# United States Patent

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[54] **PHOTOELECTRIC SWITCH FOR TURNING ON LIGHTS IN RESPONSE TO ACTIVATING BEAM OF LIGHT**
**14 Claims, 6 Drawing Figs.**


[52] **U.S. Cl.** ..... **250/214,** 250/206, 317/130
[51] **Int. Cl.** ..... **H01j 39/12**
[50] **Field of Search** ..... 250/206, 214; 317/124, 130, 141; 307/141



[56] **References Cited**

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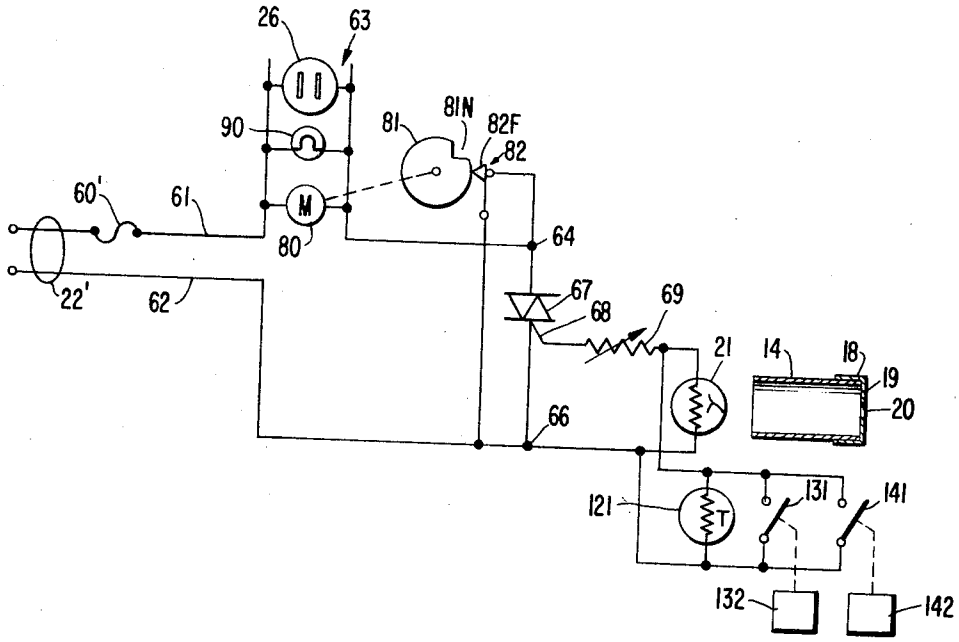
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**ABSTRACT:** Illumination system for store buildings, parking lots, and the like areas, activated for selected time intervals by a beam of radiant energy such as a light beam from a patrolman's flashlight, patrol car spotlight, etc. or condition sensors. A detector is mounted in or near the area to be illuminated, with the muzzle thereof aimed in such a way as to exclude inadvertent actuation by ambient light or reflected light, when actuated by a light beam or light beam pulses produces a gate signal for a solid state switch, such as a triac, which is in circuit with a source of alternating current power and a load circuit such as floodlights, and/or a low voltage lighting control system. A time delay device bypasses the solid state switch for a selected time interval, and after passage of the selected time interval, opens to deenergize the load circuit and conditions the circuit for subsequent actuation by a beam of radiant energy.

