Feb. 26, 1957 E. V. SUNDT 2,783,331

INDICATING FUSE HOLDER

Filed Dec. 23, 1953

Fig. 1.

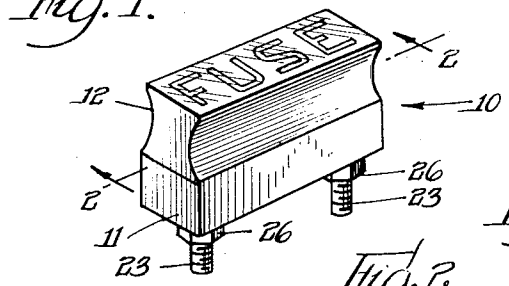


Fig. 2.

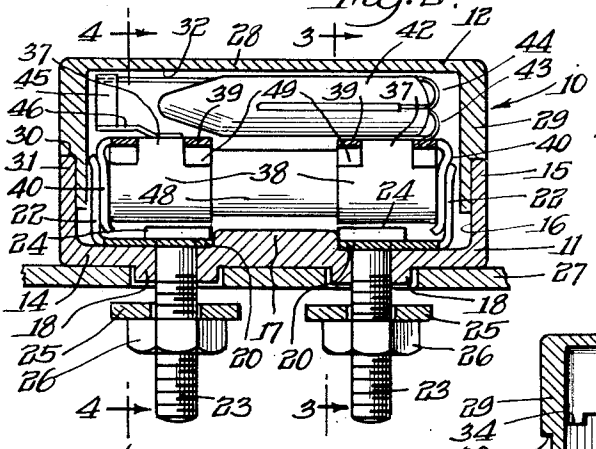


Fig. 3.

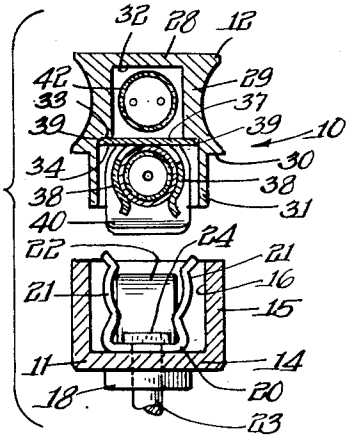


Fig. 4.

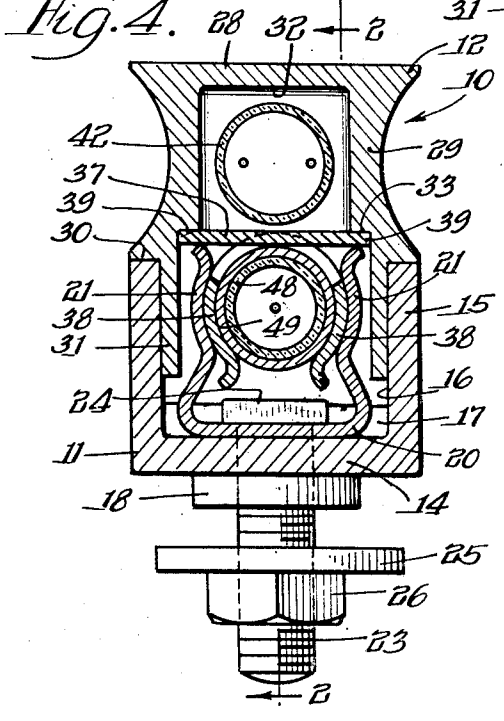


Fig. 5.

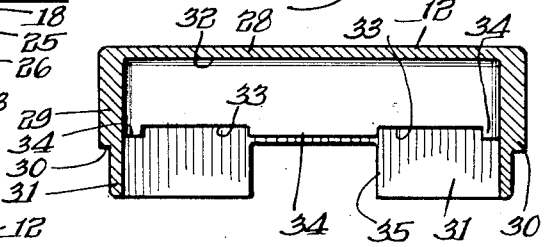


Fig. 6.

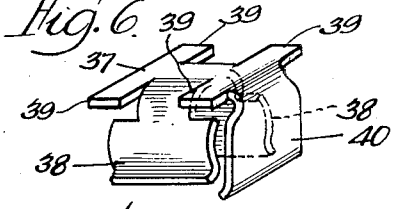
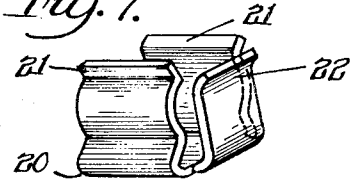


Fig. 7.



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INDICATING FUSE HOLDER

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15 Claims. (Cl. 200—121)

This invention relates to an indicating fuse holder.

