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Lai

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[54] **AUTOMATIC LIGHT CONTROL SYSTEM**

[76] Inventor: **Thomas K. Y. Lai,** 38A Nialopa Pl., Honolulu, Hawaii 96817

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[52] **U.S. Cl.**..... **315/155,** 250/209, 315/159

[51] **Int. Cl.. H05b 37/02,** H05b 39/04, H05b 41/36

[58] **Field of Search** 315/155, 159; 250/209

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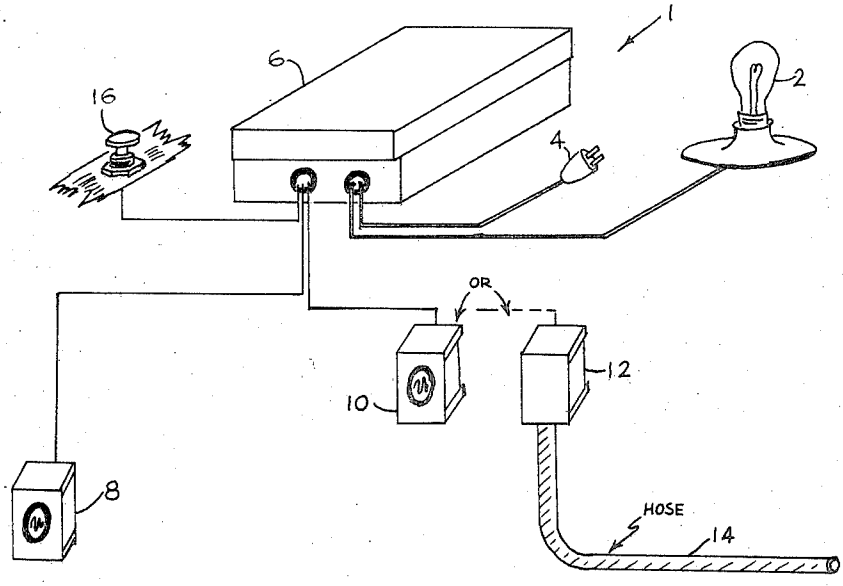
Primary Examiner—James W. Lawrence
Assistant Examiner—T. N. Grigsby
Attorney, Agent, or Firm—James C. Wray

[57] **ABSTRACT**

Garage lights are automatically turned on by a photocell which is illuminated by automobile headlights. A timing circuit keeps the lights on for a predetermined period after automobile headlights are turned off. House current is stepped down, rectified and smoothed. Direct current is applied across a variable voltage divider. A starter which may be a push button, a headlight receiving photocell or a roll over switch supplies voltage to a mid point of the divider. Voltage at the mid point is reduced during daylight hours by an exterior photocell in a conductive condition. During darkness the exterior photocell's high resistance as compared to the low resistance of a headlight actuated photocell creates a high mid point voltage. The high mid point voltage breaks down a zener diode, gating current to a capacitor and biasing an electronic switch for turning on the garage lights. When the voltage applied to the breakdown device falls, the gate turns off, and the capacitor slowly discharges through a resistor. A directional limiting device in the gate and cascaded transistors in the switch biasing connection prevent discharge of the capacitor except through the desired resistor. The electronic switch employs cascaded transistors for controlling the application of direct current to a reed relay. Power contacts of the relay complete a diac circuit, which biases on a triac, turning on the lights.

