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A Socket for Electrical Devices

Patent Application P 42 32 802.0 describes a lamp socket with a built-in starter. This lamp socket has a housing which is roughly L-shaped in side view, in which the contact spring tongues, which make the electrical connection to the pins of a two-pin socket lamp, are arranged in one of the legs of the housing. The starter canister and associated capacitor are located in the other leg of the roughly L-shaped housing.

Electrical connection between the external wiring and one of the two contact spring tongues occurs through self-clamping contacts, while the end of the wire, which is stripped of insulation, is inserted from the outside through a suitable opening in the housing. The contact spring tongue also contains an additional stamped metal tongue in the area of the opening and a contact area which is raised with a 90° offset in the connection to the tongue as an abutment for the inserted ends of the wire, which is pinched between this area and the free end of the spring tongue. The whole arrangement of the contact spring tongue for the connection pins and the contact tongue for the conductor connection is made from a sheet metal strip which basically is appropriately bent across its flat side.

The connection between the external wiring and the starter is made via a separate clamping spring tongue which is accommodated in the other part of the housing.

A further patent application with the file number P 42 18 740.0 shows the use of the so-called insulation piercing connection technique in connection with sockets for two-pin socket lights.

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in order to provide an automatic wiring of the light. For this, two insulation piercing springs of roughly U-shaped design sit opposite each other arranged in an off-set manner in the socket housing made from insulating material. The insulation piercing slot formed in this way is too open towards the top and it allows the radial insertion of a conductor not previously stripped of insulation into the insulation piercing contact. Groove-like recesses provided at the side next to the insulation piercing contact protect against accidental contact with possibly existing bare ends of the conductor. The width of the recess and the depth of the insertion of the conductor in the insulation piercing contact are selected so that with the aid of a standard test ball the live components cannot be contacted.

It is the aim of the invention to create a socket adapted for use of insulation piercing contacts whose individual parts are easy to manufacture and easy to assemble into the finished socket.

This problem is solved according to the invention by the socket with the characteristics of Claim 1. Owing to the single-piece construction of the contact spring tongue with the insulation piercing contact, additional wiring is avoided inside the socket housing. Rather, for reasons of space, the insulation piercing contact and the contact spring tongue can be manufactured together with the connecting piece as a single stamped sheet metal part which has to be inserted in the housing only after appropriate bending, if necessary. The insulation piercing contact is itself located in a chamber, accessible from the outside, which is provided with insertion slots on its side walls and which has insertion slots aligning with the insulation piercing slot.

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In order to not obstruct insertion of the wiring, the width of the groove-like recess, which should prevent inadvertent contact with live parts, is larger than the outside diameter of the wiring. In addition, the groove-like recess is deeper than the insertion slot, thus it is always ensured that the necessary conductor cross-section and the necessary wall thickness of plastic insulation of the conductor actually can be inserted as far as possible into the insulation piercing slot.

Insertion of the conductor into the insulation piercing contact is made easier if the insertion slot projecting above the insulation piercing contact is tapered in a funnel-shape in the direction of the insulation piercing slot and the latter, in turn, is likewise provided with a funnel-shaped opening.

The completely automatic assembly of a light equipped with the new socket is further simplified if the housing is preferably provided with a one-piece fixture.

The new socket can be used for both fluorescent lamps and incandescent lamps as well as for accepting starters, if its geometry is suitably adjusted. For example, for taking two-pin socket lamps it is useful if the socket housing has two legs running approximately at right-angles to each other, in which one leg has an opening for the connection pins while the chambers with the insulation piercing contacts are accommodated in the other leg. Then it is particularly advantageous if the groove-like recesses each form two grooves which are adjacent to the respective insulation piercing contacts and which run parallel and apart from each other and with a gap between them and the front face of the first leg. As a result, it is possible for the tool or the wire to be inserted unhindered past the front of the socket. There is no risk of fouling the front by the tool.



Insertion of the insulation piercing contacts into the chamber on the one hand and the pushing of the conductor into the insulation piercing contacts is then uncomplicated if the grooves contain openings in an extension of each chamber towards the front so that the insulation piercing contact can be inserted in its associated chamber from the first leg. In this way, its support inside the housing, which has to apply the cutting force during insertion of the conductor, is not impaired. Rather, it is possible for the floor or the back of the chamber to be firmly connected in one piece to the second leg which then comes down, so to speak, into a base plate from which the ribs forming the sides walls of the recesses project. As a result of this arrangement, no force is produced during insertion of the conductor which tries to push out the insulation piercing contact in the opposite direction to which it was inserted into the chamber.

Damage to the insulation of the conductor in the groove, which is the closest adjoining the front wall, is positively excluded if the connecting piece of the contact spring arrangement is at least lower than the base of the insulation piercing slot in the area in which it crosses the outside groove, with its top edge.

Insertion of the contact spring arrangement into the socket housing during assembly is very much simplified if the bottoms of the groove and the chamber merge smoothly into each other at the corresponding openings, because in this way all edges, on which the contact spring arrangement could catch during insertion, are avoided. A further simplification of assembly is achieved if small ribs, which converge like a funnel towards the openings, are provided on the sides remote from the grooves adjacent to the openings.

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An additional material saving can be achieved in the new housing if the cover covering the entire back is not provided on the back of the first leg. Nevertheless, protection for the contact spring arrangements against accidental contact can also be achieved there, in that side walls and partitions are used between the contact spring arrangements, between which are the contact spring connecting pieces.

If the socket according to the invention is used together with a starter, the starter socket device is advantageously housed in a lateral extension of the first leg. It is thus possible to bring the contact spring arrangement from the second leg by bending across the face in that area in which its connection pins are located with an inserted starter.

If the new socket should be used solely for retaining the starter, the housing advantageously has a cuboid form in which the chambers for the insulation piercing contacts are accommodated in the area of one of the sides of the cuboid.

Even though the contact spring arrangement is advantageously made from a stamped sheet metal part, it can be bent around an axis perpendicular to the face if a desired bending point is specified. This arrangement is advantageously used in socket housings in which an appropriate bottom area is integrally mounted via a film hinge on the first housing leg. The contact spring arrangement can be inserted in such a housing in the flat condition in appropriate holding members or structures, and the desired bent shape, which complies with the assembly wiring, is achieved by folding up the relevant bottom area.

An example of design of the subject of the invention is depicted in the drawing. It shows:

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- Fig. 1 a socket for a two-pin socket lamp with a socket on both sides in a perspective view,
- Fig. 2 the socket according to Fig. 1, partially sectioned and in an exploded view,
- Fig. 3 the socket according to Fig. 1 in a top partial view on the lower housing leg,
- Fig. 4 a socket similar to that in Fig. 1 with a starter socket attached on the side,
- Fig. 5 the socket according to Fig. 4 in a rear view and in an opened condition,
- Fig. 6 a separate socket in a lamp housing for a starter in a perspective view,
- Fig. 7 the socket according to Fig. 6, in a front view,
- Fig. 8 the socket according to Fig. 4, sectioned along the line VIII-VIII in Fig. 9,
- Fig. 9 the socket according to Fig. 6 in a top view and partially sectioned along the line IX-IX in Fig. 8,
- Fig. 10 a socket similar to that in Fig. 1 in a side view and partially sectioned,
and
- Fig. 11 the socket according to Fig. 10 in the folded-up condition.

Fig. 1 shows a two-pin socket 1 for fluorescent lamps with sockets at both ends. The socket 1 contains a housing 2 made from insulating material which, when viewed from the side, is approximately L-shaped. It consists of a projecting first housing leg 3 and a horizontal second housing leg 4, whose longitudinal axes intersect at right angles. The two housing legs 3 and 4 merge into one another in a corner region 5 to form a single piece. They are both cuboid in design in the broadest sense.

The first housing leg 3 is delimited by a front wall 6 turned towards the second housing leg 4, with which a side wall arrangement 7 forms one piece. This side wall arrangement 7 forms a collar which largely follows the outer profile of the front wall and which extends to the back. A cover 8 which belongs to the first housing leg 3, is fitted on the back. This cover 8 ends with a bottom edge 9, which is higher than the top of the second housing leg 4. It is roughly here, where the first housing leg 3 has two symmetrically arranged shoulders 11, that the first housing leg 3 narrows with regard to its width. After the two shoulders 11, the first housing leg 3 turns into two sides 12 running parallel to each other.

The front wall 6 contains in a known way a cylindrical bore 13 in which a slot 14 extends from the top and passes through the side wall arrangement 7. In the bore 13 there is a rotatably mounted rotary component 15 which is T-shaped when viewed in cross-section, and which is used to close off access to electrical conducting parts inside the socket 1 when lamps are removed.

The second housing leg 4 consists of an essentially flat base plate 16, which is connected at its end adjoining the first housing leg 3 to the first housing leg 3 by the two sides 12 running

parallel and separated from each other. Two arms 17, which project laterally from the face adjacent to the two sides 12 towards the first housing leg 3 and which have a foot 18 pointing downwards at their free end, are divided by the base plate 16. Opposite the feet 18, two attachment lugs 19, which are separated from each other, are formed integral with the sides of the base plate 16 remote from the first housing leg 3. The feet 18 and the attachment lugs 19 face in the same direction, namely, away from the base plate 16.

Three walls 21, 22, 23, which run parallel and apart from each other and also are parallel to a plane defined by the front wall 6, all project together from the upper surface of the base plate 16 which is turned away from the first housing leg 3. These three walls 21, 22, and 23 delimit two grooves 24 and 25 running parallel to each other. Their top edges 26 are in each case flat and are the same height, whereby the top edge 26 of the wall 23 changes into a covering 27 which is formed into one piece on the front wall 6.

The sides 12 also merge as a single piece into the wall 23 below the covering 27, and into the underside of the covering 27. Two separating walls 28, which run between the two sides 12, are roughly L-shaped like the sides 12 and are formed on the back of the front wall 8, the underside of the covering 27, the back of the wall 23 and the upper surface of the base plate 16. Their rear edge 29 is slightly set back with respect to a rear edge 31 of the sides 12, whereby the rear edges 31 are flush with the free edge of the side wall arrangement 7.

The groove 24, whose wall 21 does not extend along the whole width of the base plate 16, is divided into two roughly similar length groove-like recesses 34 and 35 by a chamber 33 approximately in the centre, in which each groove-like recess 34, 35 is delimited by two straight

groove walls 36 and 37 running parallel to each other and, running at right angles to them, the bottom 38 of a groove which at the same time is also the upper surface of the base plate 16.

The chamber 33 is delimited by two chamber walls 38, which are a mirror-image of each other and which run parallel apart and at right angles to the grooves 36, 37. Aligned insertion slots 39, which are located in the centre of the relevant groove 24 and end clear above the base plate 16 at 41, are contained in both chamber walls 38, which extend from the upper edge 26 to the upper surface of the base plate 16. The insertion slots 39 in the two chamber walls 38 widen out to a funnel-shape at their upper end at 43. As can be particularly seen in Fig. 3, the chamber 33 has a somewhat greater width in the structural clearance of the groove 24, measured in the longitudinal direction of the groove 24, than in a section of the chamber 43 to the left of the groove 24. This section of the chamber 43 is likewise delimited with parallel sides and extends down as far as the upper surface of the base plate 16.

Referring to Fig. 3, the chamber 33 is provided at its right hand end with a slot 44 extending from the upper edge 26 to the upper surface of the base plate 16, which slot extends completely through the wall 26. This slot 44 has a funnel-shaped enlargement 45 towards the groove 25 and has a widened section on the inside of the wall 26 extending from the upper edge 26 to the upper surface of the base plate 16.

The slot 44 is symmetrical with regard to a plane extending symmetrically through the chamber section 43 and vertical to the base plate 16. Likewise, a rectangular opening 47 which is enclosed on all sides, is situated in a shoulder 46 in the wall 23. The width of the opening 47 corresponds to the internal width of the slot 44, while the height is markedly less than the height

of the rest of the equal-height walls 21, 22 and 23. At its lower end, the opening 47 merges smoothly into the upper surface of the base plate 16. Finally, the opening 47 is symmetrical between the separating wall 28 and each of the adjacent sides 12. The space between the side 12 and the separating wall 28 is greater than the width of the opening 47.

Finally, small ribs, which originate at the opening 47 and run obliquely to the adjacent surface of the dividing wall 28 and the side 12, are formed on the back of the wall 23. These ribs are not shown in the figures.

There is an additional chamber 48 in the groove 25, and in fact the chamber 48 is offset with regard to the chamber 33 in the longitudinal direction of the groove 25. The chamber 48 is similarly delimited by two chamber walls 38 which are designed in the same way as the chamber walls 38 in the chamber 33 and which is why in this respect the same reference characters are used. Also an insertion slot 39 extends partially through these chambers.

As before, the chamber 48 has a chamber section 43 which in this case, however, is in the wall - 46.

The only difference, which distinguishes the chamber 48 from the chamber 33, is the fact that in the chamber 48 the slot 44 merges directly into an opening 47 in the wall 23, whereby this opening, however, has the same shape as the aforementioned opening 47, with the simple difference that it lies between the other side 12 and the other separating wall 28. Consequently, two separating walls 28, which run parallel and apart from each other, are located between the two openings 47.

In the inside of the housing 2, the socket 1 contains two substantially similar contact spring arrangements 49. The contact spring arrangement 49 shown is intended for use in the chamber 23. It has a contact spring tongue 51, a connecting piece 52 and a insulation piercing connector 53, all of which are combined in a single piece.

The insulation piercing contact 53 has the shape of a rectangular plate with a height of about 8 mm and a thickness of about 0.3 to 0.5 mm. It is delimited laterally by two edges 54 and 55 parallel to each other, and above and below by two edges 56 and 57. The edge 57 is straight and parallel to the edge 56. An insulation piercing slot 58, which extends parallel to the edges 54 and 55 towards the bottom edge 57, starts from the edge 56. The height of the insulation piercing contact 53, measured between the bottom edge 57 and the upper edge 56, is slightly less than the height of the opening 47. The bottom end of the insulation piercing slot 58, by comparison, is closer to the bottom edge 57 than is the bottom end 41 of the insertion slot 39 to the upper surface of the base plate 16.

To facilitate insertion of the conductor into the insulation piercing slot 58, the insulation piercing slot 58 is also provided with a funnel-shaped enlargement 59 in the vicinity of the upper edge 56.

The connecting piece 52, which joins the insulation piercing contact 53 and the contact spring tongue 51 into one piece, is roughly L-shaped and consists of a lower leg 61 whose bottom edge merges flush with the bottom edge 57 as well as an upper leg 62, which is arranged at right angles to the leg 61. A section 63, running at approximately 45° and from which a projection 64 extends into the gusset area between the legs 61 and 62, is fitted between the two legs 61 and 62. The height of the leg 61 is designed in a such a way that it is markedly less than the

distance of the lower end 41 of the insertion slot 39 from the upper surface of the base plate 16. The intermediate piece 63, except for the projection 64, has roughly the same width as the leg 61, and also the leg 62, which finally projects upwards at right angles and in the same plane as the insulation piercing contact 53, has a width corresponding to the leg 61.

