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2,766,358

HOLD-UP ALARM SIGNAL SYSTEM

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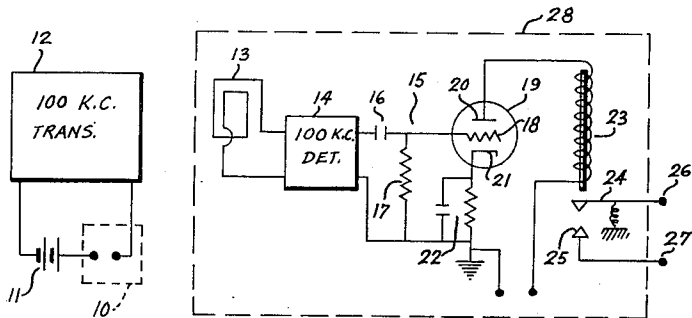


Fig. 1

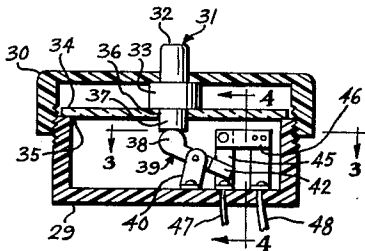


Fig. 2

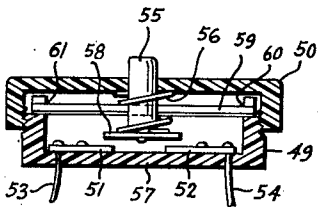


Fig. 5

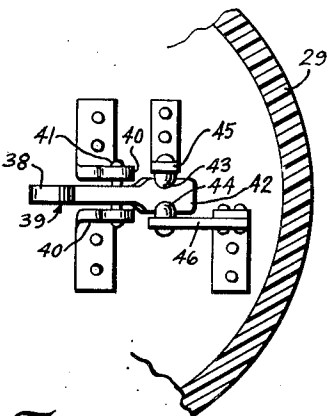


Fig. 3

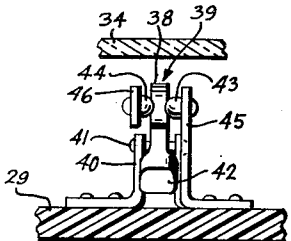


Fig. 4

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## HOLD-UP ALARM SIGNAL SYSTEM

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1 Claim. (Cl. 200—168)

This invention relates to a hold-up alarm signal system, and is a divisional application of application Serial No. 200,675, filed December 13, 1950.

In my prior United States Patent No. 1,946,781 of February 13, 1934, I disclose an alarm system for banks and the like wherein the operator carried a switch device on his person which could be placed in electrical communication with a signalling device such as an electrically actuated bell. In such system the switch device carried by the person was adapted to be fastened to the leg and to be actuated by bringing the legs together to cause a button to be depressed therebetween for an electrical switching function in the said circuit. Although such prior system has been particularly satisfactory in many installations, I have found that a radio communication between the switch device and the signalling device is more satisfactory principally for the reason that the person carrying the switching device is not tied by communicating wires to any one point. It has taken some time to develop a satisfactory radio communicating system which would be relatively foolproof and the following is a disclosure of the system which I have now conceived and which has been tested and proved satisfactory.

An object of the invention is to provide a hold-up alarm signal system wherein the switch device carried by the operator is designed when actuated to cause a continuous signal to be sent by the transmitter.

A further object of the invention is to provide a signal system and switch device as before wherein the switch device includes a breakable component which is required to be broken before the switch can be actuated to send a signal from the transmitter.

Other objects of the invention will be appreciated by a study of the following specification taken in conjunction with the accompanying drawings.

In Figure 1, I illustrate an alarm radio frequency signalling system according to the invention showing the novel portions of the electrical circuit arrangements in electrical schematic form.

Figure 2 is a sectional view of a preferred form of electrical switching device adapted to be carried on the person.

Figure 3 is a view taken on the line 3—3 of Figure 2.

Figure 4 is a view taken on the line 4—4 of Figure 2.

Figure 5 illustrates an alternative form of switching device according to the invention of simplified nature.

Referring in more detail to the drawings, and particularly to Figure 1, the alarm system of the invention comprises a suitable switching device 10 adapted to be carried on the person and controlling electrical current from battery 11 adapted to operate the transmitter 12. The transmitter may comprise suitable components forming a well known type of oscillator but it is preferred that such oscillator send a signal of a relatively low radio frequency, such as about one hundred kilocycles. There are a number of reasons for choosing a low radio frequency. In particular, however, it is relatively simple to control the strength of an oscillator of such low fre-

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quency for it is desired that the signal only be of a nature which will extend for one hundred feet or so. Manufacture of an oscillator for such a low frequency is not nearly so critical as manufacture of oscillators for higher frequency, nor is the operation so difficult to maintain. In short, this lower frequency type of oscillator is in general more reliable, taking into account problems of manufacture. Still more important, however, is the fact that it is desired to avoid interference and noise in the signalling system and, therefore, a relatively low frequency should be chosen and has been found to be very satisfactory. The signal is received by a suitable loop aerial 13 connected to a suitable detector 14 of well known construction and design, after which the detected signal is fed through the grid circuit 15 of predetermined time constant by reasons of the values of condensers 16 and grid resistor 17 and leading directly to the grid 18 of the electron tube 19, having a plate 20 and cathode 21. The grid 18 is biased by any suitable system such as the condenser and resistor biasing means 22 in the cathode circuit of the tube 19 whereby the grid is normally biased almost to cut-off but normally allowing current to pass through the tube 19 and the relay coil 23 in the plate circuit thereof. Said relay coil during normal energization holds the contact arm 24 out of engagement with the contact 25, thus providing an open circuit across the terminals 26 and 27, these latter being connected to any suitable alarm device such as an electrically actuated bell or light (not shown).

