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8-5-75 XR 3,898,639

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Muncheryan

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[45] **Aug. 5, 1975**

[54] **SECURITY SURVEILLANCE LASER SYSTEM**

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[21] Appl. No.: **283,542**

[52] **U.S. Cl.** ..... **340/258 B;** 340/227; 350/172

[51] **Int. Cl.** **G08b 13/18**

[58] **Field of Search** ..... 340/258 R, 258 B, 227 R, 340/276, 279, 52 D, 416, 221; 350/172, 171; 356/3

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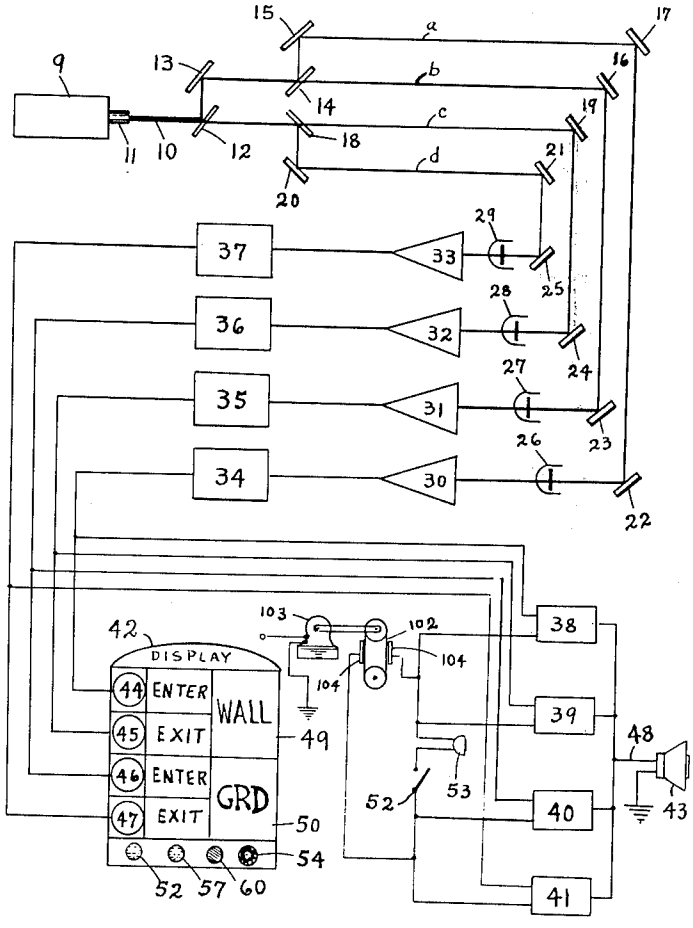
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Primary Examiner—Marshall M. Curtis

[57] **ABSTRACT**

A security surveillance laser system is described, covering applications for securing restricted areas, institutional buildings, land boundaries, military and civilian installations, penitentiaries, rehabilitation centers and the like against vandalism, arson, theft or property, escape or intrusion of unauthorized persons over the walls or fences guarding these areas. Four concealed and invisible continuous beams of laser radiation are projected over the top and sides of the walls or fences surrounding the guarded areas, and the interruption of any one of the beams by a human body initiates visual displays in the central station wherein the laser equipment is located and sounds an alarm announcing whether the unauthorized person is escaping or entering the grounds, or causing any damage to the property for entrance into or escaping from the grounds. The system discriminates against interruption by birds, dogs, cats, rabbits, or other creatures.

