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APPARATUS FOR SIGNALING

Filed Jan. 12, 1932

2 Sheets-Sheet 1

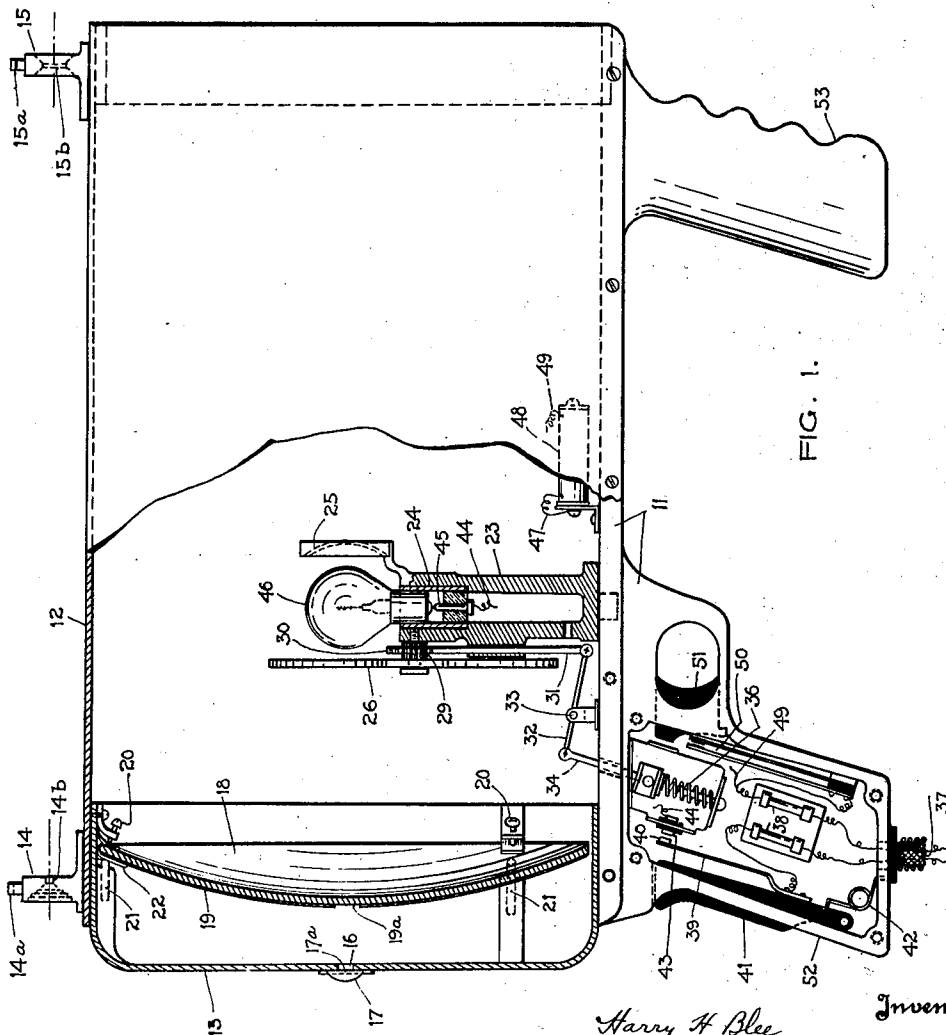


FIG. 1.

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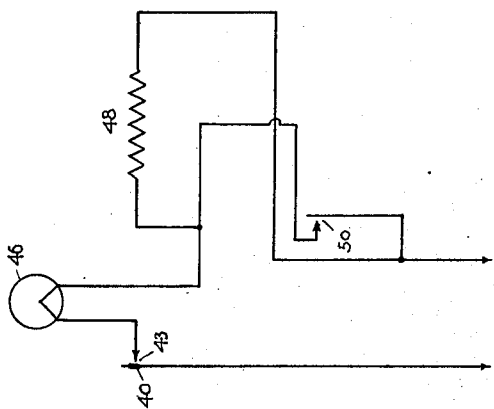


FIG. 3.

