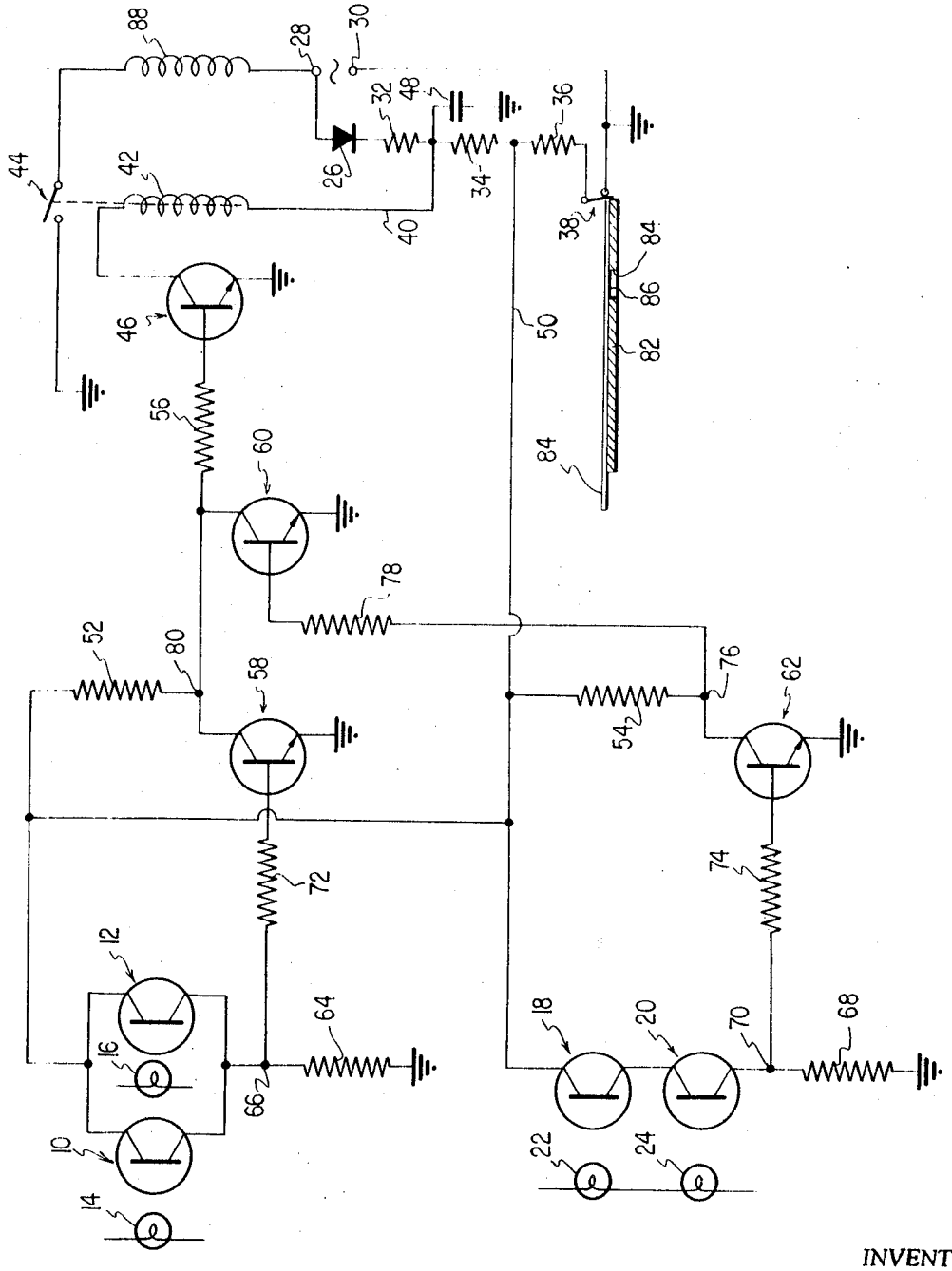
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ELECTRICALLY ACTUATED SECURITY SYSTEM

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ELECTRICALLY ACTUATED SECURITY SYSTEM

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ABSTRACT OF THE DISCLOSURE

Two sets of photocells, one set in series with each other and the other set in parallel with each other, individually control circuit elements such that a coded card masking all of the parallel photocells while unmasking all of the series photocells operates to energize the circuitry to a mechanism-unlocking condition.

