(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 439 113 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
08.06.2022 Bulletin 2022/23

(21) Application number: **17896554.7**

(22) Date of filing: **21.12.2017**

(51) International Patent Classification (IPC):
H01R 4/48 *(2006.01)* ***H01R 9/24*** *(2006.01)*
H01R 9/26 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
H01R 4/4827; H01R 9/2475; H01R 9/26

(86) International application number:
PCT/JP2017/045957

(87) International publication number:
WO 2018/150727 (23.08.2018 Gazette 2018/34)

(54) **LEAD WIRE TERMINAL BLOCK AND ELECTRIC DEVICE CONNECTION SOCKET INCLUDING THE SAME**

ELEKTRODENDRAHTANSCHLUSSLEISTE UND ANSCHLUSSDOSE EINER ELEKTRISCHEN VORRICHTUNG DAMIT

BORNIER POUR FIL DE SORTIE ET PRISE DE CONNEXION D'APPAREIL ÉLECTRIQUE POURVUE DE CELUI-CI

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **16.02.2017 JP 2017026723**

(43) Date of publication of application:
06.02.2019 Bulletin 2019/06

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Description

Technical Field

[0001] The present invention relates to a lead wire terminal block to which a large number of lead wires are connected and an electric device connection socket including the lead wire terminal block.

Background Art

[0002] For example, a device disclosed in JP 2002-298943 A is known as an electric device connection socket.

[0003] The electric device connection socket disclosed in JP 2002-298943 A is a device that connects an electric device, such as a relay or a timer, to an external circuit through lead wires and includes an electric device terminal block and a lead wire terminal block.

[0004] In the electric device terminal block, a terminal surface is formed in a surface of a case and plug-in terminal insertion holes are formed in the terminal surface. Connection portions connected to plug-in terminals inserted into the plug-in terminal insertion holes are provided in the case.

[0005] In the lead wire terminal block, terminal surfaces are formed in the surface of the case in a plurality of stages and lead wire insertion holes are formed in the terminal surface in each stage. Connection portions connected to cores of lead wires inserted into the lead wire insertion holes are provided in the case.

[0006] In addition, relay conductive plates for electrically connecting the connection portions of the electric device terminal block and the connection portions of the lead wire terminal block are provided in the case.

[0007] However, for example, in an electric device connection socket including a relay with 4-pole contact points, since a large number of plug-in terminals (14 plug-in terminals in a relay with 4-pole contact points) protrude, a large number of plug-in terminal insertion holes and a large number of connection portions are provided in a relay terminal block (electric device terminal block) and lead wire insertion holes and connection portions corresponding to the number of relay terminal portions need to be provided in a lead wire terminal block.

[0008] In general, each of the lead wire insertion holes provided in the lead wire terminal block includes a set of two lead wire insertion holes, that is, a hole into which a signal lead wire is inserted and a hole into which a distribution lead wire (for a contact point with a different pole in the same socket and for a crossover wire) is inserted.

[0009] DE 102 44 480 A1 discloses a clamping block for terminal ends of electrical conductor wires. The clamping block has a stepped pressure block, which may be moved downwards. The block is designed to press on hollow spring elements which may trap the ends of the conductor wires against a current conductor rail. The conducting contact region has an open end and has a guide rib and a catch.

[0010] EP 1 850 418 A2 shows an electric connector that has an insulation material housing providing a connection space for disposition. A contact pin and an electrical conductor are insertable adjacent to one another in parallel direction, and overlaps with its axial lengths. The conductor has a constructive approved adjustment area transverse to its longitudinal axis. A flat spring of the conductor-clamp connection of the conductor actuates in the direction of the contact pin.

[0011] US 6,428,343 B1 also relates to an electrical connector. The electrical connector is for the electrical connection between insulated power conductors and a printed circuit board. The electrical connector is defined by an insulated housing having a plurality of side-by-side cavities to receive the electrical contacts. The electrical contacts are of the wire-trap style, where a wire is trapped between a portion of the terminal and a resilient tongue, which is reversely bent beneath a contact portion. The electrical contacts further include printed circuit board contacts extending downwardly and through the housing. The electrical contacts are designed and are loaded within the cavities in such a manner that electrical arcing between adjacent contacts is eliminated.

Summary of Invention

Technical Problem

[0012] In the lead wire terminal block of the electric device connection socket including a relay with multi-pole contact points (for example, a relay with 4-pole contact points), a large number of lead wires, such as signal lines and distribution lines, are connected while being closely spaced, as described above. Therefore, it is difficult to easily check the display of symbols or characters on mark tubes attached to the ends of the lead wires.

[0013] Accordingly, an object of the invention is to provide a lead wire terminal block that enables a user to easily check the display of a mark tube attached to the end of each lead wire even in a case in which a large number of lead wires are connected and an electric device connection socket including the lead wire terminal block.

Solution to Problem

[0014] The invention is defined by the subject matter of the independent claims. Advantageous embodiments are subject to the dependent claims.

[0015] In order to achieve the object, a lead wire terminal block according to an aspect of the invention includes a plurality of lead wire insertion holes formed in a terminal surface of a case; and a plurality of lead wire connection portions provided in the case, the plurality of lead wire connection portions electrically connecting cores of lead wires inserted into the lead wire insertion holes to contact points; and a plurality of tool insertion

holes corresponding to the plurality of lead wire insertion holes respectively is formed in the terminal surface of the case. The plurality of lead wire insertion holes and the plurality of tool insertion holes are arranged in zigzag in the width direction, respectively.

[0016] In particular, the plurality of lead wire insertion holes is formed on two reference lines extending in parallel along the terminal surface. The lead wire insertion holes formed on one of the two reference lines and the lead wire insertion holes formed on the other of the two reference lines are arranged in zigzag not to be aligned in a direction perpendicular to the reference lines.

[0017] An electric device connection socket including the lead wire terminal block according to the aspect of the invention includes an electric device terminal block having an electric device connection portion configured to electrically connect an electric device such as a relay or a timer, the lead wire terminal block, and a relay conductive member configured to electrically connect the electric device connection portion and the lead wire connection portion.

Advantageous Effects of Invention

[0018] The lead wire terminal block and the electric device connection socket including the lead wire terminal block according to the invention enable the user to easily check the display of a mark tube attached to the end of each lead wire even in a case in which a large number of lead wires are connected.

Brief Description of Drawings

[0019]

FIG. 1 is a perspective view illustrating the front of an electric device connection socket according to a first embodiment of the invention;

FIG. 2 is a perspective view illustrating the side and back of the electric device connection socket according to the first embodiment of the invention;

FIG. 3 is a plan view illustrating the electric device connection socket according to the first embodiment of the invention;

FIG. 4 is a diagram illustrating the inside of the electric device connection socket according to the first embodiment of the invention;

FIG. 5 is a perspective view illustrating a lead wire connection portion provided in the electric device connection socket according to the first embodiment of the invention;

FIG. 6 is a perspective view illustrating a conductive metal part forming the lead connection portion illustrated in FIG. 5;

FIG. 7 is a perspective view illustrating a spring member forming the lead connection portion illustrated in FIG. 5;

FIG. 8 is a diagram illustrating the opening position of a lead wire insertion hole and a tool insertion hole with respect to the lead wire connection portion; and

FIG. 9A is a diagram illustrating a plurality of lead wire insertion holes according to the invention which is arranged in zigzag and FIG. 9B is a diagram illustrating a device according to the related art in which a plurality of lead wire insertion holes is arranged in a straight line.

Description of Embodiments

[0020] Hereinafter, a first embodiment of the invention will be described with reference to the drawings . In the following description of the drawings, the same or similar portions are denoted by the same or similar numerical numbers. However, it is noted that the drawings are schematic and, for example, the relationship between a thickness and planar dimensions and the ratio of the thicknesses of layers are different from the actual ones. Therefore, specific thicknesses or dimensions need to be determined in consideration of the following description. In addition, the drawings may include portions that have different dimensional relationships and ratios.

[0021] The first embodiment which will be described below illustrates a device or a method for embodying the technical idea of the invention. The technical idea of the invention does not limit, for example, the materials, shapes, structures, and arrangements of components to the following. The technical idea of the invention can be modified in various ways within the technical scope defined by the claims.

[0022] FIG. 1 is a perspective view illustrating the front of an electric device connection socket (hereinafter, referred to as a socket) 1 according to the first embodiment which is formed in a rectangular parallelepiped shape in appearance. FIG. 2 is a perspective view illustrating the side and back of the socket 1. FIG. 3 is a plan view illustrating the socket 1. In FIGS. 1 to 3 and other drawing, a longitudinal direction of socket is referred to as a lengthwise direction and a direction perpendicular to the lengthwise direction is referred to as a widthwise direction.

[0023] The socket 1 includes a case 2 made of a synthetic resin and a base 3.

[0024] Rail attachment portions 4a and 4b are provided in the base 3. The rail attachment portions 4a and 4b are members that are used to attach the socket 1 to rails provided on a distribution board (not illustrated) so as to be detachable.

[0025] A first lead wire terminal block 5 is formed at one end of the socket 1 in the longitudinal direction. A second lead wire terminal block 6 is formed at the other end of the socket 1 in the longitudinal direction. A relay terminal block 7 is provided at the bottom of a concave portion that is formed between the first lead wire terminal block 5 and the second lead wire terminal block 6.

[0026] The first lead wire terminal block 5 has first to third terminal surfaces 8A, 8B, and 8C which are formed in a surface of the case 2 in a plurality of stages with

different heights.

[0027] In this embodiment, the socket includes a plurality of lead wire insertion holes that are formed in a terminal surface of the case and a plurality of lead wire connection portions that are provided in the case and electrically connect cores of the lead wires inserted into the lead wire insertion holes to contact points . The plurality of lead wire insertion holes are arranged in zigzag.

[0028] As illustrated in FIGS. 1 and 3, four first to fourth lead wire insertion holes L1 to L4 are formed in the first terminal surface 8A which is the lowest terminal surface among the first to third terminal surfaces 8A, 8B, and 8C so as to be arranged in a line in the widthwise direction. In addition, a plurality of tool insertion holes 9 corresponding to the first to fourth lead wire insertion holes L1 to L4 are formed in the first terminal surface 8A at positions that are closer to the second terminal surface 8B than the first to fourth lead wire insertion holes L1 to L4 so as to be arranged in a line in the widthwise direction.

[0029] The first lead wire insertion hole L1 includes two holes, that is, a signal line insertion hole 10 and a distribution line insertion hole 11. Similarly, each of the second to fourth lead wire insertion holes L2 to L4 includes two holes, that is, the signal line insertion hole 10 and the distribution line insertion hole 11. In this embodiment, the insertion hole 10 is a signal line insertion hole and the insertion hole 11 is a distribution line insertion hole. However, the insertion hole 10 may be the distribution line insertion hole and the insertion hole 11 may be the signal line insertion hole.

