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MULTIPLE LAMP BLOCK INDICATOR

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The invention relates to illuminated indicators of the type commonly known as “block indicators” and generally described in the pending application, Serial No. 392,312, of Frank A. Harrington and Thomas W. Jentges, filed April 21, 1953. A plurality of small electric lamps are housed in casings of hollow form, with faces of the casings being translucent and in some instances having indicia for identifying the signal which is indicated by the illumination thereof. The indicator lamps may be mounted on instrument panels, such as those of aircraft, where a large number of operative units, such as servo-units, are utilized—operating conditions of the servo-units being reflected through the indicator lamps.

A particular problem is to provide a lamp assembly which requires a minimum amount of space so that a large number of such lamps can be congregated on a single instrument panel.

An object of the invention is to provide an indicator lamp assembly which may accommodate a selected plural number of lamps up to a maximum of five or six, on a single lamp base.

Another object of the invention is to provide a lamp base having electrical conductor parts which are arranged to establish parallel connections to the terminals of two or more lamps without encountering any necessity for increase in size of said parts.

Another object is to provide a lamp assembly including the combination of a socket unit for mounting a plurality of lamps, together with a cap for shading the lamps, and the combination embodying a very simple yet effective release mechanism between the socket unit and the cap, of a character such as to accommodate maximum compactness.

Other objects and advantages will be apparent upon examination of the following specification and appended drawings in which:

Fig. 1 is a sectional view through a block indicator embodying the invention wherein two lamp sockets are employed, one lamp being removed;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is an exploded view of the invention of Figs. 1, 2 and 3;

Fig. 5 is a diagrammatic view showing the electrical circuitry;

Fig. 6 is a modified form of the invention showing a three lamp arrangement; and

Fig. 7 is another modified form of the invention showing a four lamp arrangement.

In Figs. 1 through 4 of the drawings the apparatus is shown on a linear scale which is magnified approximately three times.

As each of one form in which the invention may be embodied, we have shown, in Figs. 1 through 5, a two-lamp block indicator assembly anchored to a mounting panel 2 provided with openings 3 and 4 through which sockets 5 and 6 of the indicator assembly project. The indicator assembly includes a terminal socket unit, indicated generally at 7, anchored to the panel 2, and a block indicator casing or cap 8 which is attached to the terminal socket unit. Cap 8 is of translucent material (e. g. a synthetic resin plastic material) and may carry selected indicia on its front face.

A base 9, of metal, has a central opening defined within a circular collar 10 on the bottom 11 thereof, and has an internally threaded cylindrical arm 11′. A ground terminal 12 is mounted on collar 10 and is tightly secured by an outwardly turned flange on the end of the collar.

A socket block 13, of insulating material, has a head 14 of circular disc form, and an externally threaded, integral, concentric cylindrical skirt 15 projecting axially therefrom. Head 14 has therein a pair of diametrically opposed, threaded socket openings 17 which terminate in segmental apertures 16 in skirt 15. Sockets 5 and 6 are threaded into the respective socket openings 17. The insulating block 13 is threaded into the base to a depth where the annular shoulder 18, constituting the under surface of head 14, is seated against the rim of base 9.

A “hot” terminal 19 is mounted in the base 9 so as to be insulated therefrom, by means of a mounting comprising a grommet mounting block 20 which carries a circular conductor disc 21. Disc 21 is received concentrically within the cylinder defined by the inner wall of collar 10, the periphery of the disc being uniformly and continuously offset from the inner wall of collar 10. The mounting block is formed of insulating material with a head portion 22 resting against the bottom of base 9 and an axially directed body portion projecting through the opening 10 in the base. An insulating washer 24 is positioned between the “hot” terminal 19 and the base flange 11. A conductor rivet 23 has heads at its opposite ends peened to anchor the “hot” terminal assembly relative to the base 9. Electrical current is conducted from the terminal 19 through the conductor rivet 23 and thence to the conductor disc 21.

Each indicator lamp 29 has a cylindrical base cap 25 which is electrically connected in a conventional manner to one end of the lamp filament, the other end of the filament being connected to a central terminal 26 which engages the conductor disc 21 when the lamp and socket is assembled to the insulating block 13. The assembly of the lamps in their sockets 5 and 6 simply involves inserting the lamps into the open ends of the sockets from below, a base flange 27 on each cartridge engaging the lower end of the respective socket. Then the lamp sockets are threaded into the threaded openings 17 in the socket block 13 until their annular shoulders 28 engage the face of the block. When the lamp sockets are thus installed, the peripheral flange 27 makes electrical contact with the threads of base 9 which in turn is in electrical contact with ground terminal 12. When more lamps mounted in one terminal unit assembly, the base 9 serves as a common ground conductor for the several lamps. It will be understood that the socket openings 17 are arranged symmetrically around the axis of block 13, thereby assuring that the circumferential flange 27 on each lamp base will make contact with the conductor base 9 when the lamp sockets are threaded into the insulating block.

