

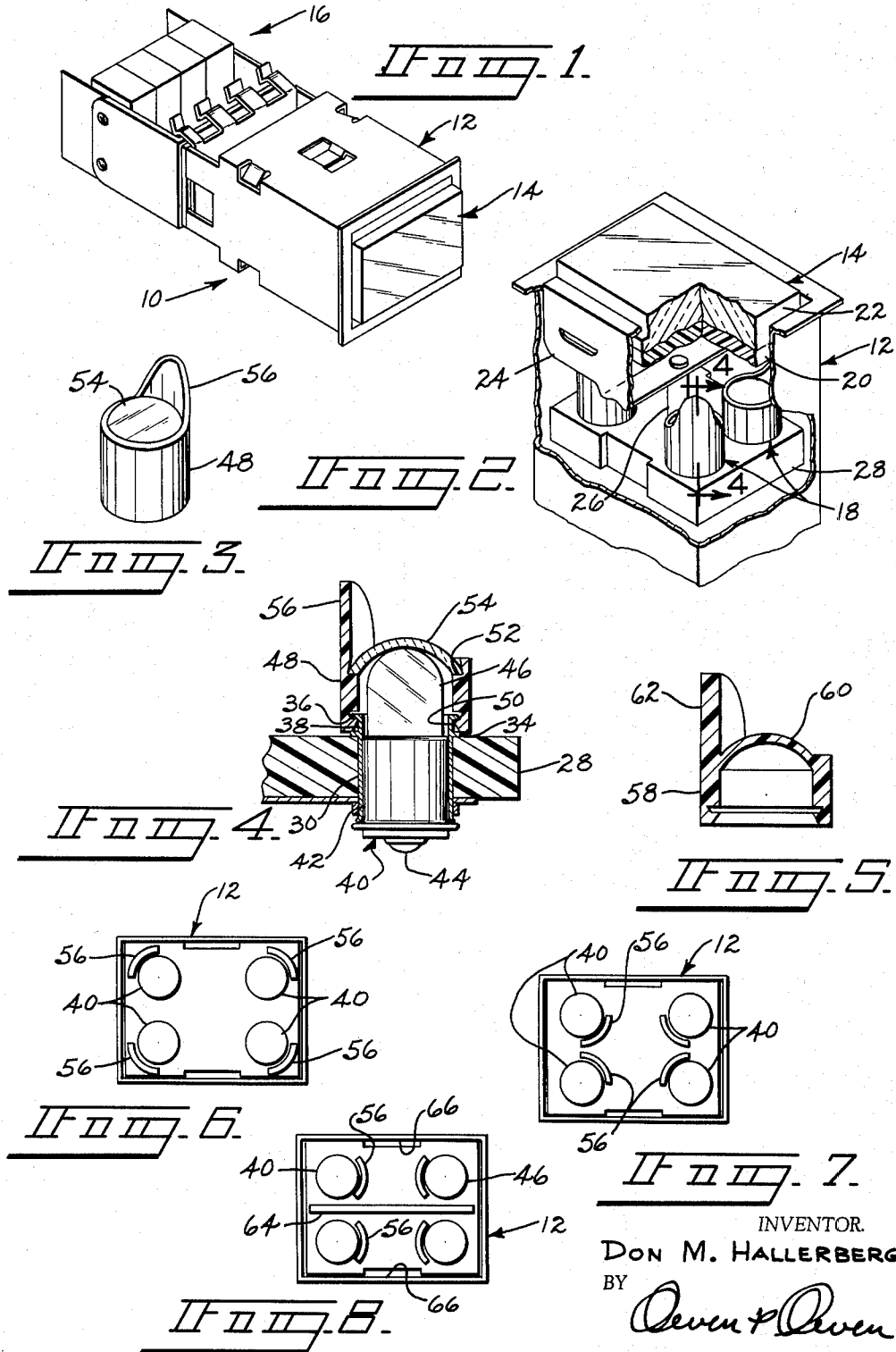
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ILLUMINATED SIGNALLING UNIT WITH LIGHT DIRECTING MEANS

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ILLUMINATED SIGNALLING UNIT WITH LIGHT DIRECTING MEANS

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This invention relates to an illuminated signalling unit having lamps with rotatable light-directing shields.

Illuminated signalling units of the general type with which the present invention is concerned are often used in conjunction with switches to monitor and control a condition. If a change in the condition occurs, it is indicated by signalling lamps of the unit and an operator can manually actuate the switch of the unit to change the condition. Signalling units of this nature are discussed more fully in a co-pending application of Don M. Hallerberg, Serial No. 111,806. These signalling units are used as warning light devices by either turning on lights or turning off lights when an abnormal condition occurs. In addition, the units are provided with lamp test circuits which can be built into or connected with the device to test the lamps therein in order to determine if a lamp is extinguished because of an abnormal condition to which it is responsive or because of failure of the lamp itself.

