

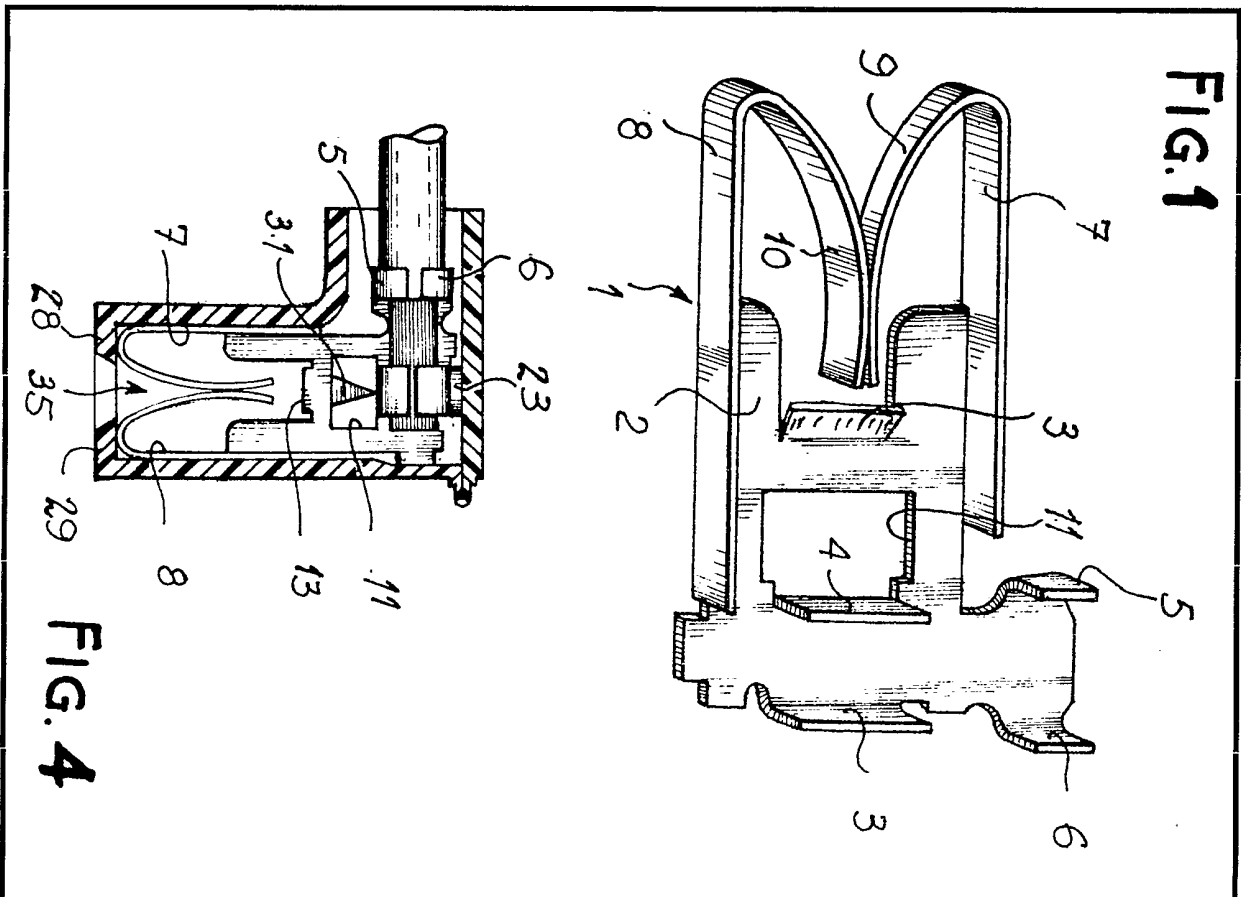
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 (71) Applicant Precision Mecanique Labinal 17 Rue de Clichy 93403 Saint Ouen

France
 (72) Inventor Raymond Chapelot
 (74) Agents Batchellor Kirk & Eyles

(54) Electrical connectors and housings therefor

(57) The invention describes an electrical connector 1 of electrically conducting resilient metal strip, cut and bent to form a plate with an opening and means 3-6 at one end for connection to an electrical conductor and a pair of arched, facing resilient tongues 9, 10 perpendicular to the plate. The housing (15, Fig. 2, not shown) for one or more such connectors provides a body with channels for the connector or connectors, each channel having at one end an opening 35 for a male connector (e.g. a printed circuit

plate) and at the other end an opening for said electrical conductors, the channels being open on the side adjacent the latter opening but provided with a hinged cover 18. Each channel has on an internal lateral wall a projection 31 co-operating with a corresponding element 11 of the connector whereby the connector is held in its channel independently of the closure of the cover. The housing and connector(s) may be coupled to a printed circuit board (not shown).



