

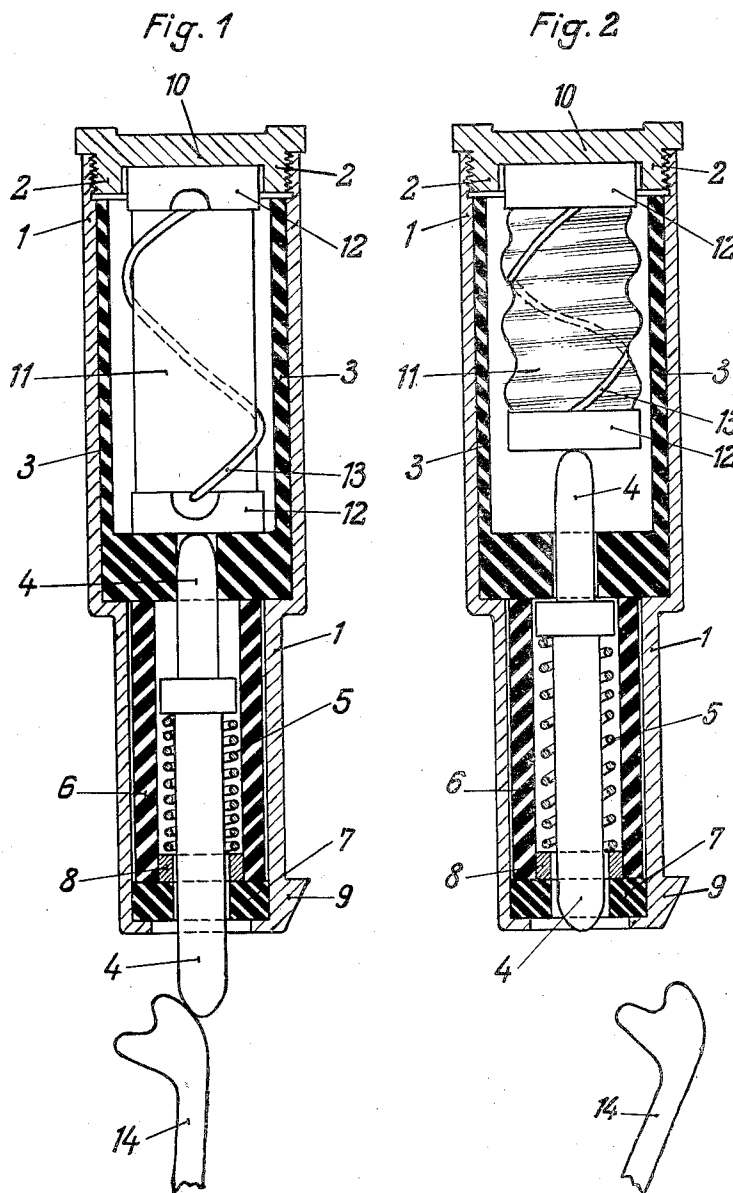
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ELECTRICAL SAFETY PLUG

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ELECTRICAL SAFETY PLUG

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1 Claim. (Cl. 200—122)

The present invention relates to electrical safety plugs. A disadvantage of the safety devices hitherto known is the fact that the time of their working is between twenty (20) to forty (40) seconds. This time is considered to be too long. By such long release times much damage may be caused by the forming of arcs. Other disadvantages are for instance in telephone exchanges that a soft soldering metal is used, such as Wood's metal, for retaining the release pin. Thereby a resoldering becomes possible after the release operation which will greatly reduce the reliability of the safety device.

Since in the known heat wire safety devices the winding of heating wire wound around a metal sleeve must be an insulated wire also a loss of heat is caused until the heat softens and melts the solder. This counts for the long time of the releasing.

According to the present invention an exchangeable plug is used, made of a material which will be softened by heat and become compressible. Such a material is cellulose and especially a nitrated cellulose melted with camphor and the like. Said body may be directly surrounded with a winding of naked metal wire which will prevent loss of heat. The release time may be predetermined by using narrow or wide winding, thick or thin wire and stronger or weaker walls of the hollow deforming body. By tests release times of six (6) to seven (7) seconds have been obtained, while the commonly used safety devices require from twenty (20) to forty (40) seconds for the releasing. If a deforming plug has become deformed it can easily be replaced by a new one, which will afford absolute security. Since only said body has to be replaced, while the casing remains intact, a great economy is realized for such safety devices.

