United States Patent [19]

Mann et al.

[11] **3,886,537**

[45] **May 27, 1975**

[54] **ALARM BOOTH**

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[52] **U.S. Cl.** **340/304**; 340/272; 340/274

[51] **Int. Cl.** **G08b 21/00**

[58] **Field of Search** 340/304

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Attorney, Agent, or Firm—Edelson and Udell

[57] **ABSTRACT**

A booth having an entrance door and being otherwise totally enclosed with a fire alarm call box mounted inside to one wall. Electrical switches actuated by weight on the booth floor and closing of the booth door cause the booth door to be automatically locked for a pre-set time interval upon the ringing of the fire alarm. After elapse of the pre-set time interval, unless the door lock has already been deactuated by fire or police department personnel arriving at the booth, the door automatically unlocks to release the person inside. Means are described to insure door unlocking in the event of power or component failure, and a local alarm and system test means are provided. Under conditions of no power failure, the booth door must be closed with the alarm sender inside the booth or the fire alarm cannot be actuated.

6 Claims, 8 Drawing Figures

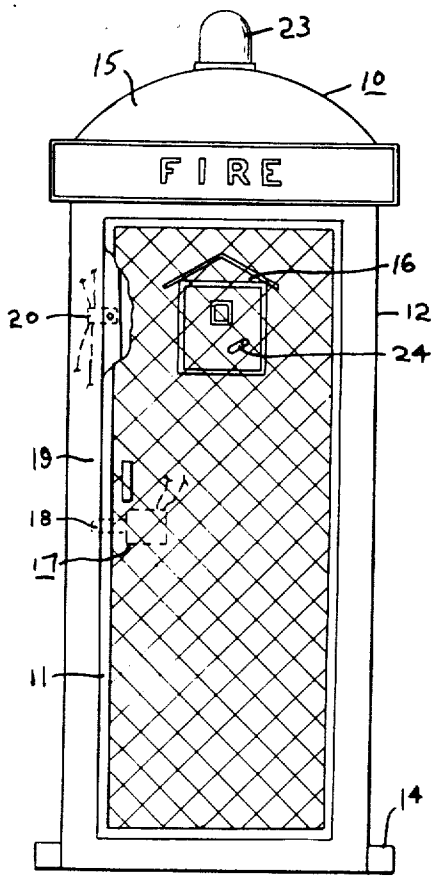


FIG. 1

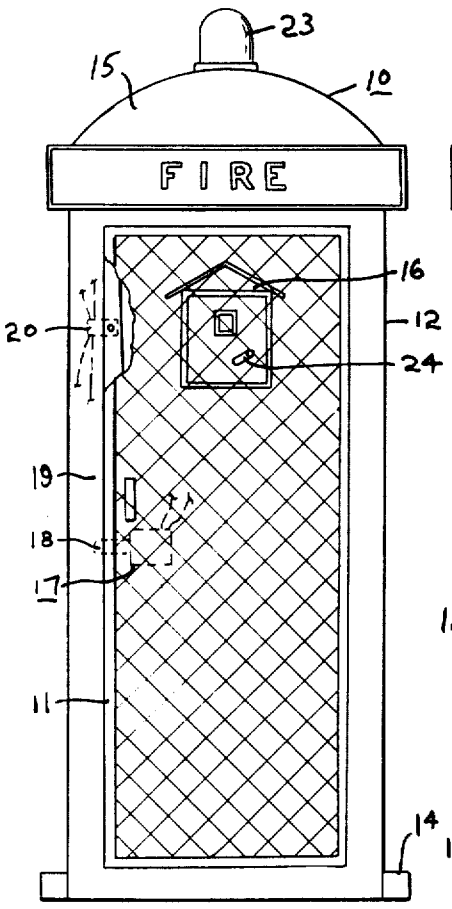


FIG. 2

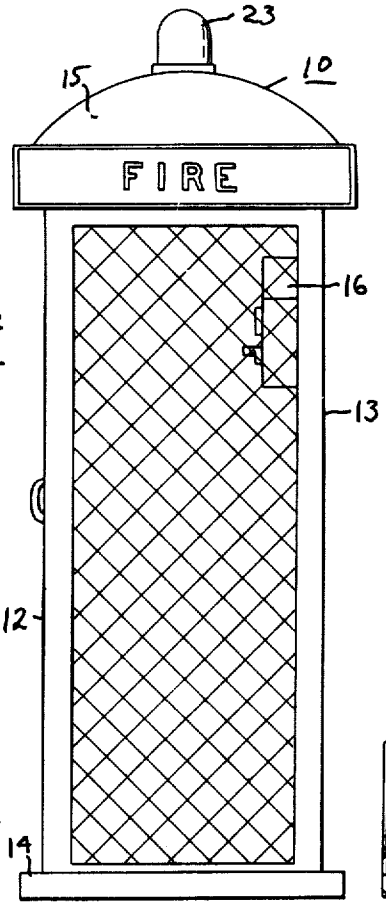


FIG. 3

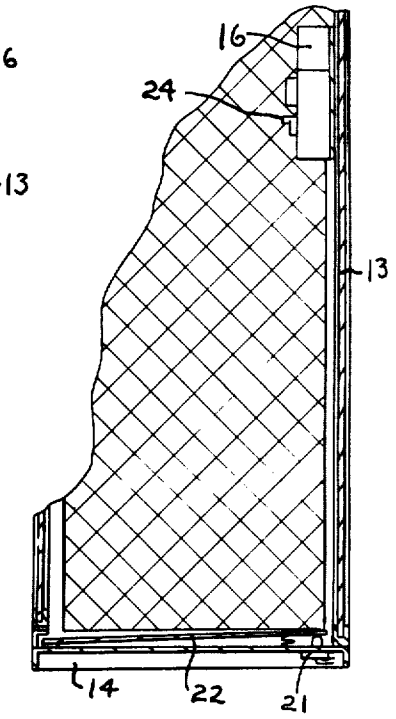


FIG. 4

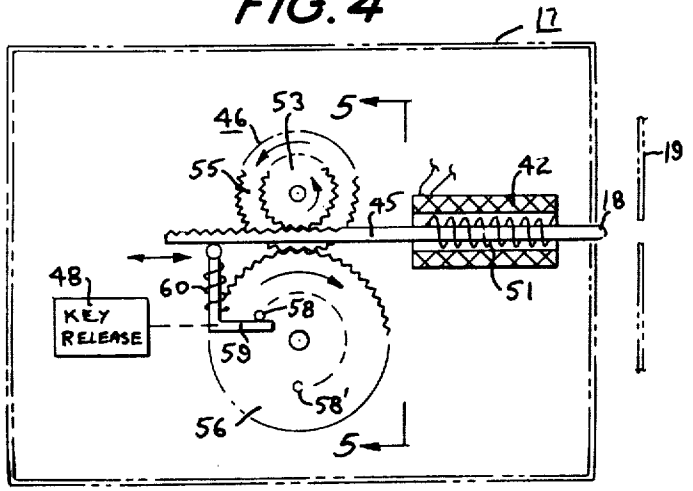


FIG. 5

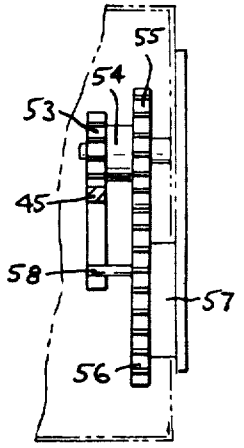


FIG. 6

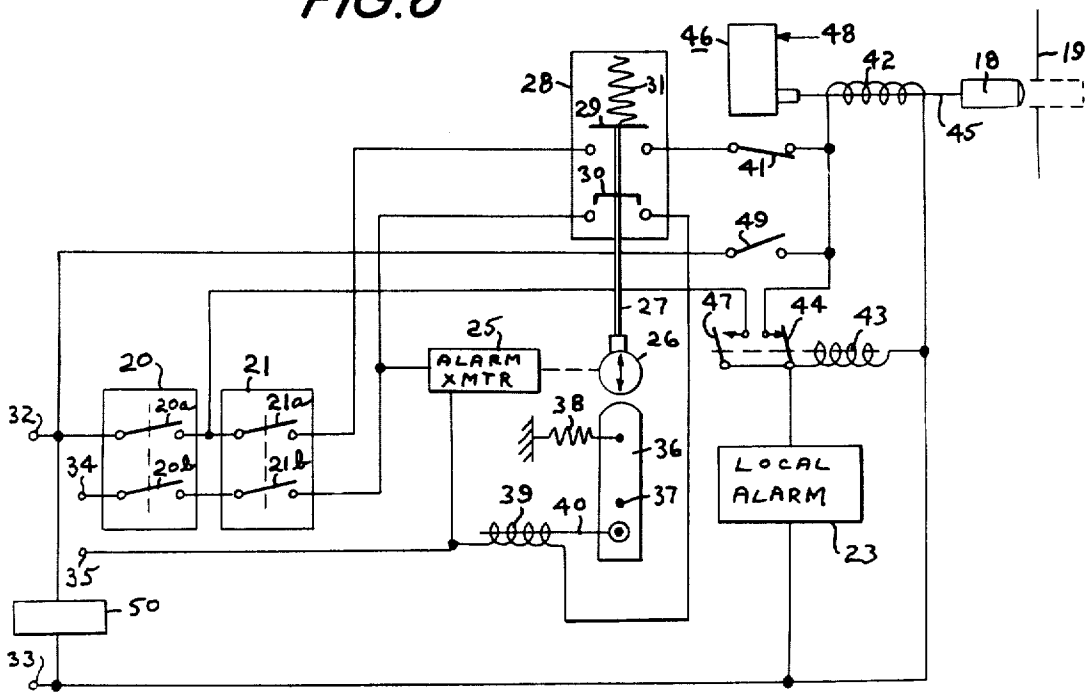

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42
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ALARM XMTR
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21
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20a
21a
36
34
20b
21b
LOCAL ALARM
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37
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23
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33