BACKGROUND OF THE INVENTION

Various mechanisms are contemporarily in use in which some service is rendered in response to coin deposit, as for example in coin operated laundry and drying machines. Such machines are provided with a coin vault which collects and stores the monies deposited incidental to the coin operation of the mechanism. These coin vaults ordinarily are provided with a key controlled lock mechanism so that authorized personnel may periodically open the vault and remove the monies therefrom. Unfortunately, the keys may be duplicated, become lost or due to other circumstances unauthorized personnel may find access to the coin vaults. It would therefore be desirable to provide some means for making the normal key controlled lock more secure. Unfortunately change of the tumbler mechanism and concomitant change in the key configuration is costly and time consuming and it would thus be advantageous to provide some simple means whereby the lock mechanism for the coin vault could be made more secure.

BRIEF SUMMARY OF THE INVENTION

The present invention seeks to overcome the above mentioned difficulties by the provision of an auxiliary security system of an electrical nature which requires possession of a coded card in addition to the proper key for unlocking the coin valuts on coin operated machines and the like.

More particularly, the present invention relates to a security control system which consists of requisite electronic circuitry operating through the medium and control of photocells accurately to read out an associated coded card so as to release or actuate the mechanism only in response to presentation of the proper code to the device.

More specifically, the present invention utilizes two sets of photocells, the first set being arranged in parallel to each other and the second set being arranged in series relationship and adapted to be properly actuated when all of the parallel photocells are darkened and all of the series photocells are energized thus to control associated circuitry to actuate the normally locked mechanism to unlocked condition.

BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWING

FIG. 1 is a circuit diagram showing the operative components of the system.

DETAILED DESCRIPTION OF THE INVENTION

Reference characters **10** and **12** indicate a first set of photocells which, as shown, are connected in parallel, each having an energizing lamp **14** and **16** associated therewith. A second set of photocells as indicated by the

reference characters **18** and **20** having associated light sources **22** and **24**, the second set **18** and **20** being disposed in series as illustrated.

Any conventional power source for the circuitry shown may be utilized, the specific configuration illustrated in the drawing incorporating a rectifying diode **26** connected across a conventional 110 volt alternating current supply as indicated by reference characters **28** and **30** through the medium of a resistor chain **32**, **34** and **36** and through a normally open switch indicated generally by the reference character **38**. The conductor **40** connects a relatively positive voltage level to the winding **42** of a solenoid or relay controlling the normally open switch **44**, the circuit being completed through the collector-emitter path of the semi-conductor device **46**. A smoothing capacitor **48** is provided for preventing relay chatter. The conductor **50** connects the relatively positive potential point (but negative with respect to the conductor **40**) to the biasing resistors **52** and **54**, and also connects to the photocells **10** and **12** in parallel and to the photocells **18** and **20** in series, substantially as shown.

The semi-conductor device **46** is normally non-conducting until a positive going signal appears at its base through the resistor **56** and in order normally to retain the semiconductor device **46** in non-conducting condition, the semi-conductor pair **58** and **60** and the associated inverter **62** are provided.

