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J. A. MOSSIE ET AL

1,964,439

ALARM SYSTEM SWITCH

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Fig. 1.

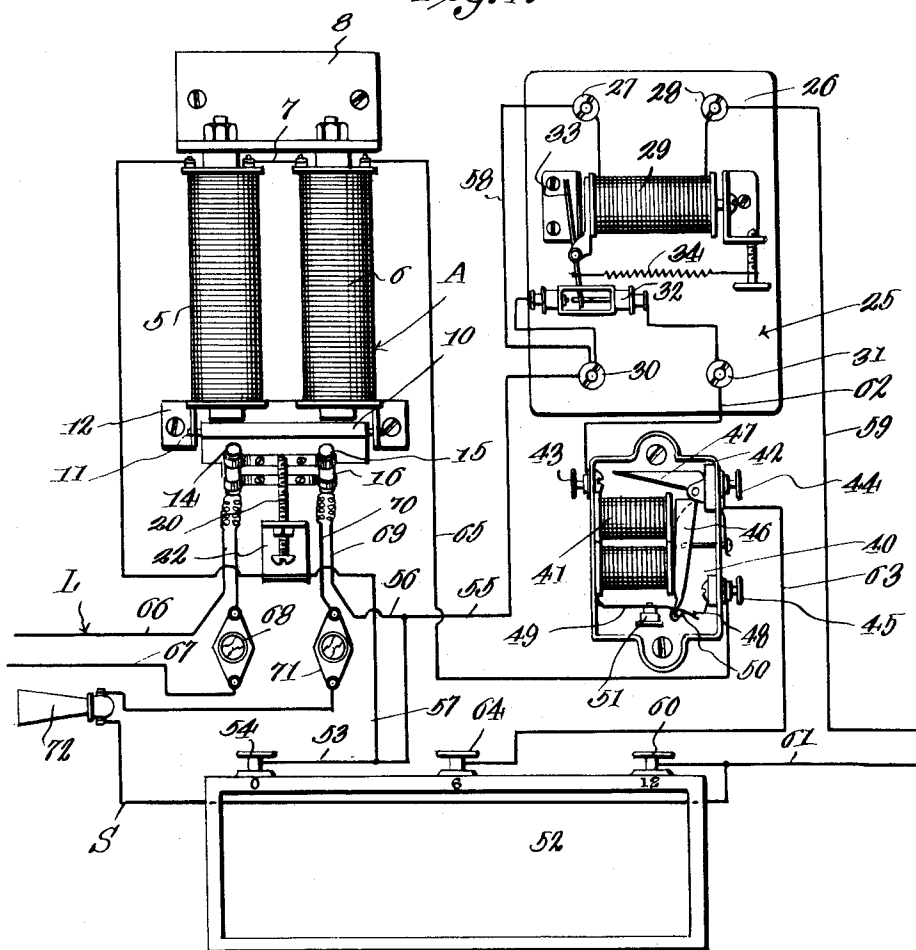


Fig. 3.

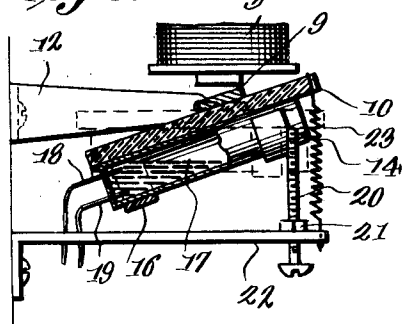
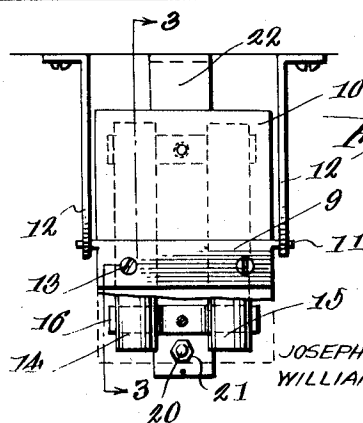


Fig. 2.



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ALARM SYSTEM SWITCH

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1 Claim. (Cl. 200—112)

This invention appertains to burglar or like alarm devices, in which a closed circuit is employed for controlling a signal circuit or circuits, whereby upon the breaking of the closed circuit by unauthorized persons the signal circuit will be set in operation.

One of the primary objects of our invention is the provision of novel means whereby the signal circuits will be positive in operation and function immediately upon the breaking or rupturing of the control closed circuit wiring system.

Another object of our invention is to provide a signalling device which will operate sound and like signals when an electric current is broken by the turning of a door-knob, the raising of a window, or the breaking of a glass in a door or window and to provide in such a device wires extending to the openings from which signals may be caused, or made, or charged with electricity so that the breaking of any of the wires will operate the signals and further provide such a device that will signal continuously until manually set to stop the signalling.

A still further object of our invention is to provide an improved device of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture, and one which can be placed upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawing, in which drawing:—

Figure 1 is a diagrammatic view illustrating our improved device and the method of wiring the various parts of the device together.

