July 13, 1937. A. FINKELSTEIN 2,086,861

ELECTRICAL DEVICE AND FUSE THEREFOR

Filed July 24, 1934

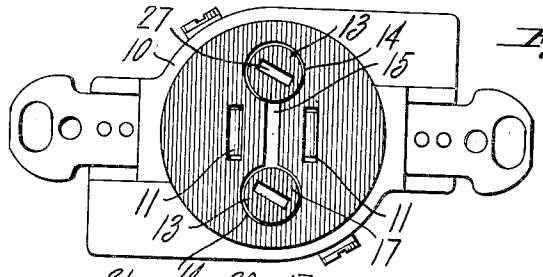


Fig. 1.

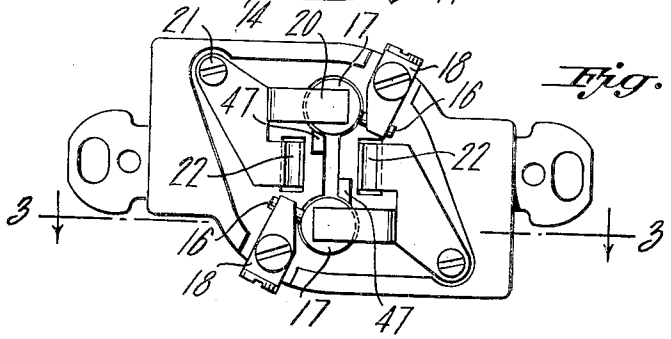


Fig. 2.

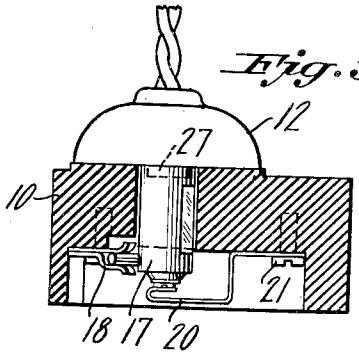


Fig. 3.

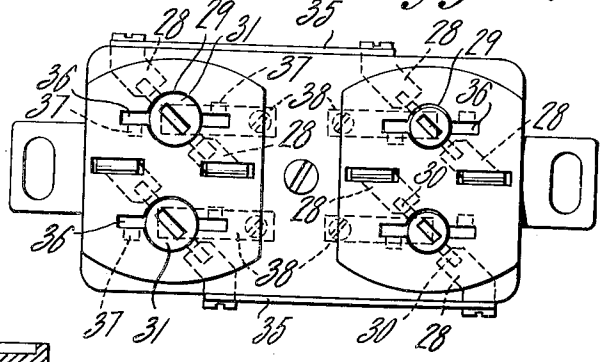


Fig. 4.

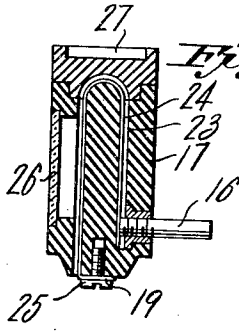


Fig. 6.

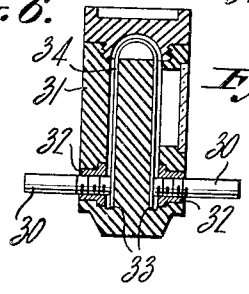


Fig. 7.

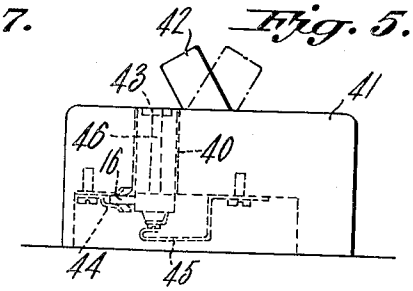


Fig. 5.

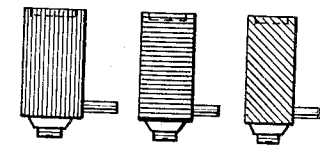


Fig. 8.

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ELECTRICAL DEVICE AND FUSE THEREFOR

Alex Finkelstein, Brooklyn, N. Y.

