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Lewis

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[54] **ELECTRICAL ALARM SYSTEMS**

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[51] **Int. Cl.** **G08b 19/00**

[58] **Field of Search**.... 340/213 R, 409, 420, 253 R, 340/253 B, 253 E, 214 R, 276; 307/37; 317/150, 123

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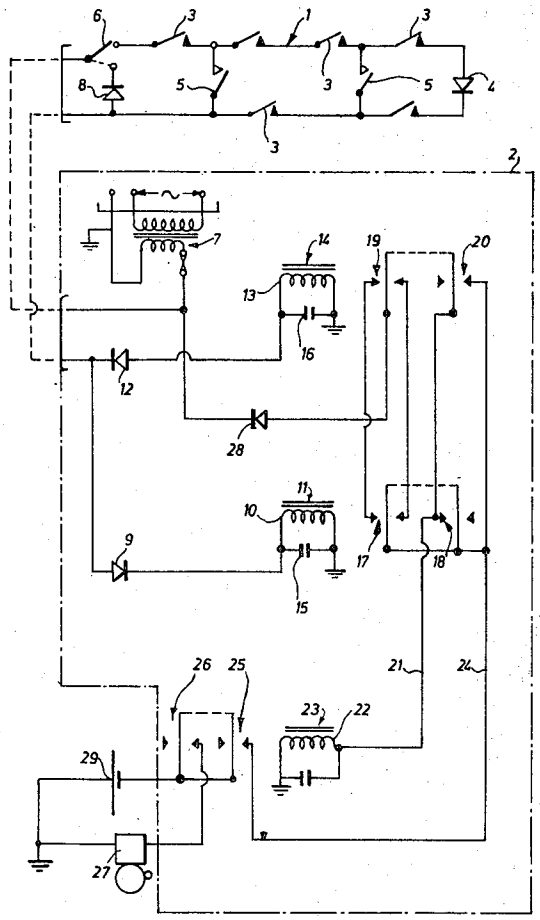
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[57] **ABSTRACT**

This invention provides an alarm system comprising a loop which incorporates a rectifier element and which is connected to an alternating current supply. The loop may be arranged and adapted — for example by the inclusion of appropriate switches — to be responsive to any contingency, such as intruders or fire. A sensing circuit is connected to the loop and may for example include two relays so arranged that upon effective open-circuiting of the loop, in which both relays are de-energised, and effective short-circuiting of the loop rectifier element, in which both relays are energised, an alarm is activated.