18 Claims, 6 Drawing Figures



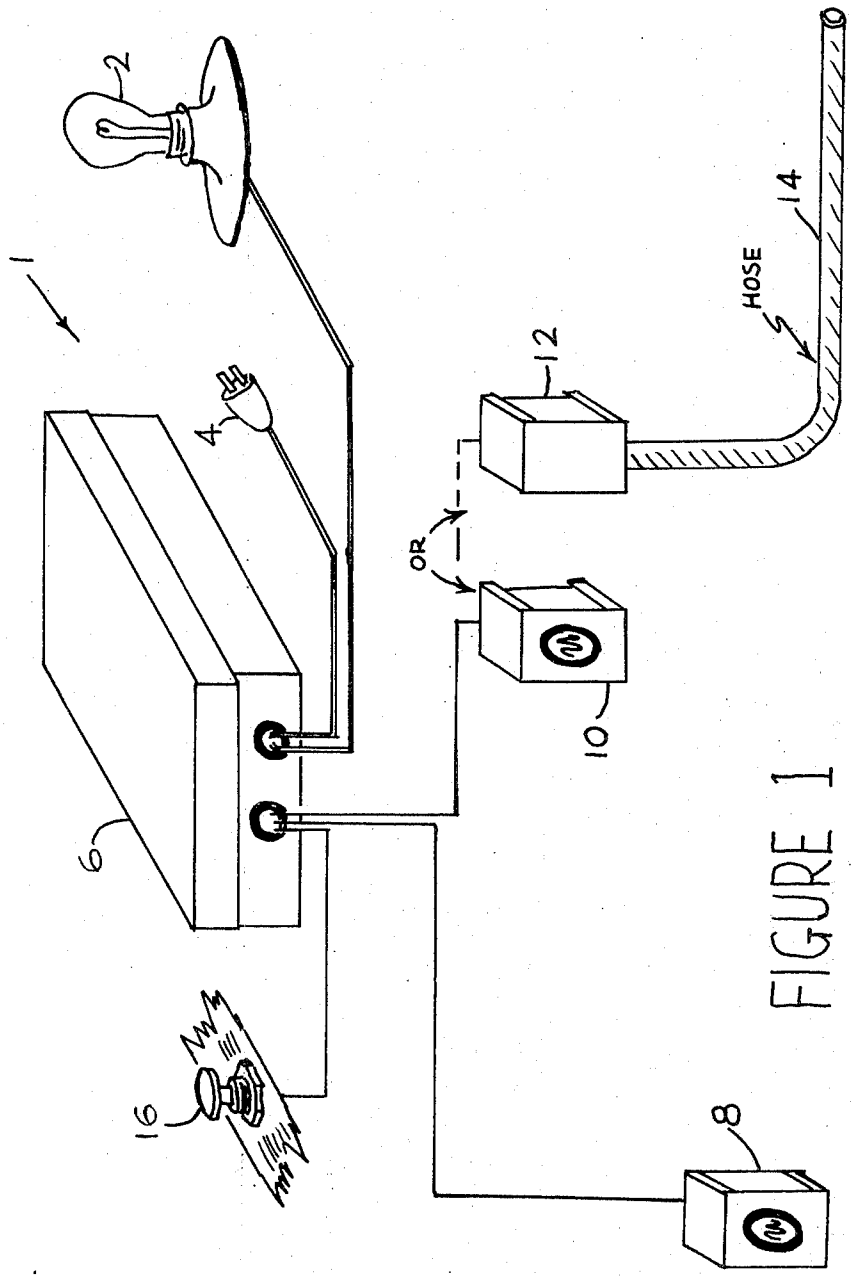


FIGURE 1

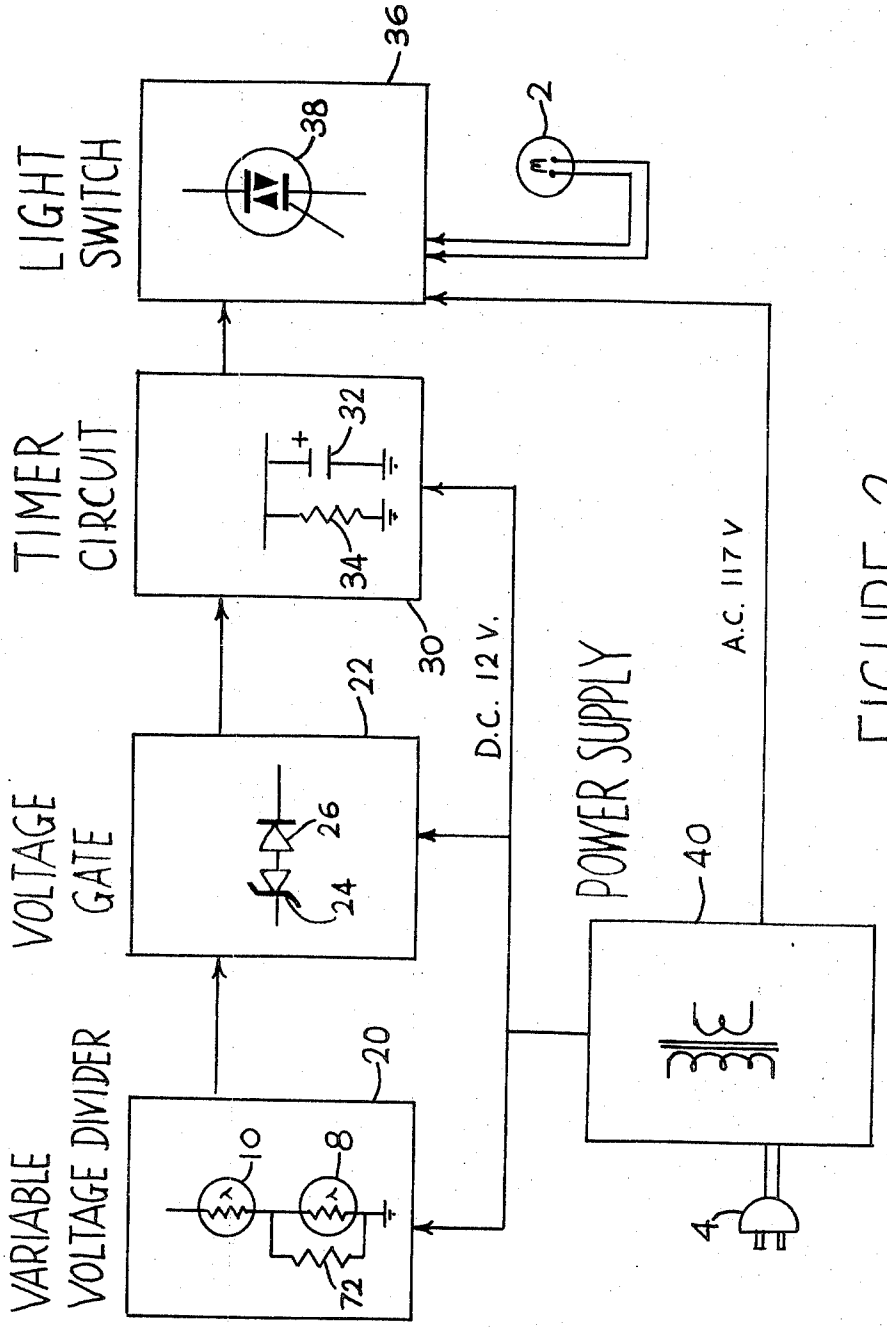

LIGHT SWITCH
36
38
2
TIMER CIRCUIT
32
34
30
VOLTAGE GATE
22
26
24
VARIABLE VOLTAGE DIVIDER
20
10
8
72
D.C. 12 V.
POWER SUPPLY
40
A.C. 117 V
4

