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(54) Electrical contact assembly.

(57) An electrical contact assembly eg. for a track lighting system comprises a housing (20) carrying bus-bars (20) in supports, preferably integrally moulded with the housing, adapters (30) for electrical devices and having contacts (32), a slot (34) extending along the housing and means (26,28) cooperating with the adapters (30) to locate them at desired positions with a portion (36) projecting through the slot (34) so that the contacts (32) register with the bus-bars (24). The adapters (30) comprise means (36,58,60) to lock them on the housing only when correctly oriented and which, as the adapter (30) is locked moves the contacts (32) into contact with a corresponding one of the bus-bars. The locating means (26,28) and portions (52,54) are preferably visible to facilitate mounting. An earth contact preferably engages the associated bus-bar before the other contacts.

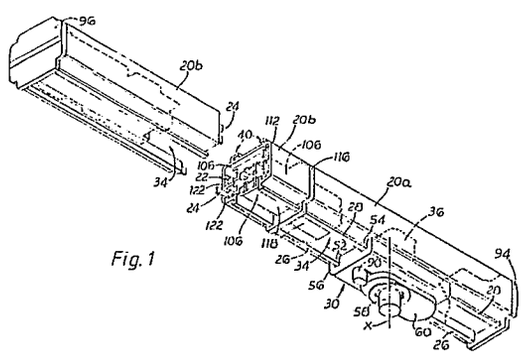

Fig. 1

EP 0 322 203 A2

Description

ELECTRICAL CONTACT ASSEMBLY

This invention relates to track electrical contact assemblies and is especially concerned with track lighting assemblies.

Track lighting assemblies have been proposed in which a series of bus-bars connected to an electrical supply are mounted so that a lighting fitment can be positioned at any point along the bus bars and take its electricity supply from them. Known existing track lighting assemblies have been of expensive construction and have consisted of a sheet metal outer member in which are accommodated suitable insulating supports carrying appropriate bus-bars. Adapters which have been provided heretofore for mounting lighting units on the metal casing and electrically connecting the lighting units to the bus-bars have likewise been of rather expensive construction and have often been difficult to mount in the correct place; for example, in some known assemblies mounting of the adapter has required a considerable amount of force and also making the electrical connections at the same time which is undesirable or, in other known assemblies where provision has been made for first mounting the adapters to the track (the adapters being of complex construction) and thereafter locking the adapter in place and making the contact connections with the bus-bars, separately actuable means have been provided for first mounting the adapter and then making the contact which is cumbersome. In many instances the manipulation of the adapter to adequately seat it and lock it in position, together with making the electrical contact is awkward. In addition, in some of the previously proposed track lighting systems there has been a significant risk that contact of the user with the bus-bars could occur whilst mounting the adapter on the track.

One of the various objects of the present invention is to provide an improved electrical contact assembly.

In one aspect the invention provides an electrical contact assembly comprising an elongate housing having a plurality of bus-bars mounted therein, mounting means adapted to carry an electrical device and provided with a plurality of contacts for engagement with the bus-bars, an elongated slot extending lengthwise of the housing and locating means adapted to cooperate with the mounting means whereby to locate the mounting means in a desired orientation on the housing at any position lengthwise of the housing so that a portion thereof projects through the slot , with the contacts projecting into the housing in register with the bus-bars. the mounting means comprising operating means by which it can be locked in place on the housing only when in said desired orientation and by which, as the mounting means is locked in position, the contacts are moved, each into electrical contact with a corresponding pre-selected one of the bus-bars.

In a preferred assembly, where one of the contacts is an earth contact and one of the bus-bars is intended to be earthed, the operating means is arranged to ensure that one of the contacts, namely the earth contact, engages the associated bus-bar (the earth bus-bar) before any of the other contacts engage their corresponding bus-bars.

Preferably the locating means comprises means provided on the housing arranged to cooperate with locating portions on a base portion of the mounting means whereby to locate the mounting means in said desired orientation on the housing. Suitably said locating portions and locating means may be provided by projections on one and recesses on the other of the housing and base portion which can only be brought into mating engagement when in the desired orientation. Conveniently the projections are provided by parallel rails of different widths on the housing and the recesses by parallel grooves of different widths corresponding with the rails on the base portion.

Suitably the slot of the housing of an assembly in accordance with the inventin is of such a width and so positioned as to militate against the contacting of the bus bars by a linear probe inserted through the slot.

Preferably the housing of an assembly in accordance with the invention also comprises integrally mounted shielding means within the housing to shield the bus-bars from being contacted by linear probes inserted through openings in the housing.

In a preferred assembly in accordance with the invention the housing is extruded of a suitable plastics material which is rigid (but not brittle) and provides good electrical insulation and the housing has integrally moulded internal supports for the bus-bars. The preferred contact assembly is a track lighting assembly and the mounting means in this case carries a suitable lighting device, e.g. a spot-light.

Preferably an assembly in accordance with the invention comprises support means integrally moulded with the housing, by which the assembly can be mounted on a surface. Suitably the support means comprises a pair of parallel rails having inwardly facing lips adapted to be engaged by a cooperating device secured to the surface.

Preferably mounting means for use in an assembly in accordance with the invention comprises a base portion adapted to engage the locating means of the housing whereby to locate the mounting means on the housing, locking means for locking the base portion in located position to the housing and means for moving the contacts into electrical contact with the bus-bars after the mounting means has been located on the housing. Preferably the locking means and the means for moving the contacts into electrical contact with the bus-bars are arranged to be operated, by an operating member, from an inoperative to an operative condition (and vice versa) in a single movement.

A preferred mounting means comprises a carrier by which the contacts are carried and which also

comprises locking means adapted to engage portions of the housing whereby to retain the mounting means in location on the housing. The carrier is preferably mounted for rotation on a base portion about an axis extending at right angles to the base portion and to the lengthwise direction of the housing (when the mounting means is located thereon) to move said locking and contact means into and out of their operative conditions. However in assemblies in accordance with the invention other systems may be employed to effect locking and contact with the bus-bars, for example a linear movement from a retracted to an extended position by operation of a slider mounted on the base portion externally of the housing. Conveniently the carrier may comprise a plurality of parts assembled together to provide the carrier and the parts used will be selected according to the precise use to which the assembly is to be put: for example, where only two bus-bars are to be used, the carrier may provide two contact sets but where a plurality, for example four, bus-bars are to be used a further member may be included in the assembly of the carrier to accommodate the two further contact sets.

An assembly in accordance with the invention may be designed to accommodate any convenient number of bus-bars; however, the preferred assembly comprises a housing with internal supports for up to four bus-bars, although only two or three may actually be used (or indeed, present) in some circumstances.

Conveniently the base portion and parts of the carrier of the mounting means are moulded e.g. injection moulded, from a suitable plastics material.

A track lighting assembly according to the invention may further comprise end members adapted to be received in open end portions of the housing to close the ends. At least one of the end members preferably comprises connector assemblies by means of which conductors of an electrical supply e.g. mains wiring, may be connected to bus-bars in the housing. Preferably the end member carrying the connector assemblies is constructed so that it can only be inserted in one end of the housing, in correct orientation to ensure that each connector assembly can contact only a pre-determined one of the bus-bars. Conveniently the end members comprise means ensuring that the bus-bars occupy the correct positions lengthwise of the housing.