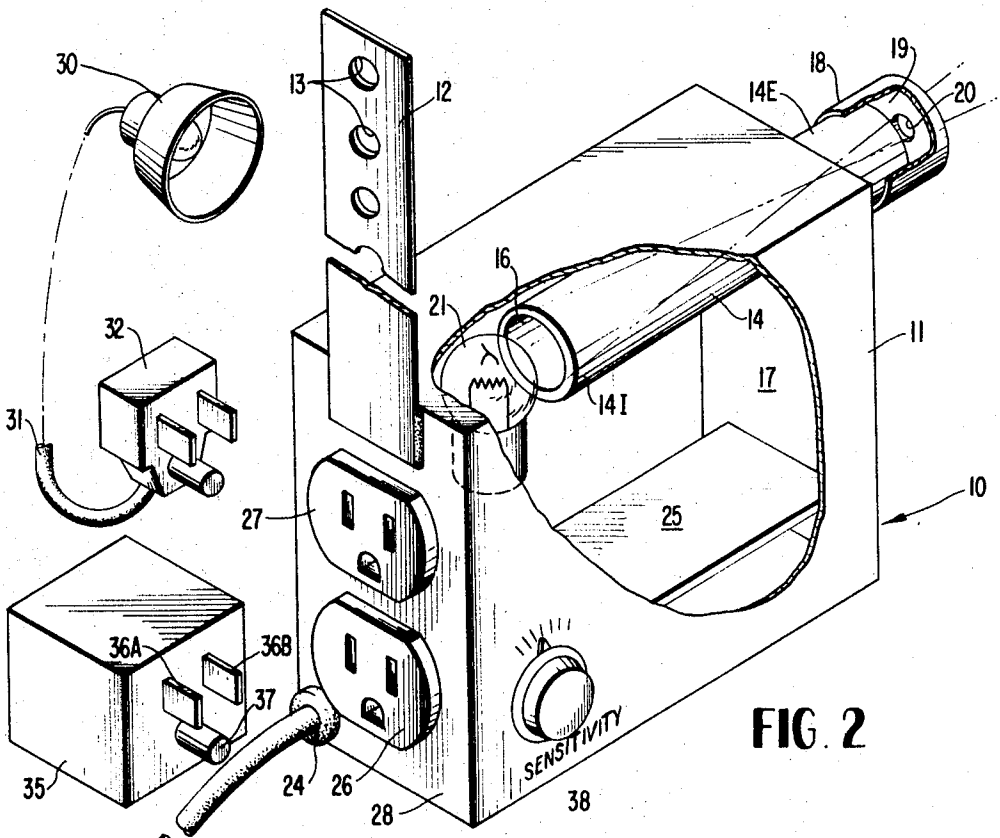



FIG. 2

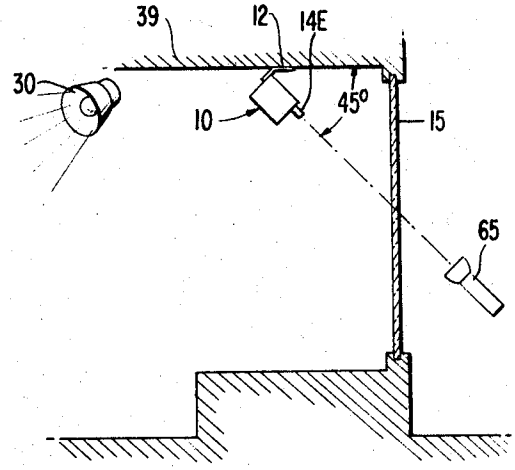



FIG. 1

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FIG. 6

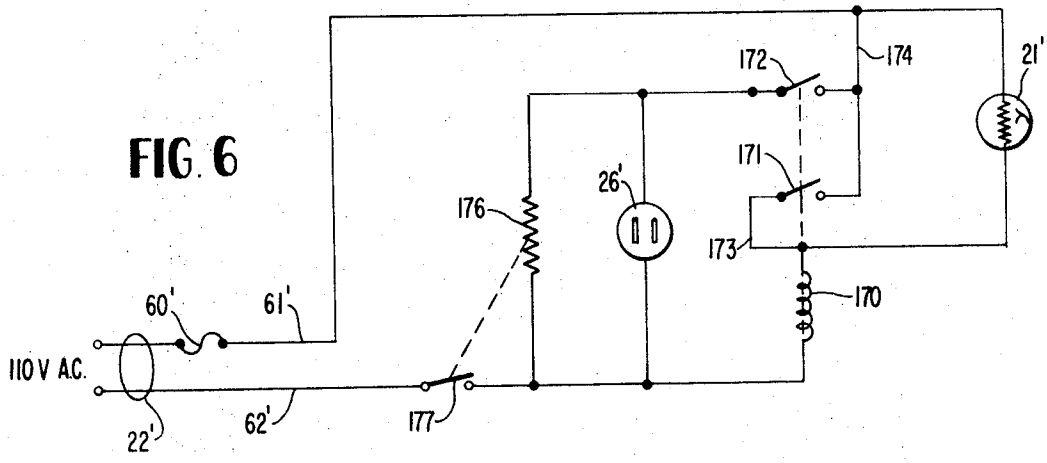



FIG. 4

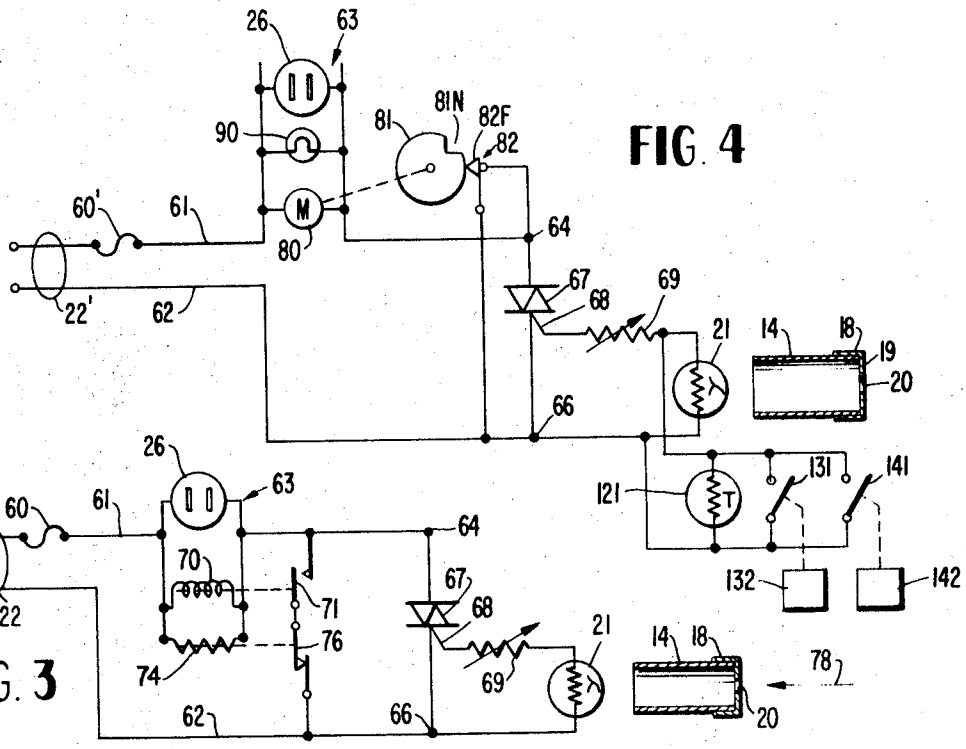
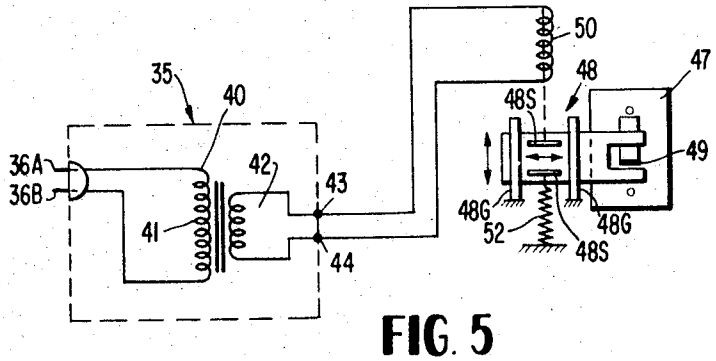



FIG. 3




FIG. 5




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# PHOTOELECTRIC SWITCH FOR TURNING ON LIGHTS IN RESPONSE TO ACTIVATING BEAM OF LIGHT

In the preferred arrangement, the output power to the load is by way of a normally nonenergized convenience receptacle on the detector housing so that auxiliary lighting units may be used independently of the conventional lighting system. The low voltage lighting control system includes a stepdown transformer plugged into the receptacle with low voltage wiring to a solenoid to control a wall switch to turn on a conventional lighting system. When the convenience receptacle is energized at the detector, the primary winding of the transformer is energized via energization of the receptacle to thus energize the low voltage secondary winding and supply operating power to the solenoid to actuate a wall switch and turn the lights on and maintain the lights on as long as the solenoid is energized. Deenergization of the receptacle and the subsequent deenergization of the stepdown transformer and solenoid permits a spring to return the solenoid arm to a normally inactivated position to turn off the lights. Consult the specification for other features and details.

The present invention is directed generally to reliable illumination apparatus designed as an aid to law enforcement officials or special guards, as a deterrent to crimes, such as breaking and entering, burglary, etc., and more particularly to a remote lighting control system activated by a beam of artificial radiant energy, such as a flashlight, spotlight or other light beam.