FIGURE 2

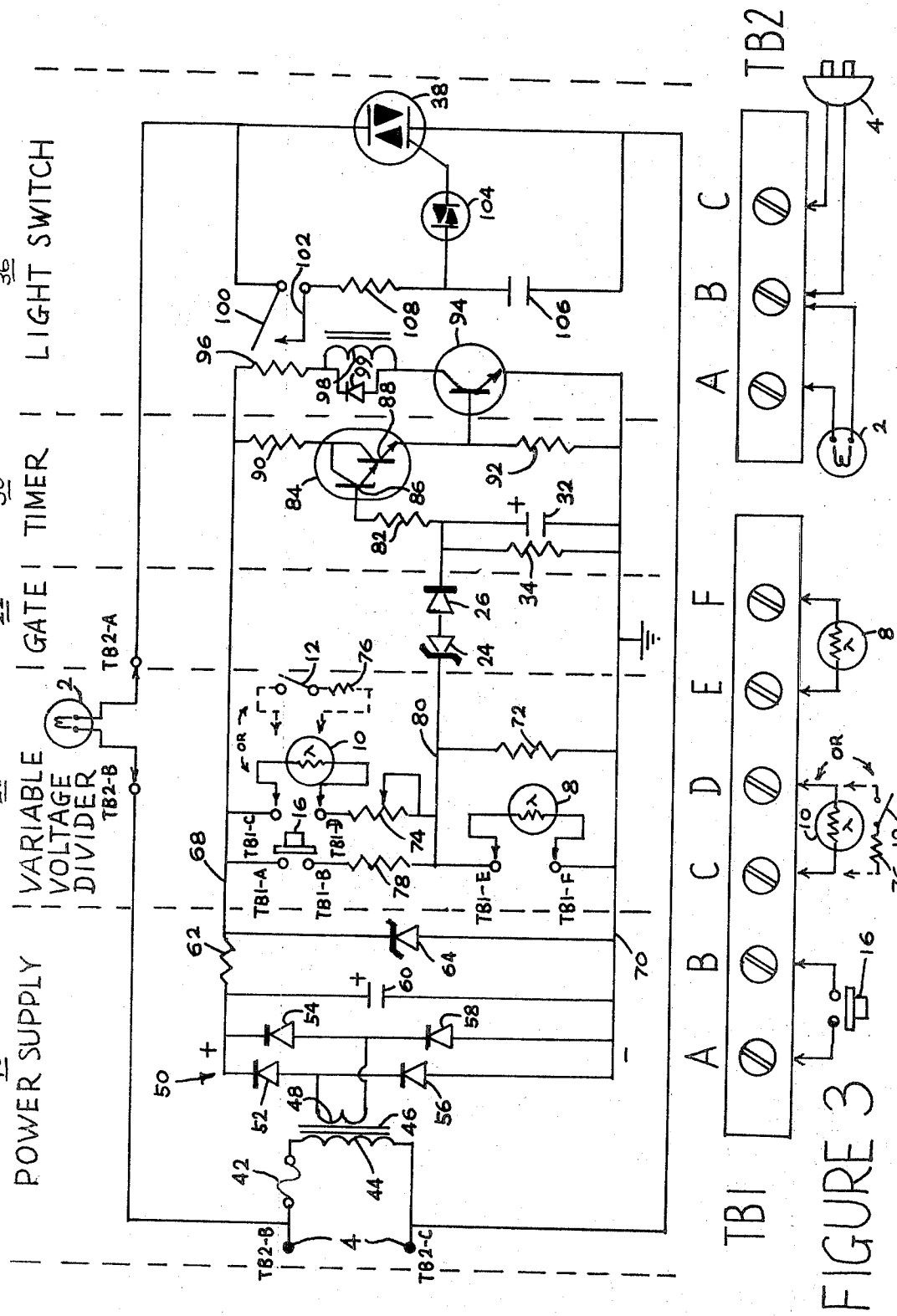
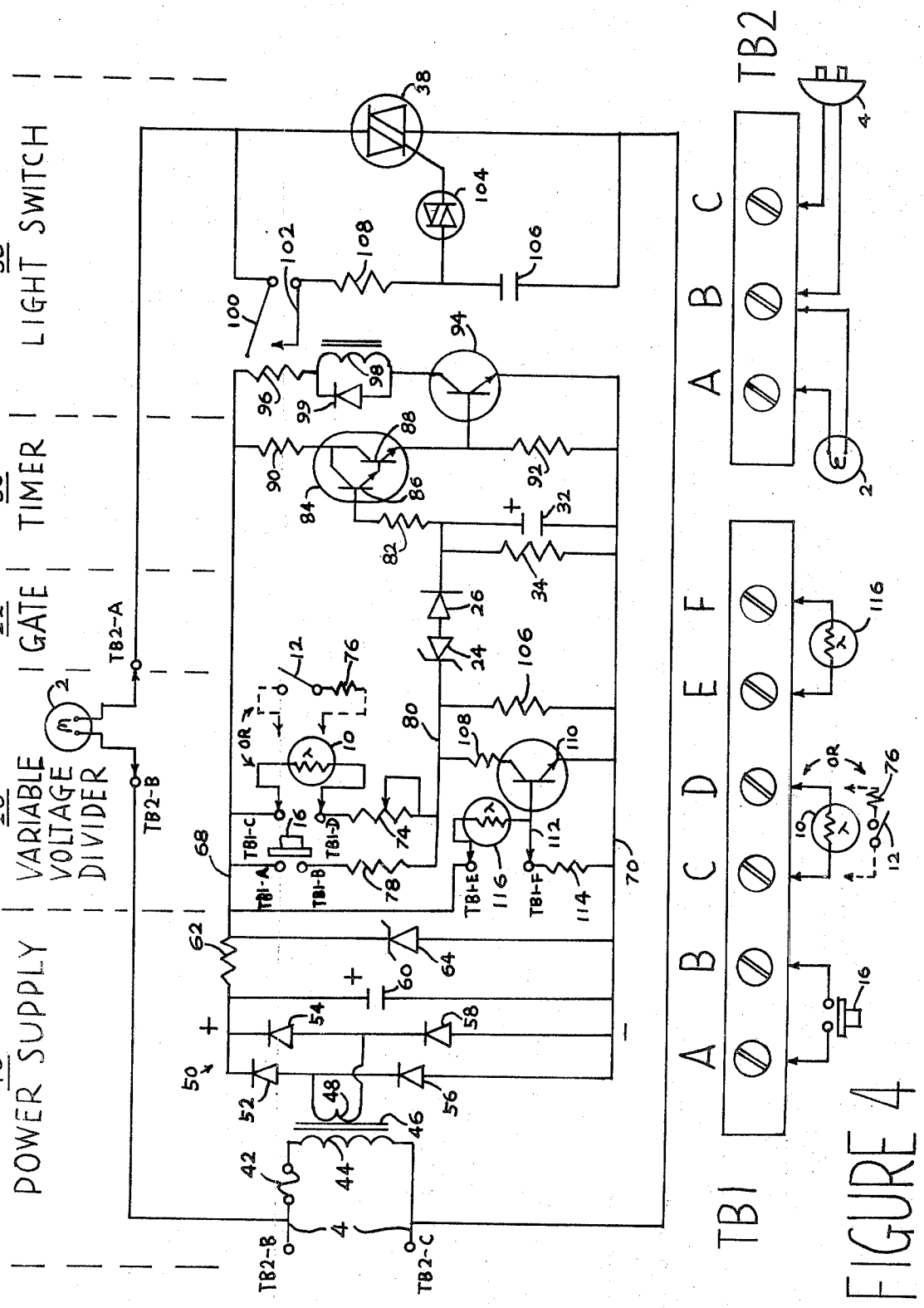