17 Claims, 2 Drawing Figures



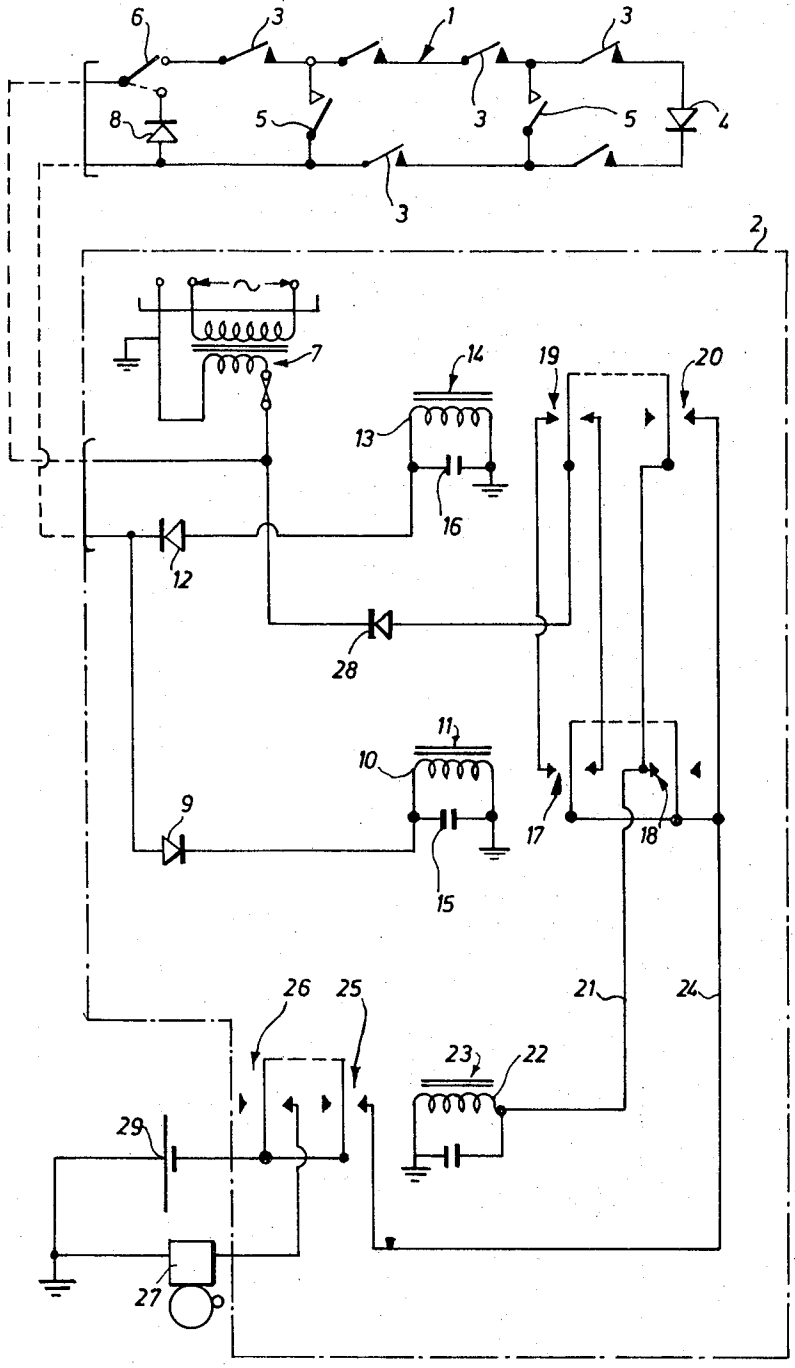

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FIG.1.

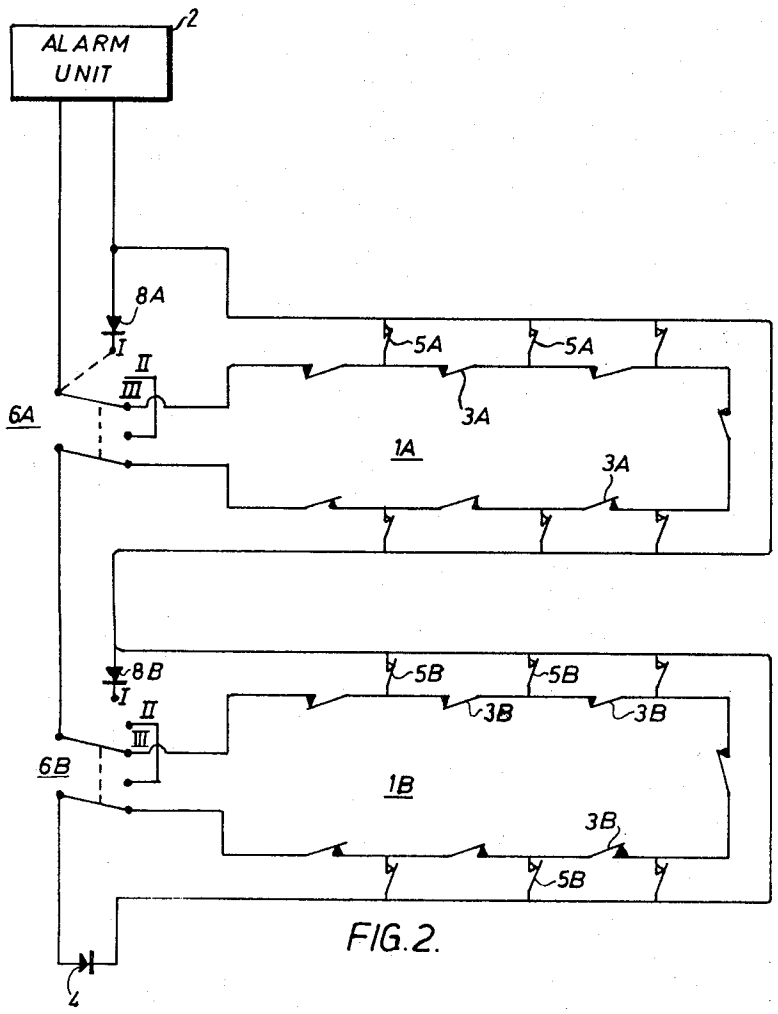

ALARM UNIT
2
8A
I
II
III
6A
5A
5A
3A
1A
3A
8B
I
II
III
6B
5B
5B
3B
3B
1B
3B
5B
4

FIG. 2.