The contact spring tongue 51 adjoining the upper end of the leg 62 is slightly bent into a V-shape at its centre at 65 and its width is matched to the length of the connection pins making contact, i.e. its width corresponds approximately to the clearance between the back of the front wall 6 and the inside of the back cover 8.

At its upper end the contact spring tongue 51 turns into a tab 66 by which the contact spring tongue 51 is held in a known way between suitable ribs in the first housing leg 3.

The projection 64 is delimited by an upper and front edge 67 and 68, whose precise shape will be given by the following description of the assembly .

The other contact spring arrangement 49, not shown, differs from the depicted form of design with regard to the length of the leg 61, as will also be given by the following description of the assembly:

During the manufacture of the depicted new socket, the contact spring arrangement 49 is pushed into the prefabricated housing 2 from the back of the first housing leg 3. In this way the insulation piercing contact 53, with its bottom edge 57 on the upper surface of the base plate 16, is slid between the separating wall 28 visible in Fig. 2 and the side 12 seen in Fig. 1. The contact

spring arrangement 49 is manoeuvred into the opening 47 by the above-described ribs just before the opening 47 and is pushed through from there out across the groove 25. The funnel-shaped enlargement 45 in the slot 44 feeds the insulation piercing contact 53 into the chamber 33, by which its front edge 53 will be located in the chamber section 43. In this final position, the front edge 68 of the projection 64 touches against the rear of the wall 23 above the opening 47. The front edge 54 of the insulation piercing contact 53, by comparison, has a small clearance from the opposite wall of the chamber extension 43. At the same time, the front edge of the contact spring tongue 51, which is lying flush, is in this position and the front edge of the leg 62, which carries on into the extension, presses against the rear of the front wall 6. The upper edge 67 of the projection 64, on the other hand, is located, with a small clearance, below the underside of the covering 27. Finally, the tab 66 is gripped between suitable ribs in the housing leg 3.

In this assembled condition, the leg 61 of the connecting piece 52, which is lying exposed, runs across the groove 25. However, this occurs at such a distance from the upper edges 26 of the two walls 22 and 23 that contact is excluded. Also insulation of a wire running above it through the section of the leg 61 across the groove 25, is not put at risk, because the upper edge of the leg 61 lies markedly lower than the bottom end of the insertion slot 39.

The contact springs 49 (not visible) for the chamber 48 has, apart from the length of the leg 61 already mentioned, the same design as the displayed contact springs 49. The length of the leg 61 is dimensioned so that on insertion of these contact springs into the other opening 47 (not shown), the afore-mentioned insulation piercing contact 53 will be in the chamber 48 when the

front edge 68 of the projection 64 and the front edge of the contact spring tongue 65 push against the back side of the wall 23 and the back side of the front wall 6 respectively.

On insertion, both contact springs 49 slide on the upper surface of the base plate 16 into their respective chamber 33 and 48 with their bottom edge 57 free and without being impeded by any projections. Both contact springs 49, when assembled, have their bottom edge 57 flat on the upper surface of the base plate 16, whereby each insulation piercing slot 58 is in the centre of the insertion slot 39 of the two chamber walls 38. The lower end of the insulation piercing slot 58 disappears below the respective chamber wall 38.

After the two contact springs 49 are inserted, the rotary component 15 is inserted from the front in the normal way and the back cover 8 is snapped on. In this way the two contact springs 49 between the front wall 6 and the back cover 8 are prevented from falling back out of the housing 2.

Although the back cover 8 does not cover the bottom part of the first housing leg 3 and also the adjoining area of the second housing leg 4, and therefore a part of the leg 62 as well as the intermediate piece 63 is exposed, there is still no danger because the side walls 12, in combination with the two separating walls 28 ensure protection against accidental contact. The rear edge of the leg 62 and the intermediate piece 63 respectively spring back far enough against the rear edges 29 and 31 that the normal test ball, for testing for safety from accidental contact, cannot reach the contact springs 49 in the given space between the separating wall 28 and each adjacent side wall 12.

Wiring of the new socket is done in such a way that a conductor without the insulation stripped away, and of suitable cross-section and external diameter, is pushed into the respective chamber 33 from above with the aid of a tool. The insulation piercing contact 53 cuts through the insulation which incidentally is only clamped between the sides of the insertion slot 39. The force of assembly occurring therein is transferred directly to the base plate 16. No forces occur which would try to eject the contact spring arrangements 49 back out of the housing in the opposite direction to the above-mentioned insertion movement during assembly of the socket 1. This result is achieved because the insulation piercing slot 38, which determines the force direction during contact, extends at right angles to the assembly direction in which the contact spring arrangement 49 is inserted into the housing 2.

As shown in Figs. 4 and 5, the new solution also finds application in sockets which have a socket facility 72 for a lamp starter in a lateral arm 71. With this socket according to Fig. 4, the second housing leg 4 has the same design as the form of design according to Figs. 1 to 3. The first housing leg 3 differs from the above-mentioned form of design simply in that the side wall arrangement 7 is curved out laterally to form the socket facility 42. Apart from that, there are no differences. Finally, the socket according to Fig. 4 contains the contact spring arrangement 49 according to Fig. 2. The course of the other contact spring arrangement 49 and the connection device for the connection pins and the corresponding starter pins are shown in the back view Fig. 5.

In this rear view are components, which have already been explained in connection with Figs. 1 to 3 and repeated in Fig. 5, and are provided with the same reference characters. The base plate 16, the two parallel side walls 12 extending parallel and apart from each other, the separating

walls 28 arranged in between them and the rectangular openings 47 located between each pair of separating wall 28 and side wall 12 were thus identified in Fig. 3. The contact spring arrangement 49 shown in Fig. 2 is in the left one of these two openings 47. The contact spring arrangement 73 differs from the second contact spring arrangement in the form of design in Fig. 2 inasmuch as the leg 62 is bent to the right just above the shoulder 11 and from there runs as a straight tongue 74 to one of the two keyhole-shaped openings 75 for the starter connection pins. The tongue 74 extends just across the open section of the bottom opening 75 and is held by ridges 76 formed in the lateral part 71 of the rear side of the front wall 6. The tongue 74 fits from behind closely against the front wall 6 over its entire length.

The second electrical connection between the lamp to be inserted and the starter is made by a contact spring tongue 77 which has a section 78, similar to the contact spring tongue 51, extending across the drilled hole 13 and which changes into a straight section 79 above and to right of the hole 13. Suitable ridges 81, through which the section 78 runs, are provided on the circumference of the hole 13 for protection of this contact spring 77. Its lower end lodges in a cavity 82.

The straight section 79, starting from the ribs 81, leads to an offset 83 and from there, again leads as an additional straight section 84 just across the open section of the upper opening 75. In the region of the upper opening 75, the section 84 is retained by additional moulded ridges 85.

Assembly of the socket according to Figs. 4 and 5 is analogous to that already described above.

Figures 6 to 9 show a socket 1 which is designed to hold a starter or another electrical product

with appropriate connection pins inside a lamp housing. In this case, the same reference characters are also used for components, which are functionally identical with components from Figs. 1 to 3 and Figs. 5 and 6 respectively, in order to be able to better recognise the correspondence between the components.

The socket 1 according to Figs. 6 to 9 consists of a single-piece housing 2 which has a front wall 87 as well as a back wall 88, which are joined to each other via webs 89 or side walls 90 running between them in such a way that a large gap is formed, stretching between the front and back walls 87, 88. The gap is so dimensioned that if a starter with its connection pins is inserted through the keyhole-shaped opening 75 in the front wall 87, the free ends of the connection pins do not touch against the inner face of the back wall 88.

Further, two downward pointing snap connectors 19, which are formed adjacent to the two bottom corners of the housing 2, are used together with mounting feet 18 for attaching the socket 1 in a suitable sheet metal casing.

The two chambers 33 are provided adjacent to the two upper corners for insulation piercing contacts 58 which are electrically separated from each other. The two chambers 33 are exact mirror-images of each other, so that the following description is applicable by analogy for both chambers 33.

In the chamber 33, one of the chamber walls 38 is formed by the front wall 87, while the other rear chamber wall 38 is formed from a region of the rear wall 88 offset towards the front wall 87. Yokes 93, which join to both chamber walls 38 to the front and rear, delimit the groove-

shaped recesses 34 and 35 on both sides of each chamber 33. The two yokes 93 form, in turn, a continuous groove which is interrupted by the chamber 33. Different to the previous design examples, in the design examples according to Figs. 6 to 9 the axis of these grooves, which is defined by the groove-like recesses 34 and 35, is perpendicular to the front wall 27.

As is best shown in Fig. 8, the chamber 33 opens into a slot 94, which is open to the top, towards the interior between the front wall and the back wall 87, 88, while the side wall 90, which in other respects closes off the interior between the two walls 87 and 88 on both sides, continues below the slot 94.

The contact spring arrangements 58 in the two chambers 58 are mirror images for the left and right hand side of the socket 1. They consist of the already described insulation piercing contact 53, which changes into a tab 95 at its bottom. An upward pointing locking tongue 96, which is used to retain the clamping spring arrangement 58 permanently engaged in the associated chamber 33, is released out of the tab 95.

The connecting piece 52 is formed in the vicinity of the upper edge 56 and changes into the contact spring tongue 51 which is a leaf spring strip whose width is the same as the internal gap between the front wall 87 and the back wall 88. The plane of this contact spring tongue 51 is perpendicular to the plane defined through the insulation piercing contact 53, i.e. as the auxiliary view on A shows, it is bent in an L-shape out of the plane of the insulation piercing contact 53.

Assembly of the described socket 1 is easily done in such a way that the two contact spring arrangements 58 are inserted into each chamber 33 in the one-piece injection moulded part which

forms the housing 2. The bottom part of each chamber 33 is pocket-shaped and accommodates the extension 95 which stands with its bottom 97 on a base 98 of the chamber 33. In this condition the locking tongue 96 snaps into a corresponding opening 99 in the vicinity of the lower base 98 of each chamber 33. Since the locking tongue 96 is pointing upwards, withdrawal of the contact spring arrangement 58 in an upwards direction is prevented after engagement of the locking tongue. By contrast, the insertion force, which arises when the conductor is pushed into the insulation piercing slot 58 and which occurs during contact, is transferred directly from the base 98 to the housing 2.

Finally, Figs. 10 and 11 show a form of design in which a desired bending point 101 is contained in the run of the connecting piece 49 of the contact spring arrangement 49. In this form of design, the socket 1 also has an L-shaped housing, when viewed from the side, which is formed by two housing legs 3 and 4 connected to each other. The first housing leg 3 consists of a side wall arrangement 7, on which this time a back wall 102 is formed in one piece. By comparison, the front wall 6 is designed as a snap-on cover with the rotary component 15 inserted in it.

At its lower end remote from the rotary component 15, the back wall 102 changes into a film hinge 103 in a part of the base 104 of the two housing legs 4. The part of the base 104 is substantially plate-shaped and in the assembled condition extends between two lateral raised edges 105 of the base of the two housing legs 4. A walled-structure, as is explained for the housing leg 4 in connection with Fig. 1, is located in the middle folding section of the base 104. In addition, the chambers 33 and 48, which in turn are offset from each other, are located between these walls whose axial length is delimited by the distance between the two raised edges of the base 105. Slotted webs 106, which are formed as projections on the base section 104,

originate from a position following the chambers 33 and 48, where the slot 44 is located. Groove-shaped slots are situated in these webs 106.

The contact spring arrangement 49 to be used in connection with this design example is shown separately in Fig. 10 and shows in turn the already explained contact spring tongue 51, which is slightly bent in a V-shape at 65, the connecting piece 52 and the insulation piercing contact 53. The insulation piercing contact 53 is designed in the same way as the contact explained in connection with Fig. 2, and the contact spring tongue 51 has a design which has already been mentioned. The connecting piece 52 differs merely in its configuration, insofar as it is provided with the already mentioned desired bending point 101 at the appropriate point between the contact spring tongue 51 and the insulation piercing contact 53. The desired bending point 101 results from the fact that the width or height of the sheet metal strip, from which the contact spring arrangement 51 is produced, is markedly reduced compared with the other sections of the connection piece 52.

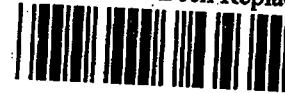
The two contact spring arrangements 49 for the two different connection pins differ simply in the distance between the insulation piercing contact 53 and the desired bending point 101.

The production and assembly of the design example according to Figs. 10 and 11 is as follows:

The housing 2 of the socket 1 is extruded in one piece from a thermoplastic plastic with the exception of the front wall 6 which is designed as a cover, and in fact can be seen in Fig. 10. In the housing 2, the two raised edges of the base 105 of the second housing leg 4, project upwards at right angles from the back wall 102. On the other hand, the section of the base 104 which

stretches between them is an extension of the back wall 102, i.e. the film hinge 103 is stretched out. Then the contact spring arrangements 49, which are produced as straight stamped sheet metal parts, are inserted into the slots contained in the webs 106, from one contact spring arrangement 49 the insulation piercing contact 53 is in the chamber 48 and with the other contact spring arrangement 49 the insulation piercing contact 53 is in the other chamber 33. These two chambers are at different distances from the film hinge 103, in fact they are staggered in the same way as that previously explained in connection with Fig. 1. Then the middle section of the base 104, together with the inserted contact spring arrangements 49, is bent upwards in a clockwise direction until the base section 104 is flush between the two raised edges of the base 105. In this way both contact spring arrangements 49 are bent at their desired bending point 101 about an axis which is vertical to the plane defined by the flat surface of the insulation piercing contact 53. The sheet steel shapes are bent edgewise, as it were, through the narrow face.

After folding up the middle base section 104, it locks in the folded-up position, which can be seen in Fig. 11, with latching components (not shown). Operation for the rest is as previously explained.



Claims

1. A socket (1) for electrical devices, such as gas discharge lamps, incandescent lamps or starters, with a housing (2) made from insulating material; with at least one contact spring arrangement (51) in the housing (2), which contact spring arrangement (51) is equipped for making contact with a contact available for electrical equipment; with at least one essentially plate-shaped insulation piercing contact (53) which is accommodated in the housing (2), and is accessible from the outside, and with an insulation piercing slot (58) for clamping a supply line, which slot (58) is open at the side and has a width which brings about a clamping connection of a conductor in an inserted lead; with an electrically conducting connecting piece (52) lying between the contact spring tongue (51) and the insulation piercing contact (53), in which the contact spring tongue (51), the insulation piercing contact (53) and the connecting piece (52) are joined in a single piece and form a contact spring arrangement (58); with at least one chamber (33, 48) provided in the housing (2) for the insulation piercing contact (53) which contains in its side walls (38), insertion slots (39) which are open at the side and aligned with the insulation piercing slot (38) and in which the insulation piercing contact (53) is accommodated and protected against accidental contact, and on whose base (16, 98) the insulation piercing contact (53) is supported or on whose base (16, 98) the insulation piercing contact (53) stands; and with protective lands (36, 37, 38) which are mounted adjacent to each insertion slot (39) and which form a groove-shaped recess (34, 35) adjacent to each insertion slot (39), which recess (34, 35) serves as protection against accidental contact with a possibly uninsulated conductor end sticking out of the insulation piercing slot (53).