FIG. 8

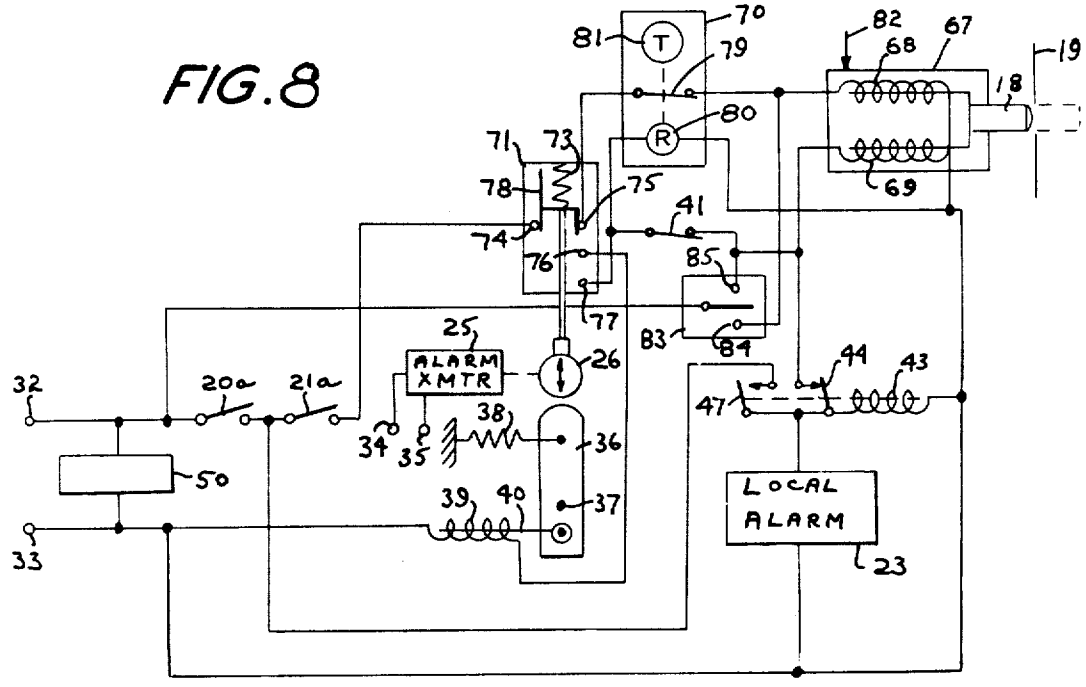
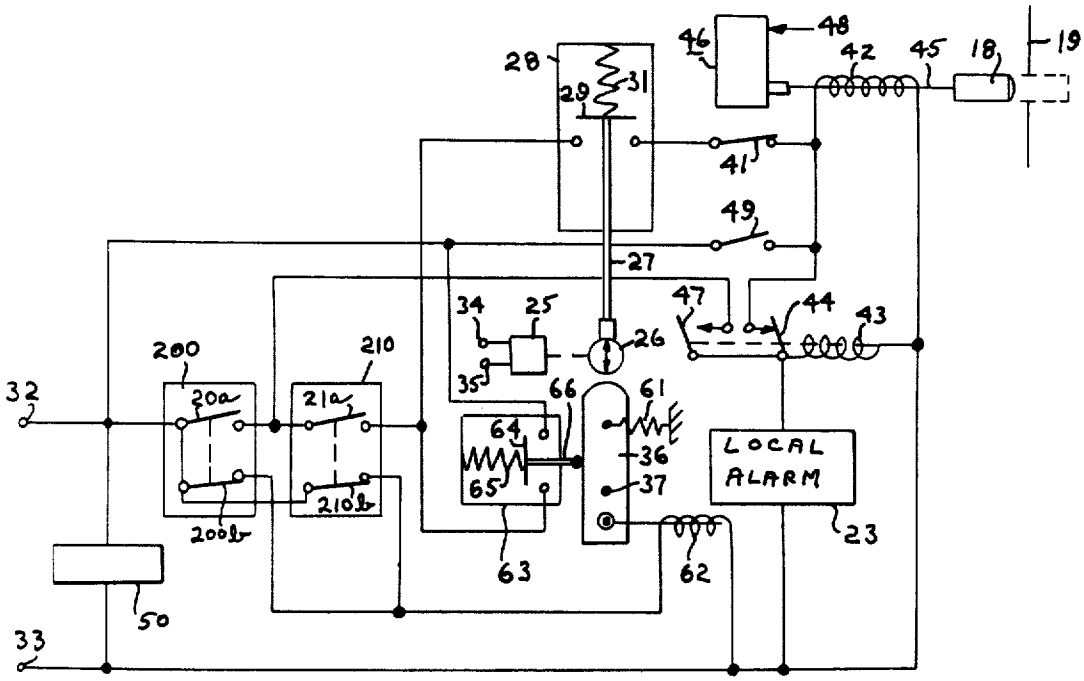

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ALARM XMTR
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20a
21a
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36
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37
LOCAL ALARM
33
23

FIG. 7


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200
210
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20a
21a
35
66
61
64
36
65
37
LOCAL
ALARM
200b
210b
63
62
23
50
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ALARM BOOTH

This invention relates generally to alarm systems, and more particularly is directed toward fire alarm systems in which a known problem is that of the sending of false alarms resulting in the unnecessary dispatch of fire fighting equipment attended by the high costs incurred and the unavailability of the equipment at other locations where a real fire may require its presence.

Under present circumstances, fire alarm call boxes are located at various points in an open environment such that an alarm may be rung in by unknown persons who then quickly depart from the scene and are not apprehendable. The present invention is directed toward changing the environment of the fire alarm call box so that a person turning in a fire alarm must of necessity remain at the fire alarm call box for a pre-determined minimum length of time which is normally sufficient for fire fighting equipment or a police car to arrive at the location of the fire alarm call box for instruction as to the location of the fire.

