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BASE FOR RAPID START FLUORESCENT LAMP

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1 Claim. (Cl. 315—32)

This invention relates to an improved base and involves circuit arrangement thereto for use with rapid start fluorescent lamps wherein high voltage between heated electrodes is utilized for instigation of the initial discharge to start the lamp.

Inasmuch as the longer lengths of lamps of the "rapid start" type utilize rather high voltage even with provision for heating the electrodes, there is a definite hazard present that a user, in exchanging one lamp for another may touch opposite terminals of the lamp and be subjected to a high voltage shock. Primarily and in the broad concept of the present invention the purpose is to eliminate such hazard.

More specifically the invention proposes breaking the primary circuit immediately upon release of an end of the lamp from its socket.

Of similar nature, an object of the invention is to provide a base, cooperating socket and circuit by which the high voltage is eliminated from the terminals exposed by partial or entire removal of the lamp from either socket or from both sockets.

Other objects, advantages and distinguishing characteristics of the invention will appear to persons skilled in the art to which it appertains, as the description proceeds, both by direct recitation thereof and by implication from the context.

Referring to the accompanying drawing, in which like numerals of reference indicate similar parts throughout the several views:

Fig. 1 shows a fluorescent lamp in elevation together with circuit arrangement therefor;

Fig. 2 is an end view of one base representative of both bases, as used with and as part of said lamp;

Fig. 3 is an enlarged sectional view on line III—III of Fig. 2; and

Fig. 4 is an inside end view of the base.

In the specific embodiment of the invention illustrated in said drawing, the lamp is shown as providing an elongated envelope 12 having a flare tube 13 at each end terminating inwardly as a press 14 for sealing pairs of leads 15 therethrough from the exterior to the interior of the lamp where each pair of leads carries an electrode 16. In use, a high potential difference of several hundred volts is established between the electrodes sufficient to drive electrons from one electrode to the other. Gas is present in the lamp as result of which ionization takes place creating ultraviolet radiation which acts upon fluorescent coating on the interior wall of envelope 12 and produces the fluorescent glow desired in the lamp. A limited amount of current is applied to the electrodes for obtaining and maintaining the electron discharge. The currents and potentials applied to the lamp are derived from a transformer or ballast 17 exterior to the lamp. A portion 18 of this ballast serves as a primary, and, as will be readily understood, this primary is serviced from a usual commercial service line such as the well known 110 volt house-lighting source of alternating current electricity.

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Each base of the present invention provides a pair of metallic pin terminals 19 projecting therefrom in a direction generally parallel to the axis of the lamp at opposite sides of the axis. Each pin is connected with a different one of the leads 15 to an electrode 16 so that the pair of pins are in series with that electrode. Each pair of pins 19 makes contact through the socket (not shown) to a limited number of turns 20 of the transformer secondary for supplying heating current to the electrode. However, since the opposite electrodes make connection through the pins to opposite ends of the ballast coil, a high potential, usually 300 volts or more, exists between pins at opposite ends of the lamp. This high voltage creates a hazard in prior art lamps to a person who might touch the pins while exchanging a lamp.

In order to eliminate the aforementioned hazard, I provide for interruption of the primary circuit to the ballast when an end of the lamp is withdrawn from the socket therefor. For this purpose I utilize a third pin 21 projecting from each base, this third pin being shown between and parallel to the other two pins and on the lamp axis. This third pin may have a body of insulative material conveniently formed integrally with the phenolic condensation material, such as "Bakelite" of which the body of the base is fabricated. The pin body has a metallic ferrule or cap 22 permanently secured thereon but without any direct electrical connection from the cap or ferrule to the interior of the lamp. This third pin, with its metallic ferrule is arranged to function as a jack-plug or switch, to be in series with the commercial service source of electricity and the ballast primary. Thus when the circuit, including said third pin, is broken by removal of the pin from the lamp socket, the primary current to the ballast is interrupted and therefore no secondary currents will be derived so that all pins of the lamp become "dead" simultaneously.

While there are some lamp and socket installations wherein one end of the lamp has to be removed from its socket before the other end is releasable, I have arbitrarily illustrated circuit arrangement adapted to break the primary current when either end of the lamp is removed from its socket.

As indicated in Fig. 1, the lamp sockets are therefore each provided with a pair of spring contacts 23 which engage on opposite sides of the cap or ferrule 22 of the third pin at each end of the lamp when the pin is located in place in the socket. For this arbitrary showing, one of the spring contacts of one socket is connected by wire 24 or otherwise to one of the spring contacts of the other socket. One of the other spring contacts is connected by line 25 to one primary tap to the ballast and the other spring contact of the other socket connects to the power supply line by connection 26. Where break at only one end of the lamp is needed, lines 25 and 26 would be combined to go directly to the power supply line. The other side of the power supply line has a connection 27 to the other primary tap to the ballast. Thus it will be seen in the illustrated arrangement that both of the third pins bridge between the respective spring contacts of the socket in which located, and complete a series circuit from the source of electricity to the ballast primary. Therefore withdrawal of either of these third pins will interrupt the primary circuit completely, and thus entirely eliminate any hazard in the exchange of one lamp for another since all terminals are "dead" while any are exposed. It is not until all pins are inserted in the socket, and thus protected from being touched, that any will have current or voltage applied thereto.

I claim:

70 A fluorescent lamp having a base at each end thereof, each base having conductive pins therein offset from and parallel to the axis of said base, electrodes in the lamp

and series connections from each electrode to a pair of pins in its respective base, and a third pin for each base coaxial to the axis thereof and nonconductive to the interior of the lamp and having a conductive ferrule thereon exterior to the lamp, said ferrules of both of said third pins adapted to be included in series with a primary circuit from a ballast and to either one break the circuit upon withdrawal of the lamp from position of use, said

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pairs of pins having series connection with the secondary of said ballast in use.

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