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[54] **TIME DELAY ALARM SYSTEM**


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[58] **Field of Search** ..... 340/276, 274, 2.0



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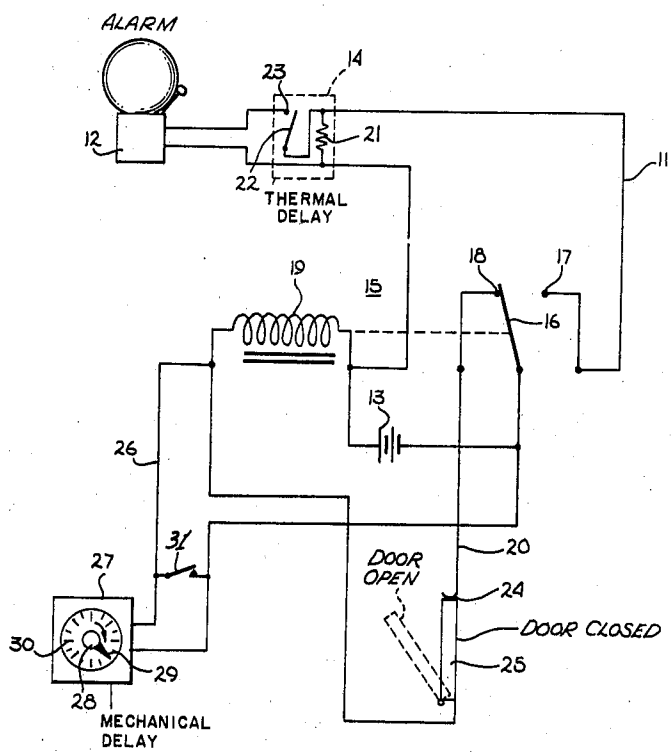
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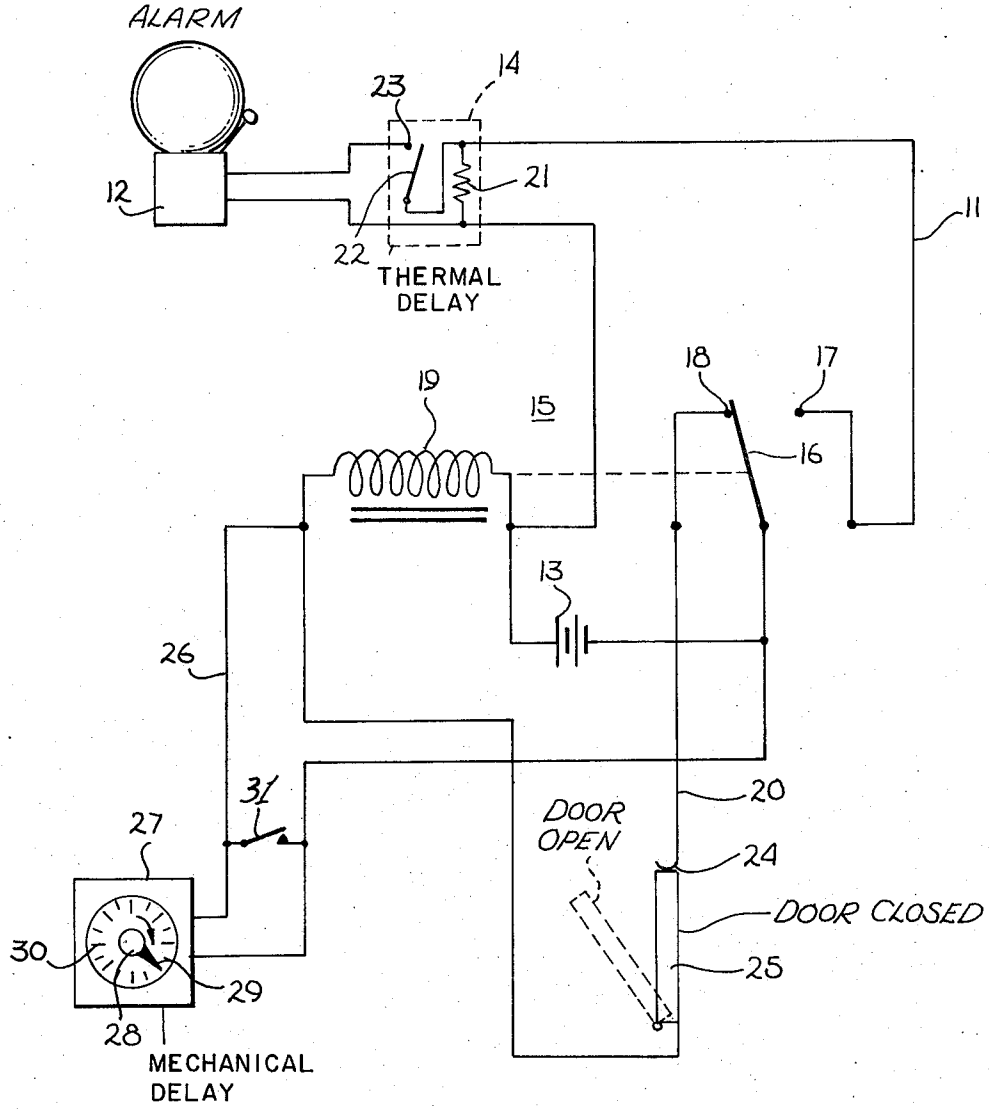


