

PATENT SPECIFICATION

(11) 1371598

1371598

- (21) Application No. 40851/73 (22) Filed 30 Aug. 1973
 (31) Convention Application No. 285232 (32) Filed 31 Aug. 1972 in
 (33) United States of America (US)
 (44) Complete Specification published 23 Oct. 1974
 (51) International Classification F21L 11/00//15/22
 (52) Index at acceptance



F4R 242 254 262 268 269 275 27Y 290 292 294 392
 39Y 409 442 445 446 447 44Y 455 466 473 476
 47Y 481 501 506 507 509 543 610 619 621 62Y
 632 635 653

(54) IMPROVEMENTS IN OR RELATING TO PORTABLE FLUORESCENT LANTERNS

(71) We, UNION CARBIDE CORPORATION, a corporation organized and existing under the laws of the State of New York, United States of America, of 270 Park Avenue, New York, State of New York 10017, United States of America (assignee of ROBERT EDWIN BRINDLEY), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to portable lighting devices in general, and more particularly to improvements in a portable fluorescent lantern of the type wherein the batteries that power the lantern are enclosed inside the lantern along with the lantern parts including the fluorescent lamp, lens and reflector.

Fluorescent lighting devices have been used for many years now both in industry and the household. These fluorescent lighting devices offer a number of outstanding advantages over the more conventional incandescent lighting devices among which may be mentioned the fact that they consume less power and are able to operate more efficiently and also they produce a softer and more widely distributed pattern of light. With these advantages in mind, attempts have been made in recent years to manufacture a portable fluorescent lantern. One of the requirements of such a lantern is the provision of a high voltage DC power supply to operate the fluorescent lamp. Although this requirement can be readily satisfied through the use of one or more special high voltage batteries which are now commercially available, the problem has been that these batteries are necessarily made of an unusually large size, that is, they comprise a plurality of individual flat electrochemical cells which are stacked in series in order to attain the high voltages required, and they are of course bulky and heavy. Since the lantern must be designed to

accommodate these high voltage batteries along with the main lantern parts, the structure of the lantern must also be made unusually large, bulky and heavy. Consequently, the lantern is awkward and difficult to carry. This of course seriously limits the use of the lantern in many applications.

By the practice of the present invention there may be provided a portable fluorescent lantern which uses one or more of the special high voltage batteries that are required for its operation but which at the same time is not limited by its size and weight and which can be easily carried from place to place without undue difficulty and which can be readily utilized in a variety of applications that were not heretofore practicable with the portable lanterns of the prior art.

According to the present invention there is provided a portable fluorescent lantern comprising, in combination, a first casing adapted to receive a fluorescent lamp, said first casing having mounted therein a lens and a reflector, a second casing adapted to contain at least one high voltage battery, means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed in a location remote from the other casing, and means for establishing an electrical circuit through said fluorescent lamp when contained in said first casing and said battery when contained in said second casing, said circuit including an extension cord mounted in one of said casings for making electrical connection between said fluorescent lamp when contained in said first casing and said battery when contained in said second casing when said lantern is operated with said casings detached from one another and with one casing placed in a location remote from the other casing.

In one embodiment of the present invention there is provided a portable fluorescent

[Price 25p]

Price 7.5p

lantern comprising, in combination, a first casing, a fluorescent lamp, a lens and a reflector mounted in said first casing, a second casing containing at least one high voltage battery, means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one with one of said casings being placed in a location remote from the other casing, and means for establishing an electrical circuit through said fluorescent lamp in said first casing and said battery in said second casing, said circuit including an extension cord mounted in one of said casings for making electrical connection between said fluorescent lamp and said battery when said lantern is operated with said casings detached from one another and with one casing placed in a location remote from the other casing.

In a further embodiment of the present invention there is provided a portable fluorescent lantern comprising, in combination.