11 Claims, 11 Drawing Figures



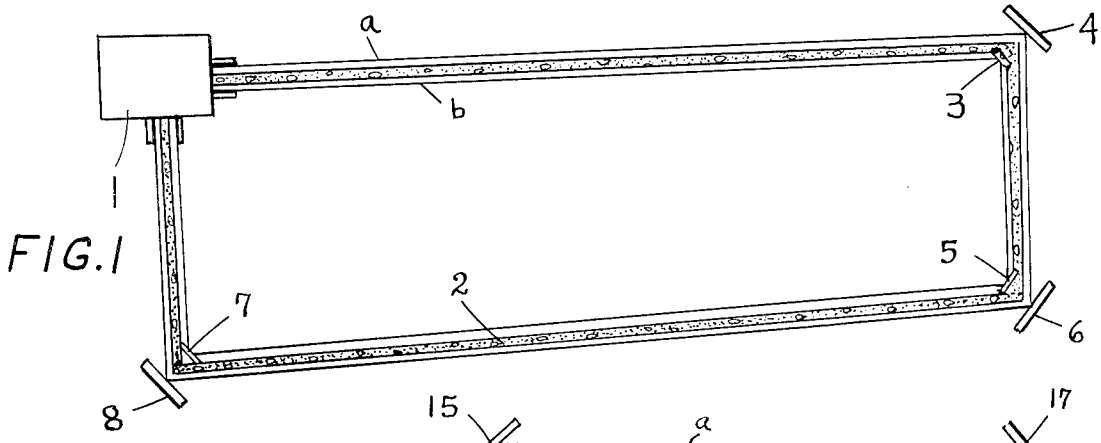

a
b
1
2
3
4
5
6
7
8

FIG. 1

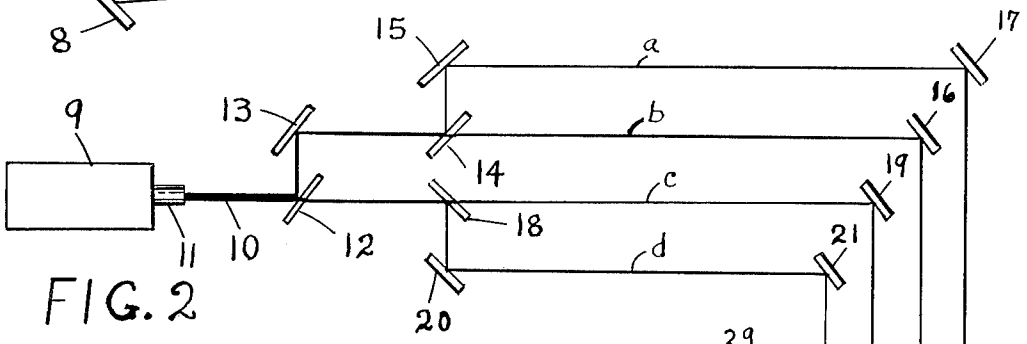
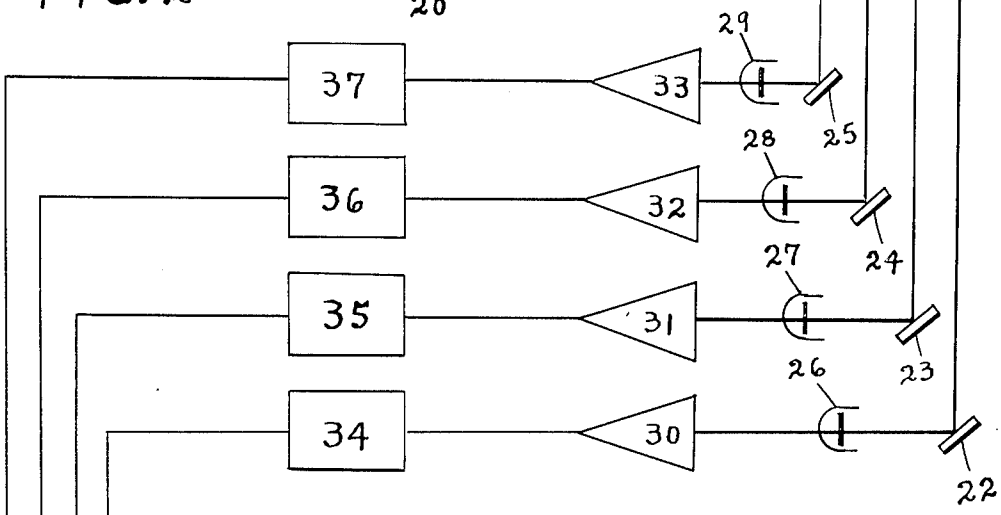
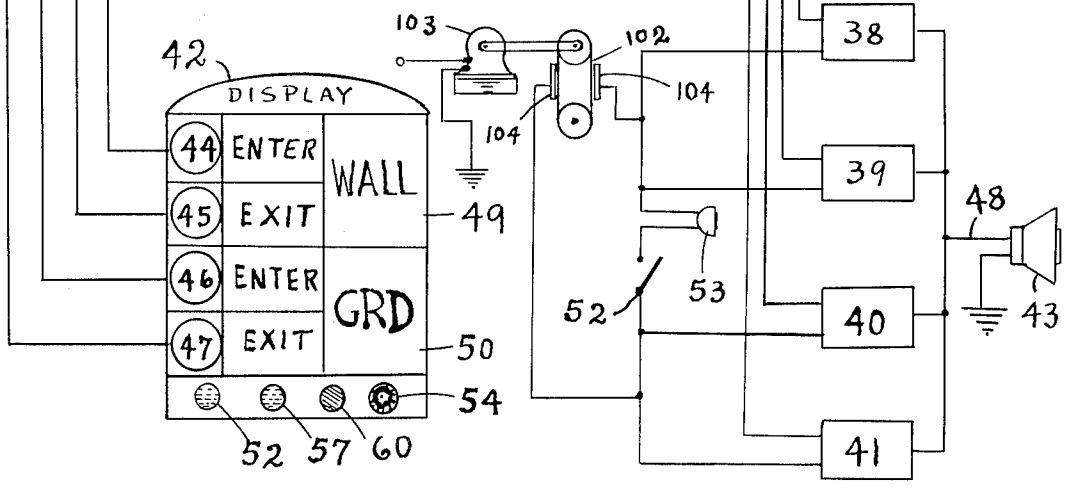