At the present time, shopping areas are inspected by foot or car patrolmen, with the policeman or guard inspecting the darkened interior by the slow process of peering through the door or display windows into the darkened interiors or by attempting to illuminate the store interior by means of a multicell flashlight or by patrol car spotlight. In either case, the glass of the store window or door tends to reflect substantial amounts of light back in the same manner as if the light were shined into a mirror, and the patrolman is at times at least partially blinded by the glare, and if there are intruders in the store, they may stand motionless or otherwise avoid being detected.

Objects of the present invention include the provision of a reliable, inexpensive radiant beam actuated illumination system, an inexpensive lighting control system in which regularly installed lighting systems may be turned on for selected time intervals by a patrolman's flashlight, scout car spotlight, etc. and which does not require expert installation or maintenance and an auxiliary lighting system for buildings, parking lots etc. which is actuated for a selected time interval.

In its simplest terms, the present invention relates to an inexpensive unobtrusive device that can be mounted inside a store display window, on the exterior store front, or other appropriate location as desired, which, when struck by a strong beam of light activates an AC power source, flooding the interior of the store with light for a selected time interval thus exposing to plain view anyone inside the premises. An intrusion sensor or fire sensor may likewise activate the lighting system or an auxiliary lighting system to draw the attention of police, guards, etc.

