter.

4. Electrical connecting element and housing adapted to contain such an element according to any one of claims 1 to 3, wherein the cover comprises, on its internal face, projections which each correspond to a channel.

5. Electrical connecting element and housing adapted to contain such an element, according to any one of the preceding claims, wherein one of the guides of one of the ends of the corresponding face of the body is divided into at least two sections providing a free space between them, while the

other guide is formed of at least one section corresponding to the said free space, the said corresponding face being provided with seatings for receiving the free ends of the said sections.

- 5 6. In combination, at least one electrical connecting element and a housing therefor, substantially as shown in the accompanying drawings and described herein with reference thereto.

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Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd.,  
Berwick-upon-Tweed, 1980.  
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY,  
from which copies may be obtained.