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(54) **INDICATING DEVICE OF DUAL-POWER AUTOMATIC TRANSFER SWITCH AND DUAL-POWER AUTOMATIC TRANSFER SWITCH**

(57) An indicating device of a dual-power automatic transfer switch comprises a first driving component connected to a first moving contact of a first power supply and a second driving component connected to a second moving contact of a second power supply. The indicating device comprises a mechanical indicating device and an electrical indicating device; and an indicating part acting on the mechanical indicating device and the electrical indicating device. The first driving component and the second driving component respectively drive the indicating part to move; the movement of the indicating part drives the mechanical indicating device to move to a position indicating where the first power supply is switched on, a position indicating where the second power supply is switched on and a position where both the first power supply and the second power supply are switched off; the movement of the indicating part correspondingly actuates the electrical indicating device to indicate the switch on signal of the first power supply, the switch on signal of the second power supply and the switch off signal of the first power supply and the second power supply. A dual-power automatic transfer switch comprises the indicating device.

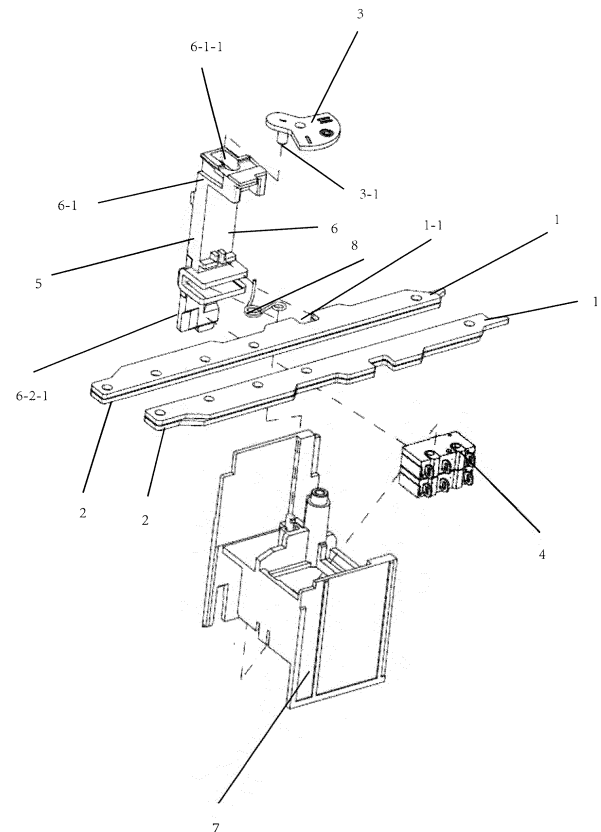


FIG. 2

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## Description

### Technical field

**[0001]** The present disclosure relates to an indicating device for a dual-power automatic transfer switch and a dual-power automatic transfer switch including the same indicating device.

### Background art

**[0002]** An indicating device of ATSE is a safety-related functional module, which indicates to the user the current opening and closing state of contacts of ATSE, such as being closed to the first power supply (S1 ON) or closed to the second power supply (S2 ON) or being disconnected from the first power supply and the second power supply (OFF). When ATSE has isolation function, users can padlock at OFF position to ensure the isolation between power supply and load terminal, and let maintenance personnel safely maintain load terminal equipment.

**[0003]** However, in some products of the prior art, the contacts are not rigidly connected with the mechanism drive, which leads to incorrect indication when the indicator is connected with the mechanism drive instead of the contacts rigidly. For example, when the moving contact cannot be separated by the mechanism due to welding or jamming, the driving of the mechanism has reached the OFF position, which is dangerous. If mechanical indicators provide mechanical indication of contact position, then mechanical indicators provide electrical indication of contact position, so their correct design is also very critical.

### Summary

**[0004]** In order to solve the defects in the prior art, according to one aspect of the present disclosure, there is provided an indicating device of a dual-power automatic transfer switch, which includes a first driving component connected to a first moving contact of a first power supply and a second driving component connected to a second moving contact of a second power supply.

**[0005]** The indicating device comprises a mechanical indicating device and an electrical indicating device; and an indicating part acting on the mechanical indicating device and the electrical indicating device.

**[0006]** The first driving component and the second driving component respectively drive the indicating part to move.

**[0007]** The movement of the indicating part drives the mechanical indicating device to move to a position where the first power supply is switched on, a position where the second power supply is switched on and a position where both the first power supply and the second power supply are switched off.

**[0008]** The movement of the indicating part corre-

spondingly actuates the electrical indicating device to indicate a switch on signal of the first power supply, a switch on signal of the second power supply and a switch off signal of the first power supply and the second power supply.

**[0009]** According to the above aspect of the present disclosure, the indicating member is an indicating rod.

**[0010]** A first end of the indicating rod is provided with an indicating rod groove.

**[0011]** A mechanical swing rod arranged on the mechanical indicating device can slide in the indicating rod groove.

**[0012]** With the movement of the indicating rod, the indicating rod groove actuates the mechanical swing rod, so that the mechanical indicating device rotates around a rotating center arranged on the housing of the dual-power automatic transfer switch to a position indicating that the first power supply is switched on, a position indicating that the second power supply is switched on and a position indicating that both the first power supply and the second power supply are switched off.

**[0013]** According to the above aspects of the present disclosure, an indicating rod pressing plate is provided on a second end of the indicating rod.

**[0014]** The indicating rod pressing plate comprises a pressing plate opening.

**[0015]** The electric indicating device comprises a first micro switch and a second micro switch.

**[0016]** When the indicating rod pressing plate simultaneously presses the first micro switch and the second micro switch, both the first micro switch and the second micro switch provide a switch off signal.

**[0017]** When the indicating rod pressing plate presses the first micro switch and the second micro switch is at the pressing plate opening, the first micro switch provides the switch off signal of the first power supply and the second micro switch provides the switch on signal of the second power supply.

**[0018]** When the indicating rod pressing plate presses the second micro switch and the first micro switch is at the pressing plate opening, the second micro switch provides the switch off signal of the second power supply, and the first micro switch provides the switch on signal of the first power supply.

**[0019]** According to the above aspects of the present disclosure, an indicating rod matching part is provided between the first end and the second end of the indicating rod.

**[0020]** The indicating rod matching part comprises a first indicating rod joint part and a second indicating rod joint part.

**[0021]** The first indicating rod joint part engages with the first driving component, and the movement of the first driving component actuates the first indicating rod joint part so as to drive the indicating rod to move.

