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L. W. COOK

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FLOURESCENT LAMP STARTING AND CONTROLLING APPARATUS

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Fig. 1.

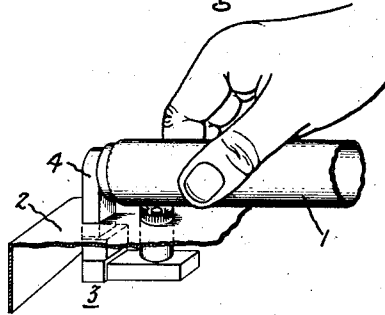


Fig. 2.

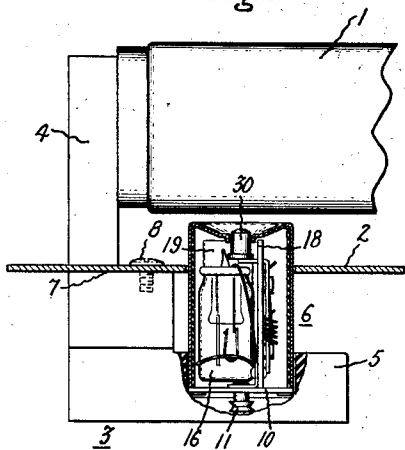


Fig. 3.

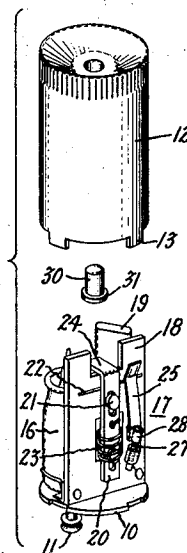
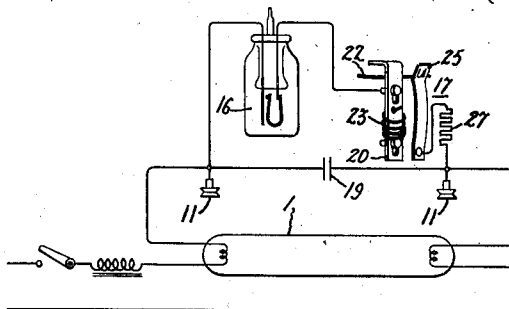


Fig. 4.



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UNITED STATES PATENT OFFICE

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FLUORESCENT LAMP STARTING AND
CONTROLLING APPARATUSLeonard W. Cook, Stratford, Conn., assignor to
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Application December 24, 1942, Serial No. 470,008

1 Claim. (Cl. 315—100)

My invention relates to fluorescent lamp apparatus. More particularly, it relates to the construction and mounting of the switching apparatus by which the lamps are started and controlled.

In a common form of fluorescent lamp apparatus the lamp and the starting switch therefor are mounted in a panel or reflector by means of holders, one part of each of which extends through an opening in the panel and detachably holds the lamp at one side of the panel and another part at the opposite side of the panel detachably holds the starting switch unit. To provide ready accessibility to the starting switch unit from the lamp side of the panel or reflector the upper end of the enclosing casing of the unit is made to project up through an opening in the panel directly beneath the lamp which must be removed from its holder before the switch unit is applied or removed. Lamp holders and starting switch units such as those illustrated in the drawing now are in extensive use and as they are being manufactured in large quantities have dimensions which have become standard. In such apparatus the space between the panel and the lamp when the latter is in place is small and the casing of the starting unit extends within close proximity to the lamp. Enough of the casing, however, is designed to extend above the panel to enable a person to grasp it with his fingers and to give it the movement necessary to secure it in and to release it from its socket.

In more recent developments, the starting switch unit includes not only the starting switch but a lock-out switch by which the starting switch is rendered inoperative after it has made a number of unsuccessful attempts to start the lamp until it is manually reset. According to that construction the lockout switch trips open when the lamp refuses to start after repeated trials and in so doing the switch pushes up a button mounted in the upper end of the enclosing casing whereby the button serves as an indicator or telltale that the lockout switch has operated. By pushing down on the button the lockout switch is reset. A disadvantage of the above described construction when used with standard apparatus is that the resetting button may interfere with the lamp. Moreover, if one seeks to avoid this difficulty by materially reducing the height of the casing of the starting switch unit a new difficulty is confronted, namely, not enough of the casing will project above the panel to enable one to get a sufficient hold

of the casing to secure the unit in or to release it from its socket.

It is the object of my invention, therefore, to provide an improved construction of this character which avoids the difficulties mentioned above, is simple in construction, and is inexpensive to manufacture.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claim.