Figure 2 is a horizontal section looking down on the non-conductor plate, a portion of the swinging non-conductor plate being shown broken away, and

Figure 3 is a fragmentary vertical section through our improved control means for the signal light and sound circuit, taken on the line 3—3 of Figure 2 looking in the direction of the arrows.

Referring to the drawing in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates our improved alarm system, which comprises a pair of electro-magnets 5 and 6 connected together in series by a suitable bridge wire 7. These magnets 5 and 6 are secured together and held in place in any desired

way such as by a bracket 8, of angle shape in cross section. The electro-magnets 5 and 6 are adapted to attract an armature plate 9, which extends transversely across a bed plate 10 of insulation. The terminals of the armature 9 are provided with bearing lugs 11 which are rockably mounted in side brackets 12 which are suitably secured in position. The armature plate 9 can be rigidly secured to the bed plate 10 of insulation by the use of suitable fastening elements such as screws 13. Secured to the lower face of the bed plate 10 of insulation are spaced contact tubes 14 and 15 which may be formed of glass or other insulating material. If desired, straps 16 can be employed for securing the tubes 14 and 15 in position on the lower face of the bed plate 10. The contact tubes 14 and 15 are adapted to receive a predetermined quantity of mercury or like conducting material 17 therein and each tube has imbedded in the rear end thereof spaced contacts 18 and 19. As clearly shown in Figure 3 of the drawing, the contacts 18 and 19 are arranged one above the other so that when the tubes 14 and 15 are in a horizontal position, the mercury 17 seeking its level will ride away from the uppermost contact 18 and open the circuit controlled by said contacts. It is obvious that a slight rocking movement of the bed plate 10 will open or close the circuit according to the direction of movement of said base plate.

The downward movement of the base plate 10 is controlled by a set screw 20 which is held in adjusted position by a suitable lock nut 21, the screw 20 being adjustably carried by a supporting bracket 22. A light coil spring 23 is employed for normally holding the bed plate 10 in a substantially horizontal position and in contact with the limiting screw 20 so that when the electro-magnets 5 and 6 are deenergized the bed plate 10 will be held in a horizontal position and against the screw 20 with the mercury 17 out of engagement with the upper contact 18. In accordance with our invention we utilize the circuits controlled by the contact tube 14 for a signal light circuit L, while we utilize the circuit controlled by the contact tube 15 for an audible sound circuit S, as will be later described. However, it is to be understood that the plate 10 may carry more contact tubes than two, as shown.

This means comprises a relay 25 and a positive drop relay 40 and these relays are arranged in a closed circuit above mentioned. The relay 25 embodies a suitable base plate 26 having binding posts 27 and 28 at one end thereof which are electrically connected to the opposite terminals

of the electro-magnet 29 mounted on said base plate. The opposite end of the base plate has connected therewith binding posts 30 and 31 as shown. The electro-magnet 29 controls a switch 32, the switch being operated by the pivoted armature 33 of said electro-magnet 29. A contractile coil spring 34 is employed for swinging the armature away from the electro-magnet 29 when the current is broken through said electro-magnet. The switch 32 is moved to its open position when the armature is swung away from the electro-magnet by the spring 34.

The positive drop relay 40 includes electro-magnets 41 arranged within the usual protecting casing 42 and the casing supports contact posts 43, 44, and 45. A pivoted armature 46 is provided for the electro-magnets 41 and this armature is held away from the magnets 41 when the same are deenergized by the weighted tail piece 47 formed on said armature. The movement of the pivoted armature 46 controls the operation of a switch which includes a stationary contact 48 electrically connected with the binding post 45 and a movable resilient trip contact 49 which is electrically connected with the electro-magnets. Both the relay 25 and the positive drop relay 40 are of conventional construction and the positive drop relay 40 is of the type in which the switch including the contacts 48 and 49 is closed upon the deenergizing of the electro-magnets 41 of said relay 40. Normally the resilient trip contact 49 is hooked over the armature 46 and while the relay is energized and the armature 46 in contact therewith, the trip contact 49 is held in a raised position but upon the deenergizing thereof the contact 49 is tripped by the movement of the armature and the contacts with the stationary contact 48. A button 51 is utilized for resetting the movable trip contact 49 and it thus can be seen that it is necessary to manually reset the positive drop relay in order to set the entire apparatus again in proper working condition after the operation thereof.

In connection with the device, we utilize a storage battery 52 of any desired voltage, preferably including, however, the usual positive post 54, a six volt post 64 and a twelve volt post 60. Leading from the positive binding post 54 is a feed wire 53 which in turn has connected thereto branch feed wires 55, 56, and 57.

The branch wire 55 is electrically connected to the binding post 30 and a bridge wire 58 is employed for connecting the binding post 30 with the binding post 27. Electrically connected with the binding post 28 of the relay 25 is a wire 59 which is extended throughout the house or building to be protected and connecting with a return wire 61 which is in turn connected with the binding post 60 of the storage battery 52. The wire 59 and the return wire 61 extend over the doors, windows, door-knobs and the like in any preferred arrangement so that upon the breaking of the window, or the opening of the window or door the wire will be broken, it being seen that normally there is a closed circuit through the relay from the battery 52, wire 53, wire 55, binding post 30, wire 58, through the electro-magnet 29, through binding post 28, through wire 59 and then back through wire 61 to the battery. Electrically connected to the binding post 31 of the relay 25 is a wire 62 which is in turn connected with the post 43 of the positive drop relay 40, and it is to be noted that the binding posts 30 and 31 are operatively connected to the switch 32. Leading from the binding post 44 of the positive

drop relay 40 is a wire 63 which is in turn connected with the six volt posts 64 of the storage battery 52.

