

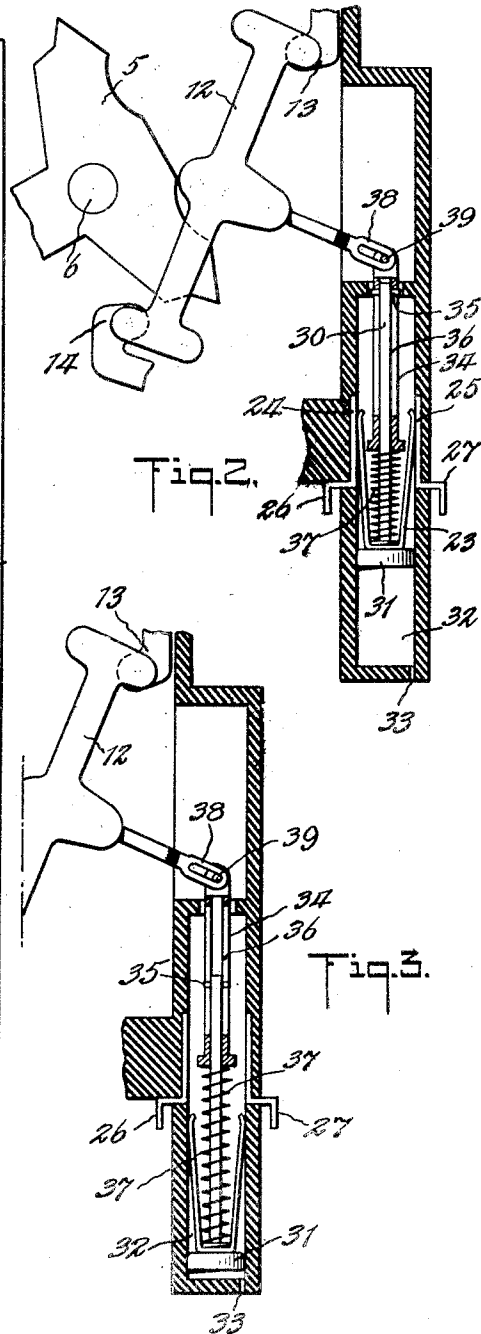
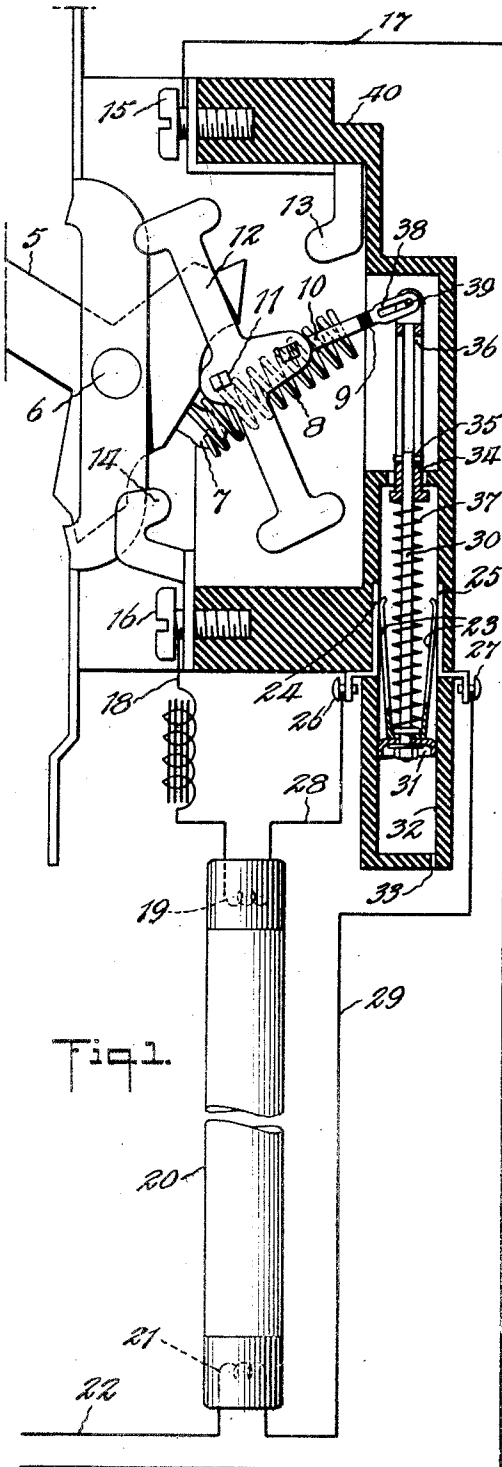
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LAMP CONTROL SWITCH

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LAMP CONTROL SWITCH

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4 Claims. (Cl. 200-5)

The invention here disclosed relates to the control of devices in the nature of fluorescent lamps.

Special objects of the invention are to provide simple, mechanical switch mechanism for automatically interposing preliminary circuit connections for warming up the electrodes and which will be combined with and in effect form part of the main switch mechanism for controlling supply of current to the lamp.

