

# **SAFETY PLUG WITH A FUSE**

## **Background of the Invention**

### **1. Field of the Invention**

The present invention relates to a safety plug. In particular, the present  
5 invention relates to a safety plug with a fuse.

### **2. Description of the Related Art**

Plugs are used to conduct electricity from the power source to electric  
appliances, machines, apparatuses, etc. Fire resulting from overload is not  
uncommon. Many countries have specification requirements as well as other  
10 requirements for the plugs for safety consideration. Some of the plugs have a  
fuse mounted therein. These plugs, which are known as safety plugs, are tubular  
in shape to allow easy replacement and installation of the fuse. Assembly of  
such a safety plug cannot be accomplished quickly, as the design of the safety  
plug is inappropriate. Further, the wires mounted in the safety plug might be  
15 disengaged from the associated blades due to oxidation, unreliable assembly, or  
loosening. The wires in the safety plug may come in contact with each other and  
thus result in a short circuit, leading to fire.

## **Summary of the Invention**

In accordance with the present invention, a safety plug includes a body, a  
20 cover removably mounted to the body, a fuse seat mounted to the body and  
housed by the cover, and a fuse mounted to the fuse seat. A neutral blade, a  
grounding blade, and a hot blade are mounted to the body.

Each of the neutral blade and the grounding blade has a screw hole on an  
end thereof. An end of a neutral wire of a cable is fixed and electrically  
25 connected to the neutral blade by a first clamping piece and a first screw

extending through the first clamping piece and the screw hole of the neutral blade.

An end of a grounding wire of the cable is fixed and electrically connected to the grounding blade by a second clamping piece and a second screw extending through the second clamping piece and the screw hole of the grounding blade.

- 5 The fuse seat is riveted and electrically connected to the hot blade. An engaging seat extends from a side of the fuse seat and includes a hole into which a hot wire of the cable extends, the engaging seat further includes a fixing hole that is in communication with the hole of the engaging seat and that extends in a direction transverse to the hole of the engaging seat, a screw is extended through the fixing
- 10 hole into the hole to retain the hot wire in place, providing electrical connection between the hot wire, the fuse, and the hot blade. The body includes a plurality of spacing walls located between the blades for preventing short circuit resulting from mutual contact between the wires. The cover includes a plurality of stops for preventing disengagement of the first screw and the second screw.

- 15 Preferably, the first clamping piece includes two ends extending across the neutral blade and respectively engaging with two opposite sides of the neutral blade for preventing rotation of the first clamping piece.

- Preferably, the second clamping piece includes two ends extending across the grounding blade and respectively engaging with two opposite sides of the
- 20 grounding blade for preventing rotation of the second clamping piece.

Other objectives, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

### **Brief Description of the Drawings**

Fig. 1 is a front perspective view of a safety plug with a fuse in accordance with the present invention, wherein a cover of the safety plug is removed.

5 Fig. 2 is a rear perspective view of the safety plug in accordance with the present invention, wherein the cover of the safety plug is removed.

Fig. 3 is an exploded perspective of the safety plug in accordance with the present invention.

Fig. 4 is a sectional view taken along plane A-A in Fig. 6.

10 Fig. 5 is a sectional view taken along plane B-B in Fig. 4.

Fig. 6 is a perspective view of the safety plug in accordance with the present invention.

### **Detailed Description of the Preferred Embodiment**

Referring to Figs. 1, 2, and 6, a safety plug 1 with a fuse in accordance with the present invention comprises a body 11, a cover 15, and a fuse 16. The  
15 body 11 includes at least one peg 111 having a screw hole. A neutral blade 12, a hot blade 13, and a grounding blade 14 are securely held by the body 11. Each of the neutral blade 12 and the grounding blade 14 includes a screw hole 121, 141 in an end thereof. An end of a neutral wire 22 of a cable 2 is fixed and  
20 electrically connected to the neutral blade 12 by a first clamping piece 123 and a first screw 122 extending through the first clamping piece 123 and the screw hole 121 of the neutral blade 12. Similarly, an end of a grounding wire 21 of the cable 2 is fixed and electrically connected to the grounding blade 14 by a second clamping piece 143 and a second screw 142 extending through the second  
25 clamping piece 143 and the screw hole 141 of the grounding blade 14. Thus, the neutral wire 22 and the grounding wire 21 of the cable 2 are electrically

connected to the neutral blade 12 and the grounding blade 14 respectively. Each clamping piece 123, 143 includes two ends 124, 144 (see Figs. 3 through 5) extending across the associated blade 12, 14 and respectively engaging with two opposite sides of the associated blade 12, 14 to reliably retain the associated wire 21, 22 in place and to prevent rotation of the clamping piece 123, 143.