ELECTRICAL ALARM SYSTEMS

BACKGROUND OF THE INVENTION

This invention relates to electrical alarm systems. More particularly, but not exclusively, the invention concerns electrical alarm systems capable of providing warning of an intruder — that is, a burglar alarm — and/or of fire.

An alarm system is ideally required to be reliable in operation, sensitive, easy to install, and difficult to disable. There is, moreover, a need, particularly with the increase of crime and of fire losses, for such an alarm system which is cheap and of simple construction.

One known type of alarm system employs a bridge circuit which is unbalanced when an alarm condition is sensed. Such a system requires electrical components of high stability, and this can in general, be achieved only at considerable expense.

Another known type of alarm system employs a line incorporating sensing switches sited at, for example, doors and windows, one end of the line being connected to an alarm unit and the other end being connected to a power supply. If a portable power supply such as a battery is used such a system is vulnerable on account of the inherent decline of the battery voltage, while if a mains supply is used a connection has to be made to the system outside the alarm unit, and this tends to increase the installation cost.

An object of the present invention is to provide an alarm system which is easy to install and which is operable in a number of different variations, while being difficult to disable without initiating an alarm.

SUMMARY OF THE INVENTION

According to the invention there is provided an alarm system comprising a loop which incorporates a rectifier element and which is adapted to be connected to an alternating current supply, and sensing means connected to the loop and responsive both to effective open-circuiting of the loop and effecting short-circuiting of the loop rectifier element to provide an alarm indication.

The sensing means preferably include at least one directional current responsive device which activates an alarm circuit in response to substantially zero current flow, indicative of effective open-circuiting of the loop and in response to bi-directional current flow, indicative of effective short-circuiting of the loop rectifier element.

In a preferred embodiment of the invention the system includes a first current-responsive device connected to the loop so as normally to be energised by the partially rectified current which flows in one direction in the loop in the alert condition of the system, a second current-responsive device connected to the loop and responsive to current flow in the opposite direction so as normally to be de-energised in the alert condition of the system, and an alarm circuit operatively associated with the first and second current-responsive devices so as to be activated to provide an alarm (a) when both said devices are energised, caused by effective short-circuiting of the loop rectifier element, and (b) when both said devices are de-energised, caused by effective open-circuiting of the loop.

Since the alarm system of the invention does not incorporate a bridge circuit or components of critical value it has, potentially, the advantages of stability and

reliability while using relatively cheap components. Moreover, since the alarm circuit is activated by either an open-circuit or a short-circuit condition of the loop the system can utilise a wide range of types of sensing device in the loop, and is, moreover, inherently difficult to disable, giving an alarm in response to most attempts to tamper with the loop.

In practice the system preferably includes a control switch, suitably concealed, operable to connect across the loop a rectifier element opposed to that incorporated in the loop so as to de-activate and/or reset the alarm system. The rectifier elements may conveniently comprise solid state diodes.

A further practical advantage of the system is that, in a typical installation, the only wires externally of the housing for the system would be those forming and leading to the loop, the loop itself being entirely passive and devoid of power sources, so that the system is potentially cheap and easy to install, as well as being easy to conceal effectively.

Each current-responsive device may comprise or include a solid-state element such as a thyristor or a suitable trigger or bistable circuit, possibly in a solid state integrated circuit. Thus in one embodiment of the invention the current-responsive devices may comprise respective bistable devices connected by way of an AND gate and a NAND gate to the alarm circuit.

In a preferred practical embodiment of the invention the current-responsive devices comprise relays having respective contacts connected to the alarm circuit. In one embodiment, for example, the second relay may be polarised and responsive only to current in the opposite direction to that which flows in the loop in the alert condition of the system. Alternatively the second relay may be connected to the loop through a rectifier element opposed to that incorporated in the loop.

