May 18, 1948. L. M. HERTZ 2,441,815

MULTIPLE FILAMENT INCANDESCENT LAMP

Filed May 2, 1947

Fig. 1.

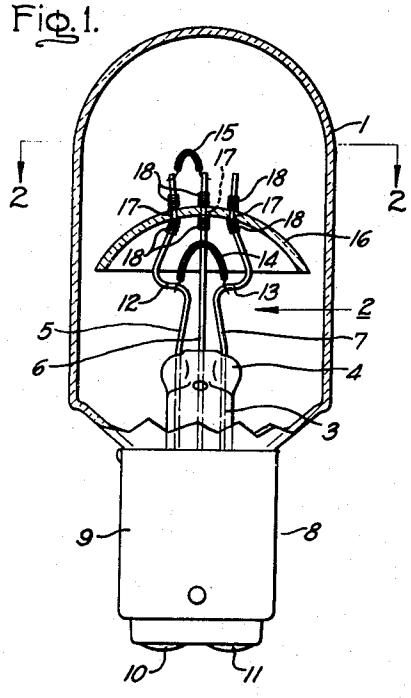


Fig. 4.

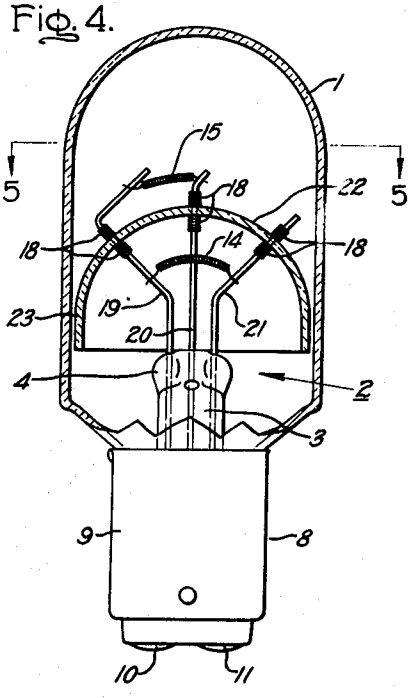


Fig. 2.

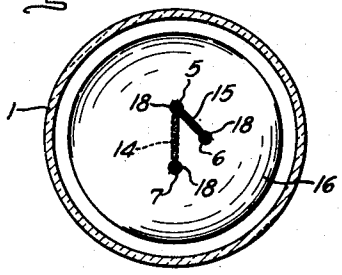


Fig. 3.

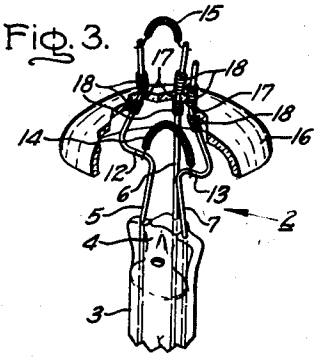


Fig. 5.

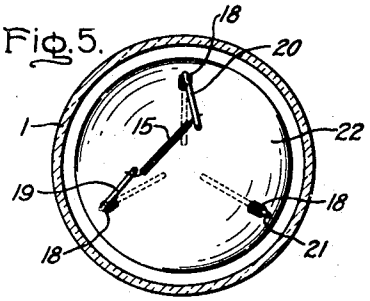
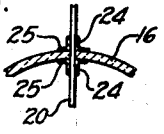


Fig. 6.



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MULTIPLE FILAMENT INCANDESCENT LAMP

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Application May 2, 1947, Serial No. 745,496

7 Claims. (Cl. 176—26)

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My invention relates to electric incandescent lamps in general and, more particularly, to a multiple filament signaling lamp adapted to emit beams of different colors upon independent energization of the filaments.

Light signaling means are in use at present on airplanes for flashing two alternate light beams or position signals of different colors, usually red and white. At present, two separate lamps are employed for this purpose, the two lamps being mounted in a housing provided with a suitable color filter and being alternately energized to produce the two differently colored light beams.

It is an object of my invention to provide a multiple filament electric incandescent lamp of novel design which will emit differently colored light beams forwardly of the lamp when its filaments are independently energized.

Another object of my invention is to provide an electric incandescent lamp of the above-mentioned character suitable for use as a signaling lamp on airplanes, which lamp will withstand the shocks and vibrations attending such use.

