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BOMB RELEASE SIGNAL LAMP ASSEMBLY

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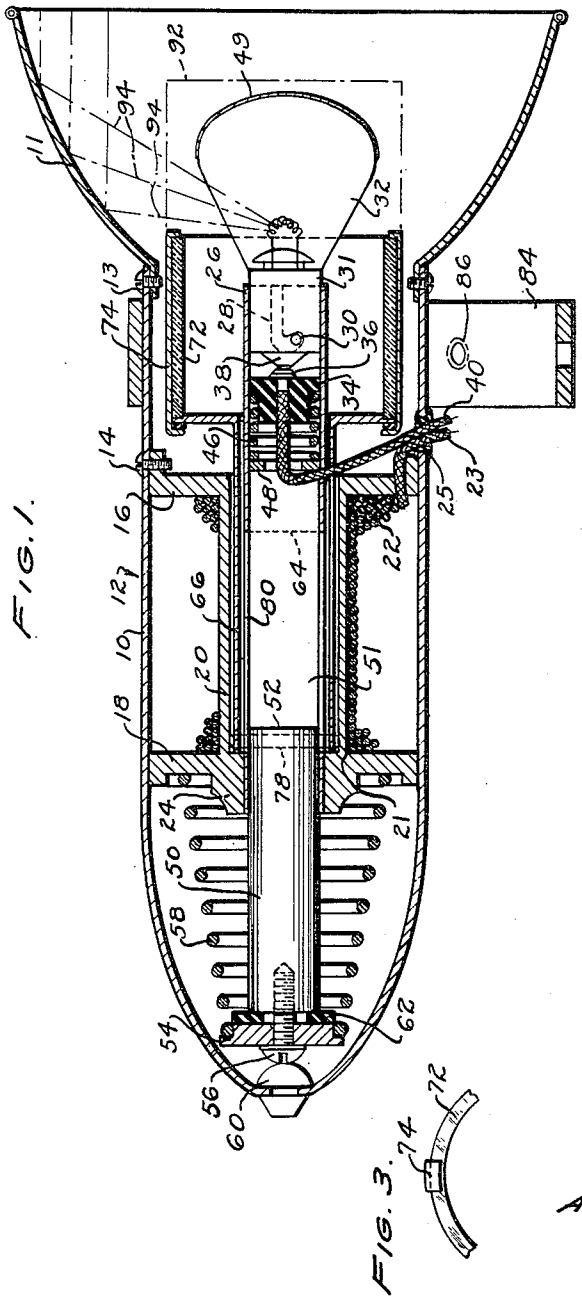


FIG. 1.

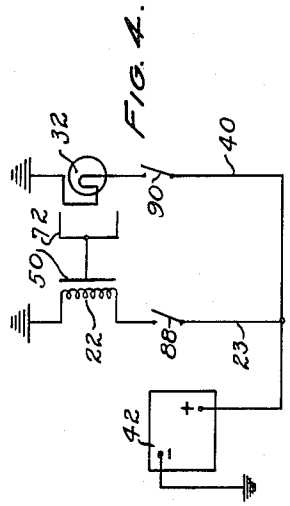


FIG. 4.

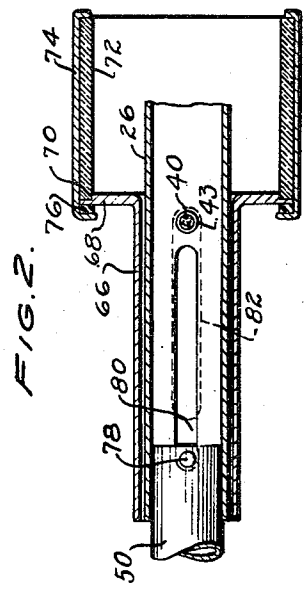


FIG. 2.

FIG. 3.

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BOMB RELEASE SIGNAL LAMP ASSEMBLY

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3 Claims. (Cl. 177—329)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a bomb release signal lamp, and especially to a remote controlled arrangement for flashing signals of different colors.