A track lighting assembly in accordance with the invention may comprise a plurality of similar housings each joined to the next by coupling means having portions received in adjacent open end portions of adjacent housings and comprising coupling connector assemblies adapted to engage the bus-bars of the adjacent housing to electrically connect the bus-bars. Preferably the coupling means is constructed so that it can only be inserted in correctly orientated housings whereby to ensure that each coupling connector assembly can contact only pre-determined ones of the bus-bars in each housing, thus to ensure that corresponding bus-bars in each housing are interconnected by the coupling means.

In another aspect, the invention may provide an elongate hollow plastics housing for an electrical contact assembly having integrally moulded internal supports for a plurality of bus-bars, and means for locating mounting means for an electrical device on the housing in position for contacts mounted on the mounting means to engage bus bars carried by the internal supports.

There now follows a detailed description to be read with reference to the accompanying drawings of a track lighting assembly embodying the invention. It will be realised that this track lighting assembly has been selected for description to illustrate the invention by way of example.

In the accompanying drawings:-

Figure 1 is a perspective view of a track lighting system embodying the invention;

Figure 2 is a perspective view of an adapter of the assembly in an unlocked condition;

Figure 3 is a perspective view of the adapter shown in Figure 2 in a locked position;

Figure 4 is a perspective view of a coupler;

Figure 5 is a perspective view of a connector end member of the assembly;

Figure 6 is a view in section of a housing of the illustrative assembly;

Figure 7 is a view in side elevation of the adapter;

Figure 8 is a view of part of a carrier of the adapter showing contacts of the carrier;

Figure 9 is a plan view of part of the carrier showing the position of contacts therein;

Figure 10 is a perspective view of an end closure member of the assembly;

Figure 11 is a view in section of a further part of the carrier;

Figure 12 is a plan view of a support for the assembly;

Figure 13 is a side view of the support; and

Figure 14 is a view of a base portion of the adapter from below.

Referring to Figure 1, a perspective view of the illustrative track lighting assembly is shown. The illustrative assembly comprises an elongated, extruded, hollow plastics housing 20 having integrally moulded internal supports 22 (see Figure 6) for a plurality of bus-bars 24 and means comprising a pair of parallel rails 26, 28 for locating mounting means, provided by an adapter 30 for a light unit, on the housing 20 in position for contacts 32 (see Figure 8) mounted on the adapter 30 to engage the bus-bars 24 carried by the internal supports 22. The housing 20 is extruded from a suitable plastics material, for example acrylonitrile-butodiene-styrene copolymer, which is rigid but not brittle and provides good electrical insulation and satisfactory heat resistance. A suitable plastics material is available under the Trade name "Bayblend T".

The housing 20 has an elongated slot 34 bounded by the rails 26, 28 extending lengthwise of the housing and through which a portion of the adapter, namely a carrier 36 is arranged to project into the interior of the housing 20. The slot 34 is of such a width and so positioned as to militate against contacting of the bus-bars 24 by any linear probe

inserted through the slot. The housing 20 further comprises integrally moulded shielding means 38, 39 in the housing to shield the bus-bars 24 from being contacted by probes inserted through any openings, primarily the slots 34, in the housing 20. The housing 20 further comprises support means provided by a pair of parallel rails 40 integrally moulded with the housing 20 having inwardly facing lips 43 adapted to be engaged by a cooperating device secured to a surface on which the housing 20 is to be mounted, for example a wall or ceiling.

A mounting device 42 is shown in Figures 12 and 13 and a plurality of such devices are secured to the surface to which the housing 20 is to be mounted. Each device comprises a central boss 44 having a central hole 46 therein. A flange 48 comprises two parts which project from the boss 44 at opposite sides thereof. A number of the devices 42 are secured by means of screws passing through the holes 46 to the surface with the boss in engagement with the surface and with the flange 48 spaced from the surface. The devices 42 are aligned with their flanges 48 projecting parallel to the line joining adjacent ones of the mounting devices 44. In this position, when the housing 20 is presented to the mounting devices 42, the mounting devices 42 are received between the rails 40. Each boss 44 is provided with an hexagonal flatted portion 50 which may be engaged by a spanner to rotate the mounting device 42, after the flange portions have been positioned between the rails 40, so that the flanges 48 are received between the lips 43 and the main body of the housing 20 in a channel therebetween (see Figures 1 and 6). To assist in entry of the flanges 48 between the lips 43 and body of the housing 20, the flanges 48 are provided with tapering lead-in portions (see Figure 13). By this means the housing 20 can readily be mounted on a support surface.

As hereinbefore mentioned locating means comprises a pair of parallel rails 26, 28 bounding the slot 34: the rails 26, 28 are of different widths and the adapter 30 comprises cooperating locating portions. The adapter 30 comprises a base portion 56 in which the locating portions, namely a first groove 52 adapted to cooperate with the rail 26 and a second, wider, groove 54 adapted to cooperate with the rail 28 are formed. As it is only possible for the rails 26, 28 to be received in the grooves 52, 54 when the orientation of the base portion 56 is correct, means is thus provided so that the adapter 30 can only be located on the housing 20 in a desired orientation. The adapter 30 further comprises the carrier 36 which is carried on the base portion 56. The carrier 36 is arranged to carry the contacts 32 and comprises locking means adapted to engage portions of the housing when in a locking position whereby to retain the adapter 30 in location on the housing 20. The carrier 36 is mounted for rotation on the base portion 56 about an axis X extending at right angles to the base portion and to the lengthwise direction of the housing (when the adapter 30 is mounted thereon) in order to move the locking and contact means into and out of an operative condition.

The carrier 36 comprises a plurality of parts maintained in assembled condition by means of a screw or other device (not shown). The parts comprise a spindle member 58 mounted for rotation in an opening in the base portion 56, operating means including an operating member 60 received on an end portion of the spindle member 58 projecting outwardly of the adapter 30 beyond the base portion 56, and a plastics nut 62 providing a guide collet for a connecting cable to a lighting unit and threadedly received on the projecting end portion of the spindle member 58. A shoulder 64 on the spindle member 58 (see Figure 11) locates the spindle member 58 axially along the axis X relative to the base portion 56. The operating member 60 is keyed to the spindle member 58 so that rotation of the member 60 about the axis X is effective to likewise rotate the spindle member 58. At an inner end portion of the spindle member 58 means is provided for mounting a pair of contacts 32 at opposite sides of the axis X, the means comprising a pair of pegs 66 adapted to be received in cooperating locating holes in the contacts 32. The means further comprises a housing portion including a groove adapted to receive a portion of the contact to prevent rotation of the contact about the peg 66.