A fuse seat 17 is mounted on the body 11 and includes a first section 171 and a second section 172. A side of the first section 171 is riveted to the hot blade 13. Thus, the fuse seat 17 is electrically connected to the hot blade 13. An engaging seat 18 extends from a side of the second section 172 and includes a hole 181 and a fixing hole 182 that is in communication with the hole 181 and that extends in a direction transverse to the hole 181. A hot wire 23 of the cable 2 is extended into the hole 181. A screw 183 is extended through the fixing hole 182 into the hole 181 to retain the hot wire 23 in place. Thus, the hot wire 23, the fuse 16, and the hot blade 13 are electrically connected to one another.

A plurality of spacing walls 115 are mounted on the body 11 and located between the blades 12, 13, and 14. In a case that any one of the wires 21, 22, and 23 of the cable 2 are disengaged from the associated blades 12, 13, and 14 due to oxidation, unreliable assembly, or loosening, short circuit resulting from mutual contact of the wires 21, 22, and 23 is avoided by the spacing walls 115. The spacing walls 115 also prevent mutual contact of naked portions of the wires 21, 22, and 23.

The cover 15 includes at least one mounting hole 151 aligned with the screw hole of the peg 111 of the body 11, allowing the cover 15 to be removably mounted to the body 11. The cover 15 further includes a plurality of stops 152. When the cover 15 is mounted to the body 11, the stops 152 are spaced from the screws 122 and 142 by an appropriate distance and prevent loosening of the

screws 122 and 142. Namely, movement of the screws 122 and 142 in the loosening direction is stopped when the screws 122 and 142 come into contact with the stops 152. Short circuit resulting from rolling of the screws 122 and 142 in the body 11 is avoided.

5           The body 11 further includes a half casing 116 extending from a side thereof, and the cover 15 includes a half casing 153 extending from a side thereof. The half casings 116 and 153 together define a passageway through which the cable 2 extends. Mounting of the cable 2 is thus convenient. Damage to the sheath of the cable 2 and short circuit resulting therefrom are prevented.

10           Further, the body 11 may include a seat 113 for guiding the cable 2, and a positioning member 112 with screw holes (not labeled) may be fixed by screws 14 to the seat 113 for securely retaining the cable 2.

          Although a specific embodiment has been illustrated and described, numerous modifications and variations are still possible without departing from  
15   the essence of the invention. The scope of the invention is limited by the accompanying claims.

**Claims:**

1. A safety plug comprising:
  - a body (11);
  - a cover (15) removably mounted to the body (11);
  - 5 a fuse seat (17) mounted to the body and housed by the cover;
  - a fuse (16) mounted to the fuse seat; and
  - a neutral blade (12), a grounding blade (14), and a hot blade (13) mounted to the body (11), characterized in that:
    - each of the neutral blade (12) and the grounding blade (14) has a screw
    - 10 hole (121, 141) on an end thereof;
    - an end of a neutral wire (22) of a cable (2) is fixed and electrically connected to the neutral blade (12) by a first clamping piece (123) and a first screw (122) extending through the first clamping piece (123) and the screw hole (121) of the neutral blade (12);
    - 15 an end of a grounding wire (21) of the cable (2) is fixed and electrically connected to the grounding blade (14) by a second clamping piece (143) and a second screw (142) extending through the second clamping piece (143) and the screw hole (141) of the grounding blade (14);
    - the fuse seat (17) is riveted and electrically connected to the hot blade
    - 20 (13);
    - an engaging seat (18) extends from a side of the fuse seat (17) and includes a hole (181) into which a hot wire (23) of the cable (2) extends, the engaging seat (18) further includes a fixing hole (182) that is in communication with the hole (181) of the engaging seat and that extends in a direction transverse
    - 25 to the hole (181) of the engaging seat, a screw (183) is extended through the fixing hole (182) into the hole (181) to retain the hot wire (23) in place, providing

electrical connection between the hot wire (23), the fuse (16), and the hot blade (13);

the body (11) includes a plurality of spacing walls (115) located between the blades (12, 13, and 14) for preventing short circuit resulting from mutual  
5 contact between the wires (21, 22, and 23); and

the cover (15) includes a plurality of stops (152) for preventing disengagement of the first screw (122) and the second screw (142).

2. The safety plug as claimed in claim 1 wherein the first clamping piece (123) includes two ends (124) extending across the neutral blade (12) and  
10 respectively engaging with two opposite sides of the neutral blade (12) for preventing rotation of the first clamping piece (123).

3. The safety plug as claimed in claim 1 wherein the second clamping piece (143) includes two ends (144) extending across the grounding blade (14) and respectively engaging with the grounding blade (14) for preventing rotation  
15 of the second clamping piece (143).

4. The safety plug substantially as hereinbefore described with reference to and as shown in the accompanying drawings.