July 16, 1940. E. V. SUNDT 2,207,837

FUSE POST

Filed Feb. 16, 1939

Fig. 1

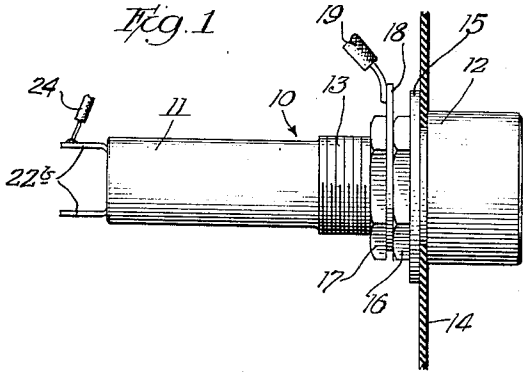


Fig. 4

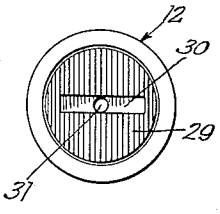


Fig. 5

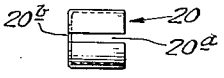


Fig. 2

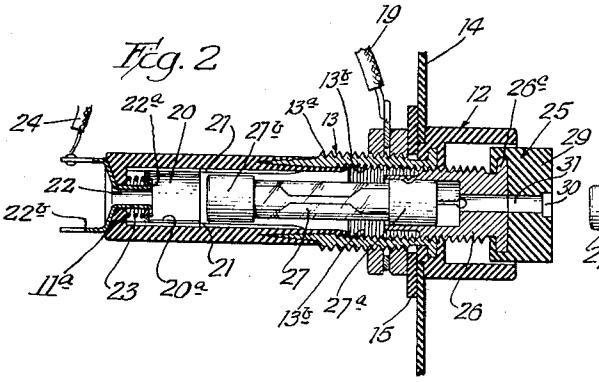


Fig. 6

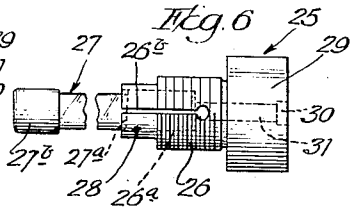


Fig. 3

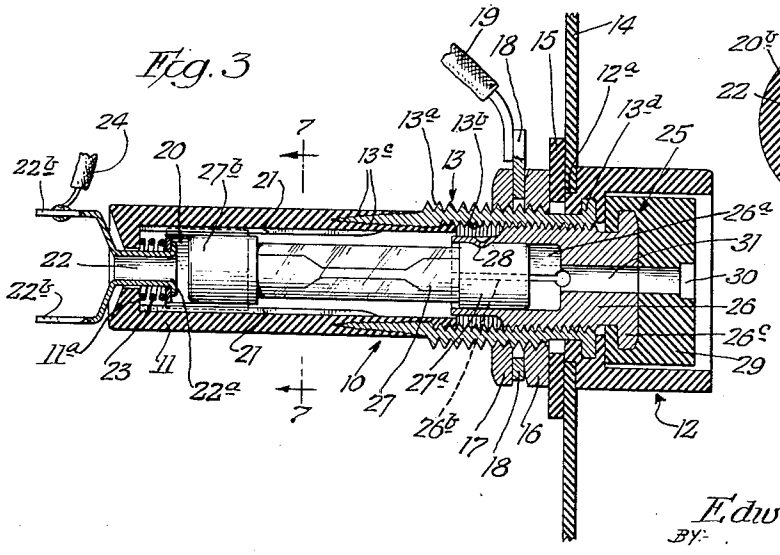
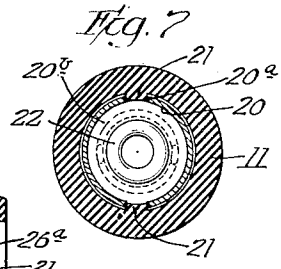


Fig. 7



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Patented July 16, 1940

2,207,837

UNITED STATES PATENT OFFICE

2,207,837

FUSE POST

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Application February 16, 1939, Serial No. 256,621

9 Claims. (Cl. 200—129)

This invention relates to improvements in fuse posts.

One object of the invention is to provide an improved post for fuses of the cartridge type which completely encloses a fuse when the latter is in operative position therein or when a fuse in being installed in a post has been advanced sufficiently towards final position to effect closure of a circuit the electrically live portions of the fuse will be within the post thereby precluding injury to a person by electric shock.

Since heavy surges of current sometimes fracture the glass tubes of fuses of the type mentioned it is sometimes difficult to remove the fuse caps. It is, therefore, another object of the invention to provide an arrangement of parts whereby a clean-out passage is provided in the post assembly by means of which detached fuse caps or other fragments of fuses may be removed without difficulty. Such passage is also of use in that they provide access to the interior of the fuse post when the fuse is in position therein whereby, by the use of suitable instruments. test of the circuit can be made.

