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(58) Field of search
G1N

(54) Switches for standard and table lamps

(57) A standard or table lamp has annular conductive plates A, B and C insulated from one another and from the remainder of the lamp. A control circuit 4 is connected to the plates A and C so that, when either the plates A and B or the plates B and C are touched momentarily and simultaneously, the lamp is turned on or off (depending on whether the lamp is off or on initially) and, when the lamp is on and either the plates A and B or the plates B and C are touched simultaneously for longer than 10 milliseconds, the brightness of the lamp is increased or decreased. In a modification only the plates A and C are provided, the earth plate B being omitted.

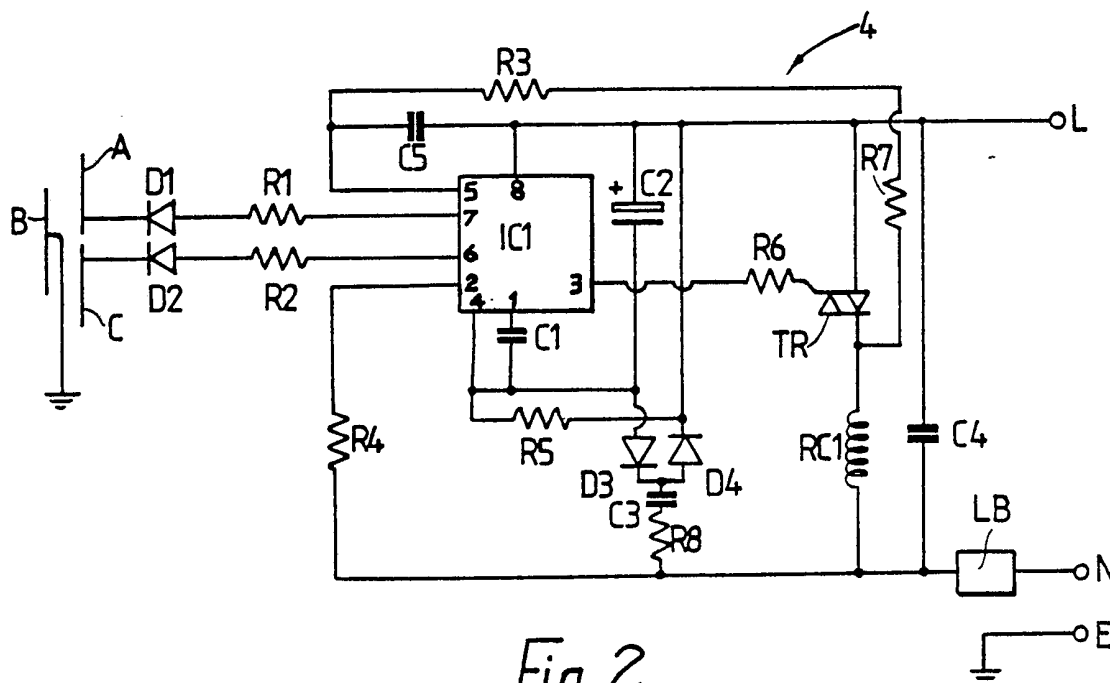


Fig. 2.

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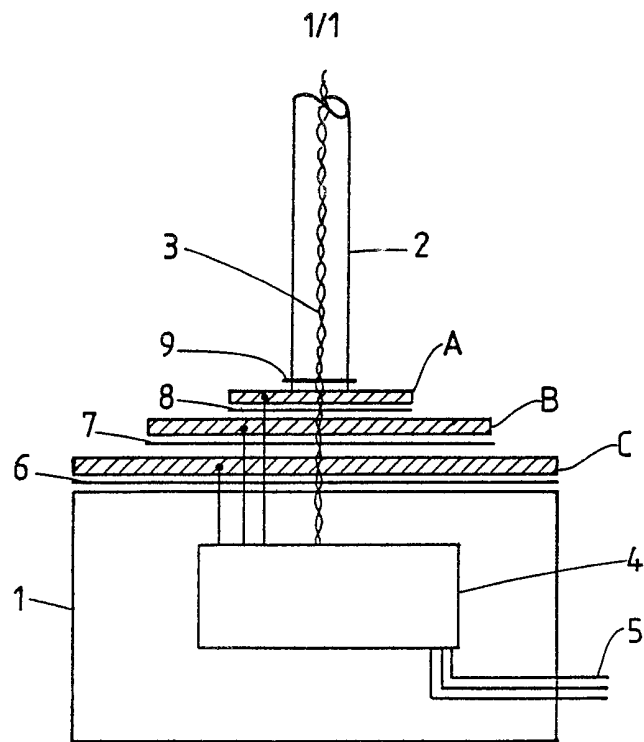


Fig. 1.