2. A socket according to Claim 1, characterised in that the width of the groove-like recess





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(34, 35) is greater than the outside diameter of a lead which is to be clamped.

3. A socket according to Claim 1, characterised in that the groove-like recess (34, 35) is deeper than the insertion slot (39).
4. A socket according to Claim 1, characterised in that the insertion slot (39) is sharp-edged.
5. A socket according to Claim 1, characterised in that the insulation piercing slot (38) widens out into a funnel shape at its open end.
6. A socket according to Claim 1, characterised in that the insertion slot (39) widens out into a funnel shape at its open end.
7. A socket according to Claim 1, characterised in that the housing (2) has moulded fixtures (17, 18, 19).
8. A socket according to Claim 1, characterised in that the housing (2) has a first and second housing leg (3, 4) which are both joined together into one piece in such a way that the housing (2) is L-shaped when viewed from the side, and in that the longitudinal axes of the housing leg (3, 4) are perpendicular to each other.
9. A socket according to Claim 8, characterised in that the first housing leg (3) has in its front wall (6) adjoining the second housing leg (4) at least one opening (13) for the base or connection pins of the electrical devices.



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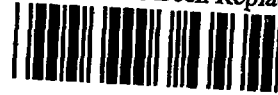


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10. A socket according to Claim 9, characterised in that a rotary component (15) for accommodating a two-pin connection lamp is rotatably mounted in the front wall (6).
11. A socket according to Claim 8, characterised in that at least one of the chambers (33, 38) in the second housing leg (4) is intended for the insulation piercing contact (53).
12. A socket according to Claim 11, characterised in that the second housing leg (4) contains two chambers (33, 48) for two insulation piercing contacts (53); in that each of the two grooves (24, 25) which are open at the ends and which have varying width along their length and which have their longitudinal axis at right angles to the longitudinal axis of the second housing leg (4), define the connecting groove-like recesses (34, 35) in the chambers (33, 48); in that the grooves (34, 35) are spaced apart from each other; and in that the two chambers (33, 48) are offset from each other when viewed in the longitudinal direction of the grooves (24, 25).
13. A socket according to Claim 12, characterised in that the closer groove (25) adjacent to front wall (6) contains in its two side walls (36, 37) openings (44, 47) into the other groove (24) in an extension of the chamber (33), through which the insulation piercing contact (53) can be inserted into its associated chamber (33) from the first housing leg (3).
14. A socket according to Claim 13, characterised in that the openings (47) are matched to the cross-sectional profile of the insulation piercing contact (53).
15. A socket according to Claim 13, characterised in that the chamber (33) and the adjacent groove (25) have bases which are level with each other, and in that the openings (44, 47) merge



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smoothly at the relevant edge.

16. A socket according to Claim 13, characterised in that the second housing leg (4) has a base (16) in the region between the front wall (6) and the groove (25) adjacent to it, which base (16) merges smoothly into the bottoms of the adjacent groove (24) and merges smoothly into a chamber (33) lying on the other side of the groove (24).

17. A socket according to Claim 11, characterised in that the chamber (48) contains an opening (47) in the groove (25) adjacent to the front wall (6), which opening (47) opens to the first housing leg (3) in such a way that the associated insulation piercing contact (53) can be put into its chamber (33) from the first housing leg (3).

18. A socket according to Claim 17, characterised in that the second housing leg (4) has a base (16) in the region between the front wall and the groove (25) adjacent to it, which base merges smoothly into the bottom of the associated chamber (48).

19. A socket according to Claim 1, characterised in that the first housing leg (3) is open in an extension of the openings (47, 44) into the groove (25) adjacent to the front wall, and in that between the openings (47, 44) at least one separating wall (28) is arranged stretching to the back side of the first housing leg (3) remote from the front wall (6), which separating wall (28) together with side wall areas (12) of the first or second housing leg (3, 4) form groove-like recesses serving as protection against accidental contact.





20. A socket according to Claim 19, characterised in that two separating walls (28) are provided, which are spaced apart from each other and which together with side wall areas (12) of the first or second housing leg (3, 4) form groove-like recesses serving as protection against accidental contact.

21. A socket according to either Claim 19 or 20, characterised in that the side wall areas (12) and the separating walls (28) have ribs which lead in a funnel-shape to the openings (44, 47).

22. A socket according to Claim 8, characterised in that the first housing leg (3) has a base area (104) which is joined into one piece with the first housing leg (3) through a film hinge (101), and in that the chambers (33, 48) and the groove-shaped recesses (34, 35) are arranged on the base area (104).

23. A socket according to Claim 22, characterised in that webs run from the chambers (33, 48) towards a back side (102) of the first housing leg (3), which back side (102) is remote from the front wall (6) and in which there are grooves opening upwards and a part (52) of the respective contact spring arrangement (49).

24. A socket according to Claim 23, characterised in that the first housing leg (3) is closed at its back side (102).

25. A socket according to Claim 8, characterised in that a housing extension (71), which contains an additional socket facility (72), is provided at the side of the first housing leg (3).





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26. A socket according to Claim 25, characterised in that the additional socket facility (72) is a starter socket device.

27. A socket according to Claim 1, characterised in that the housing (2) has essentially the shape of a cuboid with a front wall (87), a rear wall (88) and side walls (90), and in that at least one opening (75) is contained in the front wall (87) for the base or connection pins of the electrical device.

28. A socket according to Claim 27, characterised in that a chamber (33) is formed in one of the side walls (90).

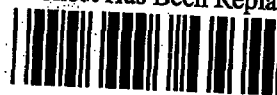
29. A socket according to Claim 28, characterised in that two chambers (33) are formed in one of the side walls (90) in the vicinity of the relevant corners.

30. A socket according to Claim 27, characterised in that the groove-shaped recesses (34, 35) extend through the front wall (87) and/or the rear wall (88).

31. A socket according to Claim 1, characterised in that the insertion slot(s) (39) open in a direction extending away from the fixtures (17, 18, 19).

32. A socket according to Claim 1, characterised in that the contact spring arrangement (49, 58) is a stamped sheet steel part.





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33. A socket according to Claim 1, characterised in that the contact spring arrangement (49, 58) is essentially an L-shaped configuration.
34. A socket according to Claim 1, characterised in that the insulation piercing slot (38) points in the same direction as the contact spring tongue (51).
35. A socket according to Claim 1, characterised in that the connecting piece (52) has two legs (61, 62) at right angles to each other and is slanted at the junction point (63).
36. A socket according to Claim 35, characterised in that, in the angled section of the L-shaped configuration, a projection (64) is provided whose shoulder (67), which is shared with the contact spring tongue (51), is higher than the opening of the insulation piercing slot (38), referring to a bottom edge (57) of the insulation piercing contact (53).
37. A socket according to Claim 1, characterised in that the contact spring tongue (51) is essentially in the same plane as the insulation piercing contact (53).
38. A socket according to Claim 1, characterised in that contact spring tongue (51) lies in a plane which essentially is at right angles to the plane in which the insulation piercing contact (53) lies.
39. A socket according to Claim 1, characterised in that the connecting piece (52) merges into the insulation piercing contact (53) at an area of the insulation piercing contact (53) adjacent to the open end of the insulation piercing slot (38).



* C L M S *

40. A socket according to Claim 1, characterised in that the connecting piece (52) contains a desired bending point (101) which facilitates bending of the contact spring arrangement (49) with regard to a bending axis which is perpendicular to the plane defined by the faces of the insulation piercing contact (53).

41. A socket according to Claims 22 and 40, characterised in that the desired bending point (101) is located at the film hinge (103) in an inserted contact spring arrangement (49).

42. A socket according to Claims 1 and 2, characterised in that the connecting piece (52), at the point at which it crosses the groove (25) of one contact spring arrangement, is designed so that its upper edge, referring to the bottom (16) of the groove (25), is lower than the bottom end of the insulation piercing slot (38) of the other contact spring arrangement (49).

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Abstract:

In a socket (1) for electrical devices, there is at least one contact spring arrangement (49) which is located in a housing (2) made from an insulating material, and in which a contact spring (51), for the connection pins of the electrical devices to be inserted, is joined to an insulating piercing contact (53) by a connecting piece (52) to form a single component.

(Fig. 2)

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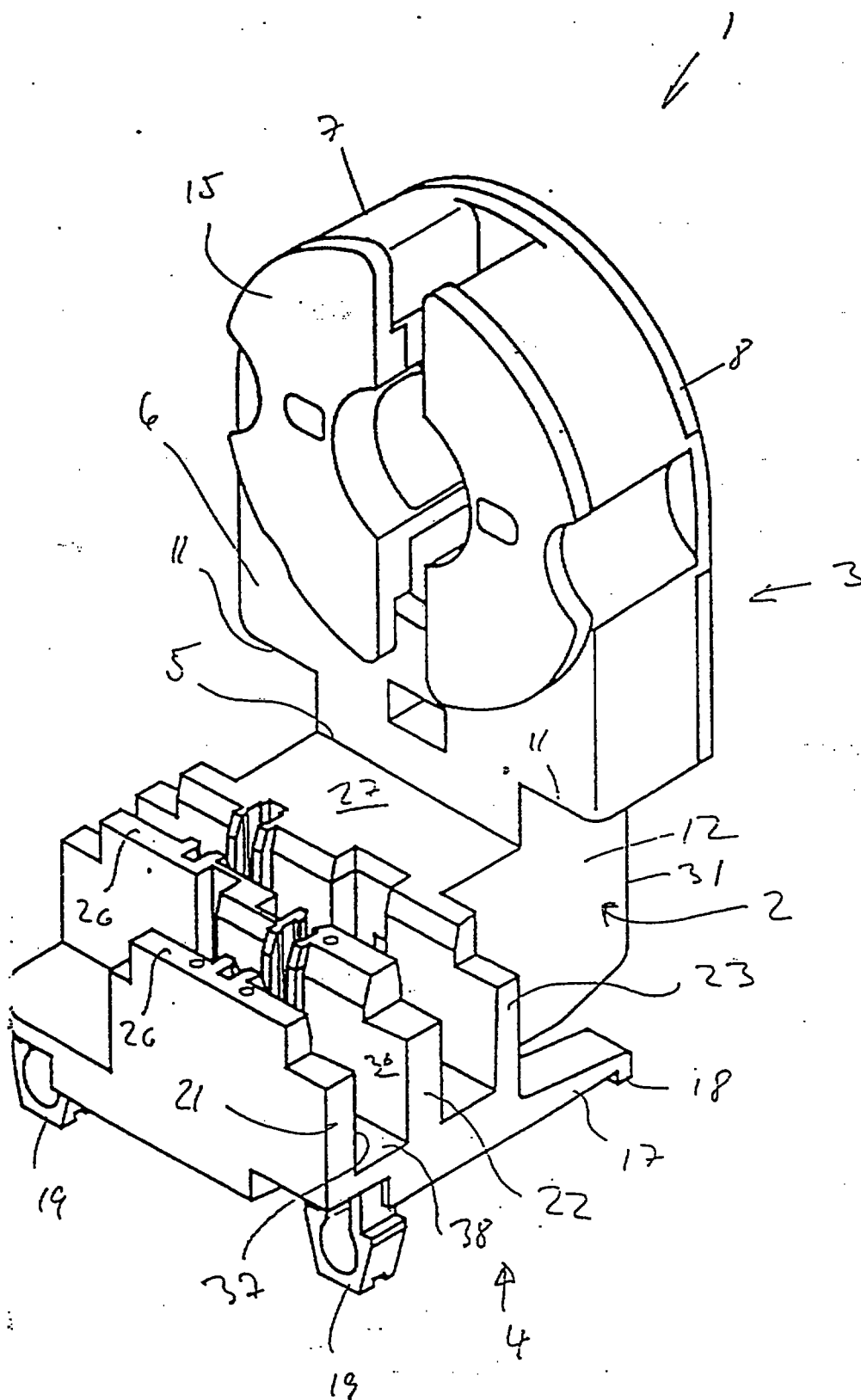
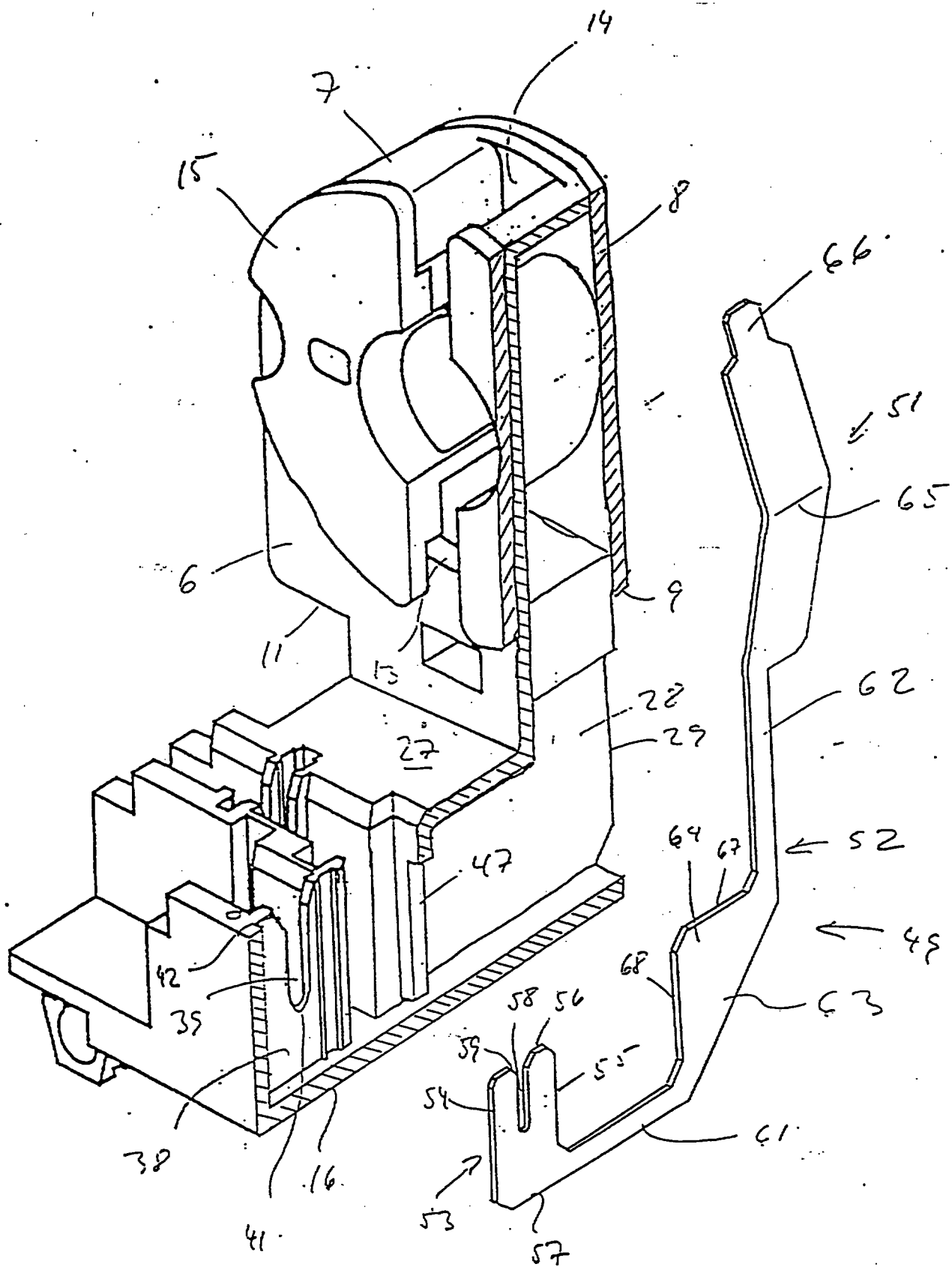