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FIG. 3

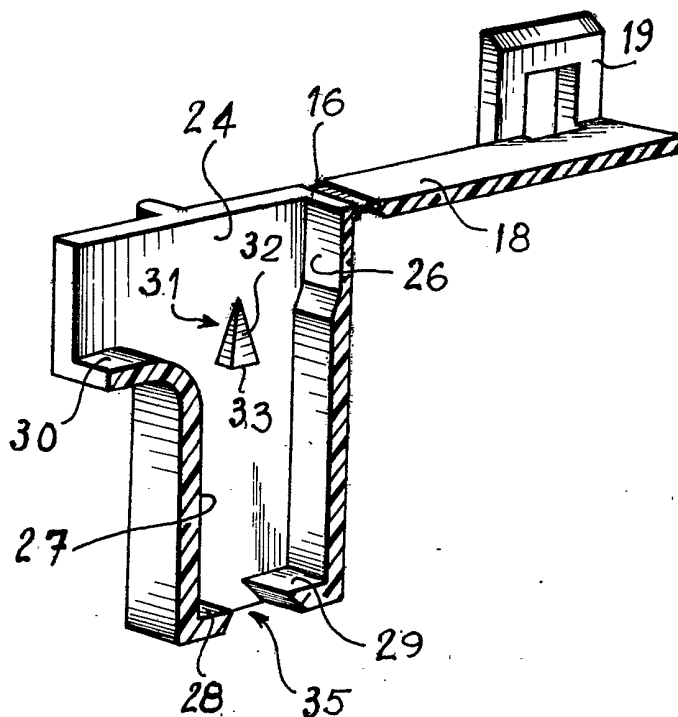
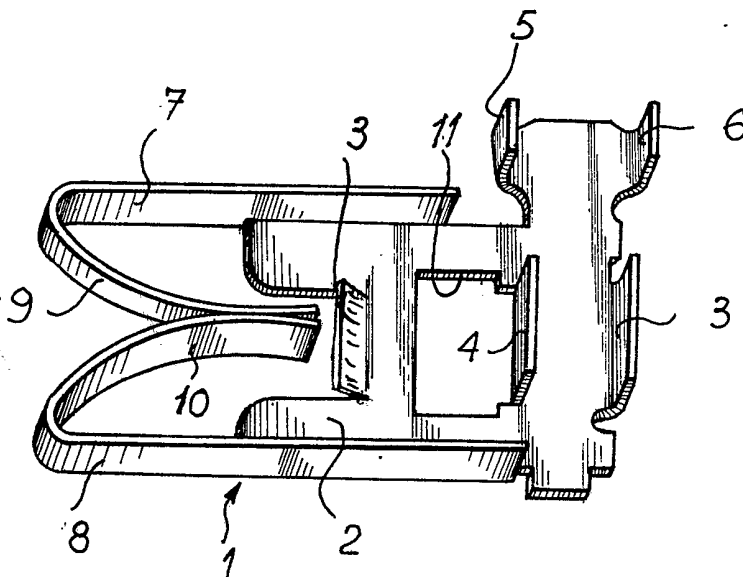


