

18055
copy

9606007-1

TITLE OF THE INVENTION

Suspension apparatus ✓

BACKGROUND OF THE INVENTION

1.FIELD OF THE INVENTION

The present invention relates to a suspension apparatus to be used for suspending a truck-type circuit breaker or the like when the circuit breaker is put on or take off from a truck of a switchboard frame.

2.DESRIPTION OF THE PRIOR ART

A conventional suspension apparatus, which is to be used for suspending a truck-type circuit breaker or the like, is described referring to FIGs. 6 and 7. FIG.6 is a perspective view for showing the truck-type circuit breaker or the like which is suspended by the conventional suspension apparatus. FIG.7 is a sectional side view showing a constitution of a hook part shown by VII-VII line in FIG.6.

As is obvious from the figures, a pair of hollows 2 are provided on both side face of a truck-type circuit breaker 1. As shown in FIG.7, each hollow 2 is overhanged toward the bottom of the circuit breaker. A pair of suspension adapters 3, which have substantially J-letter section, are respectively engaged with the hollows 2 from below. Each suspension adapter 3 has a hole 4, so that a rope or wire 5 is tied to the adapter 3 through the hole 4.

REPLACED SHEETS		SG
☒	Description : paged 1 to paged 7	
☒	Claim(s) : paged 8 to paged -	
☒	Drawing(s) : paged 1 to paged 7	
☒	Abstract : paged 9 to paged -	
DATE OF RECEIPT		-

For of suspending the circuit breaker 1 by the conventional suspension apparatus, when the circuit breaker 1 is once put on a truck of a switchboard frame or a floor, the rope or wire 5 is loosened, and thereby, the suspension adapters 3 are disengaged from the hollows 2 of the circuit breaker 1. Therefore, disengaged suspension adapters 3 is to be re-engaged with the hollows 2 for suspending the circuit breaker 1 again.

SUMMARY OF THE INVENTION

Purpose of the present invention is to solve the above-mentioned problems and to provide an improved suspension apparatus wherein the suspension adapters may not be disengaged from the hollows of the object to be suspended even when the rope or wire which is tied to the suspension adapters is loosened.

Suspension apparatus in accordance with the present invention comprises:

- a pair of first hollows respectively provided on both side faces of an object to be suspended;

- a pair of second hollows respectively provided on upper face of the object in the vicinity of both boundaries between a top face and the side faces of the object;

- a pair of suspension adapters each having a hook to be engaged with the first hollow provided at an end thereof and means for tying a rope or wire being tied in



the vicinity of the end; and

a pair of stoppers respectively provided on the suspension adapter for engaging with the second hollow.

When the suspension adapters are engaged with the first hollows of the object to be suspended, the stopper means such as hooks or plate springs are respectively engaged with the second hollows. Therefore, even when the rope or wire is loosened, the suspension adapters are firmly coupled to the object.

While the novel features of the invention are set forth particularly in the appended claims, the invention, both as to organization and content, will be better understood and appreciated, along with other objects and features thereof, from the following detailed description taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a perspective view showing a suspension of an object by using a first embodiment of a suspension apparatus in accordance with the present invention.

FIG.2 is a sectional side view showing a constitution of the first embodiment of the suspension apparatus.

FIG.3 is a front view of the first embodiment of the suspension apparatus.

FIG.4 is a perspective view showing a suspension of an object by using a second embodiment of a suspension



apparatus in accordance with the present invention.

FIG.5 is a sectional side view showing a constitution of the second embodiment of the suspension apparatus.

FIG.6 is the perspective view showing the suspension of the object by the conventional suspension apparatus.

FIG.7 is the sectional side view showing the constitution of the conventional suspension apparatus.

It will be recognized that some or all of the Figures are schematic representations for purposes of illustration and do not necessarily depict the actual relative sizes or locations of the elements shown.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A first preferred embodiment of a suspension apparatus in accordance with the present invention is described referring to FIGs. 1, 2 and 3. FIG.1 is a perspective view showing a suspension of an object by using the first embodiment of the suspension apparatus in accordance with the present invention. FIG.2 is a sectional side view showing a constitution of II-II section of the first embodiment of the suspension apparatus shown in FIG.1. FIG.3 is a front view of the first embodiment of the suspension apparatus which is seen from a direction shown by arrow III in FIG.2. Elements designated by the same numerals as those of the



conventional suspension apparatus are substantially the same.