The conductor disc 21 serves as a common conductor electrically connecting the terminal post 26 of each lamp to the single “hot” terminal 19 through a conductor rivet 23. Fig. 5 schematically demonstrates the electrical circuitry of the terminal unit assembly when two lamps are utilized. When more than two lamps are utilized the connections are established in the same manner with each disc 21 providing a “hot” connection for each lamp and the single conductor base 9 providing a ground connection for each lamp. Thus each lamp is connected in parallel to a current supply circuit communicating with the terminal bars 12 and 19.

Each of the sockets 5, 6 has a segmental cylindrical sleeve 30 projecting axially from its base and surrounding a major portion of the lamp 29 which is mounted in the socket. Sleeve 30 comprises a plurality of circumferentially separated fingers each having an outwardly thickened tip, such tips collectively constituting an external radial flange 30′.

Cap 8 has a plurality of cylindrical chambers 31 positioned to receive the respective sleeves 30 of sockets 5, 6, the cylindrical walls of chambers 31 being fittig snugly, with a friction fit, to the segmental flanges 30′. The fingers comprising sleeves 30 are sufficiently resilient to spring inwardly slightly upon entering chambers 31, and to maintain constant yielding expanding pressure against the walls of chambers 31, so as to sup-
port and hold cap 8 in place, completely enclosing sleeves 30 and bearing against panel 2. In the form of the invention shown in Fig. 6 three lamps are employed and the shade cap 8b may be of cylindrical form so as to best utilize the surface area within which the lamp chambers 31 are formed. The circuitry, however, between the lamps and the terminal post 29 and 39 may be established without any variations in the arrangement of the various parts which make up the terminal socket assembly 7 except that socket block 13b is provided with an additional lamp socket opening 17.

In the form of the invention shown in Fig. 7 four lamps are employed and the shade cap 8b may be of rectangular shape to best utilize the surface area within which the accommodating chambers are formed. Again the arrangement of the various parts of the terminal socket assembly 7 is not varied except that the insulating block 13b is provided with four socket openings 17, and in this instance the size of the socket block, conductor disc 21 and conductor base 9 may be increased slightly so as to accommodate the four lamp sockets.

We claim:

1. A block indicator: a cup shaped conductor base including a rim and a bottom having a central opening; a socket block of insulating material having a peripheral contour mating with that of the base, said socket block including an annular skirt mounted within said rim and a head covering the open side of said base and provided with a plurality of socket apertures, said socket block and base cooperatively constituting a casing; an insulator block mounted in said bottom and extending through said opening into said casing; a conductor post on the major axis of the indicator, mounted in said insulator block and extending therethrough into the casing; a flat sheet metal conductor within said casing, connected to said post and mounted on the inner end of said insulator block in a plane normal to said major axis and encircled by said skirt; a plurality of lamp sockets each having a body portion mounted within a respective socket aperture and a segmental sleeve portion projecting beyond said head; a plurality of lamps each having, as its terminals, a central contact seated against said conductor disc and a lateral contact engaged between the inner end of its respective socket and said base rim; external terminals connected to said base and to the outer end of said conductor post respectively; and external terminals connected to said base rim; and external terminals connected to said base and to the outer end of said conductor post respectively.

2. In a block indicator: a cup shaped conductor base including a rim and a bottom having a central opening; a socket block of insulating material having a peripheral contour mating with that of the base, said socket block including an annular skirt mounted within said rim and a head covering the open side of said base and provided with a plurality of socket apertures, said socket block and base cooperatively constituting a casing; an insulator block mounted in said bottom and extending through said opening into said casing; a conductor post on the major axis of the indicator, mounted in said insulator block and extending therethrough into the casing; a flat sheet metal conductor within said casing, connected to said post and mounted on the inner end of said insulator block in a plane normal to said major axis and encircled by said skirt; a plurality of lamp sockets each having a body portion mounted within a respective socket aperture and a segmental sleeve portion projecting beyond said head; a plurality of lamps each having, as its terminals, a central contact seated against said conductor disc and a lateral contact engaged between the inner end of its respective socket and said base rim; external terminals connected to said base and to the outer end of said conductor post respectively; and a shade cap of block form having therein a pair of cylindrical chambers in which said segmental sleeves are received with a friction fit such as to maintain said cap attached to said conductor base.