The contacts 32 are of the type known as insulation displacement connectors (although other types of contacts may be used). Each contact 32 comprises a projecting portion 68 projecting generally outwardly of the axis X and lying in a plane perpendicular to the axis X. An outermost edge portion 70 of the projecting portion 68 is, in the operation of the illustrative assembly, adapted to engage a cooperating bus-bar 24 whereby to make an electrical contact. Conveniently the outermost edges 70 of the projecting portions 68 are somewhat curved when viewed in plan (although with a radius of curvature less than the greatest radial distance from the axis X to the edge portion 70). Each of the contacts 32 comprises a U-shaped spring portion 72 so that, upon pressure on the edge portion 70, the projecting portion 68 may yield inwardly towards the axis X against the resilience of the spring portion 72 urging the edge portion 70 outwardly away from the axis X. Each contact comprises at an inner end portion an insulation displacement connector of a generally known type in which a conductor is received in a narrow slot 74.

The illustrative track lighting assembly in fact comprises three bus-bars 24 (although provision is made for a fourth bus-bar) and three corresponding contacts. However, housings may, in accordance with the invention be arranged to accommodate only two bus-bars or a greater number than four.

The internal supports 22 for the bus-bars 24 are provided as the extrusion takes place and are in the form of longitudinally extending pockets 122 into which bus-bars of a generally corresponding cross-section can be slidingly introduced in the assembly of the housing portion. The pockets 122 are disposed so that the bus-bars are positioned at the sides of the housing, the bars 24 at each side of the housing being coplanar and, when viewed in a transverse sense, positioned in pairs one at either

side of the slot 34, so as to be in register with corresponding pairs of contacts of the carrier 36.

Where only two contacts 32 are required (for example in a double-insulated lighting system) the two contacts 32 on the spindle member 58 may be held in place by an end cap 76. However, in the illustrative assembly, a second contact mounting part 78 of the carrier 36 is provided and mounts a contact 32 in a similar manner to the mounting of the contacts on the spindle member 58. The mounting part 78 comprises a tubular collar 80 coaxial with the axis X projecting from the part 78 towards the base portion 56 of the adapter 30, the collar 80 being received between the spring portion 72 and the connector portion 73 of the contacts 32 mounted on the spindle member 58 whereby to assist in retaining them in place. The contact 32 carried by the mounting part 78 is likewise retained in place by a similar collar 82 on the end cap 76. Where the mounting part 78 is not used, the end cap 76 will be secured directly to the spindle member 58 and the collar 82 will assist in retaining the contacts 32 in place on the spindle member 58.

Contacts 32 carried by the spindle member 58 are positioned in diametrically opposed relationship. However, as can be seen by viewing Figure 9, the contact mounting positions on the mounting part 78 are not diametrically opposed and, in fact, the mounting position used in the illustrative assembly is offset by a 5° angle. This position is utilised as the position for the earth contact on the illustrative assembly. All of the contacts on the carrier 36 to one side of the axis X are axially aligned with one another, though spaced apart along the axial direction, as are all but the earth contact at the opposite side of the axis. The earth contact is offset by a small amount from alignment for a reason to be indicated later. When the carrier 36 is assembled, the various parts are constructed so that they can only be properly assembled with the contacts aligned as mentioned above.

As previously mentioned, the carrier is rotatable about the axis X. The construction and arrangement is such that the carrier can only, in use, be rotated through an angle of 90° between a locked operative condition and an unlocked, inoperative condition. In the inoperative condition, the carrier is positioned so that longer dimensions of the part of the spindle member carrying the contacts 32 and of the mounting part 78 and end cap 76 are aligned with the longer dimension of the base portion 56 and with the grooves 52, 54. When the carrier 36 is in this position, it is able to be inserted through the slot 34 into the hollow interior of the housing 20. A stop 86 on the spindle member 58 is received in a recess 55 extending through an arc of just over 90°, moulded into the underside of the base portion 56. The stop 86 engages a shoulder 57 defining one end of this recess to prevent rotation of the spindle member 58 about the axis X in the direction opposite the direction of the arrow A beyond the position in which the operating member 60 is shown in Figure 2. A shoulder 88 is provided on the operating member 60 and is arranged to engage a stop 90 on the base portion 56 to prevent the operating member 60 (and thus the spindle member 58) rotating in the direction of the arrow A beyond the locked condition in which it is shown in Figure 3.

When the carrier 36 is in the locked condition in which it is shown in Figure 3, portions 67 of the carrier 36 engage the ridge shielding means 39 of the housing at either side of the slot 34 to retain the adapter 30 in its located position on the rails 26, 28. Also, when the carrier 36 is in the locked condition the contacts 32 are in engagement with the corresponding ones of the bus-bars 24, the end portions 70 of the contacts 32 being resiliently biased against the bus-bars by the spring portion 72. Because the position 84 of the earth contact is offset by a small amount from the position of the other contacts, in advance of those contacts when considered in the direction of the arrow A, and the contacts 32 are all of the same dimension, the construction and arrangement of the assembly is such that in rotating the carrier 36 from its unlocked to its locked condition, the earth contact 32, being in advance of the other contacts, engages the earth bus-bar 24 before the other contacts engage the other bus-bars; likewise when the carrier 36 is rotated from the locked to the unlocked condition the contacts, other than the earth contact, break contact with their associated bus-bar before the earth contact breaks.

A lighting unit (not shown) is mounted the spindle member 58 by a suitable bracket 92 (see Figure 7), held in place by the nut 62.

The open ends of the elongated housing 20 are closed by two closure members 94, 96 (see especially Figures 5 and 10, and Figure 1). Both of the closure members 94, 96 comprise a projection (not visible in the drawings) which may, if desired, be carried on a resilient tongue portion to facilitate insertion adapted to be received in a corresponding recess in the housing so that the closure members 94, 96 are retained in place in the end of the housing by engagement of the projection in the recess. Both of the closure members comprise an end flange 98 of the same peripheral shape as the periphery of the housing 20 when viewed in cross-section, adapted to abut an end face of the housing, and a plug portion 100, on which the projection is formed, adapted to be slidingly received in an end portion of the housing whereby to close the ends of the housing 20. The plug portions 100 of the members 94, 96 are both provided with centering stops 102 adapted to engage ends of the bus-bars 24 as the closure members 94, 96 are inserted into the housing whereby to centralise the bus-bars 24 lengthwise of the housing.

The closure member 94 is intended merely to close one end of the housing 20; however, the closure member 96 is a connector closure member by means of which an electricity supply may be connected to the bus-bars 24. In order to effect the connection, contacts 104 having rounded end faces (see Figure 5) project from the plug portion 100 of the closure member 96, each in register with a corresponding one of the bus-bars 24 thus to provide an electrical connection. The connector contacts 104 are resiliently biased into engagement

with their respective bus-bars when the closure member 96 is inserted in the end portion of the housing 20. The connector contacts also comprise means, of known design, by which conductors of the electrical supply may be connected to the contacts 104 whereby the bus-bars 24 may be connected to an external power supply.

The plug portion 100 of the connector closure member 96 is also configured to provide a passage for a rib 112 extending along an inner wall of the housing 20 as it is inserted into an end portion of the housing 20, in a correct orientation but so that the rib 112 prevents insertion of the plug portion 110 of the closure member 96 when it is incorrectly oriented thereby likewise ensuring that the connector contacts 104 are in register with predetermined associated bus-bars 24.