9
10
11
12
13
14
15
16
17
18
19
20
21
a
b
c
d

FIG. 2


37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22


42
DISPLAY
44 ENTER
45 EXIT
46 ENTER
47 EXIT
WALL
GRD
49
50
54
52
57
60
103
102
104
104
38
39
40
41
48
43
52
53

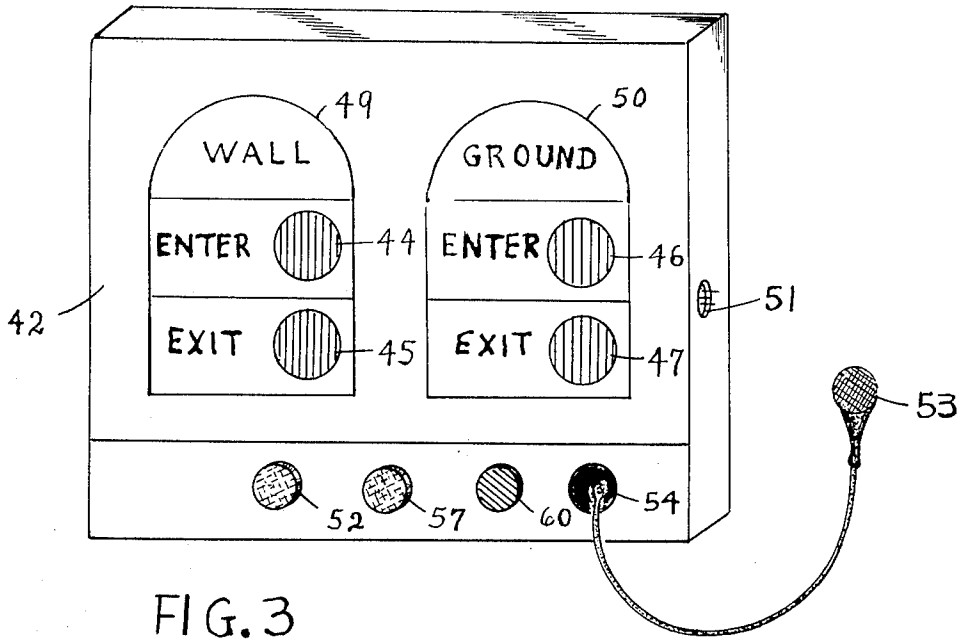


FIG. 3

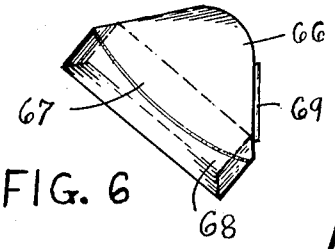


FIG. 6

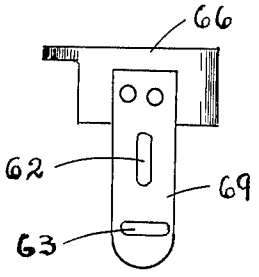


FIG. 8

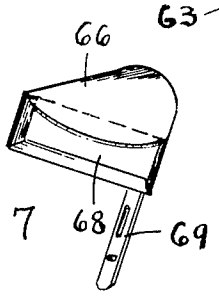


FIG 7

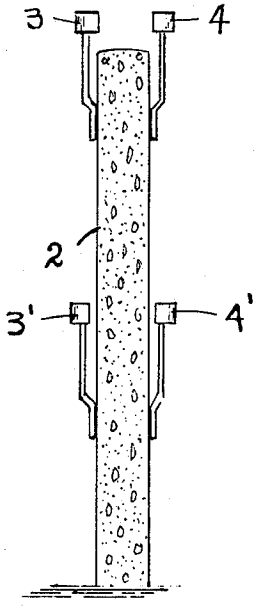


FIG. 4

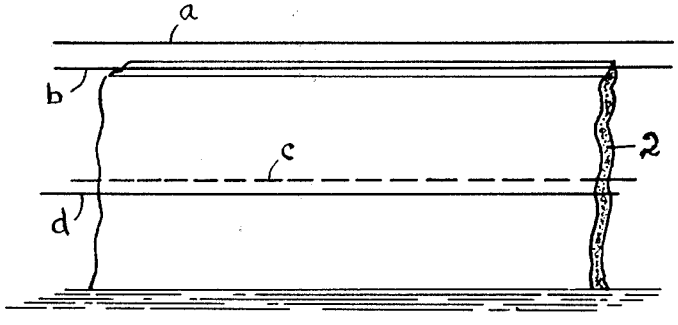


FIG. 5

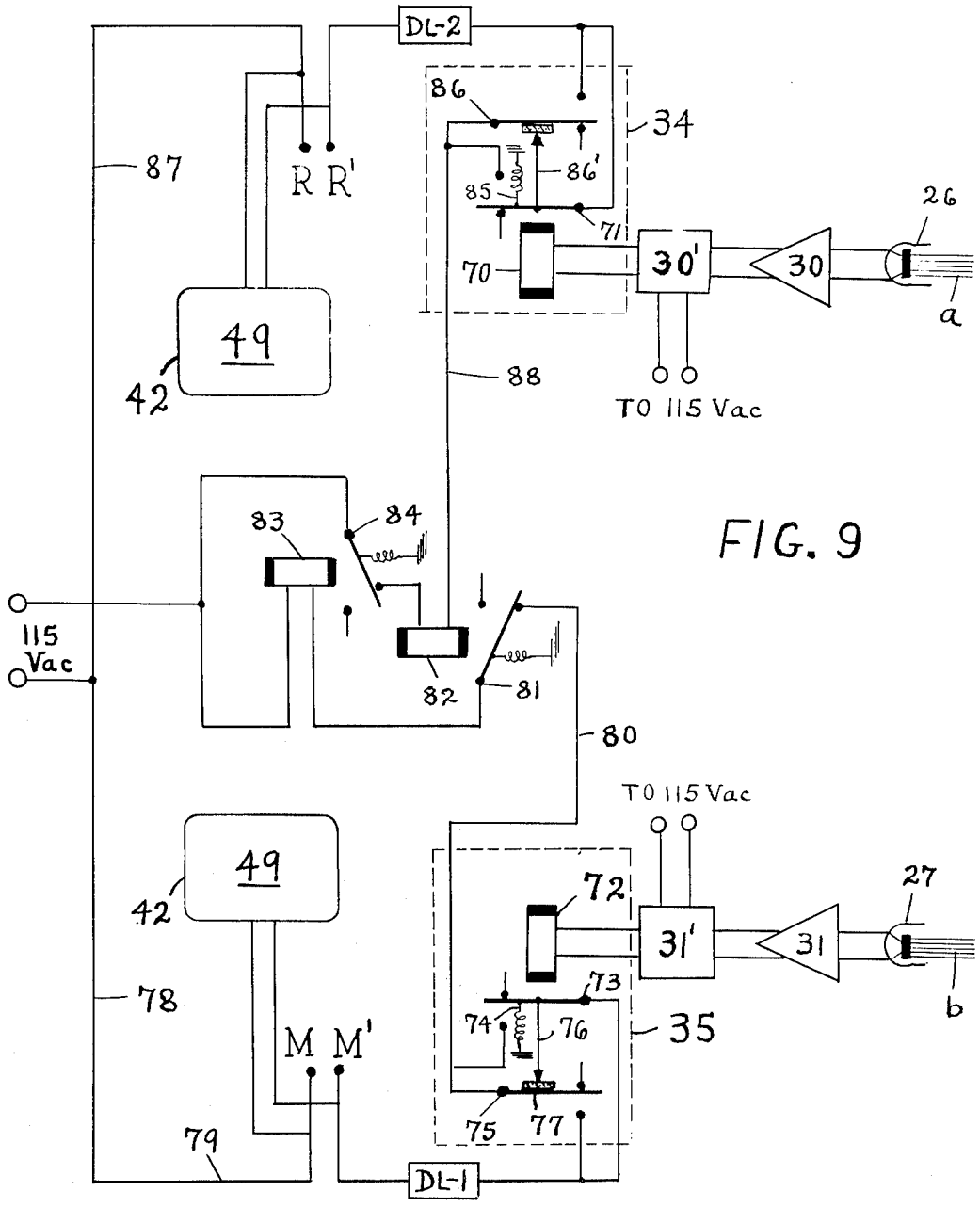

DL-2
86
34
87
R R'
86'
85
71
26
70
30'
30
a
49
42
88
TO 115 Vac
83
84
115 Vac
82
81
80
TO 115 Vac
49
42
72
27
31'
31
73
78
74
76
35
M M'
b
75
77
79
DL-1