Another object of the invention is to provide a fuse post construction adapted to be anchored in an apertured panel, box cover or the like whereby the electrical connections of the post in a circuit are concealed by such panel or cover and thereby shielded from accidental contact in changing fuses, for example, such post comprising a forward insulated end accessible at the front of the panel by means of which fuses may be removed from or inserted in the post.

An additional object of the invention is to provide a fuse post construction comprising an inner fuse-cap receiving cup or terminal which preferably is cushioned for movement axially of the post by means of a non-current carrying spring whereby the temper of the latter is not impaired by heat as would likely be the case were the spring interposed directly in a circuit. Such cup terminal is, in accordance with the present invention, non-rotatable within the post and hence the likelihood of twisting circuit connections from a terminal is avoided notwithstanding that the fuse preferably is inserted in a threaded fuse carrier which is screwed into the socket in positioning the fuse in circuit-establishing relation therein.

An additional object of the invention is to provide a fuse post comprising an electrical conducting section and nonconducting sections of molded dielectric material bonded together to provide an integral tubular unit.

Other objects will be apparent from a consideration of the following specification and accompanying drawing, wherein:

Fig. 1 is an elevation of a fuse post assembly shown in position in a supporting panel.

Fig. 2 is a longitudinal sectional view of the post and a fuse and fuse carrier incompletely positioned within the post.

Fig. 3 is a longitudinal sectional view of a post fuse and fuse carrier in final position in the post.

Fig. 4 is an end elevation of a fuse post assembly.

Fig. 5 is a detached elevation of a cup-like circuit terminal.

Fig. 6 is an elevation of a fuse carrier illustrating a conventional cartridge fuse.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 3.

In the drawing the post assembly comprises a post indicated generally by the numeral 10 which, in the particular embodiment herein disclosed, comprises an inner end portion 11 of insulating material, an outer end section 12 of similar material, and an intermediate section 13 of conducting material. The intermediate section 13 is provided with exterior threads 13*a* and interior threads 13*b*, while the inner end of said member is tapered or feathered as indicated in Figs. 2 and 3. Both the interior and exterior surfaces of the tapered end portion of the member 13 are roughened or serrated as indicated at 13*c* whereby when the member 13 is inserted in a suitable mold the moldable material of which the insulating section 11 is formed, such as "Bakelite" for example, will form an adequate bond with section 13. The opposite end of section 13 is shown as being provided with an outwardly directed flange 13*d* which is embedded in the section 12 at the time of molding the latter, which may likewise be formed of "Bakelite" or equivalent insulating material. The union of sections 11 and 12 with section 13 forms a unitary post construction as will be seen and enables the same to be inserted in an aperture in a panel 14 which may be the cover of a meter box or other support.

The inner end of the insulating section 12 preferably is provided with a shoulder 12*a* of a diameter to seat within the aperture in the panel 14. At the rear of the panel an insulating washer 15 may be positioned and against which is screwed a metal nut 16, the nut threadedly cooperating with the external threads 13*a* of the section 13. Between the nut 16 and a second nut 17 may be disposed a terminal connector 18 to which is attached a conductor 19 of a circuit to be protected by the fuse hereinafter referred to. Within the chamber or bore of the post 10 and adjacent the rear end thereof is a second circuit terminal 20 which, as shown in Fig. 5, is generally of cup-like shape and is provided with diametrically opposite slots or key ways 20*a* extending axially of the terminal for accommodating opposed ribs or keys 21 provided, as by mold-

ing, on the inner surface of the post section 11. The rib and slot construction referred to enables the terminal 20 to reciprocate within the post but prevents rotation of the terminal.

The base 20b of the terminal 20 is apertured for receiving a tubular connector 22 the inner end of which, as shown at 22a, may be spun over into engagement with the base of the terminal and soldered or welded thereto. Surrounding the tubular portion of the connector 22 is a compression spring 23 which is confined between the terminal 20 and the aperture base portion 11a of section 11. The spring thus tends to move the terminal 20 to the right as viewed in Figs. 2 and 3, but inasmuch as the spring rests upon the insulating base 11a current does not flow through the spring and hence it is not heated appreciably by the flow of current through the post assembly and its usefulness is thus not impaired. The connector 22 is shown as provided with a pair of outwardly extending fingers 22a to either one of which a second circuit conductor 24 may conveniently be attached. These fingers limit the movement of the terminal 20 to the right under action of the spring and during the removal of a fuse.