This objective is accomplished by locating the fire alarm call box inside a booth which is so equiped that under normal circumstances it is necessary for a person wishing to call in a fire alarm to first step inside of the booth and close the door. Only then can the fire alarm be actuated, and simultaneously with such alarm actuation, the door to the fire alarm booth becomes immediately locked and a local alarm is actuated at the booth to call attention to the fact that an alarm has been rung in. The door of the booth remains locked for a predetermined length of time and is then automatically unlocked to release the person in the booth.

The automatic unlocking of the booth door is an important aspect of the invention and provides two functions. Firstly, it is unlikely that anyone would be willing to enter a booth to turn in a fire alarm in the case of a real fire if the person understood that indefinite detention inside the booth would be the consequence. Moreover, it would always be possible that a malfunction in the fire alarm signal equipment might occur so that no alarm in fact was rung into the central control point and there would be no knowledge whatever that someone had been locked into a booth at some particular location. The possible adverse legal and medical consequences of such an event are apparent and constitute the major reasons why indefinite detention type alarm booths have never gained acceptance despite the fact that such a concept has been put forth for almost a century.

Additionally, the present invention provides an alarm booth door locking mechanism which while power actuated is capable of automatic unlocking in the event that an electrical power failure should occur after the locking mechanism had been actuated, so that under no circumstances may a person be detained in the alarm booth more than a pre-determined length of time. Once it is understood by the general public that release from the alarm booth is a certainty after a predetermined time interval, as for example five or six minutes, there will be little reluctance for members of the public to turn in a fire alarm when necessary. On the other hand, with the foreknowledge that temporary detention in the alarm booth is a certainty, there will be a great deterent effect exerted upon those persons who are prone to turn in false alarms since they will understand that they would necessarily be apprehended and subjected to the penalties of the law for their action.

It is a principal object of this invention to provide a novel alarm booth as aforesaid for temporarily detaining a person who causes an alarm to be rung so that the proper authorities have time to reach the alarm booth before release of the person detained there.

Another object of the invention is to provide a novel alarm booth in which it is a necessary pre-condition to the sending of an alarm that a person enter the booth and completely close the booth door.

Yet another object of the invention is to provide a novel fire alarm booth as aforesaid wherein in the event of an electrical power failure the detention mechanisms associated with the alarm are rendered inoperative and the alarm system remains operative so that an alarm may still be called in.

The foregoing and other objects of the invention will become clear from a reading of the following specification in conjunction with an examination of the appended drawings, wherein:

FIG. **1** is a front view of an alarm booth according to the invention within which is mounted a fire alarm call box;

FIG. **2** is a side view of the alarm booth shown in FIG. **1**;

FIG. **3** is a view similar to FIG. **2** but with portions of the booth structure sectioned away to disclose some of the operative mechanism;

FIG. **4** shows an electromechanical door lock and release mechanism;

FIG. **5** is a view of the door lock mechanism shown in FIG. **4** as would be seen when viewed along the line **5—5** thereof;

FIG. **6** is a schematic diagram of a control system for the alarm booth according to the invention;

FIG. **7** is a schematic diagram of a modified form of control system according to the invention; and

FIG. **8** is a schematic diagram of a third control system according to the invention.

In the several figures, like elements are denoted by like reference characters.

Turning now to the figures, and considering first FIGS. **1, 2** and **3,** there is seen a fire alarm booth designated generally as **10** having a front door **11,** side walls **12,** a back wall **13,** a support base **14** and closed top **15.** Mounted inside the booth to the back wall **13** is a conventional type of fire alarm call box designated generally as **16.** The booth door **11** has mounted within it a lock mechanism **17** which includes a shiftable bolt **18** that is seatable when extended in an appropriate cooperating recess in the door jamb **19** of the booth **10.** Also associated with the door jamb **19** is a door actuated electrical switch **20** which is operated in one way when the door **11** is opened and is operated in a different way when the door **11** is closed.

Similarly, as best seen in FIG. **3,** an electrical switch **21** is carried in the booth support base **14** and is actuated by the weight of a person stepping inside the booth upon the vertically deflectable booth floor **22.** The movement of the floor **22** to cause actuation of the floor switch **21** may be made so slight as to be substantially imperceptible to a person entering the booth. Carried by the booth top **15** is a local alarm **23** which may be either an audible or visual alarm or both and which is rendered operative when the fire alarm is rung in.

The fire alarm call box **16** is provided with an alarm actuating handle **24** which when pulled downward

causes the fire alarm transmitter inside the box to send out a coded signal designating which particular alarm box the incoming call emanates from. The alarm transmitter is designated in the schematic showing of FIG. **6** as **25**, and is caused to transmit when the mechanically linked vertically reciprocable operator **26** is moved downward by actuation of the alarm handle **24**. The mechanism is such that the operator **26** remains in its downward position once it has been actuated for a pre-determined length of time sufficient to enable the alarm transmitter **25** to transmit several cycles of its coded message, the operator **26** then automatically moving upward to its unactuated position.

The schematic of FIG. **6** discloses a circuit which provides a fail safe type of fire alarm transmission together with automatic release of the alarm sender from the alarm booth after a pre-determined time interval, and draws no electrical current until such time as an alarm is rung. Physically engaged with the operator **26** is the actuating arm **27** of a switch assembly **28** having two normally closed switches **29** and **30** which are held in their open circuit condition against the bias of loading spring **31** by virtue of engagement of the actuating arm **27** with the operator **26**. When the operator **26** moves downward in order to transmit an alarm, the spring **31** of switch assembly **28** drives the actuating arm **27** downward to thereby sequentially close the switches **29** and **30** with the switch **30** being the first to close.