A variety of methods of installation is available. Most common application requires installation in the display window of a business establishment so as to be readily accessible to the light source of the patrolman, watchman or police scout car. The light sensing muzzle of the device should be pointed toward the outside and angled downwardly so that a patrolman's flashlight or a scout car spotlight can activate the system, but at the same time, the muzzle must not be aimed so that it will receive direct rays of sun or direct beams of automobile headlights. An adjustable mounting bracket is provided to make it possible for suspending from a wall, ceiling at a desired angle. The bracket can be easily bent to achieve the desired position. Preferably, normally nonenergized female electrical convenience receptacles for plugging in spotlights



that are strategically located to provide, when the female convenience receptacles are energized illumination of the interior. At the same time, or alternatively, energization of the female convenience receptacle may be used as the control signal for actuating a conventional lighting switch at some remote wall location to thereby illuminate the area. Thus, the invention includes a stepdown transformer having a male electrical plug for connection to the female convenience receptacles, a pair of terminals at the low voltage winding of the stepdown transformer being available for low voltage, noncode, wiring to a solenoid mounted on a wall near a light switch. The solenoid has associated therewith a light switch actuating member which, in a nonactuated solenoid condition, is controlled so that in normal operation, the light switch is off. Energization of the female receptacle having the stepdown transformer plugged therein energizes the solenoid to turn on the light by "on" translating movement of the light switch actuating member. Deenergization of the female receptacle after a selected time interval deenergizes the transformer and the solenoid and the light switch actuating member is translated in a direction to turn off the lights.

The above and other objects, advantages and features of the invention will become apparent from the following specification taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a preferred form of the apparatus with a portion of the detector housing removed to expose a portion of the interior thereof,

FIG. 2 is a diagrammatic illustration of one installation of the invention in a commercial building and a patrolman's flashlight being used to actuate same,

FIG. 3 is a circuit diagram incorporating one embodiment of the invention;

FIG. 4 is a circuit diagram incorporating a further embodiment of the invention;

FIG. 5 is a circuit diagram showing application of the invention to actuate conventional lighting systems;

FIG. 6 is a circuit diagram of a further embodiment of the invention.

With reference to FIG. 2 of the drawings, detector assembly **10** includes a housing **11** having welded or otherwise secured thereto mounting bracket **12**. Bracket **12** has a plurality of apertures **13** for nailing or otherwise securing to the ceiling or wall or other mounting surface. Other forms of mounting brackets and arrangements may be used. Bracket **12** is adjustable (by bending and/or twisting) to accommodate any desired muzzle angle as described later herein. Light beam limiting tube or muzzle **14** which has blackened interior or bore **16** (tube **14** may be nonreflecting black plastic tubing) has an end **14E** projecting outwardly from wall **17** of housing **11**. A light limiting cap **18** telescopes over the end **14E** of tube **14** projecting outwardly from the housing. The end **19** of cap **18** has an aperture or hole **20** of a selected size to admit light therethrough into the bore **16** of tube **14**. Tube **14** is of a length such that approximately 1 inch projects outwardly from the housing and approximately 3 inches projects inwardly into the housing. Tube **14** is mounted in housing **11** by means of a grommet (not shown) in wall **17** or other mounting means. Photo detector **21** (shown by its symbol in FIG. 2) is positioned at the interior end **14I** of light tube **14** so that a beam of light directed at aperture **20** and generally along the axis of tube **14** will strike photo detector **21**, photo detector **21** being of the character described later herein. It will be appreciated that cap **18** is for the purpose of limiting light entry to the bore **16** with the size of aperture **20** being adjusted for different sensitivities. However, cap **18** may be eliminated and sensitivity adjustments made electrically as described hereinafter. For a tube about 4 inches long and having a bore **16** of about three-eighths inch the size of hole **20** may be three-eighths inch, one-fourth inch thirteen sixty-fourths inch or one-eighth inch.

A power cord **22** having a grounded male plug **23** for plugging into any convenient outlet or female receptacle

passes through grommet 24 into the interior of detector housing 11 to supply alternating current power to the unit. A pair of conventional female receptacles 26 and 27 are mounted in the rear wall 28 of housing 11, such convenience outlets 26 and 27 being in a normally nonenergized condition and energized by a light beam directed through aperture 20 along the axis tube 14 to photo detector 21. Various devices and control circuits may be energized upon energization of either convenience outlet 26 of 27. For example, a flood light 30, which may be a spotlight or conventional lamp having an extension cord 31 and ground male plug 32, is plugged into convenience outlet receptacle 27 so that upon energization of outlet 27 the spotlight 30 is turned or energized and upon deenergization of outlet 27 spotlight 30 is likewise deenergized. A small stepdown transformer 40 (FIG. 5) (a bell transformer) may be contained within a small housing 35, which has extending therefrom male plug or prong elements 36A and 36B and a ground terminal 37, may be plugged directly into female receptacle 26 to energize the primary winding of transformer 40, for purposes described later herein, upon energization of female receptacle 26. Electrical circuitry may be mounted upon an insulating board 25 within housing 11 and a sensitivity adjustment knob 38 may likewise be mounted for adjustment of the sensitivity of the device from the exterior thereof. The ground wire in power cord 22 is connected directly to all elements shown as having a grounding means in a conventional manner to avoid electrical shock.