A fuse carrier best shown in Fig. 6 is provided and is indicated generally by the numeral 25. The carrier comprises a conducting section 26 which is provided with a recess 26a into which may be inserted a cap 27a of a conventional cartridge fuse 27. The member 26 preferably is so constructed as to enable the same to be expanded slightly in inserting a fuse therein whereby the fuse will be gripped firmly and retained therein against displacement longitudinally and rotatively. The desired expansibility of the member 26 may be provided by slotting the same as indicated at 26b. The holding action of the member 26 upon the fuse cap may be increased by the provision of one or more depressions 28 which form projections on the inner surface of the member 26 which tend to bite into the metal of the cap 27a and preclude the displacement of the fuse from initial carrying position. The gripping action of the member 13 upon the inserted fuse cap 27a is in excess of the frictional contact of the terminal cup 20 upon the cap 27b whereby the fuse will turn with the carrier during insertion or removal of a fuse from the post. The outer end of the carrier 25 comprises an insulating member or knob 29 within which the inner flanged end 26c of member 26 is embedded during the molding of the section 29.

When a fuse has been positioned in a carrier 25 as indicated in Fig. 6, the two members may be inserted as a unit in the fuse post. The member 26 is exteriorly threaded as shown and cooperates with the inner threads 13b of the conducting portion 13 of the post whereby intimate electrical connection is established between section 13 and the cap 27a of the fuse, that is, the coaction of the threads of the member 26 with the threads 13b provide relatively large areas of contact for the conduction of current between the cap 27a and the member 13. As the carrier 25 is screwed into the post assembly the other fuse cap 27b is caused to enter the cup terminal 20 which frictionally engages the cap and provides intimate electrical contact therewith. The terminal 20, however, is restrained from rotation due to the coaction of the slots 20a and the ribs 21, as above mentioned. As the fuse is advanced into the post the spring 23 is, of course, compressed as illustrated in Fig. 3, the spring being sufficiently stiff to offer sufficient resistance to the movement of the terminal to the left to assure that the cap 27b enters the same a distance sufficient to provide adequate electrical contact therewith. Fuses varying in length within certain limits can, therefore, be inserted in the fuse post without danger of the inner cap 27b bottoming at the inner end of the post and the glass capsule of the fuse being fractured by further inner turning movement of the carrier. As indicated in Fig. 2 all current conducting portions of the carrier 25 and a fuse 27 therein are sufficiently advanced within the post at the position wherein the fuse cap 27b contacts the terminal as to be shielded against contact by one's fingers in inserting a new fuse.

In the illustrated embodiment of the invention, the dimensions of the knob 29 of the fuse carrier 25 are such as to enable the same to seat fully within the housing 12. To facilitate the insertion of a fuse in the post and the removal of the carrier therefrom the member 29 may be provided with a tool-receiving recess, such as a screw driver slot 30, which necessitates the use of a tool in completely seating a fuse in position or in removing the carrier from the post, thereby discouraging unauthorized tampering with the assembly by children or the like.

I prefer to color the outer end of the member 29 so as to distinguish the same from the member 12 to lessen the likelihood of the use of a wrench or like tool to the member 12 in an effort to replace a fuse by one not acquainted with the fuse post assembly. Thus in Fig. 4, the end surface of the member 29 is hatched to indicate the color red, for example, to distinguish the member from the surrounding housing 12 which preferably is of a contrasting color.

Since the glass tubes of fuses of the cartridge type are sometimes shattered by an excessively heavy current, thus preventing withdrawal of the inner cap 20 when the fuse carrier is removed from the assembly, the connector member 22, as stated above, preferably is of tubular or annular form which in conjunction with the hollow post and annular terminal 13 provides a passage through which an instrument may be inserted to expel a loosened fuse cap or other fragments of a broken fuse. Likewise, the carrier 25 may be made of annular form by providing an axial passage 31 therethrough for facilitating the removal of a detached fuse cap from the member 26 although the slots 26b are helpful in this respect. The passage 31 additionally provides access to a cap in the fuse for a suitable testing instrument, although for use in many instances the passage may be omitted as will be apparent.

While I have shown and described a specific structure embodying the present improvements for the purpose of illustration, it will be apparent that modifications may be made therein without departing from the spirit of the invention as, for example, in some instances it is desirable to have the fuse carrier removable without the use of a tool, in which instance the cylindrical housing 12 may be reduced in length or omitted, which will leave the knob member 29 exposed for manipulation directly by the hands. Other variations in the particular structure disclosed will be apparent to those skilled in the art.

I claim:

1. A fuse post assembly comprising a hollow post provided with an outer end of insulating material terminating in a cylindrical housing, a pair of circuit terminals carried by said post, means for mounting the post in a panel support

with said housing on the forward side thereof, a carrier for a cartridge fuse comprising a conducting member expansible for receiving and frictionally gripping one cap of a fuse and to connect the same electrically with one of said terminals when the carrier and fuse are inserted in said post with the other cap of the fuse in electrical contact with said other terminal, and an insulating knob at the outer end of said carrier receivable within said housing when the carrier is disposed in said circuit closing relation within the post.

