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(54) **SPRING-CONNECTED GROUNDING TERMINAL**

(57) The present invention provides a spring-connected grounding terminal for connecting to a grounding end for grounding of conductive wires, the grounding terminal comprising a current bar bracket, on which at least one terminal is connected, wherein: at least one current bar connecting end is disposed on the current bar bracket, wherein each current bar connecting end is connected to a terminal, the current bar bracket has a second through hole connected to the grounding end disposed therein, positioning holes are disposed at two sides of the second through holes, the positioning holes mating with a convex portion disposed on the grounding end to secure the position of the current bar bracket. The spring-connected grounding terminal of the present invention can implement rapid grounding of conductive wires in any case and can implement insertion and removal of the conductive wires without aid of any tool.

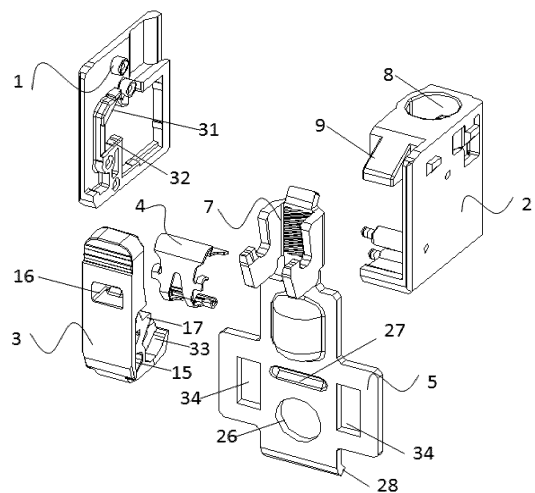


Fig. 1

Description

Technical Field

[0001] The present invention relates to the field of wiring terminals, and more particularly, to a spring-connected grounding terminal.

Background

[0002] In prior arts, the electrical devices such as machines and instruments are grounded to protect humans and animals from electric shocks. To do so, the conductive members, particularly the housing members, which do not belong to the circuits with operating currents of an electric machine or instrument, and with which people are likely to touch and contact, of the devices are connected to the ground wire. The ground wire is connected to the operational grounding of the power grid. In addition, the devices can be jointly or individually grounded at the side of end users via a protective grounding such as grounding in the land.

[0003] One grounded grounding wire is connected to all of the electrical devices to have those devices jointly grounded. One continuous grounding wire is used for this purpose.

[0004] Screwing is often used for grounding of terminals in prior arts, which needs relatively larger installation space for grounding of terminals during operation. In the process of implementation, if operational space inside the cabinets is small, the operational tools are unable to enter the cabinets, therefore the conductive wires cannot be connected.

[0005] In prior arts, each grounding part can only implement grounding of one terminal, but cannot implement simultaneous grounding of a plurality of terminals.

Summary of Invention

[0006] The present invention intends to provide a spring-connected grounding terminal, which can implement rapid grounding of conductive wires in any case and can implement insertion and removal of the conductive wires without aid of any tool.

[0007] A spring-connected grounding terminal for connecting to a grounding end for grounding of conductive wires, the grounding terminal comprising a current bar bracket, at least one terminal being connected on the current bar bracket, wherein:

at least one current bar connecting end is disposed on the current bar bracket, wherein each current bar connecting end is connected to a terminal;
the terminal comprises a housing, a spring, and a handle, the housing having disposed therein a first support bolt and a second support bolt, wherein the spring is sleeved inside the first support bolt, and the spring has an open state and a closed state;

a clamping slot is disposed on the housing;
a through hole, which mates with the second support bolt, is disposed on the handle; a hollowed-out portion is disposed on the handle;

the spring has, at one end, two support legs, which are connected to an executing arm through a clamp arm, wherein the executing arm is in a contact or separate state with respect to the conductive wire inserted into the terminal, the clamp arm is rotatably installed inside the first support bolt, and the handle is bridged inside the two support legs;

the executing arm at the other end of the spring mates with the current bar bracket to connect the conductive wires;

the current bar connecting end has a base portion and a retaining arm connecting to two side edges of an upper portion above the base portion and perpendicular to the base portion, wherein the retaining arm has a transition edge, a retaining edge, and a clamping edge connecting the transition edge and the retaining edge;

when the spring is in a closed state, the hollowed-out portion mates with the clamping slot and the two support legs of the spring are in contact with the clamping edge; when the spring is in an open state, the hollowed-out portion is in a separate state with respect to the clamping slot and the two support legs of the spring are in a separate state with respect to the current bar connecting end;

the current bar bracket has a through hole connected to the grounding end disposed therein, the through hole having positioning holes disposed at its two sides, the positioning holes mating with a convex portion disposed on the grounding end to secure the position of the current bar bracket.