FIG. 1



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FIG. 2

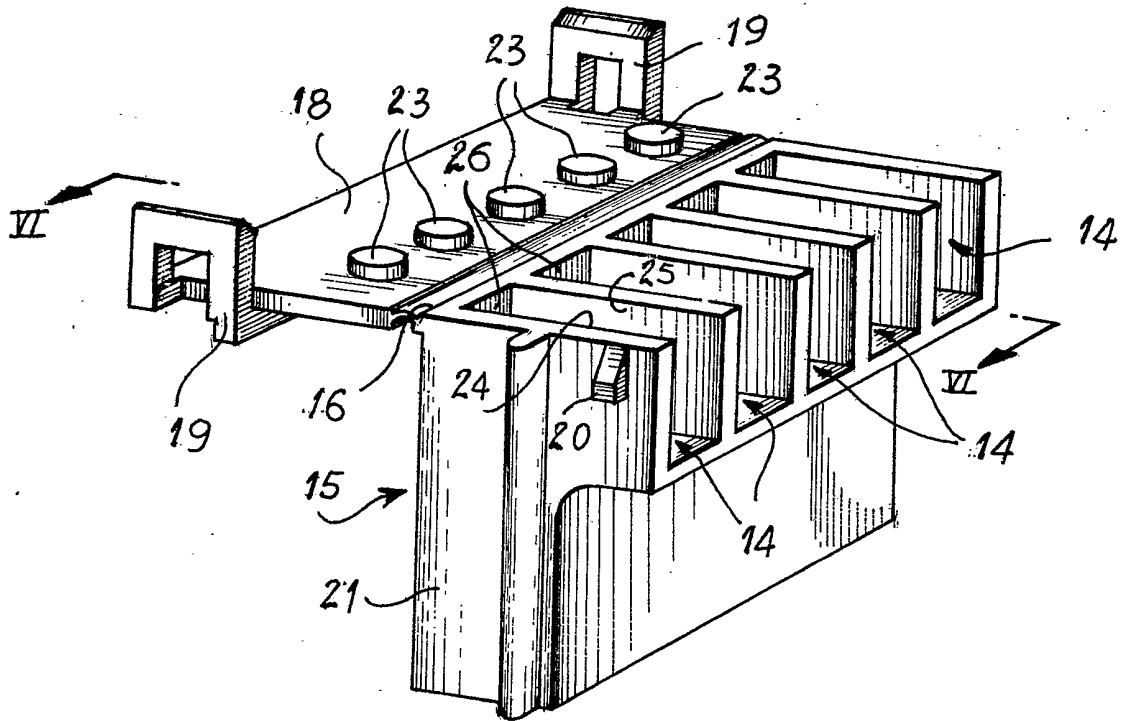
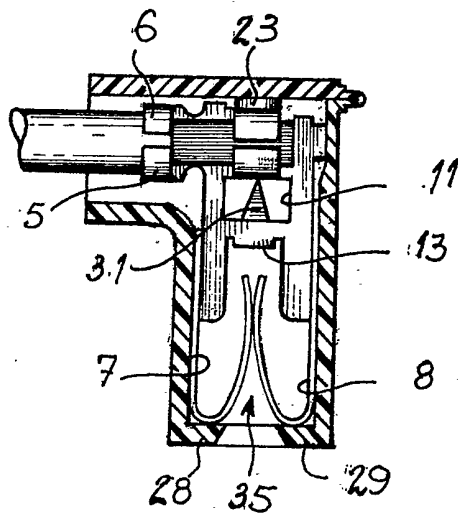


FIG. 4



SPECIFICATION

Electrical connectors and housings therefor

5 The present invention relates to electrical connectors which are designed to establish an easily detachable electrical connection between two conductor elements, one of which is fixed and the other of which is movable, and it is more particularly concerned with assemblies which comprise an insulating housing carrying a large number of female contact elements designed to co-operate with a plate carrying a printed circuit forming the male contact element.

The invention is more particularly concerned with connectors made from an electrically conductive resilient metal strip which is suitably cut out and bent so as to form a plate of generally rectangular form, of which one of the sides comprises means for its connection to an electrical conductor, while the two other sides adjacent to the latter and facing one another each comprise a tongue extending in a plane substantially perpendicular to the said plate, and the said tongues each comprise an arched extension bent in the direction of the end provided with the connection means, the said extensions being disposed facing one another and bearing one against the other.

Generally, such electrical connectors are mounted in housings which comprise a series of parallel channels, each channel having a shoulder on one of its walls, while one of the tongues is provided, at its end opposite the extension, with a projecting connecting strip designed to co-operate with the said shoulder by means of an elastic deformation.

Such an arrangement has a certain number of disadvantages: in particular when the connectors are mounted in the housing, it is practically impossible to withdraw them and, in addition, the said arrangement is not well adapted to an entirely automatic positioning of the connectors in the housings.

The present invention seeks to improve such connectors by overcoming the disadvantages referred to above.

The present invention is concerned with connectors made from a resilient metal strip which is a good conductor of electricity and which strip is suitably cut out and folded or bent so as to form a plate having an opening therein and, at a rearward end, means for its connection to an electrical conductor, and a resilient tongue along each of the two opposite sides, adjacent the said rearward end, the said tongues being disposed substantially perpendicularly of the plate and each comprising an extension of arched section, the said extensions being opposite one another, and housings made of a moulded insulating plastics material in order to provide a body with a series of channels which are each designed to contain a connector, each channel having an

opening for introducing the male connector at one end and, at the other end, an opening for the passage of the electrical conductor and each said channel being open on one side adjacent to the passage opening of the conductor, the said open sides being concealed by a cover, one of the lateral walls inside each channel of the housing being provided with a projection designed to co-operate with a corresponding member of the connector so as to hold the connector in its channel independently of the closure of the cover.

Because of this arrangement, we have found that the connectors can be very easily placed in position in the channels of the housing and, once they are placed in position, they are perfectly held, even if the cover is not closed, this greatly facilitating the assembly and permitting the use of automatic machines.

In accordance with one particular preferred feature, the internal side wall of each channel adapted to co-operate with the plate of a connector comprises a projection, of which the end opposite the opening for introducing the male connector comprises an abrupt edge, while, on the opposite side, it is connected to the wall by an inclined ramp, the position of this projection being such that it is adapted to be seated in the opening of the plate of the connector when the latter is placed in position.