Fig. 1

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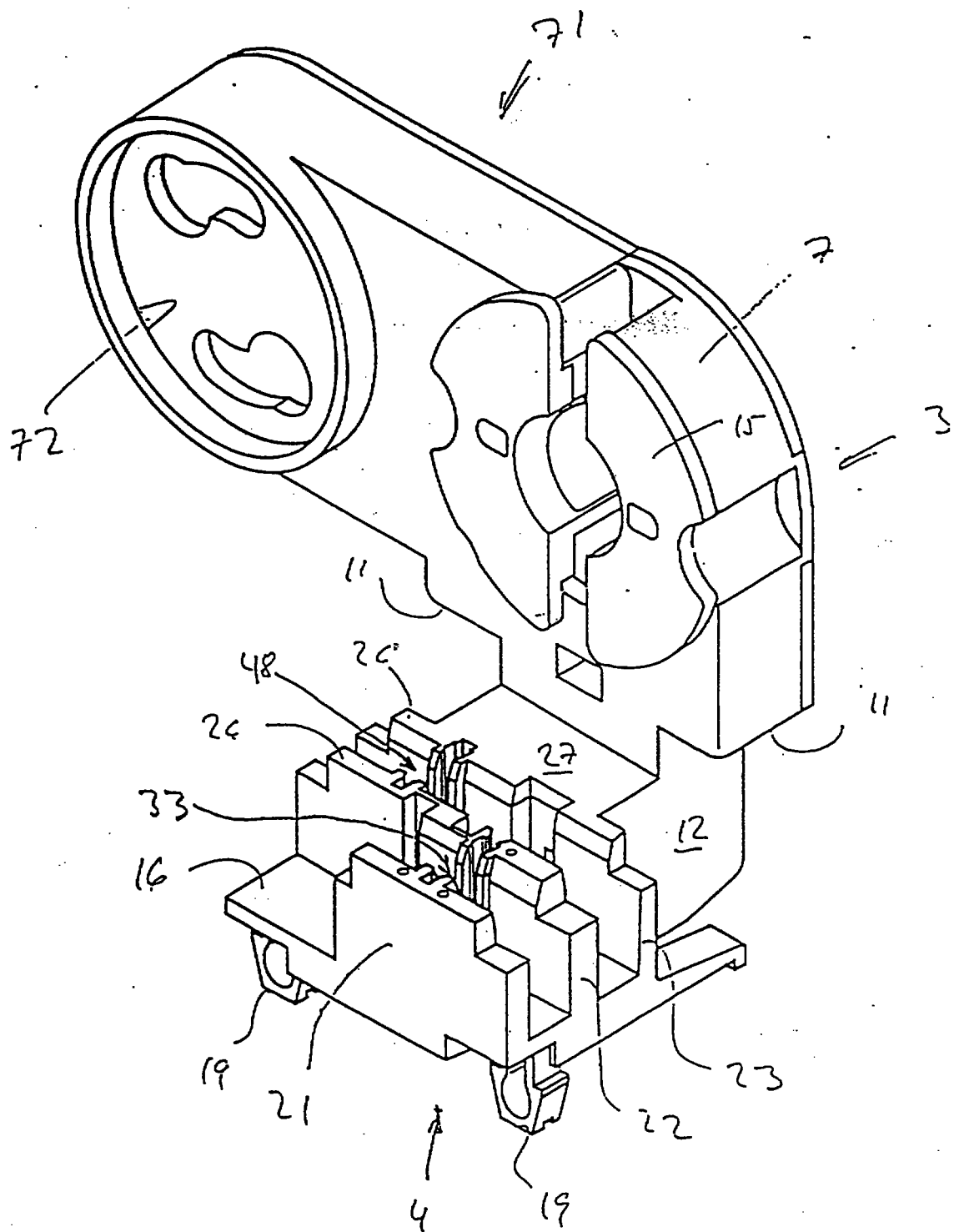




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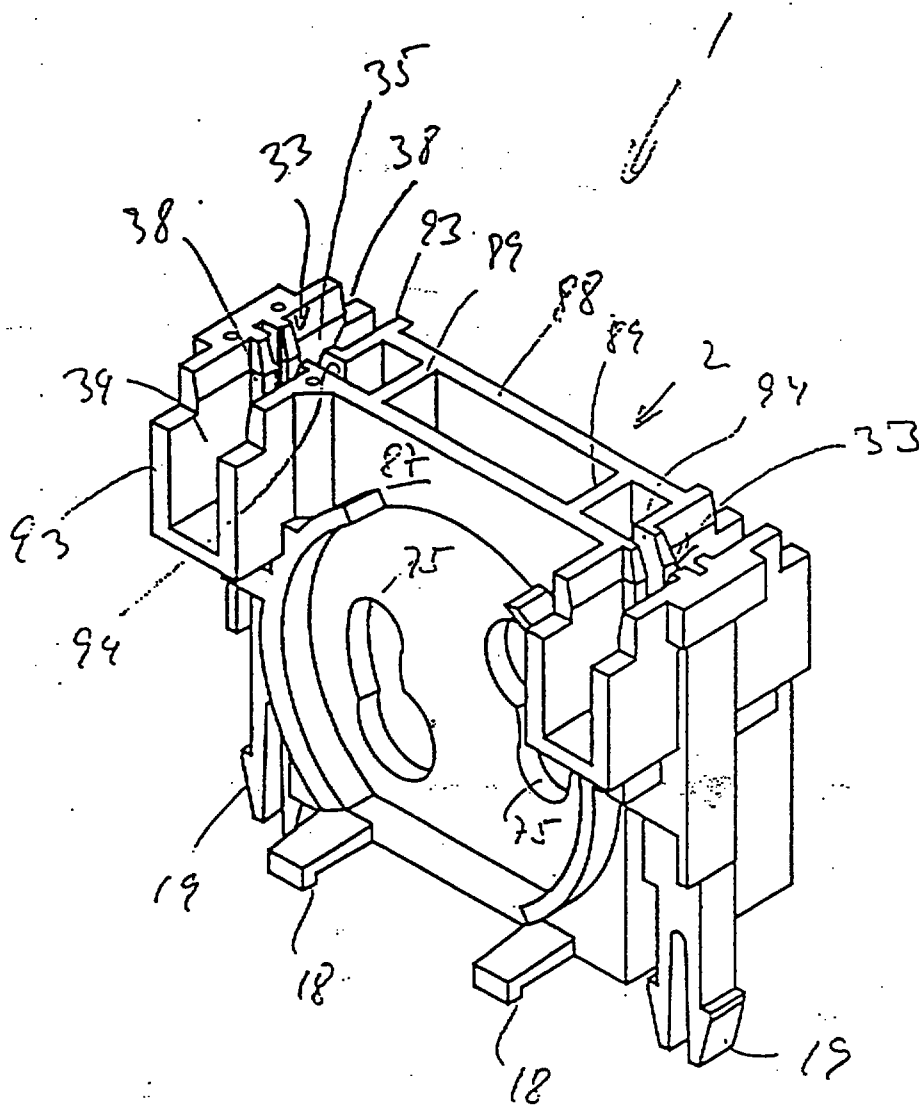
Fig. 2



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Fig. 4

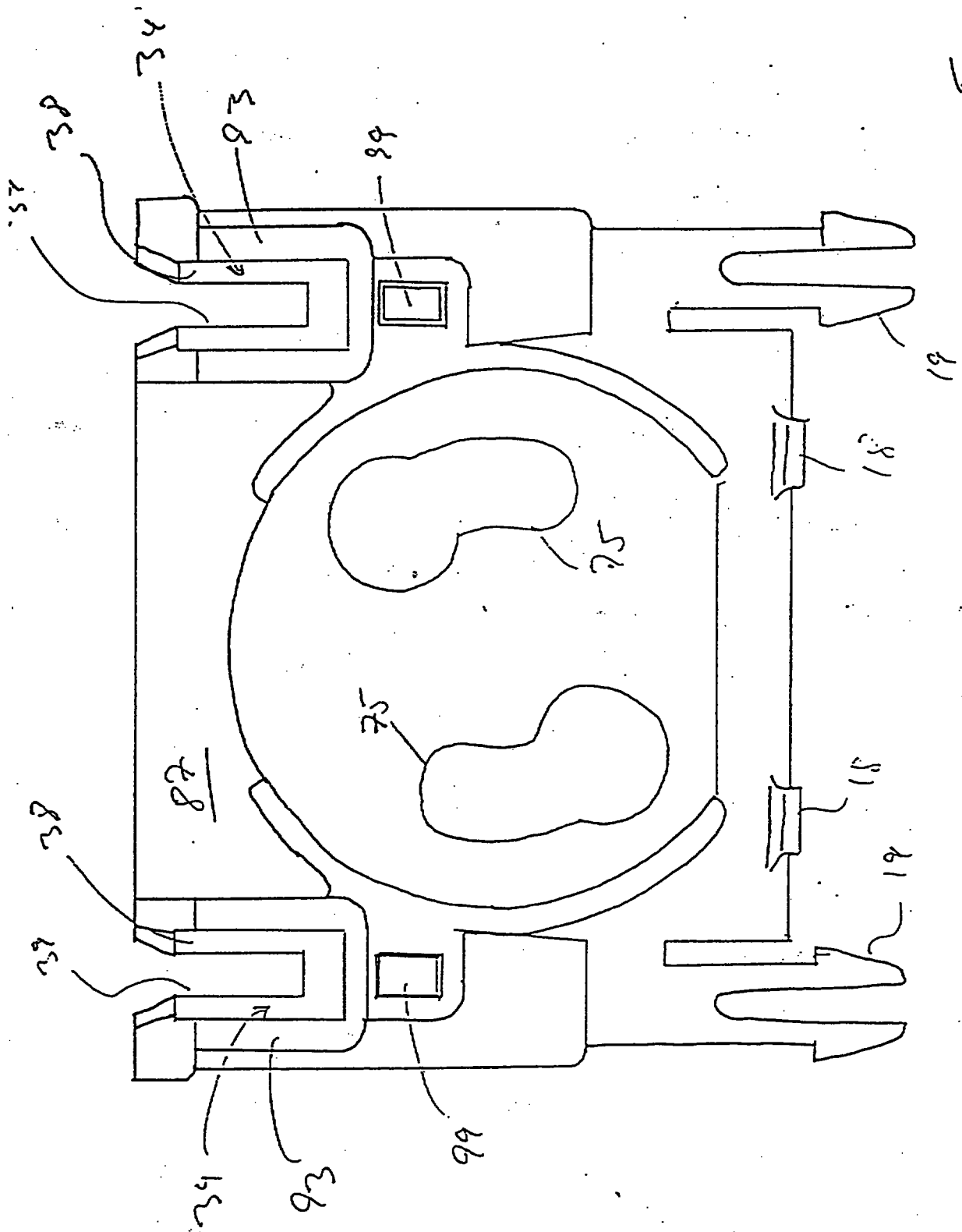


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Fig. 6

Fig. 7



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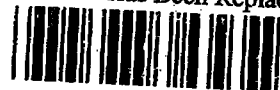
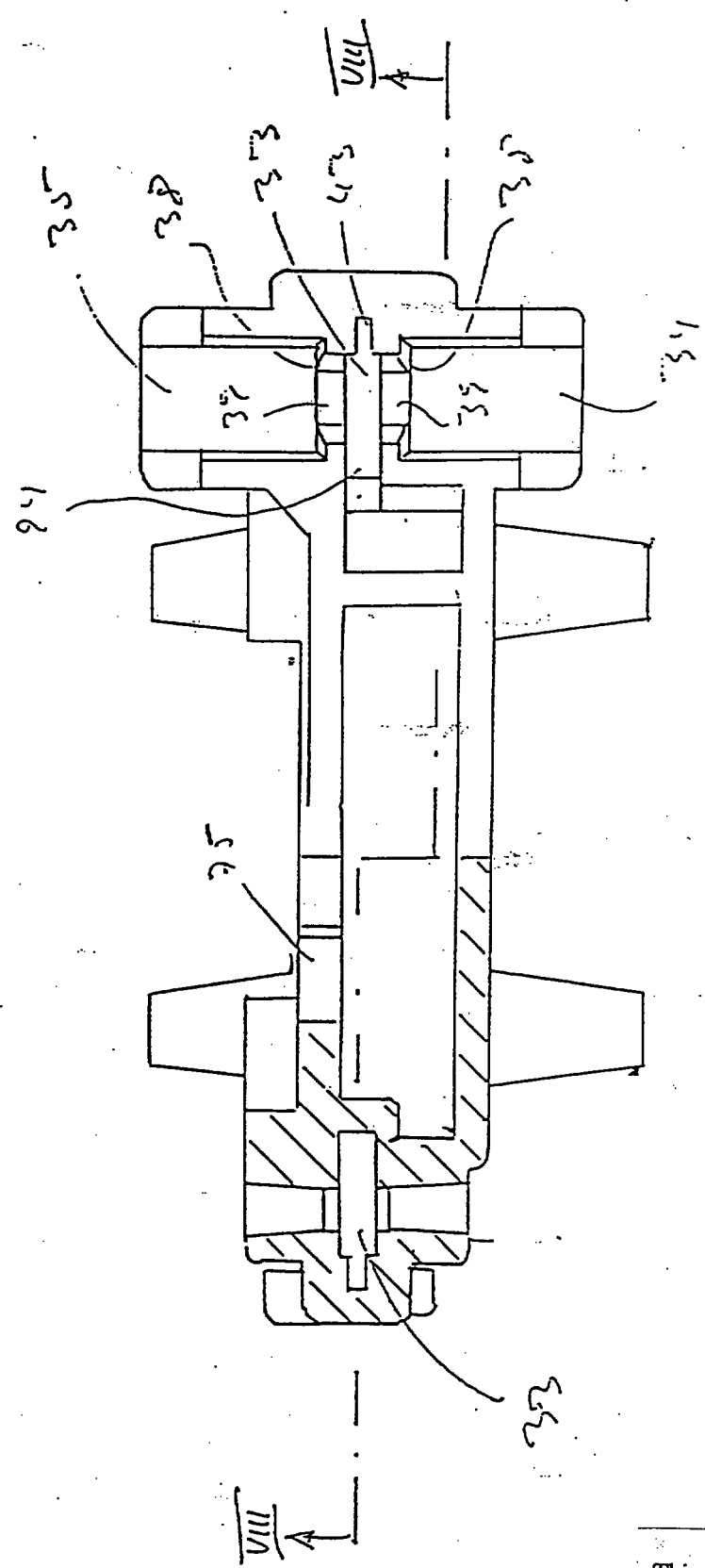