FIG. 9

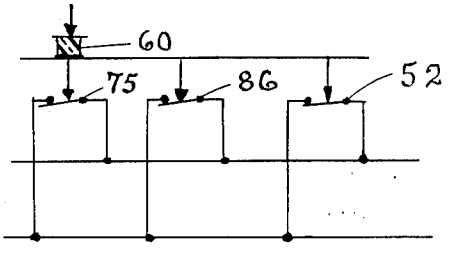

60
75
86
52

FIG. 11

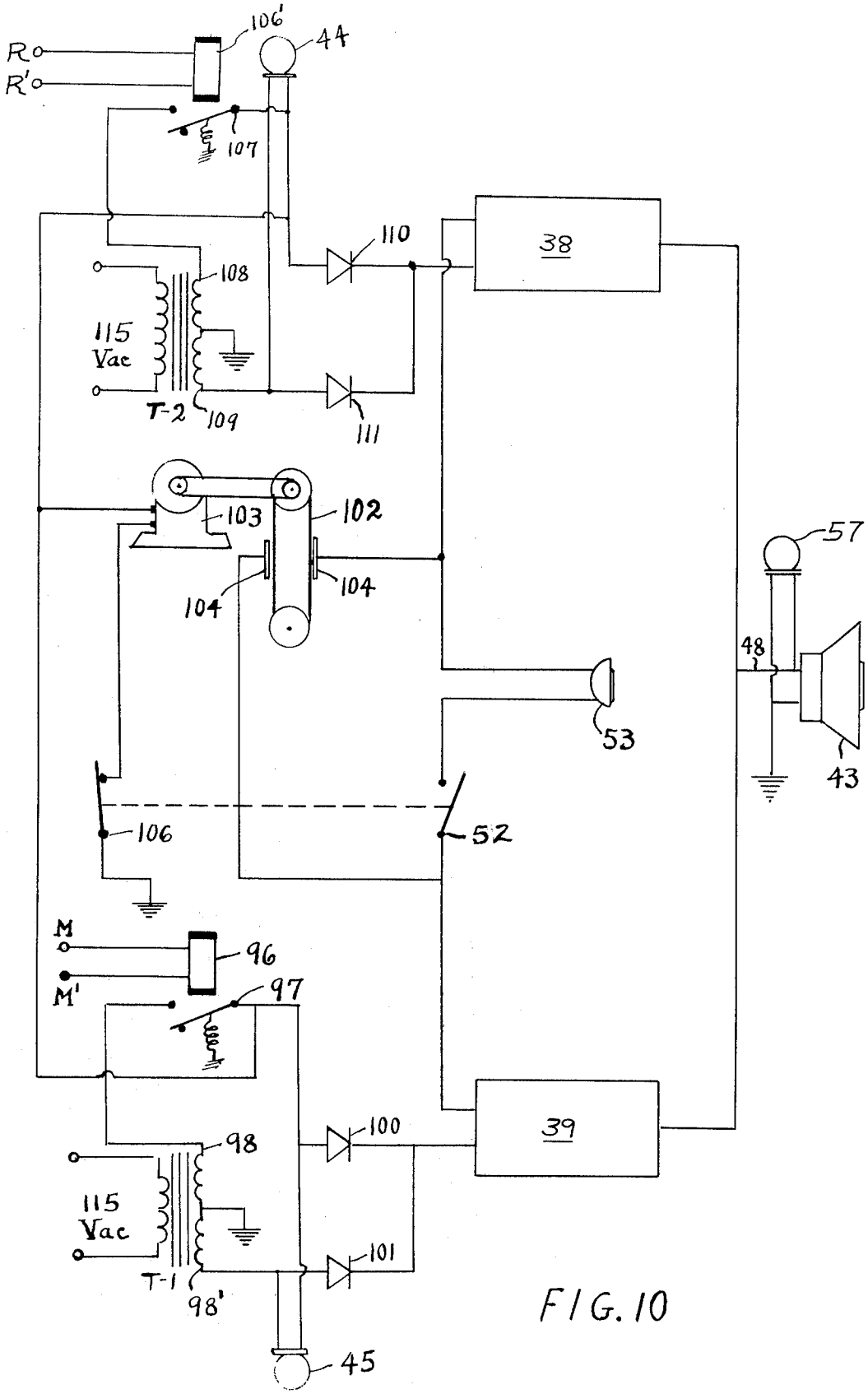

R
R'
106'
44
107
110
38
108
115
Vac
T-2
109
111
103
102
104
104
57
48
53
43
106
52
M
M'
96
97
98
100
39
115
Vac
101
T-1
98'
45

FIG. 10

SECURITY SURVEILLANCE LASER SYSTEM

The present invention relates to security surveillance systems and more particularly to a system of the character utilizing laser beams for surveillance and detection of a crime or the like committed by a person during intrusion into a restricted area, in escaping from a confinement center, or causing any damage to the surroundings of such locations.

From times immemorial, stealing, committing arson, escaping from a prison or concentration camp, illegal immigration at border areas from one country to another, and the like have been with the poeple of all countries throughout the world. Various contrivances have been devised and installed at strategic points in many of these grounds or areas with some success but the crime wave has not been curtailed; instead it has been in the growth from day to day. For instance, mechanical traps have been devised to catch the culprit in person, infrared devices have been innovated and placed at various points of strategy whereby any change in the events at any area would be sensed and an alarm system such as a siren would sound. Television cameras have also been used, by placing a dozen or more of the cameras in various points of concern so that the area can be monitored visually every minute of the day and night by an observer at the central monitoring station. Furthermore, microwave devices and radio or radar equipment have also been used, each with some degree of success. However, all of these devices have had some form of disadvantages, for instance, in failing to perform the function intended, being bulky, costly, and a large number of them would be necessary to cover a given area successfully. Another serious disadvantage with all of these methods has been the tripping of the systems by dogs, cats, rabbits, cows, or even birds. Accordingly these devices and equipments have not been very popular for application successfully and economically.

The present invention, therefore, is made to transcend the functions and applications of the earlier devices and systems used for security surveillance purposes, because the invention uses a relatively simple and effective method at low cost; in addition it overcomes the problems encountered in the earlier methods, as aforementioned. The system consists of a laser unit projecting a single laser beam which prior to distribution in the area monitored is split into four laser beams of equal intensities to cover the entire surrounding walls, fences, or embankments so that when any one of the beams is interrupted momentarily by a person entering into the grounds or escaping from the grounds, a "talking" alarm mechanism is instantly actuated which sounds continuously to be heard in the monitoring station, in the buildings, as well as in the outside grounds, whereby corrective measures could be taken immediately in meeting the situation. Both a display of written words such as "ENTER" or "EXIT" is exhibited in a console attached to a wall in the central station and the word "Entering" or "Exitting" is repeated over the intercommunication loud speaker until the situation has been corrected, whereupon the system is reset for the next event.

