

April 17, 1956

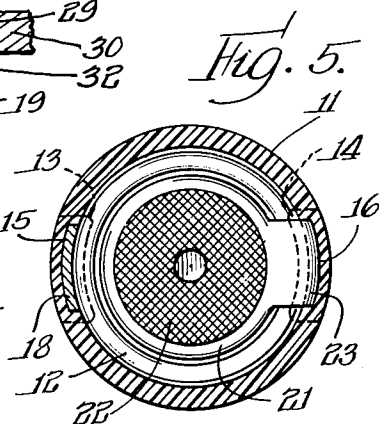
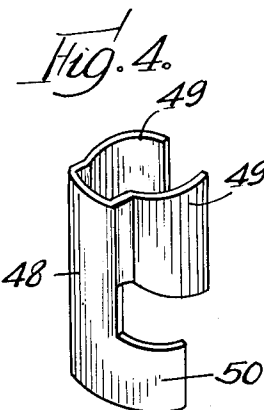
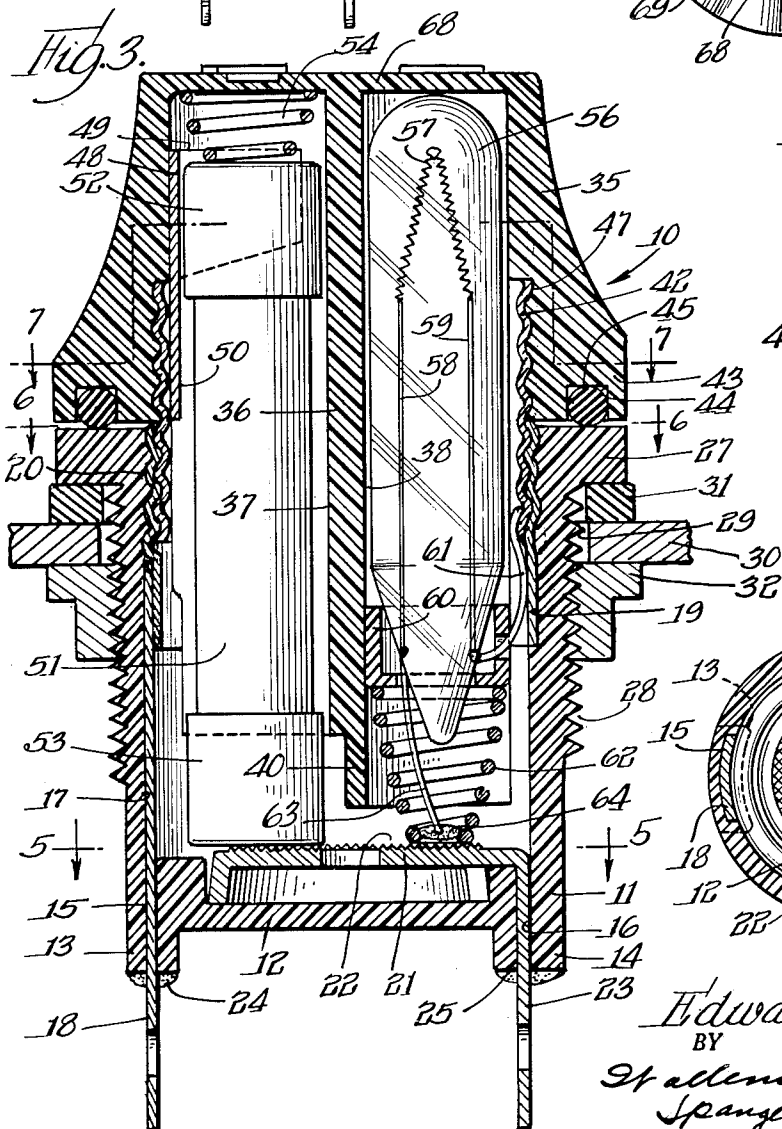
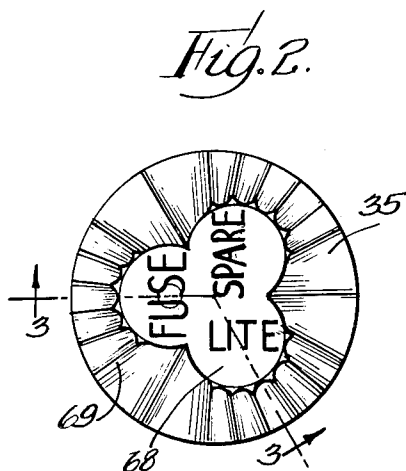
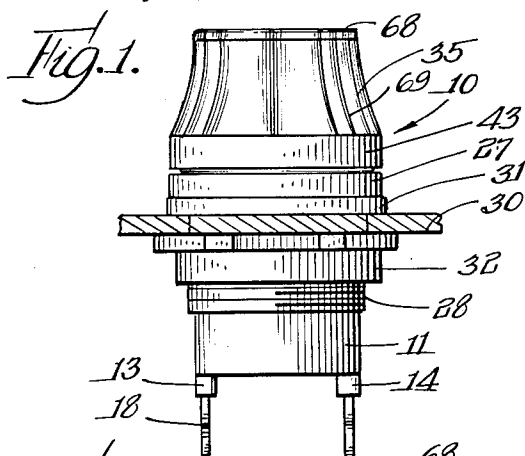
E. V. SUNDT