Application July 24, 1934, Serial No. 736,652

12 Claims. (Cl. 200—129)

My invention relates to electrical devices, and more particularly to such devices as plug receptacles and switches, etc., and to fuses for protecting devices of this nature and the appliances and wiring connected thereto, one of my objects being to provide better protection for various electrical apparatus and wiring systems than has heretofore been the practice.

Prior to my invention many types of apparatus and wiring systems have been installed with fuses of relatively large current carrying capacity, for instance, several pieces of apparatus have been connected to a branch line fed from the main through a fuse cut-out box containing fuses of sufficiently large capacity to maintain the circuit for the combined pieces of apparatus in use. Under these conditions no single piece of apparatus or appliance is properly protected since a fuse of an adequate capacity to protect all is too large to properly protect a fractional portion of the entire apparatus or other wiring on the line, resulting in destruction thereof requiring costly repairs, and danger of fire. This is especially true with reference to lamp and appliance cords which become frayed and broken and subject to short circuit.

To overcome the foregoing disadvantages I provide outlets and receptacles and other devices with individual fuses of a current carrying capacity properly designed to protect the apparatus and wiring or appliances individually, so that in case of short circuits or other need for opening the circuit in time to prevent the hazard of fire, or the destruction of the wiring or appliances connected thereto, the circuit will be opened with respect to the individual apparatus on the line without affecting other circuits leading from the main fuse box.

Another feature of my invention is the provision of fuses of various sizes and/or colors representing definite capacities for use with the different receptacles or other sub-feeding devices, whereby the proper fuse for use in any particular circuit is readily found, and without mistake, by simply selecting the proper size and/or color corresponding to the size of fuse socket or the color of the receptacle or other device with which the fuse is adapted to be used.

Another feature is the provision of a fuse plug and a receptacle or outlet wherein the fuse is so positioned in the body of devices of this kind that the fuse plug cannot be either inserted or removed until the attachment cap is removed from the outlet. I also incorporate this feature in the combination of a fuse plug and a switch, for instance of the toggle type, wherein the switch must be turned to off position before it is possible to insert or remove the fuse plug.

Various other features and advantages of my invention will appear as the description proceeds.

Reference is directed to the accompanying drawing which is illustrative of practical embodiments of my invention, and in which:

Fig. 1 is a top plan view of a receptacle or outlet disclosing my invention in one of its forms;

Fig. 2 is a bottom view of the receptacle shown in Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a duplex outlet illustrating a modification;

Fig. 5 shows the application of my invention to a switch;

Fig. 6 is a cross sectional view of a fuse plug suitable for use with the outlet shown in Fig. 1;

Fig. 7 is a similar cross section of a fuse plug for use with the outlet shown in Fig. 4;

Fig. 8 represents the provision of fuse plugs of various sizes and/or colors corresponding to different ampere carrying capacities.

In the drawing the numeral 10 represents the body of a receptacle or outlet which may be installed in any wiring system as desired. This outlet is provided with any suitable contact slots such as those shown at 11 for reception of the blades or fingers of a cord attachment cap 12. I provide fuse plugs directly in such an outlet, as shown at 13, and a pair of sockets 14 for the plugs. The sockets may be molded or provided in any other appropriate way in the body 10 at opposite sides of the contact slots 11. A slot 15 is adapted to receive the radial projection or pin 16 of a fuse plug 17 such as that illustrated in Fig. 6, the plug being arranged to be inserted into the socket 14 so that the pin 16 will ride through the slot and prevent rotation of the body of the fuse during insertion of the plug to the bottom of the socket. The fuse plug 17 is then partially rotated as will be seen from Fig. 2 to engage the pin 16 between the resilient jaws of a contact piece 18 and to bring a base contact 19 of the plug into electrical engagement with a spring contact piece 20 fastened at 21 to the body of the receptacle 10. The contact pieces 20 carry spring contacts 22 extending into the slots 11 to make electrical connection in the well known manner with the parallel blades of a cord attachment cap. The two fuse plugs thus provide protection in both sides of the line.

