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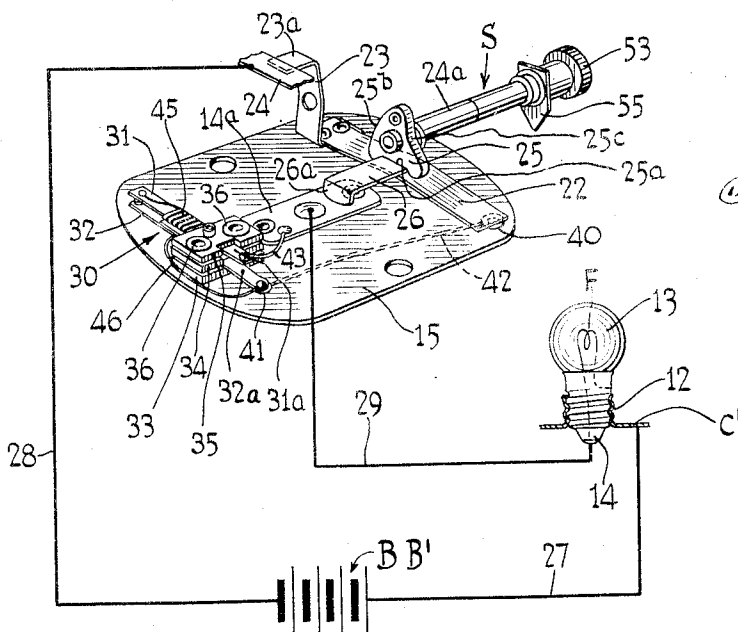
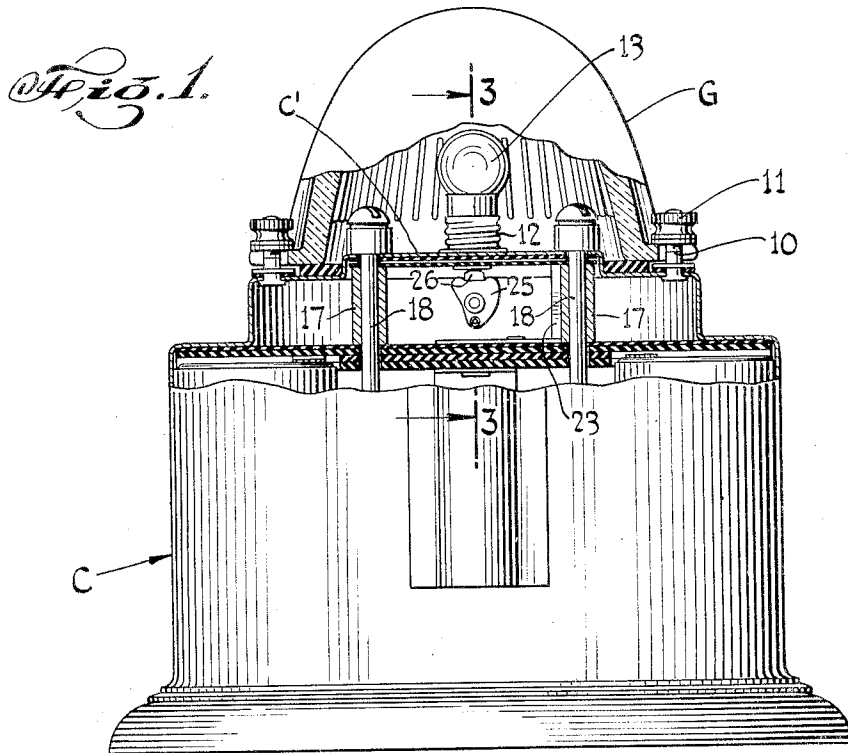
B. F. MULDOON