2,742,545

INDICATING FUSE POST

Filed May 12, 1953

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

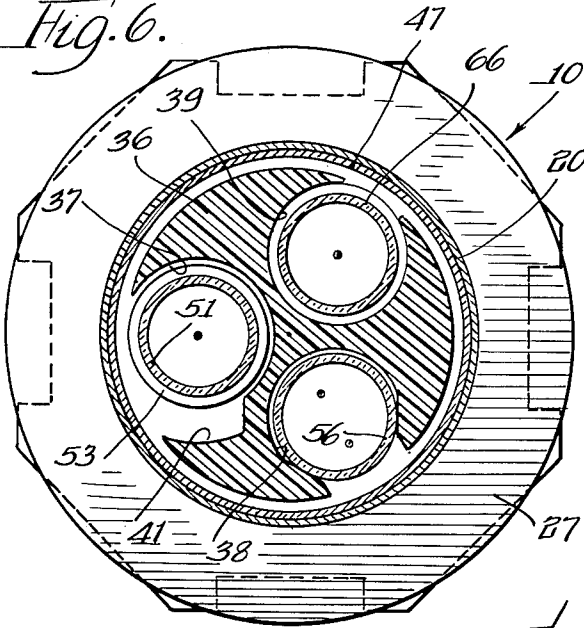


Fig. 7.

