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R. H. EARLE

1,927,157

INDICATING DEVICE FOR FUSES

Filed March 2, 1931

Fig. 1

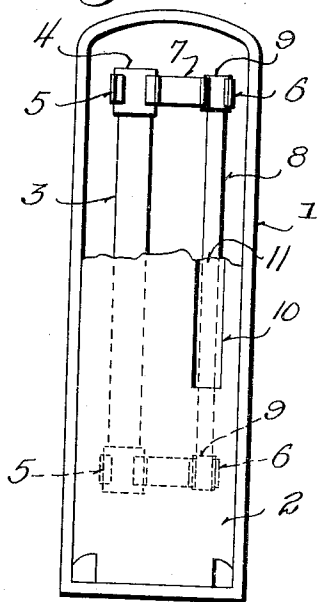


Fig. 2

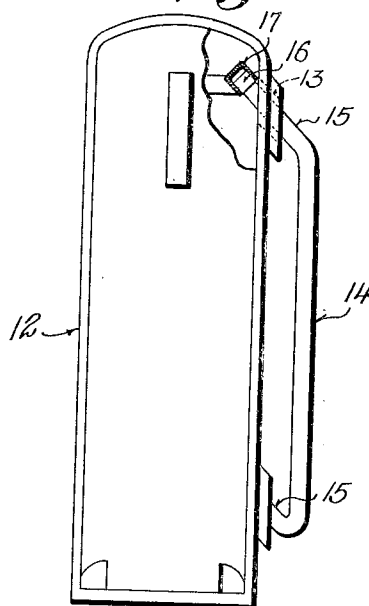


Fig. 3

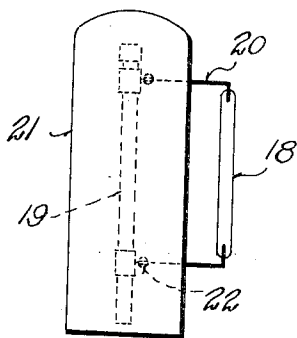


Fig. 4

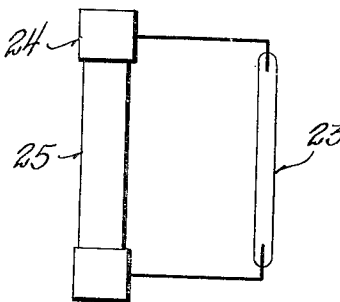
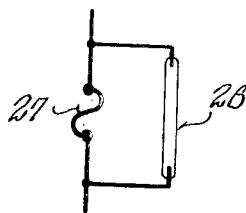


Fig. 5



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UNITED STATES PATENT OFFICE

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INDICATING DEVICE FOR FUSES

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2 Claims. (Cl. 200—121)

This invention relates to indicating devices for fuses.

With fuses, particularly high voltage fuses, it is frequently difficult to find which of several fuses have blown, and this difficulty is often complicated or emphasized by the fact that the high voltage fuses are very often carried in an enclosing container on the one hand, or are placed in a somewhat difficultly accessible position.

This invention is designed to overcome the defects noted above, and objects of this invention are to provide a novel form of indicating device for fuses, such, for instance, as high voltage fuses, which is so made that although the fuse may be located at a considerable distance from the operator or in a relatively difficultly accessible position, that nevertheless a definite and certain indication will always be given by the indicating device when the fuse has blown, so that the operator or attendant may at a glance find out the condition of the fuse.

Further objects of this invention are to provide an indicating device for a high voltage fuse which in no way lessens the factor of safety of the fuse, or in other words, which does not increase the chance of defective operation, but which maintains the same conditions of safety for the fuse as that possessed by the fuse prior to the addition of the indicating device.

In greater detail, objects of this invention are to provide an indicating device in the form of a glow tube, such as a neon tube, which is associated with the fuse and which is connected to opposite ends of the fuse, so that while the fuse is intact, a very small voltage is impressed on the neon tube or glow tube, but when the fuse is ruptured, a high voltage is impressed on the neon or other type of glow tube, thus causing the tube to light and give the desired indication.

Embodiments of the invention are shown in the accompanying drawing, in which:—

Figure 1 is a front view of a fuse structure equipped with a neon tube, such tube being located within the fuse box, a portion of the door of the fuse box being broken away.

Figure 2 is a face view of a further form of the invention, in which the neon tube is supported by the fuse box and projects outwardly from the box, such view showing a portion of the door of the fuse box broken away.

Figure 3 is a diagrammatic view showing the neon tube applied to an expulsion type of fuse.