The signalling units carry a plurality of lamps, all of which indicate a single condition, or some of which indicate one condition and the rest of which indicate another condition. In either instance, there are at least two lamps to indicate any individual condition so that one lamp will still function even if another one burns out. More specifically, four lamps are usually used in such a unit with all four indicating one condition or two being responsive to one condition and the other two responsive to a second condition. If one lamp burns out, another will still function and the first can be replaced when convenient without interruption of the operation. In some instances, however, it is impossible to tell when one lamp has burned out. Consequently, all of the lamps could burn out without notice, with the result that if the lamps are intended to light when a given condition occurs, no notice thereof will be given to the operator. When the shield members according to the invention are used, however, the light from each lamp is restricted to a particular portion of the signal panel. Consequently, if a lamp burns out, it will be readily noticed because a definite dark area will be visible on the signal panel.

With some arrangements, on the other hand, the lamps do not provide a uniform distribution of light on the face of the signal, with the result that indicia on the face may be difficult to read. In such an instance, the lamp covers can be rotated relative to the lamps to place the shields thereof in such positions that they act as diffusers to spread the light more evenly over the signal face.

The new lamp covers are also provided with glass inserts which can be of any color so that a desired effect can be achieved without the necessity of employing special colored lamps therefor.

It is, therefore, a principal object of the invention to provide a signalling unit with rotatable shield members for lamps thereof.

Other objects and advantages of the invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawing, in which:

FIG. 1 is a view in perspective of a signalling unit employing lamp shield members embodying the invention;

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FIG. 2 is a fragmentary view in perspective, with parts broken away, of the signalling unit of FIG. 1;

FIG. 3 is a greatly enlarged view in perspective of a lamp shield member embodying the invention;

FIG. 4 is a view in vertical cross section taken along the line 4-4 of FIG. 2;

FIG. 5 is a view similar to FIG. 4, but on a smaller scale, of a slightly modified lamp shield member; and

FIGS. 6-8 are diagrammatic views of three possible lamp arrangements for the signalling unit of FIGS. 1 and 2.

Referring to the drawings, and more particularly to FIG. 1, a signalling unit 10 embodying the invention includes a lamp housing 12, a signalling panel 14, and a switch unit 16.

As shown in FIG. 2, the lamp housing 12 contains a plurality of lamp assemblies 18 which are suitably wired either to light or to be extinguished upon the occurrence of a predetermined condition. Light from the assemblies 18 is transmitted to the signal panel 14 which includes a translucent or diffusing layer 20 and an indicia-carrying layer 22. These are carried by a bracket 24 which is supported on a switch rod 26 which extends through a lamp mounting panel 28 to the switch unit 16. When a change in the light on the signal panel 14 occurs, indicating a change in condition, the operator can push the panel 14 inwardly which moves the rod 26 inwardly to actuate contacts in the switch unit 16, as is disclosed in more detail in the aforementioned copending application. The switch unit 16 then causes the desired change in the condition, which change again can be indicated by the lamp assemblies 18 and the signal panel 14.

Referring more particularly to FIGS. 3 and 4, each of the lamp assemblies 18 includes a lamp socket 30 extending completely through the lamp mounting panel 28 with its lower end electrically connected to a metal grounding plate 32. The upper end of the socket 30 includes a shoulder 34 lying against the upper surface of the mounting plate 28 and an annular flange 36 which forms a groove 38 around the socket 30 in combination with the shoulder 34. A small lamp 40 is frictionally held in the socket 30 with a casing 42 of the lamp grounded through the socket 30 and the plate 32 and with a central terminal button 44 of the lamp 40 being connected to a suitable electrical contact (not shown). A glass bulb 46 extends from the casing 42 above the lamp socket 30.

A cylindrical wall 48 of suitable flexible and resilient material such as plastic or rubber is located around the upper end of the socket 30 and has an inwardly extending flange 50 at the lower end thereof which cooperates with the groove 38 of the socket 30, the wall 48 being spaced from the bulb 46 to prevent undue build-up of heat. Near the upper end of the cylindrical wall 48 is a shoulder 52 which holds and supports a suitable glass insert or lens 54 of arcuate cross section. The cylindrical wall 48 is slightly smaller than both the flange 36 of the socket 30 and the insert 54 so as to hold both securely. A shield 56, generally in the shape of a segment of an ellipse, is structurally integral with about one-third of the circumference of the cylindrical wall 48 and extends upwardly therefrom a distance of approximately 50% to 100% percent of the height of the cylindrical wall 48. The shield 56 is preferably opaque, or substantially so, to restrict the passage of light from the glass insert 54 past the shield. At the same time, the shield 56 acts to diffuse and to reflect light and thus direct it more effectively above the lamp assembly 18, on the lamp side of the shield 56.

One of the important features of the lamp assembly 18 is that the wall 48 and the shield 56 can be rotated

on the socket 30 to position the shield 56 in any desired location. In some instances, the shield 56 is positioned so as to restrict the passage of light and sometimes is positioned to serve primarily as a reflector or diffuser of light. One part does the work of two and fewer parts thus need be stocked.