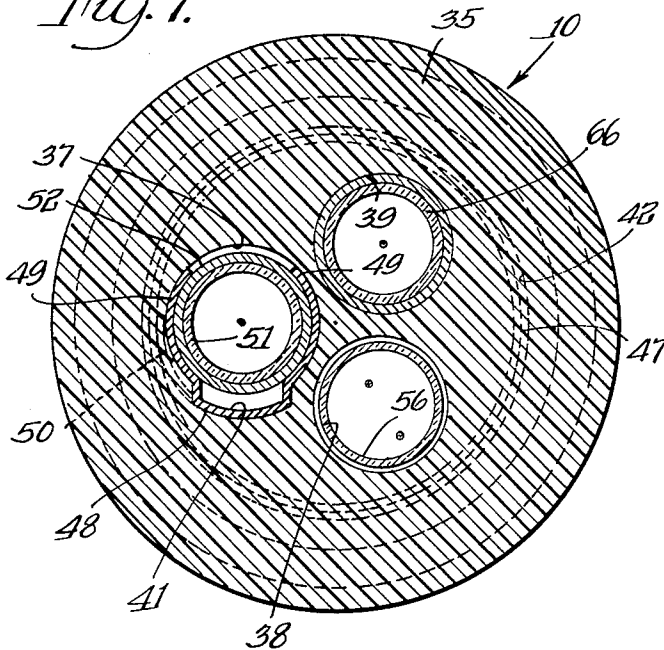
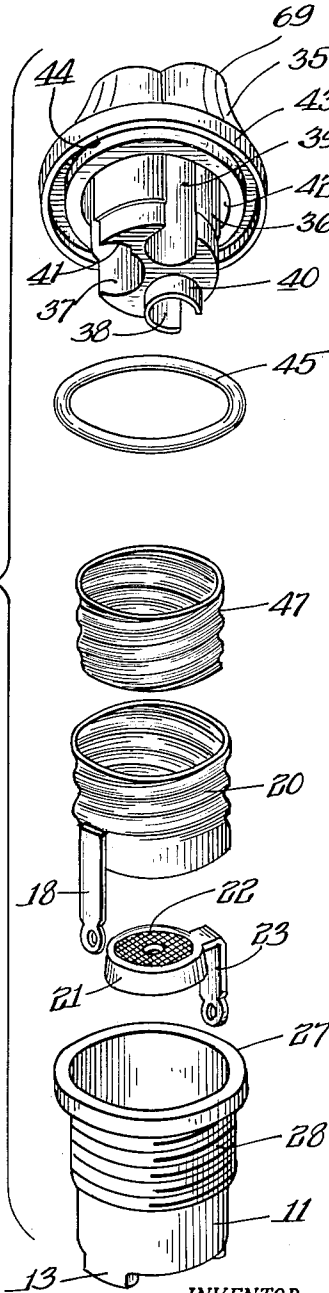


Fig. 8.



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2,742,545

INDICATING FUSE POST

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Application May 12, 1953, Serial No. 354,528

10 Claims. (Cl. 200—121)

This invention relates to fuse posts, such as, of the type having a body member for mounting on a panel and having electric terminals for connecting to an electric circuit, and a knob member for holding a cartridge fuse and connecting the cartridge fuse to the terminals when the knob member is received in the body member.

The principal object of this invention is to provide an improved fuse post of this type wherein the knob member also carries an indicating lamp, the cartridge fuse and indicating lamp being longitudinally and parallelly arranged, wherein the knob member may also carry in the same arrangement a spare fuse, wherein the space requirements of the knob member and hence the entire fuse post are maintained at a minimum, wherein the cartridge fuse and indicating lamp are automatically connected in parallel across the electric terminals of the body member when the knob member is received in the body member, wherein the indicating lamp is illuminated when the cartridge fuse is blown for visually indicating through the knob member the blown condition of the cartridge fuse, wherein the cartridge fuses may be readily and safely replaced upon removal of the knob member, wherein the knob member and body member of the fuse post are sealed air tight, wherein the body member of the fuse post is sealed air tight to the panel, and wherein the fuse post may be inexpensively manufactured and installed and may be utilized and operated in a fool proof manner.

Briefly, the indicating fuse post of this invention includes a substantially cylindrical and hollow body member formed of electrical insulating material and it is closed at its inner end and open at its outer end. A contact plate is mounted in the body member on the closed inner end thereof and has a terminal extending through the closed inner end of the body member. A contact sleeve which is preferably screw threaded is mounted in the body member adjacent the open outer end thereof and it has a terminal which extends through the closed inner end of the body member. The indicating fuse post also includes a substantially cylindrical knob member formed of electrical insulating material and it is closed at its outer end and has at least two and preferably three longitudinally arranged parallel cavities which are open at the inner end of the knob member. A contact sleeve which is preferably screw threaded is mounted on the knob member. A fuse clip is mounted in one of the cavities in the knob member and it is electrically connected to the contact sleeve of the knob member for receiving and holding one end of a cartridge fuse with the other end thereof protruding from the open end of the cavity. An indicating lamp is located in another of the cavities in the knob member and it has a pair of leads. A spare fuse may be received in the third cavity so as to be available for ready replacement of the blown fuse. One of the lamp leads is suitably electrically connected to the contact sleeve of the knob member. A resilient contact member is located in the cavity containing the indicating lamp and it is electrically connected

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to the other lamp lead and it protrudes from the open end of the cavity. The arrangement is such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and indicating lamp in parallel across the terminals of the body member.