Accordingly, a principal object of the invention is the provision of a laser-beam array covering the top and the sides of the walls or the fence surrounding the area secured, any of which beams when interrupted can actuate the visual display and the talking alarm. By a talking alarm, it is meant an alarm which sounds words rather than sounding a siren.

A further object of the invention is to provide the alarm system with a repeating announcement, such as Entering, when an unauthorized person attempts to enter the grounds, and in doing so interrupts the outside beam of the laser radiation; when a person is escaping from the grounds, then the inside laser beam is interrupted, which action displays the word EXIT on the display console and at the same time turns on the alarm system which repeats the word Exitting or any other word or words giving the same meaning.

Another object of the invention is to provide two outside laser beams and two inside laser beams; an outside and an inside laser beam are located near the top of the wall or fence and an outside and an inside laser beam are located near ground level, for instance, about two feet from the ground.

A still further object of the invention is to provide each laser beam with its own amplifying, relaying, and sound modulating channel, so that there are four sets of such channels for the four laser beams to function independently of each other.

Another object of the invention is the provision of a set of relays in each of the four sets of channels; the respective relays in each channel operates only that channel while maintaining the other three channels in a quiescent state.

One other object of the invention is the provision of a microphone located on the display console whereby instructions or announcements can be given throughout the grounds either during the time the event is occurring or at any other time.

A further object of the invention is to provide an array of laser beams which is in the invisible spectral range, thereby concealing the laser beam array from suspected intruders or escapees from the grounds.

A further object of the invention is to provide a constructional design which affords a compact, low cost, and easily installable system.

Other objects and advantages of the invention will become more apparent from the following specification taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views of the invention, and wherein:

FIG. 1 is a schematic top view of a general restricted area to be secured, showing the top of the wall surrounding the area with two accompanying laser beams with reflectors.

FIG. 2 is a block diagram of the entire security surveillance system.

FIG. 3 is a front view of the display console, showing the details of parts included therein.

FIG. 4 is a vertical sectional view of the wall surrounding a secured area, showing the relative locations of the laser-beam reflectors.

FIG. 5 is a sectional view of the wall in perspective view, showing the approximate locations of the four laser beams.

FIG. 6 is a perspective view of a laser beam reflector.

FIG. 7 is a front view of the reflector.

FIG. 8 is a side view of the reflector.

FIG. 9 is a partial simplified schematic and block diagram of the electrical circuit of the system, showing the relaying channels in detail.

FIG. 10 is a simplified schematic and block diagram of the signal modulating and amplifying circuits located within the display console, and

FIG. 11 is a general schematic view of the reset switch, which sets the system relays in a normal (quiescent) operating state, ready for an event* to occur.

*Note: An "event" as used hereinafter means an interruption of the laser beam.

Referring now to the drawings, numeral 1 represents the security surveillance laser system, which is usually located at a monitoring station. The monitoring station is strategically located in a restricted area being secured. The laser beams *a* and *b* positioned adjacent to the top of the wall or fence 2 are reflected by highly polished metal reflectors or mirrors 3 through 8, which project the beams back to the system for processing thereby. Prisms may also be used for laser-beam reflectors. Numeral 9 designates a laser-beam generating unit located in said security surveillance laser system 1, projecting a laser beam 10 from its radiation exit port 11. The laser-beam generator may be a solid-state-type, a liquid-type, or a gas-type continuous laser-beam generator. The laser beam 10 falls on a semi-transmissive mirror 12 constructed so that it will transmit 50 percent of the laser beam and reflect the other 50 percent. The reflected beam from mirror 12 is again reflected from a second mirror 13 unto a third mirror 14 which reflects 50 percent of the radiation received unto another mirror 15 and transmits the remaining 50 percent of the radiation as *b* unto a mirror 16. The reflected laser beam from mirror 15 projects as beam *a* unto a mirror 17, if desired. The beams may be collimated by a cylindrical lens to ribbon-like beams.

The 50 percent transmitted laser beam from mirror 12 falls on a mirror 18, which transmits 50 percent of the incident radiation as *c* unto a mirror 19 and reflects the 50 percent of the radiation unto a mirror 20, from which the beam projects as *d* to mirror 21. In this manner, the laser beams *a*, *b*, *c*, and *d* will each have an equal intensity of 25 percent of the laser beam 10 issuing from the laser generator 9.

The laser beams *a*, *b*, *c*, and *d* reflected from the respective mirrors 17, 16, 19, and 21 become incident unto mirrors 22, 23, 24, and 25, respectively, and thereafter further become reflected to the respective photosensors 26, 27, 28, and 29. The photosensors may be of the type sensitive to wavelengths from visible spectrum of 6000 angstroms to infrared spectrum up to 15,000 angstroms; or, they can be made to respond to the beam wavelengths from 2000 angstroms to 6000 angstroms, especially when liquid lasers are used. The detectors may be installed so that they are interchangeable and the one most suitable to the wavelengths required may be used; of these, silicon detectors may be used both in the visible and infrared spectral regions, and other detectors, such as lead sulphide, lead selenide, lead antimonide, gallium arsenide, antimony sulfide, and the like are suitable for invisible or infrared laser beams from carbon dioxide, neodymium glass, or neodymium YAG. Lead sulfide and indium arsenide, including a number of others, may be used with liquid lasers in the ultraviolet.

The security surveillance laser system comprises four channels in which the respective photosignals from the array of four laser beams are processed and transmitted to the loudspeaker to announce the event occurring in any region of the inclosure surveyed by any one of the laser beams in the laser beam array. Each channel includes a photosensor, a photosignal amplifier, a signal relaying section, an acoustic signal-producing section common to all four channels with four sound-recording tracks thereon, one track for each channel, a signal display section in a common display console, and an acoustic signal modulating and amplifying section from which the finally processed acoustic signals are transmitted to a loudspeaker located remotely from the signal display console, and the laser system. One channel operates at a time while the other three channels are in an inoperative or quiescent state.