As shown in FIG. 1, the detector 10 may be mounted upon a ceiling 39 with screws (not shown) passing through apertures 13 in bracket 12. Flood light 30 may be mounted at any convenient location in the store building with power cord 31 (not shown in Fig. 1) being plugged into one of the receptacles 26 or 27. Obviously, more than one flood light 30 may be placed at various locations in the building or at areas to be illuminated, only one being shown for purposes of illustration. Again, with reference to FIG. 1, the muzzle of detector 10 is shown mounted downwardly at an angle of about 45° so as to minimize inadvertent triggering of the device by vehicle headlights, reflected light and/or ambient sunlight. Also shown in FIG. 1 is a store front window 110 and a patrolman's flashlight 111 being directed along the axis of tube 14 to photo detector 21 within housing 11.

Figure 3 illustrates a preferred form of circuit incorporating the invention. While silicon controlled rectifiers (SCR) may be used, triacs are preferred since these devices conduct in both directions when triggered into conduction by a low energy positive or negative gate signal with an attendant simplicity in overall circuitry. Once the gate signal has be removed (e.g. the photo detector having a high impedance due to no light beam thereon) the triac will continue to conduct. In order to turn off the triac, and condition the circuit for subsequent triggering, the invention includes means for shunting or bypassing the triac for the remainder of the "triggered" state of the circuit so current conduction through the triac is only for a time sufficient to actuate the timer circuit as described more fully hereinafter. The timer circuit includes a series connected normally open contacts 71 and normally closed contacts 76 connected in shunt or bypass relation to the triac. Normally open contacts 71 are closed to complete the holding of a timed latch or bypass of the triac. Thus, with reference to FIG. 3, alternating current power as supplied through conductors 22, fuse 60, and conductors 61 and 62 to load circuit 63 and terminals 64 and 66 of triac 67. Gate electrode 68 of triac 67 is connected through sensitivity control resistor 69 and photo detector 21 to terminal 66. Resistor 69 may be adjusted by knob 38 so as to adjust the sensitivity of the device or, alternatively, resistor 69 may be fixed (about 200 ohms) and the opening 20 in end cap 19 on tube 14 may be of varying sizes to adjust the sensitivity of the device to ambient conditions. A set of caps having openings 20 calibrated according to a range of sensitivities may be provided.

A single convenience outlet receptacle is shown at 26 which corresponds to outlet 26 shown in FIG. 2, it being understood that more than one outlet may be connected as shown in FIG. 3. Timer relay coil 70 is connected between input conductor 61 and terminal 64 of triac 67 and in parallel with relay coil 70 is a thermal time delay heater element 74. Relay coil 71 controls normally open contacts 71 whereas thermal time delay heater elements 74 controls normally open contacts 76 being connected in a series circuit bypassing terminals 64 and 66 of triac 67 so that substantially no load current flows through triac 67.

This circuit operates as follows: A beam of light, indicated by arrow 78 aimed along the axis of tube 14 (because of the length of tube 14 and the size of opening 20 a few degrees off axis beams can trigger or actuate the detector, with dimensions given earlier herein defining included angles between about 6° to 13°) passes through opening 20 and strikes photo detector 21. Photo detector 21 may be a cadmium sulfide cell or other photo electric device and in the embodiment shown has a normally high resistance which is lowered upon being struck or impinged upon by a beam of light 78. The lowering of the resistance of photo detector 21 serves as a gate signal, through sensitivity resistor 69, on gate electrode 68 of triac 67 to turn on this triac 67 and cause current to flow therethrough. Current flowing through triac 67 flows through relay coil 70 and energizes this relay to close contact 71. At the same time, thermal time delay 74, which is in parallel with relay coil 70 is likewise energized and begins to heat up. It will be noted that on closing of relay contact 71 the triac 67 is thus bypassed out of the circuit and essentially returned to a normal nonconductive condition so that the convenience outlet terminals 26 are now in an energized condition and effectively connected across the input conductors 61 and 62 to the alternating current supply from power cord 22. With plug 32 in receptacle 26, spotlight or floodlight 30 (FIG. 2) will be energized or turned on to illuminate the interior of a store building, for example, or other patrolled areas. The period of time for which the terminals of convenience outlet 26 are energized is determined by thermal time delay element 74 and a period of time that it takes open normally closed contact 76 to thereby be energized by terminals or receptacle 26. This time period may be of any selected duration but, for purposes of specificity is about two to three minutes. This time duration is ample for the patrolman or guard to visually determine whether there is any intruder within the premises or about the premises being patrolled.