The illustrative track lighting assembly is preferably of modular form: the housing 20 has a plurality of housing units 20a, 20b each of the same or different lengths, provided to build up tracks of any suitable length as desired. To join together adjacent lengths of housing units, a coupler 106 may be provided (see Figures 1 and 4). In Figure 1, a first housing unit 20a is shown complete but a second housing unit 20b otherwise similar to the first housing unit is shown fragmented to show the insertion of the coupler to connect the housing units 20a, 20b of the assembly. The coupler 106 comprises two plug portions 108, 110. The plug portions are generally similar in construction but are configured so that the plug portions 108, 110 can only be inserted in a correct orientation into the end portion of the housing. The rib 112 extending along the inner wall of the housing is adapted to be received in a corresponding recess in a plug portion inserted in a correct orientation but to prevent insertion of a plug portion 108, 110 which is incorrectly oriented. This ensures that contacts 114 of the coupler 106 each contact an associated one of the bus-bars 24. The two plug portions 108, 110 project from a flange portion 116 having a peripheral shape corresponding to the outer shape of a cross-section of the housing units 20a, 20b so that when the coupler 106 is in position connecting the housing units 20a, 20b, the outer surface of the flange portion 116 is flush with the outer surfaces of the housing units 20a, 20b. Plug portions are provided with other portions 118 which provide a cover over the slot 34 in the region of the coupler 106 preventing access to the interior of the coupler. The contacts 114 are resiliently biased into engagement with the bus-bars 24 when the coupler 106 is in position. However, the contacts 114 are so positioned within the coupler that they are not accessible through the slot 34 from outside the housing units 20a, 20b.

The coupler 106 is also provided with projections (not shown) adapted to engage the same recesses in the housing units 20a, 20b were the housing units 20a, 20b to be used as single tracks without the coupler but with insertion of appropriate ones of the closure members 94, 96.

Preferably the illustrative assembly may be supplied in two kit forms - a first, starter kit in which a single housing unit length is supplied, with sufficient mounting devices 42 to support it and with one each of a closure member 94 and closure member 96 to provide a complete assembly. A second, extension kit comprises one further housing unit 20b and a coupler 106. If it is wished to extend an existing track, it is merely necessary to prise off an appropriate one of the closure members 94, 96 (depending upon which end of the track it is desired to extend) using a suitable tool for example a coin, and to mount the next housing in the desired position.

One or more adapters 30 may be mounted at desired positions along the housing units 20a, 20b and readily locked in place by a single movement of the operating member 60 from the unlocked to the locked condition, this movement also making the necessary electrical contacts. By the construction of the earth contact it is ensured that the earth contact is in electrical connection with its associated bus-bar before any of the live contacts are made. The housing units 20a, 20b are produced simply and relatively cheaply by extrusion and are of such design that access of dirt or moisture to the interior of the housing units 20a, 20b is militated against. In order to further restrict access of dirt and also to prevent inadvertent introduction of foreign bodies to the interior of the housing 20, covers may be provided (not shown) to clip over the rails 26, 28 to cover the slot 34 where it is exposed. Suitably the cover strip may be supplied of a suitable extruded plastics material which may be cut to appropriate lengths by the user.

The illustrative assembly is believed to meet the current British Standard Tests for track lighting assemblies and provides a cheap and simple to use track system which may readily be provided with two, three or four bus-bars. Where four bus-bars are provided, two live bars may be provided with independent switching means so that it is possible to switch different lights on a single track (provided that the adapters 30 supplied are appropriately configured).

Claims

1. An electrical contact assembly comprising an elongate housing (20) having a plurality of bus-bars (24) mounted therein, mounting means (30) adapted to carry an electrical device and provided with a plurality of contacts (32) for engagement with the bus-bars a slot (34) extending lengthwise of the housing and locating means (26,28) adapted to cooperate with the mounting means (30) whereby to locate the mounting means (30) in a desired orientation on the housing (20) at any position lengthwise of the housing so that a portion (36) thereof projects through the slot into the housing with the contacts (32) in register with the bus-bars, characterised in that (30) comprises operating means (36, 58, 60) by which it can be locked in place on the housing only when in said desired

orientation and by which, as the mounting means (30) is locked in position, the contacts (32) are moved, each into electrical contact with a corresponding pre-selected one of the bus-bars (24).

2. An electrical contact assembly according to claim 1 characterised in that locating portions (52,54) of the mounting means (30) and the cooperating locating means (26,28) are readily visible.

3. An electrical contact assembly according to either one of claims 1 and 2 characterised in that said locating portions (52,54) and locating means (26,28) are provided by projections (26,28) on one and recesses (52,54) on the other of the housing (20) and a base portion (56) of the mounting means (30) only be brought into mating engagement when in the desired orientation.

4. An electrical contact assembly according to claim 3 characterised in that the projections (26,28) are provided by parallel rails (26,28) of different widths on the housing (20) and the recesses (52,54) by parallel grooves (52,54) of different widths corresponding with the rails on the base portion (56).

5. An electrical contact assembly according to any one of the preceding claims characterised in that the housing (20) is so configured and the width of the slot (34) is such as to militate against the contact of bus-bars (24) by a linear probe inserted through the slot (34).

6. An electrical contact assembly according to any one of the preceding claims characterised in that the housing (20) is moulded of plastics material and comprises integrally moulded supports (22) for the bus-bars (24).

7. An electrical contact assembly according to claim 6 characterised in that the assembly comprises support means (40) integrally moulded with the housing, by which the assembly can be mounted on a surface.

8. An electrical contact assembly according to any one of the preceding claims characterised in that the operating means (36,58,60) comprises an operating member (60) adapted to operate locking means by which the mounting means (30) is locked in place and to move the contacts (32) into engagement with the bus-bars (24) in a single movement.

9. An electrical contact assembly according to any one of the preceding claims characterised in that the operating means (36,58,60) is so constructed and arranged as to ensure that one of the contacts (32) engages its associated bus-bar (24) before the other contacts (32) engage their associated bus-bars.

10. An electrical connector assembly according to any one of the preceding claims characterised in that the assembly comprises an end member (92) adapted to be received in an open end portion of the housing to close it, the end member (96) comprising connector assemblies by means of which conductors of an electrical supply may be connected to the bus-bars (24).

11. An electrical contact assembly according to any one of the preceding claims characterised in that the assembly comprises a plurality of housing (20), one joined to the next by coupling means (106) having portions (108,110) received in adjacent open end of adjacent housing and comprising coupling connector assemblies (114) adapted to engage the bus-bars of the adjacent housing (20) to electrically connect the bus-bars.

12. An elastic housing having integrally moulded internal supports for a plurality of bus-bars, and means for locating mounting means for an electrical device on the housing in position for contacts mounted on the mounting means to engage bus-bars carried by the internal supports.

13. Mounting means for use with an assembly according to any one of the claims 1 to 11 characterised in that it comprises a base portion (56) adapted to engage the locating means (26,28) locking means (60,58,67) for locking the base portion (56) in located position to the housing (20) and means (36) for moving the contacts (32) into electrical contact with bus-bars (24) after the mounting means (30) has been located on the housing (20).