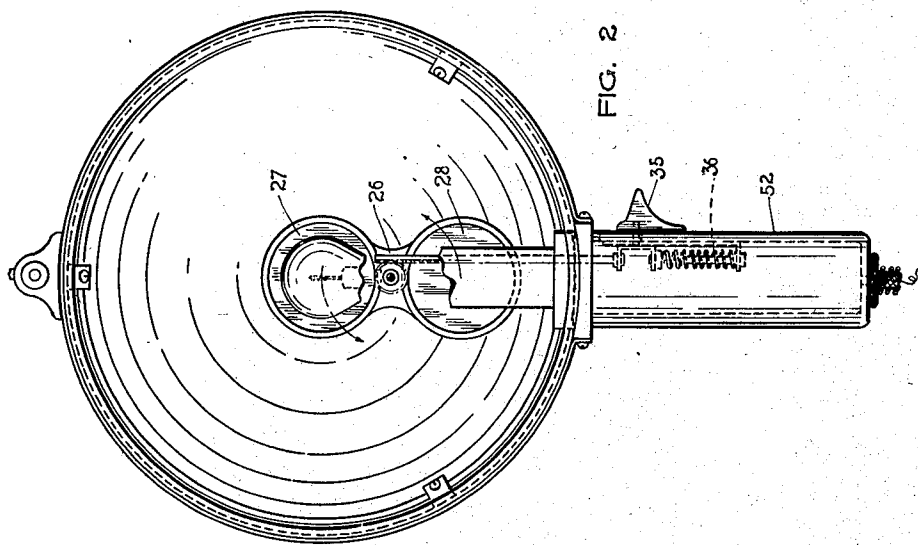


FIG. 2

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UNITED STATES PATENT OFFICE

2,017,849

APPARATUS FOR SIGNALING

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Application January 12, 1932, Serial No. 586,162

4 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 of the United States for governmental purposes only without the payment of any royalty thereon.

Our invention relates to signaling devices employing light for the purpose of signaling to or from aircraft, water craft or other vehicles or between two stations on the ground.

By means of our invention, signals may be transmitted from or to an officer in charge of an aircraft at the time such aircraft is about to land or take off, especially with a view to instructing such aircraft whether or not to take off, or land, or to make known to persons not on the same vehicle the intended movements of the vehicle.

A further object of our invention is to provide a device which is sufficiently compact and light to be easily carried and supported while in use by the operator without the assistance of any supplementary support or means for moving the same.

With the foregoing and other objects in view, a preferred form of our invention is illustrated in the accompanying drawings and described herein-after.

In these drawings:

Figure 1 is a side view of one form of our device, a cover plate of a rear hand grip being removed and the remainder of the device being partly in section.

Figure 2 is an end view of our device as seen from the right of Figure 1.

Figure 3 is a diagram showing portions of the electrical circuits.

In these figures 11 indicates a frame, 12 an enclosing casing, 13 a cup-shaped rear extension of the casing 12 telescopically fitted within the latter.

Companion sights 14 and 15 are supported at opposite ends of the casing 12 with the line of sight parallel to the axis of the casing 12. These sights are provided with the open sights 14a and 15a and also the closed sights 14b and 15b.

An aperture 16 in the casing 13 is covered by a jewel 17 which is provided with a ground glass inner face 17a and serves as a signal indicator.

A concave reflector 18, preferably a good quality parabolic glass mirror, is provided with a reflecting coating 19 in which there is a central opening 19a.

The reflector 18 is adjustably supported in the casing 13 between three focusing screws 20, and co-operating elements 21, which may be resilient buffers, adjustable screws or the like with a U-shaped piece of felt 22 interposed between each of the parts 20, 21 and the reflector.

Mounted on the frame 11 is a hollow support

23 provided with a lamp socket 24 in which there is mounted an incandescent lamp of the highest available filament brightness in a bulb of the smallest practical size. A second concave reflector 25 is also held in place by the support 23 and serves to both reinforce the light from the filament and to fill in the space between the filament coils with the reflected image of these coils. This increases the maximum candlepower, and improves the uniformity of the beam thus assisting in forming a relatively concentrated source of light of high candlepower. In full size projectors which have been built and tested the bulbs selected were the 32 candlepower 6 to 8 volt single contact bulbs used in automobile headlights. The low voltages of these lamps necessitated the "stepping-down" of the 115 volt alternating current to say about six volts, because we did not have satisfactory 115 volt lamps giving adequate filament brightness in a sufficiently small bulb.

Revolubly mounted on the support 23 is a light filter holder 26 in which there are mounted an aviation-green light filter 27 and an aviation red light filter 28 which may be interchanged in the filter holder 26. A pinion 29 is secured to the holder 26 and is engaged by a rack 30 mounted on a rod 31 which is actuated through a lever 32 pivoted at 33 and a second rod 34 which may be pulled downwardly by a trigger 35 (Fig. 2), the parts being returned to their initial positions upon the release of the trigger by resilient means, such as a coiled spring 36.

The current of the voltage required for operating this bulb is supplied through a flexible insulated cable 37 from a suitable transformer (not shown) of well known type. From the cable 37 the current first passes through one of two fuses 38 to a spring blade 39 carrying a switch contact 40 and mounted on a pivoted rear trigger 41 preferably of insulating material which is yieldingly pressed outwardly by a spring 42 to separate the switch contact 40 from a companion contact 43. The contact 43 is connected by a conductor 44 to one terminal 45 of an electric lamp socket in which an electric bulb 46 is mounted.

