

Jan. 24, 1950

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2,495,252

INSULATOR

Filed March 16, 1948

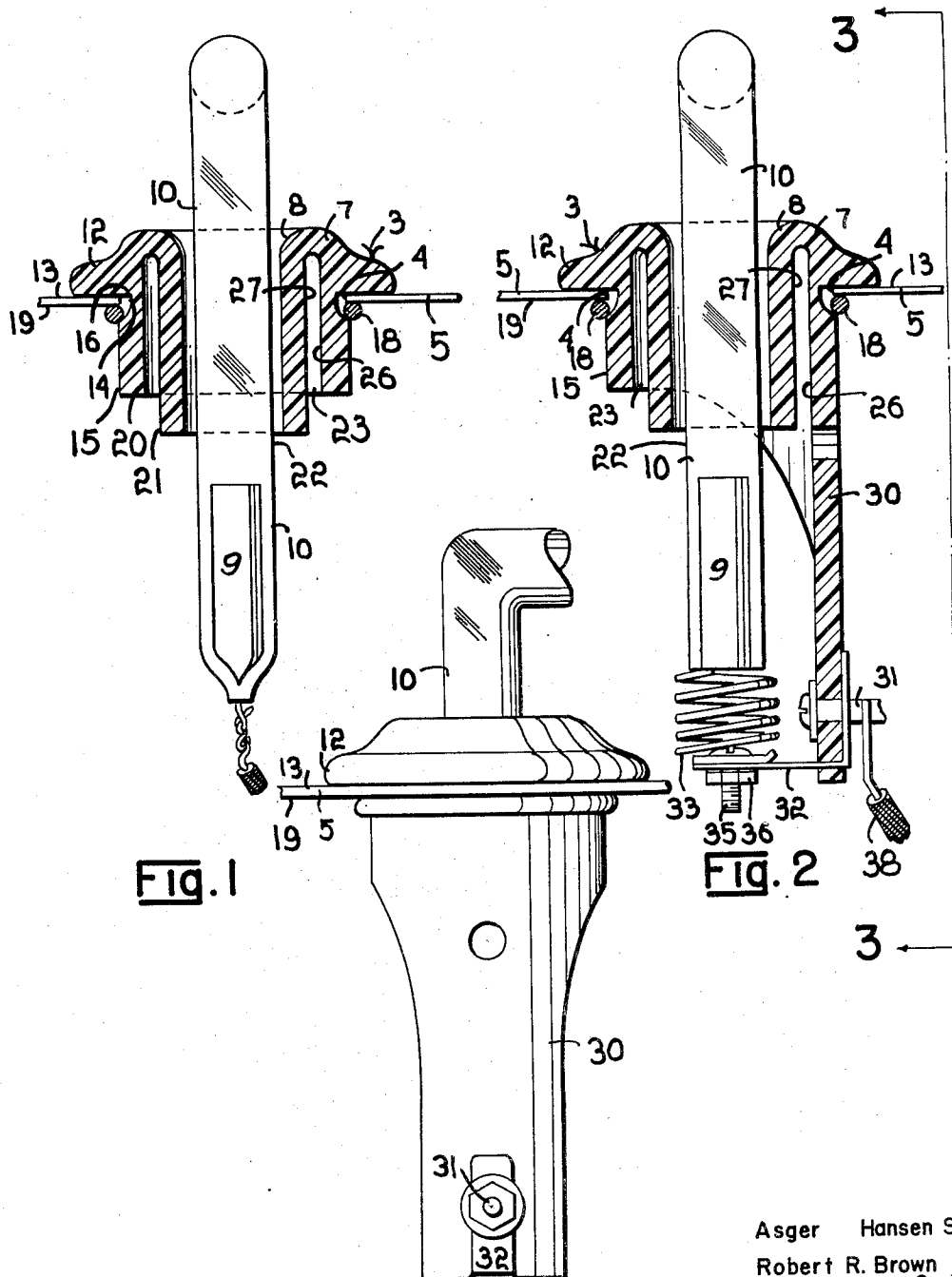


Fig. 1

Fig. 2

Fig. 3

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2,495,252

INSULATOR

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Application March 16, 1948, Serial No. 15,068

3 Claims. (Cl. 174-153)

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The invention relates to an improvement in insulators and is particularly adapted for use as insulating bushings and housings for passing illuminating sign elements outwardly through a plate or panel comprising the base of a sign.