A slightly modified lamp member is shown in FIG. 5 and includes a wall 58, a lens 60, and a shield 62 which are made of one piece of colored silicone rubber, for example. The lens 60 is much thinner than the wall 58 and the shield 62.

Several examples of arrangements for the lamp assemblies 18 are shown in FIGS. 6-8. Referring to FIG. 6, the lamps 40 in the housing 12 are of two different colors, with the lower left and upper right lamps transmitting green light by means of the glass inserts 54 and the upper left and lower right lamps 40 transmitting red light. The lamps for the green and red light are electrically connected to separate circuits so that the green indicates one condition, and the red indicates a second condition, with all four lamps never being lighted simultaneously. With this arrangement, the light visible on the signal panel 14 ordinarily is nonuniform with opposite corners being either relatively bright or dim which renders it difficult to read the insignia carried on the upper layer 22. To overcome this problem, the cylindrical walls 48 are rotated on sockets 30 so that the shields 56 lie between the lamps 40 and the corners of the housing 12 in the positions shown in FIG. 6. The shields 56 thereby reflect the light more effectively over the panel 14 and increase the uniformity of light distribution. If one of the two lamps of either diagonal pair burn out, this is still readily noticeable to the operator observing the panel 14, because of the relatively wide spacing between the diagonal lamps.

Referring to FIG. 7, the four lamps 40 are all electrically connected into one circuit so that all four operate simultaneously to indicate a condition, all four of the lamps 40 in this instance being either lighted or extinguished. Uniformity of the light distribution on the sign panel 14 is not a problem here, although the intensity might be slightly greater in the central portion of the panel. In this instance, the problem is that if one of the lamps 40 should burn out, or possibly even two diagonal ones, the change in the light on the sign panel 14 may not be noticed. In such an instance, the safety factor of having two or more bulbs to indicate a condition would be decreased or nullified. However, by employing the cylindrical walls 48 and the shields 56, and by rotating the shields 56 to a position 180° opposite to that of FIG. 6 with the shields now being located toward the center of the sign panel, if one of the lamps should burn out, it would be readily noticed on the panel 14 because the corresponding corner of it would be substantially darker. This is due to the fact that each of the shields 56 restricts the light from its associated lamp to the corner in which the lamp is located.

Referring to FIG. 8, the housing 12 in this instance has a central divider 64 which separates the housing 12 into two longitudinal compartments 66, each containing two of the lamps 40. The two lamps 40 in each compartment then operate together and separately from the two lamps in the opposite compartment, whereby one pair of lamps indicates one condition and the other pair of lamps indicates another condition. With this arrangement, it is possible for all four lamps to be lighted at the same time to indicate that both conditions have occurred. If either of the lamps 40 in either of the compartments 66 should burn out, again this might not ordinarily be noticed by the operator since the remaining lamp would

still provide fairly uniform light over the corresponding half of the sign panel 14 on the corresponding side of the divider 64. To overcome this, the shields 56 are rotated so as to be positioned toward the other lamp of the pair, as shown in FIG. 8, so that if one light should burn out, the area of the sign panel thereabove would be considerably darkened and readily noticed by the operator. This occurs because the shields 56 restrict the light from the associated lamps to the immediate areas above them.

It is to be understood that the above three examples are only to illustrate some applications in which the shields 56 can be used and are not intended to limit the scope of the invention.

Various modifications of the above described embodiment of the invention will be apparent to those skilled in the art, and it is to be understood that such modifications can be made without departing from the scope of the invention, if they are within the spirit and the tenor of the accompanying claims.

What I claim is:

1. In combination with a signalling unit employing a plurality of lamps, said lamps being located on a side of a signalling panel toward a face of the unit in sockets having annular, outwardly extending flanges near the upper ends thereof, a resilient member for each of said lamps comprising a cylindrical wall having an annular flange on the lower end, said lower flange extending inwardly to cooperate with the flange of one of said sockets, said cylindrical wall having a shoulder near the upper end thereof, a shield extending upwardly from about one-third the circumference of the upper end of said wall, said shield having a height from approximately 50% to approximately 100% of the height of the cylindrical wall, and a translucent lens member extending from and enclosing the upper end of said cylindrical wall, said wall having a diameter slightly less than that of said socket flange to fit securely therewith and yet be capable of rotation with respect to said socket.

2. In combination with a signalling unit employing a plurality of lamps, said lamps being located on a side of a signalling panel toward a face of the unit in sockets having annular, outwardly extending flanges near the upper ends thereof, a resilient member for each of said lamps comprising a cylindrical wall having an annular flange on the lower end, said lower flange extending inwardly to cooperate with the flange of one of said sockets, said cylindrical wall having a shoulder near the upper end thereof, a shield extending upwardly from the upper end of said cylindrical wall, and a light-transmitting lens member extending from and closing the upper end of said cylindrical wall, said wall having a diameter slightly less than that of said socket flange to fit securely therewith and yet be capable of rotation with respect to said socket.

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