Preferably, the knob member is formed of a light transmitting material so that light is transmitted through the outer end of the knob member when the lamp is illuminated upon blowing of the fuse. Also, a spring is preferably interposed between the cartridge fuse and the closed end of the cavity containing the fuse for resiliently urging the cartridge fuse against the contact plate of the body member when the knob member is received in the body member. This assures good electrical contact. Means are also preferably provided for securing the body member in an opening in a panel with the open outer end thereof in front of the panel and the closed inner end thereof behind the panel. In this connection the body member is provided with a flange adjacent its open outer end and is provided with screw threads on the exterior surface of the body member between the flange and the inner closed end thereof. A nut is carried by the screw threads for securing the body member in the opening in the panel and clamps the panel between the flange and the nut. A gasket is preferably utilized for sealing the joint between the body member and the panel.

Also, preferably the terminals where they extend through the closed end of the body member are sealed. The knob member is also preferably provided with a flange having an annular groove and an O-ring is located in the groove for sealing the joint between the knob member and the body member when the knob member is received in the body member.

Further objects of this invention reside in the details of construction of the indicating fuse post and in the cooperative relationships between the component parts thereof.

Other objects and advantages of this invention will become apparent to those skilled in the art upon reference to the accompanying specification, claims and drawings in which:

Figure 1 is an elevational view of the indicating fuse post of this invention applied to a panel;

Figure 2 is a top plan view thereof;

Figure 3 is an enlarged vertical sectional view taken through the indicating fuse post substantially along the line 3—3 of Figure 2;

Figure 4 is a perspective view of the fuse clip utilized for securing the cartridge fuse in the knob member;

Figure 5 is a horizontal sectional view taken substantially along the line 5—5 of Figure 3;

Figure 6 is a horizontal sectional view taken substantially along the line 6—6 of Figure 3;

Figure 7 is a horizontal sectional view taken substantially along the line 7—7 of Figure 3;

Figure 8 is an exploded perspective view of the indicating fuse post.

The indicating fuse post is generally designated at 10. It includes a substantially cylindrical and hollow body member 11 which is formed of electrical insulating material as, for example, a thermoplastic material such as nylon or the like. It is closed at its inner end by an end wall 12 and is open at its outer end. The closed end 12 of the body member 11 is provided with a pair of depending ears 13 and 14 having holes 15 and 16 extending therethrough. The hole 15 forms a continuation of a slot 17 in the inner side wall of the body member 11. A metallic electric terminal 18 is located in this slot 17

and extends through the hole 15. The upper end of the terminal 18 is suitably secured as by welding to a metallic sleeve member 20 which is preferably screw threaded. The sleeve member 20 is received in the counterbore 19 in the body member 11 and is firmly held in place therein as by heat sealing. A metallic contact plate 21 is mounted in the end wall 12 and it preferably has its upper face serrated as indicated at 22. This contact plate 21 is provided with a terminal 23 which extends through the hole 16 in the ear 14. The holes 15 and 16 through which the terminals 18 and 23 extend are preferably sealed, this being accomplished by dipping the same in melted nylon. The seals are indicated at 24 and 25, respectively.

The open outer end of the body member 11 is provided with a flange 27 and the outer wall of the body member 11 is provided with screw threads 28 between the flange 27 and the closed end thereof. The body member 11 is insertable through a hole 29 in a panel 30 for mounting the same with the outer open end in front of the panel and the closed inner end behind the panel. A gasket 31 is interposed between the flange 27 and the panel 30 for sealing the joint between the body member 11 and the panel 30. A nut 32 is screw threadedly mounted on the screw threads 28 of the body member 11 for clamping the body member 11 in place on the panel 30 and for sealing the body member with respect to the panel. In this way the body member 11 is readily and securely fastened to the panel 30. Circuit connections are therefore made from behind the panel 30 to the terminals 18 and 23 of the body member 11 so that no electrical connections are exposed in front of the panel.