Fig. 8



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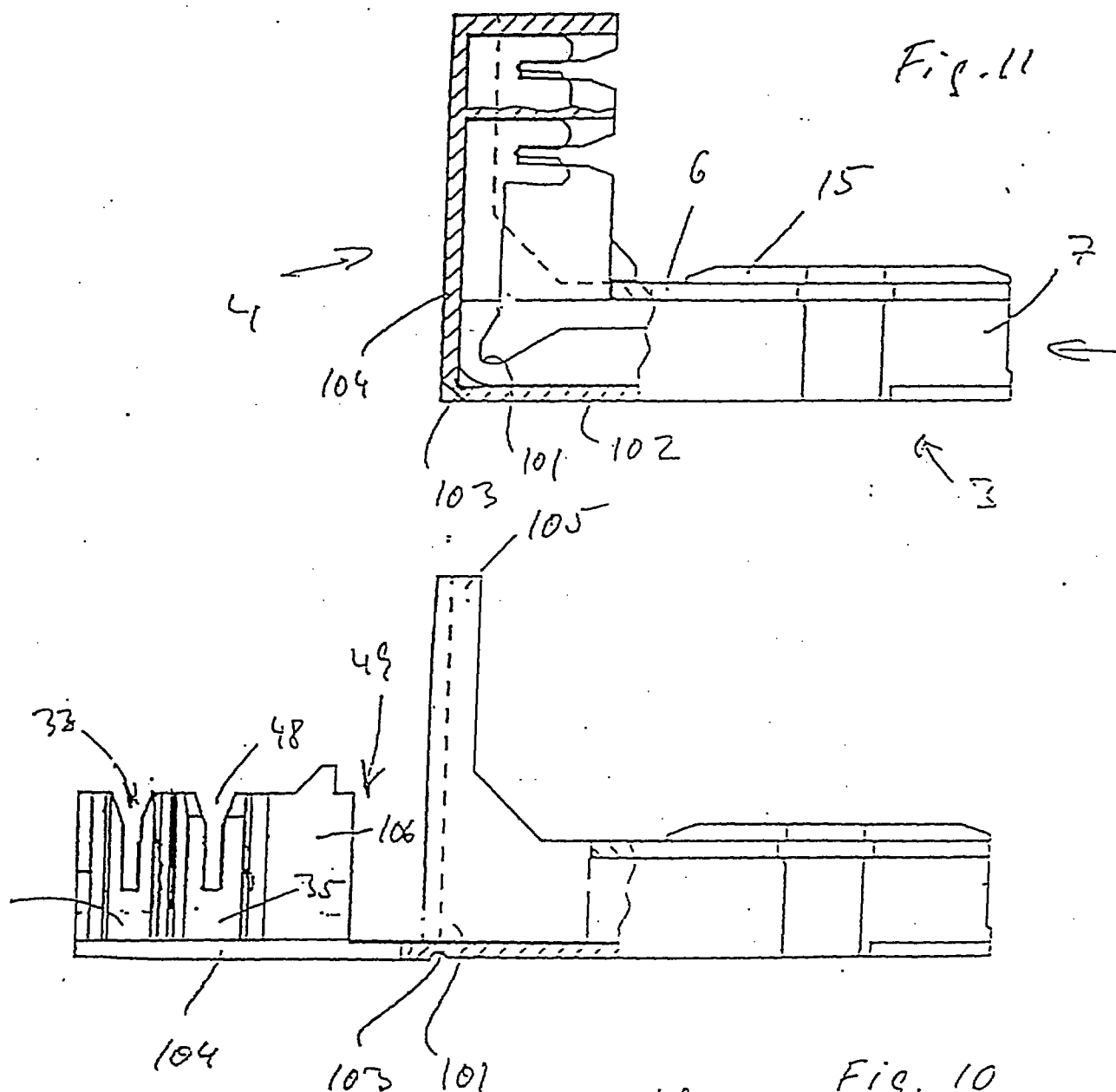


Fig. 11

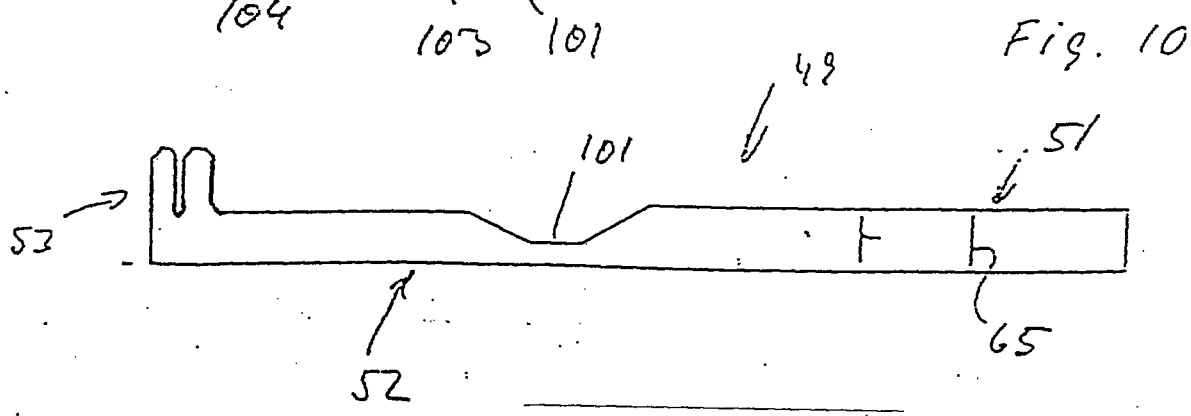
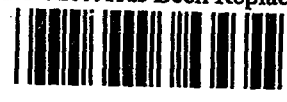


Fig. 10

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A SOCKET FOR ELECTRICAL DEVICES

ABSTRACT

In a socket (1) for electrical devices, there is at least one contact spring arrangement (49) which is located in a housing (2) made from an insulating material, and in which a contact spring (51), for the connection pins of the electrical devices to be inserted, is joined to an insulating piercing contact (53) by a connecting piece (52) to form a single component.

Fig. 2

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☐ Description :	paged to paged	
☐ Claim(s) :	paged to paged	
☒ Drawing(s) :	paged <u>4/9</u> to paged <u>10/10</u>	
☒ Abstract :	paged <u>30</u> to paged	
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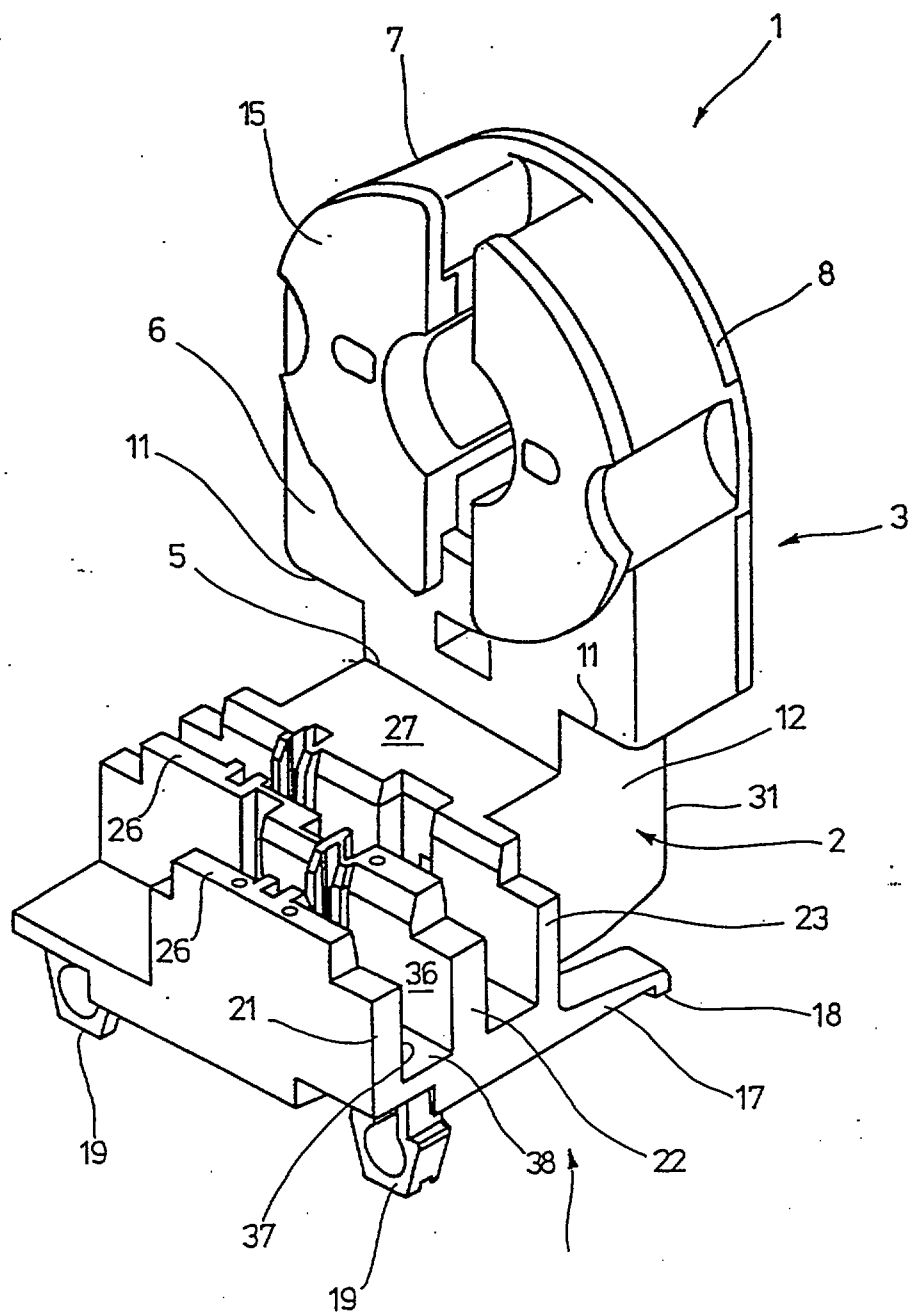
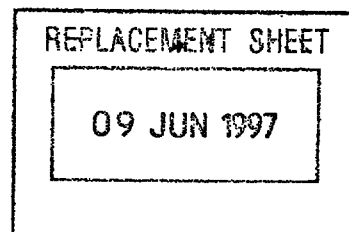


Fig. 1



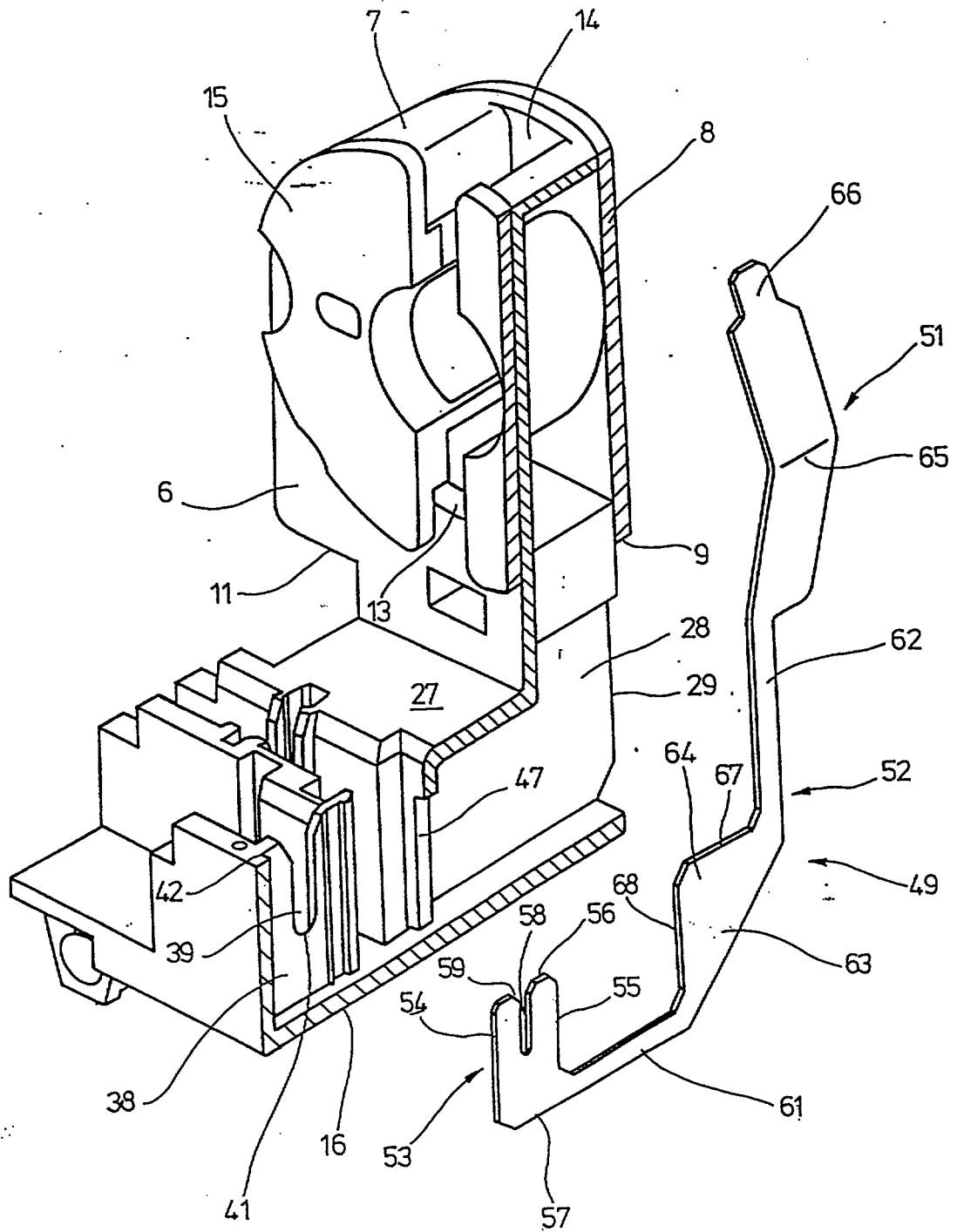
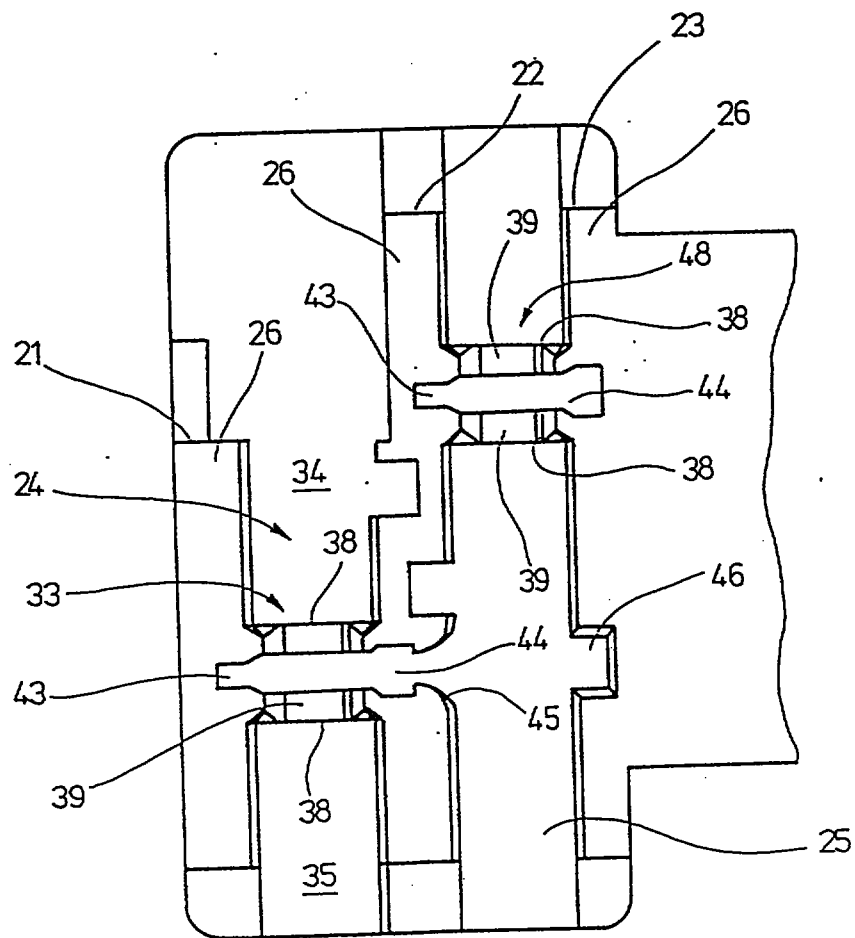


