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G. E. MEESE ET AL

2,344,160

ELECTRIC LAMP

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Fig. 1.

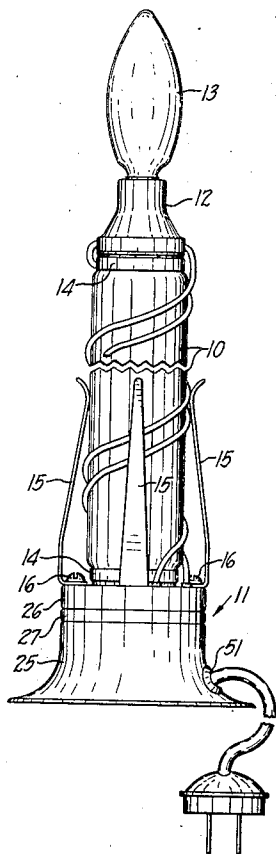


Fig. 2.

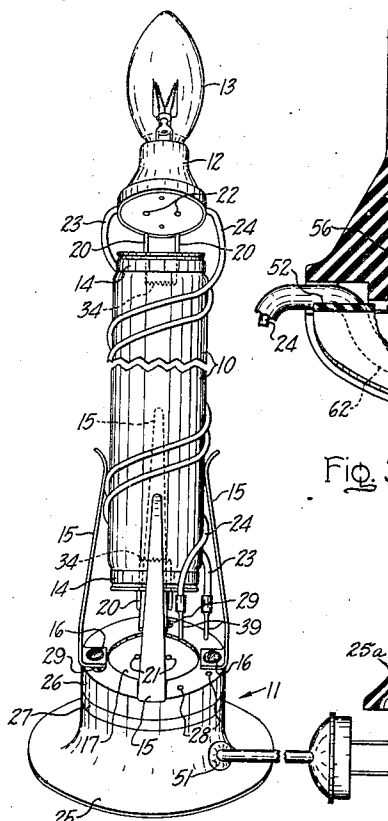


Fig. 5.

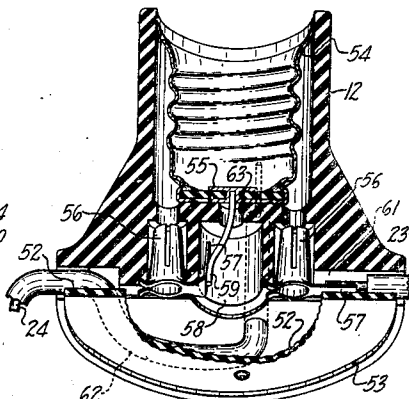


Fig. 3.

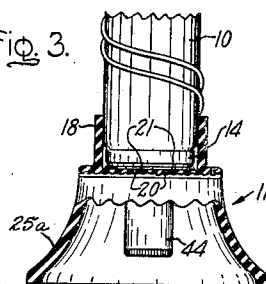


Fig. 4.

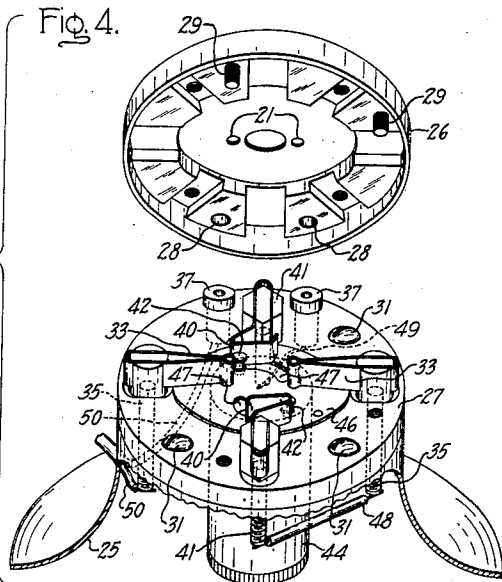
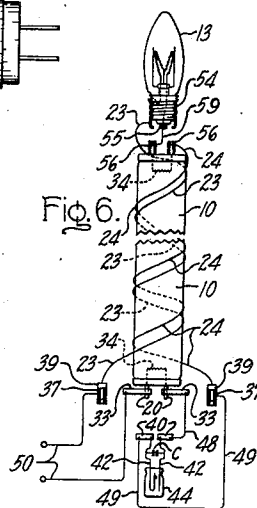


Fig. 6.