Alternatively, or even simultaneously, instead of merely turning on floodlight or spotlight 30, stepdown transformer 40 (FIG. 5), within housing 35 and plugged into one of the electrical outlet receptacles shown in FIG. 2, has its primary winding 41 connected directly to prongs 36A and 36B which are received in female receptacle 27, for example. Secondary winding 42 of transformer 40 has its ends connected to a pair of terminals 43 and 44 to which may be connected low voltage wiring 46 which may be run in a noncode manner to the proximity of a light switch 47 mounted on a wall of the premises being patrolled. Bifurcated switch actuating arm or member 48 is fitted over toggle lever 49 of switch 47 and constrained by guides 58G to translate or move in an up and down direction so that translatory movement of arm 48 upwardly serves to move toggle 49 up and turn on the conventional store lights. This upward movement of arm 48 is effected by solenoid 50 which receives its operating current via low voltage wiring 46 from the secondary winding 42 of transformer 40. In the embodiment illustrated, tension spring 52 is connected to arm 48 to bias or maintain same at a down or "off" condition so that any time that solenoid 50 is not energized toggle switch lever 49 is down or "off." It will be appreciated that push button type wall switches and the like may be actuated by equivalent apparatus, the only essential being that whenever solenoid 50 is deenergized, wall switch 47 is maintained or biased to an off position. Hence, the operation of the circuit described in FIG. 5, taken in conjunction with the circuit of FIG. 3 with prongs 36A and 36B plugged in electrical receptacle 26, is as follows: A beam of light 78 aimed at and

entering muzzle aperture 20 strikes photocell 21 to lower the impedance thereof thereby serving as a gate signal to gate electrode 68 of triac 67 through resistor 69. Such a gate signal switches triac 67 on to thereby energize convenience receptacles 26 and 27 and, at the same time, relay 70 and thermal time delay element 74. Contacts 71 are closed to establish a latching or holding circuit about triac 67 to thereby permit same to recondition or reset for subsequent operation. Energization of convenience receptacle 26 energizes the primary winding 41 of transformer 40 to produce a stepped down low voltage on the secondary winding 42 (110v. AC to 24v. AC is satisfactory). When transformer secondary 42 is energized, the low voltage wiring 46, as connected to terminals 43 and 44, is likewise energized to thereby energize solenoid 50. Solenoid 50 is mechanically linked to arm 48 and hence on energization of solenoid coil 50 the bifurcated arm is moved or shifted upwardly in guides 48G thereby tensioning or stretching tension spring 52 and moving toggle switch lever 49 upwardly to turn "on" the conventional lighting in a building or the premises being patrolled. Meanwhile, thermal time delay element 74 has been energized and is heating and, according to the time delay thereof, will open contacts 76 to thereby open or deenergize the convenience outlets 26 and 27. Upon deenergization of convenience outlets 26 and 27, primary winding 41 of transformer 40 is deenergized resulting in deenergization of the secondary winding 42 and the attendant deenergization of solenoid 50. This permits spring 52 to return arm 48 downwardly to a nonenergized or unactuated condition to thereby move toggle switch lever 49 downwardly and thereby turn off the lights.

In Order to permit normal use of light switch 47, the unit may be detachably or pivotally mounted on the wall (not shown) adjacent switch 47. Alternatively, bifurcated arm 48 may be shifted to the right to disengage the bifurcations from toggle lever 49, slots 48S being formed in arm 48 to permit this disengaging movement.

Preferable to using a thermal time delay is timer motor 80 as shown in FIG. 4 which circuit, except for timer motor 80 is essentially the same as FIG. 3. On energization of timer motor 80, a cam 81 driven by timer motor 80 controls normally open contacts 82 (which in FIG. 4 are shown closed or actuated) closed to affect the bypassing of triac 67. In this embodiment, the rate of rotation of timer motor 80 and the diameter of cam 81 determine the time period that the circuit remains triggered. There may be more than one notch 81N so that cam 81 need not rotate a full revolution for each time interval. Normally, contact follower 82F is in cam notch 81N so that the full voltage applied to the circuit through conductors 22 appear across triac 67 and no current flows to the output circuit constituted by the timer motor 80 and any load plugged into convenience outlet 26. When a beam of light is directed onto photocell 21 through tube 14, the impedance or resistance of photocell 21 is lowered to constitute a gate signal on gate electrode 68 of triac 67 which triggers or switches triac 67 to a conductive condition. Current now flows through the triac and timer motor 80. As soon as timer motor 80 begins to operate and cam 81 is rotated, cam follower 82F moves out of the notch 81N to close contacts 82 to thereby form a bypass or parallel path to triac 67 and energize convenience 26. A load such as floodlights 30 (FIG. 2) plugged in such convenience receptacle and/or transformer 35 plugged into convenience receptacle 27 (FIG. 2) is energized. As soon as motor 80 completes one revolution or the preset time interval, cam follower 82F drops into notch 81N to thereby open contacts 82 and the circuit is ready for further triggering by a light beam directed upon photocell 21. A small pilot lamp 90 may be connected across the output terminals and used to adjust sensitivity of the device by adjustments of resistor 69 and to further indicate proper operation of the circuit.