**[0022]** The second indicating rod joint part engages with the second driving component, and the movement of the second driving component actuates second indi-

cating rod joint part so as to drive the indicating rod to move.

**[0023]** According to the above aspects of the present disclosure, the first indicating rod joint part is a first protrusion which is engaged with a first groove arranged on the first driving component, and the movement of the first groove actuates the first protrusion so as to drive the indicating rod to move.

**[0024]** The second indicating rod joint part is a second protrusion which is engaged with a second groove arranged on the second driving component, and the movement of the second groove actuates the second protrusion so as to drive the indicating rod to move.

**[0025]** According to the above aspects of the present disclosure, the indicating device further comprises a reset spring.

**[0026]** One end of the reset spring is installed on a housing of the dual-power automatic transfer switch.

**[0027]** The other end of the reset spring acts on the indicating rod, and the reset spring exerts its elastic force on the indicating rod in the direction of switching on the first power supply.

**[0028]** For example, the first driving component connected to the moving contact of the first power supply directly drives the indicating rod to move to the right to switch on, but the indicating rod does not move to the rightmost end because the switch-on is not in place, and the electrical indicating device may not be completely released (the indicating rod pressing plate still presses the first micro switch), resulting in the switch off signal of the first power supply still being indicated. At this time, due to the existence of the rest spring, the indicator rod is returned to a position where the first power supply is switched on (the indicating rod pressing plate will not press the first micro switch, that is, the first micro switch is completely in the pressing plate opening).

**[0029]** According to the above aspects of the present disclosure, the indicating rod matching part is a U-shaped groove.

**[0030]** The first driving component and the second driving component are respectively engaged with the first protrusion and the second protrusion in the U-shaped groove.

**[0031]** According to the above aspects of the present disclosure, the first micro switch and the second micro switch are stacked on top of each other.

**[0032]** The pressing plate openings are arranged to be staggered along the moving direction of the indicating rod and respectively correspond to the first micro switch and the second micro switch.

**[0033]** Based on the above disclosure, the rigid connection between the indicating device and the moving contact is realized, thus avoiding the situation of incorrect indication. In addition, by providing a double indication device with the mechanical indicating device and electrical indicating device, the situation of incorrect indication is avoided.

**[0034]** According to another aspect of the present dis-

closure, there is provided a dual-power automatic transfer switch, which is characterized in that the dual-power automatic transfer switch comprises the indicating device as described above.

**[0035]** So far, in order that the detailed description of this disclosure can be better understood and the contribution of this disclosure to the prior art can be better recognized, this disclosure has summarized the content of this disclosure quite broadly. Of course, embodiments of the present disclosure will be described below and will form the subject matter of the appended claims.

**[0036]** Likewise, those skilled in the art will recognize that the concepts on which this disclosure is based can be easily used as a basis for designing other structures, methods and systems for carrying out several purposes of this disclosure. Therefore, it is important that the appended claims should be considered to include such equivalent structures as long as they do not go beyond the spirit and scope of the present disclosure.

### Brief description of drawings

**[0037]** Those skilled in the art will have a better understanding of this disclosure through the following drawings, and the advantages of this disclosure can be more clearly reflected. The drawings described herein are only for illustrative purposes of selected embodiments, not all possible implementations and are not intended to limit the scope of the present disclosure.

Fig. 1 shows an assembled perspective view of a dual power automatic transfer switch including a housing and an indicating device according to the present disclosure;

Fig. 2 illustrates an exploded perspective view of a dual power automatic transfer switch including a housing and an indicating device according to the present disclosure;

Fig. 3 shows an exploded perspective view of an indicating device according to the present disclosure;

Fig. 4 shows that the indicating device according to the present disclosure does not correctly indicate the switching on due to the switch-on is not in place;

Fig. 5 shows that the indicating device according to the present disclosure correctly indicates switching on under the action of the reset spring;

Fig. 6 shows the indicating device according to the present disclosure in a position indicating that the first power supply is switched on;

Fig. 7 shows the indicating device according to the present disclosure in a position indicating that both

the first power supply and the second power supply are switched off;

Fig. 8 shows the indicating device according to the present disclosure in a position indicating that the second power supply is switched on.

### Detailed description

**[0038]** Embodiments according to the present disclosure will be described below with reference to the drawings.

**[0039]** Figs. 1 and 2 show an assembled perspective view and an exploded perspective view, respectively, of a dual-power automatic transfer switch including a housing and an indicating device, which includes a first driving component 1 connected to a first moving contact of a first power supply and a second driving component 2 connected to a second moving contact of a second power supply.

**[0040]** The indicating device comprises a mechanical indicating device 3 and an electrical indicating device 4 (see fig. 2), and an indicating part 5 acting on the mechanical indicating device 3 and the electrical indicating device 4.

**[0041]** The first driving component 1 and the second driving component 2 respectively drive the indicating part to move.

**[0042]** The movement of the indicating part 5 drives the mechanical indicating device 3 to move to a position for indicating the first power supply to switch on (as shown in fig. 6), a position for indicating the second power supply to switch on (as shown in fig. 8) and a position for indicating that both the first power supply and the second power supply are switched off (as shown in fig. 7).

**[0043]** The movement of the indicating part 5 correspondingly actuates the electrical indicating device 4 to indicate the switching on signal of the first power supply, the switching on signal of the second power supply and the switching off signal of the first power supply and the second power supply.

**[0044]** According to the above embodiment of the present disclosure, the indicating part 5 is an indicating rod 6.

**[0045]** A first end 6-1 of the indicating rod 6 is provided with an indicating rod groove 6-1-1.

**[0046]** A mechanical swinging rod 3-1 arranged on the mechanical indicating device 3 can slide in the indicating rod groove 6-1-1.

**[0047]** With the movement of the indicating rod 6, the indicating rod groove 6-1-1 actuates the mechanical swing rod 3-1, so that the mechanical indicating device 3 rotates around the rotation center provided on a housing 7 of the dual-power automatic transfer switch to the position indicating that the first power supply is switched on (as shown in fig. 6), the position indicating that the second power supply is switched on (as shown in fig. 8) and the position indicating that the first and second power

supply are all switched off (as shown in fig. 7)

**[0048]** According to the above embodiments of the present disclosure, an indicating rod pressing plate 6-2-1 (as shown by the hatching in figs. 4 to 5) is provided on the second end 6-2 of the indicating rod 6.