In series with the switch **29** of switch assembly **28** are the normally opened switches **20*a*** and **21*a*** of the door switch assembly **20** and floor switch assembly **21** respectively, and in series circuit with the switch **30** of switch assembly **28** are the normally open switches **20*b*** and **21*b*** of the door switch assembly **20** and floor assembly switch **21** respectively. If desired, the floor switch **21** may be omitted. Switch **20*a*** is also connected to one terminal **32** of a source of electrical energy such as the normally available 120 volt alternating current of most municipal power supplies, the other terminal of the power supply being that designated as **33**. Switch **20*b*** of door switch assembly **20** is connected to one terminal **34** of the source of electrical power used to energize the fire alarm transmitter **25**, and which is usually an independent source of power maintained by the fire department and which will remain operative even in the event of a failure of the normal municipal power supply, the other terminal of the alarm transmitter power supply being designated **35**.

An interference member **36** is so positioned with respect to the vertically shiftable operator **26** that the operator **26** cannot be pulled downward to the bottom of its travel position in order to actuate the alarm transmitter **25** unless the interference member **36** is physically shifted to an unobstructing position. The interference member **36** is pivotable about pivot **37** against the action of spring **38** so that its upper end moves to the right into a position of non-interference with operator **26** by energization of solenoid **39** which pulls the solenoid plunger **40** to the left. Energization of the solenoid **39** to shift the interference member **36** can only occur when both the door switch **20** and the floor switch **21** have been closed and the alarm actuating handle **24** has thereafter been pulled downward.

The interference member **36** is so positioned with respect to the operator **26** that limited downward movement of the operator **26** can take place before it encounters the interference member. To this end, switch **30** of switch assembly **28** is arranged to close within the range of limited downward movement of the operator **26** so that a completed electrical circuit from the power source **34–35** through solenoid **39** is established through closed switches **20*b***, **21*b***, and **30**. Energization of solenoid **39** pivots the interference member **36** to the right to permit continued downward movement of the operator **26** to the point where the alarm transmitter **25** is tripped. The electrical circuit for the alarm transmitter **25** is also completed through switches **20*b*** and **21*b***.

In order for the foregoing sequence to occur so that an alarm is transmitted, it is clear that floor switch **21** and door switch **20** must both have been closed. Closure of floor switch **21** occurs when a person wishing to ring in an alarm walks into the booth and exerts pressure downward on the deflectable booth floor **22** by virtue of the person's normal body weight. The alarm at this point can still not be rung because the door of the booth must also be closed in order to close door switch **20**. Consequently, not only must a person walk into the booth but must positively close the door in order to establish the conditions which will permit the alarm transmitter **25** to be activated by permitting the interference member **36** to be moved out of the way of the operator **26**.

As operator **26** is moved downward to first close switch **30** it will be observed that this switch closing action occurs by movement of the switch actuating arm **27** downward under the influence of spring **31**. The action of spring **31** continues the downward movement of actuating arm **27** so that switch **29** closes just prior to or simultaneously with the actuation of the alarm transmitter **25**. Since door switch **20** and floor switch **21** are already closed, power flows from source **32–33** through switches **20*a***, **21*a*** and **29**, through normally closed key switch **41**, through door lock solenoid **42**, and through relay coil **43** and local alarm **23** via a set of normally closed relay contacts **44**.

Energization of the door lock solenoid shifts the solenoid plunger **45** to the right thereby causing door lock bolt **18** to be engaged in the bolt opening of door jamb **19**, as shown in dotted line, and simultaneously winds a mechanical timer designated generally as **46**. The mechanical timer **46** holds the solenoid plunger in its bolt locking position against the urging of a plunger return spring (not shown in FIG. **6**) until such time as the timer has timed out and thereby releases the solenoid plunger **45** for retraction of the door locking bolt **18** provided that the door lock solenoid **42** has previously been de-energized.

Door lock solenoid **42** will normally have previously been de-energized because alarm transmitter operator **26** only remains in its downward shifted actuating position for a preset length of time sufficient for the alarm transmitter **25** to transmit several cycles of its identifying code, the operator **26** thereafter returning to its upward unactuated position and thereby shifting switch actuating arm **27** upward to open switches **29** and **30**. The opening of switch circuit **29** of course de-energizes door lock solenoid **42**. However, the locking bolt **18** is not at that time retracted because the timer **46** will not have as yet timed out. Generally, the time set for the mechanical timer **46** will be a time just somewhat longer than the time normally required for police or fire department personnel to reach the scene of the alarm booth.

Energization of the relay coil **43** causes the normally open relay contacts **47** to close prior to the opening of normally closed relay contacts **44** to thereby establish a holding circuit for relay coil **43** from the source of electrical power **32–33** via closed door switch circuit **20*a***. The initial closing of switch **29** and the establishment of the holding circuit by relay **43** energizes the local alarm **23** which may, as previously described, be an audible or visual alarm such as a siren or a flashing light to call attention to the fact that an alarm has been rung in from that particular alarm booth and that someone is presently inside the booth. The holding circuit for the local alarm **23** which is established through relay contacts **47** is necessary in order to maintain the local alarm in a functioning state at such time as switch **29** opens, and to maintain the alarm in operation continuously thereafter so long as the door of the alarm booth is closed.

