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2,481,368

STARTING SWITCH FOR FLUORESCENT LAMPS

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Fig. 1.

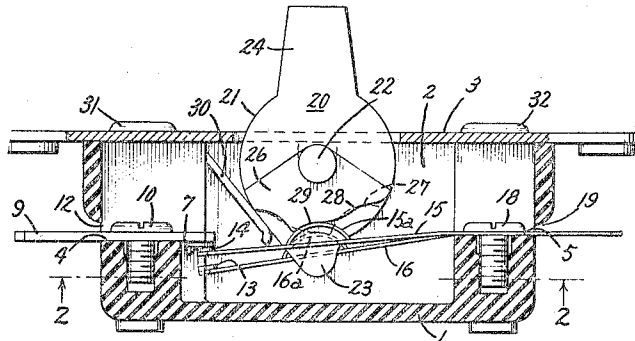


Fig. 2.

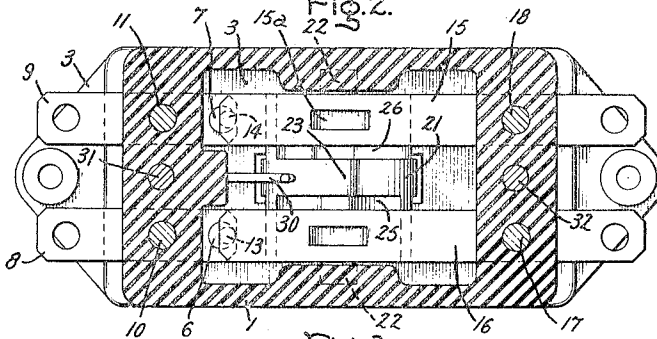
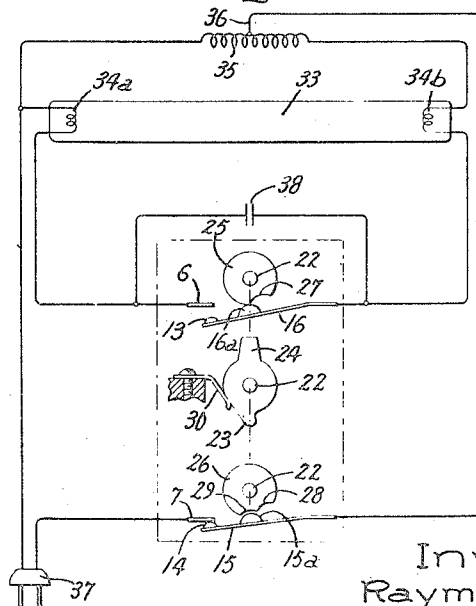


Fig. 3.



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STARTING SWITCH FOR FLUORESCENT LAMPS

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1 Claim. (Cl. 200—6)

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The present invention relates to a starting switch for fluorescent lamps of the hot cathode type.

It is the object of our invention to provide a manually operated fluorescent lamp starting switch having only a few simple parts which can be manufactured at a low cost and yet provide reliable long life operation.

Our invention will best be understood from the following description taken in connection with the accompanying drawing in which Fig. 1 is an elevation of the switch mechanism with the case and cover in partial section; Fig. 2 is a section taken along the line 2—2 in Fig. 1 and showing the under side of the switch mechanism and Fig. 3 is a diagrammatic representation of the switch as connected in a lamp starting circuit.

Referring to Figs. 1 and 2, our switch comprises a casing 1 which is preferably molded of insulating material in a single piece having a cavity 2 open at the top and adapted to be closed by a cover plate 3. Both of the thickened end walls of the casing have portions of their inner surfaces cut-away to provide separated ledges 4 at the left end and ledges 5 at the right end as viewed in Fig. 1. Two screw and one rivet receiving holes extend vertically into each end wall.

Stationary contacts 6 and 7 are mounted beneath terminal elements 8 and 9 respectively, the latter being supported on the ledges 4 and held in place by screws 10 and 11 threaded into the outermost holes in the ledges 4. The contact elements 6 and 7 are inside the recess 2 while the opposite ends of the terminal elements 8 and 9 project outside of the casing through suitable openings 12 in the casing and wall. Connections to the stationary contacts of the switch can thus readily be made to the terminal elements 8 and 9 outside the switch casing.

The opposite ledges 5 support the movable contacts. These consist of contact elements 13 and 14 secured to elongated, conducting, spring members 15 and 16 respectively, which are mounted on the ledges 5 and secured thereto by screws 17 and 18 threaded into the outermost holes in the ledges 5. Contacts 13 and 14 are positioned within the cavity 2 so as to be adapted to engage the contacts 6 and 7 respectively. The opposite ends of the spring contact members 15 and 16 project out of the casing through openings 19 in the casing end wall to provide terminals for the connection of the movable contacts into a lamp starting circuit. The center portions of the spring members 15 and 16 are lanced to provide arcuately shaped upwardly ex-

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tending metal projections forming cam followers 15a and 16a adapted to ride against cams operated by a manually operable trigger member 20. The cover plate 3 of the switch is held in place on the casing 1 by means of the rivets 31 and 32 or equivalent fastening means which pass through the central holes in the thickened end walls of the casing. The cover plate has an opening through which the handle 24 of trigger member 20 projects.