The energising current for the alarm circuit may be supplied through respective contacts associated with both the first and the second relay only when said contacts are in their positions corresponding to simultaneous energisation or simultaneous de-energisation of both relays, the contacts of the first and second relays also completing a holding circuit which maintains the energisation of the alarm circuit once the alarm system has been tripped.

Preferably the holding circuit includes a battery, contacts of the first and second relays maintaining the energisation of the alarm circuit through said battery once the alarm system has been tripped. The battery therefore maintains the alarm once it has been tripped, even if the alternating current supply is subsequently cut off, either accidentally or by design.

In a preferred embodiment the alarm circuit comprises an alarm relay having contacts which upon energisation of said relay in response to tripping of the alarm system complete a circuit containing the battery and an alarm device and also complete the holding circuit maintaining energisation of the alarm relay from the battery. The alarm relay should have a slower response than the first and second relays to prevent a spurious alarm being given in the event of a power cut, either when the power supply ceases or upon reconnection of the supply.

The loop may in practice extend over a substantial part of a room or space for which security is required. The loop may include a number of different types of switching elements. For example, it may include one or

more normally closed switches connected in series with the loop rectifier element, so that opening of any one of these switches, or, of course, cutting of the loop, open-circuits the loop. Alternatively, or in addition, the loop may include one or more normally open switches connected in parallel with the loop rectifier element so that closure of any one of the latter switches short-circuits the loop rectifier element.

The switches in the loop may, for example, be operated by pressure pads strategically placed so that they are operated by opening of a door, window or drawer, or by other means. In the case of a fire alarm, the switches would be responsive to heating of a thermally sensitive element.

In the alert or primed condition of the system, the loop conducts in alternate half-cycles of the alternating current supply, so that the first relay is energised and the second de-energised. Conveniently, the alternating current current fed to the loop is derived from alternating current mains by way of a step-down transformer. Alternatively, a battery-driven inverter or chopper may provide the alternating current, so that the system is then largely independent of the integrity of the mains supply, although with such an arrangement provision may be made for continuous charging of the battery from a mains supply.

The alarm system according to the invention can readily be adapted to serve a number of separate areas simultaneously, for example different floors of an apartment building, or different dwelling spaces. For this purpose the loop may comprise a number of series-connected loop sections interposed between the loop rectifier element and an alarm unit which includes the current-responsive devices and means for supplying alternating current to the loop, each loop section being provided with a separate control switch having an 'alert' position in which the loop section is connected in series in the loop and a 'dormant' position in which the loop section is excluded from the loop while the remainder of the loop remains intact.

Each loop section would be installed in a different area to be guarded by the system, and the individual loop sections may be rendered 'alert' or 'dormant' independently by means of their respective control switches. Such an arrangement involves a considerable economy, since one alarm unit then serves a number of different areas. Each control switch would preferably also have a 'reset' position in which it connects across a portion of the loop including the said loop section and the loop rectifier element a rectifier element opposed to the loop rectifier element. Each control switch would normally be spring-loaded into its 'dormant' position.

The loop may incorporate, instead of or in addition to the aforementioned switches, one or more series choke or shunt capacitor devices responsive to the proximity of an intruder or other specific external influence to cause a substantial open- or short-circuit of the loop respectively.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, merely by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a purely schematic circuit diagram of an alarm system according to one embodiment of the invention, and

FIG. 2 is a schematic circuit diagram illustrating an alarm system according to the invention in which a single alarm unit serves several different areas.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1 represents a combined burglar and fire alarm system according to the invention, consisting essentially of a loop 1 and an alarm unit 2 (indicated in broken outline) in which most of the alarm system circuitry is housed, the unit 2 being installed in a concealed position. If desired, the entire system, apart from the loop, can be housed in a single casing and located, for example, outside a house or building being guarded.

The loop 1, which has any desired length, extends over the entire area to be guarded and includes a number of normally closed series switches 3. A rectifier element 4 is inserted in the loop 1 at the end of the loop remote from the alarm unit 2.

The loop 1, in this example, also includes a number of normally open shunt switches 5, each connected in parallel with the loop rectifier element 4.