In due course, personnel of either the fire department or the police department arrive at the booth and can release the alarm sender from the booth by means of a key release **48** which discharges the mechanical timer **46** of its bolt retracting function. In the event that some malfunction occurs in the alarm transmitter **25** so that an alarm is in fact not received at the alarm receiving center, and no one is dispatched to the alarm booth, or if for any other reason the fire or police personnel do not reach the alarm booth before a pre-determined time for which the mechanical timer **46** has been set, as for example 6 or 8 minutes, then the timer **46** times out and releases the solenoid plunger retraction spring so that the door locking bolt **18** is automatically retracted and the booth door **11** is unlocked to permit the alarm sender to leave the booth. As soon as the booth door is opened, switch **20*a*** of course opens and breaks the holding circuit to relay **43** which immediately drops out and shuts off the local alarm **23.**

The normally closed key switch **41** is provided for testing the alarm transmitter **25** without actuating the door lock mechanism or the local alarm **23.** This is achieved simply by opening the switch **41** so that when operator **26** is shifted downward to close switches **29** and **30,** there is no power transmission through switch circuit **29** to any of the door lock solenoid **42,** local alarm **23** and relay coil **43.** When the alarm transmitter has been checked out, the switch **41** is manually restored to its closed condition and the system is rendered again functional.

Also provided is a normally open key switch **49** which connects the power source **32–33** directly to door lock solenoid **42** and relay coil **43,** by-passing switch assembly **28** altogether. Switch **49** when closed tests the operability of the door lock circuit and the local alarm **23** without transmitting a fire alarm into the alarm receiving center. When the test has been satisfactorily completed, the switch **49** is restored to its open condition.

Finally, an electrical surge protection mechanism **50** is provided at the power supply terminals **32–33** to prevent overvoltage conditions on the line, such as lightning strokes, from rendering the system inoperative.

Any suitable mechanical timer **46** may be used, and one particular form of such a device is shown in FIGS. **4** and **5** to which attention should now be directed. As best seen in FIG. **4,** the solenoid plunger **45** is disposed through the door lock solenoid coil **42** and is spring loaded by spring **51** to be in a normally retracted position. The left end of the plunger **45** is provided with teeth to form a rack **52** engaged with a pinion gear **53.** The pinion gear **53** is connected through a one way drive mechanism **54,** seen in FIG. **5,** to a driving gear **55** which latter is in turn meshed with a timer gear **56** spring loaded by spring mechanism **57.** The mechanism **54** prevents reverse drive of gear **53** by gear **55.** Fixed to and extending from the side of gear **56** is a pin **58** which is normally engaged with one arm of an L-shaped plunger **59,** the other arm of the plunger being loaded by a spring **60** in such direction as to normally drive the plunger **59** against the rack of the solenoid plunger **45.**

In the timed out state of the timer **46** as shown in FIG. **4,** the pin **58** occupies a position in which the plunger **59** is held retracted away from the rack **52** against the bias of spring **60** so that the solenoid spring **51** is enabled to retract the solenoid plunger **45.** When however the door lock solenoid coil **42** is energized, the solenoid plunger **45** is immediately shifted to the right causing the rack **52** to rotate pinion gear **53** and driving gear **55** in the direction shown through the one way clutch **54** to thereby rotate the spring loaded timer gear **56** in such a direction, as shown by the arrow, to cause pin **58** to move around the dotted circle to a position **58′** and hence to be disengaged from the plunger **59.** The loading spring **60** causes the plunger **59** to move upward into a position behind the end of rack **52** which has moved to the right so that the rack **52** cannot return to the left while the plunger **59** is in its obstructing position.

De-energization of the door lock solenoid **42** merely allows the spring **51** to shift the solenoid plunger **45** just slightly to the left until it engages the obstructing plunger **59,** it thus being restrained from further unlocking movement of the bolt **18.** As the timing spring mechanism **57** counter-rotates the timer gear **56,** the pin **58** counter-rotates about the dotted circle toward its initial position, and the gear **55** which is engaged with the timer gear **56** spins freely in disengagement from the rack gear **53** by means of the one way clutch **54.** When the pin **58** counter-rotates to a position where it engages the arm of plunger **59** and continues its counter-movement towards its initial rest position, it carries plunger **59** with it against the bias of spring **60** until the end of the plunger **59** moves outward from its obstructing position behind the rack **52** and permits the spring **51** to then fully retract the solenoid plunger **45** and locking bolt **18.**

If the fire or police personnel arrive at the booth before the timer has timed out, they may unlock the door immediately by means of the key release **48** which merely retracts the plunger **59** irrespective of the particular position of the pin **58** at that time. Of course, retraction of the plunger **59** will, as previously described, free the rack **52** and allow retraction of the locking bolt **18** by means of the solenoid spring **51.**

The system shown and described in connection with FIG. **6** is a fail safe system insofar as a failure of the municipal power supply system **32–33** does not prevent a fire alarm from being transmitted since the separately maintained alarm circuit power system **34–35** will still be functional. However, while failure of the switches **20*b***, **21*b*** and **30** is extremely unlikely, nevertheless, there is a possibility that a failure could ultimately occur in the solenoid coil **39** so that the availability of power in circuit **34–35** would still not permit an alarm to be transmitted because a failure of the solenoid **39**

would leave the interference member **36** in its interfering obstructing position with respect to the operator **26** and no alarm could be transmitted. A somewhat modified fail safe system which avoids this possibility is illustrated in the circuit of FIG. **7** to which attention should now be directed.