[0030] As illustrated in FIG. 3, the first to fourth signal line insertion holes 10 of the first to fourth lead wire insertion holes L1 to L4 are formed on a first reference line K1 that extends in the widthwise direction at regular intervals. The first to fourth distribution line insertion holes 11 of the first to fourth lead wire insertion holes are formed on a second reference line K2 that is parallel to the first reference line K1 in the lengthwise direction and extends in the widthwise direction at regular intervals.

[0031] The first to fourth distribution line insertion holes 11 on the second reference line K2 are formed at positions that deviate from the first to fourth signal line insertion holes 10 on the first reference line K1 in the widthwise direction. Therefore, the first to fourth signal line insertion holes 10 and the first to fourth distribution line insertion holes 11 forming the first to fourth lead wire insertion holes L1 to L4 are formed so as to be arranged in zigzag in the widthwise direction.

[0032] Eight tool insertion holes 9 are formed at positions that are separated from the first to fourth signal line insertion holes 10 and the first to fourth distribution line insertion holes 11 in the lengthwise direction and are matched with the insertion holes in the widthwise direction so as to be arranged in zigzag in the widthwise direction.

[0033] The second terminal surface 8B and the third terminal surface 8C have the same structure as the first terminal surface 8A.

[0034] That is, four fifth to eighth lead wire insertion holes L5 to L8 are formed in the second terminal surface 8B so as to be arranged in a line in the widthwise direction. A plurality of tool insertion holes 9 corresponding to the fifth to eighth lead wire insertion holes L5 to L8 are formed in the second terminal surface 8B at positions that are closer to the third terminal surface 8C than the fifth to eighth lead wire insertion holes L5 to L8 so as to be arranged in a line in the widthwise direction.

[0035] Each of the four fifth to eighth lead wire insertion holes L5 to L8 formed in the second terminal surface 8B includes two holes, that is, the signal line insertion hole 10 and the distribution line insertion hole 11. The signal line insertion holes 10 and the distribution line insertion holes 11 are formed so as to be arranged in zigzag in the widthwise direction.

[0036] Eight tool insertion holes 9 corresponding to the fifth to eighth lead wire insertion holes L5 to L8 are formed at positions that are separated from the fifth to eighth signal line insertion holes 10 and the fifth to eighth distribution line insertion holes 11 in the lengthwise direction and are matched with the insertion holes in the widthwise direction so as to be arranged in zigzag in the widthwise direction.

[0037] In addition, four ninth to twelfth lead wire insertion holes L9 to L12 are formed in the third terminal surface 8C so as to be arranged in a line in the widthwise direction. A plurality of tool insertion holes 9 corresponding to the ninth to twelfth lead wire insertion holes L9 to L12 are formed in the third terminal surface 8C at positions that are closer to the relay terminal block 7 than the ninth to twelfth lead wire insertion holes L9 to L12 so as to be arranged in a line in the widthwise direction.

[0038] Each of the four ninth to twelfth lead wire insertion holes L9 to L12 formed in the third terminal surface 8C includes two holes, that is, the signal line insertion hole 10 and the distribution line insertion hole 11. The signal line insertion holes 10 and the distribution line insertion holes 11 are formed so as to be arranged in zigzag in the widthwise direction.

[0039] Eight tool insertion holes 9 corresponding to the ninth to twelfth lead wire insertion holes L9 to L12 are formed at positions that are separated from the ninth to twelfth signal line insertion holes 10 and the ninth to twelfth distribution line insertion holes 11 in the lengthwise direction and are matched with the insertion holes in the widthwise direction so as to be arranged in zigzag in the widthwise direction.

[0040] In a terminal surface 6a of the second lead wire terminal block 6 formed at the other end of the socket 1 in the longitudinal direction, a thirteenth lead wire insertion hole L13 and a fourteenth lead wire insertion hole L14 are formed and the tool insertion holes 9 are formed at positions that are closer to the relay terminal block 7 than the thirteenth and fourteenth lead wire insertion holes L13 and L14 so as to be arranged in a line in the widthwise direction.

[0041] Each of the thirteenth lead wire insertion hole

L13 and the fourteenth lead wire insertion hole L14 includes two holes, that is, the signal line insertion hole 10 and the distribution line insertion hole 11, similarly to, for example, the first lead wire insertion holes L1 formed in the first terminal surface 8A.

[0042] The tool insertion holes 9 are formed at positions that are separated from the signal line insertion holes 10 and the distribution line insertion holes 11 of the thirteenth lead wire insertion hole L13 and the fourteenth lead wire insertion hole L14 in the lengthwise direction and are matched with the insertion holes in the widthwise direction.

[0043] An electric device terminal block that electrically connects an electric device, such as a relay or a timer, is formed between the first lead wire terminal block 5 and the second lead wire terminal block 6. In this embodiment, the relay terminal block 7 is formed as the electric device terminal block. Fourteen plug-in terminal insertion holes 15 are formed in a terminal surface 7a of the relay terminal block 7.

[0044] Next, FIG. 4 illustrates the internal structure of the socket 1 from which the case 2 has been detached. A lead wire connection portion according to this embodiment includes a conductive metal part in which a contact point is provided and a spring member biasing a core of a lead wire to the conductive metal part.

[0045] First to twelfth lead wire connection portions H1 to H12 forming the first lead wire terminal block 5, thirteenth and fourteenth lead wire connection portions H13 and H14 forming the second lead wire terminal block 6, fourteen plug-in terminal connection portions 16 forming the relay terminal block 7, and a plurality of relay conductive plates 18a, 18b, and 18c electrically connecting the first to fourteenth lead wire connection portions H1 to H14 and the fourteen plug-in terminal connection portions 16 are provided on the base 3.

[0046] As illustrated in FIG. 5, the first lead wire connection portion H1 includes a conductive metal part 21 that is fixed to the base 3 and a spring member 22 that is integrally attached to the conductive metal part 21.

[0047] As illustrated in FIG. 6, the conductive metal part 21 is a member formed by bending a metal flat plate in a substantially cylindrical shape and includes a spring member surface contact portion 23, a relay plate connection portion 24, a pair of spring member locking pieces 25, a first extension portion 26, a first fixed contact point 27 which is a first contact point, a second extension portion 28, a second fixed contact point 29 which is a second contact point, and a spring support piece 30.

[0048] That is, the relay plate connection portion 24 extends from a lower part of the spring member surface contact portion 23 with a flat plate shape and the spring support piece 30 extends from an upper part of the spring member surface contact portion 23.

[0049] The first extension portion 26 is bent from one side edge of the spring member surface contact portion 23 at a right angle and extends. The second extension portion 28 is bent from the other side edge of the spring member surface contact portion 23 at a right angle so as to be parallel to the first extension portion 26 and extends so as to be longer than the first extension portion 26.

[0050] The pair of spring member locking pieces 25 bent in the direction in which the spring member locking pieces 25 become closer to each other are formed in the lower parts of the first extension portion 26 and the second extension portion 28 which are close to the spring member surface contact portion 23.

[0051] The first fixed contact point 27 that is bent so as to be parallel to the spring member surface contact portion 23 is formed at the leading end of the first extension portion 26. The second fixed contact point 29 that is bent so as to be parallel to the first fixed contact point 27 is formed at the leading end of the second extension portion 28.

[0052] As illustrated in FIG. 7, the spring member 22 is a member formed by bending a conductive metal plate and includes a conductive metal part surface contact portion 31 with a flat plate shape, a conductive metal part locking concave portion 32 that is formed in a lower part of the conductive metal part surface contact portion 31, and first and second elastic portions 33 and 34 that extend from an upper part of the conductive metal part surface contact portion 31 in a strip shape and are bent substantially in the same direction.

[0053] The first elastic portion 33 includes a protruding portion 33a that protrudes to one surface 31a of the conductive metal part surface contact portion 31, a bent portion 33b that is bent from the protruding portion 33a at an interior angle less than 90°, and a first movable contact 33c that linearly extends from the bent portion 33b.

[0054] The second elastic portion 34 includes a straight extension portion 34a that linearly extends from the upper part of the conductive metal part surface contact portion 31, a bent portion 34b that is bent from the straight extension portion 34a at an interior angle less than 90°, and a second movable contact 34c that linearly extends from the bent portion 34b.

[0055] In order to integrally attach the spring member 22 to the conductive metal part 21, the conductive metal part surface contact portion 31 of the spring member 22 is inserted into a cylindrical space of the conductive metal part 21 and the pair of spring member locking pieces 25 of the conductive metal part 21 are locked to the conductive metal part locking concave portions of the spring member 22 while being elastically deformed, with the conductive metal part surface contact portion 31 coming into surface contact with the spring member surface contact portion 23 of the conductive metal part 21. In a state in which the spring member 22 is integrally attached to the conductive metal part 21, the leading end of the first movable contact 33c of the first elastic portion 33 as a first movable contact point 33d comes into contact with the first fixed contact point 27 and the leading end of the second movable contact 34c of the second elastic portion 34 as a second movable contact point 34d comes into contact with the second fixed contact point 29.

[0056] The second to fourteenth lead wire connection portions H2 to H14 have the same structure as the first lead wire connection portion H1.

[0057] FIG. 8 illustrates the opening positions of the first to fourth lead wire insertion holes L1 to L4 and the tool insertion holes 9 formed in the first terminal surface 8A of the case 2 with respect to the first to fourth lead wire connection portions H1 to H4 forming the first lead wire terminal block 5 in the socket 1.

[0058] The signal line insertion hole 10 of the first lead wire insertion hole L1 is open in the vicinity of the first movable contact point 33d of the first lead wire connection portion H1 and the distribution line insertion hole 11 of the first lead wire insertion hole L1 is open in the vicinity of the second movable contact point 34d of the first lead wire connection portion H1. One of two tool insertion holes 9 is open on the base end side of the first movable contact 33c and the other tool insertion hole 9 is open on the base end side of the second movable contact 34c.

[0059] The opening positions of the second to fourth lead wire insertion holes L2 to L4 and the tool insertion holes 9 with respect to the second to fourth lead wire connection portions H2 to H4 have the same structure as the opening positions of the first lead wire insertion hole L1 and the tool insertion hole 9 with respect to the first lead wire connection portion H1.

[0060] In addition, the opening positions of the fifth to twelfth lead wire insertion holes L5 to L12 and the tool insertion holes 9 formed in the second and third terminal surfaces 8B and 8C of the case 2 with respect to the fifth to twelfth lead wire connection portions H5 to H12 forming the first lead wire terminal block 5 have the same structure as the opening positions of the first to fourth lead wire insertion holes L1 to L4 and the tool insertion holes 9 with respect to the first to fourth lead wire connection portions H1 to H4 illustrated in FIG. 8, which is not illustrated in the drawings.