3. In a block indicator: a cup shaped conductor base including a rim and a bottom having a central opening; a socket block of insulating material having a peripheral contour mating with that of the base, said socket block including an annular skirt mounted within said rim and a head covering the open side of said base and provided with a plurality of socket apertures, said socket block and base cooperatively constituting a casing; an insulator block mounted in said bottom and extending through said opening into said casing; a conductor post on the major axis of the indicator, mounted in said insulator block and extending therethrough into the casing; a flat sheet metal conductor within said casing, connected to said post and mounted on the inner end of said insulator block in a plane normal to said major axis and encircled by said skirt; a plurality of lamp sockets each having a body portion mounted within a respective socket aperture and a segmental sleeve portion projecting beyond said head; a plurality of lamps each having, as its terminals, a central contact seated against said conductor disc and a lateral contact engaged between the inner end of its respective socket and said base rim; external terminals connected to said base and to the outer end of said conductor post respectively; and a shade cap of block form having therein a pair of cylindrical chambers in which said segmental sleeves are received with a friction fit such as to maintain said cap attached to said conductor base.
7. In a block indicator: a conductor base of cup shape including a cylindrical rim and a bottom having a central opening; an insulator block mounted in said opening; a conductor post extending axially through said insulator block; a conductor disc secured to the inner end of said conductor post; a socket block of insulating material including an annular skirt mounted within said rim and encircling said conductor disc and a head having a plurality of socket apertures, said head being seated against said rim; a plurality of lamp sockets each having a body portion mounted within a respective socket aperture; a plurality of lamps, each having, as its terminal, a central end contact seated against said conductor disc and a lateral contact engaged between the inner end of its respective socket and said base rim; and external terminals connected to said base and to the outer end of said conductor post respectively.

8. In a block indicator: a conductor base of cup shape including a cylindrical rim and a bottom having a central opening; an insulator block mounted in said opening; a conductor post extending axially through said insulator block; a conductor disc secured to the inner end of said conductor post; a socket block of insulating material including an annular skirt mounted within said rim and encircling said conductor disc and a head having a plurality of internally threaded, circular socket apertures, said head being seated against said rim, whereby said base and block cooperatively constitute a casing, encircling said disc; a plurality of lamp sockets each having a body portion threaded into a respective socket aperture; a plurality of lamps, each having, as its terminals, a central end contact seated against said conductor disc and a lateral contact of flange form engaged between the inner end of its respective socket and said base rim; and external terminals connected to said base and to the outer end of said conductor post respectively.

9. A block indicator light as defined in claim 8, wherein in each of said sockets there is a segmental sleeve portion projecting beyond said head, and a shade cap of block form having therein a plurality of cylindrical chambers in which said segmental sleeves are received with a friction fit such as to maintain said shade cap attached to said conductor base.

10. In a block indicator comprising: a conductor base, including an internally threaded rim and a bottom having an opening; a terminal anchored to the base; an insulator grommet mounted in said opening; a conductor post extending through said grommet out of contact with the base; a conductor disc carried by the inner end of said grommet and anchored thereto by said post; a socket block of insulating material threaded into the base; a lamp socket threaded into said block; a lamp in the socket, said lamp having, as its terminals, an annular flange in contact with said base rim, and a central contact engaging the conductor disc when the lamp and socket are assembled on the socket block.

11. In a block indicator: a conductor base of cup shape including an internally threaded rim and a bottom having a central opening; a socket block of insulating material including a threaded annular skirt threaded into said rim and a head seated against said rim, said head having socket openings arranged symmetrical to the axis thereof; lamp sockets mounted in said socket openings and projecting into the space encircled by said skirt; a conductor plate mounted within said space and exposed toward the lamp sockets, said conductor plate being carried by the base but insulated therefrom; lamps in the sockets, each having a central terminal in contact with the conductor plate and a lateral terminal in contact with the base.

12. A block indicator as defined in claim 4, wherein said cap is of elongated rectangular form and there are two of the lamps arranged on the longitudinal axis thereof.

13. A block indicator as defined in claim 4, wherein there are more than two of the lamps, arranged in equal circumferential spacing on a common circumference of the major axis of the indicator, and wherein said cap is cylindrical in form.

No references cited.