2,303,086

ELECTRIC DEVICE

Filed Aug. 18, 1937

2 Sheets-Sheet 1



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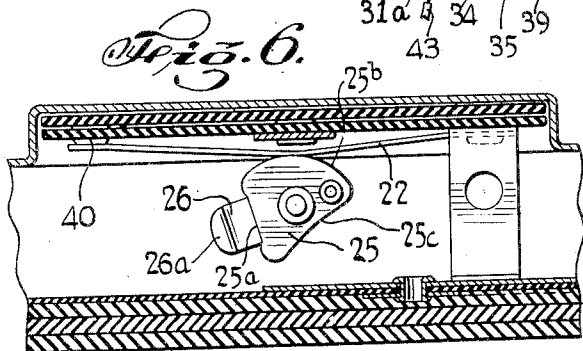
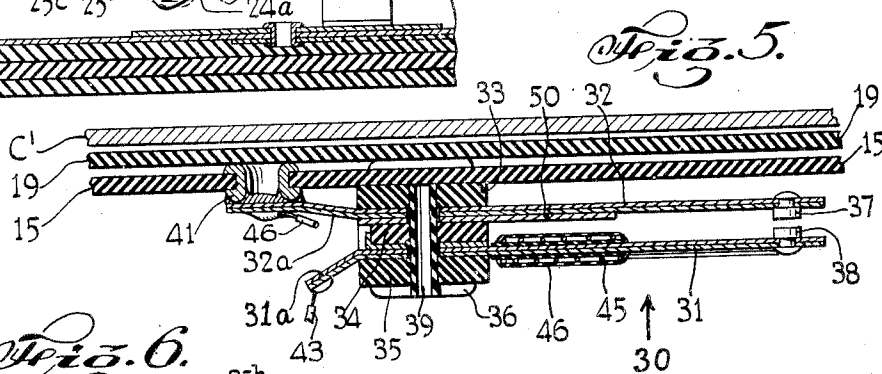
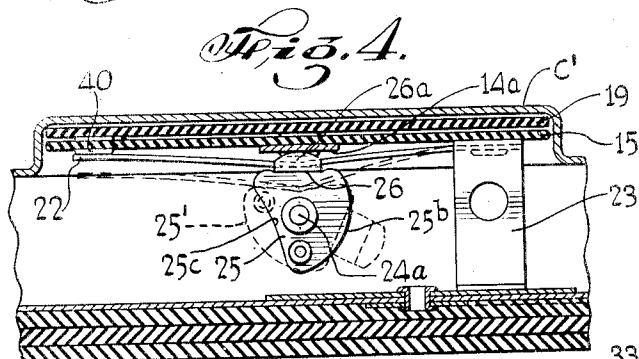
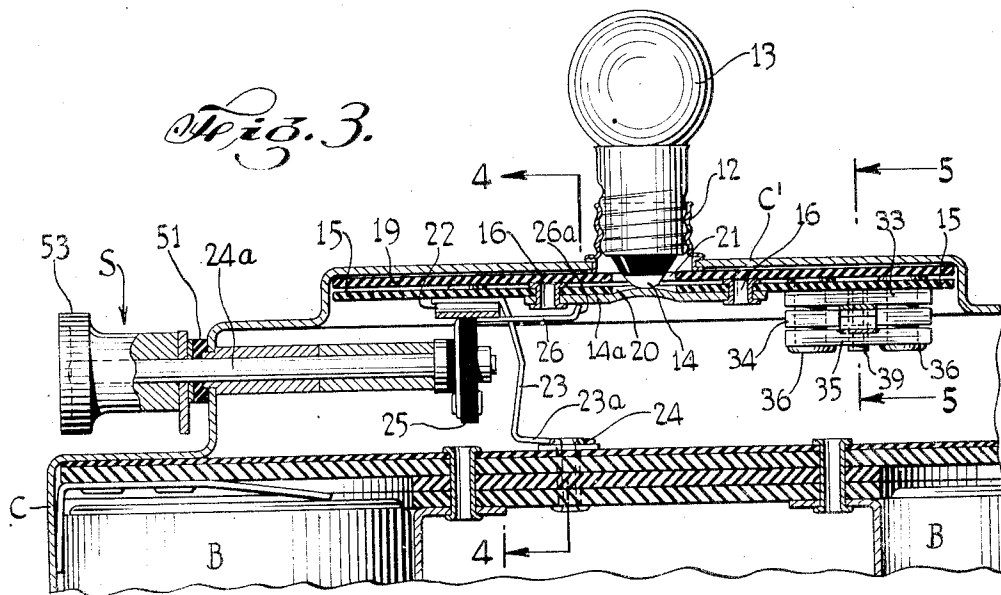
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ELECTRIC DEVICE

Filed Aug. 18, 1937

2 Sheets-Sheet 2



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2,303,086

ELECTRIC DEVICE

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Application August 18, 1937, Serial No. 159,663

5 Claims. (Cl. 200—122)

This invention relates to portable electric hand lantern devices. More particularly, this invention relates to the type of hand lantern device adapted for use as a caution or safety light.