So as to facilitate the positioning of the connector in its respective channel, the end of the plate adjacent to the free ends of the extensions facing one another is preferably cut out so as to form a connecting strip folded from the side of the face of the plate to which the tongues extend substantially perpendicularly.

Finally, so that each connector is perfectly secured in the corresponding channel of the housing, the cover preferably comprises on its internal face protuberances which each correspond to a channel and which abut against the connectors when the cover is closed.

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

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

Figure 2 is a perspective view of a housing designed to contain connectors, such as that which is shown in Fig. 1;

Figure 3 is a sectional view on the line III-III of Fig. 2; and

Figure 4 is a sectional view similar to Fig. 3, the housing being assumed to be closed and equipped with connectors.

Illustrated in Fig. 1 is a connector, bearing the general reference 1, which connector comprises a plate 2 with two lugs 3 and 4 which are designed to grip an electrical con-

ductor and two lugs 5 and 6 for gripping the conductor sheath.

5 Cut into the plate 1 are two tongues 7 and 8 with respective extensions 9 and 10, which are disposed facing one another and bearing one against the other.

The lug 4 is formed by a cutting of the plate 2, which cutting defines an opening 11.

10 Cut out in the plate 2 is a connecting strip 13 which is slightly bent over from the same side as the lugs 3, 4, 5 and 6, so as to facilitate the positioning of the connector in the channel 14 of a housing 15, as will be hereinafter described in detail.

15 The housing 15 (see Figs. 2, 3 and 4) is formed of a body consisting of moulded plastics material, along one edge 16 of which is hinged a cover 18 comprising two resilient tongues 19 designed to co-operate with corresponding projections 20 of the side walls 21 of the housing body so as to ensure the locking of the said cover 18 in the closed position.

25 On its face adapted to be arranged facing the channels 14 in the closed position, the cover 18 comprises a protuberance 23 for each channel.

30 Each channel 14 is defined by two side walls 24 and 25, a bottom wall 26 with a stop 29 and a wall 27, disposed facing the bottom wall 26 and extending into an opening 30.

35 Provided on the wall 24 of each channel is a projection 31, which comprises an inclined portion 32 on the side facing the cover and a sharp edge or surface 33 on the side facing the stop 29.

40 The end of the wall 27 comprises a stop 28. The stops 28 and 29, between them, define an opening 35 in which it is possible to insert a male connector formed by a printed circuit plate which is adapted to be positioned between the extensions 9 and 10 by an elastic deformation of the latter.

45 Each connector 1 is engaged in a channel 14 so that the ends of the tongues 8 and 7 co-operate with the respective stops 28 and 29, the pre-locking being assured by the projection 31 which is adapted to be engaged in the opening 11, whereas the final locking is obtained by the closure of the cover 18, of which the protuberances 23 block the connectors in the channels.

55 The introduction of the connectors 1 into the channels 14 is facilitated, because of the connecting strip 13 of the plate 2.

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

1. An electrical connector and a housing and a housing adapted to contain at least one such connector, the connector being made from a resilient metal strip which is a good electrical conductor, and suitably cut out and bent so as to form a plate in which there is an opening and having means for its connection to an electrical conductor at a rearward end and a resilient tongue along each of the two opposite sides adjacent to this rearward end, the said tongues being disposed substantially perpendicularly of the plate and each comprising an extension of arched section, the said extensions facing one another, and the said housings being made of a moulded insulating plastics material in order to provide a body with a series of channels each adapted to contain one connector, each channel having an opening for the introduction of a male connector at one end, and at the other end, an opening for the passage of said electrical conductor, and each said channel being open on one side adjacent to the opening for the passage of the conductor, the said open sides being concealed by a cover, and one of the internal lateral walls of each channel of the housing being provided with a projection designed to co-operate with a corresponding element of the connector so as to hold the connector in its channel independently of the closure of the cover.

2. An electrical connector and a housing adapted to contain at least one such connector, according to claim 1, wherein the projection of the internal side wall of each channel has an abrupt edge at its end opposite the opening for the introduction of the male connector, while it is connected to the wall from the other side by an inclined ramp, the position of this projection being such that it is adapted to be seated in the opening of the plate of the connector when the latter is placed in position.

3. An electrical connector and a housing adapted to contain at least one such connector, according to claim 1 or 2, wherein the end of the plate adjacent the free ends of the extensions which face one another is cut out to form a connecting strip folded from the side of the face of the plate to which the tongues extend substantially perpendicularly.

4. An electrical connector and a housing adapted to contain at least one such connector, according to claim 1, 2 or 3, wherein the cover comprises on its internal face protuberances which each correspond to a channel and abutting against the connectors when the cover is closed.

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

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