As shown in FIG. 4, other sources of gate signals for triac 67 may be incorporated into the system. Thus connected in parallel with photocell 21 shown a temperature sensor such as thermistor 121 which has a high resistance value corresponding to a normal ambient temperature and which lowers its resistance significantly on an increase in ambient temperature to produce a gate signal for triac 67. Additional condition sensors may likewise trigger the circuit to turn on lights and illuminate the premises. For example, a humidity sensor 132 may close switch 131 to illuminate the premises on an abnormal increase in humidity, or a sound sensor 142 may close switch 141 to illuminate the premises on changes in noise level within the premises. In these latter circumstances, as long as the abnormal condition persists the lights will remain on or energized since after the end of the time interval of timer cam 81 triac 67 will be retriggered as soon as contacts 82 open. This retriggering of triac 67 is effective to continue the running of timer motor 81 and reclose contacts 82 so that the bulk of the load current flows through the bypass circuit for triac 67.

Figure 6 illustrates a modification of the invention which does not require the use of a semiconductor such as the triac illustrated in FIGS. 3 and 4. In this embodiment cadmium sulfide photocell 21' is connected in series with relay coil 170 and across input power conductors 61' and 62'. Relay coil 170 controls a pair of normally open contacts 171 and 172. Normally open contacts 171 are connected in parallel or bypassing relation to photocell 21' by means of conductors 173 and 174 and serve as latching contacts for relay coil 170. Normally open contacts 172 provide a circuit path to convenience receptacle 26' so that energization of relay coil 170 is effective to energize receptacle 26'. Thermal time delay resistance element 176 is connected in parallel with convenience receptacle 26' and is energized therewith to control normally closed contacts 177 connected between input power conductor 62' and the lower end of relay coil 170.

With alternating current power on input conductors 61' and 62', the circuit of FIG. 5 operates as follows: In the quiescent state, the resistance of photocell 21' is high so that only a very small current flows through relay coil 170, such current being insufficient to actuate or energize the relay. When a beam of light or other radiant energy impinges on photocell 21', the resistance thereof drops to permit sufficient current to flow through relay coil 170 to actuate normally open relay contacts 171 and 172 to a closed condition. Closing of contacts 171 provides a bypass for photocell 21 and connects relay coil 170 directly to the input power conductors. Simultaneously with the closing of contacts 171, contacts 172 close to connect convenience outlet 26' directly across input power conductors 61' and 62' to thereby energize same and any load connected thereto. Thermal time delay element 176 is likewise energized and begins to heat up associated normally closed bimetallic switch contact elements 177. After a selected time interval, contacts 177 open to deenergize relay 170 and recondition the circuit for further operation. It will be noted that in this modification, as well as the modification illustrated in FIG. 3, residual heat in the thermal time delay elements can affect the time delay so that for repeated cycling or triggering, the time delay may vary. For this reason the embodiment illustrated in FIG. 4 is preferred where it is desired to avoid slight variation in the time delay interval on two triggerings of the circuit that are relatively close in time.

It is obvious that various changes may be made in the form and construction of the invention without departing from the spirit thereof. Hence, the invention includes such modifications and departures which as may properly come within the scope of the claims appended hereto.

What I claim is:

1. Radiant beam controlled illumination apparatus comprising in combination,

a pair of alternating current power input terminals,

a pair of alternating current power output terminals,

conductor means directly connecting one of said input power terminals to one of said output power terminals,

radiant beam controlled switch means for directly electrically connecting the other of said input power terminals to the other of said output power terminals for a selected

time interval, said radiant beam controlled switch means including

an electronic switch having a pair of main terminals and a gate terminal,

means connecting one of said main terminals to the said other of said input power terminals and the other of its main terminals to the said other output power terminal,

radiant beam sensor connected between said gate terminal and said the other of said input power terminals, said radiant beam sensor applying a signal to said gate terminal upon impingement thereon of a beam of radiant energy to render said electronic switch conductive between said main terminals,

timer means,

means connecting said timer means across said pair of output power terminals,

normally open switch means closed upon energization of said timer means for a selected time interval,

means connecting said normally open switch means in parallel to the said main terminals of said electronic switch to thereby bypass said electronic switch for said selected time interval, and

an illumination circuit connected to said pair of output power terminals and energized on energization of said pair of output power terminals.

**2.** The invention defined in claim **1**, wherein said pair of output power terminals is constituted by an electrical convenience receptacle, and

including an electrical plug having connector prongs adapted to be inserted in said convenience receptacle,

a voltage stepdown transformer,

said transformer being contained in a housing common to said electrical plug and having the primary winding thereof directly connected to the connector prongs of said plug, and

a pair of low voltage terminals on the exterior of said housing, said low voltage terminals being directly connected to the secondary winding of said transformer whereby said low voltage terminals are energized on energization of said pair of output power terminals for said selected time interval.