The indicating fuse post 10 also includes a substantially cylindrical knob member 35 formed of electrical insulating material as, for example, a thermoplastic material such as nylon or the like. The knob member 35 is also preferably light transmitting and in this connection it may be either transparent or translucent. The knob member 35 has a substantially cylindrical depending portion 36 which is adapted to be received within the body portion 11. The portion 36 is provided with a plurality of cavities such as the three cavities indicated at 37, 38 and 39. These cavities are open at their inner ends and are also preferably open somewhat at their sides. The outer ends of the cavities are closed. The depending portion 36 is preferably provided with an extension 40 about the open end of the cavity 38. The cavity 37 is provided with a longitudinally extending groove 41. The knob member 35 is provided adjacent the depending portion 36 with a deep annular groove 42 and adjacent this groove 42 the knob member 35 is provided with a flange 43 which is adapted to overlie the flange 27 of the body member 11. The flange 43 is provided with an annular groove 44 which receives an O-ring 45. Thus, when the knob member 35 is received in the body member 11 the flanges 43 and 27 thereof are brought together and the O-ring 45 seals the joint therebetween.

A contact sleeve 47 which is preferably screw threaded is mounted in the deep groove 42 in the knob member 35, the sleeve being heat sealed in place therein. A fuse clip 48 is located in the upper end of the cavity 37, the fuse clip having a straight portion which is received in the longitudinally extending groove 41 and a pair of clamping portions 49. The fuse clip 48 is also provided with a tab 50 which is suitably secured as by welding to the screw threaded contact sleeve 47. In this way the fuse clip 48 is permanently held in place in the cavity 37 adjacent the outer closed end thereof. A cartridge fuse 51 having the usual caps 52 and 53 is removably received in the cavity 37, the cap 52 being engaged by the clip members 49 of the fuse clip 48 and, hence, in electrical contact therewith. The other end of the fuse protrudes beyond the open end of the cavity 37 so that its fuse cap 53 is at least partially exposed. A spring 54 located between the fuse cap 52 and the closed end of

the cavity 37 urges the cartridge fuse 51 toward the open end of the cavity 37.

An indicating lamp 56 is mounted in the cavity 38 of the knob member 35. This indicating lamp 56 is preferably of the neon type having a filament 57 and leads 58 and 59. The indicating lamp 56 is held in place in the cavity 38 by a retainer cup 60 which in turn is engaged by a spring 62. The lead 59 of the lamp 56 is electrically connected by a member 61 to the contact sleeve 47 and the lead 58 is electrically connected by a member 63 to the lower end of the spring 62, the member 63 being secured to the spring 62 as by soldering as indicated at 64. The spring 62 protrudes beyond the end of the cavity 38 and it is guided by the extension 40.

Since the cartridge fuse cap 52 is connected through the fuse clip 48 to the contact sleeve 47 and since the lead 59 of the indicating lamp 56 is also electrically connected to the contact sleeve 47, the fuse cap 52 and the lead 59 of the indicating lamp 56 are electrically connected together and are also electrically connected to the electric terminal 18 which is also electrically connected to the contact sleeve 47 when the knob member 35 is received in the body member 11. This latter electrical connection is established by the contact sleeve 29 engaging the contact sleeve 47. A spare fuse 66 is removably carried in the third cavity 39 so that it will always be available for replacement purposes upon blowing of the cartridge fuse 51.