The switches 3 and 5 would normally be concealed. One or more of the switches 3 or 5 may, for example, comprise a magnetically operated reed switch located at the edge of a fitted carpet beneath a door and cooperating with a concealed magnet carried by the door, so that the switch is operated in response to opening of the door. Alternatively, one or more of the switches 3 or 5 may be operable by a pressure pad concealed beneath a carpet. Similar switches may be associated with windows or drawers, and arranged either for direct mechanical operation or for magnetic operation or, for example, for operation under the control of a heat- or light-responsive device where a fire alarm capability is required.

The loop 1 is open-circuited by the opening of any one of the series switches 3 and the loop rectifier element 4 is short-circuited by the closing of any one of the shunt switches 5.

At the end of the loop 1 a control switch 6 is provided, comprising in this example a two-position switch having an 'alert' position, as shown, in which it connects the loop 1 in series with an alternating current source 7 consisting of a step-down mains transformer, and a 'reset' position (shown by a broken line) in which the switch 6 connects a rectifier element 8, opposed to the loop rectifier element 4, across the loop output leads, effectively shunting the loop 1.

The loop 1 is connected in series, through a diode 9 of the same polarity as the loop rectifier element 4, with the solenoid 10 of a first relay 11, and through a diode 12 of the opposite polarity to the loop rectifier element 4 with the solenoid 13 of a second relay 14. Respective capacitors 15, 16 are connected across the solenoids 10, 13 so as to maintain energisation of the respective relays 11, 14 when half-wave rectified alternating current is applied thereto.

If the two relays 11 and 14 comprise polarised relays energisable current in opposite respective directions, the diodes 9 and 12 may be omitted.

Each of the relays 11, 14 has two pairs of associated contacts: the first and second pair of contacts of the first relay 11 are designated 17 and 18 respectively and the first and second pair of contacts of the second relay 14 are designated 19 and 20 respectively. In each case the description "front" and "back" is applied to the

contacts of each pair to designate the contacts in each pair which are respectively closed and open when the associated relay is energised. The front contacts of the respective first pairs of contacts **17** and **19** are interconnected, as are the rear contacts of the first pairs; the front contact of the second pair of contacts **18** of the first relay **11** is connected to the movable contact arm of the second pair of contacts **20** of the second relay **14**, while the rear contact of the second pair of contacts **20** of the second relay **14** is connected to the movable contact arms of the first and second pairs of contacts **17, 18** of the first relay **11**.

The movable contact arm of the second pair of contacts of the second relay **14**, and the front contact of the second pair of contacts **18** of the first relay **11**, is connected via a line **21** to a solenoid **22** of an alarm relay **23**, while the movable contact arms of both pairs of contacts **17** and **18** of the first relay are connected to a line **24**. The alarm relay **23** has a slower response time than either of the relays **11** and **14**.

The alarm relay **23** has two pairs of associated contacts **25, 26**, and two movable contact arms which are electrically interconnected as shown. In the energised state of the alarm relay **23** the line **24** is connected through the two contact arms, to a suitable alarm device **27**. The alarm device **27** may include any one or more of the following, for example: a bell; siren; buzzer; radio signalling device; external flashing light; an automatic telephone dialing device; automatic door locks or, in the case of a fire alarm, automatic-fire-fighting appliances such as sprinklers.

The alarm device **27** may be situated at a remote position, for example in a police station or fire station.

The alternating current source **7** is connected to the movable contact arm of the first pair of contacts of the second relay **14** by way of a diode **28**.

The mode of operation of the system will be apparent from the circuit diagram. In the normal primed or alert state of the system, with the control switch **6** in its 'alert' position as shown, the loop **1** conducts during positive half-cycles of the alternating current supply and causes energisation of the first relay **11** through the diode **9**: the second relay **14** remains de-energised because of the blocking action of the diode **12**, and in consequence no circuit is completed through the diode **28**, because the back contact of the first pair of contacts **17** of the energised first relay **11** is isolated. The alarm relay **23** is therefore unenergised and no alarm is given.