As is obvious from FIG.1, a pair of first hollows 2 are provided on both side face 1a of a truck-type circuit breaker 1. As shown in FIG.2, each first hollow 2 is formed overhanging from a side face over the bottom of the circuit breaker. A pair of suspension adapters 3, which have substantially J-letter section, are respectively engaged with the hollows 2 from below. As shown in FIG.3, each suspension adapter 3 has a hole 4, so that a rope or wire 5 is tied to the adapter 3 through the hole 4. As is also obvious from FIG.1, a pair of second hollows 6 are provided on the upper face in the vicinity of the boundaries between the side faces 1a and a top face 1b of the circuit breaker 1. A stopper 7, which is substantially a hook lever, is rotatively held so as to cradle around a pivot 8 on each suspension adapter 3. The stopper 7 has a hook 7a which is to be engaged with the second hollow 6 of the circuit breaker 1. Furthermore, the stopper 7 has another hook 7c which is to be engaged with the suspension adapter 3 and a flat part 7b.

As shown in FIGs. 1, 2 and 3, when the suspension adapter 3 is engaged with the first hollow 2 and the hook 7a of the stopper 7 is also engaged with the second hollow 6 of the circuit breaker 1, the suspension adapter 3 is firmly coupled with the circuit breaker 1.



Therefore, even when the rope or wire 5 is loosened, the suspension adapter 3 is not detachable from the circuit breaker 1.

For detaching the suspension adapter 3 from the circuit breaker 1, the stopper 7 is manually rotated, for example, in counterclockwise direction in FIG.3, and thereby, the hook 7a is disengaged from the hollow 6 of the circuit breaker. The suspension adapter 3 is fallen by the gravity when the rope or wire 5 is loosened, similarly to the conventional suspension apparatus.

A second preferred embodiment of a suspension apparatus in accordance with the present invention is described referring to FIGs. 4 and 5. FIG.4 is a perspective view showing a suspension of an object by using the second embodiment of the suspension apparatus in accordance with the present invention. FIG.5 is a sectional side view showing a constitution of the second embodiment. Elements designated by the same numerals as that of the above-mentioned first embodiment of the suspension apparatus are substantially the same, and thereby, the explanation of them are omitted.

As shown in FIGs. 4 and 5, a stopper 9, which is made of an resilient material and has substantially L-letter shaped section, is provided on the suspension adapter 3 in a manner that a protrusion 9a of the stopper 9 is to be engaged with the second hollow 6 of the circuit



breaker 1.

As shown in FIG.5, when the suspension adapter 3 is engaged with the first hollow 2 and the protrusion 9a of the stopper 9 is also engaged with the second hollow 6 of the circuit breaker 1, the suspension adapter 3 is firmly coupled with the circuit breaker1. Therefore, even when the rope or wire 5 is loosened, the suspension adapter 3 is not detachable from the circuit breaker1. For detaching the suspension adapter 3 from the circuit breaker 1, the suspension adapter 3 with stopper 9 is forcibly rotated, for example, in clockwise direction in FIG.5, and thereby, the protrusion 9a of the stopper 9 is disengaged from the hollow 6 of the circuit breaker. The suspension adapter 3 falls by the gravity when the rope or wire 5 is loosened, similarly to the above-mentioned first embodiment.

Although the present invention has been described in terms of the presently preferred embodiments, it is to be understood that such disclosure is not to be interpreted as limiting. Various alterations and modifications will no doubt become apparent to those skilled in the art after having read the above disclosure. Accordingly, it is intended that the appended claims be interpreted as covering all alterations and modifications as fall within the true spirit and scope of the invention.





WHAT IS CLAIMED IS

1. A suspension apparatus comprising:
 - a pair of first hollows respectively provided on both side faces of an object to be suspended;
 - a pair of second hollows respectively provided on upper face of said object in the vicinity of both boundaries between a top face and said side faces of said object;
 - a pair of suspension adapters each having a hook to be engaged with said first hollow provided at an end thereof and means for tying a rope or wire in the vicinity of said end; and
 - a pair of stopper respectively provided on said suspension adapter and for engaging with the second hollow.
2. A suspension apparatus in accordance with claim 1, wherein
 - said stopper is a hook lever which is rotatively held on said suspension adapter and has a hook part to be engaged with said second hollow.
3. A suspension apparatus in accordance with claim 1, wherein
 - said stopper is made of resilient material and has substantially L-letter shape and has a protrusion in the vicinity of an end thereof in a manner to be engaged with said second hollow.

