Feb. 9, 1943. E. B. MOSS 2,310,743

ELECTRIC LIGHTING APPARATUS

Filed Jan. 7, 1942

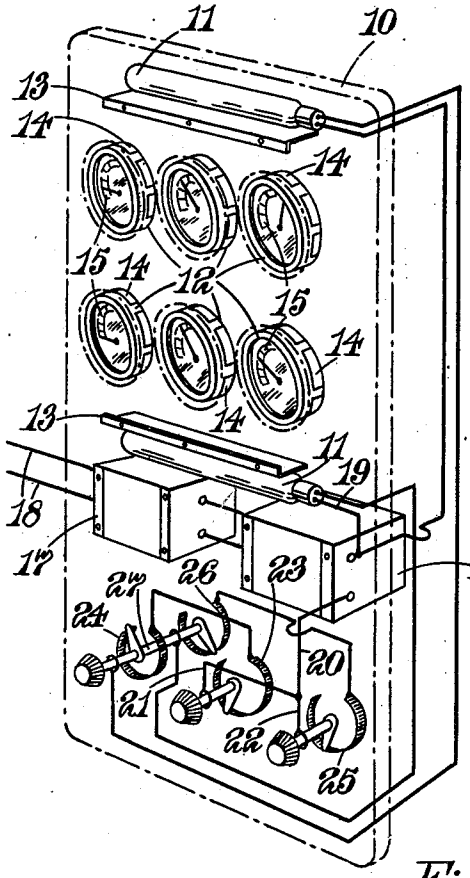


Fig. 1.

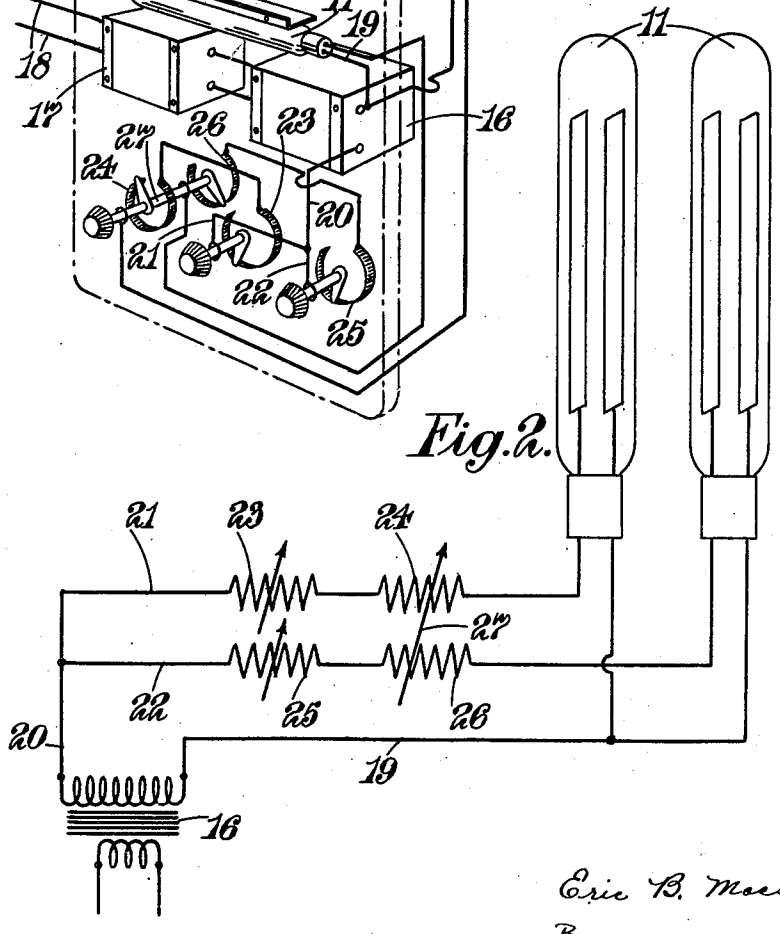


Fig. 2.

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ELECTRIC LIGHTING APPARATUS

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Application January 7, 1942, Serial No. 425,944
In Great Britain November 19, 1940

1 Claim. (Cl. 176—124)

This application corresponds to the application of S. Smith & Sons (Motor Accessories) Limited and Eric Beecroft Moss, Serial No. 16,679/40, which was filed in Great Britain on November 19, 1940.

