Jan. 25, 1938. A. J. RAKOS 2,106,658

ALARM SYSTEM

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Fig. 1.

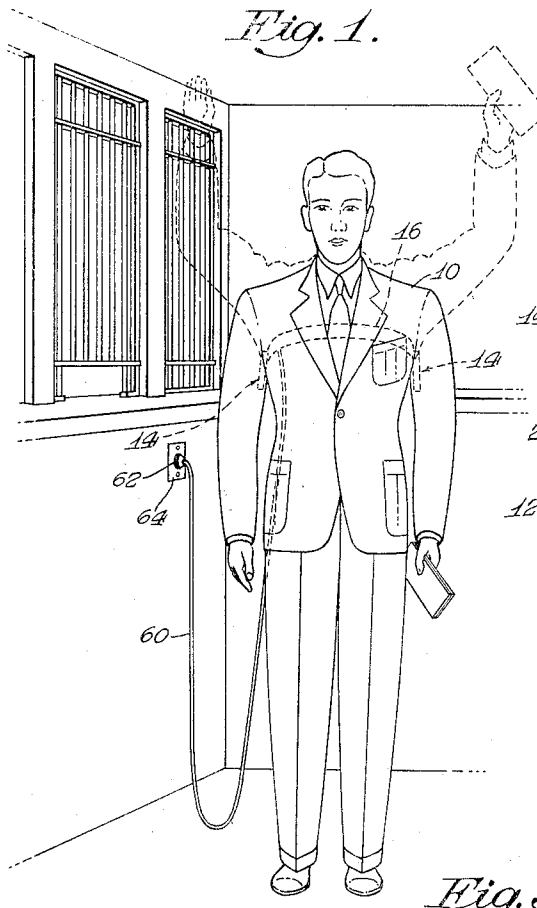


Fig. 2.

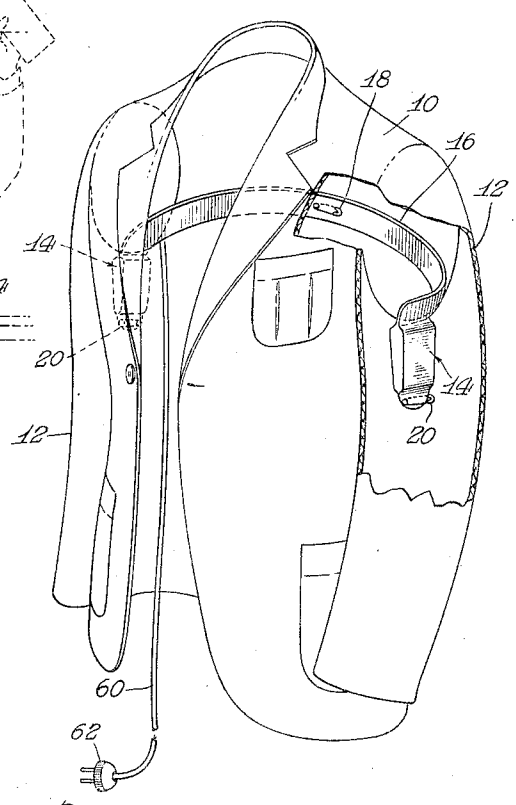


Fig. 3.

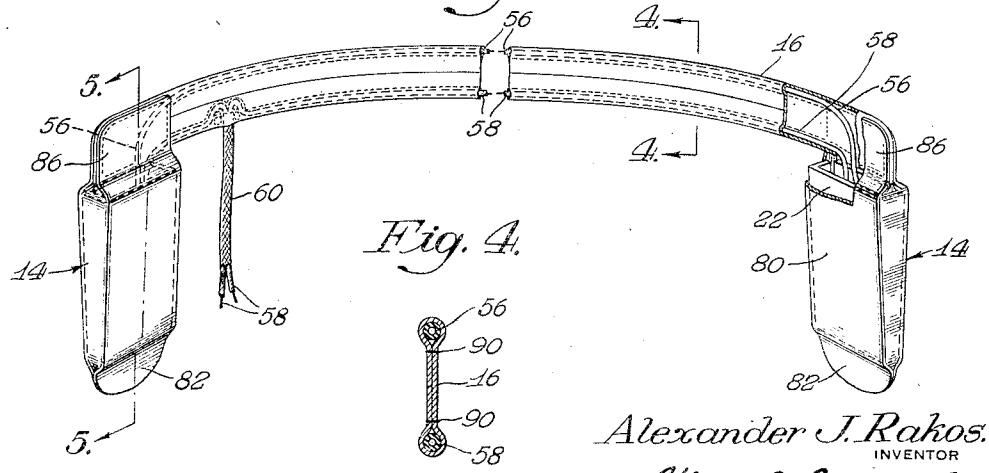


Fig. 4.