A further special object is to effect the combination of the supplemental switch mechanism necessary to control the starting circuit, in a practical and desirable way, with more or less standard switch mechanisms, such as the conventional toggle switches or "wall" switches.

Other desirable objects and the novel features by which all purposes of the invention are attained are hereinafter set forth or will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates one present preferred embodiment of the invention. It is to be understood however, that structure may be modified and changed as regards this particular illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a longitudinal sectional view of a wall switch of the toggle type having features of the present invention embodied therein and showing diagrammatically how such a switch can be connected to control the main supply circuit and the starting circuit of a fluorescent lamp. In this view, the main supply switch portion of the apparatus is shown in the "off" or open circuit position and the supplemental switch mechanism controlling the starting circuit is shown in the "on" or closed circuit condition.

Fig. 2 is a broken sectional detail showing the switch thrown to the "on" position, closing the supply circuit to the lamp, the supplemental switch, due to its delayed operation structure remaining still in the closed circuit position.

Fig. 3 is a broken sectional view showing the position of parts following closing of the main switch, with the supplemental switch having sufficient time to shift to the open circuit relation.

In Fig. 1, the parts of a toggle switch of more or less conventional design are illustrated, comprising the toggle lever 5, pivoted at 6, and carrying the bearing 7, for one end of the compression spring 8, whose opposite end engages the stud 9, of a rocker 10, pivoted on a center 11, and carrying the bar contact 12, for cooperation with fixed contacts 13 and 14.

The terminals 15, 16, of the main switch mechanism described are shown connected the first by wiring 17, to one side of an electric supply circuit and the second by wiring 18, to one end of one electrode 19, in the lamp tube 20. The other electrode 21, is shown connected at one end by wiring 22, to the other side of the supply circuit.

The supplemental switch mechanism for controlling the starting circuit is shown as comprising a U-shaped spring contact 23, adapted to bridge opposed spaced contacts 24, 25, having terminals 26, 27, connected respectively by wires 28, 29, with the open ends of the filaments or electrodes 19, 21.

The supplemental switch contactor 23, is shown fixed on the end of a rod 30, carrying a piston washer 31, operating in air cylinder 32, having a timing vent 33.

The upper end of the switch rod 30, is shown as slidably engaged in a tubular link 34, and as carrying a cross pin 35, operating in a slot 36, in said link.

A compression spring 37, is shown interposed between the end of the slotted link 34, and the contact carrying end of the switch rod.

Connection between the main and supplemental switch mechanisms are provided in the present illustration by means of a slotted extension 38, on the inner or rearward swinging portion of the toggle yoke 9, receiving a cross pin 39, in the upper, slotted end of the tubular link 34.

The air cylinder 32, may be constituted as an integral rearward extension of the insulating base 40, of the switch and the mechanism of the main control switch may be substantially conventional as to design, except for modification of the swinging yoke to provide it with the rearward extension 38.

Operation

In the "off" position of the switch as determined by the actuating lever 5, the main switch, embodying movable switch contact 12, in association with stationary contacts 13, 14, is in the open circuit position shown in Fig. 1. At such time, the switch yoke 9, through rearward extension 38, has drawn the tubular link 34, to the upward extent of its movement and the lower end of slot 36, therein through engagement with cross pin 35, has raised the rod 30, to carry the contactor 23, up into its upper position, where, as indicated in Fig. 1, it closes the supplemental starting circuit represented by wire 28, contacts 24, 25, and wire 29, for connecting the open ends of the lamp electrodes 19, 21. Thus in the open

circuit position of the main control switch, the supplemental starter switch is in position closing the bridging or starting circuit across the lamp electrodes.

Fig. 2 illustrates the position of parts at the instant the switch is thrown to the "on" position. At such time, the main supply circuit for the lamp is closed by contactor 12, across switch contacts 13, 14, and by way of terminal 15, and conductor 17, to one side of the line and by way of terminal 16, and conductor 18, to one end of electrode 19. At this instant of closing the main circuit, the piston 31, of the supplemental switch delays downward circuit opening movement of the supplemental switch, thus to leave the bridging circuit closed across the wiring 28, 29, etc., and establish the electrodes in the series connected relation indicated in Fig. 1.

The time required for the downward movement of the supplemental switch contactor may be regulated by the size of the escape vent 33, in the lower end of the air cylinder and by the strength of the expanding spring 37. At the end of the predetermined period, the spring 37, forces the piston down far enough to carry the movable contactor clear of the switch contacts 24, 25, Fig. 3, thus to interrupt the bridging or starting circuit across the ends of the electrodes and to leave the electrodes connected at their other ends with the opposite sides of the supply circuit.

When the switch is again thrown to "off" position, the lower end of the slot 36, in the tubular link 34, will pick up the cross pin 35, in the switch rod and carry the supplemental switch contactor back up into the closed circuit position illustrated in Fig. 1.

The slot 36, as shown in Fig. 3, may be long enough to permit the tubular link 34, to start its upward movement before picking up the rod carrying the contactor 23. Thus the spring actuated yoke or toggle of the main switch may begin its movement practically free of any load from the supplemental switch. Similar lost motion, if desired, may be provided between the slotted end 38 of the yoke and pin 39 so that the yoke may be started in the opposite direction of movement before taking up any load from the supplemental switch.