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UNITED STATES PATENT OFFICE

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ELECTRIC LAMP

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9 Claims. (Cl. 240—81)

This invention relates to lighting equipment, and affords a novel lighting unit in which are associated a tubular or double-ended lamp and an incandescent or other electric lamp which may be of a different type from the first lamp. The first-mentioned lamp may advantageously be of the present ordinary positive column fluorescent type, and is here illustrated and generally referred to as a tubular lamp or lamp tube. In suitable forms such as here shown, the lighting unit is in effect a candle lamp, with the body or shaft of the candle represented or simulated by the lamp tube, and the candle flame by the other lamp. However, our invention includes various combinations and parts which may be found useful for other purposes besides a candle lamp unit.

Other features and advantages of the invention will become apparent from the following description of species or forms of embodiment, and from the drawing.

In the drawing, Fig. 1 is a side view of a lighting unit conveniently embodying our invention, a portion of the tubular lamp being broken out and removed, and likewise a portion of the connecting cord of the unit; Fig. 2 is a view similar to Fig. 1 but showing the main components of the unit partly separated and tilted relative to one another; and Fig. 3 is a view similar to the lower portion of Fig. 1 illustrating a modification, one of the parts being shown partly in vertical axial section.

Fig. 4 is a view of the pedestal of the unit with its principal components separated and oppositely tilted, and with a hollow base or skirt partly broken away; and Fig. 5 is a sectional view of the incandescent lamp base structure shown in Fig. 2, on a larger scale.

Fig. 6 is a circuit diagram for the unit.

As shown in Figs. 1, 2, and 3, the lighting unit comprises a fluorescent tubular lamp 10 of discharge type upstanding from a pedestal 11 and surmounted by a socket adapter 12 in which is an incandescent lamp 13, which may have a conoidal or flame-shaped bulb. The socket adapter 12 is shown as conically reduced, upward, from the size of the upper end of the lamp 10 to a size appropriate for surrounding the base of the lamp 13, and may be of molded plastic, for example. The tubular lamp 10 is shown as of ordinary type, equipped with the usual bipost bases 14 at both ends. The pedestal 11 is shown as cylindrical with a flared bottom, and as socketed to engage around the lower portion or end of the lamp 10 and thereby brace the lamp 10 relative to the pedestal. The pedestal 11 may be made of sheet metal and molded plastic. In Figs. 1 and 2, the socket means of the pedestal 11 that takes the lamp 10 comprises a number

of metal spring fingers or clips 15 mounted on the pedestal, to which their inbent lower ends or feet are attached by screws 16, around a shallow depression or recess 17 in the upper surface of the pedestal in which the lower lamp base 14 engages snugly but not tightly. In Fig. 3, the pedestal socket consists entirely of a recess formed by an annular flange 18 upstanding from the upper plastic member of the pedestal, and fitting snugly but not tightly around the lower end of the lamp tube, the spring fingers being omitted.

In both Fig. 2 and Fig. 3, the contact posts 20, 20 of the lower base 14 are accommodated and engaged in apertures 21, 21 in the top of the pedestal 11, and thus serve to align the lamp 10 with the pedestal, and to guide the base and the lamp end into the recess 17 or 18. Similarly, the contact posts 20, 20 of the upper base 14 are accommodated and engaged in apertures 22, 22 in the bottom of the socket adapter 12, and thus serve to align the adapter 12 with the lamp 10 and to keep these parts in proper relation. Wires 23, 24 are shown extending from the adapter 12 to the pedestal 11 along the exterior of the tubular lamp 10, and as helically wrapped or coiled around the latter. These wires may serve to hold the socket adapter 12 to the upper end of the fluorescent tube 10 and to hold the lower end of said tube to the pedestal 11, and may also form parts of circuits that are explained hereinafter.