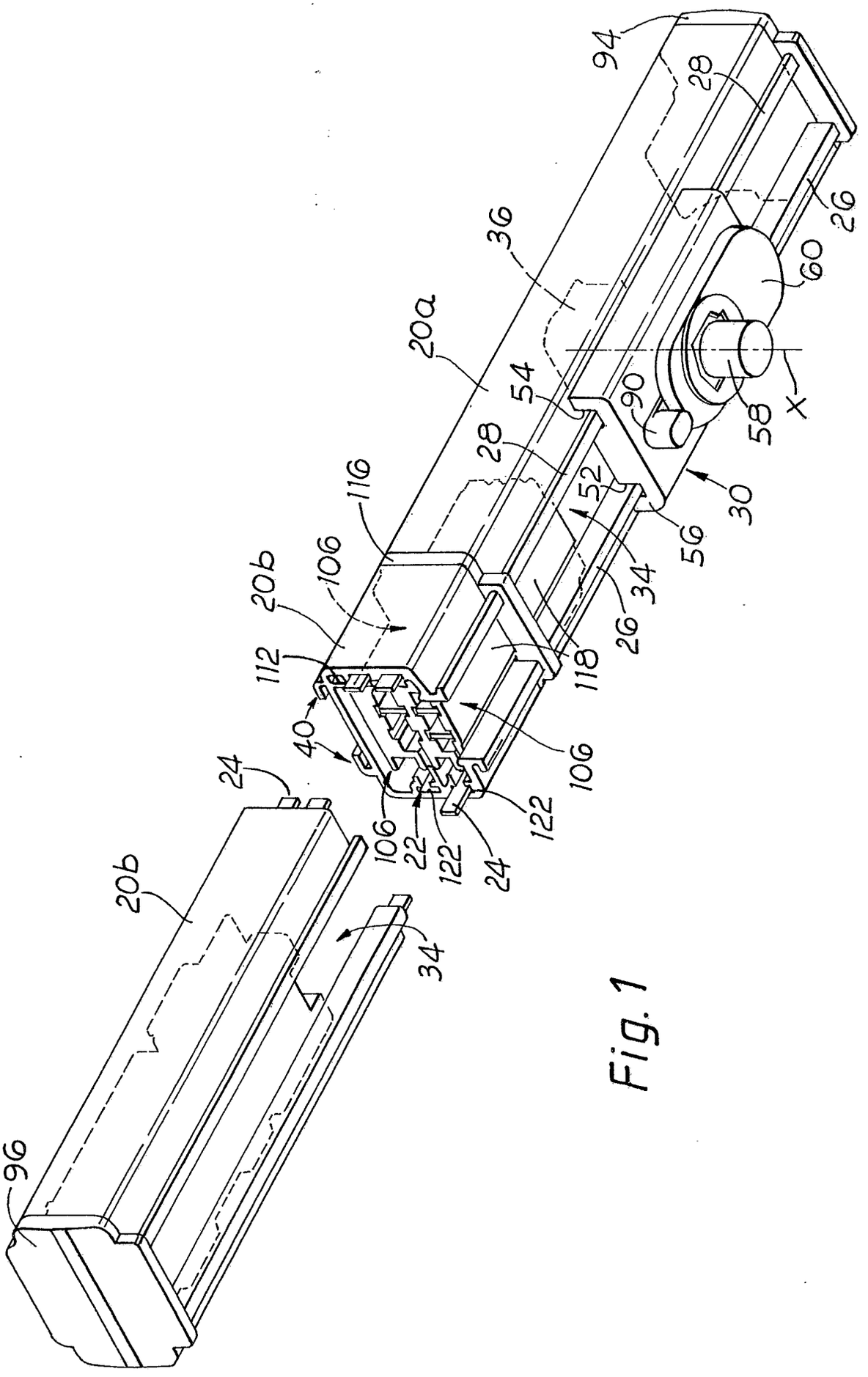
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Fig. 1