- (a) a first casing having an open forward and rearward end;
- (b) a fluorescent lamp, lens and reflector mounted within the open forward end of said first casing;
- (c) a basal structure mounted within the open rearward end of said first casing;
- (d) switch means mounted in a portion of said basal structure and extending through a portion of the walls of said first casing;
- (e) a ballast transformer for starting said fluorescent lamp mounted in a portion of said basal structure within said first casing;
- (f) a second casing containing at least one high voltage battery;
- (g) means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed at a location remote from the other casing; and
- (h) means for establishing an electrical circuit through said fluorescent lamp, switch means and ballast transformer in said first casing and said battery in said second casing, said circuit including an extension cord mounted in said first casing and means for electrically connecting said extension cord to said battery in said second casing.

In a preferred embodiment of the invention, the means for electrically connecting the fluorescent lamp, transformer and switches in one casing with the high voltage batteries contained in the other casing may include an extension cord having a conventional two-

prong plug at one end. The casing containing the batteries may also include a conventional electrical receptacle for receiving the two-prong plug of the extension cord. Both of the two casings are further provided with means for detachably joining the casings together, such as a slidable latch mechanism.

The invention will now be further described by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective elevational view of a portable fluorescent lantern of the present invention;

Figure 2 is a front elevational view thereof;

Figure 3 is a perspective elevational view of the lantern with parts being shown in exploded fashion in order to illustrate the assembly in greater detail;

Figure 4 is an elevational view taken along the line 4—4 in Figure 3;

Figure 5 is an elevational view taken along the line 5—5 in Figure 3;

Figure 6 is a top plan view of the lantern with part being broken away to show details of construction;

Figure 7 is a side elevational view of the lantern also with part being broken away to show details of construction;

Figure 8 is a schematic representation of the electrical circuit used in the lantern; and

Figure 9 is a perspective view of the lantern in reduced scale showing the two casings detached from one another for use separately in operation of the lantern.

Referring now to the drawings in detail and more particularly to Figures 1—3, it will be seen that the embodiment of the portable fluorescent lantern illustrated comprises two separate, complimentary, elongated rectangular shaped casings 10, 11 which are both made of a one-piece molded plastic structure. Both casings 10, 11 are preferably molded from a high shock resistant, flame retardant plastic composition such as a modified acrylonitrile butadiene styrene copolymer. The two casings 10, 11 in the normal portable mode of operation as illustrated are detachably joined together by means of a slidable latch mechanism which will be hereinafter described in detail.

The casing 10 incorporates the main lantern parts including an elongated rectangular lens 12, the fluorescent lamp 13, an elongated rectangular metal reflector 14 as well as the electrical circuit and circuit components for operating the fluorescent lamp 13, while the casing 11 contains a pair of elongated rectangular high voltage batteries 15, 16 (see Figure 5) which are mounted therein in side by side relation.

As more particularly shown in Figure 3, the molded casing 10 has a top wall 17, bottom wall 18, two side walls 19, 20 and a partial front wall 21 which is located adja-

cent the top wall 17. The front wall 21 terminates a short distance below the top wall 17 and is formed integrally at its lower edge with an inner panel 22 (see Figure 7) which projects rearwardly inside the casing 10. The panel 22 together with the top wall 17 and front wall 21, defines an upper compartment 23 for receiving one of the fluorescent lamp holders as will be hereinafter described. To accommodate the switch components as will also be described, the top wall 17 is formed with a generally U-shaped cut-out portion 24 which is open at the rearward end of the casing 10. Support for the two side walls 19, 20 is provided by three spaced apart rib structures 25, 26 and 27 which are molded integrally with the casing 10. The upper and lower rib structures 25 and 27 are each provided with two apertures through which pass metal screws 28 in assembly of the casing 10, only three of the apertures 25a, 25b on the rib structure 25 and the aperture 27b on the rib structure 27 being shown in the drawing. A second inner panel 29 is formed integrally with the side walls 19, 20 at the lower end of the casing 10. This panel 29 is spaced a short distance from the bottom wall 18 to form a narrow slot 30 (see Figure 7) and is further provided with a semi-circular cut-out portion 31 in order to accommodate the other fluorescent lamp holder as will be described. The casing 10 is open at its forward end between the two panels 22, 29 and has an open rearward end. Both of the side walls 19, 20 are formed with elongated rectangular recess portions 32, 33 respectively which extend along the length of the forward open end of the casing 10. The two side walls 19, 20 are further formed along the front longitudinal edge portion with shoulders 34, 35 (see Figure 6) for purposes of mounting the lens 12 and reflector 14.