In illuminated signs embodying what is commonly termed "neon tubes" of the neon type, a relatively high voltage is required to illuminate the gas filled luminescent tubes comprising the sign. A great deal of difficulty is experienced in the use of this relatively high voltage in that it leaks over insulating surfaces and thus finds a parallel path of conductivity. Particularly does this leakage occur between luminescent tubes and the sign plate through which the tubes pass, and such leakage eventually results in the destruction of the tubing and, as well, the transformer supplying the high voltage energy. The leakage between the tube and the sign plate is increased when the housing or bushing, contacting the sign plate, and the tube, become damp in wet weather, such leakage frequently progressing to form a short circuit between the two. It has been found, also, that bugs, which are attracted towards the sign stick to such tubes and form a conducting material between the sign plate and the tubes.

The present invention is directed to an improved insulator herein described as a housing or bushing which is adapted to receive a tubular luminescent element mounted on a sign plate, which housing or bushing is provided with a re-entrant passage or air space to effectively insulate the electrode from the sign plate.

Another object of the invention is to provide an insulator for passing a luminescent tube through a sign plate which insulator can be removably secured to the sign plate and which is provided with a re-entrant passage to provide an elongated surface for leakage, and also an air space which cooperate to minimize leakage between the tube and the plate.

Still another object is to provide an insulator to surround an element to be insulated, such insulator having an annular reentrant passage about, but spaced from, such element whereby there is provided an extended surface and an air space which effectively prevent electrical leakage over the surface of the insulator to the element.

Other objects and advantages of the invention will become more readily apparent from a consideration of the following description and drawing, wherein:

Fig. 1 is a vertical sectional view of an insulator embodying the invention and comprising a

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bushing showing in elevation a luminescent tube positioned therein.

Fig. 2 shows a vertical sectional view of an insulator housing with a tube positioned therein and illustrates a means of conducting an electrical current to the electrode or illuminating tube.

Fig. 3 is a view on the line 3-3 of Fig. 2.

The preferred embodiment of the invention is illustrated in Figs. 1 and 2 and is shown as comprising the insulator denoted generally at 3 positioned in the opening 4 of the sign plate 5. The receptacle 3 comprises the annular element 7 which is provided with the opening 8 extending therethrough arranged to pass the illuminating tube having an electrode 9 therein.

The insulator 3 may be positioned on the sign plate 5 in any suitable manner, and to this end there is formed thereon a flange 12 arranged to abut one side 13 of the sign plate 5. A groove 14 is arranged in the outer periphery 15 of the insulator 7 and immediately adjacent the base 16 of the flange 12. A snapping 18 fits in the groove 14 and is arranged to abut the side 19 of the sign plate 5. In this manner the housing or receptacle 25 can be readily positioned on a sign plate.

Heretofore, a great deal of difficulty has been experienced by the leakage of voltage along the surface or periphery 15 of the insulator 7. Such electrical energy leaks around the edge 20 across the surface 21 and thence discharges to the tube 10 proximate the point 22. This leakage is of course increased when the surfaces 15 and 21 become damp, and in any event it leads to ultimate destruction of the tube 10 and attendant damage, as well as loss of use of the sign pending repair.

Also, it has been found that insects and bugs, which are attracted to the sign, become stuck between the housing 7 and the tubing 10 adjacent the point 22 on the surface of such tube, and the electrode therein thereby forming a leakage path between the sign plate 5 and the illuminating tube 10.