Fig. 2

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Fig. 3



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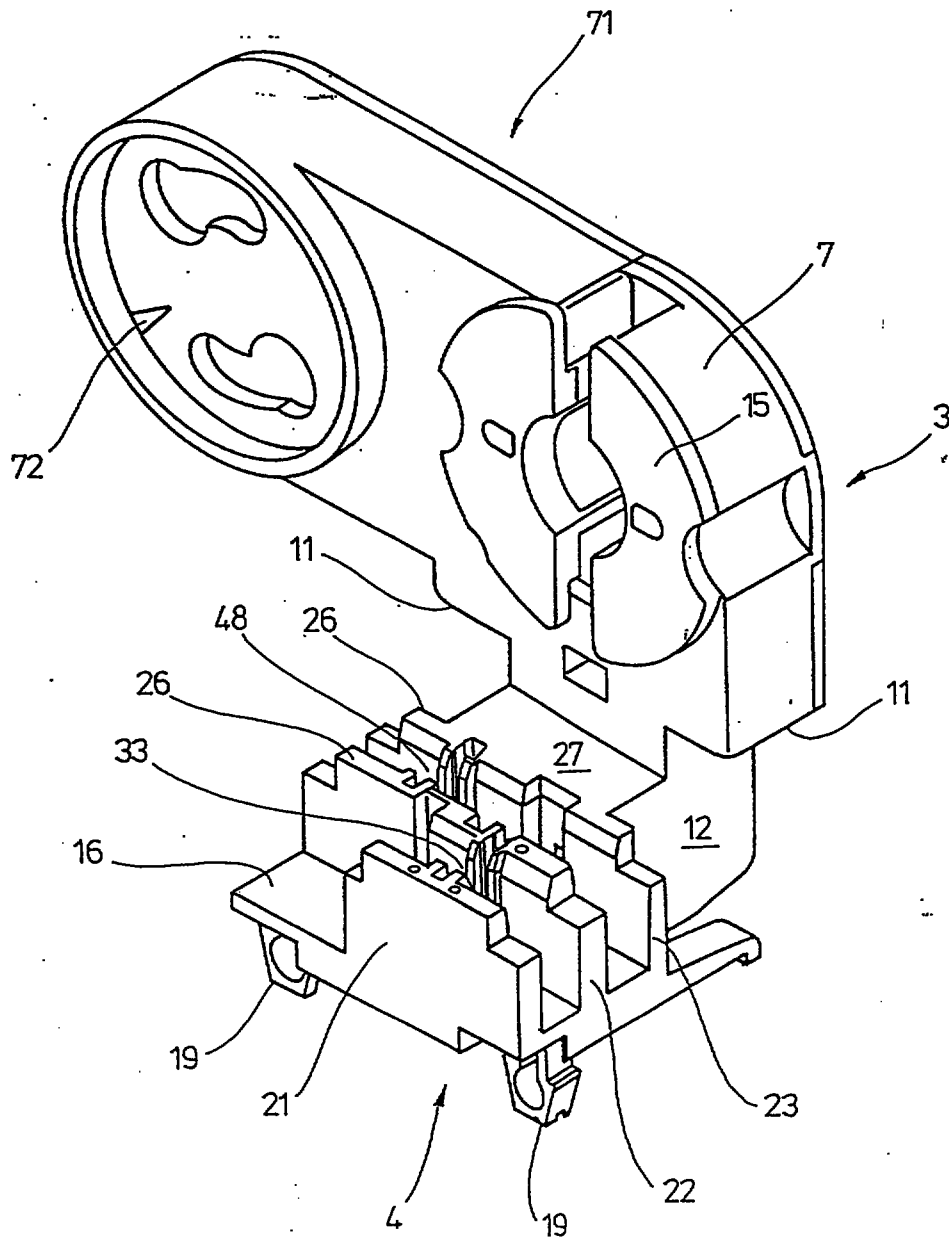
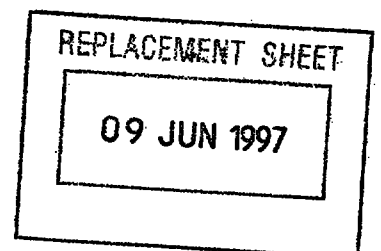
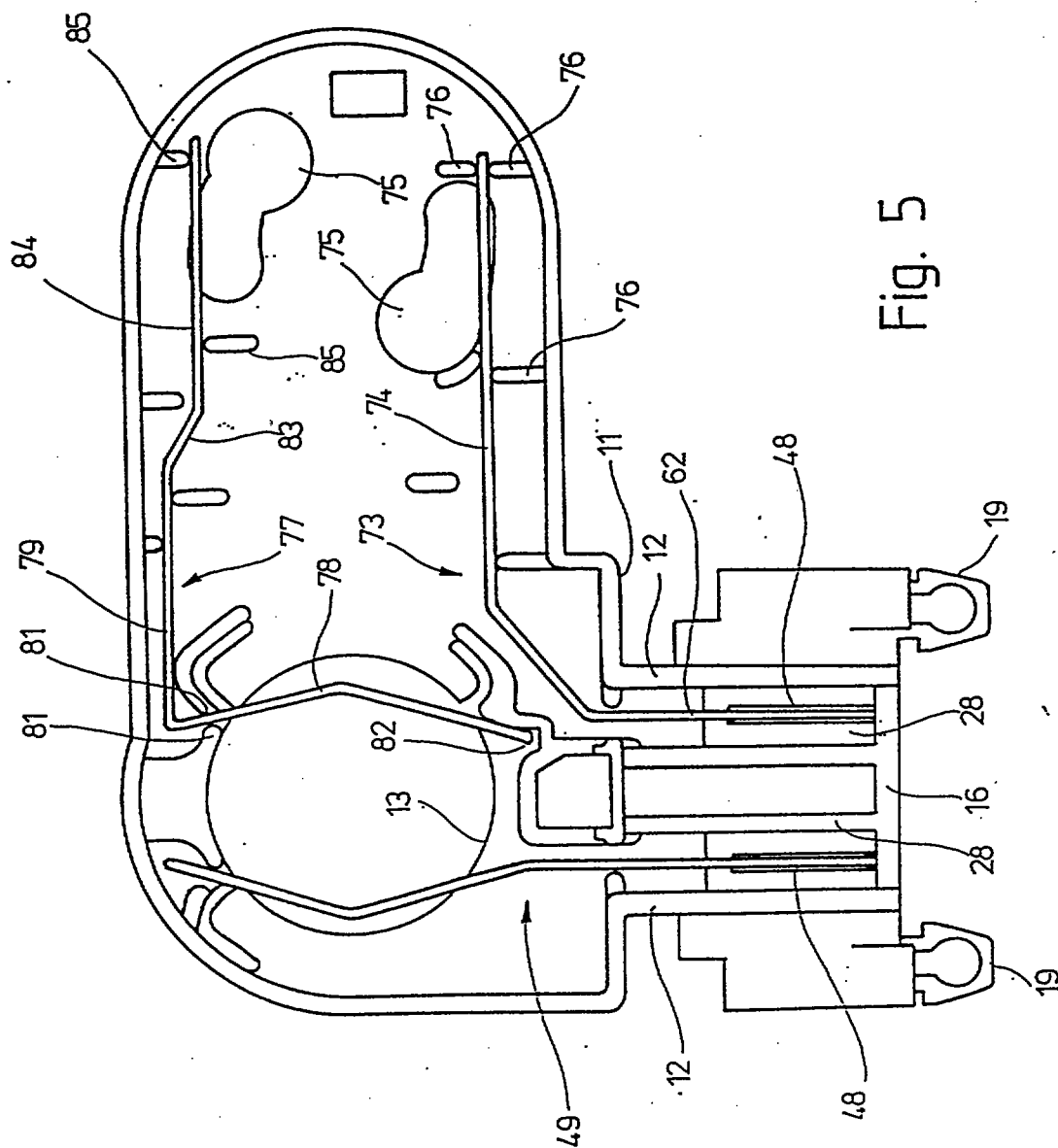


Fig. 4





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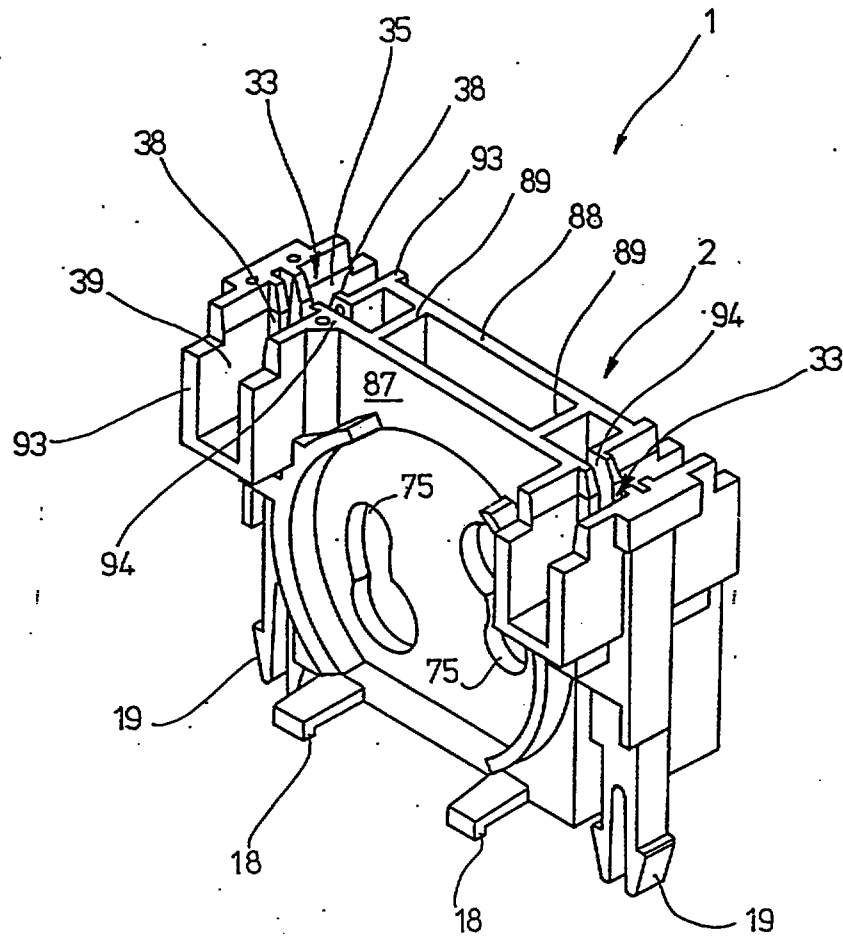