2. A fuse post assembly comprising a post provided with an outer end of insulating material providing a shoulder adapted to abut an apertured panel in which the post is mounted and having an open cylindrical recess coaxial with the post, longitudinally spaced circuit terminals within the post adapted to be bridged electrically by a fuse, the foremost of said terminals being threaded, and a fuse carrier comprising an exteriorly threaded conducting expansible portion adapted frictionally to engage a cap of a fuse and to be threaded into said threaded terminal within the post for electrically connecting said threaded terminal to said cap and for advancing said carrier and fuse into the post to effect engagement of the other cap of the fuse with said other terminal, said carrier terminating in a cylindrical outer insulating knob adapted to enter said housing and provided with a tool receiving recess for facilitating the positioning of the carrier in final position wthin the post and the removal of the same therefrom.

3. A tubular fuse post assembly provided with inner and outer end portions of insulating material and an intermediate portion of conducting material, said intermediate portion constituting an internal terminal for a fuse and also one exterior terminal for connection in an electric circuit, a second terminal in said inner end portion, and a carrier for a cartridge fuse comprising an outer end portion of insulating material adapted to be housed within the outer end portion of the post when said carrier is in circuit closing position and an inner portion of conducting material constituting a gripping receptacle for a cap of a fuse and adapted to make electrical contact with said terminal member of said post and to position and removably retain the other cap of the fuse within said second terminal when said carrier and fuse are inserted in said post.

4. A fuse post assembly for a cartridge fuse comprising a tubular post provided with insulated inner and outer end portions and a conducting intermediate interiorly threaded portion, said intermediate portion constituting a circuit terminal, a spring cushioned cup-like circuit terminal in said inner end portion, and a fuse carrier comprising an outer insulated knob and an attached conducting portion provided with a resilient-walled recess for receiving frictionally a cap of a fuse and having exterior threads adapted to coact with the threads of said intermediate post member whereby said carrier and a fuse therein can be screwed into said post to force the other cap of the fuse into contact with said cushioned terminal.

5. A fuse post assembly comprising a post provided with a fuse recess accessible at the forward end of the post, a pair of longitudinally spaced circuit terminals arranged for electrical connection with the caps of a cartridge fuse when positioned in said recess, and a removable fuse carrier insertable in said post for establishing electrical connections between said terminals and the cap of a fuse in said carrier, the inner of said post terminals being adapted to engage electrically the respective fuse cap, the rear end of said post and said inner terminal having registering passages for the reception of an instrument for expelling portions of a broken fuse from said post recess.

6. A fuse post comprising a tubular body provided with an intermediate interiorly threaded portion of conducting material and adapted to be connected to a circuit conductor and inner and outer end portions of non-conducting material, a resilient terminal in said inner end adapted to be connected to a second circuit conductor, and a removable fuse-carrying member provided with an exteriorly threaded portion of conducting material adapted to be screwed into said conducting portion of the post and constituting a gripping receptacle for receiving one cap of a cartridge fuse and to press the other fuse cap into frictional contact within said resilient terminal within said post.

7. A tubular fuse post comprising a non-conducting outer end adapted to seat in an opening in a post support, a terminal within the post at the inner end thereof adapted to be connected to a circuit conductor, an intermediate conducting section threaded exteriorly for cooperation with said outer insulated end for clamping engagement with the support and constituting a second terminal for attachment thereto of a second circuit conductor said intermediate section being internally threaded also, and fuse carrying means comprising an outer insulating knob member and an inner conducting member provided with a recess adapted frictionally to engage one cap of a cartridge fuse and having exterior threads for coaction with the interior threads of said post whereby said carrying member can be turned into said post to establish electrical contact between said threaded terminal of the post and the threaded carrier member and to press the second cap of the fuse into engagement with said first mentioned terminal to effect electrical connection of said terminals through said fuse.

8. A fuse post assembly comprising a hollow post provided with a reciprocal circuit terminal, a non-current carrying compression spring for resisting movement of said terminal in the direction of movement of an inserted fuse, a second terminal in said post spaced longitudinally from said first terminal and being of annular shape and provided with internal threads, and a fuse carrier comprising a fuse cap gripping member provided with exterior threads arranged for coaction with the threads of said second mentioned terminal for electrically connecting said second terminal to said fuse cap and advancing the other fuse cap into spring compressing contact with said first mentioned terminal.

9. A hollow fuse post comprising axially aligned outer and inner annular end sections of insulating material and an intermediate annular portion of conducting material having the ends thereof embedded in the insulating material of the respective end portions of the post.

EDWARD V. SUNDT.