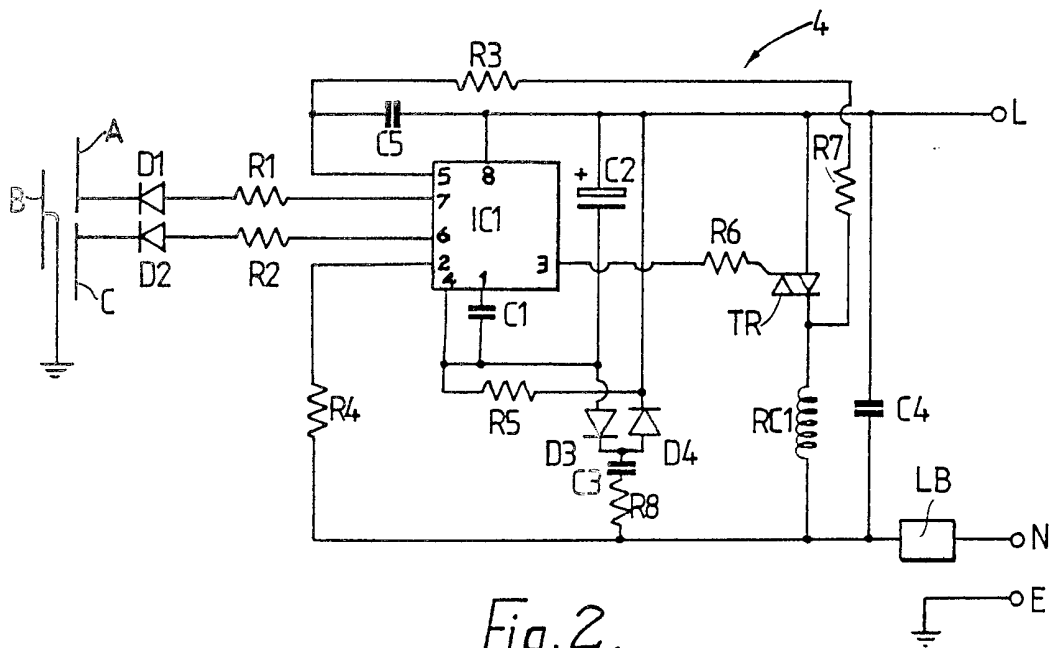


Fig. 2.

SPECIFICATION

Standard and table lamps

- 5 This invention relates to standard lamps, that is lamps which are intended to be stood on the floor and generally comprise a tall stem, and table lamps, that is lamps which are intended to be stood on a table or other surface above floor level.

10 The switches for standard or table lamps are generally either mounted on the body of the lamp, often in the vicinity of the socket for the light bulb, or are incorporated in the lead running from the base of the lamp to the mains socket. Such switches are often inconvenient to operate and, where the switch is incorporated in the mains lead, there is a real danger that the lamp will be pulled over or pulled off the surface on which it is supported, when the switch is operated. Moreover, more particularly in the case of a standard lamp, it may be difficult or impossible to operate the lamp from a seated position.

- 25 It is an object of the invention to provide standard and table lamps of novel construction which are capable of being operated safely and simply.

According to the invention there is provided a standard or table lamp incorporating an electrically conductive portion and a control circuit electrically coupled to the conductive portion and adapted to change the lamp from a first state to a second state in response to the conductive portion being touched.

30 The conductive portion may simply be constituted by a body portion or a base portion of the lamp, or a part of such a portion, and the arrangement may be such that the lamp can be turned on or off or dimmed or brightened by simply touching this portion. Thus, with this construction, it is possible to dispense with unsightly switches incorporated in the mains lead or base of the lamp, and the lamp may be controlled in a very straightforward manner simply by touching the appropriate part of the lamp. Conveniently the conductive portion comprises a fairly large part of the lamp which can be easily located by touch, as may be necessary for example when operating the lamp in a darkened room.

In one form of the invention the control circuit is adapted to change the lamp from the first state to the second state in response to the conductive portion being touched when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to the conductive portion being touched when the lamp is initially in the second state. This may be referred to as the "single plate" form of the invention.

In another form of the invention the lamp incorporates two electrically conductive portions mutually insulated from one another, and the control circuit is adapted to change

the lamp from the first state to the second state in response to one (or a first) of the conductive portions being touched when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to one (or a second) of the conductive portions being touched when the lamp is initially in the second state. This may be referred to as the "two plate" form of the invention.