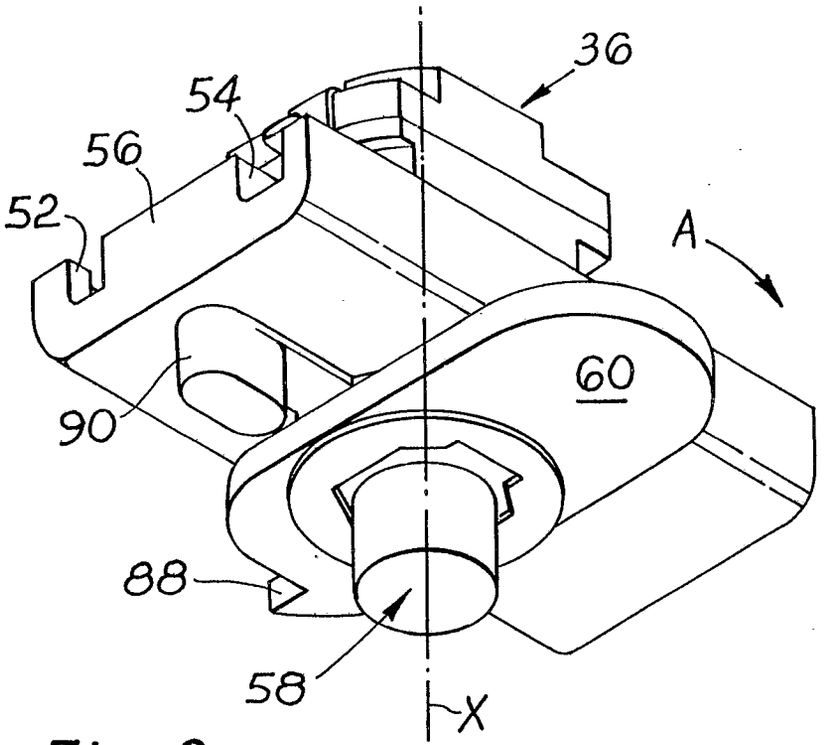


Fig. 2

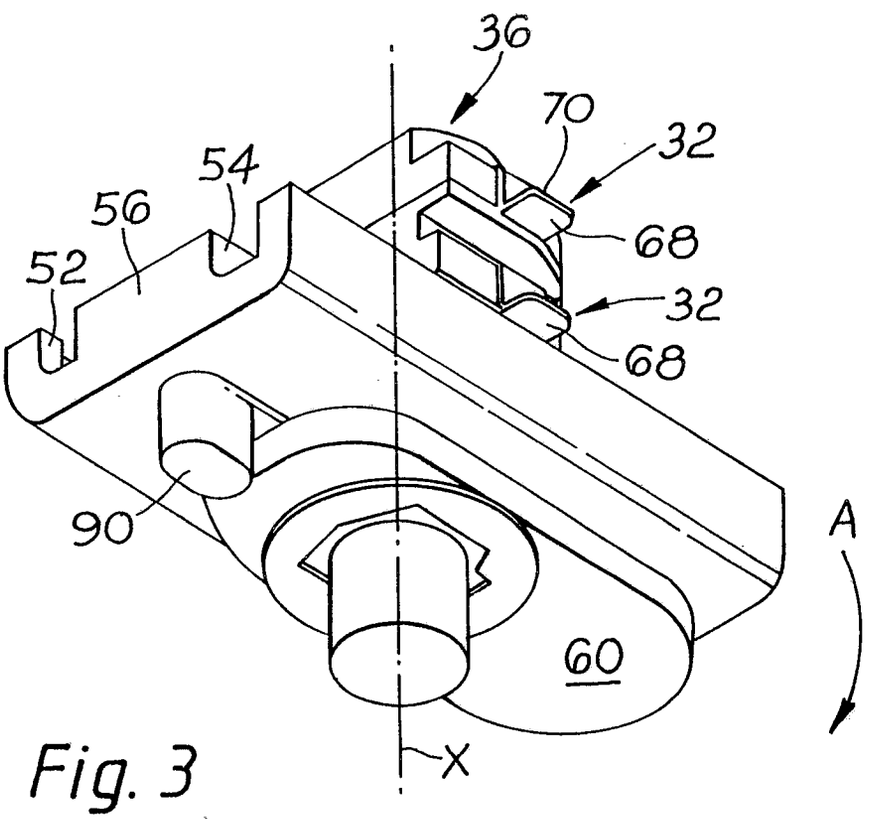


Fig. 3

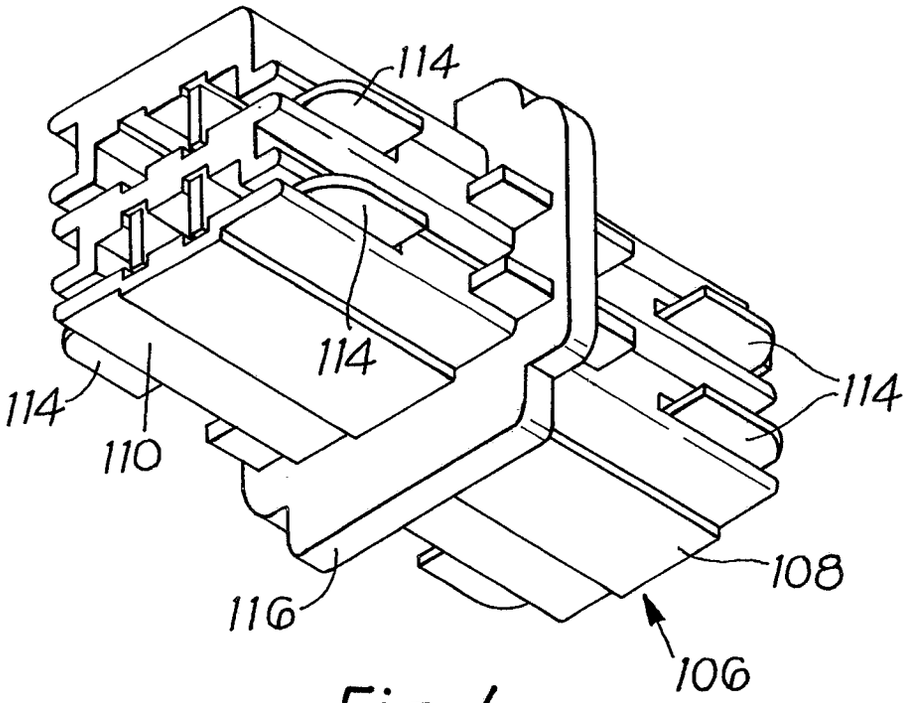


Fig. 4

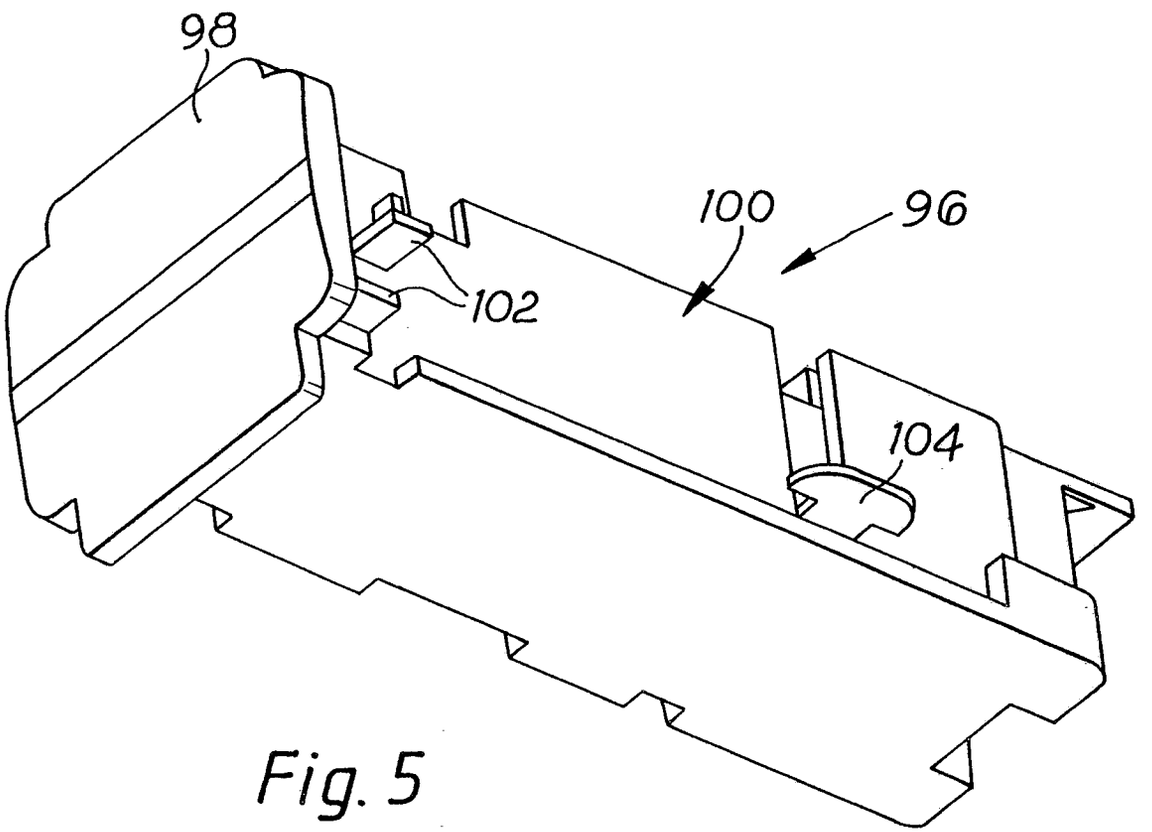
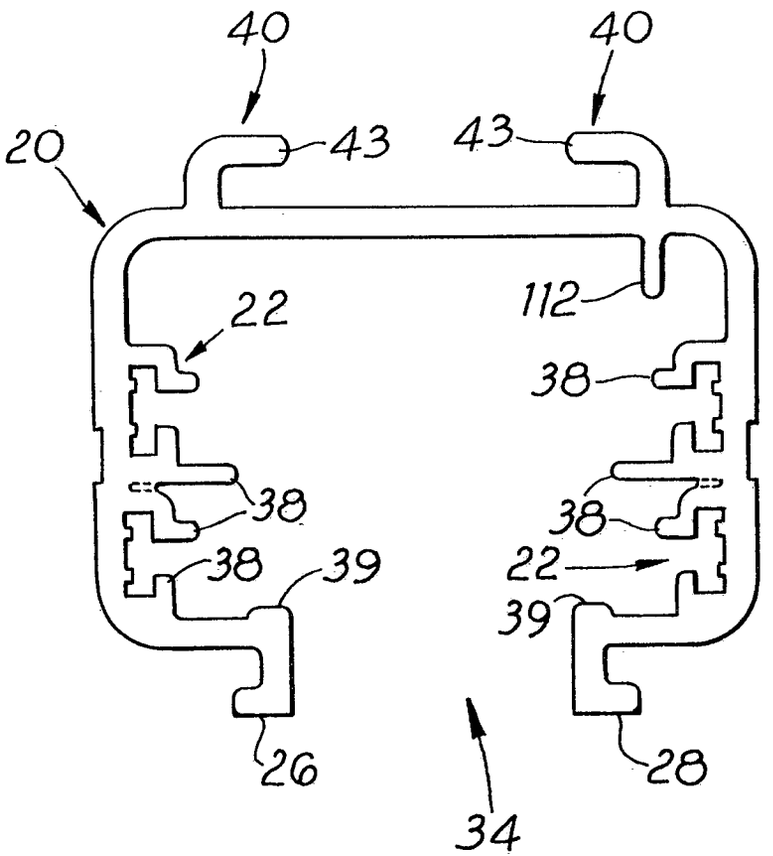