As shown in Figs. 2, 3, and 4, the pedestal 11 comprises a hollow base or skirt 25 with an insulative top that covers connectors for the lamp tube 10, the wires 23, 24, and also for lamp auxiliaries such as a starter and condenser. This top may be horizontally divided into separate parts 26, 27 that afford a chamber or recesses between them. The upper or cover part 26 has the socket recess 17 or 18 and the contact-post holes 21, 21 in its upper side, as well as holes 28, 28 for the ends or terminals of the wires 23, 24, and the spring fingers 15 may be attached directly to it by the screws 16. Its lower side is hollowed out or recessed to accommodate various parts, and it may be secured to the lower part 27 by means of screws 29. The lower disc part 27 is in effect a diaphragm across the hollow base 25. In Figs. 1, 2, and 4, the hollow base 25 is shown as of sheet metal, and secured to the part 27 by screws or bolts 31. In Fig. 3, the hollow base 25a is of insulating material, and is in effect a skirt integral with the part 27.

As here shown, the parts in the chamber between the cover 26 and the diaphragm 27 are mounted on the latter. Amongst these parts are spring-clamp connectors 33, 33 whose separable and transversely grooved members are aligned with the holes 21, 21 in the cover 26 and resili-

iently grip the posts 20, 20 between them when they are inserted through the holes, thus holding the lamp 10 to the pedestal 11 and also making electrical connection to the posts and to the cathode coil 34 connected between them inside the lamp, Fig. 2. The connectors 33, 33 may be mounted on the heads of screw-posts or bolts 35, 35 bolted through the diaphragm 27 near its periphery. Also mounted on the diaphragm 27 in a similar manner are hollow socket connectors 37, 37 which are aligned with the holes 28, 28 in the cover 26 and take terminal or contact-pins 39, 39 on the lower ends of the wires 23, 24. In addition, there are starter connectors 40, 40 consisting of leaf springs mounted on the heads of screw-posts or bolts 41, 41 mounted on the diaphragm 27 like the posts 35, 35, and having their free inner ends reversely bent to extend on a slope, Fig. 4. These spring contacts 40, 40 engage the usual contact heads 42, 42 of a starter 44 which is accommodated and housed in the pedestal base 25 below the diaphragm 27, with its upper end rather loose in a central socket recess or opening in this diaphragm. The thin central diaphragm web across the opening in base 25 (shown as a separate disc 45 secured on top of the diaphragm 27 proper) has a pair of annularly extending keyhole slots 47, 47 that receive the starter contact-heads 42, 42 and lock under them when they are inserted and turned past "dead center" in contact with the springs 40, 40, according to the usual manner of mounting and connecting such starters. As shown in Fig. 4, one of the bipost connectors 33, 33 is connected to one of the starter connectors 40, 40, within the hollow base 25, by means of a wire 48 attached to the lower ends of the corresponding connector posts 35, 41, and the other starter connector 40 is similarly connected to one of the socket connectors 37 by means of a wire 49. The other socket connector 37 and the other bipost connector 33 are connected to current supply leads 50, 50 embodied in a flexible attachment cord extending into the base 25 through a hole 51.

As shown in Fig. 5, the socket adapter 12 comprises a hollow insulative body or casing with a separate insulative end or bottom wall disc 52 detachably secured thereto in a shallow depression 53 in its large lower end (that lies against the end of the lamp tube 10), and apertured at 22, 22 to take the lamp contact and terminal posts 20, 20. Accessible at the upper end of the adapter 12 are the usual insulatively separate screw shell and center contacts 54, 55 for securing the incandescent lamp 13, Figs. 1 and 2, and making connection thereto, as hereinafter described. In bores opening into the depression 53 are resilient hollow connector clamps 56, 56, aligned with the bipost openings 22, 22 in the bottom disc 52. They resiliently grip the base biposts 20, 20 when the latter are inserted through the openings 22, 22, thus holding the adapter 12 to the lamp 10 and also making electrical connection to the posts and to the cathode coil 34 connected between them inside the lamp. One of these post connectors 56 has a lateral lug or ear 57 that is bent back into a central cavity 58 in the adapter 12 and is connected to the center contact 55 by a wire 59, thus securely fastening in place the connector 56 and both of the contacts 54, 55. The other post connector 56 has its lateral lug or ear 57 extending outward into a radial groove or passage 61 in the lower end of the adapter 12, where it is connected to the upper end of the lead wire 23. This connector 56 is

securely held in place by the disc 52. The other lead wire 24 extends in through a curving groove 62 and up through the central cavity 58 and a hole 63 to the screw shell contact 54, to which it is connected.