[0008] Further, an inclined portion is disposed at a base portion of the spring-connected grounding terminal, wherein the inclined portion is connected to the base portion and is at a certain angle with respect to the base portion.

[0009] Further, a plurality of evenly distributed convex slots are disposed at a side of the base portion that is in contact with the conductive wires.

[0010] Further, a convex hull extruding from a plane of the current bar bracket is disposed above the through hole disposed on the current bar bracket.

[0011] Further, a curved surface is disposed at the bottom of the current bar bracket, where the curved surface curves in a same direction as the curving direction of the convex hull.

[0012] Further, a first stopper is disposed on the handle. When the handle is in an open state, the first stopper extends between the two support legs and causes the front end of the handle to be in contact with the two support legs of the spring.

[0013] Further, two positioning springs are respectively disposed at the two side edges of the two support legs

of the spring that are in contact with the housing, wherein the first positioning spring is located at a position where the support legs are connected to the clamp arm, and the second positioning spring is located at ends of the support legs, the first positioning spring is in a contact or separate state with respect to a first rib disposed on the housing, the spring is in an open state when the first positioning spring is in a contact state with respect to the first rib, and the spring is in a closed state when the first positioning spring is in a separate state with respect to the first rib.

[0014] The second positioning spring is in a contact or separate state with respect to a second rib disposed on the housing, wherein a height of the second rib with respect to a bottom of the housing is the same as a height of the transition edge disposed on the current bar connecting end with respect to the bottom of the housing, the spring is in an open state when the second positioning spring is in a contact state with respect to the second rib, the spring is in a closed state and the second positioning spring is located inside the clamping edge disposed on the current bar connecting end when the second positioning spring is in a separate state with respect to the second rib.

[0015] Further, the number of the current bar connecting ends is three.

[0016] It can be known from the above technical content that the spring-connected grounding terminal of the present invention, in which at least one terminal is connected on a current bar bracket, enables a plurality of terminals to be connected on one current bar bracket, increasing efficiency of connection.

[0017] The terminal comprises a housing, a spring, and a handle. During connection of the conductive wires, the conductive wires can be reliably connected into the terminal without aid of any tools, and it is not necessary to reserve relatively larger operational space inside the cabinet.

[0018] The current bar bracket has a through hole connected to the grounding end disposed therein. Positioning holes are disposed at two sides of the through hole. The positioning holes mate with the convex portion disposed on the grounding end to secure the position of the current bar bracket. Mating of the through hole and the positioning holes has the current bar bracket secured with a simple structure.

[0019] A convex hull extruding from a plane of the current bar bracket is disposed above the through hole disposed on the current bar bracket. When the grounding end is not in planar contact with the contact end of the current bar bracket, the convex hull can adjust the position of the current bar bracket to keep it co-planar.

[0020] A plurality of evenly distributed convex slots are disposed at a side of the base portion that is in contact with the conductive wires. The convex slots increase the friction between the conductive wires and the base portion of the current bar so that the conductive wires may not easily fall off the terminal.

[0021] It should be understood that all combinations of the aforementioned concepts and the additional concepts detailed below can be regarded as a part of the inventive subject matters of the present disclosure as long as such concepts are not mutually contradictory. In addition, all combinations of the claimed subject matters are regarded as a part of the inventive subject matters of the present disclosure.

[0022] The foregoing and other aspects, embodiments and features taught by the present invention can be more comprehensively understood from the following description with reference to the accompanying drawings. Other additional aspects of the present invention, such as the features and/or beneficial effects of the exemplary embodiments, will be apparent in the following description, or learned from the practice of the specific embodiments taught by the present invention.

Brief Description of the Drawings

[0023] The accompanying drawings are not intended to be drawn on scale. In the drawings, each of same or approximately same constituent parts shown in each figures can be indicated by same reference numbers. Not each of the constituent parts is labeled in each figure for clarity. Embodiments of various aspects of the present invention are now described from examples in conjunction with the drawings, in which:

Fig. 1 is a structural schematic diagram of the invention with one terminal.

Fig. 2 is a structural schematic diagram of the invention with three terminals.

Fig. 3 is a structural schematic diagram of a handle of the invention in a closed state.

Fig. 4 is a structural schematic diagram of a handle of the invention in an intermediate state between an open state and the closed state.

Fig. 5 is a structural schematic diagram of a handle of the invention in the open state.

Fig. 6 is a structural schematic diagram of a current bar bracket of the invention.

Fig. 7 is a structural schematic diagram of a spring of the invention.

Detailed Description

[0024] Detailed embodiments in conjunction with the accompanying drawings are provided as followings for better understanding of the technical contents of the present invention.