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Fig. 5.

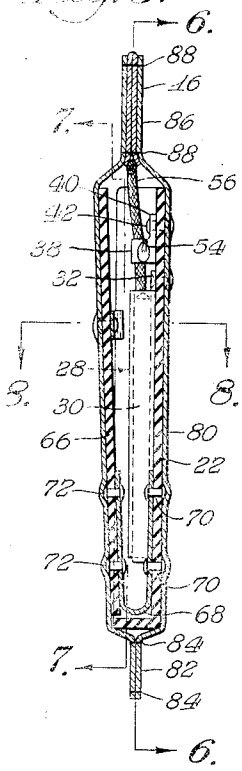


Fig. 6.

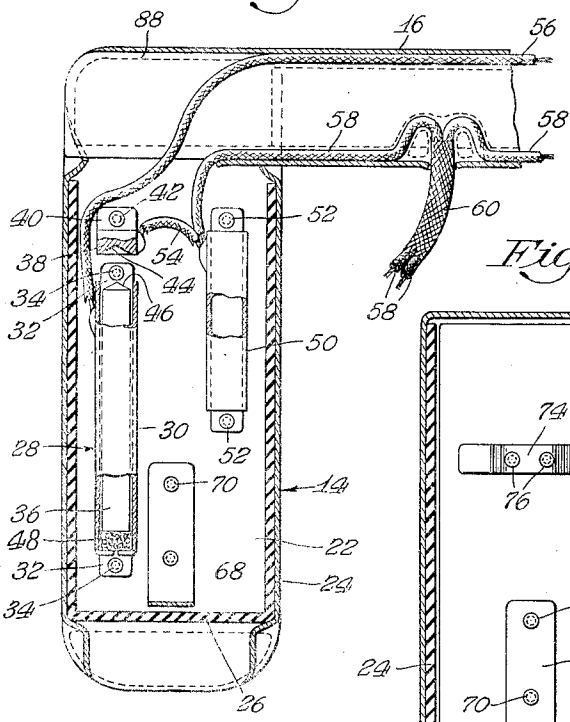


Fig. 7.

Fig. 8.

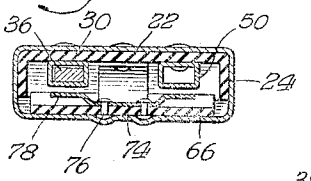
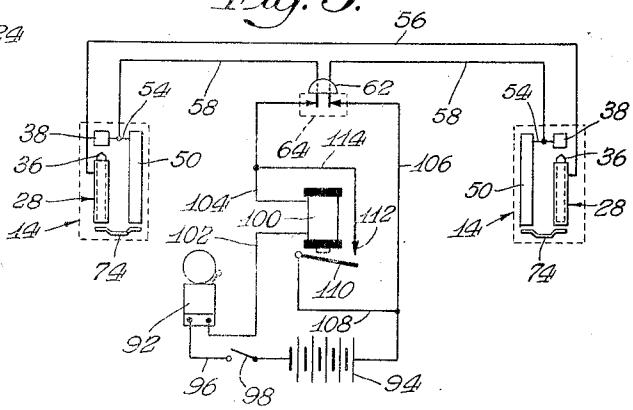


Fig. 9.



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UNITED STATES PATENT OFFICE

2,106,658

ALARM SYSTEM

Alexander J. Rakos, Chicago, Ill.

Application June 11, 1936, Serial No. 84,756

2 Claims. (Cl. 177—314)

My invention relates to electric alarm systems, and has among its objects and advantages the provision of improved switch mechanism for secretly setting the system in operation.