The rectangular metal reflector 14 is parabolic in section as more particularly shown in view of the Figure 1 and preferably is painted white on the front surface 14a thereof. The metal reflector 14 covers the forward open end of the casing 10 and is provided along its opposite longitudinal edges with V-channels 36, 37. In assembly, the metal reflector 14 is pressed within the forward open end of the casing 10 until the edges of the V-channels 36, 37 engage and lock with the shoulders 34, 35 formed on the two side walls 19, 20 (see Figure 6). It will be noted that the metal reflector 14 is nearly flat prior to assembly as shown in the view of Figure 3 but readily bends into parabolic shape when pressed into the forward open end of the casing 10. Preferably, the rib structures 25, 26 and 27 are also made parabolic in shape in order to support the metal reflector 14 in its proper configuration.

The rectangular lens 12 may be made from high impact styrene or other clear plastic composition and is made of a size corresponding substantially to the forward open end of the casing 10. The lens 12 is formed with a flat front wall 12 and two opposite longitudinal side walls 12b, 12c which fit within the rectangular recess portions 32, 33 on the two casing side walls 19, 20. The two opposite side walls 12b, 12c are each formed along their longitudinal edges with small outwardly projecting lips 38, 39, which fit under neath the reflector V-channels 36, 37. The lips 38, 39 also engage with the shoulders 34, 35 on the two casing side walls 19, 20 in order to lock the lens 12 in place (see Figure 6). It will be noted of course that the fluorescent lamp 13 must be inserted into both of its lamp holders prior to assembly of the lens 12.

Mounted within the rear open end of the casing 10 is a one-piece molded plastic, elongated rectangular basal structure 40 which serves as a support for mounting the circuit components and also as a cover for the casing 10. This basal structure 40 is preferably molded from the same shock resistant, flame retardant plastic composition used for both casings 10, 11. The framework of the basal structure 40 includes a back wall 31, a top wall 42, a bottom wall 43 and two opposite longitudinal side walls 44, 45. The two side walls 44, 45 are formed respectively with stepped surface portions 44a, 45a which are adapted to fit inside the rear open end of the casing 10 while the remaining portions of the two side walls 44, 45 lie flush with the casing side walls 19, 20. The two side walls 44, 45 are further formed with rearward facing projections 44b, 45b which are adapted to fit inside the casing 11. Both the top wall 42 and bottom wall 43 lie in planes substantially perpendicular to the back cover 41 but are disposed a short distance respectively below and above the top and bottom edges thereof. It will be seen by this construction that the top wall 42 in assembly of the lantern fits inside the upper compartment 23 (see Figure 7) while at the same time the bottom wall 43 fits inside the narrow slot 30 formed by the inner panel 29 at the lower end of the casing 10.

The top wall 42 of the basal structure 40 is further formed with an upstanding rib 46 which corresponds in both size and shape to the generally U-shaped cut-out portion 24 on the top wall 17 of the casing 10 and thus snugly fits into this opening. The basal structure 40 is further integrally formed with two spaced apart inner panels 47, 48 which substantially coincide with the two rib structures 25, 27 in the casing 10. Each of the two panels 47, 48 is further formed with two cylindrical studs 47a, 47b and 48a, 48b, respectively, which coincide with the two

apertures, e.g. 25a, 25b, formed in each of the rib structures 25, 27. These studs are internally threaded for receiving the metal screws 28 which pass through the apertures formed in the rib structures 25, 27.

5 The basal structure 40 is further integrally formed with a third inner longitudinal panel 49 which intersects the two other inner panels 47, 48. It will be seen by
10 this construction that the framework of the basal structure 40 is divided by the three panels 47, 48 and 49 into four separate compartments, that is, an upper compartment 50 between the top wall 42 and the upper panel
15 47, two longitudinal side by side compartments 51, 52 separated by the inner panel 49 and a bottom compartment 53 between the lower panel 48 and the bottom wall 43 (see Figure 4).