**[0049]** The indicating rod pressing plate 6-2-1 includes a pressing plate opening 6-2-1-1 (as shown in figs. 6 and 8).

**[0050]** The electric indicating device 4 includes a first micro switch 4-1 and a second micro switch 4-2 (as shown in fig. 3).

**[0051]** When the indicating rod pressing plate 6-2-1 presses the first micro switch 4-1 and the second micro switch 4-2 at the same time, both the first micro switch 4-1 and the second micro switch 4-2 provide switch off signals.

**[0052]** When the indicating rod pressing plate 6-2-1 presses the first micro switch 4-1 and the second micro switch 4-2 is located at the pressing plate opening 6-2-1-1, the first micro switch 4-1 provides a switching-off signal of the first power supply and the second micro switch 4-2 provides a switching-on signal of the second power supply.

**[0053]** When the indicating rod pressing plate 6-2-1 presses the second micro switch 4-2 and the first micro switch 4-1 is located at the pressure plate opening 6-2-1-1, the second micro switch 4-2 provides a switching-off signal of the second power supply and the first micro switch 4-1 provides a switch-on signal of the first power supply.

**[0054]** According to the above embodiments of the present disclosure, an indicating rod matching part 6-3 is provided between the first end 6-1 and the second end 6-2 of the indicating rod 6.

**[0055]** The indicating rod matching part 6-3 includes a first indicating rod joint part and a second indicating rod joint part.

**[0056]** The first indicating rod joint part engages with the first driving component 1 and the movement of the first driving component 1 actuates the first joint part to drive the indicating rod to move.

**[0057]** The second indicating rod joint part engages with the second driving component 2 and the movement of the second driving component 2 actuates the second joint part to drive the indicating rod to move.

**[0058]** According to the above embodiments of the present disclosure, the first indicating rod joint part is a first protrusion 6-3-1 (as shown in fig. 3), which is engaged with a first groove 1-1 provided on the first driving component 1 and the movement of the first groove 1-1 actuates the first protrusion 6-3-1 so as to drive the movement of the indicating rod 6.

**[0059]** The second indicating rod joint part is a second protrusion 6-3-2 (as shown in fig. 3), which is engaged with a second groove 2-1 provided on the second driving component 2 and the movement of the second groove 2-1 actuates the second protrusion 6-3-2 so as to drive the movement of the indicating rod 6.

**[0060]** According to the above embodiments of the present disclosure, the indicating device further includes a reset spring 8.

**[0061]** One end 8-1 of the reset spring 8 is mounted on the housing 7 of the dual-power automatic transfer switch.

**[0062]** The other end 8-2 of the reset spring 8 acts on the indicating rod 6, and the reset spring 8 exerts its elastic force on the indicating rod 6 in the direction of switching on the first power supply.

**[0063]** For example, as shown in fig. 4, when the moving contact of the first power supply is closed, the first driving component 1 connected to the moving contact of the first power supply directly drives the indicating rod 6 to move to the right for switching on, but the indicating rod 6 does not move to the rightmost end because the switch-on is not in place, and the electrical indicating device 4 may not be completely released (the indicating rod pressing plate 6-2-1 still partially presses the first micro switch 4-1, the indicating rod pressing plate 6-2-1 completely presses the second micro switch 4-2), resulting in the switch off signal of the first power supply still being indicated (the mechanical indicator 3 does not move to the position indicating the first power supply to switch on). At this time, due to the presence of the reset spring 8, the indicator rod 6 is returned to a position where the first power supply is fully switched on (the indicator rod pressing plate 6-2-1 will not press the first micro switch 4-1, that is, the first micro switch 4-1 is completely in the pressing plate opening 6-2-1-1, the first micro switch 4-1 provides the switching on signal of the first power supply, while the mechanical indicator 3 moves to a position indicating the first power supply is switched on.

**[0064]** According to the above embodiments of the present disclosure, the indicating rod matching part 6-3 is a U-shaped groove.

**[0065]** The first driving component 1 and the second driving component 2 are respectively engaged with the first protrusion 6-3-1 and the second protrusion 6-3-2 in the U-shaped groove.

**[0066]** According to the above embodiments of the present disclosure, the first micro switch 4-1 and the second micro switch 4-2 are stacked on top of each other.

**[0067]** The pressing plate openings 6-2-1-1 are arranged to be staggered along the moving direction of the indicating rod 6 and respectively corresponds to the first micro switch 4-1 and the second micro switch 4-2.

**[0068]** Fig. 6 shows the indicating device according to the present disclosure in a position indicating that the first power supply is switched on. Fig. 7 shows the indicating device according to the present disclosure in a position indicating that the first power supply and the second power supply are all switched off. Fig. 8 shows the indicating device according to the present disclosure in a position indicating that the second power supply is switched on.

**[0069]** Figs. 6 to 8 also show the movement of the indicating device.

**[0070]** In fig. 6, the first moving contact 9 corresponding to the first power supply is in the switching on position, while the second moving contact 10 corresponding to the second power supply is in the switching off position. At this time, the mechanical indicating device 3 is in the position of indicating the first power supply to switch on, while the first micro switch 4-1 of the electrical indicating device 4 is not pressed by the indicating rod pressure plate 6-2-1 but is located in the pressing plate opening 6-2-1-1. The second micro switch 4-2 is pressed by the indicating rod pressure plate 6-2-1, the first micro switch 4-1 provides the switching on signal of the first power supply, and the second micro switch 4-2 provides the switching off signal of the second power supply.

**[0071]** In the changing process from fig. 6 to fig. 7, the first moving contact 9 corresponding to the first power supply starts to move toward the opening position, and the movement of the first moving contact 9 drives the first driving component 1 to move, and then the movement of the first groove 1-1 drives the first protrusion 6-3-1 to drive the movement of the indicating rod 6. With the movement of the indicating rod 6, the indicating rod groove 6-1-1 actuates the mechanical swing rod 3-1, so that the mechanical indicating device 3 rotates around the rotation center provided on the housing 7 of the dual-power automatic transfer switch to a position indicating that both the first power supply and the second power supply are switched off (as shown in fig. 7). At the same time, the first micro switch 4-1 and the second micro switch 4-2 of the electrical indicating device 4 are both pressed by the indicating rod pressing plate 6-2-1, the first micro switch 4-1 provides the switching off signal of the first power supply, and the second micro switch 4-2 provides the switching off signal of the second power supply.