[0025] In the disclosure, various aspects of the invention are described with reference to the drawings, in which many illustrative embodiments are shown. Embodiments of the disclosure are not necessarily intended to include all the aspects of the present invention. It should be understood that a plurality of concepts and embodiments introduced above and detailed below can be im-

plemented by any one of many manners, because the concepts and embodiments disclosed by the present invention are not limited to any way of implementation. In addition, some aspects of the present invention can be used alone, or in suitable combination with other aspects of the present invention.

[0026] As shown in Figs. 1-7, a spring-connected grounding terminal for connecting to the grounding end for grounding of the conductive wires comprises a current bar bracket 5, on which at least one terminal 6 is connected (the structural schematic diagrams of structures with one terminal 6 and three terminals 6 respectively connected on the current bar bracket 5 are provided by the present invention), wherein at least one current bar connecting end 7 is disposed on the current bar bracket 5, wherein each current bar connecting end 7 is connected to a terminal 6. When three terminals 6 are connected on the current bar bracket 5, the current bar connecting bar 7 is connected to a current bar bracket to form an integral part through a cantilever 35.

[0027] As shown in Fig. 1, the terminal 6 comprises a housing, a spring 4, and a handle 3, wherein the housing has an opening 8 to introduce a conductor, and a clamping slot 9 is disposed on the housing.

[0028] The housing is divided into a left housing 1 and a right housing 2. Both the spring 4 and the handle 3 are located inside the housing, in which a first support bolt 10 and a second support bolt 11 are disposed, wherein the spring 4 is sleeved inside the first support bolt 10, and the spring 4 has an open state and a closed state. A first rib 31 and a second rib 32 are respectively disposed at corresponding positions of the left housing 1 and the right housing 2, wherein the first rib 31 is used to define positions of the support legs and the second rib 32 is used to define a position of a second positioning spring 20.

[0029] As shown in Fig. 7, the spring 14 has, at one end, two support legs 12, which are connected to an executing arm 14 through a clamp arm 13, wherein the executing arm 14 is in a contact or separate state with respect to the conductive wire inserted into the terminal 6, the clamp arm 13 is rotatably installed inside the first support bolt 10, and the handle 3 is bridged inside the two support legs 12.

[0030] The executing arm 14 at the other end of the spring 4 mates with the current bar bracket 5 to connect the conductive wires.

[0031] A first through hole 15 is disposed on the handle 3. The first through hole 15 mates with the second support bolt 11. A hollowed-out portion 16 is disposed on the handle 3.

[0032] A first stopper 17 is disposed on the handle 3. When the handle 3 is in an open state, the first stopper 17 extends between the two support legs 12, and the front end of the handle 3 is in contact with the two support legs 12 of the spring 4.

[0033] A second stopper 18 is disposed on the handle 3. When the spring 4 operates from an open state to a

closed state, the second stopper 18 is in contact with the two support legs 12 and causes the second positioning spring 20 to be located inside the clamping edge 22 following the operational direction of the handle 3.

[0034] A groove 33 for accommodating the spring support legs 12 is disposed on the handle 3 at its two side surfaces.

[0035] As shown in Fig. 6, the current bar connecting end 7 has a base portion 29 and a retaining arm 30 connected to the two side edges at the upper portion above the base portion 29 and perpendicular to the base portion 29, wherein the retaining arm 30 has a transition edge 21, a retaining edge 23, and a clamping edge 22 connecting the transition edge 21 and the retaining edge 23, wherein the clamping edge 22 is in the shape of a circular arc, and a distance of the lowest point of the clamping edge 22 with respect to a bottom of the housing is smaller than a distance of the transition edge 21 with respect to the bottom of the housing.

[0036] An inclined portion 24 is disposed at the base portion 29 of the current bar connecting end 7. An accommodation cavity opposite to the inclined portion is disposed on the housing, wherein the inclined portion 24 is connected to the base portion 29 and is at a certain angle with respect to the base portion 29. The inclined portion 24 is located at the upper portion of the current bar connecting end 7. A plurality of evenly distributed convex slots 25 are disposed at the side of the base portion 29 that is in contact with the conductive wires.

[0037] The current bar bracket 5 has a second through hole 26 connected to the grounding end disposed therein. The positioning holes 34 are respectively disposed at two sides of the through hole. The positioning holes 34 mate with a convex portion disposed on the grounding end to secure the position of the current bar bracket 5. A convex hull 27 extruding from a plane of the current bar bracket 5 is disposed above the second through hole 26 disposed on the current bar bracket 5. A curved surface 28 is disposed at the bottom of the current bar bracket 5. The curved surface 28 curves in a same direction as the curving direction of the convex hull 27.