In the event of an open circuiting of the loop **1** by opening of any one or more of the switches **3**, or by cutting of the loop, the first relay **11** is de-energised: both relays **11** and **14** are then de-energised, and an energising circuit for the alarm relay solenoid **22** is completed through the back contact of the first pair of contacts **19** of the second relay **14**, the back contact of the first pair of contacts **17** of the first relay **11**, the back contact of the second pair of contacts **20** of the second relay **14** and the line **21**. When energised, the alarm relay **23** completes an energising circuit for the alarm device **27** by way of the back contact of the first pair of contacts **19** of the second relay **14**, the back contact of the first pair of contacts **17** of the first relay **11**, the line **24**, and the contacts **25** and **26** and the alarm is set off.

In the event of a short-circuiting of the loop rectifier element **4** by closing of any one or more of the switches **5** or by short-circuiting of the loop, then both relays **11** and **14** are energised simultaneously and an energising circuit for the alarm relay solenoid **22** is completed through the contacts **19, 17** and **18** and the line **21**. When the alarm relay **23** is energised an energising circuit for the alarm device **27** is completed through front contact of the first pair of contacts **19** of the second relay **14**, the front contact of the first pair of contacts **17** of the first relay **11**, the line **24** and the alarm relay contacts **25** and **26**, and the alarm is again given.

Once the alarm relay **23** has been energised, if only by a momentary operation of one of the switches **3, 5**, or otherwise, it is held in an energised state by a holding circuit formed by a battery **29**, the contacts **25**, the line **24**, either the second pair of contacts **20** of the second relay **14** or the second pair of contacts **18** of the first relay **11**, depending on whether both relays **11** and **14** are de-energised or energised, the line **21** and the solenoid **22**. The alarm condition is therefore maintained even if the switch which triggered the alarm returns to its initial condition, or even if the mains power supply is subsequently disconnected, accidentally or by design. The battery **29** must be connected in the holding circuit in such a way that the energising current in the alarm relay solenoid **22** flows in the same direction whether the current is derived from the mains (through the diode **28**) or from the battery **29**.

In order to silence and/or reset the alarm system the control switch **6** is put into the "reset" position indicated by the broken line. The rectifier element **8** conducts during negative half-cycles of the alternating supply and in consequence the second relay **14** is energised while the first relay **11** is de-energised due to the blocking action of the diode **9**. The energising circuit for the alarm relay **23** is now interrupted at the first pair of contacts **17** of the first relay **11** and the holding circuit for the alarm relay **23** is also interrupted at the relay contacts **19** or **20**. Consequently the alarm is deactivated, and the system is reset to its alert condition when the switch **6** is reverted to its original setting. It will be appreciated that the control switch **6** must be fast-acting compared with the response time of the relays **11** and **14** so as to avoid triggering off the alarm as the switch **6** is moved from the "reset" position (broken line) to the "alert" position (full line).

If desired the control switch **6** may be duplicated, or operable from a number of different positions: for example, in a domestic installation one control switch may be located upstairs and another downstairs.

The control switch **6** may have an additional position in which only the series switches **3** in the loop **1** are effective to provide an alarm condition. In this way, two different patterns of protection can be provided, for example according to whether the owner of the guarded premises is upstairs in bed or has gone out. If the series switches **3** are adapted to sense fire, while the shunt switches **5** are adapted to sense the presence of intruders, the exclusion of the shunt switches **5** from the loop **1** by appropriate positioning of the control switch renders the system alert to fire hazard only, the system being then insensitive to intruders. Energization of relay **11** alone constitutes a first signal; energization of both relay **11** and relay **14** constitutes a second signal; energization of neither relay **11** nor relay **14** constitutes a third signal; and energization of relay **14** alone constitutes a fourth signal.

Optional extensions of the loop 1 can be switched in or out by the control switch 6 or by additional switches, if desired.

The system described lends itself readily to adaptation for distinguishing between different types of alarm cause. For example, as stated previously the series switches 3 in the sensing loop 1 may be responsive to an intruder while the shunt switches 5 may be responsive to fire. Since operation of any of the switches 3 causes de-energisation of both relays 11, 14 while operation of any of the switches 5 causes energisation of both relays 11, 14, it is a simple matter to provide additional circuitry for distinguishing between these two alarm conditions: for example, the relays 11 and 14 may each have a further set of contacts arranged in series so that they complete an additional alarm circuit only when both relays 11 and 14 are energised simultaneously. This additional alarm circuit may give an additional warning as to the type of alarm condition (e.g. intruder or fire) or may, for example, be arranged to modulate the alarm given by the alarm device 27. Thus if the device 27 is a bell or audible device it may be arranged to give a steady sound when set off by an intruder and a modulated sound when set off by fire.