A working example of the novel safety device is represented in the accompanying drawing by vertical sections in the Fig. 1 the position at the normal amperage of the current, and in the Fig. 2 in the deformed state when the circuit has been broken by an excess of amperage.

The casing 1 may be made of metal. It is provided at its top with threads or a bayonet joint 2 and has an insulating sleeve 3 pressed into its hollow inside. In a bottom portion of the casing there are arranged a release pin 4, a spiral spring

5, an insulating sleeve 6, an insulating washer 7 and a bottom metal washer 8. A cam 9 of the casing serves as locking means of the device in the ordinary well known holder.

The cover 10 may also be made of metal and be provided with threads or a bayonet joint. It has to maintain the position of the safety plug 11. This cover may have any form which will allow that the safety plug be changed. To this end the height of the threaded portion might be increased for a sixteenth of an inch and the outer recessed center portion of the cover 10 could be painted. An inner central recess serves as a guide for the safety plug. This plug 11 is made of a deformable body provided at its top and bottom with a metal cap 12. A wire 13 of iron, steel, nickel, nickeline or other suitable metal is wound about this deformable body and is attached to one of the caps and wound tightly round the body and attached to the other cap. The safety plug 11 and the cover may be prepared in different sizes, each size differing in length for about a sixteenth of an inch. Each of these different plugs will receive a differently colored deforming body 11 which will agree with the color given to the cover 10.

The deformable body 11 consists of a material which will soften by heat and be deformed by pressure under the effect of a current which exceeds the normal amperage of the current. Such a material is for instance cellulose and especially nitrated cellulose melted with camphor and the like. These plugs remain hard and stiff under the effect of the heat produced in the wire 13 by the normal amperage but under the effect of a current of an increased amperage these plugs will soften and be shortened by compression due to the spring 5 working the pin 4, as is represented in the Fig. 2. By this deformation these plugs will cause the operating of interrupting switches. The body 11 may be a hollow sleeve or tube.

The body 11 is the main member of the safety device and may be changed easily at any time and without using special tools. The insulating sleeve 3 insulates the plug 11 and the release pin 4 from the casing 1. It is also a guide for the pin 4.

This pin may be of brass. It is guided in the bottom of the insulating sleeve 3 and in the washer 7. This guiding prevents any deviation

of the pin when the safety device is burned and the casing has become empty.

5 The spring 5 of spring steel is intended to press the pin 4 upwards. The sleeve 6 may be for instance of oily cardboard or ebonite and will insulate the spring 5 from the washer 8 from the casing.

10 The insulating washer 7 of an artificial resin preparation insulates the release pin 4 and the washer 8 from the casing 1. The sleeve 8 of brass serves as a solid rest for the spring 5.

The operating of the safety device is as follows:

15 The safety device is combined with a well known switch with interrupter. The release pin 4 locks the spring pawl 14 in the position of Fig. 1. The current passes from the pawl 14 through pin 4, the lower cap 12, the safety plug 11 and the safety wire 13, the upper cap 12, 20 the cover 10, the casing 1 and the well known holder of the device and further on.

25 If the amperage of the current increases, the safety wire 13 will be heated. This heating will soften the body 11 and the pressure of the spring 5 will compress the body 11 so that it will assume the shape shown in Fig. 2. Then the spring 5 will push the release pin 4 upwards and will disengage it from the pawl 14, which will work a switch and interrupt the circuit.

By changing the safety plug 11 and engaging the pawl 14 into the pin 4, the safety device will be put again into operating condition.

What I claim as new:

5 In an electrical safety plug especially for telephone exchanges the combination, a metallic casing having an upper and a lower chamber and a cover fastened removably to the upper chamber, two insulating sleeves, one sleeve forming an inner lining of the side walls of the upper 10 chamber and a partition wall separating the lower chamber from the upper and the other sleeve forming an inner lining of the lower chamber and held with an annular insulating washer between said partition wall and an inner pro- 15 jecting run of the casing, a plug comprising a cylindrical body made of a matter easily deformable by heat and held between two metal caps by means of a helically wound heating wire said plug filling the whole length of the upper 20 chamber, a contact pin projecting with one end through said washer to the outside of the casing and with the other end through a hole in said partition wall to bear against the respective metal cap of the plug and a helical compression spring held in a compressed state between 25 said washer and a shoulder of the pin to exert a pressure upon the plug.

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