[0061] In the first lead wire terminal block 5 having the above-mentioned structure, signal lines are connected to the first to twelfth lead wire connection portions H1 to H12 as follows. A tool is inserted into the tool insertion hole 9 which is open on the base end side of the first movable contact 33c in the case 2 to elastically deform the first elastic portion 33 such that the first movable contact point 33d of the first movable contact 33c does not come into contact with is inserted into the signal line insertion hole 10, the elastic deformation of the first elastic portion 33 is released and the core of the signal line is interposed between the first fixed contact point 27 and the first movable contact point 33d of the elastically restored first movable contact 33c. In this way, the signal line is connected.

[0062] In a case in which distribution lines are connected to the first to twelfth lead wire connection portions H1 to H12, a tool is inserted into the tool insertion hole 9 which is open on the base end side of the second movable contact 34c in the case 2 to elastically deform the second elastic portion 34 such that the second movable contact point 34d does not come into contact with the second fixed contact point 29. Then, after the distribution line is inserted into the distribution line insertion hole 11, the elastic deformation of the second elastic portion 34 is released and the core of the distribution line is interposed between the second fixed contact point 29 and the second movable contact point 34d of the elastically restored second movable contact 34c. In this way, the distribution line is connected.

[0063] A lead wire terminal block according to the invention corresponds to the first lead wire terminal block 5. An electric device terminal block according to the invention corresponds to the relay terminal block 7. Two reference lines according to the invention correspond to the first reference line K1 and the second reference line K2.

[0064] FIG. 9A is a diagram schematically illustrating the first terminal surface 8A in a case in which signal lines 35 and distribution lines 36 are connected to the first to fourth lead wire connection portions H1 to H4 of the first lead wire terminal block 5.

[0065] Four signal line insertion holes 10 are formed on the first reference line K1 at regular intervals and four distribution line insertion holes 11 are formed on the second reference line K1 at regular intervals. The eight signal line insertion holes 10 and distribution line insertion holes 11 are formed so as to be arranged in zigzag. Therefore, a distance between the signal line insertion hole 10 and the distribution line insertion hole 11 which are adjacent to each other can be set to D1.

[0066] FIG. 9B illustrates a lead wire terminal block according to the related art in which a plurality of signal line insertion holes S1 and distribution line insertion holes S2 are formed in a straight line on a reference line K3. A distance D2 between the signal line insertion hole S1 and the distribution line insertion hole S2 which are adjacent to each other is less than the distance D1 between the signal line insertion hole 10 and the distribution line insertion hole 11 which are adjacent to each other illustrated in FIG. 9A.

[0067] In many cases, mark tubes on which symbols or characters for identifying the type of each line are displayed are attached to the ends of the signal line 35 and the distribution line 36. In a case in which the distance between the signal line insertion hole 10 and the distribution line insertion hole 11 which are adjacent to each other is the distance D1 as illustrated in FIG. 9B, the signal line 35 and the distribution line 36 to which the mark tubes are attached are connected while being closely spaced. Therefore, it is difficult to easily check the symbol or display of the mark tube.

[0068] In contrast, in the first embodiment illustrated in FIG. 9A, a plurality of signal line insertion holes 10 and distribution line insertion holes 11 are arranged in zigzag and the distance (distance D1) between the signal line insertion hole 10 and the distribution line insertion hole 11 which are adjacent to each other is sufficiently ensured. Therefore, even in a case in which the mark tubes

are attached to all of the signal lines 35 and the distribution lines 36 connected to the first lead wire terminal block 5, it is possible to easily check the symbols or display of the mark tubes since the signal lines 35 and the distribution lines 36 are not connected while being closely spaced.

[0069] In a case in which the signal lines 35 and the distribution lines 36 are connected to the fifth to twelfth lead wire connection portions H5 to H12 forming the first lead wire terminal block 5, it is possible to obtain the same effect as that in the case in which the signal lines 35 and the distribution lines 36 are connected to the first to fourth lead wire connection portions H1 to H4.

[0070] In a case in which the signal lines 35 and the distribution lines 36 are connected to or disconnected from the lead wire connection portions H1 to H12, the spring member 22 is elastically deformed by the tool inserted into the tool insertion hole 9 provided in the vicinity of the signal line insertion hole 10 and the distribution line insertion hole 11 to temporarily release the biasing of the spring member 22 such that the first and second movable contact points 33d and 34d can be separated from the first and second fixed contact points 27 and 29.

[0071] In a case in which the signal lines 35 and the distribution lines 36 are connected to the lead wire connection portions H1 to H12, after the signal line 35 and the distribution line 36 are inserted into the signal line insertion hole 10 and the distribution line insertion hole 11, the spring member 22 is elastically restored such that the core of the signal line 35 is interposed between the first movable contact point 33d and the first fixed contact point 27 and the core of the distribution line is interposed between the second movable contact point 34d and the second fixed contact point 29. In this way, the signal line 35 and the distribution line 36 can be connected. As such, it is possible to facilitate an operation of connecting the signal line 35 and the distribution line 36.

[0072] In each of the lead wire connection portions H1 to H12, the spring member 22 is integrally attached to the conductive metal part 21. Each of the lead wire connection portions H1 to H12 includes the first fixed contact point 27 and the first movable contact point 33d for connecting the signal line 35 and the second fixed contact point 29 and the second movable contact point 34d for connecting the distribution line 36. Therefore, it is possible to reduce the number of components and the cost of the device.

Industrial Applicability

[0073] As described above, the lead wire terminal block and the electric device connection socket including the lead wire terminal block according to the invention make it possible to easily check the display of the mark tube attached to the end of each lead wire even in a case in which a large number of lead wires are connected.

Reference Signs List

[0074]

1:	socket
2:	case
3:	base
4a, 4b:	rail attachment portion
5:	first lead wire terminal block
6:	second lead wire terminal block
6a:	terminal surface
7:	relay terminal block
7a:	terminal surface
8A:	first terminal surface
8B:	second terminal surface
8C:	third terminal surface
9:	tool insertion hole
10:	signal line insertion hole
11:	distribution line insertion hole
15:	plug-in terminal insertion hole
16:	plug-in terminal connection portion
18a, 18b, 18c:	relay conductive plate
21:	conductive metal part
22:	spring member
23:	spring member surface contact portion
24:	relay plate connection portion
25:	spring member locking piece
26:	first extension portion
27:	first fixed contact point
28:	second extension portion
29:	second fixed contact point
30:	spring support piece
31:	conductive metal part surface contact portion
32:	conductive metal part locking concave portion
33:	first elastic portion
33a:	protruding portion
33b:	bent portion
33c:	first movable contact
33d:	first movable contact point
34:	second elastic portion
34a:	straight extension portion
34b:	bent portion
34c:	second movable contact
34d:	second movable contact point
35:	signal line
36:	distribution line
H1 to H14:	first to fourteenth lead wire connection portions
K1:	first reference line
K2:	second reference line
L1 to L14:	first to fourteenth lead wire insertion holes

Claims

1. A lead wire terminal block (5) comprising:

   a plurality of first pairs of lead wire insertion holes (10, 11; L1-L4) formed in a terminal surface (8A) of a case (2), wherein the plurality of first pairs of lead wire insertion holes (10, 11; L1-L4) are formed adjacent to each other and wherein the lead wire insertion holes (10, 11; L1-L4) extend in a zigzag in a width direction of the case (2);
   a plurality of first pairs of holes (9) corresponding to the plurality of first pairs of lead wire insertion holes (10, 11; L1-L4), respectively, and formed in the terminal surface (8A) of the case (2), wherein the plurality of first pairs of holes (9) is formed adjacent to each other and wherein the holes (9) extend in a zigzag in the width direction of the case (2);
   characterized in that
   the holes (9) are tool insertion holes;
   wherein each of the first pairs of tool insertion holes (9) is provided in a length direction of the case (2) relative to its corresponding first pair of lead wire insertion holes (10, 11; L1-L4); and
   the lead wire terminal block (5) further comprises a first plurality of lead wire connection portions (H1-H4) provided in the case (2) and configured to electrically connect cores of lead wires inserted into a respective first pair of the lead wire insertion holes (10, 11; L1-L4) to common contact point of the lead wire connection portion (H1-H4).

2. The lead wire terminal block (5) according to claim 1, wherein
   the first plurality of lead wire connection portions (H1-H4) is arranged adjacent to each other extending in the width direction so as to correspond to the first pairs of lead wire insertion holes (10, 11; L1-L4) and a corresponding first pair of tool insertion holes (9).

3. The lead wire terminal block (5) according to claim 1 or 2, wherein

   the first plurality of lead wire insertion holes (10, 11; L1-L4) is formed on two reference lines (K1, K2) extending in the width direction and in parallel along the terminal surface (8A), and
   wherein one lead wire insertion hole (10) of each first pair are formed on one of the two reference lines (K1) and the other lead wire insertion hole (11) of each first pair is formed on the other of the two reference lines (K2) so that they are arranged in zigzag and are displaced relative to each other in the width direction.

4. The lead wire terminal block (5) according to one of claims 1 to 3, wherein each of the first plurality of lead wire connection portions (H1-H4) includes a conductive metal part (21) providing the contact point of the lead wire connection portions (H1-H4) is provided and a spring member (22, 33, 34) biasing the core of the lead wire to the conductive metal part (21).

5. The lead wire terminal block (5) according to claim 4, wherein the spring member (22) is formed from a conductive metal plate and comprises a contact portion (31) with a flat plate shape, and first and second elastic portions (33, 34) that extend from an upper part of the contact portion (31) in a strip shape and are bent at an interior angle less than 90° relative to the contact portion (31).

6. The lead wire terminal block according to claim 4 or 5, wherein
   the spring member (22) of a respective one of the first plurality of lead wire connection portions (H1-H4) is configured to be deformed by a tool inserted into one of the first pairs tool insertion holes (9) of the corresponding first pair tool insertion holes (9) to temporarily release the biasing of the spring member (22).

7. The lead wire terminal block (5) according to any one of claims 1 to 6, wherein

   each of the first plurality of lead wire connection portions (H1-H4) includes a first contact point (27) and a second contact point (28) deviating from each other, and
   one lead wire insertion hole (10) of each first pair of lead wire insertion holes (10, 11; L1-L4) arranged in zigzag faces the first contact point (27) and the other lead wire insertion hole (11) of said first pair of lead wire insertion holes (10, 11; L1-L4) faces the second contact point (28).