From the bulb 46 the current returns through the socket 24 and support 23 and frame 11 from which are two return paths for the current, the first through a conductor 47 an impedance 48 and a conductor 49 to the return fuse 38 and thence back to the transformer; the second path being through a normally open switch 50 which may be closed by a forward trigger 51 also formed of a block of insulating material and thence to

the return fuse 33, this path being of low resistance as compared with the first.

52 designates a pistol-type handle forming a part of the frame 11 while a companion forward handle 53 may also form an integral part of the frame 11.

The reflector 25 also serves to cut off the direct light of the lamp which would otherwise have to be eliminated by louvres. The use of louvres would not only add weight but would add it to the end farthest from the operator's body where it would have the greatest effect in causing fatigue.

A readily removable water-tight cover glass (not shown) may be provided to fit the front end of the projector to exclude dust or moisture. The device may be used either with or without this cover glass.

To operate our device, it is grasped by the handles 52 and 53 and sighted upon a signal receiving station by means of the sights 14b and 15b which are preferably so proportioned as to make the field of view through 15b correspond with the field of signal reception. Pressure on the trigger 41 closes an electric circuit through the lamp 46 and the impedance 48 whereby the filament of the lamp 46 is heated without becoming sufficiently luminous to transmit a signal, thus reducing the interval required to render the filament luminous when a second trigger 51 is operated, the latter closing the shunt circuit around the impedance 48. Releasing the pressure on the trigger 51 opens the shunt of low resistance thus again reducing the current through the lamp filament to that required for preheating it.

Successive pressing, holding and releasing of the trigger 51 causes the lamp 46 to be flashed according to a prearranged signal code. Pressure on a third trigger 35 causes the filter holder 26 to be rotated through a mechanical train which reciprocates the rack 30 meshing with the pinion 29 which in turn is operatively connected to the filter holder 26 whereby one of a plurality of color filters 27 or 28 may be at will brought transversely of a beam of light projected by the filament of the lamp 46 and the reflector 25. The light which passes through the selected color filter is reflected from the large concave reflector 18 in a beam directed upon the signal receiving station.

Obviously if it should be desired to use a single color filter, one of the color filters 27 or 28 may be removed so that the operator could at will signal with either filtered or unfiltered light.

Various modifications may be made within the scope of our invention and therefore we desire to make it clear that no limitations upon our invention are intended other than those which may be incorporated in the claims as allowed.

What we claim is:—

1. In a portable light projector for signaling, the combination with a supporting casing optically opened at one end, of an electric lamp supported by said member, a principal concave reflector mounted at the other end of said casing with its focus approximately in the center of the light emitting source and provided with a sight opening, a plurality of color filters mounted on said casing, means for selectively placing one of

said filters between said light source and said reflector and transversely of the light flux, and a relatively small auxiliary reflector mounted in said casing and positioned on the side of the light source opposite said principal reflector and with its center of curvature approximately in the center of the light emitting source and facing said primary reflector.

2. In a portable light projector for signaling, the combination with a casing member optically opened at one end, of a source of light mounted in the casing, a concave reflector provided with a sight opening at the other end portion of said casing and having its focus approximately in the center of the light emitting source, a plurality of color filters mounted in the casing, means for moving said color filters in the light flux to position each respectively between the light source and said reflector, and a relatively small reflector mounted in the casing and positioned on the side of the light source opposite said first-mentioned reflector and centered with the latter.

3. In a portable self-contained signaling device, the combination with a tubular supporting casing optically opened at one end, of a concentrated source of light mounted within said casing, a concave reflector at the other end of said casing for directing the light from said source in a beam of substantially parallel rays through said opened end of the casing and provided with a light transmitting opening forming a peep-hole, a plurality of color filters mounted in said casing, means for moving said color filter means into position transversely of the light flux between said light source and said reflector, a relatively small reflector in the casing and positioned on the side of the light source opposite said other reflector, said light transmitting opening in the reflector permitting the operator to determine whether the filters are in position.

4. In a portable self contained signaling device, the combination with a tubular supporting casing being optically opened at one end, of a concentrated source of light in said casing, a principal concave reflector of substantially the internal diameter of said casing mounted in the other end of the casing and transversely of the light flux to direct said light in a beam of substantially parallel rays through the opened end of said casing, the other end of said casing and said reflector having aligned sight openings therein, a glass jewel closing said sight opening in the casing, a plurality of color filters mounted in the casing, means for selectively moving a color filter between the light source and said reflector into a position transversely of the light flux directed upon said reflector, an auxiliary concave reflector mounted in said casing on the side of the light source opposite the principal reflector with its center of curvature approximately in the center of the light emitting source and materially smaller diameter than said primary reflector and adapted to intercept diverging forwardly directed rays from said source and reflect the same onto said primary reflector.

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