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BURGLAR ALARM SYSTEM

Filed March 10, 1937

Fig. 1

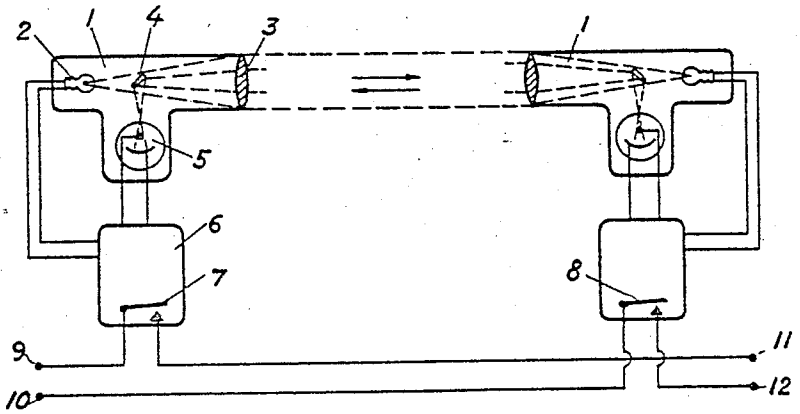
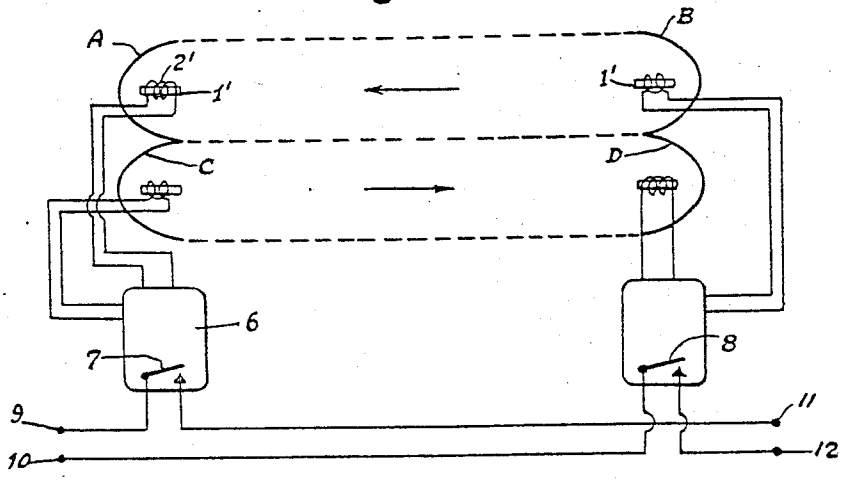


Fig. 3.



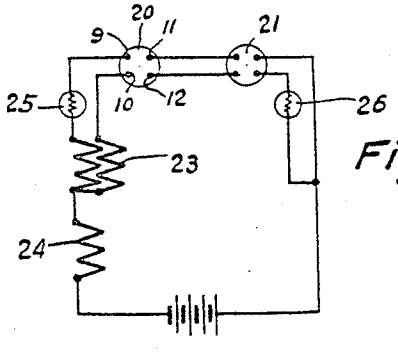


Fig. 2.

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Search Room

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BURGLAR ALARM SYSTEM

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6 Claims. (Cl. 177—314)

The present invention relates to burglar alarm systems and more particularly to burglar alarm systems of the type in which a directed ray actuates a receiver adapted to control an alarm device, for instance by controlling a contact included in an alarm circuit.

The known burglar alarm systems of the kind set forth have the inconvenience that an alarm is given not only when a burglary occurs, i. e. upon an interruption of the beam of light, but also on the occurrence of faults in the elements included in the alarm system. Burnt-out incandescent lamps in the senders and destroyed tubes or photo-electric cells in the receivers have thus caused the same alarm signal to be given in the station as a burglary. The invention has for its primary object to eliminate said inconveniences and is characterized substantially therein, that the controlling element consists of two beams of rays emitted from associated sources of light or sound, which beams of light extend close by each other and actuate each an appertaining receiver.

The invention will be more closely described with reference to the accompanying drawing, in which Figure 1 shows an alarm initiating device according to the invention. Figure 2 shows an alarm circuit in which two alarm initiating devices according to the invention are included and Figure 3 shows a further embodiment of the invention.

In the embodiment of the alarm initiating device shown in Figure 1 the two beams of light are directed towards each other. A receiver and a sender are here built together to form a unit 1 consisting of a source of light 2 and of a lens 3 for converging the outgoing rays of light, the incoming rays of light being reflected, after having passed through the same lens 3, by a mirror 4, preferably in the shape of a photometer prism, towards a photo-electric cell 5 which through an amplifier 6 controls a contact 7 or 8 respectively in an alarm circuit. When a burglary occurs both beams of light are interrupted causing both contacts 7 and 8 to be actuated, but if a fault occurs in a sender or in a receiver, for instance if an incandescent lamp burns out, only one of the contacts will become actuated. The circuit extending to the alarm device and the alarm device proper can, of course, be made in different ways. In case a single loop is used and the two contacts are series-connected, in that for instance the terminals 9 and 10 are connected with each other and the terminals 11 and 12 are connected to the signal device, the arrangement will have to be such that the contacts 7 and 8 are normally interrupted. When a burglary occurs both contacts are closed and the alarm device is operated, but if a fault occurs in one of the units 1 or in the amplifiers 6 only one contact will be closed and the alarm device remains unactuated. In case a normally closed loop is used the contacts 7 and 8 must be included in the loop in mutual parallel connection. A plurality of alarm initiating devices can be connected in this manner to the same alarm device.