[57] **ABSTRACT**

A burglar alarm system is disclosed wherein control means for temporarily deactivating a burglar alarm is located within the building being protected. The control means includes a time delay switch in a deactivating circuit which when manually closed operates to temporarily override a primary circuit which when opened results in the setting off of the alarm. Thus when an authorized person is ready to exit through a door of the building, he first manually closes the time delay switch before opening the door. Then upon the closing of the door, the system is automatically returned to its "on alert" condition at the end of the delay time manually set in the time delay switch. The alarm circuit includes a thermal delay device which delays the actual setting off of the alarm such as to give a person authorized to enter the door of the building just enough time after entering to manually close the time delay switch. The system, as when exiting, is then automatically returned to its "on alert" condition at the end of the delay time manually set in the time delay switch.


**4 Claims, 1 Drawing Figure**






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# TIME DELAY ALARM SYSTEM

This invention relates to a burglar alarm system and more particularly to an improvement in the means provided in such a system for temporarily deactivating its readiness to function.

When a door of a home or building is provided with a burglar alarm it is customary to use a control device on the outside of the building near the door such as a key and lock or similar device, to activate or deactivate the alarm system to an on or off condition (meaning its readiness or non-readiness to function upon opening the door). Thus, when such a burglar alarm system is employed the control device for the alarm can be tampered with from the outside of the building being protected. Furthermore, such a system requires the use of a key which can be lost, stolen, misplaced or duplicated.

Accordingly, one of the objects of the present invention is to provide a burglar alarm system wherein the means for controlling the deactivation of the alarm system upon both entering and exiting through a door of a building is located within the building.

Another object of the invention is to provide a burglar alarm system which obviates any need to carry a key or other device in order to temporarily deactivate the readiness of the burglar alarm system to function.

Still another object of the present invention is to provide a simple, convenient control device on the inside of a building which can be manually set to deactivate a burglar alarm system for a selected period of time either upon entering or exiting through a door of the building, and which functions to automatically reactivate the system after the selected period of time has elapsed.

These and other objects and advantages of the present invention will be apparent through a consideration of the following description when viewed in light of the accompanying drawing which shows a schematic circuit diagram of a preferred embodiment of the invention.

Referring to the drawing, the burglar alarm system shown is provided for detecting the entrance of an intruder into a building by way of a door **25.** The burglar alarm system includes an alarm circuit **11** which comprises an alarm **12** in the form of a warning bell that is connected by way of a thermal delay device **14** across a battery **13** through a main on-off relay switch **15.** Switch **15** includes a contact arm **16** movable between a contact **17** and a contact **18** by use of a relay coil **19** and a spring (not shown). When the relay coil **19** is not energized the spring acts to hold the arm **16** against the contact **17** and when the relay coil **19** is energized the action of the spring is overcome and the arm **16** is held against the other contact **18.** When the arm **16** of the main switch **15** is held against contact **17** the alarm circuit **11** is closed and current flows from the battery **13,** through the contact **17,** and through heater element **21** of the delay device **14** and back to the other side of the battery **13.** Heater element **21** is located beside a warping, heat sensitive element **22.** After the alarm circuit **11** has been closed for a short, fixed interval of time, approximately **15** seconds, the heating of element **21** causes the normally opened heat sensitive heat element **22** to close against contact **23,** thus permitting the current to flow to ring the bell of the alarm **12.**



The primary circuit **20** which includes the relay coil **19** for the main relay switch **15** is connected across the battery **13** through the contact arm **16** when the latter is held against contact **18** of the main switch **15.** The primary circuit **20** further includes an alarm actuating switch **24** whose contacts are respectively connected on the edge of the door **25** and the frame therefor, for example, and in such a manner as to open the primary circuit **20** when the door **25** is opened. Thus when the door is closed, switch **24** is closed, and, if the contact arm **16** of switch **15** is against contact **18,** current from the battery **13** flows through and energizes the relay coil **19.** As a result of so energizing the relay coil **19,** the main switch **15** acting against the spring (not shown) maintains its contact arm **16** against contact **18.** With the primary circuit **20** closed, the alarm circuit **11** is then opened and the burglar alarm system is placed in its "on alert" condition.