The receiver 28, therefore, is adapted to receive a signal from the transmitter which causes the grid 18 to be charged beyond cut-off thereby interrupting the flow of electrical current through the tube 19 and de-energizing the relay coil 23. Thus, under conditions where a signal is received from the transmitter 12 the contacts 24 and 25 will engage to close an exterior electrical circuit controlled by the terminals 26 and 27.

In respect to the time constants in the signal handling circuits of the receiver, I prefer to set the circuit values such that only a signal of relatively long duration, such as one-tenth of a second, may cause the charge on the grid 18 of the tube 19 to change to a value beyond cut-off. In this way, exterior interference and noise will not effect deenergization of the relay coil 23 and, therefore, the switch device 10 is of a particular construction according to the invention.

Thus, in Figure 2, I provide a switch device adapted to be carried on the person such as in the manner illustrated in my previous patent referred to, and which switch comprises a casing 29 having a suitable cover 30, these latter components being of an insulated material. The switch button 31 has an exposed portion 32 projecting beyond the cover 30 and adapted to be pressed by the operator. An enlarged shoulder interior of the cover limits outward movement of the button 31 and rests inwardly against a breakable disc 34 preferably of glass and which rests upon a supporting shoulder 35 in the casing 29 and has a central hole 36 designed for free passage of an actuating rod 37. The rod 37 rests against one end 38 of a switching lever 39 supported in the brackets 40 and swingable on the shaft 41 therein. An enlarged end 42 adapted to serve as a contacting member is normally disposed below the switching contacts 43 and 44 on the spring-like arms 45 and 46 respectively. Suitable electrical leads 47 and 48 lead from the arms 45 and 46 exterior of the casing 29, as also illustrated in Figure 1.

In operation, the button 31 when depressed must be actuated under sufficient force to break the breakable member 34, after which it may be depressed freely to cause the lever 39 to be rotated to a position wherein the enlarged end 42 wedges between the contacts 43 and 44. In this way the oscillator of the transmitter 12 of Figure

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1 is caused to be energized to send a continuous signal until the battery 11 is exhausted.

As a modification I may form the switching device in a different manner as illustrated in Figure 5. In this form I provide a casing 49 having a suitable cover 50 wherein the base of the casing carries contact members 51 and 52 spaced apart in predetermined manner and electrically connected to leads 53 and 54 leading exteriorly of the casing. A switch button 55 slidably extending through the cover 50 is biased under pressure of the spring 56 to move toward the base 57 of the casing. The lower end of the button 55 carries a metal switching member 58 adapted to make electrical contact between the contact bars 51 and 52 when engaging the latter. In this case, I provide a glass rod 59 passing through suitable holes 60 and 61 in the casing and through a hole 62 in the button member 55. The rod may be of any suitable breakable material but is of sufficient strength to oppose the normal biasing force of the spring 56. Thus, when the button member 55 is depressed with sufficient force to break the member 59, the button continues to move under force of the spring to cause the contacting member 58 to complete the electrical circuit between contacts 51 and 52 and such circuit is maintained continuously thereafter.

It will be, of course, appreciated that the switching device of the invention must be serviced after it has been once actuated and, of course, the breakable member serves to identify what switch in an installation of the system of the invention has been actuated.

It will be observed that in my alarm system herein disclosed, any failure of the receiver 28 will result in closure of the contacts 24 and 25, thus immediately resulting in a check being made of the complete installation. It will be apparent that the switching device disclosed herein is subject to many modifications in the particular construction, the essential factors being that the device when once actuated remains actuated until re-set and that in the actuation of the device some breakable member be destroyed or affected in some way which is not subject to repair by the operator.

It is thus intended that the present disclosure should

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not be construed in any limiting sense other than that indicated by the scope of the following claim.

What I claim as my invention is:

A one way switch device comprising in combination a casing and a removable cover therefor, a pair of contacts in said casing disposed normally in spaced apart relation, electrical leads extending from said contacts exterior of the casing, an actuating button in the cover of said casing having one end projecting exteriorly of the cover and adapted to be pressed, the other end projecting inwardly of said casing, a switching member in said casing adapted to be positively moved into engagement with said contacts by said actuating button when the latter is depressed so that said switching member constitutes an electrical conductor therebetween and a breakable member in said casing for resisting actuation of said actuating button and disposed in engagement with the latter, and means for maintaining said switching member in engagement with said contacts after movement of said switching member into engagement therewith, the said means for maintaining the switching member in engagement with said contacts being in the form of a spring, said breakable member being in the form of a rod of breakable material, a hole in said actuating button for accommodating said rod, and supporting means in said casing for supporting the ends of said rod in a position to normally maintain said actuating button in the non-actuated position until said actuating button is depressed to break said member.

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