I have illustrated in Fig. 6 a plug construction suitable for the above purpose. It consists of a

body of insulating material containing an interior channel 23 and a fuse element 24 electrically connected at its opposite ends respectively to the pin 16 and the screw 25 forming the second contact 19. A window for the usual purpose may be provided at 26. For rotating the plugs 17 to bring their projections or pins 16 into connection between the jaws of the contact pieces 18 so that the circuit will be completed through the fuse elements and the contacts 18 and 22, I provide a slot or other suitable means in the outer end of the fuse plug as shown at 27 for receiving a turning implement such as a screw driver or other appropriate turning means. The contact piece 20 is preferably of a resilient nature such as spring metal, so that it will force the plug outwardly through the socket when the plug has been rotated to disconnect the pin 16 from the contact 18 and the pin brought to position to enter the slot 15, the force of the spring being sufficient to move the plug so that it may then be readily grasped and withdrawn by the hand.

In Fig. 3, I have shown the position occupied by a cord attachment cap 12 when in operative position in the outlet 10. It will be noted that the plug 17 is covered and cannot be removed or inserted in the socket 14 until the cap 12 has been removed. Among other advantages this is an important safety feature in that it prevents closing of a circuit on the contacts before they have been fully made, thereby preventing arcing at these points with consequent destruction of the metal contact pieces.

Fig. 4 shows a somewhat modified form of the invention, in the respect that the contacts indicated in dotted lines at 28 are concealed from view through the socket 29, and are therefore not readily accessible for tampering. In this form of outlet a plug such as that shown in Fig. 7 is suitable. This plug has a pair of radial projections or pins 30 held in a body 31 of insulating material by suitable threaded bushings molded in the body 31 and into which the pins 30 are threaded to bear against the opposite ends 33 of a fuse element 34. It is clear that when the plugs 31 are inserted in the sockets 29 and rotated to bring the pins 30 into engagement with the contacts 28, circuits are completed through the plug elements 34 to the straps 35 of the duplex outlet. In order to prevent the plugs from being turned too far in the off direction, and to insure alignment of the pins 30 with the oppositely disposed slots 36, there is provided a pair of stops 37, and in Fig. 2 at 47, adjacent the sides of each of the slots. Furthermore, a spring is provided beneath each of the plugs 31 for the purpose of forcing the plugs outwardly from the sockets as explained in connection with Figs. 1, 2, and 3.

In applying my invention to switches I provide a socket 40 in the body 41 of the switch and located in a position such that when the switch arm 42 is thrown to the on position indicated in full lines in Fig. 5 the fuse plug 43 cannot be removed. This fuse may be of the type shown in Fig. 6 wherein the pin 16 forms a connection with the jaws 44 of a contact, and the end or base of the plug effects a connection with a spring contact 45 which will also force plug outwardly when turned to release the pin 16 from the contact 44 and the pin entered in the slot 46. The same principle also applies to the socket and plug connection shown in Figs. 4 and 7 when applied to the switch.

In order to insure that plugs of the proper current carrying capacity will be used with a particular outlet or other appliance, I provide such plugs in different colors and/or sizes (see Fig. 8) corresponding to the color of the outlet and/or the size of the socket with which the plug is to be used, each color and/or size plug representing a different ampere carrying capacity. With this arrangement it is necessary only to note the color of the outlet and/or the size of its socket in order to determine the proper fuse for use therewith.

In conclusion it is to be understood that the various features illustrated and described above may be incorporated in other ways within the scope of my invention, including numerous modifications of the fuse plugs, and the plug outlets used therewith, either single or multiple, and to various combinations of switches and plug outlets or other similar devices.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In an electrical device the combination of a member having a socket and electrical contacts only at the bottom of said socket, and a fuse plug provided with contacts adjacent its base, said fuse plug being adapted to be partially rotated to bring its contacts into electrical connection with the contacts at the bottom of the socket, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

2. In an electrical device the combination of a member having a socket and electrical contacts only at the bottom of the socket, and a fuse plug provided with contacts adjacent its base, said fuse plug being adapted to be partially rotated to bring its contacts into electrical connection with the contacts of said socket and being provided with means at its outer end for receiving an implement for turning said plug to on and off positions with respect to said contacts, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

3. In an electrical device the combination of a member having a socket and electrical contacts associated with the bottom of said socket, and a fuse plug provided with contacts adjacent its base, said fuse plug being adapted to be partially rotated to bring its contacts into electrical connection with the socket contacts to complete a circuit through the fuse, said socket being provided with means for forcing said plug outwardly from the socket when the plug is turned to a noncontacting position, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

4. In an electrical device the combination of a member having a socket and electrical contacts associated with the bottom thereof and contact slots for receiving the fingers of a cord attachment cap, and a fuse plug provided with contacts adjacent its base for completing a circuit through the fuse, said fuse plug and socket being located in a position such that they are covered by the attachment cap when the latter is in position with its fingers in electrical engagement with said contact slots, the contacts of said socket and said fuse plug being adapted to be brought into electrical connection or disconnection only after the attachment cap has been removed.