It should now be evident that whenever the door **25** of the building being protected is opened, the switch **24** in the primary circuit **20,** which has one of its contacts on the door **25,** is likewise opened. Accordingly, the current flow through the primary circuit **20** is interrupted such that the contact arm **16** of the relay switch **15** is moved by the spring (not shown) from the contact **18** to the contact **17** of the switch **15** such as to close the alarm circuit **11** and, after a short interval of time required for heating the heater element **21** of the delay device **14,** the heat sensitive element **22** of device **14** closes causing the alarm **12** to be set off.

It should be noted that the preferred embodiment of the burglar alarm system of the present invention operates on the principle of maintaining continuous circuit current in the primary circuit **20** to indicate a safe condition. The interruption of the continuous circuit current by the opening of the switch **24** upon opening the door **25** indicates an exit or entrance into the building which, if not properly controlled, will cause the alarm **12** to go off indicating that the person entering or exiting is an intruder.

The control means provided on the burglar alarm system of the present invention for temporarily deactivating its readiness to function includes a deactivating circuit **26** comprised of a normally open, adjustable time delay switch **27** which is preferably installed inside of the building near the door **25.** The deactivating circuit **26** is connected across the relay coil **19** of main switch **15** and battery **13** in parallel with the portion of the primary circuit **20** which includes the switch **24** and the contact arm **16** of the main switch **15.** It should thus be evident that during the time the deactivating circuit **26** is closed by the setting of delay switch **27,** the arm **16** of the main switch is held against contact **18** such that alarm circuit **11** is open. Thus, when the deactivating circuit **26** is closed, even though the switch **24** in the primary circuit **20** is opened by opening door **25,** the relay coil **19** is maintained energized such that the alarm circuit **11** is held open. It is therefore seen that the deactivating circuit **26** effectively detriggers the alarm circuit **11** in that it renders the primary or detecting circuit **20** inactive.

It should be clear that when the burglar alarm system is in its "on alert" condition, the main switch **15** is set to close the primary circuit **20** and the deactivating circuit **26** is open. Then when the delay switch **27** is closed, the deactivating circuit **26** is closed. The closing of the delay switch **27,** effectively, temporarily prevents

main switch 15 from closing alarm circuit 11. Thus the burglar alarm system is temporarily turned off and is non-functional.

Describing the operation of the burglar alarm system, when an authorized person is ready to exit through the door 25 of the building being protected, he manually sets the time delay switch 27 before opening the door 25 by turning knob 28 such that pointer 29 indicates the desired time delay on dial 30. The time interval of time delay switch 27 is set to allow the person leaving the building for the day, or night (if a business facility), or for a long trip ample time to open and close the door 25 without setting off the alarm 12, or the delay switch 27 may be set for a longer delay time if the person is interested in exiting from the building for the purpose of making a short errand and then returning and entering the building without setting off the alarm 12. In any case, the time delay switch 27 will then automatically return to its open position at the end of the set time interval and thus automatically return the burglar alarm system to its "on alert" condition necessitating no further attention on the part of the person.

In order to serve a similar function upon entering the door 25 of the building, the burglar alarm system incorporates the thermal delay device 14, the fixed delay of which results from the time required to heat the heater element 21. The delay device 14 thus allows a fixed, short interval of time to elapse before the interruption of current in the primary circuit 20 is caused by the opening of switch 24 results in the actual triggering of the alarm 12. Accordingly, in order to not trigger the burglar alarm system of the present invention upon entering the building, the person authorized to use the door, after closing the door 25, must immediately manually activate the time delay switch 27 to its closed position by rotating knob 28, the same as he did before exiting. This must be done before the previously mentioned delay device 14 has had time to heat up and actuate alarm 12. The result is to temporarily de-trigger the primary circuit 20 (sometimes referred to as the detection circuit) and then, as before, the subsequent return to the "on alert" condition of the primary circuit is automatic. It should be particularly noted that once the alarm circuit 11 is closed then the only way the alarm circuit 11 can be opened and the primary circuit 20 closed such as to place the alarm system in its "on alert" condition is to first temporarily close the deactivating circuit 26 by closing the delay switch 27 by the use of knob 28. Then, if the primary circuit 20 is closed before the deactivating circuit 26 is opened again by the running down of delay switch 27, the burglar alarm system will automatically be in its "on alert" condition.