Further objects and advantages of my invention will appear from the following description of species thereof and from the accompanying drawing in which:

Fig. 1 is an elevation, partly in section, of an electric incandescent lamp comprising my invention; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary perspective view, partly broken away, of the mount structure shown in Fig. 1; Fig. 4 is a view similar to Fig. 1 showing a modified form of mount structure according to the invention; Fig. 5 is a transverse section on the line 5—5 of Fig. 4; and Fig. 6 is a fragmentary view of another modified form of mount structure according to the invention.

Referring to the drawings, the lamp there shown comprises a short tubular bulb or envelope 1 of clear glass provided at its neck end with a re-entrant stem 3 forming a part of the mount 2 of the lamp. The stem 3 extends into the bulb 1 in the direction of its axis and is provided with a press portion 4 within which a plurality (three in this case) of lead-in wires or in-leads 5, 6, 7 are sealed. The said lead-in wires are connected at their outer ends to separate terminals on a bayonet type base 8 mounted on the bulb, so as to provide two separate electrical supply circuits. Lead-in wire 5 is connected to the shell 9 of the base 8 and serves as a common lead for the two electrical supply circuits. The two other leads 6 and 7 are connected, respectively, to bottom contacts or eyelets 10 and 11 on the base.

The lead-in wires or in-leads 5, 6 and 7 extend into the bulb from the stem press 4 in the general direction of the bulb axis and arranged in triangular relation, with the in-leads 5, 7 disposed in a plane including the bulb axis and the in-lead

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6 disposed substantially mid-way between the in-leads 5, 7 but offset to one side of the plane thereof. At corresponding points intermediate the stem press 4 and their inner ends, the lead-in wires 5, 7 are bent laterally outward and away from each other to form laterally extending offset portions 12, 13 to which are connected the ends of an incandescible filament 14, preferably in the form of a coiled tungsten wire. A second filament 15, similar to the filament 14, is connected across the inner ends of the lead-in wires 5 and 6. As shown, the two filaments 14, 15 are spaced laterally of the bulb axis, with the lower filament 14 more or less centered with respect to the bulb axis and lying in the plane of the lead-in wires 5, 7 and with the upper filament 15 offset slightly to one side of the bulb axis (Fig. 2).

Mounted on the lead-in wires 5, 6, 7 between the two filaments 14, 15 is a cupped or concave color filter or shield 16, preferably of colored glass, for transmitting light rays within a certain color band only of the light spectrum. For the particular airplane signaling purpose for which the illustrated lamp is intended to be used, a red filter 16 is employed for transmitting only those radiations in the red color band or near thereto. The color filter 16 is mounted on the lead-in wires in a position centered wth respect to the bulb axis, with its concave or recessed side facing the stem 3 and at least partially enclosing the lower-most filament 14 so as to intercept the cone of light rays emanating from the said filament within a cone angle of approximately 180° or thereabouts.

For supporting the filter 16 in place on the lead-in wires, apertures 17 are provided in the filter through which the lead-in wires extend with a close fit therebetween. The lead-in wires 5, 6, 7 thus hold the filter 16 in place laterally of the bulb. For holding the filter 16 in place longitudinally of the bulb, suitable retaining means may be provided on the lead-in wires. In accordance with the invention, the said retaining means may comprise slip-over retainer members in the form of wire slip-over coils 18 mounted on the lead-in wires 5, 6, 7 on each side of the filter, with the proximate ends of the pair of slip-over coils on each lead-in wire engaging and compressed against the opposite sides of the filter. The slip-over coils 18 are suitably fastened to the lead-in wires (as by welding, for instance) at their ends remote from the filter 16, i. e., at the distal ends of each pair of slip-over coils on each lead-in wire, whereby the ends of the coil bearing against the filter are free to move along the lead-in wire. Being secured to the lead-in wires under compression, the slip-over coils 18 thus exert a constant spring pressure against the opposite sides of the filter which, coupled with the three-point support of the filter, serves to effectively hold the latter in place on the lead-in wires against tilting or

other movement thereon under all normal conditions of service of the lamp.

The modified lamp construction shown in Figs. 4 and 5 is similar to that of Figs. 1–3 except that the three lead-in wires 19, 20 and 21 are spread or flared out, inwardly of the stem 3, so as to support the color filter 22 at points more widely spaced than in the case of the form of invention shown in Fig. 1. In this way, a firmer three-point support for the filter is provided. The filter 22 in Figs. 4 and 5 also differs from the filter 16 of Fig. 1 in that it is provided with a cylindrical extension 23 at its periphery which extends down beyond the lower filament 14 for the purpose of intercepting a great proportion of the light rays from the said filament than in the case of Fig. 1.