In order to prevent destructive leakage in the manner above described, the present invention provides a re-entrant passage 23 adjacent the opening 8 and extending about the tube 10. This toroidal reentrant passage preferably extends outwardly beyond the plane of the side 13 of the plate 5 whereby there are provided concentric cylindrical surfaces 26 and 27 joined at their outermost ends. By virtue of such construction the surfaces 26 and 27 will remain dry even in the most severe storms thereby preventing leakage which would otherwise take place. It is to be noted that the surface over which leakage must

occur is greatly increased. At the same time an air space is provided which assists in resisting the entrance of moisture.

The housing, as shown in Fig. 2 and embodying the invention, is provided with an arm 30 which extends rearwardly and longitudinally of the housing 7. Secured adjacent the lower end of the arm 30 by suitable means such as the lug 13 is a bracket 32 adapted to receive the resilient contact 33 thereon. The resilient contact may be secured to the bracket 32 by any suitable means and is shown as being retained in position by the bolt 35 and the nut 36. The lug 31 also functions as a high potential terminal to which a cable 38 may be secured to supply electrical energy through the bracket 32 and the contact 33 to the illuminating tube 10.

While it is believed that the construction and operation of the invention is apparent from the foregoing, by way of further illustration and amplification it will be assumed that the device is to be secured to an electrical sign having the front plate 5 through which the tubular illuminating elements 10 are to pass. The flange 12 is fitted adjacent the front side 13 of the sign plate 5 while the snap ring or another suitable clamping device is arranged in the groove 14 to abut the rear side 19 of the sign plate 5 thereby positioning the housing or bushing 7 in the opening 4 through the sign plate.

Leakage of electrical energy along the surfaces 15 and 21 and the edge 20 to the electrode 10 adjacent the point 22 is eliminated by providing an air space which insulates the illuminating tube 10 from the sign plate 5. Such air space is formed by the reentrant passage 23 which extends into the housing or bushing 7 adjacent the opening 8 and is formed continuous about the tube 10. Before the electrical energy creeping along the surface 15 can contact the tube 10 approximate the point 22 thereon, it is necessary that it pass over the surfaces 26 and 27 of the reentrant passage. It has been found, as a practical matter, that this increased distance and the air space formed by the novel structure effectively prevent leakage which has heretofore caused damage to the illuminating tube and, as well, the transformer supplying energy to the sign.

Broadly, the invention contemplates a new and improved insulator which successfully prevents destructive leakage or discharge of electrical energy to the element intended to be insulated thereby.

What is claimed is:

1. An insulator for electric signs having a front

plate and tubular illuminating elements passing therethru comprising, an annular thickened body of insulating material, a central passage for the tubular element, a flange extending radially of said body and having a base to fit against the sign plate, a groove spaced from such base, wire retainer to fit said groove and said plate, an annular air gap extending into one end to provide inner and outer spaced walls, said gap extending from the rear of the body forwardly beyond the sign plate to increase the insulating effect of the body between the sign plate and the element.

2. In combination with an electric sign having a front plate and tubular illuminating electrodes, a receptacle formed of insulating material to receive a luminescent element extending through the sign plate, said receptacle having a passage therethrough to receive said element, a flange formed on said receptacle to abut the sign plate, there being a groove adjacent said flange, and lock means positioned in said groove to hold the sign plate and receptacle together, and a reentrant air gap in said receptacle concentric about said passage in which the illuminating element is positioned, said gap extending forwardly beyond said plate to insulate the sign plate from the element.

3. A receptacle for receiving luminescent elements passing through a sign plate comprising, an annular body formed of insulating material, means to secure said body in a sign plate, there being an opening through said body to receive the luminescent element, an annular reentrant passage adjacent said opening and extending forwardly thereabout beyond the plane of the sign plate to create air gap insulation from the element extending through the housing, and an arm extending rearwardly and longitudinally of said housing to receive an electrical terminal for connection with said luminescent element.

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