Referring to the drawing, Fig. 1 is a perspective view of apparatus illustrating my invention; Fig. 2 is a side view partly in section and drawn to a large scale showing that apparatus; Fig. 3 is a perspective view of the starting switch unit with parts thereof disassembled; and Fig. 4 is a circuit diagram.

Referring to Figs. 1 and 2 the lamp 1 which may be one of the modern fluorescent type in common use is supported above the panel or reflector 2 by the holder 3 which has suitable contacts for engaging the contacts of the lamp thereby to complete the circuit of the lamp and to retain the lamp in a definite position with respect to the panel. The lamp holder 3 comprises the upstanding portion 4 which extends up through an opening in the panel and directly connects with the lamp and the portion 5 spaced below the panel for supporting the starting switch unit 6. An intermediate portion of the holder has the shoulder 7 which firmly engages the under face of the panel when the holder is secured thereto by the attaching screw 8.

The starting switch unit 6 comprises the base plate 10 having two contact-making and securing terminals, one only of which is shown at 11, and the enclosing casing or can 12 which by means of the lugs 13 is firmly secured to the base plate. The terminals 11 serve both to connect the starting and lockout switches of the unit with contacts, not shown, in the part 5 of the holder and to retain the unit in place, a bayonet type of connection being commonly used. When secured to the holder in proper position the casing of the unit extends up through another opening in the panel in close proximity to the lamp.

The starting unit may comprise starting and lockout switches of various constructions. In the drawing, I have chosen to show by way of example at 16 a starting switch of the well known glow discharge tube type and at 17 a lockout switch of a form which I have disclosed and claimed in my copending application Serial No. 470,007, filed December 24, 1942, and assigned to the same

assignee as my present application. Secured to the base plate 10 is the insulating supporting plate 18 at one side of which the glow tube starting switch 16 and the capacitor 19 are mounted and on the other side of which the lockout switch 17 is mounted. The latter switch comprises the slide bar 20 attached to the plate 18 and guided by the headed pins 21 secured to the plate. Extending from opposite sides of this bar are the cross pins 22 which bear against the plate 18, one pin also functioning as one of the switch contact elements. The bar is normally urged upward, namely, to its open circuit position by the coil 23 and at its upper end the bar is bent at right angles as shown at 24. The cooperating switch contact element is shown at 25, being a resilient bi-metal strip secured to the plate at its lower end and having a latch at its upper end arranged when the strip is not heated to engage one of the cross pins and retain the bar in its lower position against the force of the spring. Heat from the resistance heater 21 is accumulated in and transmitted to the bi-metal strip by the metal strap 28, the heater and the switch contacts being connected in series between one terminal 11 and the glow switch 16. If the lamp is defective or for any other reason fails to start after the glow switch has made several attempts to start it the heat accumulated in the heater, in the metal strap and in the bi-metal strip will be sufficient to warp the upper end of the strip away from the plate to release the cross pin it engages, thus opening the circuit of the glow switch. Upon replacement of the lamp, if defective, with a good lamp the lockout switch needs to be reset. To facilitate this without removing the casing, the casing is provided with a central opening in its end face in which the small button 30 slides, the button having the flange 31 to limit its outward movement in the casing and to engage the

bent part 24 of the bar. To reset the switch one merely presses down on the button with a finger until the switch contacts reclose and the latch engages. As shown particularly in Figs. 2 and 3 the end face of the casing is concave or depressed in the central portion thereof so that even though the resetting button is in its upper position or that corresponding to the open circuit position of the lockout switch its upper end does not project materially, if any, above the side wall of the casing hence does not interfere with the lamp. Since the part of casing which projects above the panel has not been decreased the starting switch unit may be attached to and detached from the panel just as readily as before and no changes need be made in the dimensions of the parts. Moreover the button will still function as a telltale indicator of the operation of the lockout switch and serves as a convenient means for the resetting of that switch.

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

In a fluorescent lamp mounting comprising a mounting panel having an opening therein, a member secured to said panel having a part thereabove for detachably holding a fluorescent lamp closely adjacent to said panel, and a starting switch unit in combination with a telltale adapted to protrude therefrom to indicate a predetermined condition, said switch unit being detachably supported by a part of said member below said panel and projecting through said opening a distance sufficient to form a hand grasp for manipulating said unit and into close proximity to the lamp, the end of said switch unit being inset to accommodate the protruding movement of said telltale member between said unit and the lamp, so that it does not protrude materially beyond the unit toward said lamp.

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