In order better to appreciate the operation of the system, let it be assumed for the moment that no card has been inserted but that the switch **38** nevertheless is in closed condition thus to energize the power circuitry so that the aforementioned voltages appear on the conductors **40** and **50**. Under these conditions, the light sources **14**, **16**, **22** and **24** are energized and since no card is present, all of the photocells **10**, **12**, **18** and **20** are likewise energized. The load resistor **64** of the parallel photocells will therefore produce a positive voltage at the junction **66** and, likewise, the load resistor **68** of the series photocells will produce a positive voltage at the junction **70**. The positive voltage at the junction **66** biases the base of the semi-conductor device **58** through the resistor **72** sufficiently to render this semiconductor device conductive. At the same time, the relatively positive voltage at the junction **70** is sufficient to bias the semi-conductor **62** through its base resistor **74** to make this device conductive. Current will flow therefore through the resistor **54** producing a relatively negative voltage at the junction **76** which will turn off the semi-conductor device **60**, the base of which is connected to the junction **76** through the resistor **78**. The conducting condition of the semi-conductor device **58** causes the junction **80** to be at a relatively negative potential whereby the base of the semi-conductor device **46** is insufficiently biased to conduct and the switch **44** remains in its normally open condition.

From the above it will appear that in order to actuate the circuitry to an unlocked condition wherein the switch **44** is closed, the devices **58** and **60** must both be non-conducting. Obviously, then, a properly coded card must allow all the series photocells **18** and **20** to be energized while preventing energization of all of the parallel photocells **10** and **12**. If any one of the parallel photocells **10**, **12** are allowed to conduct, the voltage drop across the resistor **64** is sufficient to bias the semi-conductor device **58** to conducting condition. Naturally, if any of the series photocells **18**, **20** is not energized, the resulting negative potential at the junction **70** will render the semi-conductor device **60** conductive.

The machine includes a slot-like mechanism having a base **82** onto which the coded card **84** is adapted to be placed and when positioned home closes the normally open switch **38** to energize the entire circuitry inclusive of the light sources **14**, **16**, **22** and **24** although the elec-

tric connections thereto have been omitted ror the sake of clarity. The base **82** is provided with a transversely enlarged opening **84** and the light sources and photocells are disposed on relatively opposite sides of the base in alignment with this opening so that the region **86** of the card forms the encoding portion thereof. The requisite portions of the card, if properly encoded, serve to mask the light sources associated with the parallel photocells **10** and **12** and to allow energization of the series photocells **18** and **20** so that, under these conditions, the photocells **10** and **12** are non-conducting so that the junction **66** goes negative correspondingly to render the semi-conductor device **58** non-conducting. Simultaneously, the photocells **18** and **20** are conducting and the junction **70** is at a relatively positive potential rendering the semiconductor device **62** conductive and thereby maintaining the junction **76** sufficiently negative as to prevent conduction of the semiconductor device **60**. Both semi-conductor devices **58** and **60** are thus non-conducting and the junction **80** goes relatively positive thereby to render the semic-onductor device **46** conductive, energizing the winding **42** to close the normally open switch **44** and complete the circuit through the winding **88** of the actuating device. The actuating device may include a suitable member for unlocking the coin vault.

Obviously, many modifications and variation of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. In an electrically actuated security system of the type including an electrically-actuated locking mechanism normally disposed in locked condition,

a first set of photocells disposed in series relation to each other,

a second set of photocells disposed in parallel relation to each other,

and circuit means responsive to a predetermined condition of said first and second sets of photocells for actuating said locking mechanism to unlocked condition, said circuit means including a first semi-conductor device biased to non-conductive condition in response to deenergization of all of said first set of photocells, a second semi-conductor device biased to conductive condition in response to energization of all of said second set of photocells, a third semi-conductor device biased to non-conductive condition in response to conduction of said second semi-conductor device, and a fourth semi-conductor device for controlling said locking mechanism, said fourth semi-conductor device being biased to conducting condition to unlock said mechanism only in response to non-conductive condition of both said first and said third semi-conductor devices.

2. In the system as defined in claim **1** including a card coded as to light transparency, a receiver for said card, said first and second sets of photocells being located on one side of said receiver and there being light source means on the other side of said receiver.

3. In the system as defined in claim **2** including a power control switch for said circuit means, said photocells and said light source means, said switch being located in said receiver for actuation by said card in response to predetermined positioning of said card in said receiver.

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