8. The lead wire terminal block (5) according to any one of claims 1 to 7, wherein the lead wire terminal block (5) further comprises:

   a plurality of second pairs of lead wire insertion holes (10, 11; L5-L8) formed in a second terminal surface (8B) of the case (2), wherein the plurality of second pairs of lead wire insertion holes (10, 11; L5-L8) are formed adjacent to each other and wherein the lead wire insertion holes (10,11; L5-L8) extend in a zigzag in the width direction of the case (2);
   a plurality of second pairs of tool insertion holes (9) corresponding to the plurality of second pairs of lead wire insertion holes (10, 11; L5-L8), respectively, and formed in the second terminal surface (8B) of the case (2), wherein plurality of second pairs of tool insertion holes (9) are

formed adjacent to each other and wherein the lead wire insertion holes (10,11; L5-L8) extending in a zigzag in the width direction of the case (2);
wherein the tool insertion holes (9) of each of the second pairs of tool insertion holes (9) is provided in a length direction of the case (2) relative to the lead wire insertion holes (10, 11; L5-L8) of their corresponding second pair of lead wire insertion holes (10, 11; L5-L8); and
a second plurality of lead wire connection portions (H5-H8) provided in the case (2) and arranged adjacent to each other extending in the width direction so as to correspond to the second pairs of lead wire insertion holes (10, 11; L5-L8) and a corresponding second pair of tool insertion holes (9),
wherein each of the second plurality of lead wire connection portions (H5-H8) is configured to electrically connect cores of lead wires inserted into a respective second pair of the lead wire insertion holes (10, 11; L5-L8) to a common contact point of the lead wire connection portion (H5-H8); and
wherein the plurality of second pairs of lead wire insertion holes (10, 11; L5-L8), the plurality of second pairs of tool insertion holes (9) and the second plurality of lead wire connection portions (H5-H8) are provided adjacent, in the length direction, to the plurality of first pairs of lead wire insertion holes (10, 11; L1-L4), the plurality of first pairs of tool insertion holes (9) and the first plurality of lead wire connection portions (H1-H4).

9. An electric device connection socket (1) comprising:

an electric device terminal block (6) including an electric device connection portion configured to electrically connect an electric device including a relay or a timer;
the lead wire terminal block (5) according to any one of claims 1 to 8; and
a relay conductive member configured to electrically connect the electric device connection portion and the lead wire connection portion.

Patentansprüche

1. Leitungsdraht-Klemmenblock (5), umfassend:

mehrere erste Paare von Leitungsdraht-Einführlöchern (10, 11; L1-L4), die in einer Klemmenoberfläche (8A) eines Gehäuses (2) ausgebildet sind, wobei die mehreren ersten Paare von Leitungsdraht-Einführlöchern (10, 11; L1-L4) benachbart zueinander ausgebildet sind und wobei sich die Leitungsdraht-Einführlöcher (10, 11; L1-L4) in einem Zickzack in einer Breitenrichtung des Gehäuses (2) erstrecken;
mehrere erste Paare von Löchern (9), die jeweils den mehreren ersten Paaren von Leitungsdraht-Einführlöchern (10, 11; L1-L4) entsprechen und in der Klemmenoberfläche (8A) des Gehäuses (2) ausgebildet sind, wobei die mehreren ersten Paare von Löchern (9) benachbart zueinander ausgebildet sind und wobei sich die Löcher (9) in einem Zickzack in der Breitenrichtung des Gehäuses (2) erstrecken;
dadurch gekennzeichnet, dass
die Löcher (9) Werkzeug-Einführungslöcher sind;
wobei jedes der ersten Paare von Werkzeug-Einführungslöchern (9) in einer Längsrichtung des Gehäuses (2) relativ zu seinem entsprechenden ersten Paar von Leitungsdraht-Einführungslöchern (10, 11; L1-L4) vorgesehen ist; und
der Leitungsdraht-Klemmenblock (5) ferner mehrere erste Leitungsdraht-Verbindungsabschnitte (H1-H4) umfasst, die im Gehäuse (2) vorgesehen und konfiguriert sind, um Kerne von Leitungsdrähten, die in ein jeweiliges erstes Paar der Leitungsdraht-Einführungslöcher (10, 11; L1-L4) eingeführt sind, mit einem gemeinsamen Kontaktpunkt des Leitungsdraht-Verbindungsabschnitts (H1-H4) elektrisch zu verbinden.

2. Leitungsdraht-Klemmenblock (5) nach Anspruch 1, wobei die mehreren ersten Leitungsdraht-Verbindungsabschnitte (H1-H4) benachbart zueinander angeordnet sind, die sich in der Breitenrichtung erstrecken, um den ersten Paaren von Leitungsdraht-Einführungslöchern (10, 11; L1-L4) und einem entsprechenden ersten Paar von Werkzeug-Einführungslöchern (9) zu entsprechen.

3. Leitungsdraht-Klemmenblock (5) nach Anspruch 1 oder 2, wobei

die mehreren ersten Leitungsdraht-Einführlöcher (10, 11; L1-L4) auf zwei Referenzlinien (K1, K2) ausgebildet sind, die sich in der Breitenrichtung und parallel entlang der Klemmenoberfläche (8A) erstrecken, und
wobei ein Leitungsdraht-Einführloch (10) jedes ersten Paars auf einer der zwei Referenzlinien (K1) ausgebildet ist und das andere Leitungsdraht-Einführloch (11) jedes ersten Paars auf der anderen der zwei Referenzlinien (K2) ausgebildet ist, so dass sie im Zickzack angeordnet sind und relativ zueinander in der Breitenrichtung versetzt sind.

4. Leitungsdraht-Klemmenblock (5) nach einem der Ansprüche 1 bis 3, wobei jeder der mehreren ersten Leitungsdraht-Verbindungsabschnitte (H1-H4) einen leitfähigen Metallteil (21), der den Kontaktpunkt der Leitungsdraht-Verbindungsabschnitte (H1-H4) bereitstellt, und ein Federelement (22, 33, 34), das den Kern des Leitungsdrahts zu dem leitfähigen Metallteil (21) vorspannt, umfasst.

5. Leitungsdraht-Klemmenblock (5) nach Anspruch 4, wobei das Federelement (22) aus einer leitfähigen Metallplatte ausgebildet ist und einen Kontaktabschnitt (31) mit einer flachen Plattenform und einen ersten und einen zweiten elastischen Abschnitt (33, 34), die sich von einem oberen Teil des Kontaktabschnitts (31) in einer Streifenform erstrecken und in einem Innenwinkel von weniger als 90° relativ zu dem Kontaktabschnitt (31) gebogen sind, umfasst.

6. Leitungsdraht-Klemmenblock nach Anspruch 4 oder 5, wobei
das Federelement (22) eines jeweiligen der mehreren ersten Leitungsdraht-Verbindungsabschnitte (H1-H4) konfiguriert ist, um durch ein Werkzeug, das in eines der Werkzeugeinführungslöcher (9) des ersten Paars der entsprechenden Werkzeugeinführungslöcher (9) des ersten Paars eingeführt ist, verformt zu werden, um die Vorspannung des Federelements (22) vorübergehend zu lösen.

7. Leitungsdraht-Klemmenblock (5) nach einem der Ansprüche 1 bis 6, wobei

jeder der mehreren ersten Leitungsdraht-Verbindungsabschnitte (H1-H4) einen ersten Kontaktpunkt (27) und einen zweiten Kontaktpunkt (28), die voneinander abweichen, umfasst, und ein Leitungsdraht-Einführloch (10) jedes ersten Paars von Leitungsdraht-Einführlöchern (10, 11; L1-L4), das im Zickzack angeordnet ist, dem ersten Kontaktpunkt (27) zugewandt ist und das andere Leitungsdraht-Einführloch (11) des ersten Paars von Leitungsdraht-Einführlöchern (10, 11; L1-L4) dem zweiten Kontaktpunkt (28) zugewandt ist.

8. Leitungsdraht-Klemmenblock (5) nach einem der Ansprüche 1 bis 7, wobei der Leitungsdraht-Klemmenblock (5) ferner umfasst:

mehrere zweite Paare von Leitungsdraht-Einführlöchern (10, 11; L5-L8), die in einer zweiten Klemmenoberfläche (8B) des Gehäuses (2) ausgebildet sind, wobei die mehreren zweiten Paare von Leitungsdraht-Einführlöchern (10,11; L5-L8) benachbart zueinander ausgebildet sind und wobei sich die Leitungsdraht-Einführlöcher (10, 11; L5-L8) in einem Zickzack in der Breitenrichtung des Gehäuses (2) erstrecken;
mehrere zweite Paare von Werkzeug-Einführlöchern (9), die jeweils den mehreren zweiten Paaren von Leitungsdraht-Einführlöchern (10, 11; L5-L8) entsprechen und in der zweiten Klemmenoberfläche (8B) des Gehäuses (2) ausgebildet sind, wobei mehrere zweite Paare von Werkzeug-Einführlöchern (9) benachbart zueinander ausgebildet sind und wobei sich die Leitungsdraht-Einführlöcher (10, 11; L5-L8) in einem Zickzack in der Breitenrichtung des Gehäuses (2) erstrecken;
wobei die Werkzeug-Einführlöcher (9) jedes der zweiten Paare von Werkzeug-Einführlöchern (9) in einer Längsrichtung des Gehäuses (2) relativ zu den Leitungsdraht-Einführlöchern (10, 11; L5-L8) ihres entsprechenden zweiten Paars von Leitungsdraht-Einführlöchern (10, 11; L5-L8) vorgesehen ist; und
mehrere zweite Leitungsdraht-Verbindungsabschnitte (H5-H8), die im Gehäuse (2) vorgesehen und benachbart zueinander angeordnet sind, die sich in der Breitenrichtung erstrecken, um den zweiten Paaren von Leitungsdraht-Einführlöchern (10, 11; L5-L8) und einem entsprechenden zweiten Paar von Werkzeug-Einführlöchern (9) zu entsprechen,
wobei jeder der mehreren zweiten Leitungsdraht-Verbindungsabschnitte (H5-H8) konfiguriert ist, um Kerne von Leitungsdrähten, die in ein jeweiliges zweites Paar der Leitungsdraht-Einführlöcher (10, 11; L5-L8) eingeführt sind, mit einem gemeinsamen Kontaktpunkt des Leitungsdraht-Verbindungsabschnitts (H5-H8) elektrisch zu verbinden; und
wobei die mehreren zweiten Paare von Leitungsdraht-Einführlöchern (10, 11; L5-L8), die mehreren zweiten Paare von Werkzeug-Einführlöchern (9) und die mehreren zweiten Leitungsdraht-Verbindungsabschnitte (H5-H8) in der Längsrichtung benachbart zu den mehreren ersten Paaren von Leitungsdraht-Einführlöchern (10, 11; L1-L4), den mehreren ersten Paaren von Werkzeug-Einführlöchern (9) und den mehreren ersten Leitungsdraht-Verbindungsabschnitten (H1-H4) vorgesehen sind.