40 POWER SUPPLY
20 VARIABLE VOLTAGE DIVIDER
22 GATE
30 TIMER
36 LIGHT SWITCH
TB1
TB2
A B C D E F
A B C
T82-A
T82-B
T82-C
T81-A
T81-B
T81-C
T81-D
T81-E
T81-F
OR

FIGURE 3


40 POWER SUPPLY
20 VARIABLE VOLTAGE DIVIDER
22 GATE
30 TIMER
36 LIGHT SWITCH
TB1
TB2
A B C D E F
A B C
TB2-A
TB2-B
TB2-C
TB1-A
TB1-B
TB1-C
TB1-D
TB1-E
TB1-F
OR
FIGURE 4

HOSE SWITCH

FIGURE 5

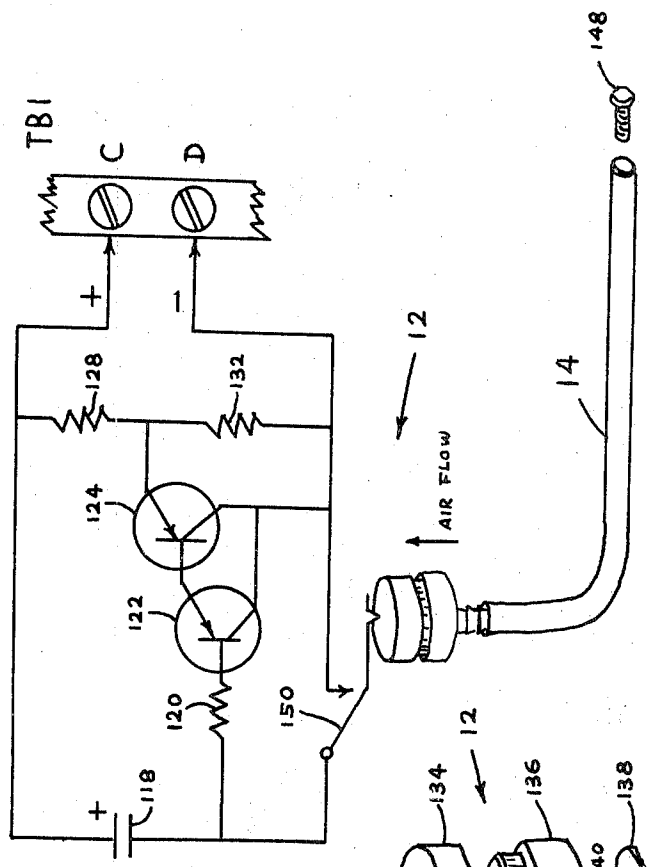
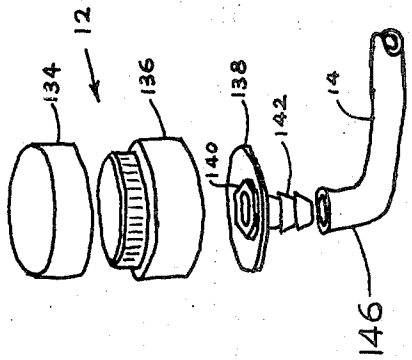


FIGURE 6



AUTOMATIC LIGHT CONTROL SYSTEM

BACKGROUND OF THE INVENTION

Known garage light systems of the prior art have employed mechanically operated switches which are held in an on position for a long time in order to sufficiently activate a timing system to delay an extinguishing of lights. Such systems have used heavy duty wiring to heavy duty relays to control the switching on and off of light circuits and timing devices. Generally, the timing systems are expensive because of their requirement for heavy duty compounds, and the systems are incapable of use with devices which supply only a very short pulse of energy. For example, none of the known fixed lighting systems employs small aimed photocells for triggering by quick flashes of headlights.

SUMMARY OF THE INVENTION

The present invention is a light system which is used for controlling lights in darkened areas usually outside a house or apartment. Lights controlled by the present system are usually those lights within a garage or those lights within passageways between a parking space and residences. The purpose of the usual application of the present invention is to provide temporary lighting for darkened spaces while one is passing from a house to an automobile or from an automobile to a residence.

In a preferred form the control of the present invention is packaged in a single unit with two terminal boards. One terminal board is a low voltage board to which the remote switching or starting elements are connected. For example, a push button switch near a doorway for starting a system as one leaves a house, a headlight receiving photocell and an exterior daylight sensing photocell may be connected through long, fine, low-voltage terminal board. The household voltage power lines and the lighting circuits are connected to the high-voltage terminal board.

In the preferred form of the invention, supplied voltage is reduced and rectified. AC ripples are smoothed with a filter, DC current is limited with a resistance, and voltage surges are grounded with a breakdown device.

The substantially constant DC voltage is supplied to a voltage divider. In the divider, an exterior photocell is connected between mid point and ground. Resistance of the exterior photocell is reduced during daylight hours, bringing mid point voltage closer to ground potential.

Starters are connected in parallel between the mid point and a point of maximum DC voltage. Usually the starters are a push button near an entrance to a residence and a headlight sensing photocell or roll over pneumatic impulse switch at a garage entrance. During darkness hours when the resistance of the exterior photocell is high, reducing resistance of any one of the starters raises the potential of the mid point of the voltage divider closer to the maximum DC voltage.

A gate is connected to the mid point. When potential of the mid point in the voltage divider exceeds breakdown voltage of a breakdown device in the gate, such as during darkness hours when one of the starters is activated, the DC power is gated to immediately charge a capacitor, turning a timer on. At the same time, an electronic switch is turned on, completing the lighting

circuit and turning on the garage and passageway lights.