One of the objects of my invention is to provide a portable electric lantern device of the character described having highly improved means for causing intermittent flashing of an electric lamp, and in which the said flashing means is so designed as to be unaffected by variations in atmospheric temperature.

Another object of my invention is to provide a portable electric lantern device of the character described having improved switching mechanism for selectively operating said device whereby it is adapted to function as a continuous light or as a flashing light.

Still another object of my invention is to provide a portable electric lantern device of the character described comprising relatively few and simple parts, which shall be easy to assemble, relatively inexpensive to manufacture, which shall be rugged in construction, simple in operation, which shall be highly waterproofed, and which at the same time, shall operate with a high degree of efficiency.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

Certain features shown and described but not claimed in this application are described and claimed in my copending application Ser. No. 159,664, filed simultaneously herewith, now Patent No. 2,224,742, issued December 10, 1940.

In the accompanying drawings, in which is shown one of the various possible embodiments of this invention,

Fig. 1 is an elevational view, partly sectional, of an electric hand lantern embodying my invention;

Fig. 2 is a perspective view, partly diagrammatic, illustrating the principle of operation of my invention;

Fig. 3 is an enlarged cross-sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view taken substantially on the line 5—5 of Fig. 3; and

Fig. 6 is a cross-sectional view similar to Fig. 4

but illustrating another step in the operation of my invention.

Referring now in detail to the drawings, there is disclosed a portable electric lantern device embodying my invention and comprising a housing or metallic casing C and a glass dome G attached to the upper portion of the casing by any suitable attaching means, such as for example, the screws 10 and the nuts 11. The details of construction of the casing C, adapted to house the operating mechanism, soon to be described, as well as the arrangement and support of the source of electric power, such as a plurality of dry cells, and the specific constructional features of the dome G are more fully shown and described in my aforementioned Patent No. 2,224,742.

Fixed to the top wall C' of the casing C is a screw shell 12 adapted to receive therein the threaded shank of an electric lamp 13 of any desired power and of usual construction and design. The lower portion of the lamp 13 is provided with an electrical contact portion 14 which is adapted to contact an electrical conductor member 14a attached to a plate 15 of insulating material by any suitable attaching means, such as, for example, the eyelets 16. The plate 15 is supported by the spacer members 17 and the screws 18, in a manner more fully described in my said co-pending application.

Interposed between the plate 15 and the top casing wall C' is an insulating member, such as a disc 19. The plate 15 and the member 19 are provided with aligned apertures 20 and 21 to permit the portion 14 of the lamp 13 to contact the member 14a.

Attached to the plate 15 is an electrical conductor member 22 having electrically connected thereto a second conductor member 23, provided with an arm 23a, adapted to engage a contact member 24 connected to one terminal of the battery of cells B (see Fig. 2). The other terminal of the battery B is connected to the screw shell 12 thru the top wall C' of the metallic casing C.

To energize the lamp 13, I have provided a switch member S comprising a shaft 24a rotatably mounted in the casing C, as shown in Fig. 3, and having a portion thereof projecting inwardly of the casing for a predetermined distance and a portion thereof extending outside of said casing in order to permit manual operation of said switch S. Fixedly attached to the end of the portion of the shaft 24a disposed inside the casing C is a cam 25 of insulating material and of specific design, the function and purpose of

which will soon be described. Fixedly attached to the cam 25 is an electrical conductor member 26 provided with a portion 26a thereof adapted to contact the member 14a, as shown in Figs. 2 and 3 of the drawings. It is noted that the member 22 is arched in the central portion thereof in such manner as to make electrical contact with the member 26 when the switch S is rotated until the portion 26a is caused to contact the member 14a.