In some embodiments of the invention the sensing switches in the loop may be such that they can be opened (or closed) momentarily, reverting to their normal positions without triggering an alarm, by including a suitable delay, such as a thermal relay, in the alarm circuit.

In some variations of the system it may be desirable to incorporate a predetermined delay in the alarm system so that the alarm warning device 24 is set in operation after a given time interval following the triggering of the system, for example by opening of one of the switches 3. Such a delay, which would typically be of the order of 30 seconds, gives time for manual resetting of the alarm system by the operation of the switch 6 should the alarm system be tripped inadvertently, for example, by the entry of a householder or authorised person into the guarded house or building while the alarm system is alert. It is, of course, essential that the switch 6 be concealed in a position known only to authorised persons. Alternatively the switch 6 may be operable by means of a key or combination lock.

A suitable alarm delay may be accomplished by, for example, arranging for the alarm relay 23 when energised to cause current to flow through a thermal relay (for example, a bimetallic strip) which in turn controls the actuation of the alarm device 24, the thermal relay having a response time equal to the said predetermined interval.

The control switch 6 may incorporate capacitive or inductive elements in place of switch contacts for effecting the changeover between the different states of the system.

FIG. 2 illustrates the adaptation of an alarm system according to the invention, such as that of FIG. 1, to the guarding of a number of different areas, such as, for example, different parts of an office or apartment building. The loop 1 is connected to a single alarm unit 2 as described previously, but in this case the loop 1 is subdivided into a number of series-connected loop sections 1A, 1B; two such sections only are shown in FIG. 2, but it will be appreciated that any number of such sections may be provided. The loop sections, each of which is in this example furnished with series and shunt switches 3, 5 respectively, are interposed between the loop rectifier element 4 and the alarm unit 1.

Each loop section 1A, 1B has a respective control switch 6A, 6B which has three positions, marked I, II and III. The first position, I, is a 'reset' position in which a respective rectifier element 8A, 8B is connected across the loop portion which includes the loop rectifier element 4, in opposition to the latter, serving the same purpose as the rectifier element 8 in FIG. 1. The second position, II, is a 'dormant' position in which the loop section in question is isolated from the system, while the remainder of the loop 1 remains intact, so that all the switches 3, 5 in the isolated loop section are then ineffective. The 'reset' position is preferably selected by a push-button action, so that the switch returns to its 'dormant' position (II) when released. The third position, III, is an 'alert' position in which the respective loop section is connected in series in the loop 1, so that operation of any of its switches 3, 5 is effective to initiate an alarm.

I claim:

1. An alarm system comprising a loop, a loop rectifier element in said loop, means connecting an alternating current supply to one end of said loop, an alarm circuit, sensing means connected to the other end of said loop and responsive both to effective open-circuiting of said loop and effective short-circuiting of said loop rectifier element to energize said alarm circuit, a further rectifier element, opposed to said loop rectifier element, and a control switch operable to connect across said loop and said further rectifier element to de-activate and/or reset the alarm system.

2. An alarm system comprising a loop, a loop rectifier element in said loop, means connecting an alternating current supply to one end of said loop, an alarm circuit, sensing means connected to the other end of said loop and responsive both to effective open-circuiting of said loop and effective short-circuiting of said loop rectifier element to energize said alarm circuit, wherein said sensing means includes at least one directional current responsive means for energizing said alarm circuit both in response to substantially zero current flow in said loop, indicative of effective open-circuiting of the loop and in response to bi-directional current flow, indicative of effective short-circuiting of the loop rectifier element, and further including a first current-responsive device connected to said other end of the loop and normally energized by the partially rectified current which flows in one direction in the loop in the alert condition of the system, a second current-responsive device connected to said other end of the loop and responsive to current flow in the opposite direction, said second current-responsive device being normally deenergized in the alert condition of the system, and said alarm circuit comprising means operatively associated with said first and second current-responsive devices and being operative for providing an alarm (a) when both said devices are energized, caused by effective short-circuiting of the loop rectifier element, and (b) when both said devices are deenergized, caused by effective open-circuiting of the loop.