**[0072]** In the changing process from fig. 7 to fig. 8, the second moving contact 10 corresponding to the second power supply starts to move towards the closing position, and the movement of the second moving contact 10 drives the second driving component 2 to move, and then the movement of the second groove 2-1 actuates the second protrusion 6-3-2 to drive the movement of the indicating rod 6. With the movement of the indicating rod 6, the indicating rod groove 6-1-1 actuates the mechanical swing rod 3-1, so that the mechanical indicating device 3 rotates around the rotation center provided on the housing 7 of the dual-power automatic transfer switch to a position indicating that the second power supply is switched on (as shown in fig. 8). At the same time, the first micro switch 4-1 of the electrical indicating device 4 is pressed by the indicating rod pressing plate 6-2-1, while the second micro switch 4-2 is not pressed by the indicating rod pressing plate 6-2-1. The first micro switch 4-1 provides the switching off signal of the first power supply and the second micro switch 4-2 provides the switching on signal of the second power supply.

**[0073]** Based on the above disclosure, the rigid connection between the indicating device and the moving

contact is realized, thus avoiding the situation of incorrect indication. In addition, by setting the double indication devices with the mechanical indication device and the electrical indication device, the situation of incorrect indication is avoided.

**[0074]** According to another embodiment of the present disclosure, there is provided a dual power automatic transfer switch, which includes the indicating device as described above.

**[0075]** With reference to specific embodiments, although the utility model has been described in the specification and drawings, it should be understood that without departing from the scope of the utility model as defined in the claims, people in the technical field can make various changes and various equivalents can replace various elements. Furthermore, the combination and collocation of technical features, elements and/or functions among specific embodiments in this paper are clear, so according to these disclosures, those skilled in the art can appreciate that the technical features, elements and/or functions of an embodiment can be combined into another specific embodiment as appropriate, unless otherwise described above. In addition, according to the teaching of the utility model, many changes can be made to adapt to special situations or materials without departing from the essential scope of the utility model. Therefore, the utility model is not limited to the individual specific embodiments illustrated in the drawings and the specific embodiments described in the specification as the best mode contemplated for implementing the utility model at present, but the utility model is intended to include all the embodiments falling within the scope of the above specification and the appended claims.

## Claims

1. An indicating device of a dual-power automatic transfer switch, the dual-power automatic transfer switch comprises a first driving component connected to a first moving contact of a first power supply and a second driving component connected to a second moving contact of a second power supply, wherein, the indicating device comprises a mechanical indicating device and an electrical indicating device; and an indicating part acting on the mechanical indicating device and the electrical indicating device; the first driving component and the second driving component respectively drive the indicating part to move; the movement of the indicating part drives the mechanical indicating device to move to a position indicating where the first power supply is switched on, a position indicating where the second power supply is switched on and a position indicating where both the first power supply and the second power supply are switched off; the movement of the indicating part correspondingly actuates the electrical indicating device to indicate

a switch on signal of the first power supply, a switch on signal of the second power supply and a switch off signal of the first power supply and the second power supply.

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2. The indicating device of the dual-power automatic transfer switch according to claim 1, wherein, the indicating part is an indicating rod; a first end of the indicating rod is provided with an indicating rod groove; a mechanical swing rod arranged on the mechanical indicating device can slide in the indicating rod groove; with the movement of the indicating rod, the indicating rod groove actuates the mechanical swing rod, so that the mechanical indicating device rotates around a rotating center arranged on the housing of the dual-power automatic transfer switch to a position indicating that the first power supply is switched on, a position indicating that the second power supply is switched on and a position indicating that both the first power supply and the second power supply are switched off.

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3. The indicating device of the dual-power automatic transfer switch according to claim 2, wherein, a second end of the indicating rod is provided with an indicating rod pressing plate; the indicating rod pressing plate comprises a pressing plate opening; the electric indicating device comprises a first micro switch and a second micro switch; when the indicating rod pressing plate presses the first micro switch and the second micro switch simultaneously, both the first micro switch and the second micro switch provide a switch off signal; when the indicating rod pressing plate presses the first micro switch and the second micro switch is at the pressing plate opening, the first micro switch provides the switch off signal of the first power supply and the second micro switch provides the switch on signal of the second power supply; when the indicating rod pressing plate presses the second micro switch and the first micro switch is at the pressing plate opening, the second micro switch provides the switch off signal of the second power supply, and the first micro switch provides the switch on signal of the first power supply.

4. The indicating device of the dual-power automatic transfer switch according to claim 2 or 3, wherein, an indicating rod matching part is arranged between the first end and the second end of the indicating rod; the indicating rod matching part comprises a first indicating rod joint part and a second indicating rod joint part; the first indicating rod joint part engages with the first driving component, and the movement of the first

driving component actuates the first indicating rod joint part so as to drive the indicating rod to move; the second indicating rod joint part engages with the second driving component, and the movement of the second driving component actuates the second indicating rod joint part so as to drive the indicating rod to move. 5

5. The indicating device of the dual-power automatic transfer switch according to claim 4, wherein, 10  
 the first indicating rod joint part is a first protrusion which is engaged with a first groove arranged on the first driving component, and the movement of the first groove actuates the first protrusion so as to drive the indicating rod to move; 15  
 the second indicating rod joint part is a second protrusion which is engaged with a second groove arranged on the second driving component, and the movement of the second groove actuates the second protrusion so as to drive the indicating rod to move. 20
6. The indicating device of the dual-power automatic transfer switch according to claim 4, wherein, 25  
 the indicating device further comprises a reset spring;  
 one end of the reset spring is installed on the housing of the double-power automatic transfer switch;  
 the other end of the reset spring acts on the indicating rod, and the reset spring exerts its elastic force on the indicating rod in the direction of switching on the first power supply. 30
7. The indicating device of the dual-power automatic transfer switch according to claim 5, wherein, 35  
 the indicating rod matching part is a U-shaped groove;  
 the first driving component and the second driving component engages with the first protrusion and the second protrusion in the U-shaped groove respectively. 40
8. The indicating device of the dual-power automatic transfer switch according to claim 3, wherein, 45  
 the first micro switch and the second micro switch are stacked on top of each other;  
 the pressing plate openings are arranged to be staggered along the moving direction of the indicating rod and correspond to the first micro switch and the second micro switch respectively. 50
9. A dual-power automatic transfer switch, wherein, 55  
 the dual-power automatic transfer switch comprises an indicating device according to one of claims 1 to 8.