In Fig. 6, showing the circuits, corresponding parts and features are marked with the same reference characters as in Figs. 1, 2, 4, and 5, so that the only description required is to trace the circuits briefly. One side of the supply circuit 50 connects through one connector 33 and lower bipost 20 to one end of the lower cathode coil 34; while the other side of this supply circuit 50 connects through one connector 37, wire 23, screw-shell 54, incandescent ballast lamp 13, center contact 55, connector 56, and one upper bipost 20 to one end of the upper cathode coil 34. These connections constitute the operating circuit of the lamp unit. Across this operating circuit, through the cathode coils 34, 34, is connected the starting circuit, which extends from the other end of the lower cathode 34 through the other lower bipost 20, connector 33, wire 48, one connector 40, starter 44 (shown in Fig. 6 as of glow-switch type, with a condenser C shunt across it as usual), other connector 40, wire 49, other connector 37, wire 24, other connector 56, and the other upper bipost 20 to the other end of the upper cathode coil 34.

The operating and starting circuits above described and the starter 44 operate in the usual manner for fluorescent lamps. When the supply circuit 50 is energized, the switch device 44 permits flow of current through the starting circuit and the cathode filaments 34, 34 in series therein for a sufficient length of time to preheat the cathodes to an adequate emissive temperature, and then suddenly opens the circuit; and the resulting voltage kick between the cathodes 34, 34 suffices to initiate discharge between them or, in other words, starts the lamp.

It will be seen that the lighting unit is very easily assembled after the pedestal 11 and socket adapter 12 have been fabricated, since the lamps 10 and 13 and the starter 44 may be standard commercial units, and the wiring 23, 24 is very simple. The mere insertion of the lamp 10 in the pedestal socket means 17 or 18 results in automatic engagement of its contact terminals 20, 20 with the connectors 33, 33; and similarly as regards the adapter contacts 56, 56 and the application of the adapter 12 to the other end of the lamp 10. By making the insulative pedestal top and the adapter 12 black or of other neutral shade or tint, as well as the lamp tube bases 14, 14 and the wires 23, 24, it is possible to use lamps 10 and 13 of any desired color(s) with good effect. Wrapped around the lamp 10, the leads 23, 24 contribute to the pleasing effect, so that their exposure offers an advantage rather than a problem of finding a way to conceal them. The hollow base or skirt 25 may be finished like the adapter 12 and bases 14 and the insulative pedestal top, or it may have a contrasting metal finish such as brass, chromium, or silver, for example. Moreover, the lamps 10 and 13 of a unit can easily be replaced by the ordinary user, either because of deterioration, or to change the colors of these lamps according to taste or for special decorative purposes.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An imitation candle lighting unit comprising, in combination, a vertically disposed double-ended discharge lamp representing the body of a

candle and provided with contact terminals at both ends, a socketed pedestal engaged around the lower end of said lamp and provided with connectors for automatically engaging the said contact terminals of said end when the latter is inserted in the pedestal socket, an incandescent lamp socket adapter removably carried by the upper end of said lamp and provided with connectors for automatically engaging the said contact terminals of said upper end when the adapter is applied thereto, an incandescent ballast lamp mounted in said socket adapter to represent the candle flame, and conductors connecting the discharge lamp and ballast lamp in circuit.

2. An imitation candle lighting unit comprising, in combination, a vertically disposed double-ended discharge lamp representing the body of a candle and provided with connecting posts at both ends, a pedestal apertured to receive the connecting posts of the lower lamp end and provided with connectors for automatically engaging said posts when they are inserted in said apertures, an incandescent lamp adapter apertured to receive the connecting posts of the upper lamp end and provided with connectors for automatically engaging said posts when they are inserted in said apertures, an incandescent ballast lamp mounted in said adapter to represent the candle flame, and conductors connecting the discharge lamp and ballast lamp in circuit.