It is thus seen from the above described construction that when it is desired to energize the lamp 13 to provide a steady light it is merely necessary to turn the shaft 24a until the portion 26a of the member 26 is brought into electrical contact with the member 14a. When this has been done, the circuit is completed thru the battery B as indicated by the lead line 27, the wall of the casing C and the screw shell 12, thru the lamp filament F of the lamp 13, and out by way of the portion 14, then on thru the lead line 29 connected to the member 14a, thru the members 26, 22, 23, 24, and then back to the battery B, thru the lead line 28. To facilitate the rotation of the shaft 24a I have provided a knurled knob 53 attached thereto.

By providing a rotatably mounted switch as above described I am able to waterproof the same in a relatively simple manner, such as for example by providing a rubber washer or tube 51 interposed between the casing C and the shaft 24a.

By my invention I have also provided means whereby the lamp 13 may be caused to light automatically at intermittent intervals to produce a flash signal suitable for such uses, as for example, on highways or for any other desired purposes. To this end I have included in the lamp and battery circuit hereinbefore described a thermostatic flasher device 30 which may comprise a pair of bi-metallic thermostat members 31 and 32, disposed in spaced substantially parallel relationship to each other. The member 31 is mounted at one end thereof between the insulating spacer blocks 33 and 34, while the member 32 is mounted at one end thereof between the insulating spacer blocks 34 and 35. The blocks 33, 34 and 35 are fixedly attached to the plate 15 by any suitable attaching means, such as, for example, the eyelets 36, shown in the drawings. To prevent axial disalignment of the members 31 and 32, end portions 31a and 32a thereof may be angularly bent over against the blocks 33 and 34, as clearly shown in Fig. 5. To further prevent disalignment of the members 31 and 32, each of the blocks 33, 34 and 35 are provided with a notch 54 adapted to receive the angularly bent portions 31a and 32a. The members 31 and 32 are provided adjacent their free ends with suitable electrical contacts 37 and 38, respectively, which may be designed to be normally out of electrical contact with each other, as shown.

To insure proper alignment of the members 31 and 32, I have provided a member 39 of insulating material, such as for example, a portion of spaghetti tubing, which is adapted to pass thru the members 31 and 32 and the blocks 33, 34 and 35, as shown.

The member 32 is electrically connected to a contact member 40 mounted on the plate 15, by any suitable connecting means, such as, by a lead line 42, one end of which is connected to a contact member 41, to which the member 32 is soldered, and the other end of said lead line 42

being connected to the contact 40. The member 31 is connected to the member 14a by means of the lead line 43 soldered at both ends. It is noted that the contact member 40 is so disposed that the member 22 may be moved into electrical contact therewith (see Fig. 2). It is thus seen from the above described construction that when the cam 25 is in the position as shown in Figs. 2, 3 and 4, that is, with the notched portion 25a contacting the member 22, which at the same time causes the member 22 to contactively engage the contact 40, and the member 26 to contact the member 14a, the flasher device 30 will be included in the battery and lamp circuit by means of the leads 42 and 43. However, when the portion 26a contacts the member 14a as described, the current from the battery B will take the path of least resistance thru the arm 26 and the member 14a, shunting the flasher device 30 out of the circuit, to cause continuous lighting of the lamp 13. When the cam 25 is rotated in a clockwise direction with respect to Fig. 2, to the position shown in Fig. 6, that is, with the member 26 out of contact with the member 14a, due to the design of the arcuate surface 25b of the cam 25, the member 22 will still be held in electrical contact with the member 40 to cause current from the battery B to flow thru the flasher device 30, to cause intermittent lighting, or flashing of the lamp 13 in a manner which will now be described.

The member 31 of the flasher device 30 is provided with a suitable heating coil 45 comprising a number of turns of wire, surrounding a portion of the said member 31, one end of said coil 45 being connected to the member 32 by the lead 46, while the other end is connected to the end of the member 31 adjacent the contact 38.

It is seen that when the switch S is turned to the position as shown in Fig. 6, as described above, the current from the battery B to the lamp 13 will flow thru the lead 28, the members 24, 23 and 22, the lead 42, and then thru the member 32, and thence by means of the lead 46 to the member 31 and back to the member 14a and then thru the lead 29 and back thru the filament F of the lamp 13 thru the casing C.