Instead of using wire slip-over coils 18 for holding the color filter 16 or 22 in place on the lead-in wires, eyelets or hollow rivets 24 may be employed as retaining members for the filter, as shown in Fig. 6. As in the case of the wire coils 18, the eyelets or rivets 24 may be welded in place on the lead-in wires, with the color filter 16 or 22 clamped between the flanged portions 25 of the eyelets.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric incandescent lamp comprising a light-transmitting glass bulb, a plurality of lead-in wires sealed through said bulb and extending thereinto, a pair of filaments in said bulb connected across different ones of said lead-in wires for independent energization, a shield disposed within said bulb between said filaments and provided with apertures through which the lead-in wires extend with a close interfit, and slip-over retainer members fastened on said lead-in wires on opposite sides of said shield and in engagement therewith to hold it in place on said lead-in wires.

2. An electric incandescent lamp comprising a light-transmitting glass bulb, a plurality of lead-in wires sealed through said bulb and extending thereinto, a pair of filaments in said bulb connected across different ones of said lead-in wires for independent energization, a shield disposed within said bulb between said filaments and provided with apertures through which the lead-in wires extend with a close interfit, and wire slip-over coils fastened on said lead-in wires on opposite sides of said shield and compressed against the said opposite sides of the shield to thereby hold it in place on said lead-in wires.

3. An electric incandescent lamp comprising a light-transmitting glass bulb, three lead-in wires sealed through said bulb and extending thereinto in the general direction of the bulb axis, a pair of filaments in said bulb spaced longitudinally of the bulb axis and connected across different ones of said lead-in wires for independent energization, a shield disposed transversely within said bulb between said filaments, said shield being provided with three triangularly arranged apertures through which the lead-in wires extend with a close interfit to provide a three-point support for said shield, and retaining means on each of said lead-in wires on opposite sides of said shield and in engagement therewith to hold it in place on said lead-in wires.

4. An electric incandescent lamp comprising a light-transmitting glass bulb, three lead-in wires sealed through said bulb and extending thereinto in the general direction of the bulb axis, a pair of filaments in said bulb spaced longitudinally of the bulb axis and connected across different ones of said lead-in wires for independent energization, a shield disposed transversely within said bulb between said filaments, said shield being provided with three triangularly arranged apertures through which the lead-in wires extend with a close interfit to provide a three-point support for said shield, and a pair of wire slip-over coils fastened on each of said lead-in wires on opposite sides of said shield and compressed against said shield to thereby hold it in place on said lead-in wires.

5. An electric incandescent lamp comprising a light-transmitting glass bulb having a re-entrant stem, a plurality of lead-in wires sealed through said stem and extending into the bulb in the general direction of the bulb axis, a pair of filaments in said bulb spaced longitudinally of the bulb axis and connected across different ones of said lead-in wires for independent energization, a cupped color filter disposed within said bulb between said filaments with its cupped side facing the stem and at least partly enclosing the filament nearest the stem, said filter being provided with apertures through which the lead-in wires extend with a close interfit, and wire slip-over coils fastened on said lead-in wires on opposite sides of said filter and compressed against the said opposite sides of the filter to thereby hold it in place on said lead-in wires.

6. An electric incandescent lamp comprising a light-transmitting glass bulb, a plurality of lead-in wires sealed through said bulb and extending thereinto, a pair of filaments in said bulb connected across different ones of said lead-in wires for independent energization, a shield disposed within said bulb between said filaments and provided with apertures through which the lead-in wires extend with a close interfit, and a pair of wire slip-over coils mounted on each of said lead-in wires on opposite sides of said shield, each pair of said coils having their distal ends welded to the respective lead-in wire with the coils compressed against the said shield to thereby hold it in place on said lead-in wires.

7. An electric incandescent lamp comprising a light-transmitting glass bulb, a plurality of lead-in wires sealed through said bulb and extending thereinto, a pair of spaced filaments in said bulb connected across different ones of said lead-in wires for independent energization, a cupped colored glass filter disposed within said bulb between said filaments, said filter being provided with a plurality of widely spaced apertures located adjacent the maximum diameter of said filter and said lead-in wires being spaced apart inwardly of the bulb to extend through the said apertures with a close interfit, and wire slip-over coils fastened on said lead-in wires on opposite sides of said filter and compressed against the said opposite sides of the filter to thereby hold it in place on said lead-in wires.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,391,922	Roper	Jan. 1, 1946