The fundamental philosophical difference between the circuits of FIG. **7** and FIG. **6** is that in the circuit of FIG. **7** the interference member **36** is normally biased to an unobstructing position by the action of spring **61** and is held in its interfering position only so long as solenoid coil **62** is energized to pivot the interference member **36** into obstruction position by overcoming the retracting spring bias of spring **61.** Such a system of course requires a constant electrical current drain of magnitude sufficient to energize solenoid coil **62,** and this requirement dictates a modification of the door switch and the floor switch to the configuration illustrated in FIG. **7** in which the door switch is designated as **200** and the floor switch as **210.**

The door and floor switches **200** and **210** respectively include normally open switches **20***a* and **21***a* which are identical to the same numbered switches in the door and floor switches **20** and **21** shown in FIG. **6,** and in fact these switch circuits function in the same manner. However, in place of switches **20***b* and **21***b* of the door and floor switch assemblies **20** and **21** of FIG. **6,** the door switch assembly **200** and floor switch assembly **210** of FIG. **7** are respectively provided with normally closed switches **200***b* and **210***b*. One side of each of the switches **200***b* and **210***b* is connected to terminal **32** of the power source while the remaining sides of each of the switches **200***b* and **210***b* are connected in parallel and to one end of the solenoid coil **62,** the other end of solenoid coil **62** being returned to the other terminal **33** of the power supply.

This circuit modification permits energization of the solenoid coil **62** from the power supply **32–33** through switches **200***b* and **210***b* so long as the alarm booth door is open and there is no one inside the booth standing on the booth floor. When a person enters the booth, switch **210***b* automatically opens but solenoid **62** remains energized through the parallel switch **200***b* of the door circuit. When the person who has entered the booth then closes the door thereby opening switch **200***b* the current flow to solenoid coil **62** is interrupted and the solenoid is de-energized permitting spring **61** to shift the interference member **36** into an unobstructing position so that the alarm may now be rung in.

If the alarm is in fact struck by moving the operator **26** downward then the door to the booth is immediately locked and the local alarm **23** is actuated in exactly the manner previously described in connection with the showing of FIG. **6.** It should be noted that the alarm transmitter **25** is directly connected to its normal power source **34–35** without any intervening switch mechanisms as is for example the case in the circuit of FIG. **6.** Accordingly, the circuit of FIG. **7** is usable with any presently existing alarm system and requires no modification whatever, all of the additional elements shown in FIG. **7** constituting peripheral equipment.

There is additionally shown in FIG. **7** a switch assembly **63** having a switch **64** normally closed by a spring **65** and which in fact is so closed when the interference member **36** has been moved to its non-interfering position. However, when the interference member **36** is in its operator obstructing position as shown, an actuating arm **66** causes the switch **64** to be opened against the bias of spring **65.** One side of the switch **64** is connected to terminal **32** of the power supply while the other side of the switch **64** is connected to switch **29** so that the switch **63** when closed effectively by-passes the door and floor switches **200** and **210,** and the switch **63** actuates the local alarm **23** in the event that an alarm is struck with power available from the power source **32–33** in the circumstance where the interference solenoid **62** fails.

In such circumstance, failure of the solenoid **62** causes the interference member **36** to be retracted even though the alarm booth door is opened and the floor switch has not been actuated. If the alarm is pulled, power is transmitted from the power source **32–33** through now closed switch **63** and the closed switch circuit **29** to the door lock and local alarm circuits. The door lock circuit will of course actuate the locking bolt **18** although the door will still be open and will therefore be ineffective, but the alarm **23** will be actuated and call attention to the malfunctioning state of the alarm booth mechanism.

FIG. **8** illustrates a third control circuit for the alarm booth according to the invention which is similar to the circuit of FIG. **6** in that the local alarm actuation is identical, and the operation of the interference member system is also identical excepting that energization for the solenoid coil **39** is taken from the power supply **32–33** instead of from the fire alarm transmitter power circuit **34–35.** Similarly, the door switch assembly **20** and floor switch assembly **21** shown in FIG. **6** have been simplified to single switches of the normally open type and previously described as the switches **20***a* and **21***a*.

The main difference in the circuit of FIG. **8** is in the door lock mechanism in that instead of the spring return solenoid **42** utilized in the circuit of FIG. **6,** a two coil solenoid **67** is provided in which one coil **68** is utilized when energized to open the door lock by retracting the bolt **18** whereas the second coil **69** is utilized when energized to lock the door by shifting the bolt **18** into locking engagement with the door jamb **19.** The two coil solenoid **67** is controlled by a time delay relay **70** and a control switch **71** which is actuated by the operator **26** by means of actuating arm **72** and spring **73** in the same manner as the switch **28** is actuated in the circuit of FIG. **6,** the difference being that the circuit contact arrangement of control switch **71** is different from that of the control switch **28** shown in FIG. **6.**

The control switch **71** has a power input contact **74** and three output contacts **75, 76** and **77** which latter are successively interconnected by means of a slider contact **78.** Switch output contact **75** is connected to a normally closed switch **79** of time delay relay **70,** which switch **79** connects to the lock opening coil **68** of the two coil solenoid **67.** Accordingly, when time delay relay switch **79** is in its normally closed position, as shown, the booth door will be unlocked even when a person is standing inside the booth and has closed the booth door.