Fig. 5



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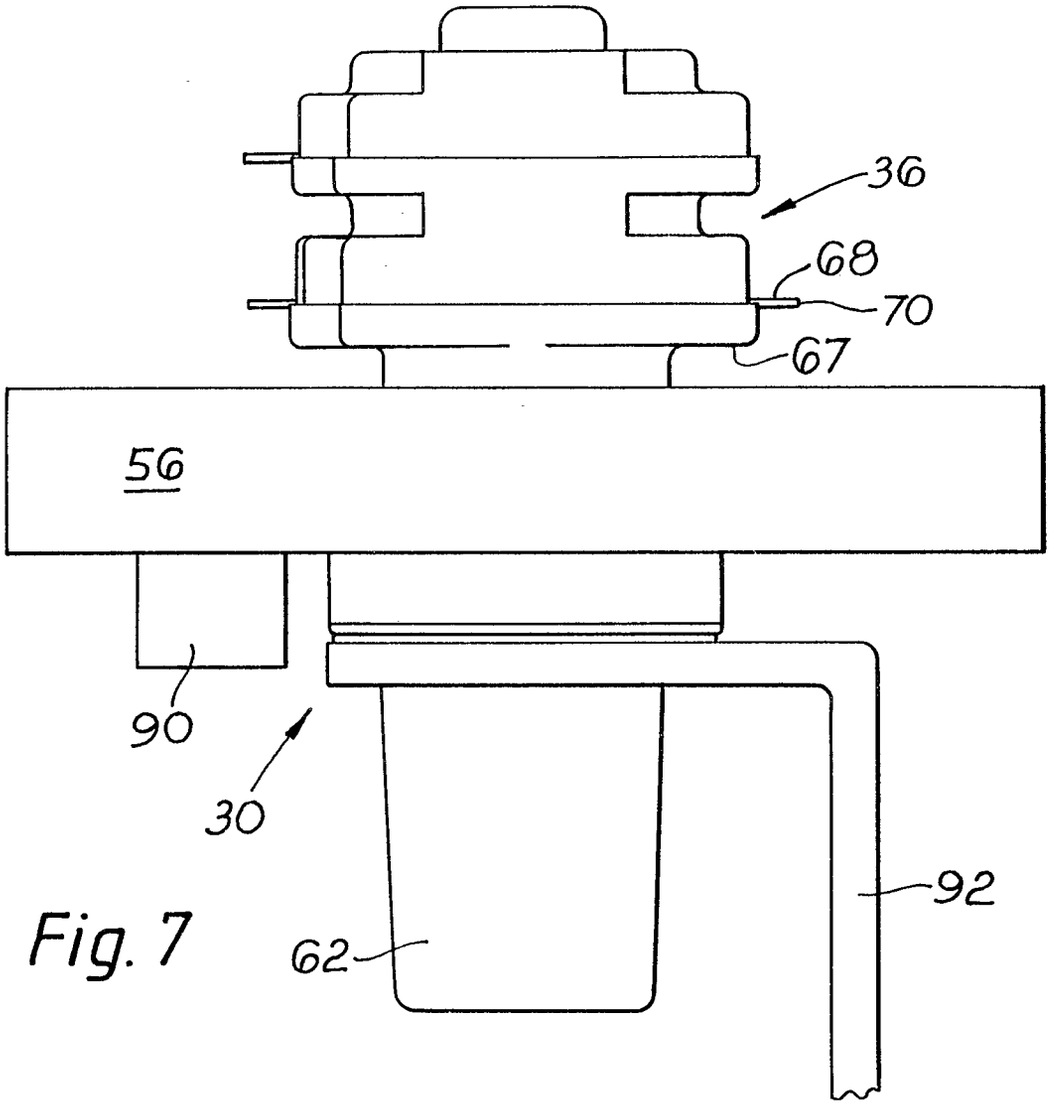