20 Mounted within the upper compartment 50 of the basal structure 40 is the switch component 54 which is secured to the top wall 42 by means of two metal screws 55, 56. The switch component 54 is of a conventional
25 type including three individual cam operated, sliding contact switches which are represented by the reference symbols S_1 , S_2 and S_3 in the schematic circuit diagram shown in Figure 8. Operation of the electrical circuit will
30 be hereinafter described in detail but for the moment, suffice it to say that the switches S_1 , S_2 and S_3 each respectively include switch buttons 57, 58 and 59 which protrude through an elongated slot 60 formed within the top
35 wall 42. Also included in the circuit as will be described is a voltage dropping resistor 61 which is mounted beneath the switch component 54 and connected in parallel with one of the switches (S_2) by soldering its leads to
40 switch lugs 63, 64. Also mounted beneath the switch component 54 is a capacitor 65 (see Figure 7) which is connected in parallel with one of the other switches (S_3) by soldering its leads to switch lugs 66, 67.

45 A ballast transformer 68 which is necessary for starting the fluorescent lamp 13, is mounted on the back wall 41 of the basal structure 40 within one of the longitudinal compartments 51. One of the fluorescent lamp
50 holders 69 is mounted beneath the top wall 42 at its forward end and is received in assembly within the upper compartment 23 of the casing 10. The other lamp holder 70 is mounted on top of the bottom wall 43 at its forward end and is received in assembly with-
55 in the cut-out portion 31 formed in the bottom inner panel 29 on the casing 10. It will be noted here that both of the lamp holders 69, 70 are positioned to receive the fluorescent lamp contact pins 13a, 13b in the usual
60 manner and to tightly hold the fluorescent lamp 13 in its place in front of the metal reflector 14. It will be further noted that the inner panel 22 which extends into the casing
65 10 is formed with a semi-circular cut-out

portion 71 (see Figure 2) in order to accommodate the upper end of the fluorescent lamp 13.

Mounted within the other longitudinal compartment 52 of the basal structure 40 is a double wire extension cord 72 having a conventional two-prong plug 73 at one end. It will be noted that the extension cord 72 is shown broken away (Figures 3 and 4) but in actual practice the cord is made of a substantial length, say, about six feet. The other end of the extension cord 72 is mounted with-
70 in slotted bushing 74 which in turn is mounted within a slot 75 in the lower inner panel 48. The extension cord 72 passes through the bushing 74 into the lower compartment 53 where it is separated into two individual wires 72a, 72b. One of the wires 72a is connected by means of nut 76 to one of the terminal wires 68a of the ballast transformer 68. The remaining wire 72b passes through the longitudinal compartment 51 and into the upper compartment 50 where it is connected to one of the switch lugs (not shown)
75 on the rear side of the switch component 54 in the view of Figure 4. The other transformer terminal wire 68b is connected by means of nut 77 to one of the wire leads 70a from the lower lamp holder 70. The other lead wire 70b from the lamp holder 70
80 passes through the compartment 51 and into the upper compartment 50 where it is connected to the switch lug 67 (see Figure 7). In a similar manner (one of the wire leads 69a from the upper fluorescent lamp holder 69 is connected to the switch lug 66 while the other lead 69b is connected to the switch
85 lug 64.

The one piece molded plastic casing 11 which contains the two high voltage batteries 15, 16, is integrally formed with a top wall 78, bottom wall 79, back wall 80, two side walls 81, 82 and has an open forward end. The top wall 78 is formed with a generally U-shaped cut-out portion 83 which is open
90 at the forward end of the casing 11. Depending from the top wall 78 are two short inner walls, only one of which walls is shown at 84 in the view of Figure 3, which walls reside respectively in close parallel relation to the two side walls 81, 82. The two short inner walls are each provided with an aperture such as shown at 85 which correspond with apertures (not shown) in the top portion of both side walls 81, 82 for purposes of mounting a metal U-shaped handle 86. The handle 86 is mounted on the casing 11 by means of rivets 87, 88 (see both Figures 1 and 3) which pass through the coinciding apertures in both the two inner walls and the side walls 81, 82. The handle 86 can be rotated about the rivets 87, 88 to an up-
95 standing position for purposes of carrying the lantern such as shown in the view of Figure 3. Alternatively, the handle 86 can be rotated
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backwards until it lies flush with the back wall 80 as shown in the view of Figure 1. The top rearward portion of the casing 11 is contoured to provide a space for accommodating the handle 86 when rotated to this position.