The principal object of this invention is to provide an improved indicating fuse holder, which occupies a minimum of both panel space and cubical content, which is simple and rugged in construction, which carries within its enclosure the cartridge fuse and an indicating lamp for indicating when the fuse has operated or blown, which includes a cover containing the indicating lamp and spring clips for releasably carrying the cartridge fuse, which includes a base having spring clip members connected into the electrical circuit and which receive the fuse receiving spring clips for fusing the electric circuit and for detachably securing the cover to the base, which includes telescoping parts on the cover and base for guiding the cover onto the base, which includes a contoured surface on the cover for readily manually manipulating the cover with respect to the base, which has tongues integrally formed on the spring clips and the spring clip members for making and breaking the circuit as the cover is applied to and removed from the base, which has studs acting to secure the spring clip members to the base, to mount the fuse holder on a panel and the like and to electrically connect the fuse into the electric circuit to be protected, which has the indicating lamp and the cartridge fuse arranged in parallel to provide minimum cubical content and use of minimum panel space, which has a light transmitting cover for passing light from the indicating lamp when the fuse is blown, which has the fuse receiving spring clips simply secured in the cover, which is fool-proof in operation, and which is simple and inexpensive to manufacture and install.

Further objects of this invention reside in the details of construction of the indicating fuse holder 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 drawing, in which:

Fig. 1 is a perspective view of the indicating fuse holder of this invention;

Fig. 2 is a vertical sectional view through the indicating fuse holder taken substantially along the line 2—2 of Figs. 1 and 4;

Fig. 3 is a vertical sectional view taken substantially along the line 3—3 of Fig. 2 but showing the cover separated from the base;

Fig. 4 is a vertical sectional view taken substantially along the line 4—4 of Fig. 2 and showing the cover applied to the base;

Fig. 5 is vertical sectional view through the cover;

Fig. 6 is a perspective view of one of the fuse receiving spring clips carried by the cover;

Fig. 7 is a perspective view of one of the spring clip members carried by the base.

The indicating fuse holder of this invention is generally designated at **10**. It includes an elongated base **11** made

of electrical insulating material, preferably a thermosetting plastic such as Bakelite or the like. The indicating fuse holder also includes an elongated cover **12** made of light transmitting electrical insulating material, preferably a thermoplastic material such as nylon or the like.

The elongated electrical insulating base **11** has a bottom wall **14** and side walls **15** which provide an elongated cavity **16** in the base. The center of the bottom wall **14** is provided with an upwardly extending boss **17** and the bottom wall **14** is provided with a pair of downwardly extending circular bosses **18**.

Carried at each end of the cavity **16** in the base **11**, is a spring clip member **20**. These spring clip members **20** are substantially U shaped and are provided with a pair of spaced apart spring arms **21** and a spring tongue **22**. The bottoms of these spring clip members are each provided with a hole for the reception of a screw threaded stud **23**. The spring clip members **22** are arranged in the bottom of the cavity **16** of the base **11** against the central boss **17** with their tongues **22** outwardly disposed. The studs **23** extend through the holes in the spring clip members **20** and through holes in the circular bosses **18**, the studs **23** having square heads **24** which also engage the central boss **17** to prevent turning of the studs. The studs **23** operate to secure the spring clip members **20** in the base **11**, to provide electrical connections to the spring clip members **20** for including the same in an electric circuit to be protected, and mount the base on a panel **27** or the like. In this latter respect, the circular bosses **18** extend into suitable holes in the panel member **27** and electrical insulating washers **25** and nuts **26** secure the base **11** to the panel **27**. The circular bosses **18** and the electrical insulating washers **25** electrically insulate the studs **23** from the panel **27**.

The elongated electrical insulating cover **12** has a top wall **28** and side walls **29** defining an elongated cavity **32** therein. The side walls **29** are provided with an external shoulder **30** and a depending skirt **31** to be telescopically received in the base **11**. The skirt **31** and the shoulder **30** therefore operate to guide the cover with respect to the base. The cavity **32** inside of the cover **12** is provided with an internal shoulder **33** having spaced projections **34**. The sides of the skirt **31** have openings **35** which facilitate the insertion and removal of a cartridge fuse in the cover.

Carried in each end of the cavity **32** of the cover **12** is a fuse receiving spring clip **37**. The spring clips **37** are substantially U shaped, each having a pair of spring arms **38**. The spring clips **37** are each provided with four (4) ears **39** which are adapted to seat against the internal shoulder **33** of the cover **12**. Each spring clip **37** is also provided with a spring tongue **40**.