It should now be clearly understood that the fixed time interval for the delay device 14 should be just sufficient to allow the authorized person when entering the building, to open and close the door 25 and manually set the time delay switch 27 to its closed position. Accordingly, the fixed delay of delay device 14 should be about 15 seconds or somewhat in excess thereof. It should be further understood that the delay time interval for the time delay switch 27 should be capable of being set for as long as a minute or more, variable according to use and conditions. Thus a time delay switch 27 may be a fixed time interval type but preferably adjustable as to time interval. Also, preferably for simplicity and so that it will be independent of power failure, switch 27 should be normally in open position and of the type provided with an automatic spring return mechanism which, after manual actuation to the closed position, automatically returns, after the set time interval has elapsed, to its normally open position. Switch 27 may be of a type operated by a knob 28 as shown, or by a button or otherwise, and preferably a type suitable for flush mounting, for example, on an inside wall of the building near the door. It is also contemplated that any other time delay switch or device may be used for the time delay switch 27 that will accomplish the described function.

In a practical installation, an additional manual on-off switch 31 may be connected in parallel with the time delay switch 27. When switch 31 is open the burglar alarm system operates as above described. When switch 31 is closed the relay coil 19 is maintained energized such that the alarm circuit 11 is held open even though door 25 is opened. The primary reason for providing such a switch 31 is thus to provide the user of the building being protected with the option of having the burglar alarm system effectively turned off during the long periods of heavy daytime building use in order to avoid any inconvenience and false alarms that might possibly occur.

While the control means disclosed herein is primarily intended for use in conjunction with burglar alarm systems of the continuous current circuit type involving a holding relay for the secondary alarm circuit, it also has application to alarms set off when a person walks through a beam of invisible light falling on a photo electric cell or other type detection, where it is desired to reduce the entry and exit control to one operation.

Although a preferred form of the invention has been illustrated and described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

What is claimed is:

1. A burglar alarm system comprising an alarm, a main switch switchable between a first and second setting and actuated by a relay coil, a source of electric energy, an alarm circuit for said alarm, said alarm circuit including said main switch for connecting said source of electrical energy across said alarm circuit when said main switch is in its second setting, a primary circuit including said main switch for connecting said source of electrical energy across said relay coil when said main switch is in its first setting and for holding said main switch in its first setting as long as the primary circuit is closed so that said system is in an "on alert" condition, said primary circuit including a normally closed alarm actuating switch which when opened disconnects said source of electric energy from across said relay coil and causes said main switch to be switched to its second setting to thereby connect said source of electrical energy across said alarm circuit, a deactivating circuit connected in parallel with the series circuit of the alarm actuating switch and the main switch in said primary circuit, a normally open time delay switch means included in said deactivating circuit, a thermal delay means in said alarm circuit for delaying the actuating of said alarm for a fixed period following the switching of said main switch to its second setting by the opening of the alarm actuating switch in said primary circuit, and means for manually setting said time delay switch means to a closed position to de-

activate said primary circuit by maintaining said main switch in its first setting for a set time period, whereby said time delay switch means is capable of being manually set to temporarily deactivate said system and automatically return it to an "on alert" condition after said set period irrespective of whether said normally closed alarm actuating switch is opened and closed prior to or after the manual setting of said time delay switch means.

**2.** A burglar alarm system in accordance with claim 1 wherein said deactivating circuit includes an additional switch which when closed provides for bypassing said time delay switch means.

**3.** A burglar alarm system in accordance with claim 1 wherein said means for manually setting said time delay switch means includes a dial and a knob having a pointer which can be rotated to indicate a desired time delay on the dial.

**4.** A burglar alarm system comprising an alarm, a main switch switchable between a first and second setting and including a relay coil which when energized holds said main switch in its first setting, an alarm circuit including said main switch and operable when said main switch is in its second setting to actuate said alarm, a primary circuit including said main switch and operable to energize said relay coil and hold said main switch in its first setting so that said system is in an "on alert" condition, said primary circuit including an alarm actuating switch which when opened while said system is in an "on alert" condition deenergizes said relay coil and permits said main switch to be switched to its second setting, a normally open time delay switch means, a deactivating circuit including said time delay switch means connected in parallel with the series circuit of the alarm actuating switch and the main switch in said primary circuit, said deactivating circuit adapted when said time delay switch is closed to energize said relay coil and hold said main switch in its first setting irrespective of whether said alarm actuating switch is opened or closed, and a thermal delay means in said alarm circuit for delaying the actuating of said alarm, whereby said time delay switch means is capable of being closed to deactivate said system for a set time period either before or after the opening and closing of said alarm actuating switch and to automatically return said system to an "on alert" condition after said set time period.

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