The movable contact actuating trigger member 20, which is preferably made in a single piece of molded insulating material, is provided with two axially aligned stub shafts 22. These shafts are journaled in bearings formed by depressions in the side walls of the casing 1. The actuating member 20 has a central portion 21 which is disc like and substantially circular in shape except for a downwardly extending projection 23 and an upwardly extending projection 24 forming an operating handle for the member 20. On both sides of the central portion 21 there are formed contact operating cam portions 25 and 26. The cams 25 and 26 are basically circular segments with centers on the axis of shafts 22. The bottom surfaces of both cams have, however, three depressions or cam steps arcuate in shape to receive the cam followers 15a and 16a to provide three definite positions for trigger 20. However, only certain of these steps are major steps deep enough to permit closing of the contacts.

Cam 25 has a single major depression or step 27. When the cam follower 16a rises into the step 27, movable contact 13 engages stationary contact 6. Cam 26, on the other hand, has two major steps 28 and 29, the latter being aligned with step 27 of the cam 25. When the cam follower 15a enters either of the steps 28 or 29, movable contact 14 engages fixed contact 7. In all other positions of the cams the respective contacts are open.

The trigger member 20 has bearing against its side a positioning spring 30, one end of which is secured to the casing 1 by means of the rivet 31. The shape of the central portion of trigger member 20, as previously mentioned, is circular except for the projection 23. Thus when the handle 24 is thrown to the left, as viewed in Figures 1 and 3, the spring 30 exerts no rotational force on the trigger member, nor does it exert any such force in the intermediate position of the handle 24, that is, the position shown in the drawing. When, however, the handle 24 is thrown to the right, the projection 23 engages spring 30 so

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that the spring will tend to return the trigger member to the position shown in the drawing.

The manner of operation of the switch will be readily apparent from Figure 3 which shows the switch connected in circuit with a fluorescent lamp 33 having hot cathodes 34a and 34b. One terminal of each of the cathodes is connected to the extremities of a ballast 35 having a center tap 36 which is connected to movable contact 14. The corresponding fixed contact 7 is connected to one side of the line, represented by a conventional contact plug 37. The other side of the line is connected to the ballast and cathode filament 34a whose opposite terminal is connected to stationary contact 6. The remaining terminal of cathode filament 34b is connected to the movable contact 13. A condenser 38 is connected in shunt across contact 6 and 13.

The switch is shown in the lamp operating position. If the handle 24 be thrown to the left, both sets of contacts will be open. To start the lamp, the handle 24 is thrown all the way to the right. In this position, cam follower 16a will move into step 27 of the cam 25 closing contacts 6 and 13, and cam follower 15a will move into step 28 of the cam 26 closing contacts 7 and 14. The two lamp filaments 34a and 34b are thereby energized. When the handle 24 is let go, spring 30 pressing against projection 23 will rotate the trigger member 20 to the central or operating position, as shown in the drawing. Contacts 6 and 13 are thereby opened while contacts 7 and 14 remain closed. Inasmuch as a portion of the ballast circuit has been interrupted by the opening of contacts 6 and 13, a high voltage kick will be produced starting the arc in the lamp 33.

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

A starting switch for a fluorescent lamp comprising a casing having walls defining a recess, a trigger member journaled in said casing, said trigger member comprising an integral molded element having three adjacent disc-like cam portions all of basically arcuate edge surface contour, the center of said cam portions having a

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projection extending therefrom and the side cam portions each having three successive depressions in their surfaces correspondingly spaced in an axial direction, two stationary contact members mounted at one end of said recess, two movable contact members mounted at the other side of said recess and extending across the same beneath said side cam portions and carrying movable contacts adapted to cooperate with said stationary contacts, said movable contact members having spring portions carrying projections adapted to bear against and to engage said depressions in said side cam portions for providing three switch positions and for the operation of said contacts, one pair of said depressions corresponding to one switch position and being relatively shallow for limiting the motion of the movable contacts whereby in that switch position said contacts are open, the central depression in only one of said side cam portions being relatively deep whereby in the central switch position one of said movable contacts engages its corresponding stationary contact and the remaining pair of depressions in both cam portions being relatively deep whereby in the third switch position both pairs of contacts are closed, and leaf spring means mounted in the casing and adapted to bear tangentially against said central portion and in the third switch position only to bear against said central portion projection for exerting a rotational force on said trigger member tending to rotate the same into said central switch position.

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