This invention relates to electric lighting apparatus employing electric discharge lamps, the radiation from which may be varied by altering the value of the current. The invention is concerned with such apparatus of the kind employing a plurality of electric discharge lamps each having a series impedance, the lamps with their impedances being connected in parallel to a supply source. If the applied voltage varies, it is found that unless the lamps are matched, one or other of them may be extinguished at lower voltages, while the remainder continue to radiate. The object of the invention is to overcome the difficulty of this irregular operation.

According to this invention an electric lighting apparatus of the kind specified above is characterized in that means is provided for compensating and equalizing the different voltage characteristics of the lamps and in that means are provided for simultaneously adjusting said series impedances. Thus, after the initial compensation of the voltage characteristics of the lamps the radiation of the lamps may be simultaneously adjusted by one control and without the disadvantage of any lamp becoming prematurely extinguished when the applied voltage is reduced.

The compensating and equalizing means may comprise individually adjustable impedances connected respectively in series with said simultaneously adjustable impedances.

In the case where the apparatus is for use with a D. C. supply an inverter is provided for supplying the A. C. to the lamps, which inverter and impedances are arranged to form a single unit.

In applying the invention for illuminating an instrument panel, for example of an aircraft, there is provided in combination with an electric lighting apparatus as referred to above, an instrument panel having the visible parts of its instruments treated with a material which fluoresces under the action of ultra-violet ray, the lamps of which apparatus are arranged to direct the rays on to the instruments and have associated therewith filters to prevent the emanation of visible light.

The following is a description of one embodiment of the invention, reference being made to the accompanying drawing, in which:

Figure 1 is a perspective diagrammatic view of an instrument panel incorporating a lighting system according to this invention, and

Figure 2 shows a wiring diagram for the apparatus.

Fastened to the back of the instrument panel 10 are two lamps 11 for generating ultra-violet rays, which lamps are arranged one on either side of a group of instruments 12. Interposed between each lamp and the group of instruments is a screen 13 arranged to cut out visible rays but which pass ultra-violet rays. The instrument may be provided with suitable windows 14 for the passage of the rays and the graduations 15 of the instrument may be treated with a material which fluoresces under the action of those rays. The pointers of the instrument may also be similarly treated. The lamps are energized by a source of high-potential alternating current which may be provided by the output side of a transformer 16 which steps up a source of alternating supply provided by an inverter unit 17 connected through cables 18 with a source of direct supply. The inverter may be of the vibrator type.

As best seen in Figure 2, one pole of each lamp is connected by a wire 19 to one output terminal of the transformer 16, while the other output terminal of the transformer is connected through a wire 20 and parallel circuits 21 and 22 with the other pole of each lamp. The circuit 21 contains a trimming resistance 23 and a light-adjusting resistance 24 of an order of about 20,000 ohms. Similarly, the circuit 22 contains a trimming resistance 25 and a light-adjusting resistance 26. The two light-adjusting resistances are ganged together as indicated diagrammatically at 27, while the two trimming resistances are individually adjustable. The inverter, transformer and the various resistances are mounted together on the instrument panel to form a unit. If desired, this unit may be separate from the instrument panel and is then provided with two leads for attachment to the lamps and two leads for connection with the source of D. C. supply.

In operation, after initial trimming to compensate for differences in characteristics of the lamps the intensity of the illuminations may be varied over a wide range by adjustment of the ganged variable resistances without risk of either lamp being extinguished.

I claim:

The combination with an instrument panel having its instruments treated with a material which fluoresces under the action of ultra-violet rays of a plurality of ultra-violet ray discharge lamps adapted to illuminate said instruments, filters associated with said lights and adapted to prevent emanation of visible light, a common source of current for said lamps, manually adjustable means for regulating the voltage applied to each lamp for compensating and equalizing the different voltage characteristics of the discharge lamps, an adjustable impedance in series with each lamp and means for simultaneously adjusting said series of impedances to simultaneously vary the light from each to the same degree.

ERIC BEECROFT MOSS.