The internal shoulder **33** in the cavity **32** of the cover divides the cavity into an indicating lamp compartment adjacent the top wall **28** and a fuse compartment adjacent the skirt **31**. Located in the indicating lamp compartment of the cavity **32** is an indicating lamp **42** which may be a conventional neon lamp. The lamp **42** is connected to one spring clip **37** by a wire **43** and to the other spring clip **37** by a wire **44**, a resistance **45** and a wire **46**. In this way, the indicating lamp **42** is connected in series with the resistance **45** and is connected across the spring clips **37**.

After the indicating lamp **42** is so electrically connected to the spring clips **37**, the spring clips are forced into the cover **12** until their ears **39** engage the internal shoulder **33** in the cavity. In so doing, the side walls of the cover are distended outwardly. The spring clips **37** are then heated, preferably by induction heating, to cause the thermoplastic material of the cover, where it is engaged by the ears **39**, to melt. As a result, the side walls of the cover resume their original shape and the ears **39** become

embedded in the side walls of the cover, permanently to secure the spring clips **37** in the cover. The proper spacing of the spring clips **37** is assured by the spacing lugs **34** in the cover.

The spring clips **37** releasably receive the end caps **49** of a conventional cartridge fuse **48**. In this way, the cover **12** carries the indicating lamp **42** and the cartridge fuse **48** in parallel relation so that the fuse holder will occupy a minimum of both panel space and cubical content. The openings **35** in the skirt **31** permit ready manipulation of the cartridge fuse **48** with respect to the spring clips **37**.

When the cover **12**, carrying the cartridge fuse **48**, is applied to the base **11** it is guided by the telescoping skirt **31**. The fuse receiving spring clips **37** are received in the spring clip members **20** carried by the base and this action performs two functions, to secure the cover to the base and to connect electrically the caps of the fuse **48** to the studs **23** for fusing the electric circuit to be protected. As the cover is being applied to and removed from the base, the spring tongues **22** and **40** of the spring clip members and the spring clips resiliently contact each other for making and breaking the electric circuit. In other words, these spring tongues **22** and **40** operate to make and break the electric circuit independently from the spring arm portions **21** and **38** of the spring clips and spring clip members. To facilitate manual manipulation of the cover **12** with respect to the base **11** the side walls of the cover are contoured. For this purpose, as illustrated in the drawing, the side walls are made concave to provide a suitable gripping surface.

After the cover with its cartridge fuse has been applied to the base, and an overload occurs in the electric circuit, the cartridge fuse operates or blows, and as a result, the indicating lamp is connected into the circuit and is illuminated upon the blowing of the fuse. The light generated by the indicating lamp is transmitted through the cover **12** to indicate that the fuse has operated or blown. When this condition occurs, the cover may be readily removed and the cartridge fuse replaced.

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 to the appended claims.

I claim as my invention:

1. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities, an indicating lamp carried lengthwise in the elongated cavity of the cover, a substantially U-shaped outwardly facing fuse receiving spring clip carried by the cover in the cavity adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown.

2. In an indicating fuse holder for a cartridge fuse, an elongated electrical insulating base, a substantially U-shaped spring clip member carried by the base adjacent each end thereof means for electrically connecting the spring clip members into an electric circuit, an elongated electrical insulating and light transmitting cover for the base, an indicating lamp carried in the cover lengthwise thereof, a substantially U-shaped fuse receiving spring clip carried by the cover adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, and the sides of said elongated cover being contoured to facilitate manual manipulation of the cover with respect to the base.

3. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities, an indicating lamp carried lengthwise in the elongated cavity of the cover, a substantially U-shaped outwardly facing fuse receiving spring clip carried by the cover in the cavity adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, and the sides of said cover being contoured to facilitate manual manipulation of the cover with respect to the base.

4. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, studs extending through the spring clip members and the base for securing the spring clip members to the base, for mounting the fuse holder and for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities, an indicating lamp carried lengthwise in the elongated cavity of the cover, a substantially U-shaped outwardly facing fuse receiving spring clip carried by the cover in the cavity adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown.

5. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp

located lengthwise in the lamp compartment in the cover cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cover cavity adjacent each end thereof and having ears engaging the shoulder and the sides of the cavity for securing the same in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, and telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities.

6. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, studs extending through the spring clip members and the base for securing the spring clip members to the base, for mounting the fuse holder and for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp located lengthwise in the lamp compartment in the cover cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cover cavity adjacent each end thereof and having ears engaging the shoulder and the sides of the cavity for securing the same in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, and telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities.

