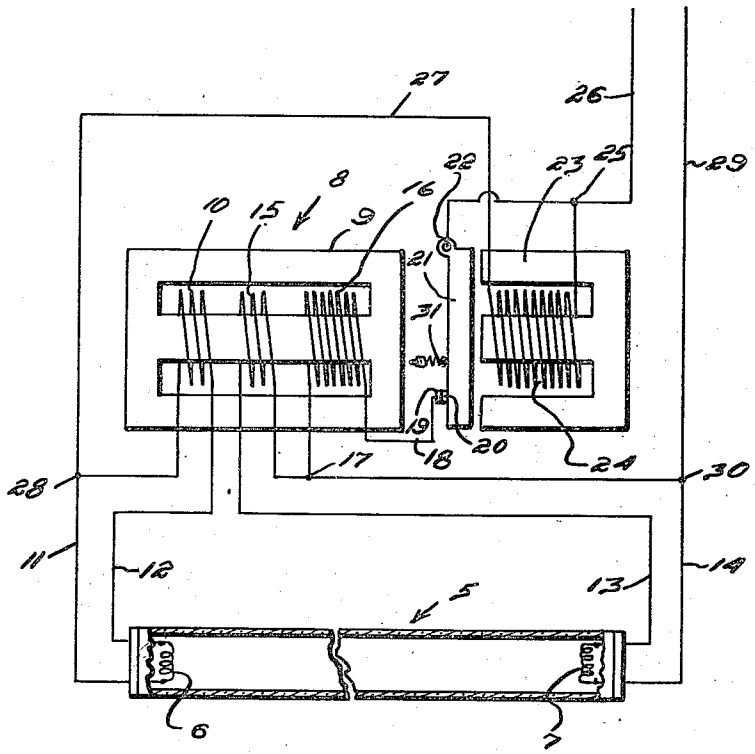
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STARTING AND OPERATING FLUORESCENT AND MERCURY ARC LAMPS

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STARTING AND OPERATING FLUORESCENT AND MERCURY ARC LAMPS

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1 Claim. (Cl. 176—124)

My invention relates generally to electrical lighting, and more particularly to means for starting and operating fluorescent and mercury arc lamps, and the primary object of my invention is to provide means of this character which involves provisions for applying a different current to each filament separately from the main arcing current, and to break the filament warming current when the main current has established the arc between the heated filaments.

Other important objects and advantages of my invention will be apparent from a reading of the following description taken in connection with the appended drawing, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawing:

The single view is a schematic wiring diagram showing a preferred arrangement in accordance with the present invention, particularized as to a fluorescent light tube.

Referring in detail to the drawing, the numeral 5 generally designates an ordinary commercial variety of fluorescent light tube which involves the electrodes 6 and 7, respectively, at the opposite ends of the tube. The said tube contains an ionizable gas (not shown) which is ionized when the electrodes 6 and 7 are sufficiently heated, so as to permit the passage of an electric current between the electrodes, using the ionized gas as a bridge. As a result of this passage of the energizing current applied to the electrodes, the tube glows in a well known manner. A similar system of operation applies to the ordinary mercury arc lamp, to which the invention is equally applicable.

In accordance with the present invention a transformer which is generally designated 8, having a closed core 9, has one secondary section 10 connected at its opposite ends to the opposite ends of the tube electrode 6 by means of the wires 11 and 12. The opposite electrode 7 is similarly connected by wires 13 and 14 to the opposite ends of another similar secondary transformer section 15. The primary winding 16 of the transformer has one end connected as indicated at 17 to the wire 14, with the remaining end of the primary winding 16 connected by the wire 18 to a stationary contact 19 which is opposed to a contact 20 carried by a magnetizable armature 21 which is suspended swingably as indicated by the numeral 22 with respect to the terminals of an E-shaped core 23 which is wound with a ballast or choke coil 24 on its center leg. One end of the coil 24 is connected at 25 to the alternating current input wire 26, the latter being also connected to the conductive magnetizable armature 21. The remaining end of the choke coil 24 is connected by a wire 27 to the wire 11 at the point 28. The remaining alternating current input wire 29 is connected at 30 to the wire 14. A retracting spring 31 normally keeps the armature 21 away from the choke coil core 23 and holds the contacts 19 and 20 closed when the lamp is not operating. In this way the ballast coil 24 is connected in series with the fluorescent lamp and the two are connected in parallel with the primary winding 16 of the transformer 8.

With the above arrangements, the passage of current through the choke coil 24 will attract the armature 21 and thereby break the engagement of the points 19 and 20 and thereby deenergize the primary 16 of the transformer. In the light of these arrangements it will be understood that when the line voltage coming through the wires 26 and 29 is applied to the combination the current goes through the primary of the transformer so as to induce a current in each of the secondary coils or sections 10 and 15, the induced current acting to warm the electrodes or filaments 6 and 7 in the tube 5. When the filaments are sufficiently heated in this manner so as to ionize the gas or vapor within the tube, the line current after passing through the ballast coil 24 arcs across between the filaments 6 and 7.

As soon as the arc is established the current flowing through the choke coil 24 materially increases the magnetism of the core 23 thereby attracting the armature 21 and opening the contact points 19 and 20, thereby stopping flow of current through the transformer 8, with the result that no current is induced in the secondary sections 10 and 15 and the tube filaments 6 and 7 are no longer heated, so that no current is wasted during the continued operation of the tube 5.

It will be obvious that dry cells or other batteries, magnetos, generators, condensers or other means of generating sufficient electromotive force, may be substituted for the transformer as means for pre-heating the filaments of the tube, but for ordinary use the small transformer shown and described is preferable because less troublesome.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not wish to limit the application of the invention thereto, except as may be required by the scope of the subjoined claim.

Having described the invention, what is claimed as new is:

In apparatus for operatively energizing a gas or vapor arc lamp of the type involving a pair of electrodes which ionize the gas between them, a unit consisting of a closed core transformer having on its middle leg a pair of secondary windings individually connected to the corresponding electrodes of the lamp and a primary winding, a main line current supply having one side thereof connected to one side of one of the electrodes, to one side of said primary winding and to one side of the corresponding secondary winding, said main line having the remaining side thereof connected to the remaining side of said primary winding and with the remaining electrode and with the secondary winding related thereto, a choke coil connected between said remaining side of the main line and the last-mentioned electrode and secondary winding, a conductive armature magnetically related to said choke coil and normally retracted therefrom, a stationary contact point engaged by said armature in its retracted position, said armature and said contact point being electrically connected in said remaining side of the main line at a point between said secondary winding and said choke coil, wherein said choke coil comprises an E-core with the coil wound on the middle leg thereof, the middle leg of the transformer core and the middle leg of said choke coil core being substantially aligned and located in close proximity to each other with said armature positioned between the two cores and extending across the terminals of the legs thereof.

BEN RANEY, JR.