[0038] When the spring 4 is in a closed state, the hollowed-out portion 16 mates with the clamping slot 9, and the two support legs 12 of the spring 4 are in contact with the clamping edge 22. When the spring 4 is in an open state, the hollowed-out portion 16 is in a separate state with respect to the clamping slot 9, and the two support legs 12 of the spring 4 are in a separate state with respect to the current bar connecting end 7.

[0039] Two positioning springs are respectively disposed at the two side edges of the two support legs 12 of the spring 4 that are in contact with the housing, wherein the first positioning spring 19 is located at a position where the support legs 12 are connected to the clamp arm 13 and the second positioning spring 20 is located at ends of the support legs 12. The first positioning spring 19 is in a contact or separate state with respect to a first rib 31 disposed on the housing. The spring 4 is in an open

state when the first positioning spring 19 is in a contact state with respect to the first rib 31, and the spring 4 is in a closed state when the first positioning spring 19 is in a separate state with respect to the first rib 31.

[0040] The second positioning spring 20 is in a contact or separate state with respect to a second rib 32 disposed on the housing, wherein a height of the second rib 32 with respect to a bottom of the housing is the same as a height of the transition edge 21 disposed on the current bar connecting end 7 with respect to the bottom of the housing. The spring 4 is in an open state when the second positioning spring 20 is in a contact state with respect to the second rib 32. The spring 4 is in a closed state and the second positioning spring 20 is located inside the clamping edge 22 disposed on the current bar connecting end 7 when the second positioning spring 20 is in a separate state with respect to the second rib 32.

[0041] The end of the first positioning spring 19 and the end of the second positioning spring 20 curve inwards, i.e., curving towards the direction of the executing arm 14.

[0042] The operational principles of the spring-connected grounding terminal of the present invention are as follows:

The conductive wires are introduced through a conductor introducing opening 8 disposed on the housing. The conductive wires pass through the conductor introducing opening 8 to be in contact with the base portion 29 of the current bar connecting end 7. The retaining arms 30 of the current bar connecting end 7 cause the conductive wires to be located between the two retaining arms 30, and at that time the handle 3 is in an open state and the spring 4 is in an open state. When the handle 3 swings from the open state to a closed state, the spring 4 moves from the open state to a closed state along the first support bolt 10 following swinging of the handle 3; or the handle is opened again through an operation in a reverse direction.

[0043] As shown in Fig. 5, when the spring 4 is in an open state, the second positioning spring 20 is in contact with the second rib 32. At that time, the first stopper 17 extends between the two support legs 12, and the second stopper 18 is in a separate state with respect to the support legs 12 when the handle 3 is operated to rotate. As the end of the transition edge 21 disposed on the current bar connecting end 7 is at the same position as the end of the second rib 32, the second positioning spring 20 of the spring 4 slides along the transition edge 21. During sliding, the first stopper 17 is in a separate state with respect to the support legs 12, the second stopper is in contact with the support legs 12 and applies a force to the spring 4, and the spring 4 enters the clamping edge 22 along the transition edge 21. At that time, the hollowed-out portion 16 disposed on the handle 3 is in contact with the clamping slot 9 disposed on the housing. As a distance of the lowest point of the clamping edge 22 with respect to a bottom of the housing is smaller than a distance of the transition edge 21 with respect to the bot-

tom of the housing, the second positioning spring 20 will not cause the spring 4 to move in a reverse direction due to its own elastic force. Therefore, the conductive wires are secured inside the housing. At that time, both the spring 4 and the handle 3 are in a closed state.

[0044] With reference to Figs. 3-5, when the handle 3 is operated along a reverse direction, the groove 33 disposed on the handle 3 squeezes the second positioning spring 20 to cause the spring 4 to move in the direction in which the handle is operated along the transition edge 21, to cause the spring 4 to move to the transition edge 21 along the clamping edge 22 and move to the second rib 22 along the transition edge 21. When the support legs 12 are in contact with the first stopper 17, the handle 3 is at a fully open position, and at that time, as the support legs 12 are fully inside the handle 3 and the spring 4 is in a fully open state without elastic force, the spring 4 and the handle 3 are secured in an open state.

[0045] It can be known from the above technical solution that the spring-connected grounding terminal of the present invention, in which at least one terminal 6 is connected on a current bar bracket 5, enables a plurality of terminals 6 to be connected on one current bar bracket 5, increasing efficiency of connection.

[0046] The terminal 6 comprises a housing, a spring 4, and a handle 3. During connection of the conductive wires, the conductive wires can be reliably connected into the terminal 6 without aid of any tools, and it is not necessary to reserve relatively larger operational space inside the cabinet.