When the starter is deactivated, the timer keeps the lights on for a time predetermined by the discharge rate of the capacitor. The discharge rate is in turn controlled by the value of a resistance which discharges the capacitor to ground. Discharge in a reverse direction through the breakdown device gate is prevented is prevented by a unidirectional element. Discharge through the electronic switch is prevented by use of a cascaded transistor with a high input resistance, for example, a Darlington transistor. If varied timing is desired, the apparatus may be provided with varied resistors connected in series or in parallel or with a variable resistor to control timing. In a preferred embodiment, a single resistor having a sufficiently high resistance to provide a slow rate of discharge is provided so that lights are held on for a number of minutes.

In a preferred embodiment of a light switch, a transistor is biased on, completing the application of the full DC current to a reed relay. Power contacts of the relay are connected in one side of an AC voltage divider. The relay completes AC power to a diac which is connected in the biasing circuit of a triac. Closing of the relay contacts turns the triac on, completing the AC power circuit to the lights.

While the present lighting system is described with particular application to a system for turning on garage lights, the present system is useful in any application where a timed power supply capable of responding to an impulse input is useful.

One object of the present invention is the provision of a lighting system which employs a timing system capable of responding to a brief starting activation.

Another object of this invention is the provision of a garage lighting system which employs a headlight sensing photocell connected in combination with an exterior daylight sensing photocell to turn on garage lights and associated passageway lights during hours of darkness when the automobile headlights are detected.

Another object of the invention is the provision of a lighting system employing starting and sensing elements in a voltage divider circuit to control gating of energy to turn on lights and to start a timing circuit.

Another object of the invention is the provision of an electronic switch for use in a lighting system.

This invention has as another object the provision of a variable voltage dividing circuit and gate for use in an automatic lighting system.

Another object of this invention is the provision of a self-contained electronic control system for automatically turning on and off garage lights.

These and other objects of the invention are apparent in the specification, which includes the foregoing and ongoing description, and the claims and from the drawings, which taken together, comprise the disclosure of the invention, using one preferred embodiment by way of example.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of the apparatus of the present invention, showing the system with its boxed electronic controls, the power source and electric light connections and the remote controlling devices.

FIG. 2 is a schematic representation of the main elements of the present invention.

FIG. 3 is a schematic diagram of the circuits of the present invention, showing in detail the interrelated elements and the terminal board connections of a preferred embodiment of the invention.

FIG. 4 is a schematic drawing similar to FIG. 3 with a modified shorting portion or lower portion of the voltage divider.

FIG. 5 is a schematic drawing of circuitry provided with an impulse switch.

FIG. 6 is a detail of an air-operated impulse switch actuator.

DETAILED DESCRIPTION OF THE DRAWINGS

Throughout the drawings, like elements are referred to by like numerals.

In FIG. 1, the numeral 1 generally indicates the light control system of a preferred embodiment of the present invention. Electric light 2 represents a lighting circuit which is controlled by the automatic device of the present invention. Plug 4 is representative of a connection for a power source. Box 6 contains the electronic circuits of the present invention and terminal boards.

Photocell 8 is mounted on an exterior of a building, for example, a garage to prevent operation of the system during daylight hours. Photocell 10 is mounted within a garage to detect headlights of cars for starting the system when a car is parked in a garage. In a two-car garage, photocell 10 may be centrally mounted to detect headlights from either car. Photocell 10 may be used with adjustable circuits to detect back up lights when automobiles are backed into a garage.

In some cases, such as in drive-through carports, no wall is available for mounting of an interior photocell. A pneumatic switch 12 may be substituted for photocell 10. Closed air hose 14 supplies a pulse of air to switch 12 as an automobile crosses the hose. It is convenient to mount a push button starter 16 adjacent a pedestrain entry to the garage. Where more than one entry to a garage is commonly used in darkness hours, two or more push buttons 16 may be connected in parallel.

As shown schematically in FIG. 2, exterior photocell 8 and interior photocell 10 are connected in a variable voltage divider 20. When darkness turns photocell 8 off and headlights turn photocell 10 on, a potential is provided to voltage gate 22 which is sufficient to breakdown device 24 and gate current to timer circuit 30. Unidirectional device 26 in gate 22 prevents reverse flow of current from timer 30.

Timer circuit 30 contains a capacitor 32 and a resistance 34 which discharges the capacitor. When the potential is gated to the timer circuit 30 and during the time that capacitor 32 maintains a sufficient potential, light switch 36 is held on. Triac 38 is schematically shown within the light switch 36 for controlling lamp 2.

Power supply 40 receives power from source 4, transmits the power to the light switch, and reduces and rectifies current which it supplies to the variable voltage divider, the gate and the timer circuit.

In FIG. 3 a low voltage terminal board generally indicated by TB1 has connections A through F which are found in the upper part of the figure. High voltage terminal board TB2 has connections A, B and C which are shown in the upper part of the drawing as, for example, TB2-A. Terminals A and B on the high voltage board are connected to lamps 2, and terminals B and C are connected to a voltage source which is shown as a plug 4. In systems which are intended for use in new constructions, lamps 2 generally indicate the basic garage lights, and source 4 is wired directly to the roughed in electrical wiring. In add on systems a plug 4 and power lines are supplied. Lamps 2 may be the existing lamps, or externally wired lamps may be provided with a kit.

On the low voltage terminal board TB1, contacts A and B receive the push button. Terminals C and D receive the internal photocell 10 or roll over switch 12, or both may be connected in parallel to terminals C and D. Terminals E and F receive low voltage wiring from the external photocell 8.

Referring to the main circuit in FIG. 3, voltage is supplied at source 4. A fuse 42 protects the circuit against voltage surges, which may be caused externally or by a short circuit in the system. Household current is applied through fuse 42 to primary 44 of transformer 46. Secondary 48 reduces the voltage to approximately 12 volts AC. A bridge rectifier generally indicated by the numeral 50 and comprising diodes 52, 54 56 and 58 changes the low AC voltage to low DC voltage. Capacitor 60 filters AC components and smooths the output of the rectifier. Current limiting resistor 62 limits the current flowing through the DC electronic components. Zener diode 64 breaks down at 12 volts, effectively shorting voltage surges and insuring that voltage between positive power line 68 and ground 70 does not exceed 12 volts.