An object of my invention is to provide alarm circuit actuating switch means which may be carried on the person and so related to that person that the switch means may be actuated without use of the hands or without bodily movements which betray the fact that the alarm has been given or that the switch means is carried on the person.

A further object is to provide circuit closing means which is automatically actuated when the operator lifts his arms to a predetermined angle in response to the command "hands up" by a person with criminal intent.

Another object is to provide an alarm circuit in which novel means is employed for preventing the alarm from being accidentally set in operation, and in which means is provided for maintaining a closed circuit once the switch means has been actuated by the operator.

Another object is to provide an electric circuit in which a novel gravity actuated and pressure responsive switch combination is employed, whereby the circuit may be closed by merely raising the arms or by pressing the arms against the body or by raising one arm and pressing the other arm against the body.

In the accompanying drawings:

Fig. 1 is a perspective view illustrating the manner in which the actuating mechanism is carried on the person;

Fig. 2 is a perspective view of a garment with the actuating mechanism attached thereto;

Fig. 3 is a perspective view illustrating the switches detached from the garment;

Fig. 4 is a sectional view along the line 4—4 of Fig. 3;

Fig. 5 is a sectional view along the line 5—5 of Fig. 3;

Fig. 6 is a sectional view along the line 6—6 of Fig. 5;

Fig. 7 is a sectional view along the line 7—7 of Fig. 5;

Fig. 8 is a sectional view along the line 8—8 of Fig. 5; and

Fig. 9 is a diagrammatic view of the circuit.

In the embodiment selected to illustrate my invention, I make use of a garment 10 which is conventional and may be worn on the person in the usual way, as indicated in Fig. 1. Within the sleeves 12 and adjacent the arm pits thereof I mount switch devices 14, which are carried by a strap 16 pinned to the inner side of the garment at 18. The switch devices are pinned to the sleeves at 20.

Switch devices 14 are identical in construction and operation, so that the description of one will apply to both. Referring to Figs. 5 to 8, inclusive, the switch device 14 illustrated therein comprises a box having a supporting wall 22, side walls 24, and an end wall 26. These walls are formed of insulating material and are preferably connected as a unit. Upon the wall 22 I mount a gravity operated switch 28 comprising a tube 30 rectangular in cross section and provided with ears 32 riveted to the wall 22 at 34. Tube 30 is formed of conductive material and encloses a gravity responsive contact 36 of conductive material. The contact 36 is so proportionally related to the tube 30 as to be freely movable therein, but to have good electrical contact therewith.

Fig. 6 illustrates the normal position of the switch devices 14, at which time the upper end of the contact 36 is arranged in spaced relation with an abutment contact 38 having an ear 40 riveted to the wall 22 at 42. Abutment 38 is provided with a recess 44 into which the tapered end 46 of the contact 36 drops when the arm is lifted sufficiently far to cause the contact 36 to drop. The tapered relation between the abutment 38 and the contact 36 establishes good electrical contact. Within the lower end of the tube 30 I mount a pad 48 of resilient material for sound damping purposes when the contact 36 falls to the normal position of Fig. 6.

A companion contact 50 is riveted to the wall 22 at 52 in spaced relation with the tube 30. A conductor 54 electrically connects the abutment 38 with the contact 50, while a conductor 56 electrically connects the tubes 30 in the two switch devices 14 (see Fig. 9). Wires 58 comprise the cord 60 in Fig. 1, which is provided with a conventional plug 62 for connection with the usual wall outlet 64. One of the wires 58 is connected with the contact 50 of one switch device 14, while the other wire 58 is connected with the contact 50 of the other switch device 14.

Each wire 58 is connected with one of the wires 54 so that the wires 58 are also connected with the abutments 38. It will thus be seen by reference to Fig. 9 that the switch devices 14 are connected in series and that the circuit may be closed only by actuating both switch devices. Such actuation may be attained by merely shifting the position of the devices to a sufficient de-

gree to cause the contacts **36** to move into contacting relation with the abutments **38**.