9. Anschlussbuchse (1) für eine elektrische Vorrichtung, umfassend:

einen Klemmenblock (6) für eine elektrische Vorrichtung, der einen Verbindungsabschnitt für eine elektrische Vorrichtung umfasst, der konfiguriert ist, um eine elektrische Vorrichtung, die ein Relais oder einen Timer umfasst, elektrisch zu verbinden;
den Leitungsdraht-Klemmenblock (5) nach einem der Ansprüche 1 bis 8; und

ein leitfähiges Relaiselement, das konfiguriert ist, um den Verbindungsabschnitt für eine elektrische Vorrichtung und den Leitungsdraht-Verbindungsabschnitt elektrisch zu verbinden.

Revendications

1. Bornier pour fil de sortie (5) comprenant :

une pluralité de premières paires de trous d'insertion de fil de sortie (10, 11 ; L1-L4) formées dans une surface de borne (8A) d'un boîtier (2), dans lequel la pluralité de premières paires de trous d'insertion de fil de sortie (10, 11 ; L1-L4) sont formées de manière adjacente entre elles, et dans lequel les trous d'insertion de fil de sortie (10, 11 ; L1-L4) s'étendent en zigzag dans une direction de largeur du boîtier (2) ;
une pluralité de premières paires de trous (9) correspondant à la pluralité de premières paires de trous d'insertion de fil de sortie (10, 11 ; L1-L4) respectivement, et formées dans la surface de borne (8A) du boîtier (2), dans lequel la pluralité de premières paires de trous (9) sont formées de manière adjacente entre elles et dans lequel les trous (9) s'étendent en zigzag dans la direction de largeur du boîtier (2) ;
caractérisé en ce que :

les trous (9) sont des trous d'insertion d'outil ;
dans lequel chacune des premières paires de trous d'insertion d'outil (9) est prévue dans une direction de longueur du boîtier (2) par rapport à sa première paire correspondante de trous d'insertion de fil de sortie (10, 11 ; L1-L4) ; et
le bornier pour fil de sortie (5) comprend en outre une première pluralité de parties de connexion de fil de sortie (H1-H4) prévues dans le boîtier (2) et configurées pour connecter électriquement des noyaux de fils de sortie insérés dans une première paire respective de trous d'insertion de fil de sortie (10, 11 ; L1-L4) à un point de contact commun de la partie de connexion de fil de sortie (H1-H4).

2. Bornier pour fil de sortie (5) selon la revendication 1, dans lequel :
la première pluralité de parties de connexion de fil de sortie (H1-H4) sont agencées de manière adjacente entre elles dans la direction de largeur afin de correspondre aux premières paires de trous d'insertion de fil de sortie (10, 11 ; L1-L4) et à une première paire correspondante de trous d'insertion d'outil (9).

3. Bornier pour fil de sortie (5) selon la revendication 1 ou 2, dans lequel :

la première pluralité de trous d'insertion de fil de sortie (10, 11 ; L1-L4) est formée sur deux lignes de référence (K1, K2) s'étendant dans la direction de largeur et parallèlement le long de la surface de borne (8A), et
dans lequel un trou d'insertion de fil de sortie (10) de chaque première paire est formé sur l'une des deux lignes de référence (K1) et l'autre trou d'insertion de fil de sortie (11) de chaque première paire est formé sur l'autre des deux lignes de référence (K2), de sorte qu'ils sont agencés en zigzag et sont déplacés l'un par rapport à l'autre dans la direction de largeur.

4. Bornier pour fil de sortie (5) selon l'une des revendications 1 à 3, dans lequel chacune de la première pluralité de parties de connexion de fil de sortie (H1-H4) comprend une partie de métal conducteur (21) fournissant le point de contact des parties de connexion de fil de sortie (H1-H4) prévu, et un élément de ressort (22, 33, 34) sollicitant le noyau du fil de sortie sur la partie de métal conducteur (21).

5. Bornier pour fil de sortie (5) selon la revendication 4, dans lequel l'élément de ressort (22) est formé à partir d'une plaque de métal conducteur et comprend une partie de contact (31) avec une forme de plaque plate, et des première et seconde parties élastiques (33,34) qui s'étendent à partir d'une partie supérieure de la partie de contact (31) dans une forme de bande et sont pliées à un angle intérieur inférieur à 90° par rapport à la partie de contact (31).

6. Bornier pour fil de sortie (5) selon la revendication 4 ou 5, dans lequel :
l'élément de ressort (22) d'une partie respective de la première pluralité de parties de connexion de fil de sortie (H1-H4) est configuré pour être déformé par un outil inséré dans l'une des premières paires de trous d'insertion d'outil (9) de la première paire correspondante de trous d'insertion d'outil (9) pour libérer temporairement la sollicitation de l'élément de ressort (22).

7. Bornier pour fil de sortie (5) selon l'une quelconque des revendications 1 à 6, dans lequel :

chacune de la première pluralité de parties de connexion de fil de sortie (H1-H4) comprend un premier point de contact (27) et un second point de contact (28) déviant l'un de l'autre, et
un trou d'insertion de fil de sortie (10) de chaque première paire de trous d'insertion de fil de sortie (10, 11 ; L1-L4) agencés en zigzag fait face au premier point de contact (27) et l'autre trou d'in-

sertion de fil de sortie (11) de ladite première paire de trous d'insertion de fil de sortie (10, 11 ; L1-L4) fait face au second point de contact (28).

8. Bornier pour fil de sortie (5) selon l'une quelconque des revendications 1 à 7, dans lequel le bomier pour fil de sortie (5) comprend en outre :

une pluralité de secondes paires de trous d'insertion de fil de sortie (10, 11 ; L5-L8) formées dans une seconde surface de borne (8B) du boîtier (2), dans lequel la pluralité de secondes paires de trous d'insertion de fil de sortie (10, 11 ; L5-L8) sont formées de manière adjacente entre elles et dans lequel les trous d'insertion de fil de sortie (10, 11 ; L5-L8) s'étendent en zigzag dans la direction de largeur du boîtier (2) ;
une pluralité de secondes paires de trous d'insertion d'outil (9) correspondant à la pluralité de secondes paires de trous d'insertion de fil de sortie (10, 11 ; L5-L8) respectivement, et formées dans la seconde surface de borne (8B) du boîtier (2), dans lequel la pluralité de secondes paires de trous d'insertion d'outil (9) sont formées de manière adjacente entre elles et dans lequel les trous d'insertion de fil de sortie (10, 11 ; L5-L8) s'étendent en zigzag dans la direction de largeur du boîtier (2) ;
dans lequel les trous d'insertion d'outil (9) de chacune des secondes paires de trous d'insertion d'outil (9) sont prévus dans une direction de longueur du boîtier (2) par rapport aux trous d'insertion de fil de sortie (10, 11 ; L5-L8) de leur seconde paire correspondante de trous d'insertion de fil de sortie (10, 11 ; L5-L8) ; et
une seconde pluralité de parties de connexion de fil de sortie (H5-H8) prévues dans le boîtier (2) et agencées de manière adjacente entre elles s'étendant dans la direction de longueur afin de correspondre aux secondes paires de trous d'insertion de fil de sortie (10, 11 ; L5-L8) et à une seconde paire correspondante de trous d'insertion d'outil (9),
dans lequel chacune de la seconde pluralité de parties de connexion de fil de sortie (H5-H8) est configurée pour raccorder électriquement les noyaux de fils de sortie insérés dans une seconde paire respective de trous d'insertion de fil de sortie (10, 11 ; L5-L8) à un point de contact commun de la partie de connexion de fil de sortie (H5-H8) ; et
dans lequel la pluralité de secondes paires de trous d'insertion de fil de sortie (10, 11 ; L5-L8), la pluralité de secondes paires de trous d'insertion d'outil (9) et la seconde pluralité de parties de connexion de fil de sortie (H5-H8) sont prévues de manière adjacente, dans la direction de longueur, à la pluralité de premières paires de trous d'insertion de fil de sortie (10, 11 ; L1-L4), la pluralité de premières paires de trous d'insertion d'outil (9) et la première pluralité de parties de connexion de fil de sortie (H1-H4).

9. Prise de connexion de dispositif électrique (1) comprenant :

un bornier de dispositif électrique (6) comprenant une partie de connexion de dispositif électrique configurée pour connecter électriquement un dispositif électrique comprenant un relais ou un temporisateur ;
le bornier pour fil de sortie (5) selon l'une quelconque des revendications 1 à 8 ; et
un élément conducteur de relais configuré pour connecter électriquement la partie de connexion de dispositif électrique et la partie de connexion de fil de sortie.