The bomb release lamp assembly, as presently employed in aerial warfare, is mounted in the tail of the bombing plane, and, due to the fact that this space must usually accommodate a tail gunner, the lamp is preferably made as compact as possible.

It is therefore an object of this invention to provide a lamp assembly which accomplishes this purpose with a single lamp bulb, yet without undue complication in the mechanism.

More specifically, an object of the invention is to arrange a single lamp bulb and a concave reflector in relatively fixed positions with respect to each other, then provide means for optional insertion of a medium between the lamp and the reflector which will alter the color of the signal without altering the color of the light emanating from the bulb.

These objects are attained in an embodiment of the invention to be hereinafter described, the description being facilitated by reference to the accompanying drawing, wherein:

Fig. 1 is a longitudinal central section through the improved lamp assembly.

Fig. 2 is a fragmentary axial section taken in a plane angularly spaced ninety degrees from the section Fig. 1.

Fig. 3 is a partial end view of Fig. 2.

Fig. 4 is a wiring diagram of the electric circuits.

In the drawing, a housing 10, at its forward end, has a concave reflector 11 secured thereto by the screws 13, and midway of its length, concentrically supports the solenoid assembly 12 which is fixed against axial movement in the housing by the screws 14.

The spool for the solenoid 12 comprises a front head 16 and a back head 18 connected by a tubular part 20, the three parts preferably being integral and of electrically conductive material, or, if they are made separately, at least the head 18 should be of metal in order that the inner end 21 of the coil 22 may be electrically connected thereto to provide a ground connection to the housing 10. The outer end of coil 22 terminates in a cable 23 which is brought out through the wall of the housing 10 through a grommet 25.

Extending rearwardly from the back head 18 is a hollow hub 24, in the opening of which a long tube 26 is press fitted and thereby rigidly supported. At the forward end, the tube 26 is slotted as at 28 to provide a bayonet lock for the pin 30 in the base of the lamp 32, whereby the outer terminal 31 of the lamp base is grounded through the head 18 to the housing 10. Inasmuch as the lamp socket is formed in the forward end of the tube 26, it may hereinafter be referred to as the lamp socket tube. The filament of the lamp 32 is positioned as nearly as practicable at the principal focus of the reflector 11.

An insulating member 34 carries a conductive pin 36 for conveying current to the inner terminal 38 of the lamp base. A cable 40 brings current from the power source 42 through an opening 43 in the wall of the tube 26 to the pin 36. The cable 40 may preferably emerge from the housing 10 through the same grommet 25 as is provided for the cable 23. The insulating member 34 is axially slidable in the tube 26, and a coil spring 46 reacts against a washer 48 which is fixed in the tube 26, thereby pressing the pin 36 into contact with the terminal 38. The lamp bulb itself may preferably be of clear glass with the front end shielded as at 49 to intercept the rays which fall beyond the front edge of the reflector 11.

A solenoid core 50 is slidable axially into the space 51 within the lamp socket tube 26, and is normally positioned, as in Fig. 1, with the forward end 52 of the core entered in the rearward end of the tube as shown. A retaining washer 54 is fastened to the outer end of the core 50 with a screw 56, and a coil spring 58, preferably under an initial stress, acts against the washer 54 and head 18, thereby sliding the core rearwardly until its movement is arrested by contact of the screw 56 with a stop 60 held in the housing 10. A buffer 62 of resilient material, also held in position by the screw 56, arrests forward movement of the core 50 by contact with the end of the hub 24, whereby movement of the core through its maximum stroke brings the front end 52 to the broken line 64.

The inside diameter of the tube 20 of the solenoid spool is considerably larger than the outside diameter of the lamp socket tube 26, thereby leaving space between these two tubes for the filter operating tube 66 to slide freely in an axial direction. The forward end of the tube 66 is flanged outwardly as at 68, the flange being shouldered at 70 to form a pilot which extends slightly into the interior of the colored glass filter

cylinder 72. Several narrow strips of metal 74 have one end bent around the forward end of the glass cylinder and the other around the rearward side of the flange to hold the cylinder and flange assembled. A resilient washer 76 may be interposed as shown, to minimize the danger of breaking the cylinder.