3. An alarm system as claimed in claim 2, in which the loop includes at least one normally closed switch connected in series with said loop rectifier element, whereby opening of said switch open-circuits said loop.

4. An alarm system as claimed in claim 2, in which said loop includes at least one normally open switch connected in parallel with said loop rectifier element so that closure of said switch short-circuits said loop rectifier element.

5. An alarm system as claimed in claim 2, in which the current-responsive devices comprise first and second relays having respective contacts connected to the alarm circuit.

6. An alarm system as claimed in claim 5, in which the second relay is polarised and is responsive only to current in the opposite direction to that which flows in the loop in the alert condition of the system, with the supply connected to said loop.

7. An alarm system as claimed in claim 5, in which the second relay is connected to the loop through a rectifier element opposed to said rectifier element in said loop.

8. An alarm system as claimed in claim 5, including respective contacts associated with both said first and said second relay, said contacts providing a path for energising current to said alarm circuit when said contacts are in their positions corresponding to (a) simultaneous energisation of said relays and (b) simultaneous de-energisation of both said relays, and in which said contacts of said first and second relays also complete a holding circuit which maintains the energisation of said alarm circuit once the alarm system has been tripped.

9. An alarm system as claimed in claim 8, in which the holding circuit includes a battery, the contacts of the first and second relays maintaining the energisation of said alarm circuit through said battery once the alarm system has been tripped.

10. An alarm system as claimed in claim 9, in which the alarm circuit comprises an alarm device and an alarm relay having contacts which upon energisation of said relay in response to tripping of the alarm system complete a circuit containing the battery and said alarm device and also complete said holding circuit, maintaining energisation of said alarm relay from the battery.

11. An alarm system as claimed in claim 10, in which said alarm relay has a slower response than said first and second relays.

12. An alarm system comprising a loop, a loop rectifier element in said loop, means connecting an alternating current supply to one end of said loop, an alarm circuit, sensing means connected to the other end of said loop and responsive both to effective open-circuiting of said loop and effective short-circuiting of said loop rectifier element to energize said alarm circuit, an alarm unit housing said current-responsive devices and said means connecting alternating current to said loop, said loop comprising a number of series-connected loop sections interposed between said loop rectifier element and said alarm unit, each loop section being provided with a separate control switch having an 'alert' position in which said loop section is connected in series in the loop and a 'dormant' position in which said loop section is excluded from said loop while the remainder of the loop remains intact.

13. An alarm system as claimed in claim 12, in which each control switch also has a 'reset' position in which it connects across a portion of said loop including the respective loop section and said loop rectifier element, a rectifier element opposed to the loop rectifier element.

14. An electrical alarm system, comprising, in combination, a conductive loop having two terminals and connectable in circuit with an A.C. current source and including rectifier means for permitting normally only the flow of D.C. current through said loop in a first direction; current-responsive means connected in circuit with said conductive loop and operative for providing a first signal in response to flow of D.C. current through said loop in said first direction, a second signal in response to flow of A.C. current through said loop indicating short-circuiting of said rectifier means, a third signal in response to absence of current flow through said loop indicating open-circuiting of said loop, and a fourth signal in response to flow of D.C. current into one of said terminals and out of the other of said terminals in a second direction opposite said first direction; and alarm means operative for generating an alarm signal in automatic response to generation of said second signal and in automatic response to generation of said third signal.

15. An alarm system as defined in claim 14, wherein said alarm means comprises resettable holding means operative in response to said second signal and operative in response to said third signal for generating a continued alarm signal continuing independently of said second signal and said third signal and terminating in response to generation of said fourth signal.

16. An alarm system as defined in claim 15; and further including resetting means operable for effecting flow of D.C. current into one of said terminals and out of the other of said terminals in said second direction to terminate said alarm signal and effect resetting of the alarm system.

17. An alarm system as defined in claim 16, wherein said resetting means comprises means operable for disconnecting the circuit connection between said rectifier means and said A.C. source means and for therewith connecting across said terminals a rectifier means adapted to conduct current in said second direction.

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