In a still further form of the invention the lamp incorporates three electrically conductive portions mutually insulated from one another, and the control circuit is adapted to change the lamp from the first state to the second state in response to two (or a first and a second) of the conductive portions being touched simultaneously when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to two (or the second and a third) of the conductive portions being touched simultaneously when the lamp is initially in the second state. This may be referred to as the "three plate" form of the invention.

In each of these embodiments the first state of the lamp may be a state in which the lamp is off and the second state may be a state in which the lamp is on. Alternatively the first and second states may be states in which the lamp is relatively dim and relatively bright respectively, in which case the control circuit serves as a dimmer.

Preferably the control circuit operates as a combined on/off and dimmer control in each of these embodiments, the lamp being switchable between its on and off states by momentarily touching one or more conductive portions and being capable of being dimmed or brightened when it is on by continuously touching one or more conduction portions to decrease or increase the lamp brightness until the required level of brightness is reached. In the "one plate" form the control circuit may be adapted to cause the brightness of the lamp to cycle between maximum and minimum levels of brightness in response to continuous touching of the conductive portion, so that any level of brightness may be chosen by removal of the operator's finger from the conductive portion at the appropriate time. In the "two plate" form the arrangement may be such that the lamp is caused to go on or off (depending on whether it is initially off or on) by momentarily touching either of the conductive portions, and an increase in brightness is achieved by continuous touching of one of the two conductive portions and a decrease in brightness is achieved by continuous touching of the other conductive portion. In the "three plate" form the arrangement may be such that the lamp is caused to go on or off (depending on whether it is initially off or on) by momentarily touching either the first and second conductive portions simultaneously or

the second and third conductive portions simultaneously, and brightness control is achieved by the first and second conductive portions being touched continuously and simultaneously to vary the brightness in one direction and the second and third conductive portions being touched continuously and simultaneously to vary the brightness in the opposite direction.

10 In order that the invention may be more fully understood, a preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

15 Figure 1 is a diagrammatic representation of a table lamp in accordance with the invention; Figure 2 is a diagram of a control circuit used in the lamp of Figure 1.

Referring to Figure 1, the lamp comprises a 20 base 1 and a stem 2, only the bottom part of the stem 2 being shown in the figure. A socket (not shown) for a lamp bulb is supported by the stem 2 and a twin flex 3 extends between the socket and a control 25 circuit 4 along the inside of the stem 2. The control circuit 4 is supplied with power from the mains supply by way of a lead 5, and this circuit 4 is adapted to determine whether the lamp is on or off and to control the brightness 30 of the lamp in response to touch controls, as will be described more fully below.

The touch controls comprise three annular plates A, B and C mounted one on top of the other but separated from one another and 35 from the remainder of the lamp by electrical insulators 6 to 9. The plates A, B and C are of different diameters, and are each connected to a respective terminal of the control circuit 4. The control circuit 4 is such that the lamp is 40 turned on or off, depending on whether the lamp is off or on initially, in response to momentarily touching of either the plates A and B simultaneously or the plates B and C simultaneously. However, if either the plates 45 A and B or the plates B and C are touched simultaneously for longer than 10 milliseconds, the lamp will be controlled by the control circuit 4 in such a way as to increase or decrease the lamp brightness. Thus, if the 50 plates A and B are touched continuously, the lamp brightness will increase continuously either until the maximum level of brightness is reached or until the operator's fingers are removed from the plates. Similarly, if the 55 plates B and C are touched continuously, the lamp brightness will decrease either until the minimum level of brightness is reached or until the operator's fingers are removed from the plates. Furthermore, if the lamp is set to a 60 particular level of brightness and is subsequently turned off, the lamp will be automatically reset to this level of brightness when the lamp is again turned on.

Figure 2 shows the circuit diagram of the 65 control circuit which is supplied from the

mains and which is adapted to control the lamp bulb LB in response to touching of the plates A, B and C in the manner described above. If the plates A and B are touched 70 simultaneously a current is caused to flow through the diode D1 by way of the resistor R1. Similarly if the plates B and C are touched simultaneously a current is caused to flow through the diode D2 by way of the 75 resistor R2. In either case the voltages on the terminals 6 and 7 of the integrated circuit IC1 are caused to go out of balance, and this is sensed by a voltage comparator forming part of IC1 and causes an output to be produced 80 by this voltage comparator. After a 10 millisecond delay, and provided that the plates A and B or B and C are no longer being touched, a signal generator also forming part of IC1 is caused to output a series of pulses to 85 a triac RC by way of a resistor R6, thus turning the triac either on or off, depending on whether it is previously off or on, and thus initiating or terminating supply of current to the lamp bulb LB.