The photosignals from the detectors or photosensors 26, 27, 28, and 29 are amplified by amplifiers 30, 31, 32, and 33, respectively, and the amplified electrical signals are fed into the respective relaying sections 34, 35, 36, and 37, from which the individual signals are transmitted to the respective modulating and amplifying sections 38, 39, 40, and 41. A signal display console 42 receives photosignal information from each of the relaying sections and displays thereon the respective information as shown in FIG. 3. A loudspeaker 43 receives a modulated and amplified acoustic signal from any one of the section 38, 39, 40, and 41 and annunciates it to the authorized personnel in the restricted area secured by the security surveillance laser system.

As stated above, one channel operates at a time, and the other channels remain in a quiescent operational state. For instance, when a signal from photosensor 26 actuates the amplifier 30, the relaying section 34 and the modulating and amplifying section 38 are energized and a signal is displayed on the pertinent section 44 of the display console 42, shown in FIGS. 2 and 3; this action also energizes the acoustic signal-producing section comprising the electric motor 103 driving the recorded tape 102, on which the respective sound track transmits the prerecorded spoken words through the transducer or pickup 104 and the modulating and amplifying section 38 to the loudspeaker 43. By way of explanation, the reference to a photosensor actuating an amplifier means that the laser beam at the respective photosensor has been interrupted by the interception of the laser beam by a human being; a reference to a channel being in a quiescent state means that the particular channel has not been activated to operation by its respective signal-relaying section (because the laser beam has not been interrupted).

The instrument panel of the display console 42, schematically shown in FIG. 2, contains the ENTER and EXIT sections for the top part of the wall or fence 2 of the restricted area, designated by "WALL" with the respective red signal indicators 44 and 45; for the near-ground section of the wall or fence 2, the panel also has ENTER and EXIT words under the designation "GROUND", which is provided with the respective red signal indicators 46 and 47. The laser beam-interruption detection signal from any one of the four channels is directed to the loudspeaker 43 through the respective signal-processing sections and cable 48.

A detailed structural arrangement of the components on the panel of the display console 42 is shown in FIG. 3, wherein the WALL section 49 is provided with written displays ENTER and EXIT, which respectively indicate whether a person is entering the restricted area over the wall or exitting (escaping) therefrom; either the ENTER section red light 44 or the EXIT section red light 45 will light up, depending on the type of event. An event as referred to herein includes a laser-

beam interruption and the consequent sounding of an alarm (by spoken words) at the loudspeaker **43.** Numeral **50** represents the near-ground section indicators and displays in like manner as section **49** the words ENTER and EXIT, with the respective signal red lights **46** and **47.** An inlet socket **51** receives the energizing power from an external source of single-phase, **115**-volt alternating current (a-c). The pushbutton **52** is a microphone switch and when depressed it cuts in the microphone **53** which is plugged into the socket **54** on the instrument panel of the signal display section **42.** When the loudspeaker **43** is on, the panel light **57** lights up; this action occurs whenever any part of section **49** or **50** is energized (see FIG. **10**).

FIG. **4** shows the vertical sectional view of the wall or fence **2,** which is provided with two upper laser-beam reflectors, for instance reflecting devices **3** and **4,** and lower reflecting devices **3'** and **4'.** The two reflecting devices **3'** and **4'** may be positioned at any desired level from the ground, such as 1½ to 3 feet from the ground. FIG. **5** is a partial view of the wall or fence **2,** showing the laser beams *a*, *b*, *c*, and *d* and their relative positions. FIG. **6** shows the perspective view of a laser-beam reflector housing **66** with a front-end flap **67** which extends about 1 to 1½ inches outwardly at its widest section. A laser-beam reflecting member **68,** preferably made of a highly polished metal surface, a mirror, or a prism, is positioned within the housing **66,** as shown, to reflect the laser beam at any desired position whereat the laser beam has to be bent in order to follow the configuration of the wall or fence **2.** The housing **66** is secured to a part of the wall **2** by an adjustable attaching means **69** with adjustment apertures **62** and **63.** The adjustable attaching means **69** can be displaced vertically, horizontally, or sideways for adjustment by the use of screws or bolts passing through apertures **62** and **63,** during the installation of the reflecting device on the wall or fence **2.**

FIG. **9** is a partial schematic-block diagram of the system circuit. Since all the four channels of the system operate in the same manner, only two channels comprising sections (**30, 34, 38**) and (**31, 35, 39**), activated respectively by the laser beams *a* and *b*, shown in FIG. **2,** will be discussed herein. The system is energized from a 115-volt 20 ampere a-c power source fed to the system through socket **51.** In quiescent (no-event) operation of the system, the laser beam, for instance beam *a*, activates the photosensor **26,** causing a small voltage to be developed in the sensor. This voltage is fed from the photosensor **26** to a preamplifier **30** and then to an amplifier **30'**, whose output energizes the relay **70,** The relay **70** then opens the normally closed switch **71**; thus no current can run through the remaining section of the circuit in this channel. Similarly, the laser beam *b* continuously incident on photosensor **27** creates a small voltage in the photosensor **27**; this voltage then is amplified by the preamplifier **31** and amplifier **31'** and fed to relay **72,** energizing the relay **72,** which opens the normally closed switch **73.** Thus, no current flows through the remaining part of the circuit in this channel. The other two channels operate in a similar manner as the ones already described. Thus, when no event occurs, i.e., when no laser beam interruption occurs, all four channels are in a quiescent operative state.

During the occurrence of an event, the laser beam, for instance the laser beam *b*, is interrupted (broken) by a person escaping from the grounds; the preamplifier **31** and the amplifier **31'** do not receive any photosignal from the photosensor **27** and therefore the relay **72** becomes de-energized. This condition causes the switch **73** to close by the action of the spring member **74**; this action further closes the springless switch **75** by the downward action of lever **76.** An insulator **77** electrically isolates the switch **75** from switch **73.** In this position of the relay switches **73** and **75,** a current runs from the 115-Vac source through cable **78,** cable **79,** M-M' relay **96** (FIG. **10**), and delay line DL-**1** to cable **80,** which transmits the current through the normally closed switch **81** of relay **82** to relay **83** and back to the 115-Vac current source, opening the normally closed relay switch **84** and thereby cutting off the channel that processes photosignal *a*.