Fig. 6

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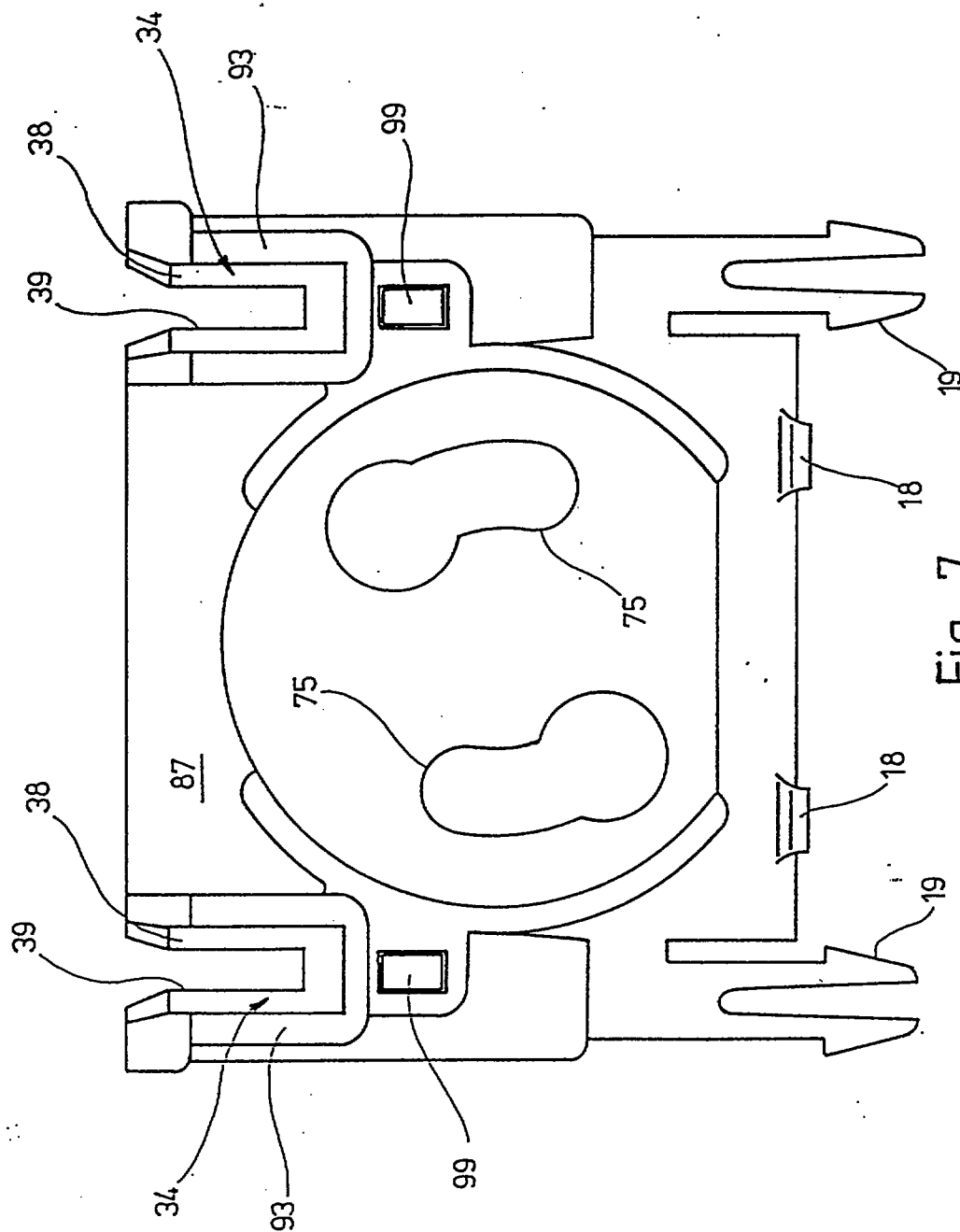
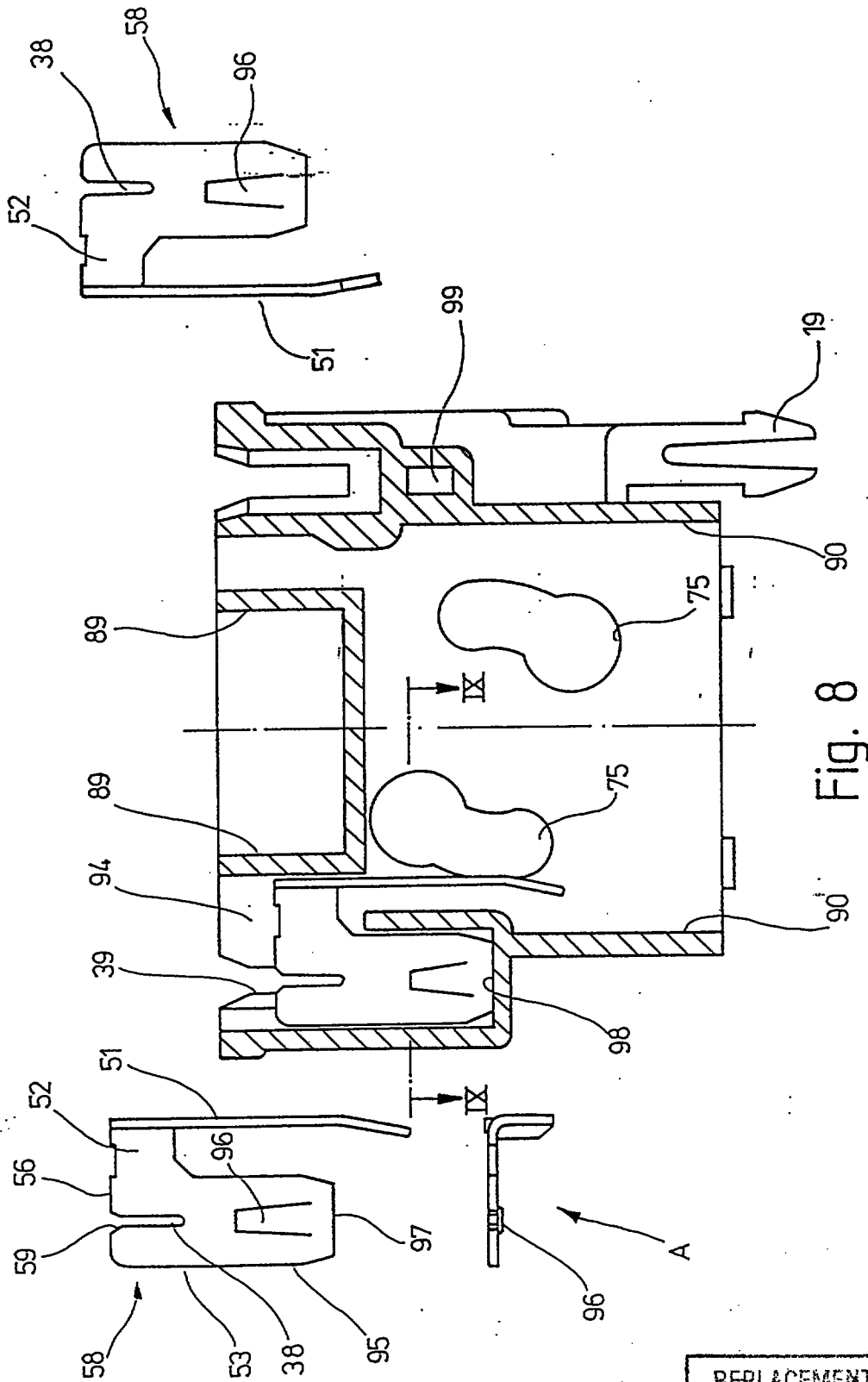


Fig. 7

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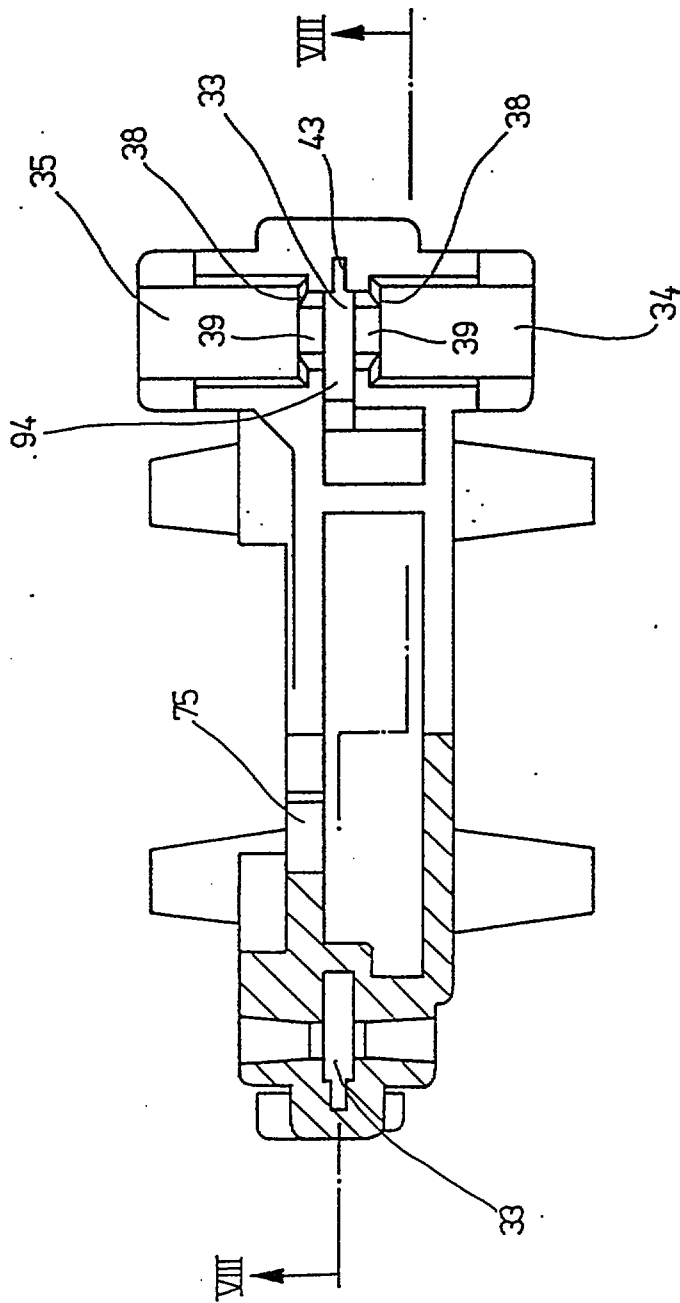


Fig. 9

Fig. 11

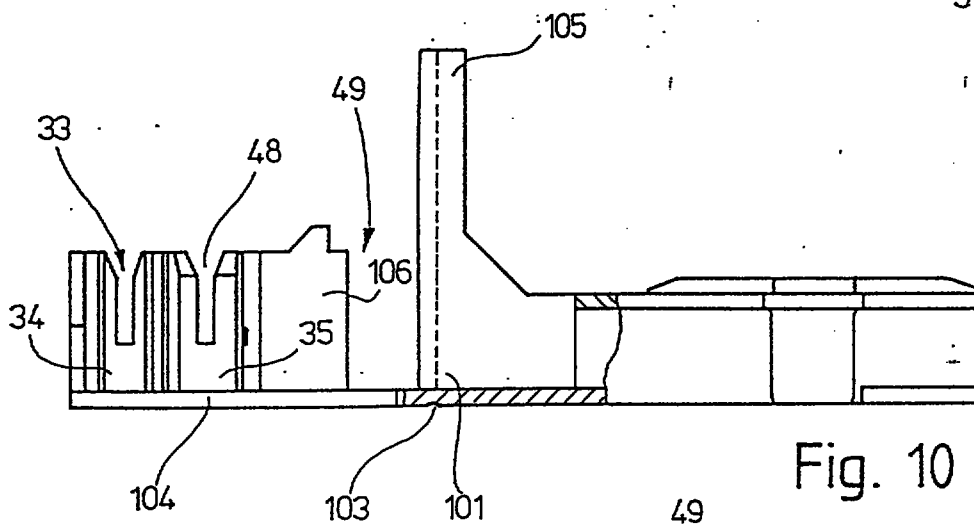
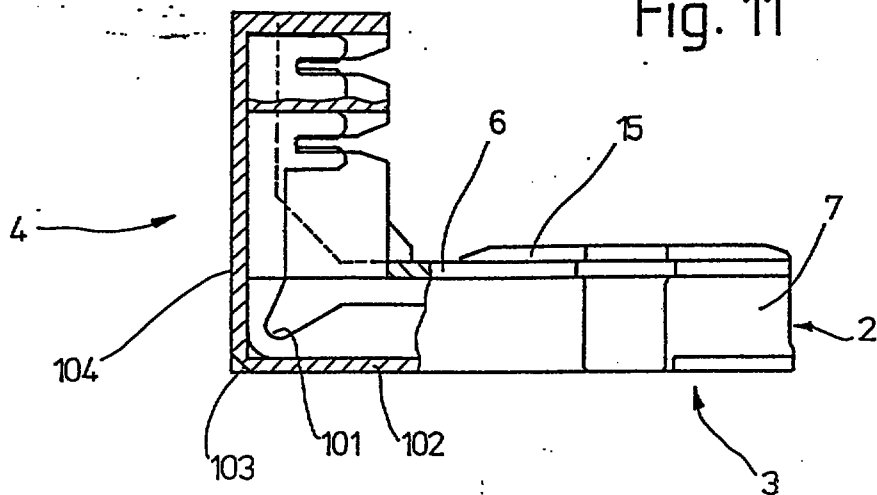
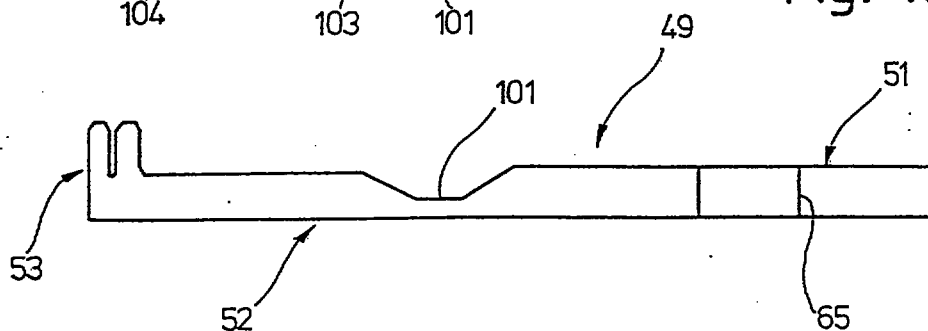


Fig. 10



**"SOCKET FOR ELECTRICAL DEVICES, PARTICULARLY TUBULAR
ELONGATED LAMPS, SUCH AS DOUBLE-BASED FLUORESCENT LAMPS
AND/OR STARTERS THEREFOR"**

Field of the Invention

The present invention relates to sockets for electrical devices, and particularly for elongated double-based fluorescent lamps, fluorescent lamp starters, combined fluorescent lamp-starter sockets, and the like, and more particularly to such sockets which are easy to make and are eminently suitable for wiring by automatic wiring apparatus.

Background of the Invention

Electrical connection between an external wiring system and contact springs adapted to be engaged by the terminals of a fluorescent lamp and/or a starter is frequently made by using terminal elements which are accessible from the outside of the socket housing through a suitable opening and which have wire clamping or similar terminals therein. The electrical connection of an insulated wire is made by introducing the connecting conductor or conductors through suitable openings into the housing after the conductor of the insulated wire has been stripped free of insulation. The contact spring is formed in the region of the opening with a flap or tongue punched therefrom to form a contact region adjacent the tongue, in which the contact region may be slightly bent to form a counter or support element for the end of the wire inserted through the opening which is clamped in that region by the free end of the tongue. The tongue is resilient. The entire arrangement can be made of a metal strip which is bent generally over its flat surface to form an element comprising the contact spring for the pins of the lamp base as well as the contact portion and contact tongue for the electrical connection to an electrical conductor.

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✓ Claim(s) :	paged .22. to paged .27.	
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✓ Abstract :	paged .28. to paged	
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The starter is connected between the outer wiring by a separate clamping spring tongue located in another portion of the housing.