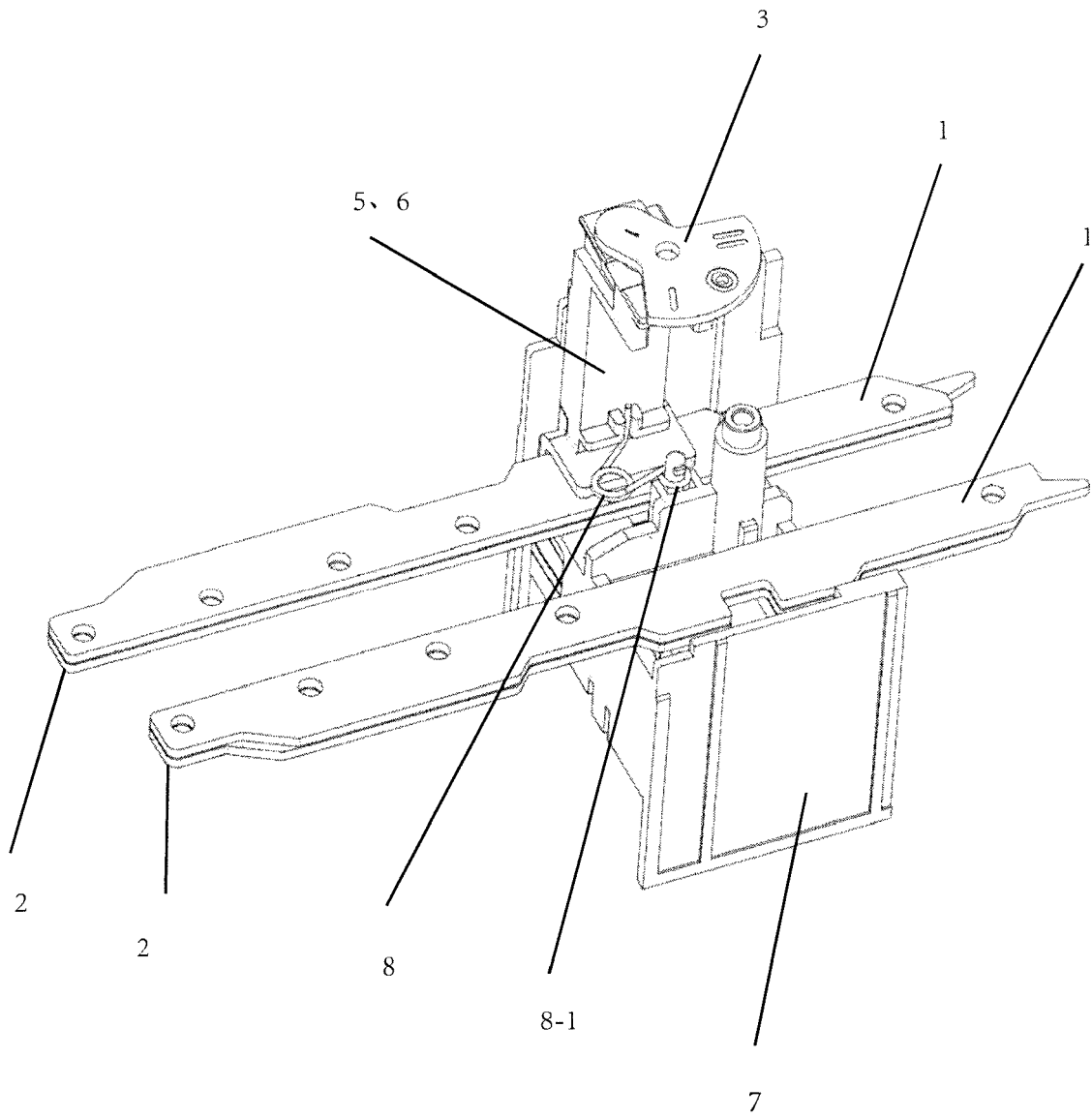


FIG. 1

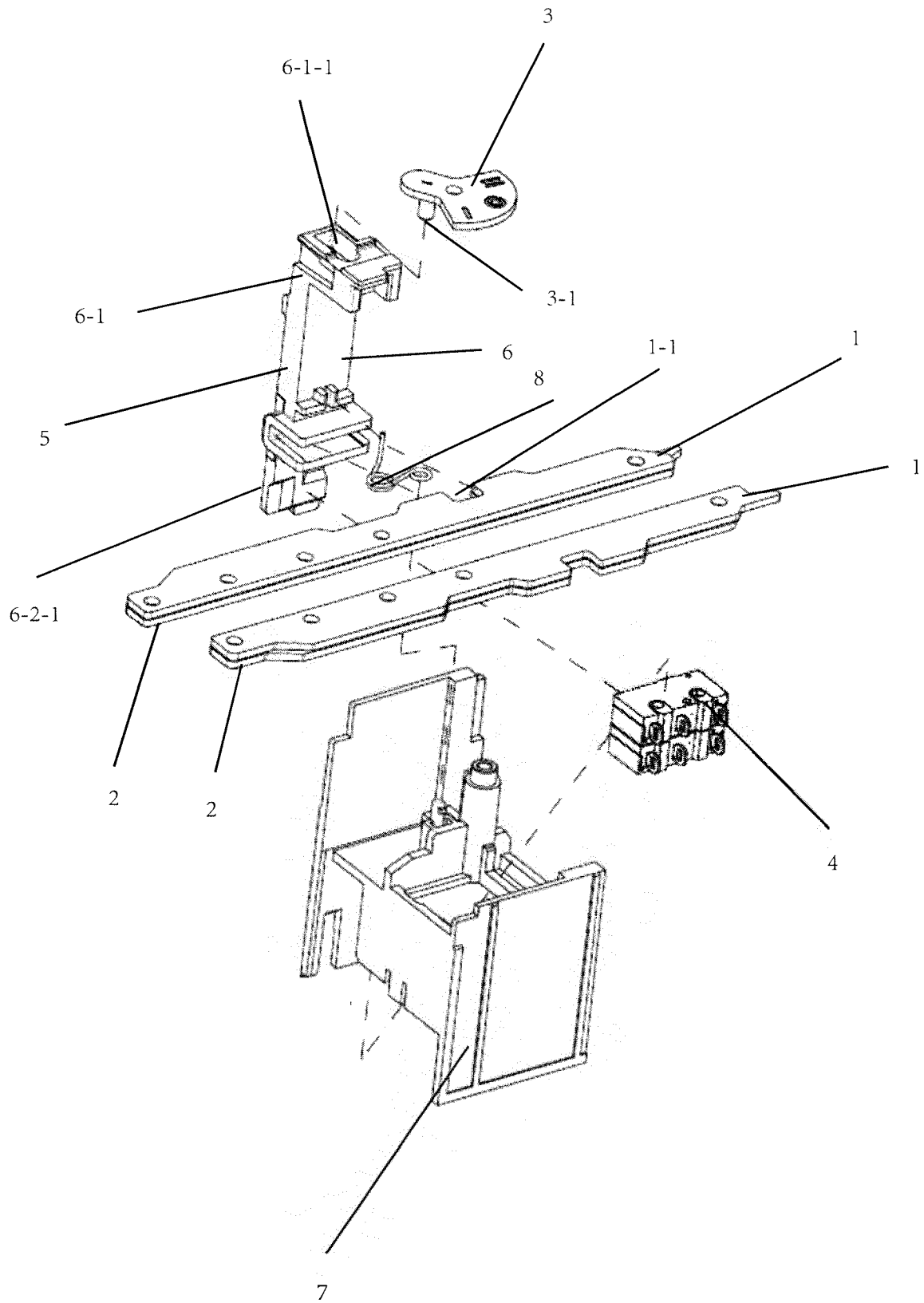


FIG. 2

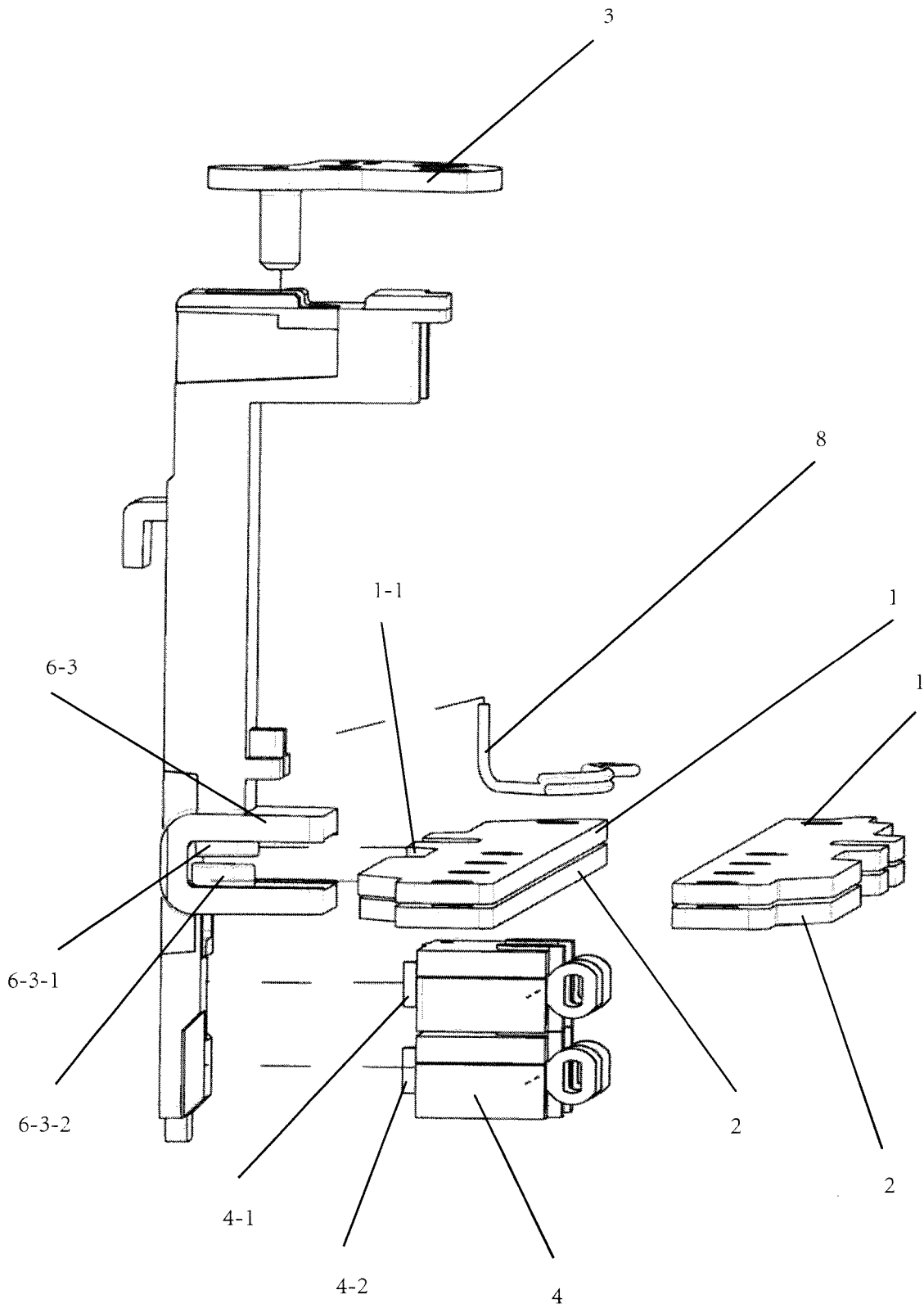


FIG. 3

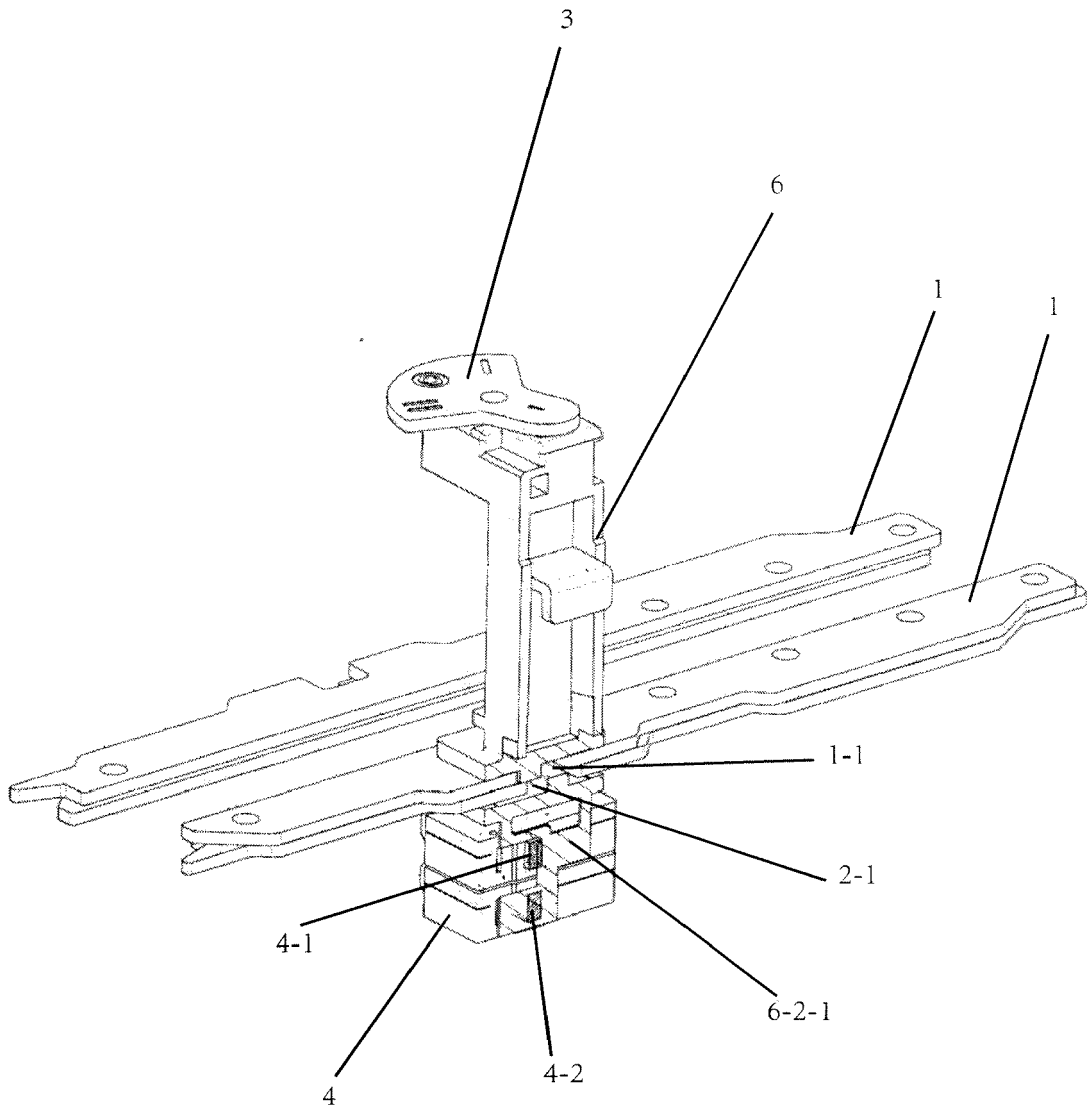


FIG. 4

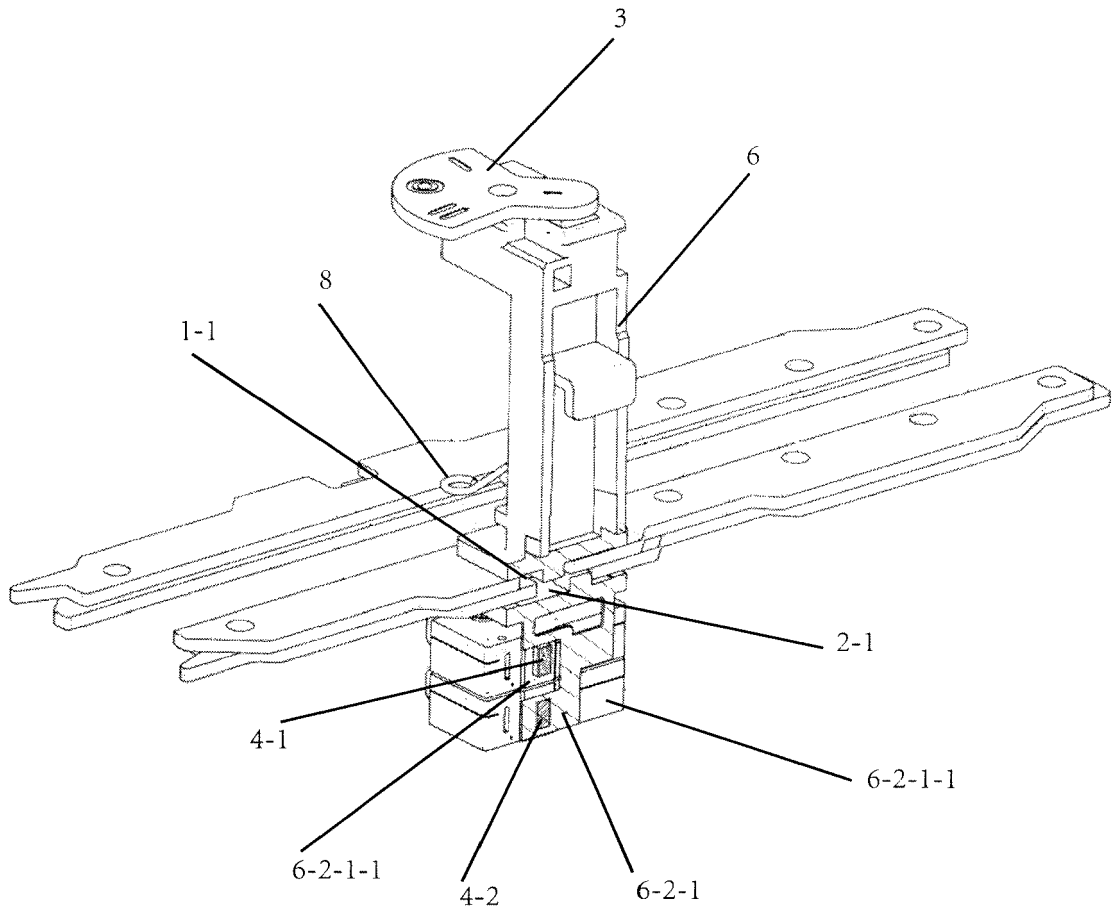