A portion of the amplified photosignal current from amplifier **31'** (laser beam *b*) passes through the display section **49,** lighting the red signal lamp **45** at the EXIT block, with no effect on section **50.** Since the EXIT portion of the wall section **49** of the display panel of display console **42** is now in the activated channel, only the EXIT portion with its respective red light lamp **45** lights up and simultaneously the loudspeaker **43** is energized, announcing repeatedly the word, for instance, EXITTING or ESCAPING; this announcement may be a single word, a phrase, or clause depending on what words the user of the system desires to have prerecorded on the magnetic tape or magnetic drum **102,** from which the loud speaker receives its processed message (signals). With the loudspeaker **43** in operation, the panel light **57** lights up, indicating that the loudspeaker **43** is in operation. Further description of the loudspeaker **43** operation and its circuit connections to the system will be described in an accompanying paragraph herein.

When the laser beam *a* is interrupted, a similar action as for the laser beam *b* takes place, in which case the photosignal *a* is cut off from the photosensor **26,** preamplifier **30,** and amplifier **30'**; this action de-energizes the relay **70** and as a result the normally open relay switch **71** closes because of the spring action by spring **85.** Simultaneously, the springless switch **86** closes by the movement of lever **86'**, whereupon a current runs from 115-Vac source through cable **87,** R-R' relay **106'**, delay line DL-**2,** the switch **71** and switch **86,** and cable **88** into relay **82** and back to 115-Vac source. This condition causes the energization of relay **82** which then opens the relay switch **81,** disconnecting the current from the EXIT portion of section **49,** and connecting the ENTER portion of section **49.** After once being closed, the switch **86** remains closed (the same as switch **75**) until the reset button **60** is manually depressed to open it subsequent to an event. Thus it will be seen that when one channel, for instance the ENTER channel of section **49** is operating, the EXIT channel of section **49** is not operating; also the other two channels (not discussed herein) are not operating. This last statement can be confirmed by using the same scheme of current tracing as for the two channels described hereinabove.

The adjustable time-delay mechanisms DL-**1** and DL-**2** are well known commercial devices for use in delaying signals in an electronic circuit. In the present system, they are used to delay the signal current to the display sections **49** and **49** respectively. The delay time may be varied from one-half to several seconds as desired and set for. The delay time is necessary in the sys-

tem in order to discriminate against interruption of the laser beam by a transient object or animal, such a flying bird or butterfly, or any other projectile that may cut off the laser beam momentarily.

FIG. 10 represents generally the acoustic-signal-producing section, modulation-amplification sections of the two system channels, and the annunciator or loudspeaker 43. Again, let it be assumed that the laser beam *b* is interrupted and the display section 49 channel is activated at EXIT portion, because this is the channel which indicates the exitting or escaping of a person from the restricted area. The output section M-M' from FIG. 9 feeds a current into the relay 96, which closes the normally open relay switch 97. This operation causes a current to run from 98, 98' of the transformer T-1 into the modulation-amplification section 39 through the rectifying diodes 100 and 101. The modulation circuit in the modulation-amplification section 39 may be either an amplitude-modulation or frequency-modulation type; the acoustic signal in either case is amplified by any one of the well-known amplification circuits. The electrical (acoustic) signal to the modulation-amplification section 39 is fed from the sound-recorded endless (continuous) magnetic tape 102 having four-channel sound tracks thereon and driven by a motor 103, the sound track in each channel corresponding to one of the four signal displays on the display console 42 panel, shown in FIG. 3.

For the channel under discussion presently, the signal presented on the panel of the display console 42 will be EXIT and, therefore, the magnetic type 102 will repeat the word EXIT or EXITTING (or, any other word or phase), or the word "ESCAPING" every 1 to 1½ seconds. If desired, the repeating interval may be set to two or three seconds; this interval can be controlled during recording on the magnetic tape 102 or by other means, such as by intermittent energization of the drive motor 103. The magnetic tape 102 or its substitute (drum) is rotated by means of the motor 103, whose speed of rotation can also be controlled by any commercially available means. The sound on the prerecorded tape 102 is sensed by transducer 104 and the acoustic signal then is fed to the modultion-amplification section 39 The modulated and amplified acoustic signal for the modulation-amplification section 39 is led to the loudspeaker 43 through the common cable 48; the loudspeaker 43 then repeats the word EXIT or the like at the rate of repetition set for.

In the meantime, if an announcement is to be made over the loudspeaker 43 from the central station where the display console 42 and the laser beam generator are located, the switch 52 is depressed (see FIG. 3 and 10) which action closes the circuit to the microphone 53 and opens the switch 106, stopping the motor 103 action and the movement of the magnetic tape 102, so that the loudspeaker line now is clear for broadcasting any speech or instruction through the microphone 53 to authorized personnel in the restricted area, either following the occurrence of an event or during the event. While the modulation-amplification section 39 is operating, the EXIT indicating light 45 is on (see also FIG. 10); while the microphone 53 is being used.

When the laser beam *a* is interrupted, the amplifier 30, 30' becomes quiescent and the circuit comprising the sections 34 and 38 (FIG. 2) becomes energized; the electrical signal by the means already described as for laser beam *b* is fed into the circuit shown in FIG. 10 through the connection points R-R' as well as to the display section 49, lighting up the signal indicator 44. This action energizes the relay 106', closing the normally open relay switch 107 and switching a current from sections 108 and 109 of transformer T-2 through the diodes 110 and 111 into the modulation-amplification section 38. The four-track sound tape (or magnetic drum) 102 automatically shifts to the next track, which produces the signal ENTER or similar information, such as ENTERING or "INTRUSION", repeating the word every 1 to 1½ second or so, as desired and set for. The sound-track shifting mechanism is a commercial sound-track shifting device and thus is not shown in the schematic diagram. The sound signal is modulated and amplified by section 38 and fed to the loudspeaker 43, which repeats exactly whatever acoustic signal that the magnetic tape 102 feeds into the section 38. When desired, the microphone 53 circuit can be cut in by depressing the usual button 52, which action cuts off the magnetic tape 102 from the loudspeaker 43 by opening the switch 106 and stopping the electric motor 103 action.

FIG. 11 illustrates the manner of operation of the reset switch 60. When either one of the springless relay switches 86 or 75 is closed, as stated earlier it remains closed until the reset switch 60 is depressed to open it. The reset switch also resets the microphone switch 52. The reset switch 60 is manually depressed after each event that has been concluded; when the system thus is reset the microphone 53 is cut off and the loudspeaker 43 is connected automatically and is ready for the next event.