In case it is desired to indicate a burglary and a fault with different alarm signals, the burglar alarm according to the invention can advantageously be connected to a two-wire loop (for instance to one of the circuits disclosed in the Swedish Patent No. 84,381). Figure 2 shows a circuit arrangement in which two burglar alarm devices 20 and 21 are connected to a two-wire loop, the two wires being parallel-connected in the alarm station. The reference numeral 23 designates a differential relay, 24 is an ordinary relay, and 25 and 26 are balancing resistances. If a burglary occurs at one of the two positions 20 and 21, a burglar alarm signal is initiated through the relay 24, whereas if a fault occurs in one of the apparatus included in any of the devices 20 and 21 a fault signal is caused by the relay 23. In other respects the same advantages are obtained, of course, through said connection as are set forth in said Swedish patent in connection with fire alarm systems.

The invention can, of course, be modified in many different ways. The two beams of rays can, for example, have the same direction. On account of the divergence to which the beams of rays emitted from the respective sources of light, which are placed close by each other, is subjected in practice, the two beams of light will cover each other to some extent, and both receivers will become illuminated from both sources of light. It is therefore necessary to make the receivers selective in one manner or another. For this purpose the senders can be devised to emit beams of light of different colours and the receivers provided with filters which transmit the rays emitted from the associated sender.

The senders can also be arranged to emit directed rays of sound, so called ultra-sonorous sound oscillations, the beams of rays being then directed towards each other, or alternatively different frequencies can be used, the receivers being then mechanically or electrically tuned each to a different frequency. A combination of light rays and sound rays is also conceivable, so that one set consisting of a sender and a receiver is

arranged to send and receive light rays and the other set ultra-sonorous sound oscillations insuring that the two systems will have no influence on each other.

The senders can also be arranged to emit directed rays of sound, so called ultra-sonorous sound oscillations, the beams of rays being directed toward each other, as shown in Fig. 3. By this arrangement the senders B, C and the receivers A, D which are identical with each other (and therefore can be used as sender or transmitter alternately) and which are arranged according to the magnetostriction method, each consists of a magnetostriction rod 1 with winding 2 and is placed in a parabolic reflector A. As in the embodiment previously described, 6 is an amplifier and 7, 8 switches. The receiver A controls the switch 7, and the receiver D the switch 8. The winding 3 of the senders B and C are in known manner supplied with alternating current of a suitable frequency. Alternatively both the beams can have the same direction, the receivers then being mechanically or electrically tuned each to a different frequency. A combination of light rays and sound rays is also conceivable, so that one set consisting of a sender and a receiver is arranged to send and receive light rays and the other set ultra-sonorous sound oscillations insuring that the two systems will have no influence on each other.

I claim:

1. A burglar alarm system comprising a circuit, spaced devices sensitive to rays, means responsive to said devices, for controlling said circuit, an alarm device in said circuit, two sources of rays each emitting a beam of rays, means for directing each beam of rays towards one of said sensitive devices spaced therefrom, said beams extending close to each other, said ray sensitive devices operating the circuit controlling means only when both of said beams are interrupted to control said circuit and cause operation of said alarm device.

2. A burglar alarm system comprising a circuit, spaced light sensitive devices, means responsive to said devices for controlling said circuit, an alarm device in said circuit, two sources of light each emitting a beam of light, means for directing each beam of light towards one of said light sensitive devices spaced therefrom, said beams extending close to each other, said light sensitive devices operating the circuit controlling means only when both of the beams are interrupted to control the circuit and cause operation of said alarm device.

3. A burglar alarm system comprising a circuit, spaced light sensitive devices and amplifiers connected therewith for controlling said circuit, an alarm device in said circuit, two sources of light each emitting a beam of light, means for directing each beam of light towards one of the light sensitive devices spaced therefrom, said beams extending close to each other, said light sensitive devices and amplifiers operating only when both of said beams are interrupted to control said circuit and cause operation of said light sensitive device.

4. A burglar alarm system comprising a circuit, spaced light sensitive devices, two switches and an alarm device interposed in said circuit, two sources of light each emitting a beam of light, said light beams having opposite directions and substantially the same position in space, said light sensitive devices operating said switches to control said circuit and cause operation of said alarm device only when both of said beams are interrupted, each source of light being assembled as a unit with one of said light sensitive devices, a ray refracting member for the emitted and for the incoming beams of each unit and a mirror in each unit for deflecting a portion of the incoming beam of light toward the related light sensitive device.

5. A burglar alarm system comprising a circuit, spaced light sensitive devices, two switches and an alarm device interposed in said circuit, two sources of light each emitting a beam of light, said light beams having opposite directions and substantially the same position in space, said light sensitive devices operating said switches to control said circuit and cause operation of said alarm device only when both of said beams are interrupted, each source of light being assembled as a unit with one of said light sensitive devices, a ray refracting member for the emitted and for the incoming beams of each unit and a photometer prism in each unit for deflecting a portion of the incoming beam of light toward the related light sensitive device.

6. A burglar alarm system comprising spaced devices sensitive to rays, two sources of rays each emitting a beam of rays, means for directing each beam of rays toward one of the sensitive devices spaced therefrom, a main circuit, an auxiliary circuit connected in parallel with the main circuit, a burglar alarm relay in the main circuit, switches in the main and auxiliary circuits operable by said ray sensitive devices only when both beams are interrupted to control said circuits and cause operation of said alarm relay, and a fault alarm relay including two windings interposed in and controlled by the respective circuits.

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