A one-piece molded plastic insert structure 89 is mounted within the uppermost portion of the casing 11. This insert structure 89 is also preferably molded from the same shock resistant, flame retardant plastic composition, and has a front wall 90 which resides within the open end of the casing 11. The front wall 90 is recessed a short distance back from the marginal edges of both the top wall 78 and the two side walls 81, 82. The insert structure 89 is further formed with a top wall 91 and a bottom partition wall 92. The top wall 91 is formed with an upstanding rib 93 which in assembly is adapted to fit snugly within the generally U-shaped cut-out portion 83 on the top casing wall 78. The bottom partition wall 92 is substantially perpendicular to the front wall 90 and fit snugly inside the casing 11. It will be noted that the partition wall 92 divides the interior of the casing 11 into an upper compartment 94 and a lower compartment 95 (see Figure 7). The two high voltage batteries 15, 16 are mounted inside the lower compartment 95 and rest on a plurality of supporting ribs 96 formed within the bottom of the casing wall 79. The front wall 90 of insert structure 89 is formed along its lower longitudinal edge portion with a slightly inwardly tapered recess 97 for receiving the upper edge of a flat metal battery cover 98. The front wall 90 is further integrally formed with two rectangular blocks 99, 100, the lower edges of which protrude over the inwardly tapered recess 97 for locking the battery cover 98 in place. Four spaced apart, hollow cylindrical studs 101—104 are integrally formed on the back side of front wall 90. These studs are adapted to mate with corresponding spaced apart, hollow cylindrical internally threaded studs 105—108 formed integrally with the back wall 80 of casing 11. The upper pair of studs 101, 102 communicate with apertures 109, 110 formed within the front wall 90 (see Figure 5) while the lower pair of studs 103, 104 communicate with apertures 111, 112 formed within the blocks 99, 100. Four metal screws (only one being shown at 113 in Figure 3) inserted through the apertures 109—112 and engaging the corresponding threaded studs 105—108, are used to secure the insert structure 89 in place within the casing 11. In order to secure the battery cover 98 within the open end of the casing 11, the forward marginal edge of the bottom wall 79 is formed with a lip 114 behind which resides the lowermost edge of the cover 98. It will be noted that the cover 98 can be readily re-

moved in order to replace the batteries 15, 16 by simply lifting the cover 98 upwardly into the inwardly tapered recess 97 so that its lower end will freely clear the lip 114.

An electrical receptacle 115 of conventional design adapted to receive the two-prong plug 73 of the extension cord 72, is mounted within a rectangular slot 116 formed in the front wall 90 of insert structure 89 and has its rearward end portion projecting into the upper compartment 94. Four metal leaf spring clips (only two of which are shown at 117, 118 in the view of Figure 7) are mounted beneath the partition wall 92 and are adapted to resiliently contact the positive and negative terminal posts on each of the two high voltage batteries 15, 16. The wire lead 115a leading from the receptacle 115 is connected to one of the metal clips which contacts the positive terminal post of the battery 15 by soldering it to a part of the clip (not shown) which extends through the partition wall 92. The other wire lead 115b is connected to the metal clip 118 contacting the negative terminal post of the battery 16 also by soldering it to a part of the clip which extends through the partition wall 92. An arc stabilizing resistor 119 is connected in series between the negative terminal post of the battery 15 and the positive terminal post of the battery 16 by soldering its wire leads in a similar manner to the two remaining metal clips.

A slidable latch mechanism indicated generally by the reference numeral 120 is provided for detachably joining together the two casings 10, 11. It will be noted first of all that the two casings 10, 11 are joined at the bottom of the assembly by the provision of a tongue 121 which is found at the lowermost edge of the basal structure 40 (see Figure 7). This tongue 121 is locked behind the lip 114 on the forward marginal edge portion of the bottom wall 79 of casing 11. As best seen in the view of Figure 5, the slidable latch mechanism includes an elongated button 122 which rests on the top wall 91 of the insert structure 89. The button 122 is attached to an elongated latch bar 123 located just underneath the top wall 91 by means of a rivet 124 which is free to slide along an elongated slot 125. The latch bar 123 is formed with two hooks 123a, 123b each of which pass through two coinciding slots 126a, 126b provided respectively in the upper portions of both the basal structure 40 and the insert structure 89. It will be seen then that the two casings 10, 11 can be easily locked together or unlocked as the case may be, by simply sliding the elongated button 122 in one direction or the other along the top wall 91.