FIG. 1

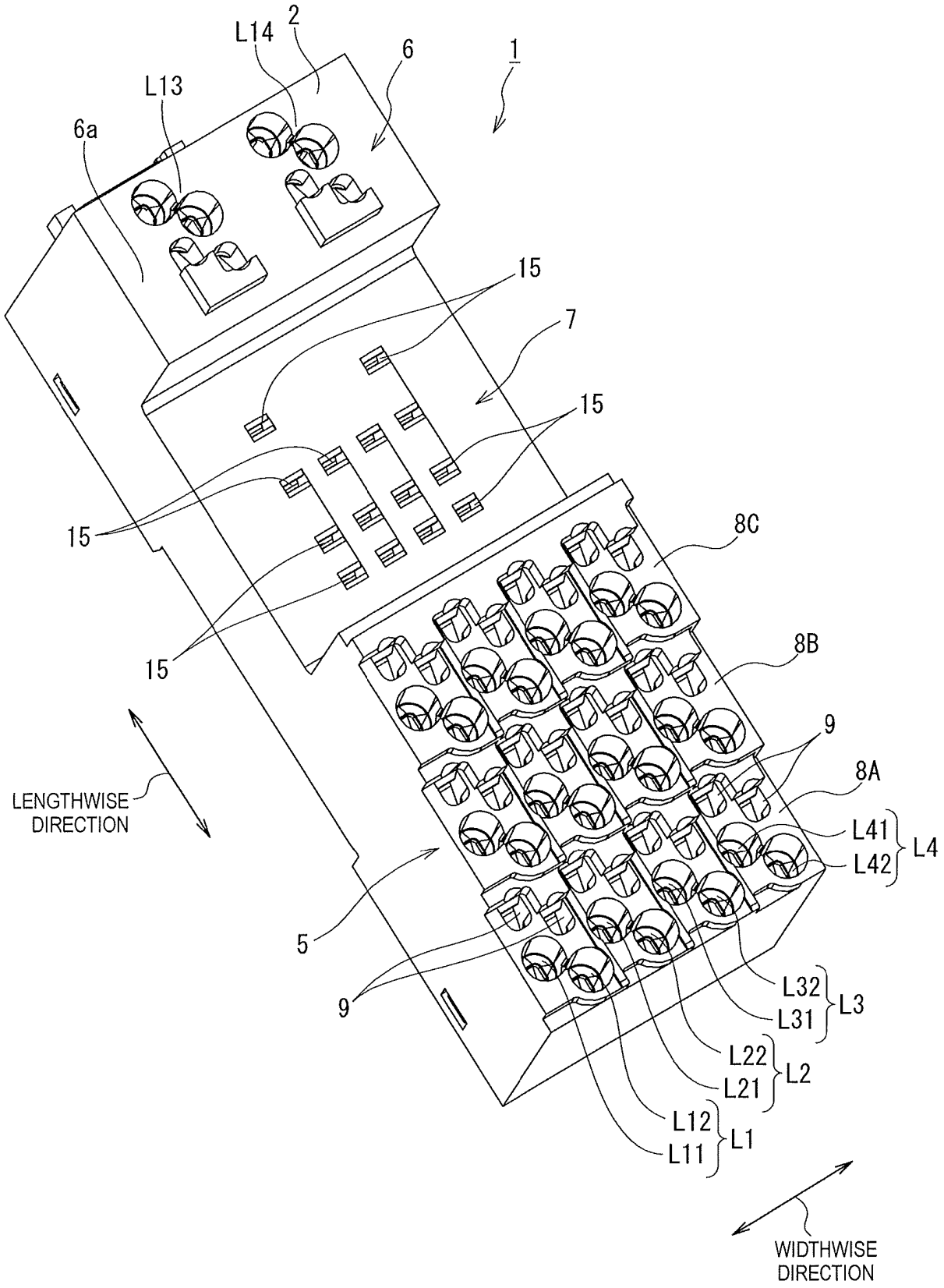

L14
2
6
1
L13
6a
15
7
15
15
15
8C
8B
9
8A
L41
L42
L4
LENGTHWISE DIRECTION
5
9
L32
L31
L3
L22
L21
L2
L12
L11
L1
WIDTHWISE DIRECTION

FIG. 2

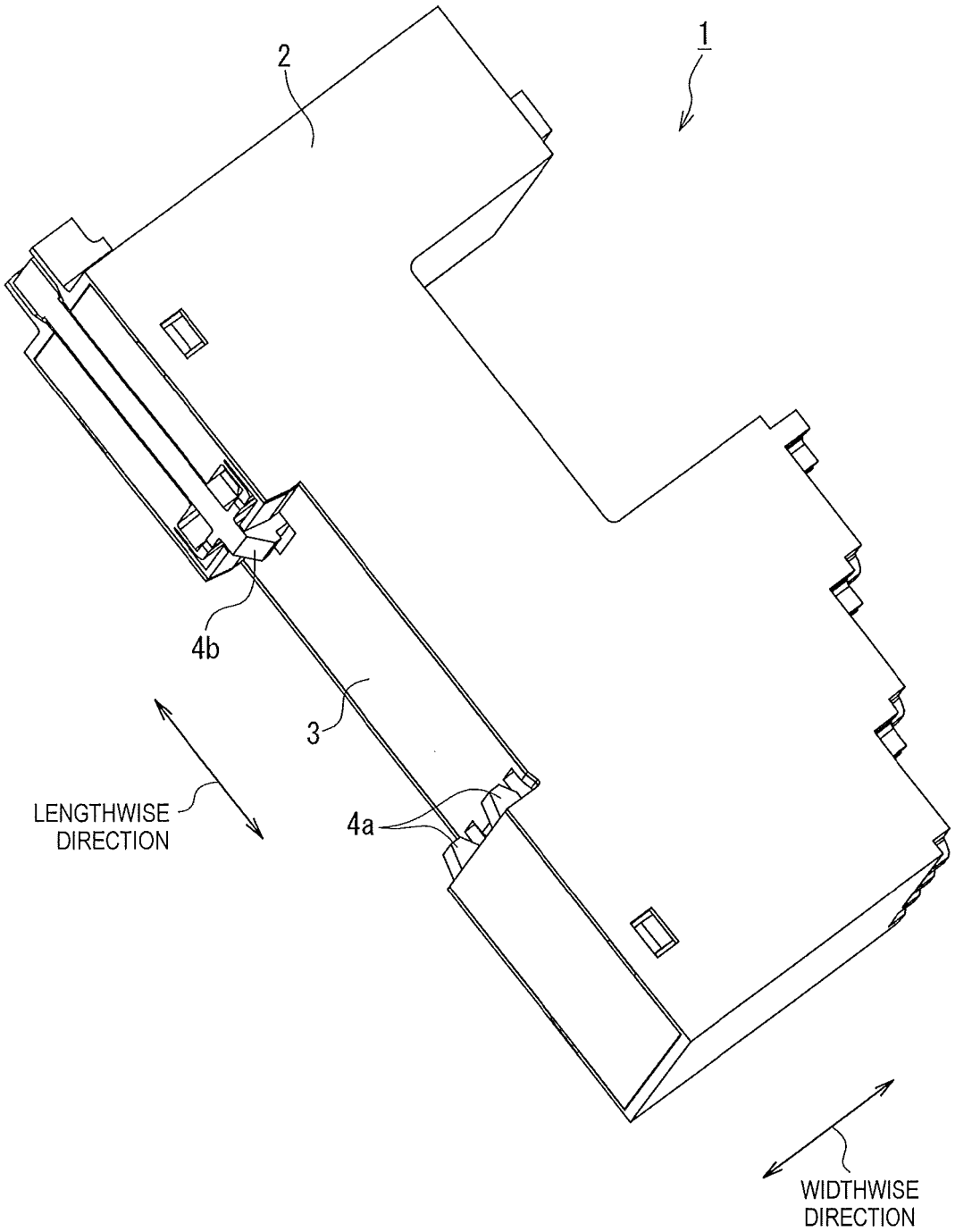


FIG. 3

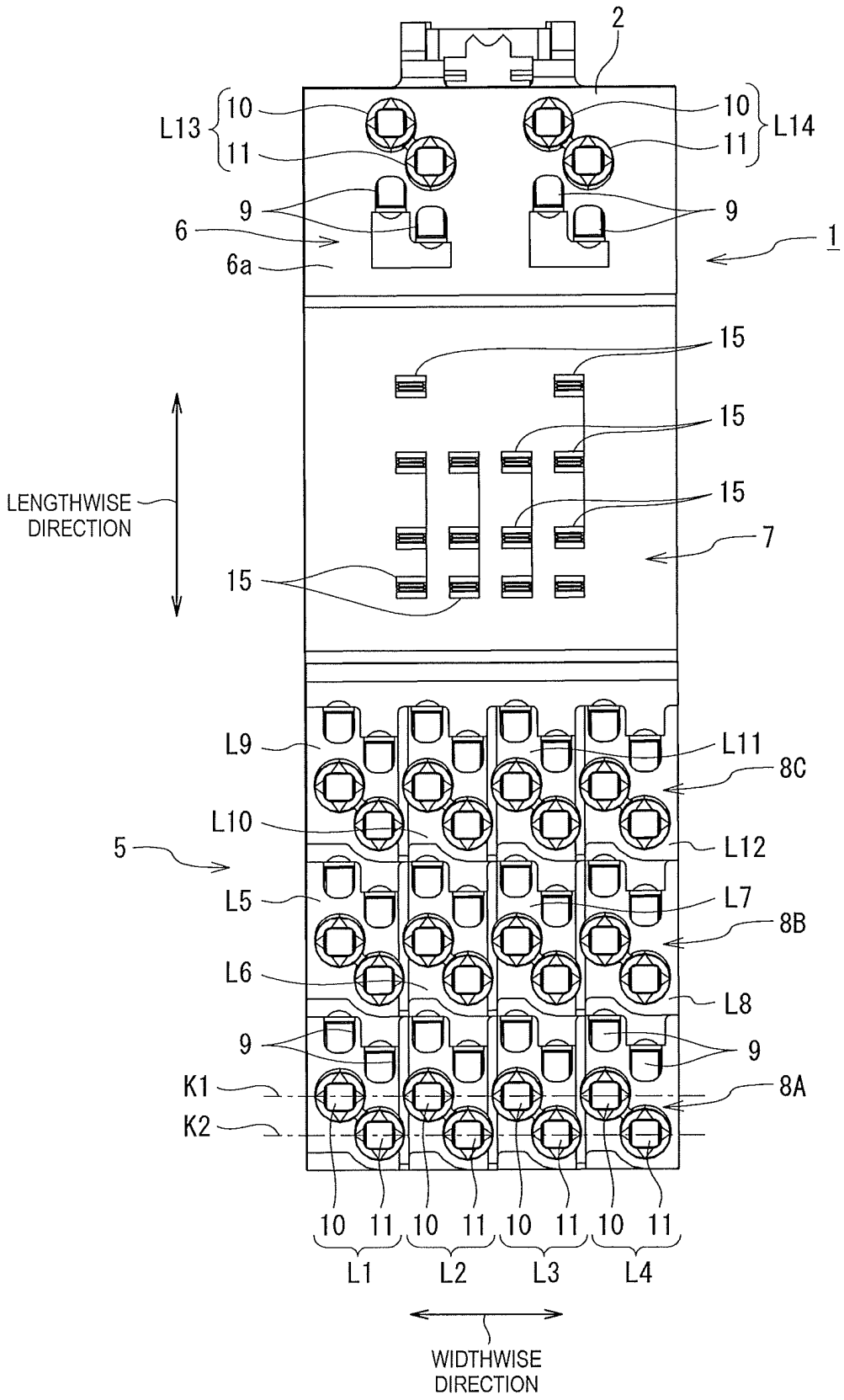

2
L13
10
11
10
11
L14
9
9
6
6a
1
15
15
15
LENGTHWISE DIRECTION
7
15
L9
L11
8C
L10
L12
5
L5
L7
8B
L6
L8
9
9
K1
8A
K2
10 11 10 11 10 11 10 11
L1
L2
L3
L4
WIDTHWISE DIRECTION