In the variable voltage divider 20, photocells 8 and 10 may have dark resistances of about 5,000 ohms, or more, which are reduced to about 500 ohms when illuminated. 15K ohm resistor 72 is connected in parallel to photocell 8 in the lower portion of the divider so that the combined resistance of photocell 8 and resistor 72 is below 500 ohms when external photocell 8 is illuminated during daylight hours. In daylight conditions, the potential of mid point 80 is thus reduced toward ground potential. In the upper portion of the divider, light cell 10 is connected in series with variable resistor 74, which has a capacity of about 25K ohms. Adjustment of resistor 74 is made to bring the mid point 80 to a potential above the breakdown voltage of the breakdown device 24 in gate 22. When 12 volts are imposed across lines 68 and 70, resistor 74 may be adjusted so that when photocell 10 is illuminated by headlights during darkness hours, mid point 80 is brought to a potential slightly above a breakdown voltage of 6.8 volts. Correctly adjusting resistor 74 according to the fixed position of photocell 10 insures correct operation of the automatic system and insures against starting of the system by spurious illumination of photocell 10.

Photocell 10 may be replaced by an impulse switch 12 or other suitable switch with a series connected resistance 76.

For convenience, one or more push buttons may be provided at entrances to a garage. Preferably the push buttons are connected in series with a resistor 78, which may have a value of about 470 ohms.

During daylight hours, the low resistance of photocell 8 and the parallel resistor 72 will always keep mid point 80 below the level of breakdown voltage required by breakdown device 24. When photocell 8 imposes its high darkness resistance, the potential of mid point 80 may be raised above the breakdown voltage by reducing resistance in photocell 10 or by completing any of the switches.

Gate 22 contains breakdown device 24 which is preferably a zener diode. When voltage at mid point 80 exceeds breakdown voltage, zener diode 24 conducts, supplying current to capacitor 32 and to timer 30 and to electronic switch 36. Storage capacitor 32 is charged immediately upon application of voltage to the timer circuit. Resistor 34 discharges voltage from capacitor 32 after the applied voltage has been discontinued. The rate at which resistor 34 discharges voltage from capacitor 32 controls the period of timer 30. Discharge of capacitor 32 through voltage divider 20 is prevented by unidirectional element 26 which is a diode. Discharge of the timer through the light switch 36 is prevented by a high input impedance device, in this case a Darlington transistor 84.

As an example, the capacitor 32 may have a value of 500 microfarads. Resistor 34 may have a value of from about 150 to about 2 megaohms. Resistor 82 may have a value of about 1.5 megaohms. Resistors 90 and 92 may have resistances of about 10 K ohms and 2.7 K ohms respectively. The function of the resistors 82, 90 and 92 and of the cascaded transistors 84 which may be comprised of individually packaged transistors 86 and 88 is to forward bias the light switch 36 while preventing substantial discharge of capacitor 32.

When transistor 94 is biased on by voltage from the timer section 30, DC power is supplied to reed relay 98 via current limiting resistor 96. Power terminals 100 and 102 of reed relay 98 close, completing the AC circuit to diac 104. Capacitor 106 and resistor 108 cooperate as an AC voltage divider so that the appropriate potential is applied via diac 104 to the biasing terminal of triac 38. Power terminals of triac 38 complete the circuit between power source 4 and lights 2.

As shown in FIG. 3, diode 99 protects the transistor 94 from sudde n surges when the field collapses in relay coil 98. At the same time, diode 99 keeps the relay polarized.

FIG. 4 is a modified form of FIG. 3, in which the variable voltage divider circuit is changed. The modification of FIG. 4 insures that the system is held off during times of partial potential sensed by the exterior photocell. With the exception of the change to the voltage divider circuit, all of the elements of FIg. 4 are the same as the elements and circuits of FIG. 3. Similar elements are designated by similar reference numerals. In the upper half of the voltage divider the elements and circuitry of FIG. 4 are similar to the elements and circuitry of FIG. 3.

In the lower half of the voltage divider resistor 106 has the same value as resistor 72 in FIG. 3. Resistor 106 is the only resistor which is conductive during darkness hours. Consequently, the potential of mid point 80 is held at a level sufficiently high to breakdown device 24 for gating current to the timer.

During daylight hours, resistor 108, which has a value of about 100 ohms, is grounded through transistor 110, effectively shorting the high resistance element 106. Transistor 110 is turned on by raising the value of its base connection 112 to an on voltage. The potential of base connection 112 is established by a second voltage divider which comprises resistor 114 and photocell 116. Resistor 114 has a value of about 150 ohms. Photocell 116 has a value of about 5,000 ohms or more when dark and 500 ohms when illuminated. Until photocell 116 resistance is raised to a point near 5,000 ohms, base 112 is held off.

The effect of the particular circuit of FIG. 4 is to bias transistor 110 on, thereby effectively shorting resistance 106 during any light. When dark, photocell 116 biases transistor 110 off, cutting off the path to ground through resistor 108, and grounding mid point 80 only through resistor 106.

When an air hose 14 is placed in such a position that a car rapidly passes over the air hose, contacts in air switch 12 may be held closed for a time insufficient to fully charge the timer 30. To provide sufficient charging of timer 30, a circuit such as shown in FIG. 5 may be employed.

In the circuit shown in FIG. 5, capacitor 118 keeps the current on for a sufficient time to charge the capacitor in timer 30.

As in FIGS. 3 and 4, air switch 12 is connected to terminals C and D of the first low voltage terminal board 1. When air switch 12 is activated, terminals 150 are closed, charging capacitor 118. The capacitor 118 holds a charge and maintains a bias through resistor 120 on cascaded transistors 122 and 124. During the time that contacts 150 are closed and the additional time in which capacitor 118 retains a charge, transistor 124 effectively shorts resistor 132 so that resistor 128 is the only resistance in the upper portion of the voltage divider 20. That resistance is schematically shown as resistor 76 in FIG. 3 and 4.

In one preferred embodiment, an air switch 12 comprises two slidable plastic cups 134 and 136. Air is supplied to cup 136 through a central opening in base 138. The upper end 146 of hose 14 fits on nipple 142. The remote end of hose 14 is closed by plug 148 as shown in FIG. 5. The upper plastic cup 134 closes contacts 150 when it is lifted by air flowing from the hose.