When the knob member 35 is received in the body member 11 the cap 53 of the cartridge fuse 51 and the resilient member or spring 62 engage the contact plate 21 for electrically connecting them to the electric terminal 23. To assure good electrical connection the face 22 of the contact plate 21 is serrated as explained above. The contact sleeves 47 and 20 in addition to establishing electrical contact therebetween also mechanically couple the knob member 35 to the body member 11 to hold the fuse post in assembled relation. The O-ring 45 is drawn up tight to seal the joint between the knob member 35 and the body member 11 and the cartridge fuse cap 53 and the resilient member 62 are resiliently urged into contact with the contact plate 21. The electric fuse 51 and the indicating lamp 56 are connected in parallel with each other across the electric terminals 18 and 23. Thus, an electric circuit connected to the terminals 18 and 23 is protected by the cartridge fuse 51. Under these conditions the indicating lamp 56 is shorted by the fuse 51. When, however, the cartridge fuse 51 is blown, due to an overload condition in the electric circuit, the indicating lamp 56 is no longer shorted and it then lights up. The light given off by the indicating lamp 56 is transmitted through the closed end wall 68 of the knob member 35 so as to visually indicate the fact that the cartridge fuse 51 is blown. This visual indication is permitted by reason of the fact that the knob member 35 is formed from light conducting material. When the cartridge fuse 51 is blown, the knob member 35 may be unscrewed from the body member 11, the blown cartridge fuse 51 disposed of and the spare fuse 66 substituted therefor. The knob member 35 may then be replaced into the body member 11 for protecting the electric circuit.

The outer end wall 68 of the knob member 35 may be provided with suitable lettering for indicating the positions of the fuse, the indicating lamp and the spare fuse as is illustrated in Figure 2. To facilitate manipulation of the knob member 35 with respect to the body member 11 it may be provided with a ribbed surface as indicated at 69 in Figures 1 and 2.

The indicating fuse post of this invention provides a compact and inexpensive way of combining a fuse, holder and indicating lamp for showing when the fuse is blown and also for accommodating a spare fuse which is available at all times for emergencies. This is all accomplished with a minimum of required space since the three ele-

ments, the cartridge fuse, the indicating lamp and the spare fuse are held in mechanical parallel position within the removable knob member. The connections for the indicating lamp are all kept away from the live cartridge fuse and its connections so that safe operation is assured, this being permitted by the mechanical parallel relationship between the cartridge fuse and the indicating lamp. The fields of application of the indicating fuse post of this invention lie principally in the electronic and aircraft fields where space is at a premium. The arrangement of the various elements of this indicating fuse post also makes it possible to provide means for sealing the fuse post airtight to its mounting panel and sealing the knob member airtight to the body member of the fuse post. As described above the electric terminals are also sealed to the body member so that a completely sealed construction is provided. This allows the fuse post arrangement to be used with pressurized equipment. A great simplification is brought about in the indicating fuse post of this invention by the fact that the contact to the active fuse and to the indicating lamp is accomplished by screwing them both into electrical connection with a common terminal at the bottom of the body member. This also assures safe operation of the indicating fuse post.

While for purposes of illustration one form of this invention has been disclosed other forms thereof may become apparent to those skilled in the art upon reference to this disclosure and, therefore, this invention is to be limited only by the scope of the appended claims.

I claim as my invention:

1. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

2. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and

adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating and light transmitting material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member and transmitting light through the outer end of the knob member when the lamp is illuminated, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

3. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, a spring interposed between the cartridge fuse and the closed end of the cavity for resiliently urging the cartridge fuse toward the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect

the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

4. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member where they extend therethrough, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

5. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a screw threaded contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, a screw threaded contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member and rotated, the

protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves screw threadedly engage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and indicating lamp in parallel across the terminals of the body member.

6. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said body member having a flange adjacent the open outer end thereof, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, said knob member having a flange thereabout and provided with an annular groove, an O-ring in the groove, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the O-ring seals the flanges of the body member and the knob member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

7. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, means for sealing the terminals to the closed end of the body member where they extend therethrough, said body member having a flange adjacent the open outer end thereof, said knob member being closed at its outer end and having at least a pair of parallel and longitudinally arranged cavities opening at the inner end of the knob member, said knob member having a flange

thereabout and provided with an annular groove, an O-ring in the annular groove, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the O-ring seals the flanges of the body member and the knob member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

8. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, a spare cartridge fuse, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and adapted to be mounted in a panel, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, a contact plate mounted in the body member on the closed inner end thereof and having a terminal extending through the closed inner end of the body member, a contact sleeve mounted in the body member adjacent the open outer end thereof and having a terminal extending through the closed inner end of the body member, said knob member being closed at its outer end and having three parallel and longitudinally arranged cavities opening at the inner end of the knob member, a contact sleeve mounted on the knob member, a fuse clip mounted in one of the cavities in the knob member and electrically connected to the contact sleeve of the knob member and receiving and holding one end of the cartridge fuse with the other end thereof protruding from the open end of the cavity, said spare cartridge fuse being located in another cavity in the knob member, said indicating lamp being located in the other cavity in the knob member, means for electrically connecting one of the leads of the indicating lamp to the contact sleeve of the knob member, a resilient contact member located in the cavity containing the lamp and electrically connected to the other lead of the indicating lamp and protruding from the open end of the cavity, the arrangement being such that, when the knob member is received in the body member, the protruding ends of the cartridge fuse and the resilient contact member engage the contact plate in the body member and the contact sleeves interengage releasably to secure the knob member in the body member and electrically to connect the cartridge fuse and the indicating lamp in parallel across the terminals of the body member.

9. In an indicating fuse post including a cartridge fuse for protecting an electric circuit, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and having

a pair of electric terminals for connection to the electric circuit to be protected, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, at least a pair of parallel and longitudinally arranged cavities in the knob member and opening at the inner end of the knob member, one of said cavities receiving and holding said cartridge fuse with one end thereof protruding from the inner end of the knob member, the other of said cavities receiving and holding the indicating lamp, a contact member electrically connected to one of the leads of the indicating lamp and mounted in the cavity containing the lamp and protruding from the inner end of the knob member, connecting means in the knob member for electrically connecting the other end of the cartridge fuse to the other lead of the indicating lamp, and means operative upon reception of the knob member in the body member for automatically electrically connecting said connecting means to one of the electric terminals and for automatically electrically contacting said one end of the cartridge fuse and said contact member with the other electric terminal.

10. In an indicating fuse post including an operating cartridge fuse for protecting an electric circuit, a spare cartridge fuse, an indicating lamp having a pair of leads and which is illuminated when the cartridge fuse is blown, a substantially cylindrical hollow body member formed of electrical insulating material and closed at its inner end and open at its outer end and having a pair of electric terminals for connection to the electric circuit to be protected, and a substantially cylindrical knob member formed of electrical insulating material and removably received in the open end of the body member, the improvement consisting of, three parallel and longitudinally arranged cavities in the knob member and opening at the inner end of the knob member, one of said cavities receiving and holding the spare cartridge fuse, another of said cavities receiving and holding the operating cartridge fuse with one end thereof protruding from the inner end of the knob member, the other of said cavities receiving and holding the indicating lamp, a contact member electrically connected to one of the leads of the indicating lamp and mounted in the cavity containing the lamp and protruding from the inner end of the knob member, connecting means in the knob member for electrically connecting the other end of the operating cartridge fuse to the other lead of the indicating lamp, and means operative upon reception of the knob member in the body member for automatically electrically connecting said connecting means to one of the electric terminals and for automatically electrically contacting said one end of the operating cartridge fuse and said contact member with the other electric terminal.

References Cited in the file of this patent

UNITED STATES PATENTS

1,507,194	Miller	Sept. 2, 1924
1,858,157	Lagandro	May 10, 1932
1,927,372	Kriegstedt	Sept. 19, 1933
1,957,345	Kriegstedt	May 1, 1934
2,206,785	Linton	July 2, 1940
2,386,060	Powell	Oct. 2, 1945
2,417,692	Kline	Mar. 18, 1947
2,673,910	Alden	Mar. 30, 1954

FOREIGN PATENTS

318,996	Great Britain	Sept. 25, 1930
566,040	Great Britain	Dec. 11, 1944