[0047] The current bar bracket 5 has a through hole connected to the grounding end disposed therein. Positioning holes 34 are disposed at two sides of the through hole. The positioning holes 34 mate with the convex portion disposed on the grounding end to secure the position of the current bar bracket 5. Mating of the through hole and the positioning holes 34 has the current bar bracket 5 secured with a simple structure.

[0048] A convex hull 27 extruding from a plane of the current bar bracket 5 is disposed above the through hole disposed on the current bar bracket 5. When the grounding end is not in planar contact with the contact end of the current bar bracket 5, the convex hull 27 can adjust the position of the current bar bracket 5 to keep it coplanar.

[0049] A plurality of evenly distributed convex slots 25 are disposed at a side of the base portion 29 that is contact with the conductive wires. The convex slots 25 increase the friction between the conductive wires and the base portion 29 of the current bar so that the conductive wires may not easily fall off the terminal 6.

[0050] Although the present invention is disclosed above with preferred embodiment, those embodiments are not to limit the present invention. One skilled in the art can make various alterations and modifications without departing the spirit and scope of the present invention. Thus, the protective scope of the present invention shall be determined by the claims.

Claims

1. A spring-connected grounding terminal for connecting to a grounding end for grounding of conductive wires, **characterized in that** the grounding terminal comprises a current bar bracket, on which at least one terminal is connected, wherein:

at least one current bar connecting end is disposed on the current bar bracket, wherein each current bar connecting end is connected to a terminal;

the terminal comprises a housing, a spring, and a handle, a first support bolt and a second support bolt are disposed inside the housing, wherein the spring is sleeved inside the first support bolt, and the spring has an open state and a closed state;

a clamping slot is disposed on the housing; a first through hole, which mates with the second support bolt, is disposed on the handle; a hollowed-out portion is disposed on the handle; the spring has, at one end, two support legs, which are connected to an executing arm through a clamp arm, wherein the executing arm is in a contact or separate state with respect to the conductive wire inserted into the terminal, the clamp arm is rotatably installed inside the first support bolt, and the handle is bridged inside the two support legs;

the executing arm at the other end of the spring mates with the current bar bracket to connect the conductive wires;

the current bar connecting end has a base portion and a retaining arm connecting to the two side edges of an upper portion above the base portion and perpendicular to the base portion, wherein the retaining arm has a transition edge, a retaining edge, and a clamping edge connecting the transition edge and the retaining edge; when the spring is in a closed state, the hollowed-out portion mates with the clamping slot and the two support legs of the spring are in contact with the clamping edge; when the spring is in an open state, the hollowed-out portion is in a separate state with respect to the clamping slot and the two support legs of the spring are in a separate state with respect to the current bar connecting end;

the current bar bracket has a second through hole connected to the grounding end disposed therein, and positioning holes are disposed at two sides of the second through hole, the positioning holes mating with a convex portion disposed on the grounding end to secure the position of the current bar bracket.

2. The spring-connected grounding terminal according

to claim 1, wherein an inclined edge is disposed at the base portion of the current bar connecting end, wherein the inclined edge is connected to the base portion and is at a certain angle with respect to the base portion.

3. The spring-connected grounding terminal according to claim 1, wherein a plurality of evenly distributed convex slots are disposed at a side of the base portion that is in contact with the conductive wires.

4. The spring-connected grounding terminal according to claim 1, wherein a convex hull extruding from a plane of the current bar bracket is disposed above the second through hole disposed on the current bar bracket.

5. The spring-connected grounding terminal according to claim 4, wherein a curved surface, which curves in a same direction as the curving direction of the convex hull, is disposed at a bottom of the current bar bracket.

6. The spring-connected grounding terminal according to claim 1, wherein a first stopper is disposed on the handle, when the handle is in an open state, the first stopper extends between the two support legs and the front end of the handle is in contact with the two support legs of the spring.

7. The spring-connected grounding terminal according to claim 1, wherein two positioning springs are respectively disposed at two side edges of the two support legs of the spring that are in contact with the housing, wherein the first positioning spring is located at a position where the support legs are connected to the clamp arm, the second positioning spring is located at ends of the support legs, the first positioning spring is in a contact or separate state with respect to a first rib disposed on the housing, the spring is in an open state when the first positioning spring is in a contact state with respect to the first rib, the spring is in a closed state when the first positioning spring is in a separate state with respect to the first rib;

the second positioning spring is in a contact or separate state with respect to a second rib disposed on the housing, wherein a height of the second rib with respect to a bottom of the housing is the same as a height of the transition edge disposed on the current bar connecting end with respect to the bottom of the housing, the spring is in an open state when the second positioning spring is in a contact state with respect to the second rib, the spring is in a closed state and the second positioning spring is located inside the clamping edge disposed on the current bar connecting end when the second positioning spring is in a separate state with respect to the second rib.