In the event that the plates A and B or the plates B and C are touched continuously for longer than 10 milliseconds the signal generator will be caused to supply voltage pulses to the triac gate so as to increase or decrease the 95 gate voltage, depending on whether the plates A and B or the plates B and C are touched, thus increasing or decreasing the brightness of the lamp bulb LB. This process is repeated for as long as the operator's fingers remain on 100 the plates or until the maximum brightness level or the minimum brightness level (corresponding to the lamp bulb being off) is reached. The signal generator is such that, when the lamp is switched on after having 105 previously been off, the pulses which are supplied to the triac TR by the signal generator are such as to apply the same voltage to the gate as had been applied prior to the lamp being turned off, so that the lamp is turned on at the same brightness level as was set prior 110 to it being turned off. Thus the control circuit 4 may be considered as incorporating a memory facility for memorising the brightness level of the lamp previously set.

115 The diodes D1 and D2 block any forward current from the plates A and C, and this prevents erroneous switching of the lamp due to stray electrostatic effects. Further diodes D3 and D4, and associated components C1, 120 R5, C3 and R8, provide a 12V d.c. supply to IC1, and the capacitor C2 serves to smooth this supply. On state and off state voltage levels are set at the terminals 2 and 5 respectively of IC1 by resistors R3, R4 and R7. The 125 inductor RC1 and the capacitor C4 provide interference suppression.

CLAIMS

1. A standard or table lamp incorporating 130 an electrically conductive portion and a con-

trol circuit electrically coupled to the conductive portion and adapted to change the lamp from a first state to a second state in response to the conductive portion being touched.

- 5 2. A lamp according to claim 1, wherein the control circuit is adapted to change the lamp from the first state to the second state in response to the conductive portion being touched when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to the conductive portion being touched when the lamp is initially in the second state.

- 10 3. A lamp according to claim 1, wherein the lamp incorporates two electrically conductive portions mutually insulated from one another, and the control circuit is adapted to change the lamp from the first state to the second state in response to a first of the conductive portions being touched when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to a second of the conductive portions being touched when the lamp is initially in the second state.

- 15 4. A lamp according to claim 1, wherein the lamp incorporates three electrically conductive portions mutually insulated from one another, and the control circuit is adapted to change the lamp from the first state to the second state in response to a first and a second of the conductive portions being touched simultaneously when the lamp is initially in the first state, and to change the lamp from the second state to the first state in response to the second and a third of the conductive portions being touched simultaneously when the lamp is initially in the second state.

- 20 5. A lamp according to any one of claims 1 to 4, wherein the first state of the lamp is a state in which the lamp is off, and the second state is a state in which the lamp is on.

- 25 6. A lamp according to any one of claims 1 to 4, wherein the first and second states are states in which the lamp is relatively dim and relatively bright respectively, and the control circuit serves as a dimmer.

- 30 7. A lamp according to any one of claims 1 to 4, wherein the control circuit operates as a combined on/off and dimmer control.

- 35 8. A lamp according to claim 7, wherein the lamp is switchable between its on and off states by momentarily touching one or more conductive portions and is capable of being dimmed or brightened when it is on by continuously touching one or more conductive portions to decrease or increase the lamp brightness until the required level of brightness is reached.

- 40 9. A lamp according to claims 2 and 8, wherein the control circuit is adapted to cause the brightness of the lamp to cycle between maximum and minimum levels of brightness in response to continuous touching of the

conductive portion.

- 45 10. A lamp according to claims 3 and 8, wherein the control circuit is adapted to cause the lamp to go on or off (depending on whether it is initially off or on) in response to momentary touching of either of the conductive portions, and to cause an increase in brightness in response to continuous touching of one of the two conductive portions and a decrease in brightness in response to continuous touching of the other conductive portion.

- 50 11. A lamp according to claims 4 and 8, wherein the control circuit is adapted to cause the lamp to go on or off (depending on whether it is initially off or on) in response to momentary touching of either the first and second conductive portions simultaneously or the second and third conductive portions simultaneously, and to control the brightness of the lamp in response to the first and second conductive portions being touched continuously and simultaneously to vary the brightness in one direction and the second and third conductive portions being touched continuously and simultaneously to vary the brightness in the opposite direction.

- 55 12. A lamp substantially as hereinbefore described with reference to the accompanying drawing.

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