What is claimed is:

1. Control mechanism for fluorescent lamps or other purposes, comprising a main switch for controlling supply of current, said main switch having a member movable in one direction on closing said switch and movable in the opposite direction on opening said switch, a supplemental switch for controlling a starting circuit, said supplemental switch having a movable switch member, connections for operating and controlling said supplemental switch from said main switch, including a link having extensibly related portions connected one with the movable member of the main switch and the other with the movable member of the supplemental switch and arranged to shift the supplemental switch to closed circuit relation when the main switch is shifted to open circuit relation, cooperable stop shoulders on the extensibly related portions of said link, separable in the movement of said link by the closing of the main switch but engageable in the opening movement of said main switch to effect shifting of the supplemental switch to closed circuit position and spring means acting on said extensible link in the direction to force the movable member of the supplemental switch to open circuit position and arranged to be tensioned on relative movement

of said extensibly related portions when said supplemental switch is in closed circuit position and said main switch is operated in the circuit closing direction, to thereby store energy for shifting the movable member of the supplemental switch in the switch opening direction, after the main switch is closed.

2. Control mechanism for fluorescent lamps or other purposes, comprising a main switch for controlling supply of current, said main switch having a member movable in one direction on closing said switch and movable in the opposite direction on opening said switch, a supplemental switch for controlling a starting circuit, said supplemental switch having a movable switch member, connections for operating and controlling said supplemental switch from said main switch, including a link having extensibly related portions connected one with the movable member of the main switch and the other with the movable member of the supplemental switch and arranged to shift the supplemental switch to closed circuit relation when the main switch is shifted to open circuit relation, cooperable stop shoulders on the extensibly related portions of said link, separable in the movement of said link by the closing of the main switch but engageable in the opening movement of said main switch to effect shifting of the supplemental switch to closed circuit position and spring means acting on said extensible link in the direction to force the movable member of the supplemental switch to open circuit position and arranged to be tensioned on relative movement of said extensibly related portions when said supplemental switch is in closed circuit position and said main switch is operated in the circuit closing direction, to thereby store energy for shifting the movable member of the supplemental switch in the switch opening direction, after the main switch is closed and means for delaying the operation of said spring means in shifting said supplemental switch to circuit closed position.

3. Control mechanism for fluorescent lamps or other purposes, comprising a main switch for controlling supply of current, said main switch having a member movable in one direction on closing said switch and movable in the opposite direction on opening said switch, a supplemental switch for controlling a starting circuit, said supplemental switch having a movable switch member, connections for operating and controlling said supplemental switch from said main switch, including a link having extensibly related portions connected one with the movable member of the main switch and the other with the movable member of the supplemental switch and arranged to shift the supplemental switch to closed circuit relation when the main switch is shifted to open circuit relation, cooperable stop shoulders on the extensibly related portions of said link, separable in the movement of said link by the closing of the main switch but engageable in the opening movement of said main switch to effect shifting of the supplemental switch to closed circuit position and spring means acting on said extensible link in the direction to force the movable member of the supplemental switch to open circuit position and arranged to be tensioned on relative movement of said extensibly related portions when said supplemental switch is in closed circuit position and said main switch is operated in the circuit closing direction, to thereby store energy for shifting the movable member of the supplemental switch in the switch

opening direction, after the main switch is closed, the portions of said extensible link comprising telescopically engaged members, said stop shoulders including a pin on one of said members operating in a longitudinal slot in the other of said members and said spring means being interposed between said telescopically related members of the link.

4. Control mechanism for fluorescent lamps or other purposes, comprising a main switch for controlling supply of current, said main switch having a member movable in one direction on closing said switch and movable in the opposite direction on opening said switch, a supplemental switch for controlling a starting circuit, said supplemental switch having a movable switch member, connections for operating and controlling said supplemental switch from said main switch, including a link having extensibly related portions connected one with the movable member of the main switch and the other with the movable member of the supplemental switch and arranged to shift the supplemental switch to closed circuit relation when the main switch is shifted to open circuit relation, cooperable stop shoulders on the extensibly related portions of said link, separable in the movement of said

link by the closing of the main switch but engagable in the opening movement of said main switch to effect shifting of the supplemental switch to closed circuit position and spring means acting on said extensible link in the direction to force the movable member of the supplemental switch to open circuit position and arranged to be tensioned on relative movement of said extensibly related portions when said supplemental switch is in closed circuit position and said main switch is operated in the circuit closing direction, to thereby store energy for shifting the movable member of the supplemental switch in the switch opening direction, after the main switch is closed, the portions of said extensible link comprising telescopically engaged members, said stop shoulders including a pin on one of said members operating in a longitudinal slot in the other of said members and said spring means being interposed between said telescopically related members of the link, a vented air cylinder in the line of movement of said link and a piston element in said air cylinder and arranged for operation by said link to delay circuit opening movement of said supplemental switch.

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