8. The spring-connected grounding terminal according to claim 1, wherein the number of the current bar connecting ends is three.

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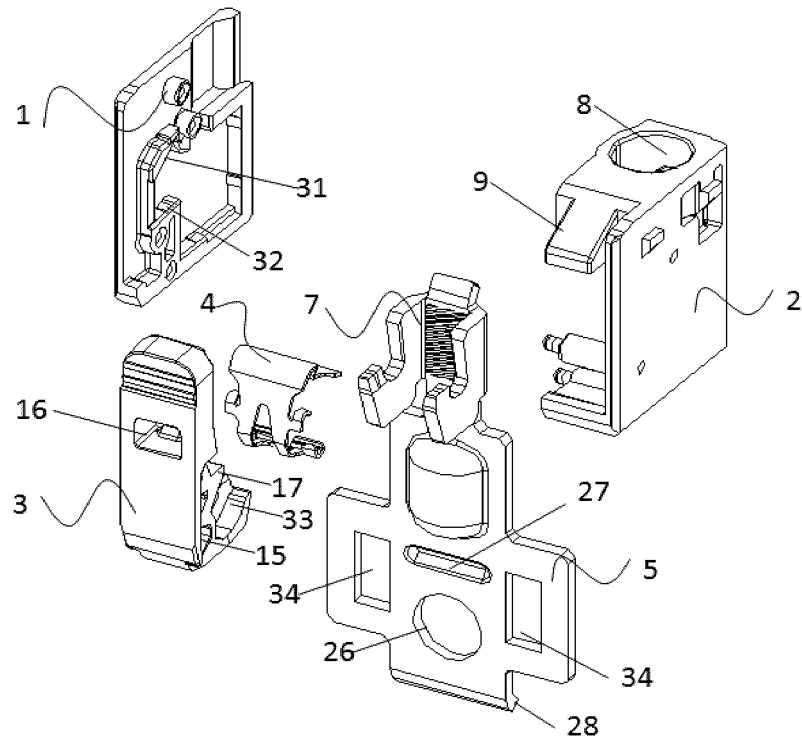