FIG. 4

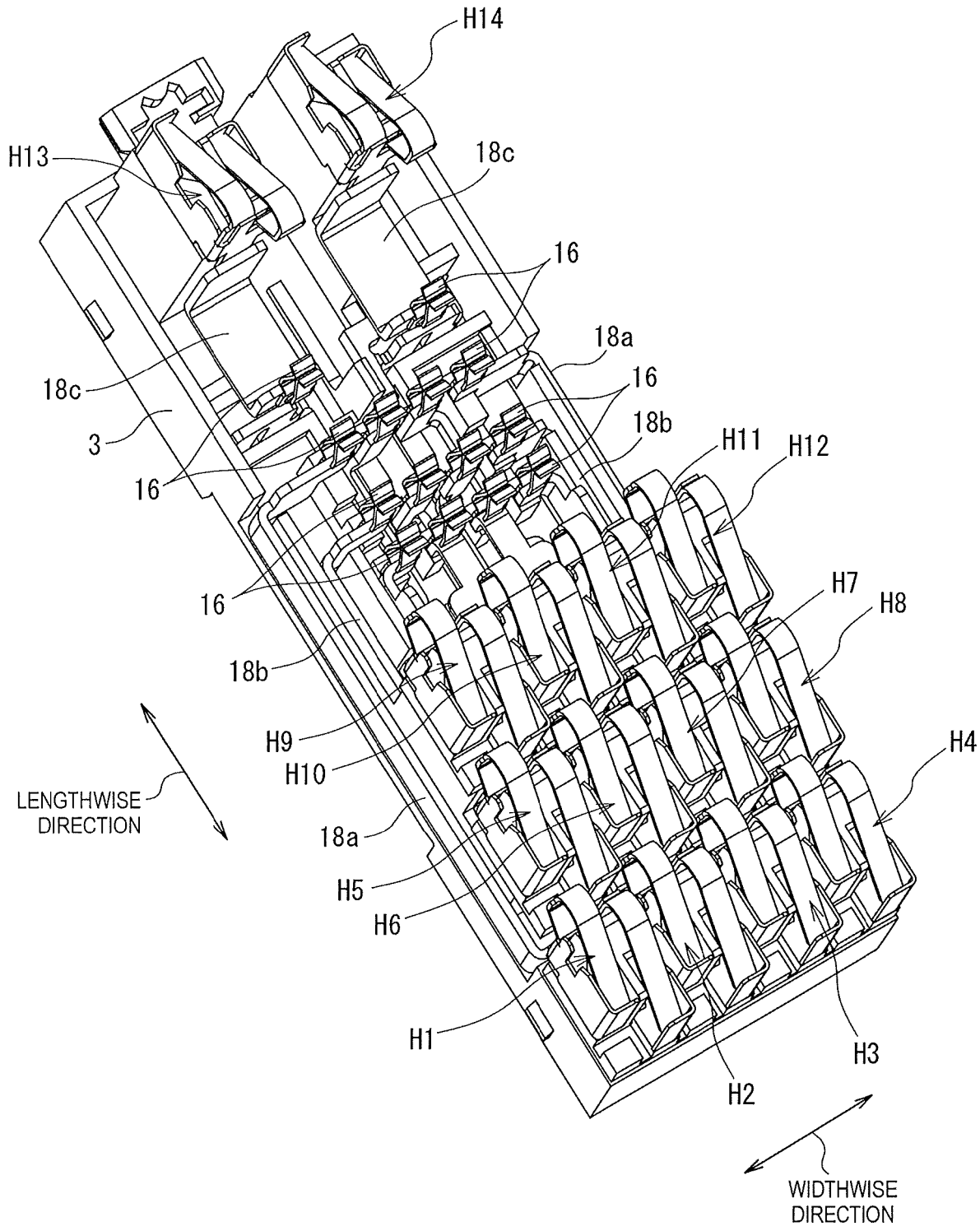

H14
H13
18c
16
18a
18c
16
3
18b
H11
H12
16
H7
H8
16
18b
H9
H4
H10
LENGTHWISE DIRECTION
18a
H5
H6
H1
H3
H2
WIDTHWISE DIRECTION