Thus when the circuit is closed through the electro-magnet 29 of the relay 25 the current will flow from the battery through wire 53, wire 55, binding post 30, through the switch 32, through binding post 31, wire 62, through binding post 43 of the positive drop relay 40, through the electro-magnet 40 thereof and out binding post 41, through wire 63 back to the battery 52.

As heretofore intimated, the closed circuit thus outlined, controls the signal light circuit L and the audible signal light circuit S through the use of the electro-magnets 5 and 6 and thus a wire 65 is extended from the binding post 45 of the positive drop relay 40 to one binding post of the electro-magnet 6. Connected to the opposite binding post of the magnet 5 is the wire 57, heretofore mentioned which is connected with the binding post 54 of the battery. It is obvious that when the magnets 41 of the positive relay 40 are deenergized, the contacts 48 and 49 will be in engagement with one another and consequently current from the battery 52 will flow from binding post 54, through wire 53, wire 57 through magnets 5 and 6, through wire 65, through binding post 45, through the contacts 48 and 49, through the coils 41 and out the binding post 44 back to the battery through the return wire 63. This will energize the magnets 5 and 6 for rocking the armature 9 and causing the closing of the signal light circuit L and the audible signal circuit S. The signal light circuit L includes wires 66 and 67 which are connected respectively to the contacts 18 and 19 in the contact tube 14. A fuse 68 may be interposed in the length of 67 for protecting said signal light circuits. This signal light circuit L may be in the conventional light circuit of a house and thus fed from the usual source of electrical energy and the contacts 18 and 19 merely act as a switch for controlling the said circuits.

The audible or sound signal circuit S includes wires 69 and 70 which are electrically connected to the contacts 18 and 19 of the contact tube 15. The wire 70 may have interposed in the length thereof a protecting tube 71 and likewise any preferred number of sound or audible signals, such as sirens 72.

The wire 71 can be of any desired length and extend entirely around the building to be protected or may lead to a police station or the like. As stated, this wire can have interposed in the length thereof at suitable intervals the desired sound or audible signal. The wire 71 is connected to either the six volt post 64 or the twelve volt post 60, as preferred. The wire 69 may form a direct part of the wire or continuation of the wire 56 which is in turn connected with the wire 53 leading from the positive post 54 of the battery. Thus a complete circuit is formed through the sound signals when the plate 10 is tilted. The wires 66, 67, 70 and 69 may be coiled adjacent to their contacts 18 and 19 so as to give during the tilting of the plate without causing undue strain or tension on said plate.

From the foregoing description, it can be seen that when the wire 59 is broken for any reason the circuit will be broken through the electro-magnet 29 and the relay 25 consequently opening the switch 32 thereof and breaking the circuit through the positive drop relay 40 and the armature 46 thereof will swing away from the

electro-magnet 41 of said relay 40. The resilient contact 49 will be tripped and will engage the stationary contact 48 and thus the circuit will be closed through the electro-magnets 5 and 6, the current flowing from the positive pole 54 of the magnet through wire 53, wire 57, through the electro-magnets 5 and 6, through wire 65, binding post 45 of the positive drop relay, through the engaging contacts 48 and 49, through the electro-magnet 41, and out of the binding post 44, through the wire 63 back to binding post 64 of the battery. The energizing of the electro-magnets 5 and 6 will attract the armature 9 and consequently tilt or rock the plate 10 with its tubes 15 and 14. The mercury in these tubes will bridge the contacts 18 and 19 in each of said contact tubes 14 and 15 and thus close the circuits through the signal light circuit L and the sound or audible signal circuits.

Changes in details may be made without departing from the spirit or the scope of this invention, but:—

What we claim as new is:

In an alarm signal system, electro-magnetic means, an armature for said electro-magnetic means, a plurality of supporting brackets, said

armature comprising a hinged plate hingedly connected to said bracket near one side edge thereof, an insulated plate secured to said armature and adapted to swing therewith, said hinged plate being arranged off center relative to said insulated plate to provide a long end and a short end for said insulated plate, a pair of spaced contact tubes engaging the under-face of said insulated plate, metallic straps passing around said tubes and secured to the under-face of said insulated plate, a pair of spaced contacts arranged within each tube, mercury carried within each tube and adapted to close the circuits between said contacts, an adjusting screw supporting arm extending under said plate and spaced therefrom, an adjusting screw adjustably mounted vertically through said supporting arm and adapted to contact with the short end of said insulated plate for limiting the swing of said insulated plate in one direction to a horizontal position, and a coil spring for engaging the short end of said insulated plate for normally pulling said insulated plate and armature away from said electro-magnetic means.

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