3. A candle-lamp comprising, in combination, a pedestal, a discharge tube lamp for representing the body of a candle, a socket for an incandescent ballast-lamp to represent the candle flame, and current leads for connecting said tube and ballast lamp in circuit wrapped around said tube and holding said socket to one end of said tube and the other end of said tube to said pedestal.

4. A lighting unit comprising, in combination, a pedestal provided with engagement means; a discharge tube having an exterior envelope, and having one end secured to said pedestal by the said engagement means of the latter; an incandescent ballast-lamp; a socket for said incandescent ballast-lamp provided with engagement means and secured thereby to the other end of said discharge tube; and current leads outside the exterior envelope of said tube for connecting said tube and ballast lamp in circuit, and also holding said engagement means of said socket engaged with its end of said tube and the other end of said tube engaged with said engagement means of said pedestal.

5. A candle-lamp comprising, in combination, a pedestal; a fluorescent tube for representing the body of a candle having an exterior envelope with bipost bases at its ends, and engaged by the biposts at one end thereof with said pedestal; an incandescent ballast-lamp representing the candle flame; a socket for said ballast-lamp engaged with said fluorescent tube by the biposts at the other end thereof; and current leads extending along said tube outside its exterior envelope for connecting said tube and ballast lamp in circuit and also holding the fluorescent tube biposts engaged with said pedestal and said socket.

6. A lighting unit comprising, in combination, a pedestal provided with mounting and connecting means for a discharge tube starter, and also having socket means for a discharge tube; a discharge tube mounted in said socket means; an incandescent ballast-lamp; a socket for said incandescent ballast-lamp mounted on the upper

end of said discharge tube; and means including current leads wrapped around said discharge tube for connecting one side of a power circuit through the discharge tube cathode adjacent said pedestal, a starter connected to said connecting means, said ballast-lamp, and the other discharge tube cathode back to the other side of said power circuit.

7. A lighting unit comprising, in combination, a pedestal provided with a fluorescent tube starter and having socket means with connectors for biposts of a fluorescent tube base, and also having starter connectors and other connectors, one of said starter connectors being connected to one of said other connectors; a fluorescent tube mounted in said socket means with the biposts of its lower base engaging said bipost connectors; an incandescent ballast-lamp; a socket structure for said incandescent ballast lamp mounted on the upper base of said fluorescent tube and having connectors engaging the biposts of said upper base, one incandescent lamp contact of said socket structure being connected to one of its said bipost connectors; current leads wrapped around the fluorescent tube for connecting another incandescent lamp contact and the other bipost connector of said socket structure to the aforesaid other connectors of said pedestal; and current supply leads for the lighting unit connected one to one of the starter connectors and one to one of the bipost connectors of said pedestal.

8. A lighting unit comprising, in combination, a pedestal containing lamp socket and contact means adjacent its upper surface, a vertically disposed double-ended electric discharge lamp having contact terminals at both ends, the lower end of said lamp being removably mounted in the said socket means with the adjacent contact terminals in engagement with the said contact means in said pedestal, an adapter removably mounted on the upper end of said discharge lamp and having connectors at its lower end engaging the contact terminals at the said upper end of the discharge lamp, said adapter also having an incandescent lamp socket at its upper end, an incandescent ballast-lamp removably mounted in the adapter socket, current supply conductors extending from said pedestal, and other conductors electrically connecting said ballast and discharge lamps to said current supply conductors.

9. A lighting unit comprising, in combination, a pedestal containing lamp socket and contact means adjacent its upper surface and a starter switch socket in its interior, a starter switch mounted in said switch socket, a vertically disposed double-ended electric discharge lamp having contact terminals at both ends, the lower end of said lamp being removably mounted in the said lamp socket means with the adjacent contact terminals in engagement with the said contact means in said pedestal, an adapter removably mounted on the upper end of said discharge lamp and having connectors at its lower end engaging the contact terminals at the said upper end of the discharge lamp, said adapter also having an incandescent lamp socket at its upper end, an incandescent ballast-lamp removably mounted in the said pedestal, and other conductors electrically connecting said ballast and discharge lamps and said starter switch to said current supply conductors.

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