Fig. 1

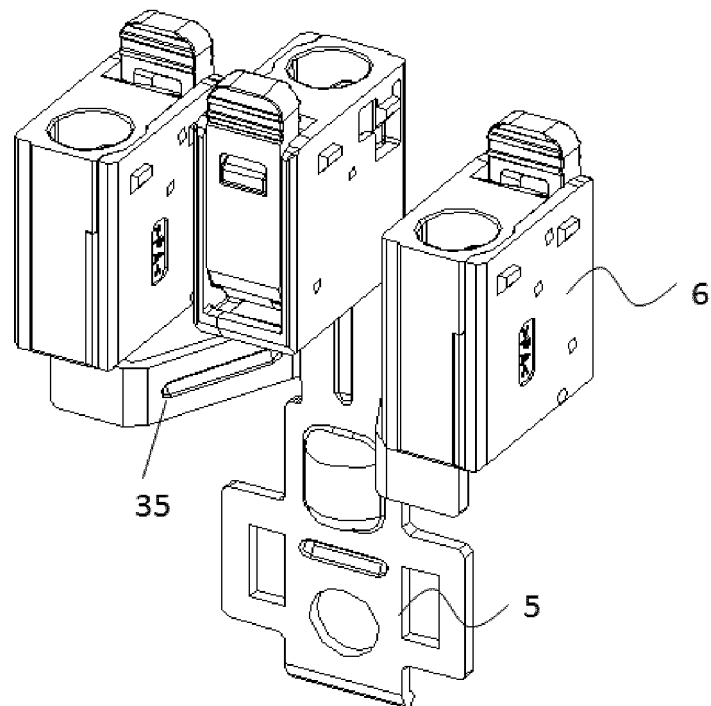


Fig. 2

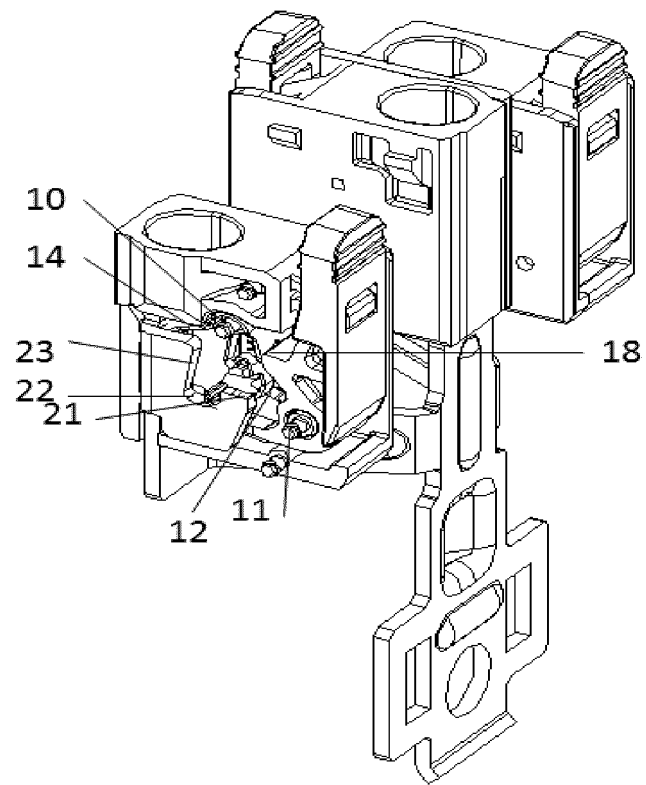


Fig. 3

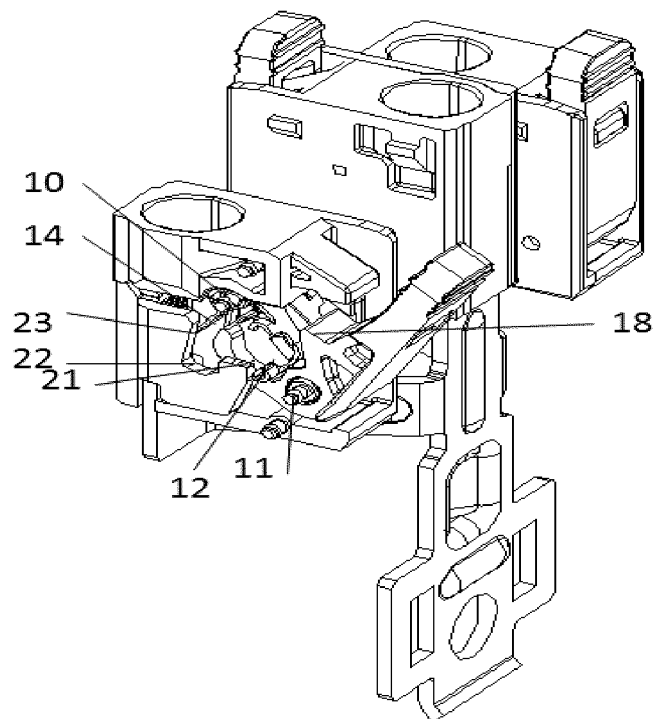


Fig. 4

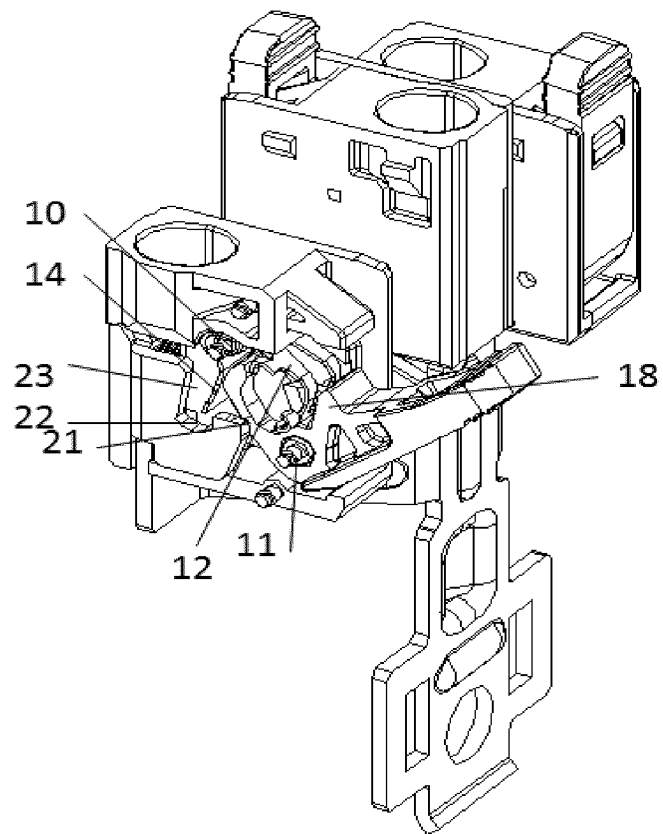


Fig. 5

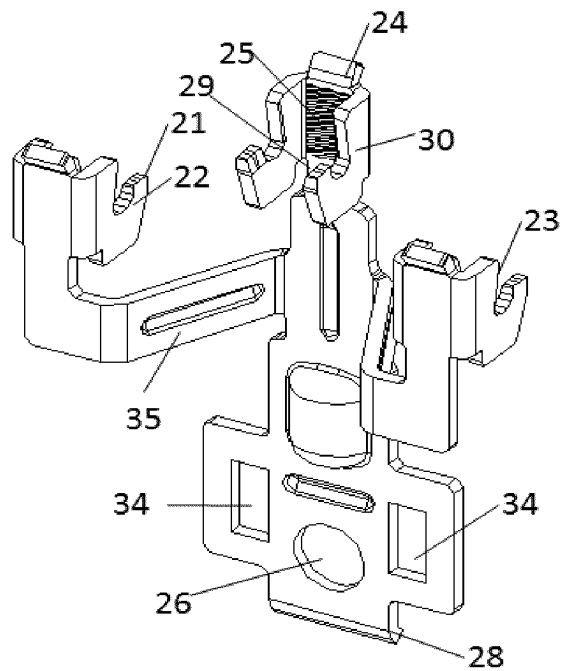


Fig. 6

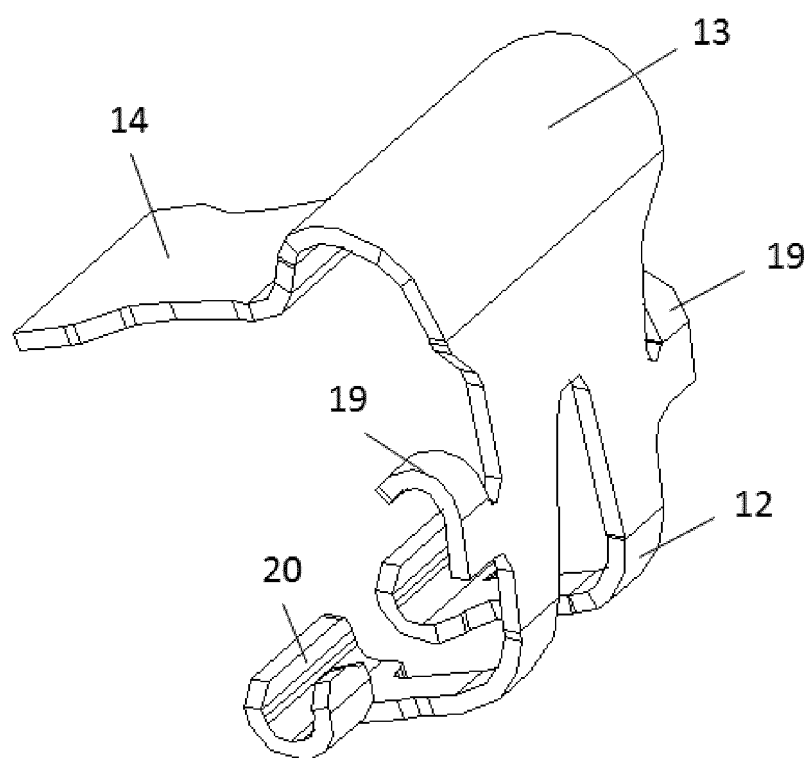


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/082374

5	A. CLASSIFICATION OF SUBJECT MATTER	
	H01R 13/15(2006.01)i; H01R 4/66(2006.01)i	
	According to International Patent Classification (IPC) or to both national classification and IPC	
	B. FIELDS SEARCHED	
10	Minimum documentation searched (classification system followed by classification symbols) H01R13/-;H01R9/-;H01R4/-	
	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched	
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS; DWPI; SIPOABS; VEN; CNTXT; WOTXT; USTXT; EPTXT; CNKI: 电连接器, 端子, 弹簧, 弹性, 压, 夹, 电线, 电缆, 线缆, 接地, 旋转, 手柄, connector, terminal, spring, elastic, press, clip, wire, cable, groudng, earthing, rotate, pivot, handle	
	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
20	Category*	Citation of document, with indication, where appropriate, of the relevant passages
	PX	CN 108346887 A (PHOENIX ASIAN PACIFIC ELECTRIC NANJING CO., LTD.) 31 July 2018 (2018-07-31) entire document
25	PX	CN 208062310 U (PHOENIX ASIAN PACIFIC ELECTRIC NANJING CO., LTD.) 06 November 2018 (2018-11-06) entire document
	A	WO 2017046129 A1 (PHOENIX CONTACT GMBH & CO., KG) 23 March 2017 (2017-03-23) entire document
30	A	CN 205029030 U (SICHUAN HUA FENG ENTERPRISE GROUP CO., LTD.) 10 February 2016 (2016-02-10) entire document
	A	CN 1295357 A (YAMAHA CORPORATION ET AL.) 16 May 2001 (2001-05-16) entire document
35		
	☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.	
40	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
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	Date of the actual completion of the international search	Date of mailing of the international search report
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50	Name and mailing address of the ISA/CN	Authorized officer
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