FIG. 5

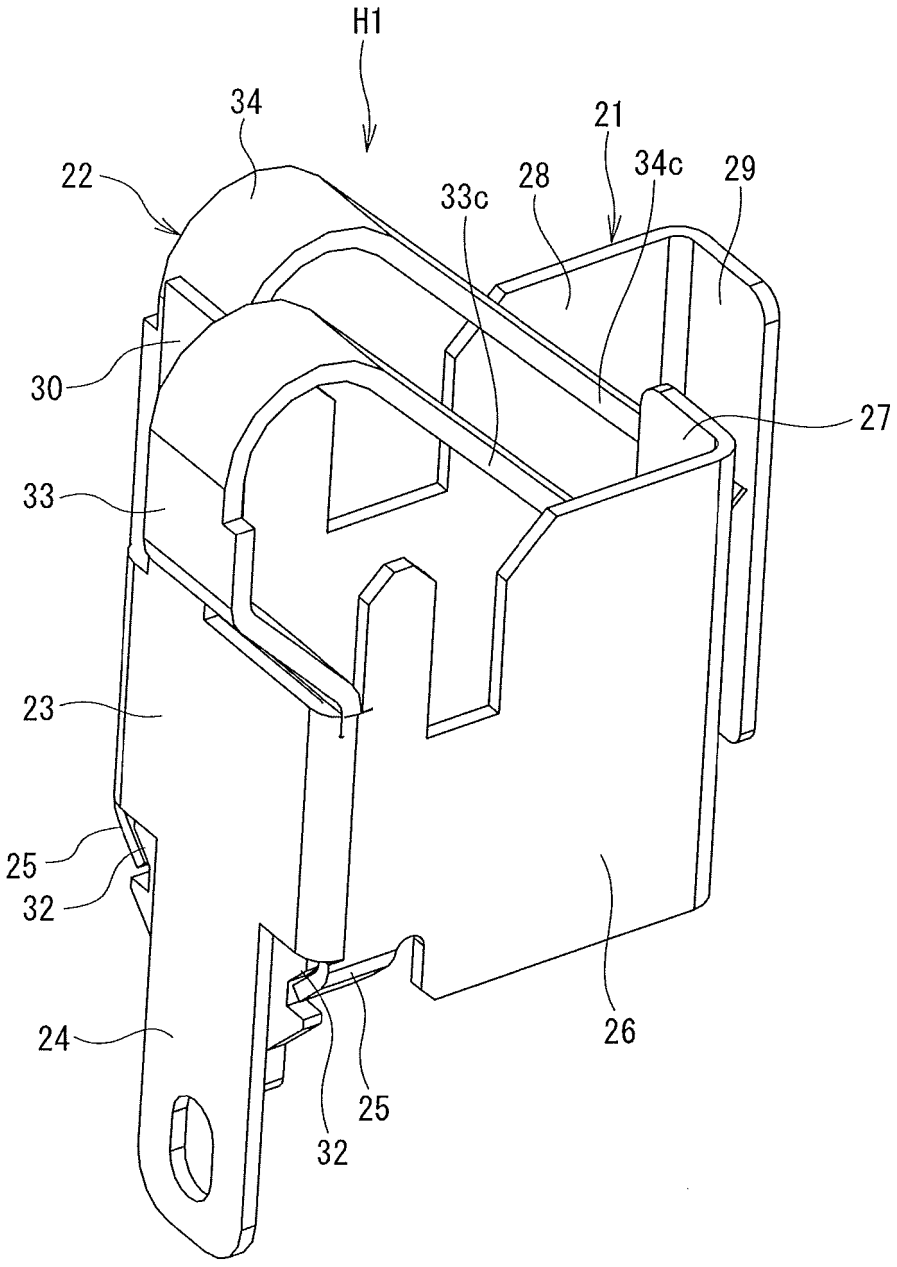


FIG. 6

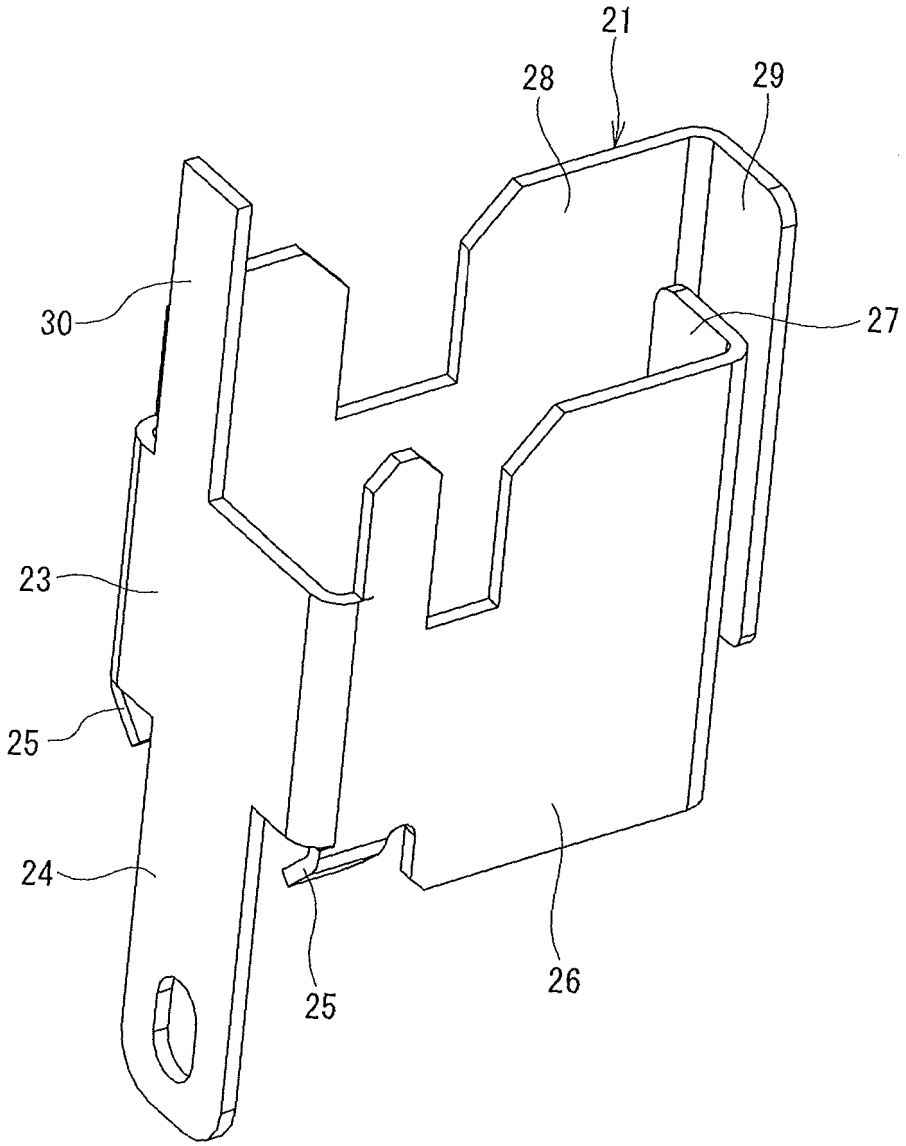


FIG. 7

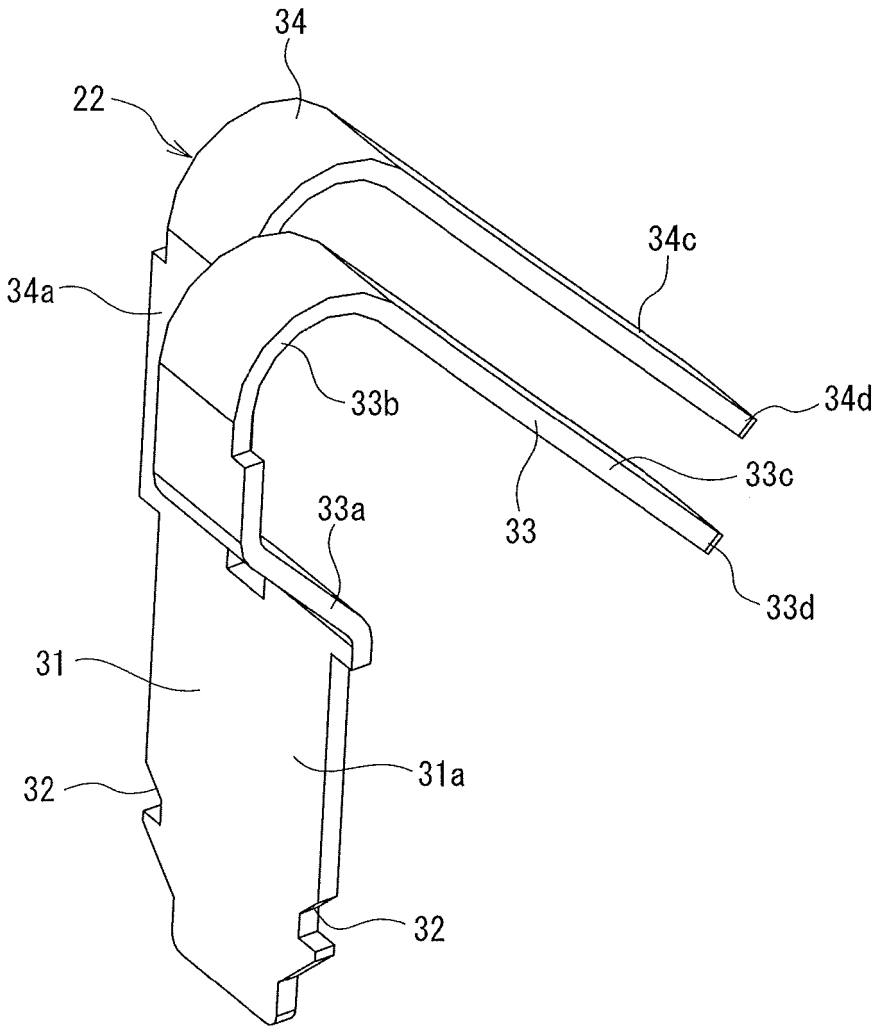


FIG. 8

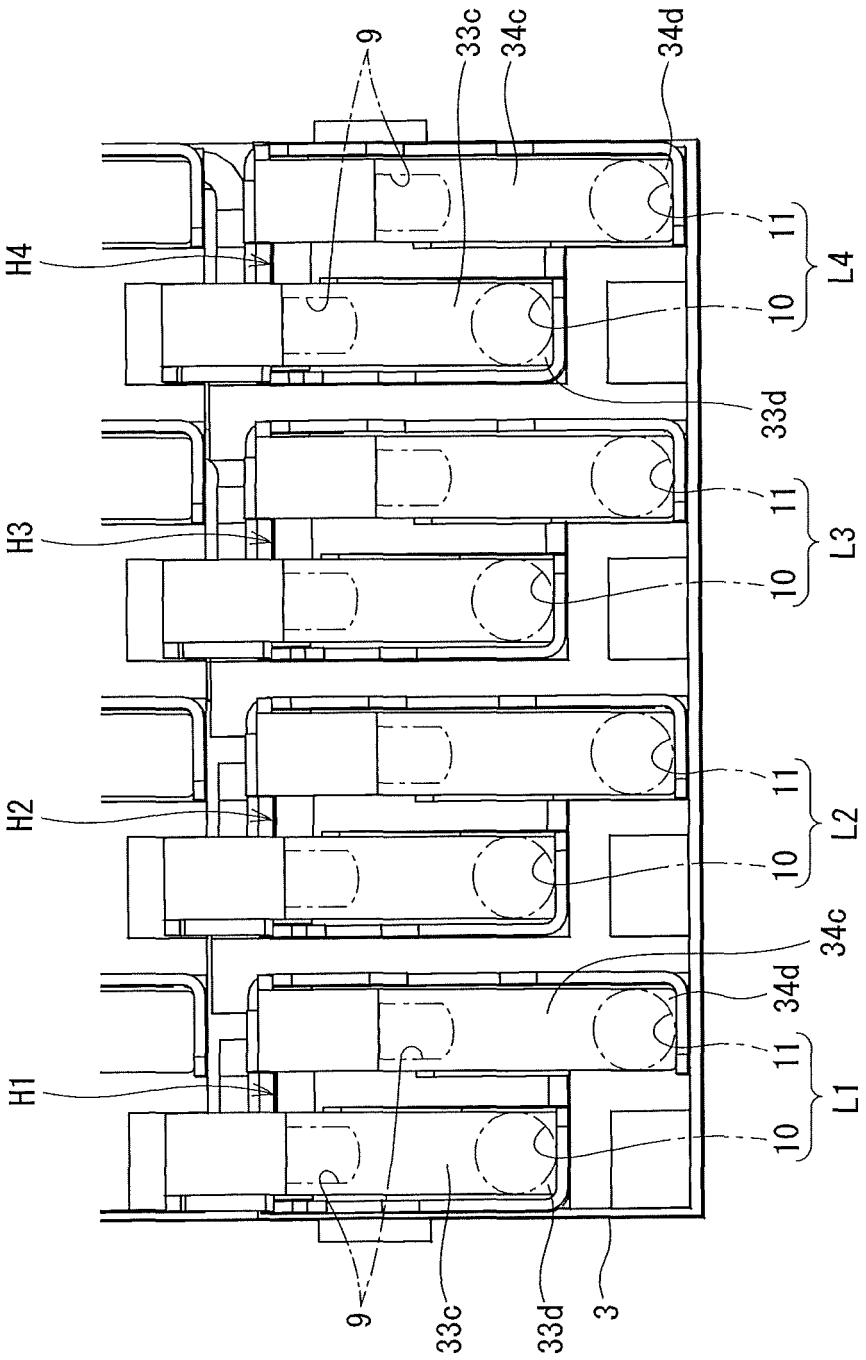

9
33c
34c
34d
H4
11
10
L4
33d
H3
11
10
L3
H2
11
10
L2
34c
34d
H1
11
10
L1
9
33c
33d
3

FIG. 9A

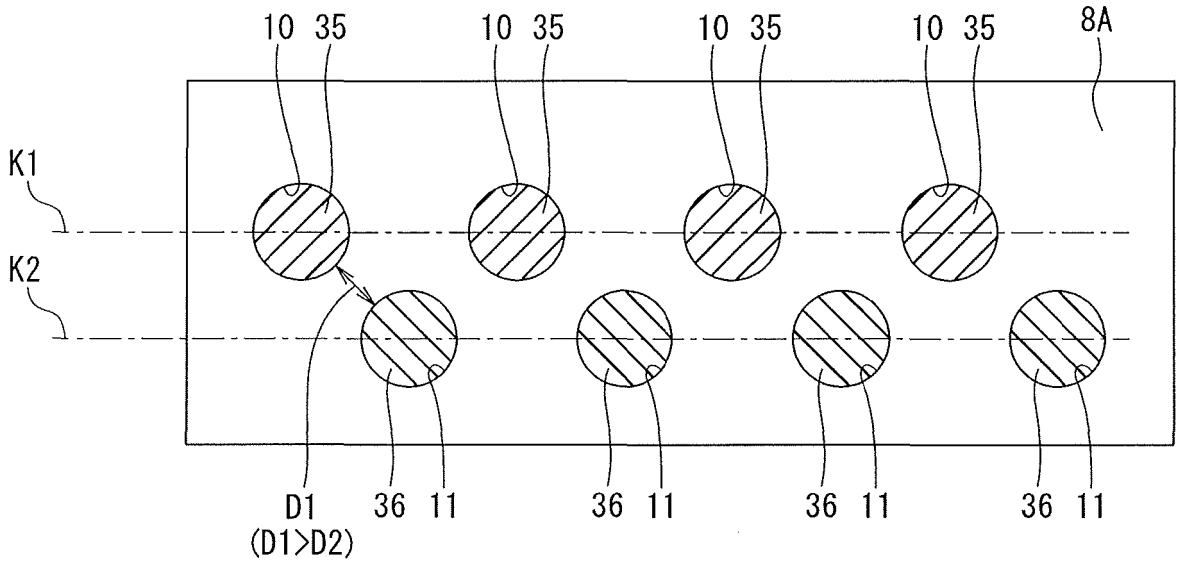
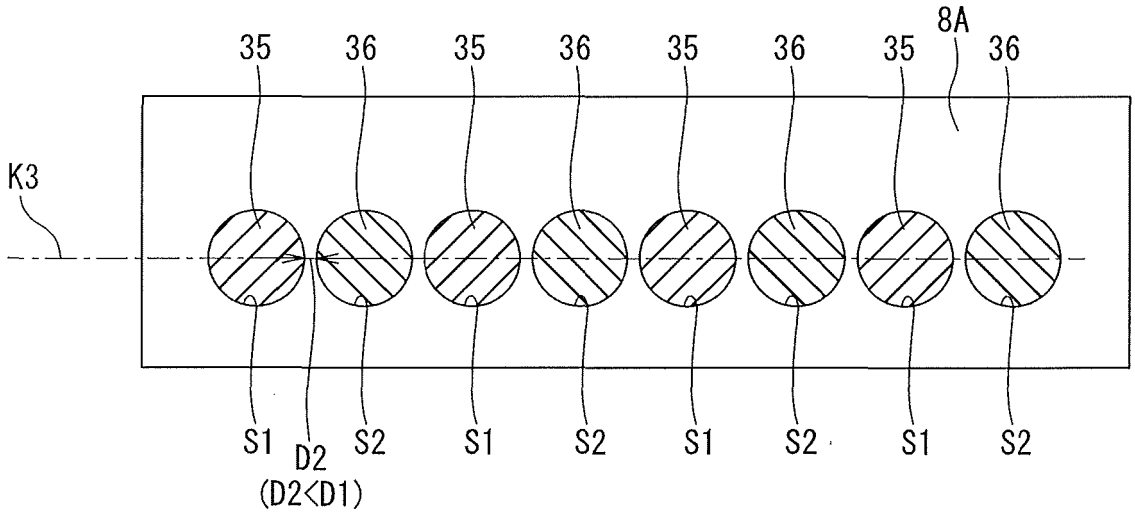

10 35
10 35
10 35
10 35
8A
K1
K2
D1
(D1>D2)
36 11
36 11
36 11
36 11

FIG. 9B


35
36
35
36
35
36
35
8A
36
K3
S1
D2
(D2<D1)
S2
S1
S2
S1
S2
S1
S2

REFERENCES CITED IN THE DESCRIPTION

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