Fig. 7

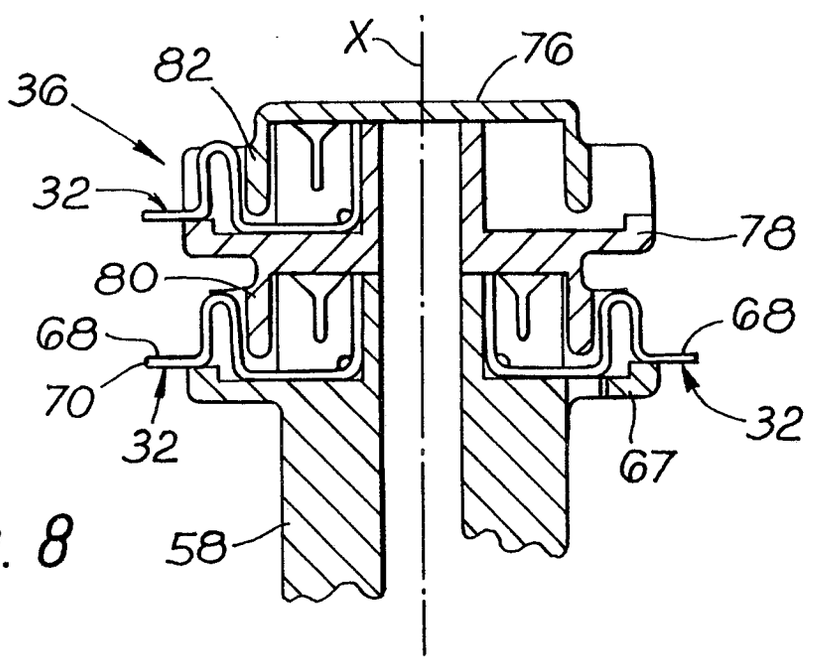

Fig. 8

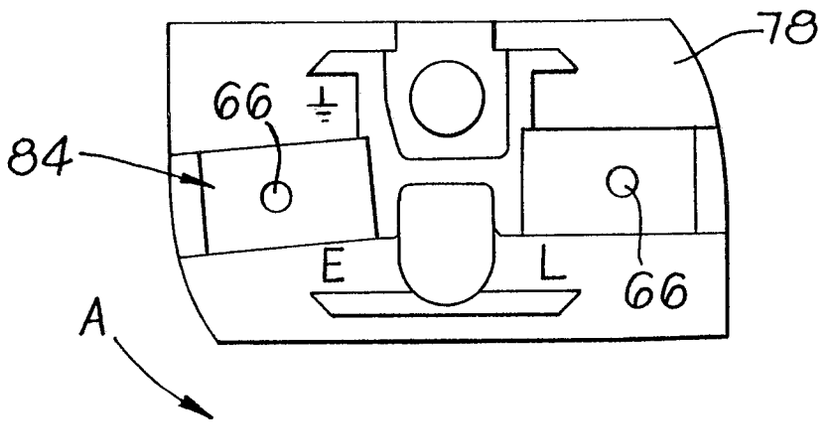

Fig. 9

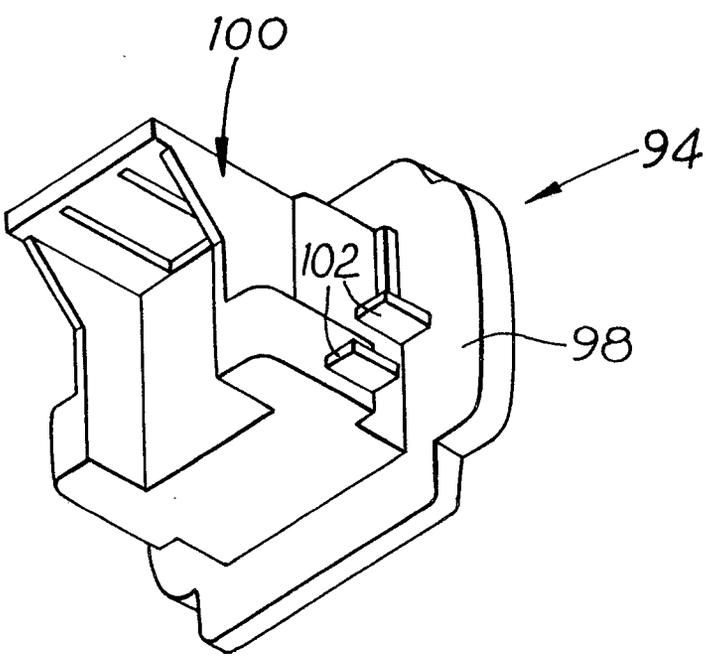

Fig. 10

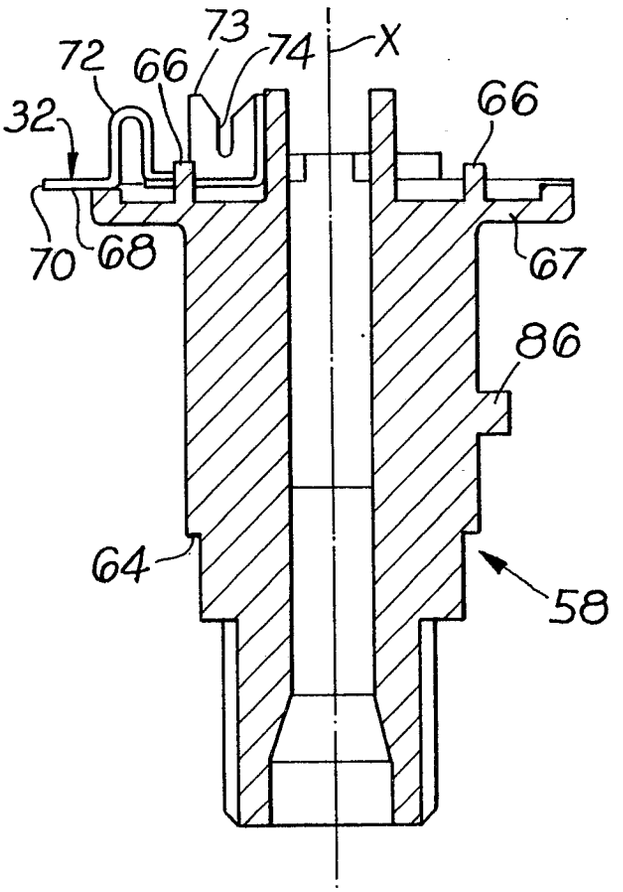

Fig. 11

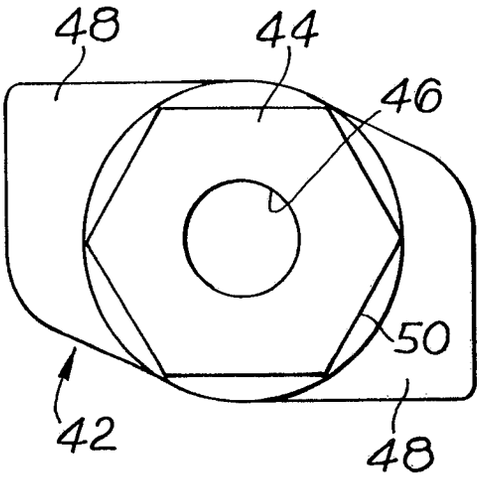

Fig. 12

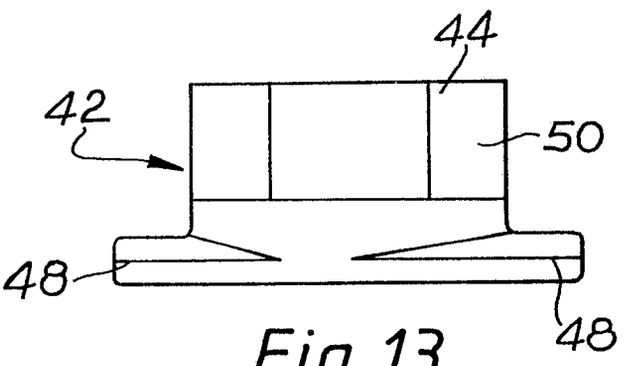

Fig. 13

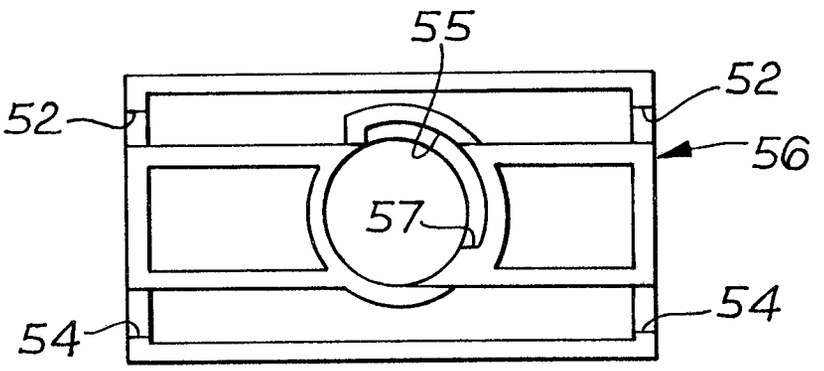

Fig. 14