Figure 9 shows schematically the manner in which the portable fluorescent lantern of the invention can be used when the two casings

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10, 11 are detached. It will be evident of course that in certain applications the size and weight of the lantern assembly may be a limiting factor in the use of the lantern, such as for example when it is desired to employ the lantern as an overhead light. In these situations, the casing 10 containing the main lantern parts, may be detached from the casing 11 and placed in the desired location remote from the casing 11. The extension cord 72 is removed from inside the casing 10 through a rectangular opening 127 provided in the back wall 41 of basal structure 40. The lanterns may then be operated simply by inserting the two-prong plug 73 into the electrical receptacle 115. If the extension cord 72 is not long enough to span the distance between the two casings 10, 11 a second extension cord can be used. As will be more clearly brought out hereinafter, the portable lantern can also be operated from an AC power supply such as a conventional wall outlet as may be found in the household.

Operation of the portable fluorescent lantern of the invention will now be described in detail with reference to the circuit diagram shown in Figure 8. It will be noted that the circuit comprises two loops, one of which contains the two high voltage batteries 15, 16, the transformer coil 68, switch S_1 , the main on-off switch and switch S_2 , the low illumination switch, while the other loop contains the starting switch S_3 . The fluorescent lamp 13 is common to both loops. To start the lantern, the starting switch S_3 is closed by depressing the starting button 59 which automatically closes the main on-off switch S_1 and the low illumination switch S_2 . This connects the two circuit loops in series so that current from the two batteries 15, 16 is able to flow through the transformer coil 68 and all of the switches S_1 , S_2 and S_3 . The field which is created by current passing through the transformer coil 68 causes the voltage to rise across the filament of the fluorescent lamp 13. As this current continues to flow, the filament heats up, the lamp fires and the current flows through the lamp 13 bypassing the circuit loop containing the switch S_3 . If it is desired to operate the fluorescent lamp 13 at low illumination, switch S_2 is opened by depressing the switch button 58 whereby the current is caused to flow through the parallel branch including the voltage dropping resistor 61. The fluorescent lamp 13 may be turned off by depressing the switch button 57 which opens the main on-off switch S_1 . The same procedure is followed in order to again start the fluorescent lamp 13. The capacitor 65 which is connected in parallel with the starting switch S_3 , prevents arcing across the switch contacts when the switch S_3 is opened. The arc stabilizing resistor 119 is necessary in order to maintain operation of the fluor-

escent lamp 13. Preferably the resistor 119 is connected in series between the two high voltage batteries 15, 16, although this is not necessary so long as the resistor is placed in the same circuit loop. It will be noted of course that the circuit loop containing the two high voltage batteries 15, 16, transformer coil 68 and the switches S_1 , S_2 also includes the extension cord 72 with its plug 73 and the electrical receptacle 115 whereby the two lantern casings 11, 12 can be detached from one another and used separately to operate the lantern.

An important feature of the invention resides in the provision of a transformer coil 68 whose impedance is chosen to substantially match the value of the arc stabilizing resistance 119. Thus when the casing 10 is detached and the lantern is operated from an AC power supply, the coil 68 takes the place of the arc stabilizing resistor 119 to permit continued operation of the fluorescent lamp 13.

It will be evident of course that a number of modifications may be made in the portable fluorescent lantern described herein above without departing from the scope of the present invention as defined by the following claims. Thus it is possible for example to modify the construction of the casing 11 in order to incorporate the extension cord 73 or to incorporate either one or both of the switch component 54 and ballast transformer 68. Other modifications will of course be apparent to those skilled in the art.