Means is also provided for closing the circuit by pressing the switch devices **14** between the arms and the body of the operator. To this end a cover **66** is movably connected with the wall **22** by a U shaped spring member **68**. One leg of the U shaped member is riveted at **70** to the wall **22** while the other leg is riveted at **72** to the cover **66**. Cover **66** is made of insulating material and is normally held in slight angular relation with the wall **22**, as illustrated in Fig. 5. To the inner face of the cover **66** I mount a contact strip **74** for bridging the tube **30** and the contact **50** when the cover is pressed in the direction of the wall **22** against the tension of the spring **68**. Rivets **76** connect the contact strip **74** with the cover **66**, and its ends **78** are distorted out of the normal plane of the strip so as to engage the contact **50** and the tube **30** upon slight movement of the cover **66**.

Each switch device **14** is enclosed within a cover **80** of resilient material such as rubber, which cover includes overlying parts **82** stitched together at **84** for defining a flap for the pin **20**. Similarly, the cover **80** is extended at **86** to overlie the strap **16** and secured thereto by stitching **88**. In Figs. 3 and 4, I illustrate the wires **56** and **58** as being housed within the strap **16**. This strap may be bent back over the wires **56** and **58** and stitched together at **90** for holding the wires in place.

In Fig. 9, the alarm is indicated generally at **92**, and the source of current at **94**. Signal **92** may be either of the audible or visual type, or a combination of both. A wire **96** connects the signal with the battery **94**, which wire may be provided with a switch **98**. The relay **100** is connected with the signal **92** by a wire **102** and also with the wall outlet **64** by a wire **104**. A wire **106** connects the wall outlet **64** with the battery **94** while a wire **108** connects the wire **106** with an armature **110** arranged in operative relation with the relay **100**. This armature is moved into electrical contact with a contact **112** when the relay is energized. Contact **112** is electrically connected with the wire **104** by a wire **114**.

The signal **92** is actuated when the switch devices **14** are turned about their transverse axes sufficiently far to bring the contacts **36** into engagement with the abutments **38**. Thus, the alarm is set in operation when the person is commanded to raise his arms, as shown in Fig. 1. In connecting the switch devices **14** in series I provide a circuit in which accidental actuation of the system is prevented since the switch devices **14** require coordinating movement of the arms. When once the circuit is closed, the relay **100** operates to maintain a closed circuit through the signal **92**.

Should the operator become aware of a holdup, before the command "hands up" is given, the signal may be set in operation by merely pressing the arms against the body for shifting the covers **66** to bridge the tubes **30** and the contacts **50**. Such pressure may be imparted to the switch devices **14** without betraying any bodily movement indicative of any warning intent on the part of the operator. Similarly, the signal may be set in operation by raising one arm and pressing the other arm against the body.

While I have illustrated the switch devices **14** as being attached to the garment **10**, the devices may be strapped to the arms. In such cases the strap **16** will perform no function other than as a housing for the wires **56** and **58**. Thus, the switch devices **14** may be attached to the person regardless of the use of any particular garment.

The switch devices **14** are relatively small in proportion and are so shaped as to permit free and easy arm movement. The devices are light in weight and are not apparent to the eye when mounted in the manner described.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. In an alarm system, the combination of an alarm circuit including an alarm device, switch supporting means for connection with the arms of an operator, a pair of gravity responsive switches carried by said switch supporting means and connected with said alarm circuit, said gravity responsive switches being closed when the operator's arms are raised, to close said alarm circuit, and a pair of pressure operated switches carried by said switch supporting means between the operator's body and arms, to be closed when the operator's arms are pressed against the body for closing the alarm circuit in the open position of the gravity responsive switches, the pressure responsive switch on one arm being connected in series with the gravity responsive switch on the other arm so that the alarm circuit will be closed when either arm is raised and the other arm pressed against the operator's body.

2. In an alarm system, the combination of an alarm circuit including an alarm device, switch supporting means for connection with the arms of an operator, a pair of gravity responsive switches carried by said switch supporting means and connected with said alarm circuit, said gravity responsive switches being closed when the operator's arms are raised, to close said alarm circuit, a pair of pressure operated switches carried by said switch supporting means between the operator's body and arms, to be closed when the operator's arms are pressed against the body for closing the alarm circuit in the open position of the gravity responsive switches, the pressure responsive switch on one arm being connected in series with the gravity responsive switch on the other arm so that the alarm circuit will be closed when either arm is raised and the other arm pressed against the operator's body, and means for maintaining the alarm circuit closed upon momentary closing of said alarm circuit by two of said switches.

ALEXANDER J. RAKOS.