When the person in the booth starts to turn in an alarm by pulling down the alarm actuating handle **24** to shift the operator **26** downward toward the interference member **36,** the first thing which occurs is that the slider contact **78** moves downward to connect switch contact **74** to both switch contact **75** and **76** and thereby cause the interference member **36** to be moved

aside in preparation for striking of the alarm. Continued downward movement of slider contact **78** interconnects switch contact **74** with output contacts **76** and **77** while at the same time disengaging from contact **75** so that the lock opening coil **68** is de-energized and inoperative. Continued contact of the slider **78** with output contact **76** maintains the interference member in its non-interfering position while the engagement with contact **77** causes timer reset mechanism **80** to open switch **79** and set the timer **81** to the preset time interval after which, when the timer times out, the switch **79** will be closed.

Energization of output contact **77** also energizes solenoid lock closing coil **69** via normally closed key switch **41** to thereby throw the bolt **18** into locked position, and simultaneously energizes relay coil **43** in the previously described manner to actuate the local alarm **23.** Accordingly, the alarm transmitter **25** transmits its coded signal while the local alarm operates continuously and the booth door is locked for the predetermined time interval. When the alarm transmitter **25** has completed its transmission cycle and the operator **26** shifts upward, the contact slider **78** is moved upward against the bias of spring **73** to the position shown in FIG. **8.** When thereafter, the timer **81** times out and closes switch **79,** lock opening coil **68** of two coil solenoid **67** will thereupon be energized and unlock the alarm booth door. The locking bolt mechanism may of course also be provided with a mechanical release mechanism indicated at **82** which is operable from the outside of the booth by someone in possession of an appropriate key.

Additionally provided for testing purposes is a center-open key switch **83** having its pole connected to terminal **32** of the power source and which is utilizable to check the actuation of the local alarm **23** and the door locking and unlocking circuit mechanism without transmitting a fire alarm by first opening the switch **41** in the manner previously described. Movement of the pole of switch **83** downward to contact **84** energizes lock opening coil **68** while movement of the pole of switch **83** to contact **85** energizes the lock closing coil **69** and the local alarm circuit.

In the event that the power available from the fire alarm power system circuit **34–35** is adequate to operate all of the equipment associated with the alarm booth multiplied by the number of the alarm booths in the system, then the power systems can be combined by connecting together power system terminals **33** and **35,** and connecting power terminal **34** of the alarm system either to power terminal **32** or to a selected control point in the system. In the circuits of FIGS. **7** and **8** this could be for example the output contact of floor switch **21***a* and the equivalent in the circuit of FIG. **6.**

Having now described the invention in connection with particularly illustrated embodiments thereof, various modifications and variations of the invention may now occur from time to time to those persons normally skilled in the art without departing from the essential scope or spirit of the invention, and accordingly it is intended to claim the same broadly as well as specifically as indicated by the appended claims.

What is claimed is:

1. A personnel detention system for holding captive a person who actuates an alarm circuit, comprising in combination,

a. a primary alarm mechanism having an actuator,

b. an enclosure within which said primary alarm mechanism is mounted, said enclosure having a door through which a person desiring to actuate said alarm may pass, and said enclosure having no other means of ingress or egress,

c. an interference mechanism normally operative to prevent operation of said primary alarm mechanism,

d. an actuatable door lock mechanism operatively associated with said enclosure door,

e. means operative to automatically deactuate said door lock mechanism and unlock said enclosure door after a predetermined time has elapsed from actuation of said lock mechanism,

f. sensing means for sensing whether or not said enclosure door is closed,

g. control means operatively coupled to said interference mechanism, to said sensing means, to said door lock mechanism and to said primary alarm mechanism effective when operated to disable said interference mechanism and permit actuation of said primary alarm mechanism responsive to sensing by said sensing means that said enclosure door is closed, and to normally actuate said door lock mechanism to lock said enclosure door when said primary alarm mechanism is actuated.

2. A system as described in claim **1** wherein said door lock mechanism includes electrically actuatable means to lock said door, wherein said sensing means comprises electrical switch means having contacts which are opened or closed as determined by the open or closed state of said door, and wherein said control means comprises electrical switch means in electrical circuit with said door lock mechanism electrically actuatable means and with said sensing means electrical switch means.

3. A system as described in claim **2** wherein said sensing means electrical switch means comprises a first switch whose contacts are closes when said enclosure door is not closed, wherein said control means comprises electrically energizable means in electric circuit with said first switch and operatively coupled to said interference mechanism, whereby, said control means electrically energizable means when energized through the closed contacts of said first switch maintains said interference mechanism operative to prevent operation of said primary alarm mechanism, and when deenergized by opening of the contacts of said first switch when said enclosure door is closed renders said interference mechanism inoperative to permit operation of said primary alarm circuit.

4. A system as described in claim **3** wherein said sensing means electrical switch means in electrical circuit with said control means electrical switch means comprises a second switch whose contacts are open when said enclosure door is not closed.

5. A system as described in claim **4** wherein said door lock mechanism is electrically actuatable and is mechanically deactuatable.

6. A system as described in claim **4** further including an actuatable secondary alarm mechanism operatively coupled to said control means, said secondary alarm mechanism being normally actuated by said control means when the latter actuates said primary alarm mechanism.

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