FIG. 5

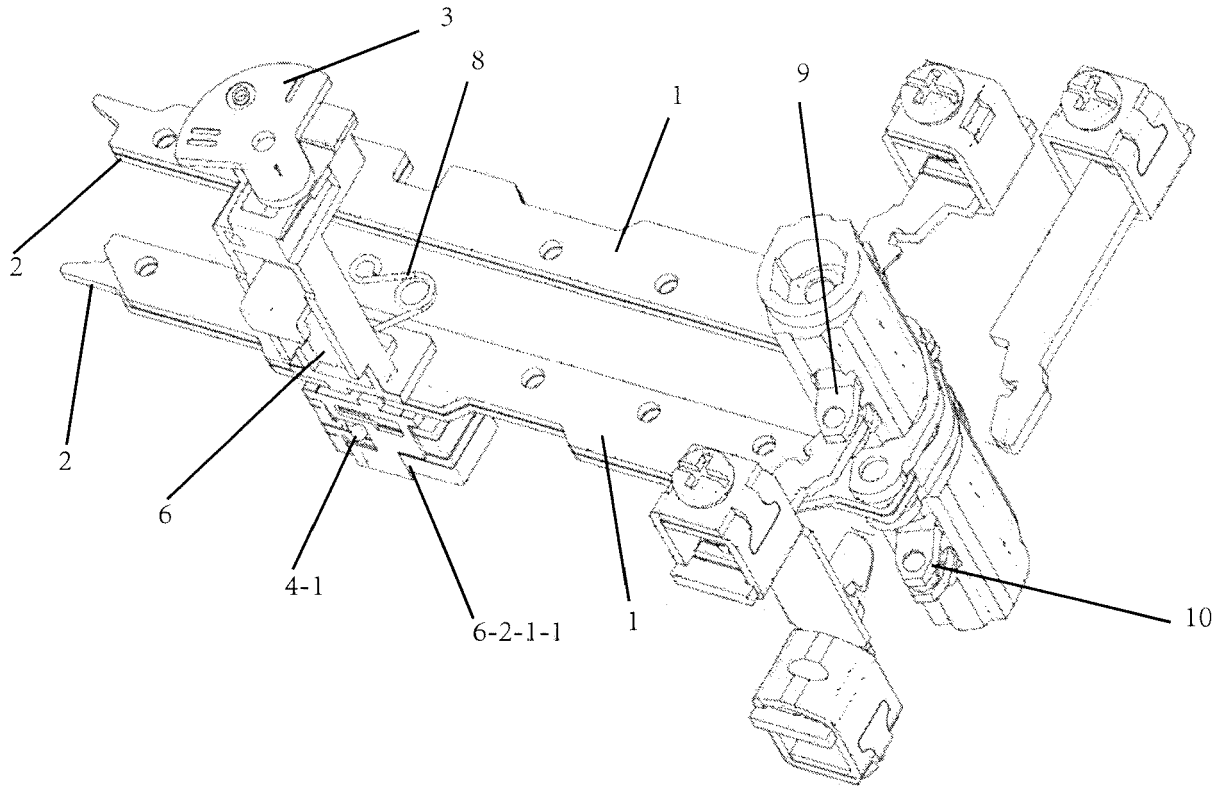


FIG 6

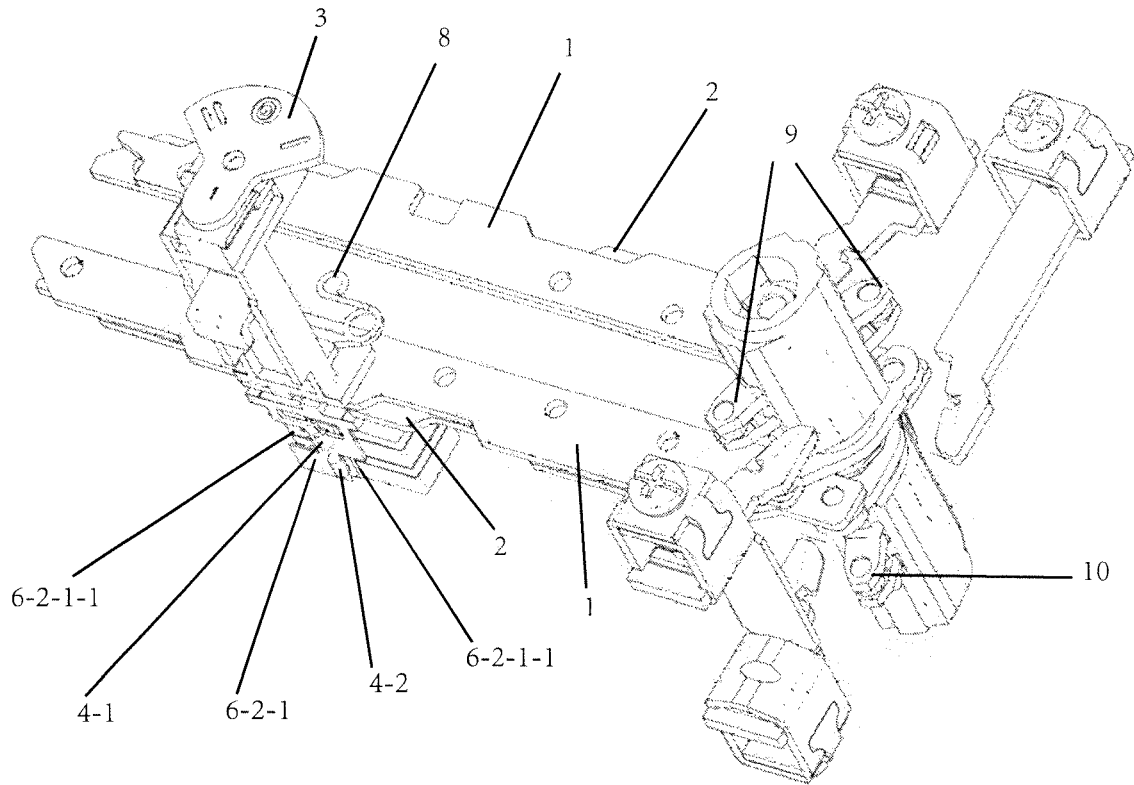


FIG. 7



EUROPEAN SEARCH REPORT

Application Number  
EP 20 30 6129

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y		9	
A		3-8	
Y	----- CN 208 142 045 U (SCHNEIDER ELECTRIC IND SAS) 23 November 2018 (2018-11-23) * figure 1 * -----	9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			H01H
Place of search		Date of completion of the search	Examiner
Munich		27 January 2021	Simonini, Stefano
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 30 6129

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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