The invention has been described in part by specific embodiments. The function is not limited to those embodiments. Several modifications may be made without departing from the scope of the invention, which is defined in the following claims.

I claim:

1. A lighting system comprising a power source, light means for illuminating a space, and control means for communicating the power source with the light means, the control means comprising a breakdown device having a first terminal and having a second terminal connected to ground, a first resistance connected between the first terminal and ground, resistance reducing means connected in parallel to the first resistance, an exterior photocell for sensing daylight conditions connected to the reducing means and for activating the reducing means, thereby maintaining a circuit through the breakdown device in the control means open during daylight conditions, a controller connected to the power source and to the first terminal for completing the circuit in the control means from the power source through the breakdown device when the controller is activated and when the exterior photocell is inactive during darkness, and switch means connected to the circuit and connected to the power source and to the light means for communicating the power source and the light means upon completion of the circuit in the control means.

2. The lighting system of claim 1 further comprising energy storage means connected to the circuit and energy drain means connected to the circuit in parallel to the energy storage means between the switch means and the second terminal of the breakdown device for

maintaining operation of the circuit and the switch means while energy is stored in the storage means and for terminating operation of the circuit and switch means when energy is drained from the storage means.

3. The lighting system of claim 1 wherein the power source comprises a source of alternating current, and wherein the light means comprises electric lamps operable upon communicating with the power source, and wherein the control means comprises a power supply connected to the power source for converting the alternating current to direct current and a voltage divider connected to the power supply, wherein the exterior photocell is connected between a midpoint and ground in the voltage divider, and wherein the breakdown device is connected to the midpoint, whereby light impinging on the exterior photocell reduces voltage of the midpoint below a breakdown voltage, and whereby the exterior photocell presents a high resistance during darkness, and whereby the controller reduces resistance in the opposite portion of the voltage divider so that voltage of the midpoint is raised to exceed breakdown voltage of the breakdown device, and wherein the switch means comprises electronic switch means having a control terminal connected to the breakdown device and having power terminals connected between the power source and the light means whereby voltage at or above breakdown voltage passes through the breakdown device to the control terminal, operating the switch, completing the power terminals and communicating the power source and the light means.

4. A timed automatic lighting system for providing illumination during passage between automobile and house doorways comprising a power supply having a primary with terminals configured for connection to a household power source and having a secondary for reducing primary voltage, rectifier means connected to the secondary for producing direct current, a starting circuit connected to the rectifier and having a starter for passing varied current according to a condition of the starter, and shorting means connected to the starting circuit and to the rectifier for substantially shorting the starting circuit, the shorting means comprising a first resistance connected between the starter and ground, resistance reducing means connected in parallel to the first resistance, and an exterior photoresistor connected in the resistance reducing means for reducing resistance and shorting the starting circuit when the exterior photoresistor is illuminated by daylight, gating means comprising a breakdown device having a first terminal connected to the starting circuit for gating current above a predetermined voltage, timing means comprising a capacitor and resistor connected in parallel between ground and a second terminal of the breakdown device and thereby connected to the gating means for receiving current from the gating means, and a switch means connected to the timing means for closing when the timing means is on, transmission means connected to the switch means and having terminals for connection to a household power source and light producing means connected to the transmission means, whereby the light means are lighted when the switch means is closed.

5. The lighting system of claim 4 wherein the timing means capacitor and resistor, comprises storage means for storing energy from the gating means, and comprises discharge control means connected to the storage means for controlling discharge rate of the storage means upon interruption of gated energy, whereby the switch means is held on for a predetermined time.

6. The lighting system of claim 4 wherein the shorting means comprises a transistor having power terminals communicating with the starting circuit and with ground and wherein the external photoresistor is connected to a base of the transistor for turning the transistor on during daylight hours.

7. A lighting system comprising a source of alternating current, electric lamps operable upon communicating with the source for illuminating a space, a power supply connected to the power source for converting the alternating current to direct current, a voltage divider connected to the power supply, an exterior photocell connected between a midpoint and ground in the voltage diver, a breakdown device is connected to the midpoint, whereby light impinging on the exterior photocell reduces voltage of the midpoint below a breakdown voltage, and whereby the exterior photocell presents a high resistance during darkness, a controller connected between the midpoint and an opposite pole of the voltage divider, whereby the controller reduces resistance in the opposite portion of the voltage divider so that voltage of the midpoint is raised to exceed breakdown voltage of the breakdown device, an electronic switch means having a control terminal connected to the breakdown device and having power terminals connected between the power source and the lamps whereby voltage at or above breakdown voltage passes through the breakdown device to the control terminal, operating the switch, completing the power terminals and communicating the power source and the lamps, a capacitor connected to ground and to a point in the circuit between the control terminal of the switch means and the breakdown device for storing energy passing through the device and a discharging resistor connected in parallel to the capacitor for slowly discharging the capacitor, whereby upon discontinuance of operation of the controller, and hence discontinuance of the breakdown voltage and discontinuance of current passing through the breakdown device, the capacitor maintains the control terminal at a voltage sufficient to hold the electronic switch means on for a period of time until the resistor discharges the capacitor to a voltage below an on voltage required by the control terminal.

8. The apparatus of claim 7 further comprising a filter connected across the power supply and parallel to the voltage divider, a current limiting resistor connected in series between the power supply and the voltage divider, and a zener diode connected in parallel to the filter, whereby voltages in excess of a breakdown voltage of the zener diode are grounded.

9. The lighting system of claim 7 wherein the circuit further comprises a reverse current preventing device inserted between the breakdown device and the capacitor for preventing discharge of the capacitor through the breakdown device, and wherein the electronic switch means further comprises a high input-resistance cascaded transistor device connected to the control terminal for preventing discharge of the capacitor through the control terminal.

10. A timed automatic lighting system for providing illumination during passage between automobile and house doorways comprising a power supply having a primary with terminals configured for connection to a

household power source and having a secondary for reducing primary voltage, rectifier means connected to the secondary for producing direct current, a starting circuit connected to the rectifier having a starter comprising a penumatic pulse operated switch for passing varied current according to a condition of the starter, and shorting means connected to the starting circuit and to the rectifier for substantially shorting the starting circuit, gating means connected to the starting circuit above a predetermined voltage, timing means connected to the gating means for receiving current from the gating means, and switch means connected to the timing means for closing when the timing means is on, transmission means connected to the switch means and having terminals for connection to a household power source and light producing means connected to the transmission means, whereby the light means are lighted when the switch means is closed.