5. In an electrical device the combination of a member having a socket and electrical contacts only at the bottom of said socket, and a fuse plug provided with contacts at its base for completing a circuit through the fuse, said fuse plug

provided with a radial projection adjacent its base, said socket having a slot for receiving said projection when the plug is inserted in the socket for preventing rotation of said plug during such insertion, said plug being adapted to be partially rotated when the projection thereon has cleared the slot adjacent the bottom of the socket, whereby the contacts of said fuse plug and said socket are brought into electrical connection, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

6. In an electrical device the combination of a member having a socket and electrical contacts only at the bottom of said socket, a fuse plug provided with contacts at its base for completing a circuit through the fuse, said fuse plug being substantially cylindrical in form and carrying a radial projection adjacent its base, said socket having a slot for clearing the said projection and preventing rotation of the plug during its insertion into the socket, said plug being adapted to be partially rotated to bring its contacts into electrical connection with the contacts of the socket when the plug has been fully inserted to bring the projection clear of the slot, and resilient means associated with said socket for forcing said fuse plug outwardly from the socket upon rotating the plug to place said projection in alignment with said slot, said projection comprising a contact, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

7. In an electrical device the combination of a member having a socket and electrical contacts only at the bottom of said socket, a fuse plug provided with contacts at its base for completing a circuit through said fuse, said fuse plug being substantially cylindrical and provided with a radial projection adjacent its base, said socket having a slot for receiving said projection and effective to prevent turning of the plug until the same has been fully inserted in the socket, said slot being adapted to thereafter clear said projection whereby the plug may be rotated to electrically connect its contacts with those of the socket, one of said socket contacts being effective to force the fuse plug outwardly through the socket upon rotating the plug to position to enter the projection in the slot, said projection constituting one of the fuse contacts, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

8. In combination, an attachment plug receptacle having a socket and electrical contacts associated therewith, and a fuse plug adapted to be received in said socket and provided with contacts for connection with the socket contacts, said receptacle also being provided with contacts for making connections with the blades of a cord attachment cap, the socket and the fuse plug being located in such position with reference to the plugged in attachment cap that said fuse plug cannot be inserted in or removed from the socket until the attachment cap has been removed from the receptacle.

9. In an electrical device the combination of a member having a socket and electrical contacts adjacent the bottom of the socket, a fuse plug provided with contacts at its base and connected to the fuse element within the plug, said fuse plug including a radial projection adjacent its base, said socket having a slot for receiving said projection and effective to guide the plug during insertion in the socket, said fuse plug being adapted to clear said slot adjacent the bottom of the socket and to be thereafter rotated to connect its contacts with those at the bottom of the socket, and a stop for limiting the reverse rotation of the plug when turning to disconnect the plug contacts from the socket contacts, and a removable cord attachment cap covering said plug and carrying a contact finger in electrical connection with a socket contact.

10. In an attachment plug receptacle, means providing for the entrance of a fuse, said entrance means being openly accessible to the fuse upon removal of a plugged in cord attachment cap normally preventing such accessibility, said entrance means comprising an opening through the body of the plug receptacle, the walls of the opeing providing a support for the fuse.

11. In an attachment plug receptacle, means providing for the entrance of a fuse, and slots adjacent said entrance means for reception of the blades of a cord attachment cap, said fuse being accessible only upon removal of the cap from the receptacle, said entrance means comprising an opening through the body of the plug receptacle, the walls of the opening providing a support for the fuse.

12. In an electrical device, means providing for the entrance of a fuse, in combination with a cord attachment cap normally preventing access to the fuse, said fuse being immediately accessible upon removal of the attachment cap, said entrance means comprising an opening through the body of the plug receptacle, the walls of the opening providing a support for the fuse.

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