WHAT WE CLAIM IS:—

1. A portable fluorescent lantern comprising, in combination, a first casing, a fluorescent lamp, a lens and a reflector mounted in said first casing, a second casing containing at least one high voltage battery, means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed in a location remote from the other casing, and means for establishing an electrical circuit through said fluorescent lamp in said first casing and said battery in said second casing, said circuit including an extension cord mounted in one of said casings for making electrical connection between said fluorescent lamp and said battery when said lantern is operated with said casing detached from one another and with one casing placed in a location remote from the other casing.

2. A portable fluorescent lantern as claimed in claim 1, wherein said extension cord is mounted in said first casing along with said fluorescent lamp, lens and reflector.

3. A portable fluorescent lantern as claimed in claim 1 wherein said extension cord is mounted in said second casing.



10, 11 are detached. It will be evident of course that in certain applications the size and weight of the lantern assembly may be a limiting factor in the use of the lantern, such as for example when it is desired to employ the lantern as an overhead light. In these situations, the casing 10 containing the main lantern parts, may be detached from the casing 11 and placed in the desired location remote from the casing 11. The extension cord 72 is removed from inside the casing 10 through a rectangular opening 127 provided in the back wall 41 of basal structure 40. The lanterns may then be operated simply by inserting the two-prong plug 73 into the electrical receptacle 115. If the extension cord 72 is not long enough to span the distance between the two casings 10, 11 a second extension cord can be used. As will be more clearly brought out hereinafter, the portable lantern can also be operated from an AC power supply such as a conventional wall outlet as may be found in the household.

Operation of the portable fluorescent lantern of the invention will now be described in detail with reference to the circuit diagram shown in Figure 8. It will be noted that the circuit comprises two loops, one of which contains the two high voltage batteries 15, 16, the transformer coil 68, switch S_1 , the main on-off switch and switch S_2 , the low illumination switch, while the other loop contains the starting switch S_3 . The fluorescent lamp 13 is common to both loops. To start the lantern, the starting switch S_3 is closed by depressing the starting button 59 which automatically closes the main on-off switch S_1 and the low illumination switch S_2 . This connects the two circuit loops in series so that current from the two batteries 15, 16 is able to flow through the transformer coil 68 and all of the switches S_1 , S_2 and S_3 . The field which is created by current passing through the transformer coil 68 causes the voltage to rise across the filament of the fluorescent lamp 13. As this current continues to flow, the filament heats up, the lamp fires and the current flows through the lamp 13 bypassing the circuit loop containing the switch S_3 . If it is desired to operate the fluorescent lamp 13 at low illumination, switch S_2 is opened by depressing the switch button 58 whereby the current is caused to flow through the parallel branch including the voltage dropping resistor 61. The fluorescent lamp 13 may be turned off by depressing the switch button 57 which opens the main on-off switch S_1 . The same procedure is followed in order to again start the fluorescent lamp 13. The capacitor 65 which is connected in parallel with the starting switch S_3 , prevents arcing across the switch contacts when the switch S_3 is opened. The arc stabilizing resistor 119 is necessary in order to maintain operation of the fluor-

escent lamp 13. Preferably the resistor 119 is connected in series between the two high voltage batteries 15, 16, although this is not necessary so long as the resistor is placed in the same circuit loop. It will be noted of course that the circuit loop containing the two high voltage batteries 15, 16, transformer coil 68 and the switches S_1 , S_2 also includes the extension cord 72 with its plug 73 and the electrical receptacle 115 whereby the two lantern casings 11, 12 can be detached from one another and used separately to operate the lantern.

An important feature of the invention resides in the provision of a transformer coil 68 whose impedance is chosen to substantially match the value of the arc stabilizing resistance 119. Thus when the casing 10 is detached and the lantern is operated from an AC power supply, the coil 68 takes the place of the arc stabilizing resistor 119 to permit continued operation of the fluorescent lamp 13.

It will be evident of course that a number of modifications may be made in the portable fluorescent lantern described herein above without departing from the scope of the present invention as defined by the following claims. Thus it is possible for example to modify the construction of the casing 11 in order to incorporate the extension cord 73 or to incorporate either one or both of the switch component 54 and ballast transformer 68. Other modifications will of course be apparent to those skilled in the art.