Figure 4 is a view showing a unit consisting of a fuse capsule and a neon tube.

Figure 5 is a diagrammatic view showing an

ordinary link fuse with the neon tube connected thereto.

Referring to Figure 1 it will be seen that a fuse box or housing 1 has been provided and may be equipped with the usual door 2. Within the box a fuse structure, such as the tube or capsule 3 provided with end contacts 4, is positioned, such fuse being of any suitable type. The end contacts are received by contact clips or other contact members 5 in the usual manner.

A second pair of contact clips 6 are provided and are somewhat spaced laterally from the contact clips 5. These contact clips 6 are similar to the contact clips 5, are permanently positioned within the fuse box, and are joined to the contact clips 5 by means of the conductors 7.

A neon tube or other glow tube 8 is provided with end contact members 9 which are removably received within the contact clips 6 to thus removably hold the neon tube 8 in place.

The door 2 of the fuse box may be provided with an opening 10 and if desired, this opening may be closed by means of a glass or other transparent plate 11. It is preferable to close this opening if the fuse is intended for positioning outside of a building.

The invention may take other forms, for example, the fuse box 12, as shown in Figure 2, may be provided with downwardly slanting openings 13 adjacent opposite ends and preferably located on one side of the body thereof. The neon tube 14 may be removably carried by the fuse box and may be provided with upwardly slanting end portions 15, which are set at the same angle as the openings 13, so that the ends of the neon tube may be passed laterally and upwardly into the fuse box. The upper portion of the door shown in Figure 2 is broken away to more clearly show this construction.

The ends of the neon tube may be provided with contacts 16 which are removably held by spring clips, or other stationary contacts 17, such contacts 17 being connected to opposite ends of the fuse, as previously described.

Figure 3 shows the neon tube 18 connected to opposite ends of an expulsion type of fuse 19. This neon tube may be located exteriorly of the casing and may be provided with rigid or stiff terminals 20, which may be projected inwardly of the casing 21 and may be removably clamped by any suitable type of clamp, such as indicated diagrammatically at 22 in Figure 3, so that the tube can be removed by merely pulling it together with the terminals 20 laterally from the fuse box.

Figure 4 is a diagrammatic view showing a neon tube 23 connected to the end contacts 24 of a fuse indicated generally at 25. This figure is intended to diagrammatically show a permanent connection between the neon tube and the fuse so that the fuse and tube may be handled as a unit.

Figure 5 is a diagrammatic view showing a neon tube 26 connected to an ordinary type of link fuse 27.

10 In all forms of the invention it will be seen that the neon tube has its opposite ends electrically connected to the opposite ends of the fuse. When the fuse is intact, only a small voltage drop occurs and is impressed upon the terminals of the
15 tube. In view of the fact that these neon tubes have characteristics of starting to glow at a fairly definite high voltage, such voltage being controllable in the manufacture of the tubes, it is apparent that they will not light up unless the fuse
20 has been ruptured and the high voltage for which the tube is designed, impressed upon the terminals of the neon tube.

It is clear that it is within the province of this invention to provide a neon tube or any other suitable type of glow device or gaseous glow tube, and to so construct this tube that it will light at any desired voltage, such voltage being slightly less than that impressed upon the terminals of the fuse after the fuse has ruptured. It is thus
30 possible to provide neon tubes or other glow tubes which will cooperate with fuses for any desired voltage. However, although the invention is not to be understood as limited thereto, nevertheless it is preeminently suitable for use with high voltage
35 fuses.

It is obvious that the neon tube could be carried by the housing for the fuse either detachably or

otherwise, and it is also clear that the neon tube could be located at a point remote from the fuse if so desired.

It is obvious that any type of fuse, such for example as the expulsion type, liquid type, throttle type, cartridge type, link type, etc., could be used with the neon tube or glow device. 80

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed. 85

I claim:

1. An indicating fuse structure for high voltage fuses comprising a housing, terminals located within said housing, a fuse normally connected to said terminals, connecting means electrically connected to said terminals and rigid with said terminals, and a gaseous glow tube removably held by said connecting means and visible from the exterior of said housing, said gaseous glow tube having a high, substantially definite starting voltage characteristic. 90 95

2. An indicating fuse structure for high voltage fuses comprising a housing, terminals located within said housing, a fuse cartridge located within said housing and removably carried by said terminals, clips carried within said housing and electrically connected to said terminals, and a gaseous glow tube removably held by said clips and located within said housing, said housing including a door giving access to said fuse cartridge and said tube, and said housing having an aperture through which said tube is visible when said tube glows. 100 105 110

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