The extreme rearward end of the filter operating tube 66 overlaps the extreme forward end of the solenoid core 50, the two being joined together for unitary axial movement by a cross pin 78. Since the lamp socket tube 26 occupies the space between the core 50 and the filter operating tube 66, the tube 26 is provided with long slots 80 (see Fig. 2) to clear the pin 78 in its axial movement, and since the conductor 40 must pass through the walls of the axially movable filter operating tube 66 as well as through the stationary lamp socket tube 26, an elongated slot 82 is formed in the movable tube 66 adjacent the round opening 43 of the tube 26, whereby the slot 82 will clear the conductor in any position to which the tube 66 may be moved.

A mounting bracket 84 surrounds the housing 10 and is secured in position thereon by the clamp screw 86. The bracket is grounded, whereby the inner end 21 of the solenoid coil and the outer terminal 31 of the lamp have connection to the grounded side of the battery 42. Switches 88 and 90 control the solenoid and lamp circuits respectively.

When the device is not in use, both switches 88 and 90 are open, and when a plain white light is desired, the switch 90 only is closed to complete a circuit through the lamp 32. Thereafter, closing of the additional switch 88 will energize the solenoid coil 22 which will draw the core 50 forwardly against the resistance of spring 58 into the space 51, so that the front end of the core which is normally at 52 will be at 64, and the buffer 62 will be against the hub 24.

When the solenoid core has thus moved forwardly, the pin 78 will have carried the tube 66 and filter cylinder 72 forwardly until the front end of the filter cylinder is on the broken line 92, whereby the light rays 94 from the lamp are intercepted by the filter cylinder and are thereby received by the reflector 11 as colored rays. The shield 49 prevents the admixture of white rays with the reflected colored rays.

When consideration is given the fact that heretofore two separate and complete lamp assemblies were employed for alternately projecting first a white then a colored beam, and that the space available for mounting two separate assemblies was wholly inadequate for the purpose, the advantages of the present invention will be apparent. Furthermore, as formerly constructed and operated, the white light was necessarily switched off when the colored light was turned on, to prevent blending of the two beams at a distance; but with the device herein disclosed, the white light is retained once it is turned on, the same being translated into colored light by projecting the filter into the line of the rays when a colored beam is desired.

Having thus described an embodiment of the invention, I claim:

1. A signal lamp assembly comprising a housing, a solenoid coil, a spool for said solenoid coil supported in said housing intermediate its ends, the rearward end of said spool being of relatively small bore and the remainder of somewhat larger bore, a long lamp socket tube supported in said smaller bore and extending forward, a lamp bulb supported in the forward end of said tube, a filter operating tube slidable axially in said larger bore and around the lamp socket tube, a color filter carried on the forward end of said operating tube normally positioned in a space around the base of the lamp but adapted to be extended by axial movement of said operating tube to a space around the filament of the lamp, a solenoid core slidable in the lamp socket tube and normally positioned therein with its forward end and the rearward end of the filter operating tube overlapping, and means extending through longitudinal slots in the wall of the lamp socket tube connecting said core and said operating tube for unitary axial movement.

2. The structure of claim 1 with a means for resiliently holding said core, said operating tube and said filter in the normal unoperated position when said solenoid coil is not energized.

3. In a signal lamp, a housing, a solenoid coil intermediate the ends of said housing, a supporting member adjacent the rear end of said coil, a lamp socket tube anchored in said supporting member and extending forward through and beyond said coil, there being axially extending slots through the wall of said lamp socket tube and a tubular space between said tube and said coil, a lamp bulb supported in the front end of said tube, a color filter normally surrounding the base of said bulb, a filter operating tube slidable axially in said tubular space and supporting said filter on its front end, a solenoid core slidable axially in said lamp socket tube, the front end only of said core being entered in said lamp socket tube, the remainder extending rearward from said supporting member, resilient means holding said core to its rearward position, and connecting means extending from the front end of said core through said slots to the rear end of said filter operating tube, whereby, upon application of an electric current to said solenoid coil said core will be drawn forward into said lamp socket tube and said filter will be moved forward around said bulb.

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