7. In an indicating fuse holder for a cartridge fuse, an electrical insulating and light transmitting thermoplastic cover having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp located lengthwise in the lamp compartment of the cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cavity and having ears engaging the shoulder and the sides of the cavity and heat sealed into the sides of the cavity for securing the spring clips in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, and means for electrically connecting the lamp across the spring clips.

8. In an indicating fuse holder for a cartridge fuse, an electrical insulating and light transmitting thermoplastic cover having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp located lengthwise in the lamp compartment of the cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cavity and having ears engaging the shoulder and the

sides of the cavity and heat sealed into the sides of the cavity for securing the spring clips in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, and means for electrically connecting the lamp across the spring clips, the sides of said cover adjacent the fuse compartment having openings to facilitate insertion and removal of the cartridge fuse.

9. In an indicating fuse holder for a cartridge fuse, an electrical insulating and light transmitting thermoplastic cover having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp located lengthwise in the lamp compartment of the cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cavity and having ears engaging the shoulder and the sides of the cavity and heat sealed into the sides of the cavity for securing the spring clips in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, and means for electrically connecting the lamp across the spring clips, the sides of the cover adjacent the lamp compartment being contoured to facilitate manual manipulation of the cover.

10. In an indicating fuse holder for a cartridge fuse having a thermoplastic cover provided with a cavity having an internal shoulder and a pair of substantially U-shaped fuse receiving spring clips provided with ears, the method of securing said spring clips in the cavity against the shoulder comprising the steps of forcing said spring clips into the cavity with the ears thereof engaging the shoulder and engaging and distending the side walls of the cavity, and induction heating the spring clips to cause their ears to melt the side walls of the cavity where they are engaged by the ears to allow the side walls to resume their normal position and thereby imbed the ears in the side walls.

11. In a fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein having a central boss, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof and the central boss, studs extending through the spring clip members and the base and having square heads engaging the boss for securing the spring clip members to the base, for mounting the fuse holder and for electrically connecting the spring clip members into an electric circuit.

12. In a fuse holder for a cartridge fuse, an electrical insulating base, a pair of substantially U-shaped spring clip members carried by the base in spaced apart relation, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating cover for the base, a pair of substantially U-shaped fuse receiving spring clips carried by the cover in spaced apart relation for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse on said cover, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electrical circuit and for releasably securing the cover to the base, each of said spring clip members and spring clips being integrally provided with tongues which engage each other as the cover is being applied to and removed from the base for making and breaking the circuit.

13. In an indicating fuse holder for a cartridge fuse, an elongated electrical insulating base, a substantially U-shaped spring clip member carried by the base adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an elongated electrical insulating and light transmitting cover for the base, an indicating lamp carried in the cover lengthwise thereof, a substantially U-shaped fuse receiving spring

clip carried by the cover adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, each of said spring clip members and spring clips being integrally provided with tongues which engage each other as the cover is being applied to and removed from the base for making and breaking the circuit.

14. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities, an indicating lamp carried lengthwise in the elongated cavity of the cover, a substantially U-shaped outwardly facing fuse receiving spring clip carried by the cover in the cavity adjacent each end thereof for receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of said cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, each of said spring clip members and spring clips being integrally provided with tongues which engage each other as the cover is being applied to and removed from the base for making and breaking the circuit.

15. In an indicating fuse holder for a cartridge fuse, an electrical insulating base having an elongated cavity therein, a substantially U-shaped and outwardly facing spring clip member carried by the base in the cavity adjacent each end thereof, means for electrically connecting the spring clip members into an electric circuit, an electrical insulating and light transmitting cover for the base and having an elongated cavity therein, said cavity having an internal shoulder dividing the cavity into a lamp compartment and a fuse compartment, an indicating lamp located lengthwise in the lamp compartment in the cavity, a substantially U-shaped outwardly facing fuse receiving spring clip located in the fuse compartment of the cover cavity adjacent each end thereof and having ears engaging the shoulder and the sides of the cavity for securing the same in place, said spring clips holding the lamp in place in the cover and receiving the ends of a cartridge fuse to releasably mount the cartridge fuse lengthwise of the cover parallel to the lamp, means for electrically connecting the lamp across the fuse receiving spring clips, said fuse receiving spring clips being received in the spring clip members of the base when the cover is applied to the base for fusing the electric circuit and for releasably securing the cover to the base, and said lamp being illuminated for transmitting light through the cover when the cartridge fuse is blown, and telescoping means on the base and cover for guiding the cover on the base and for enclosing the elongated cavities, each of said spring clip members and spring clips being integrally provided with tongues which engage each other as the cover is being applied to and removed from the base for making and breaking the circuit.

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