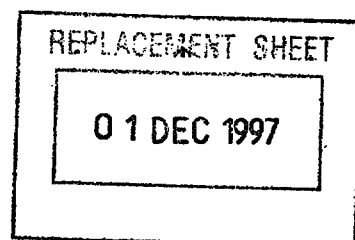
Australian Patent No. 668566, (ALBECK *et al*, PCT/DE93/00456) illustrates in Fig. 12 the use of slit blade insulation piercing connectors in combination with two-pin based lamps to permit automatic wiring of their lamp fixtures. The lamp fixture shown comprises two slit blade insulation piercing connector springs that are located in a housing of insulated material and are offset with respect to each other. The connector springs of the piercing connectors are essentially in the form of a U-shape. The insulation-piercing slit is open on top and permits radial insertion of a conductor which still contains insulation, that is, from which an end portion of insulation has not been removed. Groove-like recesses laterally located next to the slit blade insulation piercing connector are provided to protect an uninsulated blank end of the conductor against accidental contact. The width of the recesses and the depth of the insertion of the conductor into the slit blade insulation piercing connector are so selected that a standardized test ball cannot touch any elements which would carry voltage with the connector in use.

Summary of the Invention

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein a socket for electrical devices including fluorescent lamps, starters therefor, or elongated tubular lamps and having at least one projecting terminal, and adapted for connection to at least one insulated electrical supply wire including an internal electrical conductor, said socket comprising:

- a socket housing of insulating material;
- at least one unitary contact spring having
 - a contact terminal portion adapted for engagement with a projecting terminal of the electrical device;



a slit blade connector portion accessible from the outside of the housing, and including a blade part formed with a conductor insertion slit, said slit having a width forming an interference fit with the conductor of the wire; and

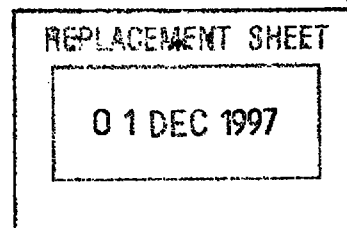
a connecting portion connecting said slit blade insulation piercing connector portion with the contact terminal portion,

said socket housing being formed with a terminal reception chamber defined by a chamber bottom and, at least in part, by side walls,

the chamber side walls being formed with facing, wire insertion slits aligned with each other, for receiving the blade part of the slit blade insulation piercing connector portion, and the chamber bottom forming an end stop for said blade part; and

groove-like recesses formed in the socket housing adjacent to said wire insertion slits and extending longitudinally with respect to the wire insertion slits, and dimensioned and shaped for reception and protection of an end portion of the wire projecting from the slit blade insulation piercing connector portion and for protection of a cut end of said internal electrical conductor from accidental contact thereof.

The width of the recesses which, preferably, are groove-like, should be somewhat larger than the external diameter of the wire to be inserted in order to permit easy insertion of the conductor and to prevent any inadvertent shock hazard upon inadvertent contact with voltage-carrying elements or parts thereof. The groove-like recess should be deeper than the insertion slit of the connector in order to ensure that, considering the cross section of the conductor inserted into the slit, and the required wall thickness of the insulating material, preferably a plastic material, insertion of the conductor deep into the slit of the blade connector is easy.



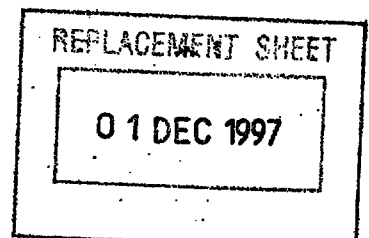
Introduction of the conductor into the slit blade insulation piercing connector may be facilitated by forming the socket material adjacent the recess with an introduction slit above the slit blade insulation piercing connector, which narrows, in funnel-shaped form, in the direction of the slit in the connector; and by also forming the slit in the connector to be narrowing towards a bottom portion thereof. Automatic attachment in a fixture or luminaire which has the sockets in accordance with the present invention is facilitated by forming the socket housing with attachment elements thereon, unitary with the housing.

Sockets which have the features in accordance with the present invention can be shaped in various ways, for reception of fluorescent lamps for example, as well as for incandescent lamps, and of starters; it is only necessary to shape the external form and the contact terminal end portion of the contact spring according to the electrical device which is to be received. For example, to receive two-pin lamps, it is appropriate to form the housing with two generally right-angle parts, one of which having an opening for the pins of the lamp, and the other part having chambers to receive the slit blade insulation piercing connectors.

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In accordance with a preferred feature of the invention, the groove-like recesses adjacent the slit blade insulation piercing connectors are formed as two grooves, located with some space between each other, and located toward the forward side of the first part. This makes it easily possible to insert wires with an insertion tool from the front side of the socket, so that it can pass the socket, and collision of the insertion tool with the front side of the socket is reliably avoided.



The claims defining the Invention are as follows:

1. Socket for electrical devices including fluorescent lamps, starters therefor, or elongated tubular lamps and having at least one projecting terminal, and adapted for connection to at least one insulated electrical supply wire including an internal electrical conductor, said socket comprising:

a socket housing of insulating material;

at least one unitary contact spring having

a contact terminal portion adapted for engagement with a projecting terminal of the electrical device;

a slit blade connector portion accessible from the outside of the housing, and including a blade part formed with a conductor insertion slit, said slit having a width forming an interference fit with the conductor of the wire; and

a connecting portion connecting said slit blade insulation piercing connector portion with the contact terminal portion,

said socket housing being formed with a terminal reception chamber defined by a chamber bottom and, at least in part, by side walls,

the chamber side walls being formed with facing, wire insertion slits aligned with each other, for receiving the blade part of the slit blade insulation piercing connector portion, and the chamber bottom forming an end stop for said blade part; and

groove-like recesses formed in the socket housing adjacent to said wire insertion slits and extending longitudinally with respect to the wire insertion slits, and dimensioned and shaped for reception and protection of an end portion of the wire projecting from the slit blade insulation piercing connector portion and for protection of a cut end of said internal electrical conductor from accidental contact thereof.

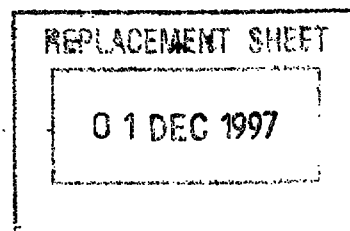
2. The socket of claim 1, wherein the recesses are delimited by side walls, spaced from each other by a distance larger than the outside diameter of said supply wire.

3. The socket of claim 1, wherein the recesses are deeper than the insulation piercing slits of the slit blade insulation piercing connector portion.

4. The socket of claim 1, wherein said insulation piercing slit has sharp edges.

5. The socket of claim 1, wherein said insulation piercing slit has funnel-shaped free ends.

6. The socket of claim 1, wherein said insertion slit has funnel-shaped free end portions.



7. The socket of claim 1, further including socket attachment means unitarily formed on said housing.

8. The socket of claim 1, wherein said housing, in side view, is generally L-shaped, and defines first and second housing parts unitarily connected together, the longitudinal axes of the housing parts being essentially at right angles with respect to each other.

9. The socket of claim 8, wherein one of the housing parts has a front wall formed with at least one opening to receive at least one connecting terminal of the electrical device.

10. The socket of claim 9, further including a rotor rotationally received in said front wall, said rotor being shaped and dimensioned to receive a two-pin base of a two-pin double-based fluorescent lamp.

11. The socket of claim 8, wherein the second housing part is formed with at least one chamber; and

wherein the slit blade insulation piercing connector portion of the at least one contact spring is located in said chamber.

12. The socket of claim 8, wherein the second housing part is formed with two chambers, each retaining the slit blade insulation piercing connector portion of a respective contact spring;

groove-like recesses are formed adjacent said chambers, open at the ends, extending with their respective longitudinal axes at right angles with respect to a longitudinal axis of the second part of the housing and defining wire receiving grooves;

said grooves being spaced from each other and being intersected by said respective chambers; and

wherein the two chambers and the respective groove-like recesses terminating thereat are longitudinally offset with respect to each other as seen in the longitudinal direction of the grooves.

13. The socket of claim 12, wherein that one of the grooves adjacent the front wall of the first part of the housing is formed with openings in side walls defining the grooves, which openings are in alignment with the chamber in the other groove to permit insertion of the slit blade insulation piercing connector portion in the chamber in the other groove, in an insertion direction extending from the first part towards the second part of the housing.



REPLACEMENT SHEET

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14. The socket of claim 13, wherein said openings have a width which corresponds at least approximately to the thickness of the slit blade insulation piercing connector portion to be inserted therein.

15. The socket of claim 13, wherein the chamber and the immediately adjacent groove is formed with bottom surfaces having equal level; and wherein the openings merge smoothly with the bottom.

16. The socket of claim 13, wherein the second housing part is formed with a bottom which, in the region between the front wall of the first housing part and the closest groove thereto, merges smoothly with the bottom of the adjacent groove and the chamber into which said adjacent groove merges.

17. The socket of claim 11, wherein that one of the chambers in the groove closest to the front wall of the first part is formed with an opening extending towards said first housing part to permit insertion of the slit blade insulation piercing portion into said chamber.

18. The socket of claim 17, wherein said groove is formed with a smooth bottom which merges smoothly with the groove and the chamber.

19. The socket of claim 13, further including a plurality of separating walls extending in the second part of the housing and into the first part of the housing at a side remote from the front side of the first part of the housing, said separating walls being located between the openings in the side walls of the grooves; and

wherein said housing has side walls, the side walls and separating walls defining spaces for accommodation of the contact springs.

20. The socket of claim 11, wherein a groove extends from the at least one chamber, and an opening is formed in a side wall defining the chamber, and aligned with the respective chamber; and wherein at least one separating wall is located on the back side of the first part of the housing and extends towards and up to said opening, said separating wall, together with at least one side wall of the housing, providing electrical contact protection with respect to the contact spring inserted in said chamber.

21. The socket of claim 19, wherein at least one of: the side wall region and the separating wall is formed with guide ribs leading to said at least one opening to direct insertion movement of the contact spring.



REPLACEMENT SHEET

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22. The socket of claim 18, wherein the first housing part and the second housing part have a common unitary bottom having two bottom portions, said bottom portions being connected by a living hinge;

and wherein said second housing portion is formed with upstanding walls defining at least one chamber and wire receiving grooves extending towards said chambers.

23. The socket of claim 22, further including separating ribs extending from the at least one chamber in the direction of the first part, and dimensioned to engage the back wall of said first part.

24. The socket of claim 23, wherein the back wall of the first housing part completely closes said first housing part.

25. The socket of claim 8, wherein the first housing part is formed with a lateral extension; and

a connecting pin receiving socket is located on said lateral extension.

26. The socket of claim 25, wherein said socket comprises a starter socket.

27. The socket of claim 1, wherein said socket comprises a housing which essentially is box-shaped, having a front wall, a rear wall and side walls; and

wherein the front wall is formed with at least one opening for insertion of at least one connecting pin of the electrical device, optionally a fluorescent lamp starter.

28. The socket of claim 27, wherein at least one side wall is formed with a recess defining at least one chamber.

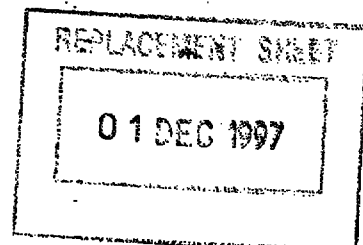
29. The socket of claim 28, wherein said at least one side wall is formed with at least two chambers, and said box-like housing defines two corners, said chambers being located adjacent the respective corners.

30. The socket of claim 27, wherein at least one of said front wall and said rear wall are formed with groove-like recesses for receiving the supply wire.

31. The socket of claim 1, wherein the housing includes attachment means formed on the housing; and

wherein said insertion slit has a direction which extends away from said attachment means.

32. The socket of claim 1, wherein said unitary contact spring comprises a punched sheet-metal element.



33. The socket of claim 1, wherein said contact spring is essentially L-shaped, wherein the slit blade insulation piercing connector portion forms one leg of the L, and at least one of the connecting element portion and the contact terminal end portion forms another leg of the L.

34. The socket of claim 1, wherein the conductor insertion slit of the slit blade insulation piercing connector portion defines a longitudinal direction, which direction is the same as that of the contact terminal end portion.

35. The socket of claim 1, wherein the connecting element includes two leg parts which extend at a right angle with respect to each other; and a connecting part is provided connecting the two leg parts, which is inclined with respect to each of said leg parts.

36. The socket of claim 35, further including a projecting part located within the angle formed by said leg parts and projecting from said connecting part, said projecting part having an upper shoulder surface which is at a level above the opening of the conductor insertion slit in the blade part of the slit blade insulation piercing portion.

37. The socket of claim 1, wherein the contact terminal end portion and the slit blade insulation piercing connector portion are located in essentially the same plane.

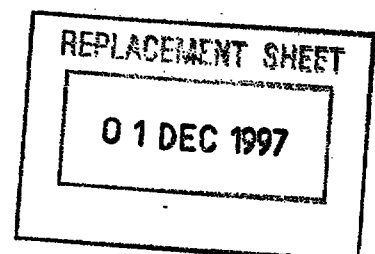
38. The socket of claim 1, wherein the contact terminal end portion and the slit blade insulation piercing connector portion are located each in planes which are essentially at right angles to each other.

39. The socket of claim 1, wherein the connecting element portion of the contact spring merges with the blade part of the slit blade insulation piercing connector portion in the vicinity of the opening of the conductor insertion slit.

40. The socket of claim 1, wherein the connecting element portion includes a pre-formed bend zone to permit bending the contact spring about an axis transverse to a plane defined by the connecting element portion.

41. The socket of claim 22, wherein the connecting element portion includes a pre-formed bend zone to permit bending the contact spring about an axis transverse to a plane defined by the connecting element portion; and

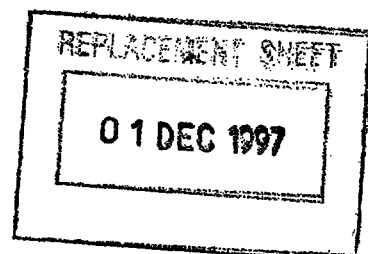
wherein the bend zone is located adjacent the living hinge when the contact spring is inserted in the housing.



42. The socket of claim 12, wherein one of the contact springs which intersects one of the recesses has an upper edge of its connecting element portion which is below the lower end of the conductor insertion slit of the slit blade insulation piercing connector portion of that contact spring which is inserted in the chamber from which said groove, which is being intersected, extends.

43. The socket of claim 1, wherein an auxiliary contact spring element is provided, secured to said unitary contact spring in the region of the contact terminal portion for receiving a terminal pin of the electrical device.

44. A socket for electrical devices including fluorescent lamps, starters therefor, or elongated tubular lamps and having at least one projecting terminal, and adapted for connection to at least one insulated electrical supply wire including an internal electrical conductor, said socket being substantially as hereinbefore described with reference to the accompanying drawings.



A SOCKET FOR ELECTRICAL DEVICES

ABSTRACT

In a socket (1) for electrical devices, there is at least one contact spring arrangement (49) which is located in a housing (2) made from an insulating material, and in which a contact spring (51), for the connection pins of the electrical devices to be inserted, is joined to an insulating piercing contact (53) by a connecting piece (52) to form a single component.

Fig. 2