Thus it is seen that the present invention can be used for security surveillance as well as an annunciator. Its applications cover a great many fields, from border surveillance between two countries or states to smaller restricted areas such as hospitals, ammunition dumps, military installations, and similar restricted areas.

I claim:

1. A security surveillance laser system for surveying and detecting unauthorized entry or exit of a person at the enclosure of a restricted area, said system comprising: a housing having therein means for producing and projecting a single laser beam, means disposed within said housing for splitting said single laser beam into an array of equal-energy laser beams with the sum of the energies thereof equal to the energy of said single laser beam, radiation-sensing elements corresponding to the number of split laser beams disposed in said housing adjacent to said means for producing and projecting a single laser beam, rows of laser radiation-diverting means positioned laterally and adjacent the top and near-ground level on each side of said enclosure, along the entire length thereof, each of said rows of radiation-diverting means receiving a split laser beam to deploy successively said laser beam from one radiation-diverting means to another along said enclosure to a corresponding radiation-sensing element in said housing, each of said radiation-sensing elements having a first means to amplify the photosignal from the respective row of radiation-diverting means and a second means electrically coupled to said first means and adapted to sustain a quiescent operational state of said system during absence of occurrence of an event therein; means for producing acoustic signals provided thereon with multiple acoustic tracks, each of which being electrically coupled to one of said second means

and activated thereby; said second means being further adapted to sense through said first means an interruption in the respective laser beam upon being crossed by a person and to determine the direction of crossing thereof, thereby transforming the quiescent operational state of that section of the system comprising the respective radiation-sensing element, the first and second means, and the respective track of said means for producing acoustic signals into an active operational state; means electrically coupled to said means for producing acoustic signals to receive an acoustic signal therefrom and to modulate and amplify said signal for transmission to an annunciator located remotely from said housing to alert authorized personnel of the type of event occurring at the enclosure of the restricted area; and, display means electrically coupled to each of said radiation-sensing elements through the corresponding second means thereof for simultaneously receiving therefrom a display signal resultant from the type of interruption of the respective laser beam sensed by the respective radiation-sensing element; said display means including a control means for the control of said security surveillance laser system.

2. A security surveillance laser system as defined in claim **1**, wherein said means for splitting said laser beam comprises a plurality of semireflective radiation-transmitting means.

3. A security surveillance laser system as defined in claim **1**, wherein said rows of radiation-diverting means positioned laterally to the enclosure of a restricted area along the entire length of said enclosure comprises a plurality of position-adjustable, discrete, and radiation-reflective components capable of directing the incident laser radiation beams along the configuration of said enclosure and back to the respective radiation-sensing elements in said housing.

4. A security surveillance laser system as defined in claim **1**, wherein said radiation-sensing elements having a second means are devices capable of converting the incident photonic energy thereupon from the split laser beams into electrical energy to perform mechanical operation in said second means.

5. A security surveillance laser system as defined in claim **1**, wherein said second means electrically coupled to said first means and adapted to sustain a quiescent operational state in said security surveillance laser system is a combination of electrical relays and switches responsive to the electrical energy resultant from said first means.

6. A security surveillance laser system as defined in claim **1**, wherein said means for producing acoustic signals electrically coupled to said second means and activated thereby upon interruption of a split laser beam is an endless, motor-driven, magnetic memory means having a plurality of discrete tracks with spoken words prerecorded thereon, each track being responsive to and operable by said first means receiving electrical signals from the respective radiation-sensing element contained in said housing of the security surveillance laser system.

7. The means for producing acoustic signals as described in claim **1** further comprises a microphone with means adapted to make electrical connection to a loudspeaker remotely located therefrom and simultaneously disconnect said means for producing acoustic signals from said loudspeaker.

8. A security surveillance laser system as defined in claim **1**, wherein said display means comprises an entry- and exit-signal display console having a delay means in the electrical circuit thereof and positioned between said signal display console circuit and said second means of said radiation-sensing elements, said delay means affording discrimination, by delaying the signals therethrough, between a signal produced by a human being and those produced by other than a human being interrupting a laser beams projected by said laser system.

9. A security surveillance laser system as defined in claim **1**, wherein said display means is an electrical console comprising an instrument panel with indicating means thereon receiving signal information from the second means of said radiation-sensing elements to selectively display on said display means the location and direction of event occurring at the inclosure of the restricted area.

10. A security surveillance laser system as defined in claim **1**, wherein said laser system has a loudspeaker remotely located therefrom, and wherein said display means is provided thereon with an instrument panel having a microphone connection means with a microphone connected thereto and an acoustic signal-control means adapted to selectively transmit an acoustic signal to said loudspeaker either from the means for producing acoustic signals or from said microphone.

11. A security surveillance laser system as defined in claim **1**, wherein said laser system comprises four sets of operational circuit channels, each channel comprising, in the order given: a laser beam split from a single laser radiation beam produced by said laser system, a plurality of optical means aligned successively in a row along a predetermined expanse of the inclosure of the restricted area and adapted to receive and deploy said laser beam split from a single laser radiation beam, a radiation-sensing element disposed in said laser system to detect said laser beam split from a single laser radiation beam and any interruption thereof at one of said optical means and to develop a photosignal therein from the energy of the laser beam detected thereby, an amplifier connected to said radiation-sensing element to amplify said photosignal, a current channeling means to receive the amplified photosignal current from said amplifier for activation of said current-channeling means and to initiate therethrough an activation current received from an external current source, an acoustic signal-producing means including means with verbal message defining the character of laser beam interruption prerecorded thereon being connected to said current channeling means to receive said activation current therefrom for activation of said acoustic signal-producing means to produce acoustic signals from the verbal message prerecorded thereon, an acoustic signal modulating and amplifying means connected to said acoustic signal-producing means to receive an acoustic signal therefrom and to modulate and amplify said acoustic signal, an annunciator connected to said acoustic signal modulating and amplifying means to receive therefrom a modulated and amplified acoustic signal characterized by said prerecorded verbal message in said means of said acoustic signal-producing means for annunciating said verbal message to the personnel in the restricted area bounded by said inclosure, and a display console having thereon event-indicating means receiving photosignal information from said radiation-sensing element through said current channeling means for activation of said event-indicating means on said display console.

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