WHAT WE CLAIM IS:—

1. A portable fluorescent lantern comprising, in combination, a first casing, a fluorescent lamp, a lens and a reflector mounted in said first casing, a second casing containing at least one high voltage battery, means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed in a location remote from the other casing, and means for establishing an electrical circuit through said fluorescent lamp in said first casing and said battery in said second casing, said circuit including an extension cord mounted in one of said casings for making electrical connection between said fluorescent lamp and said battery when said lantern is operated with said casing detached from one another and with one casing placed in a location remote from the other casing.

2. A portable fluorescent lantern as claimed in claim 1, wherein said extension cord is mounted in said first casing along with said fluorescent lamp, lens and reflector.

3. A portable fluorescent lantern as claimed in claim 1 wherein said extension cord is mounted in said second casing.

4. A portable fluorescent lantern as claimed in any one of the preceding claims, wherein said circuit further includes switch means and a ballast transformer mounted in said first casing for starting and operating said fluorescent lamp.
5. A portable fluorescent lantern as claimed in any one of claims 1 to 3 wherein said circuit further includes switch means and a ballast transformer mounted in said second casing for starting and operating said fluorescent lamp.
6. A portable fluorescent lantern as claimed in claim 1 substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
7. A portable fluorescent lantern comprising, in combination:
- a first casing having an open forward and rearward end;
 - a fluorescent lamp, lens and reflector mounted within the open forward end of said first casing;
 - a basal structure mounted within the open rearward end of said first casing;
 - switch means mounted in a portion of said basal structure and extending through a portion of the walls of said first casing;
 - a ballast transformer for starting said fluorescent lamp mounted in a portion of said basal structure within said first casing;
 - a second casing containing at least one high voltage battery;
 - means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed at a location remote from the other casing; and
 - means for establishing an electrical circuit through said fluorescent lamp, switch means and ballast transformer in said first casing and said battery in said second casing, said circuit including an extension cord mounted in said first casing and means electrically connecting said extension cord to said battery in said second casing.
8. A portable fluorescent lantern as claimed in claim 7, wherein said basal structure includes a pair of wall members which protrude within said first casing at opposite ends thereof and wherein one of a pair of lamp holders is mounted on each of said wall members for holding said fluorescent lamp in front of said reflector.
9. A portable fluorescent lantern as claimed in claim 8, wherein said switch means are mounted in one of said wall members and extend through a corresponding wall portion of said first casing.
10. A portable fluorescent lantern as claimed in any one of claims 7 to 9, wherein an insert structure is mounted within a portion of said second casing and wherein said insert structure includes means for making electrical connection between said extension cord and said battery.
11. A portable fluorescent lantern as claimed in claim 10, wherein said insert structure includes a wall member which protrudes inside said second casing and wherein the means for detachably joining said first and second casings together includes a slidable latch mounted in said wall member and extending through a corresponding wall portion of said second casing.
12. A portable fluorescent lantern as claimed in claim 10 or 11, wherein said extension cord is provided with a two-prong plug affixed to one end thereof.
13. A portable fluorescent lantern as claimed in claim 12, wherein said means for making electrical connection between said extension cord and said battery comprises an electrical receptacle adapted to receive the two-prong plug affixed to said extension cord.
14. A portable fluorescent lantern as claimed in claim 7 substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
15. A portable fluorescent lantern comprising, in combination, a first casing adapted to receive a fluorescent lamp, said first casing having mounted therein a lens and a reflector, a second casing adapted to contain, at least one high voltage battery, means for detachably joining said first and second casings together whereby said lantern may be operated with said first and second casings being joined in one assemblage or detached from one another with one of said casings being placed in a location remote from the other casing, and means for establishing an electrical circuit through said fluorescent lamp when contained in said first casing and said battery when contained in said second casing, said circuit including an extension cord mounted in one of said casings for making electrical connection between said fluorescent lamp when contained in said first casing and said battery when contained in said second casing when said lantern is operated with said casings detached from one another and with one casing placed in a location remote from the other casing.

W. P. THOMPSON & CO.,
Coopers Buildings,
12, Church Street,
Liverpool, L1 3AB,
Chartered Patent Agents.