It is seen from the above description that the coil 45 being in the circuit with the lamp 13 will become simultaneously energized. The coil 45 is so designed as to act as a resistance in the lamp circuit to such an extent that the current from the batteries will be dissipated and substantially no light will be visible from the lamp 13. However the current flowing thru the coil 45 will heat the same, the said heat being transmitted to the member 31, which will cause the said member 31 to bend, due to its bi-metallic structure, and the contact 38 is designed to then move toward the contact 37 to complete the circuit therethru causing the current to flow from the lead 43 thru the member 31 and back to the contact 41 thru the member 32 instead of thru the coil 45. The resistance of the coil 45 being thus eliminated, the filament F of the lamp 13 will light brightly. The coil 45, now carrying no current, will cool off causing the bi-metallic member 31 to cool, which will then cause the contact 38 to move away from the contact 37 to again break the circuit thru the contacts 37 and 38 and cause the current to flow thru the coil 45, which will dim the light from the lamp 13, and again heat the member 31 to cause the contact 38 to again engage the contact 37. It is thus seen that a

continuous intermittent flashing of the lamp 13 is thus obtained.

It is also noted that by my invention, in accordance with the above described construction, once the spacing between the contacts 37 and 38 have been properly adjusted, such spaced relationship will not be affected by variations in temperature, due to weather conditions. If the member 31 is caused to contract or expand and bend due to changes in temperature, the member 32 will similarly be caused to contract or expand and bend, which will leave the relative spaced relationship of the contacts 37 and 38 unchanged.

Thus it is seen that by my construction, I have eliminated the need of the frequent adjustment of the contacts, heretofore found necessary in flasher devices, due to variations in temperature.

To compensate for the resistance to the bending of the member 31 which may be caused by variations in surrounding atmospheric temperatures, because of the encircling coil 45, I have provided the member 32 with a bending resistance member 50 designed to equal the resistance to bending of the member 31, so that in the event of a drop or rise in temperature the members 31 and 32 will be caused to bend an equal amount and thus retain the contacts 37 and 38 in proper spaced relationship.

If desired, the coil 45 may be covered by any suitable insulating coating 46.

The cam 25 of the switch S is provided with an offset surface 25c which is so designed that upon further clockwise rotation of the shaft 24a to the dotted line position 25' shown in Fig. 4, the circuit from the battery B to the lamp 13 will be broken, to render both the flash and the steady light ineffective.

If desired, the switch S may be provided with a member 55 to indicate the relative positions of the cam surfaces 25a, 25b or 25c.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A temperature-compensated flasher device

of the character described comprising a pair of identical bi-metallic members, means for heating one of said members without heating the other of said members, said means comprising a coil of wire surrounding the said member to be heated and means associated with said unheated bi-metallic member to vary the bending moment thereof by an amount substantially equal to the amount the bending moment of the heated bi-metallic member is varied by said coil, whereby the angular distortion of both of said bi-metallic members caused by variations in atmospheric temperature will be equally affected by the change in bending moment caused by said heating coil and said bending moment varying means.

2. A temperature-compensated flasher device of the character described comprising a pair of normally spaced contact elements, each of which is mounted adjacent one end of one of a pair of identical bi-metallic members, means for heating one of said members without heating the other of said members, said means comprising a coil of wire surrounding the said member to be heated and means associated with said unheated bi-metallic member to vary the bending moment of said unheated bi-metallic member an amount substantially equal to the amount the bending moment of the heated bi-metallic member is varied by said heating coil, whereby the spaced relationship of said contacts at different atmospheric conditions elements will be unaffected by different angular distortions of said bi-metallic members caused by unequal bending moments.

3. A flasher as set forth in claim 2 wherein the means for varying the bending moment of the unheated bi-metallic member comprises a member disposed on said unheated bi-metallic member in the same position relative to the contact thereon as the heating coil is to the contact on the heated bi-metallic member.

4. A flasher as set forth in claim 2 wherein the means for varying the bending moment of the unheated bi-metallic member comprises a flat strip disposed in abutment against said unheated bi-metallic member.

5. A flasher as set forth in claim 2 wherein the unheated bi-metallic member comprises an elongated flat strip and wherein the means for varying the bending moment of the unheated bi-metallic member comprises a flat strip which is shorter than and is held against said bi-metallic member.

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