11. The lighting system of claim 10 wherein the pneumatic pulse operated switch comprises an air hose plugged at a distal end and connected to a nipple communicating with a base of a first cup, a second cup inverted upon the first cup and slidable thereon, and contacting means connected to the second cup, whereby the second cup is slid outward and the contacts are closed upon a compression of the air hose.

12. A timed automatic lighting system for providing illumination during passage between automobile and house doorways comprising a power supply having a primary with terminals configured for connection to a household power source and having a secondary for reducing primary voltage, rectifier means connected to the secondary for producing direct current, a starting circuit connected to the rectifier having a starter comprising a photocell and a variable resistor connected in series for passing varied current according to a condition of the starter, and shorting means connected to the starting circuit and to the rectifier for substantially shorting the starting circuit, gating means connected to the starting circuit above a predetermined voltage, timing means connected to the gating means for receiving current from the gating means, and switch means connected to the timing means for closing when the timing means is on, transmission means connected to the switch means and having terminals for connection to a household power source and light producing means connected to the transmission means, whereby the light means are lighted when the switch means is closed.

13. The lighting system of claim 12 further comprising a push button connected in parallel to the photocell and variable resistor.

14. A lighting system comprising a source of alternating current, electric lamps operable upon communicating with the source for illuminating a space, a power supply connected to the power source for converting the alternating current to direct current, a voltage divider connected to the power supply, an exterior photocell connected between a midpoint and ground in the voltage divider, a breakdown device is connected to the midpoint, whereby light impinging on the exterior photocell reduces voltage of the midpoint below a breakdown voltage, and whereby the exterior photocell presents a high resistance during darkness, a controller connected between the midpoint and an opposite pole of the voltage divider, whereby the controller reduces resistance in the opposite portion of the voltage divider so that voltage of the midpoint is raised to exceed breakdown voltage of the breakdown device, an electronic switch having a control terminal connected to the breakdown device, and having a reed relay, the reed relay having power contacts, a diac connected in series to the power contacts and to the power source, a triac having power terminals connected to the lamps and to the power source and having a control terminal connected to the diac for supplying power from the source to the lamps upon completion of the diac circuit by closing of the reed relay contacts.

15. A lighting system comprising a source of alternating current, electric lamps operable upon communicating with the source for illuminating a space, a power supply connected to the power source for converting the alternating current to direct current, a voltage divider connected to the power supply, an exterior photocell connected between a midpoint and ground in the voltage divider, a breakdown device is connected to the midpoint, whereby light impinging on the exterior photocell reduces voltage of the midpoint below a breakdown voltage, and whereby the exterior photocell presents a high resistance during darkness, a controller connected between the midpoint and an opposite pole of the voltage divider wherein the controller comprises a second photocell and a normally open push button connected in parallel whereby the controller reduces resistance in the opposite portion of the voltage divider so that voltage of the midpoint is raised to exceed breakdown voltage of the breakdown device.

16. A lighting system comprising a source of alternating current, electric lamps operable upon communicating with the source for illuminating a space, a power supply connected to the power source for converting the alternating current to direct current, a voltage divider connected to the power supply, an exterior photocell connected between a midpoint and ground in the voltage divider, a breakdown device is connected to the midpoint, whereby light impinging on the exterior photocell reduces voltage of the midpoint below a breakdown voltage, and whereby the exterior photocell presents a high resistance during darkness, a controller connected between the midpoint and an opposite pole of the voltage divider, wherein the controller comprises an air hose operated pneumatic roll over switch and a push button connected in parallel, whereby the controller reduces resistance in the opposite portion of the voltage divider so that voltage of the midpoint is raised to exceed breakdown voltage of the breakdown device.

17. A timed automatic lighting system for providing illumination during passage between automobile and house doorways comprising a power supply having a primary with terminals configured for connection to a household power source and having a secondary for reducing primary voltage, rectifier means connected to the secondary for producing direct current, a starting circuit connected to the rectifier having a starter for passing varied current according to a condition of the starter, and shorting means connected to the starting circuit and to the rectifier for substantially shorting the starting circuit, gating means connected to the starting circuit above a predetermined voltage, timing means connected to the gating means for receiving current from the gating means, the timing means comprising storage means for storing energy from the gating means, and discharge control means connected to the storage means for controlling discharge rate of the storage means upon interruption of gated energy, whereby

the timing means is held on for a predetermined time after interruption of the gated energy, the discharge controlling means comprising a resistor connected in parallel to the storage means, a unidirectional device connected between the storage means and the gating means for preventing reverse flow of current through the gating means, and base connections to cascaded transistors for preventing flow of substantial current through base circuits of the transistors; and switch means connected to the timing means for closing when the timing means is on, transmission means connected to the switch means and having terminals for connection to a household power source and light producing means connected to the transmission means, whereby the light means are lighted when the switch means is closed.

18. A timed automatic lighting system for providing illumination during passage between automobile and house doorways comprising a power supply having a primary with terminals configured for connection to a household power source and having a secondary for reducing primary voltage, rectifier means connected to the secondary for producing direct current, a starting circuit having a starter switch with normally open terminals, the starting circuit being connected to the rectifier for passing varied current according to a condition of the starter, the starting circuit comprising a capacitor connected to the terminals for storing current passing through the terminals, transistor mean having a base connected to the capacitor adjacent the terminals, for turning the transistor means on when the terminals are closed, and the transistor means having power terminals in the starting circuit; and shorting means connected to the starting circuit and to the rectifier for substantially shorting the starting circuit, gating means connected to the starting circuit above a predetermined voltage, timing means connected to the gating means for receiving current from the gating means, and switch means connected to the timing means for closing when the timing means is on, transmission means connected to the switch means and having terminals for connection to a household power source and light producing means connected to the transmission means, whereby the light means are lighted when the switch means is closed.

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