**3.** The invention defined in claim **2**, including a low voltage control solenoid,

low voltage wiring means connecting said solenoid to said low voltage terminals,

means mounting said control solenoid in the proximity of a light control means, and

means controlled by said control solenoid for actuating said light control means for said selected interval.

**4.** The invention defined in claim **3**, wherein said means controlled by said control solenoid includes:

light control means actuating lever moved in one direction on energization of said solenoid and returned to its initial position on deenergization of said solenoid.

**5.** The invention defined in claim **1**, including condition sensor means connected to said gate terminal of said electronic switch to supply a gate signal thereto upon the sensing by same of an abnormal condition.

**6.** The invention defined in claim **1**, including a tubular member for admitting said radiant beam to said radiant beam sensor,

cap means at the end of said tube remote from said sensor having an aperture therein of a size related to the length of said tube whereby the included angle is between 6° and 13°.

**7.** Lighting control apparatus comprising in combination,

an enclosure,

a tube projecting from said enclosure and extending inwardly of the exterior of said enclosure, the axis of said tube being angled downwardly,

photocell means for detecting a light beam entering said tube at the end thereof exterior of said enclosure,

semiconductor switch means electrically connected to said photocell means and operated closed upon detection of said light beam by said detector,

time delay switch means energized on actuation of said semiconductor switch means to electrically bypass said semiconductor switch means,

a pair of alternating current power output terminals, said alternating current power output terminals including a female outlet receptacle mounted in a wall of said enclosure,

means connecting the terminals of said electrical outlet receptacle to one side of a source of alternating current supply and to one side of said time delay switch means, respectively, whereby said electrical outlet receptacle is energized upon actuation of said time delay switch means, and

lighting means energized on energization of said electrical outlet receptacle.

**8.** The invention defined in claim **7**, including a stepdown transformer and a housing for said transformer,

a pair of male prongs adapted to be plugged into said electrical outlet receptacle, said male prongs being connected in parallel with the primary winding of said stepdown transformer and extending from the housing of said transformer,

controlled means remote from said receptacle connected to the low voltage winding of said transformer and actuated on energization of said electrical outlet receptacle for controlling said lighting means.

**9.** The invention defined in claim **8**, wherein said controlled means includes a solenoid,

means connecting the winding of said solenoid to receive the energizing current from said low voltage winding of said transformer,

a lever arm actuated by said solenoid,

means mounting said lever arm on the actuating lever of a wall light switch, and

spring means biasing said lever in a direction to return said light switch to an off position on deenergization of said low voltage transformer secondary.

**10.** Light actuated lighting system for buildings and the like having a window, comprising in combination,

an electric lamp lighting system for said building for lighting the interior thereof,

a photocell positioned in said building to be viewable from the exterior thereof through said window,

an elongated tube means for limiting light reaching said photocell to light directed thereto from a mobile artificial light beam source through said window and from the exterior of said building,

a triac connected in circuit with and a source of alternating current power,

means connecting said triac to said photocell to cause said triac to close the circuit to said lighting system from said alternating current electric power supply upon a beam of light being directed to said photocell, and

time delay means connected in circuit with said triac and energized thereby, switch means operated by said time delay means to bypass said triac and to carry load current to said lighting system for a predetermined time interval, and deenergize said lighting system after said predetermined time interval and open the bypass of said triac.

**11.** A light beam controlled illumination apparatus comprising

a pair of electrical power input terminals,

a pair of normally nonenergized electrical power output terminals

light beam detector means,

first switch means actuated by said light beam detector means for connecting said pair of input power terminals to said pair of output electrical power terminals to energize same,

time delay means electrically connected in parallel with said power output terminals,

second switch means actuated by said time delay means a time interval after energization of said output terminals to deenergize said output terminals, and

an illumination circuit connected to said pair of output power terminals and energized from said output power terminals for said time interval

12. The invention defined in claim 11, wherein said second switch means includes normally closed contacts connected in circuit between one of said pair of input power terminals and one of said output power terminals.

13. The invention defined in claim 11, wherein said light beam detector includes a cadmium sulfide cell the impedance of which varies as a function of light, and

wherein said first switch means includes a relay having an operating coil,

means connecting the operating coil of said relay in series circuit with said cadmium sulfide cell and said pair of input power terminals said cell having an impedance when no light beam impinges thereon such that current flow through said relay coil is insufficient to operate same and an impedance when a light beam impinges thereupon which permits sufficient current to flow through said coil to energize same,

a pair of normally open contacts, said pair of normally open contacts being closed by said relay coil on energization thereof,

first a conductor means connecting a first of

14. The invention defined in claim 13, wherein said second switch means includes normally closed contacts connected in circuit between the other of said input power terminals and said relay coil.

second conductor means connecting a second of said pair of normally open contacts to one of said input power terminals and to one of said output power terminals to thereby energize said output power terminals on closing of said second of said pair of normally open contacts.