

Dec. 7, 1937.

L. BAYLEY ET AL

2,101,040

ALARM SYSTEM FOR DETENTION WINDOWS

Filed Nov. 19, 1930

3 Sheets-Sheet 1

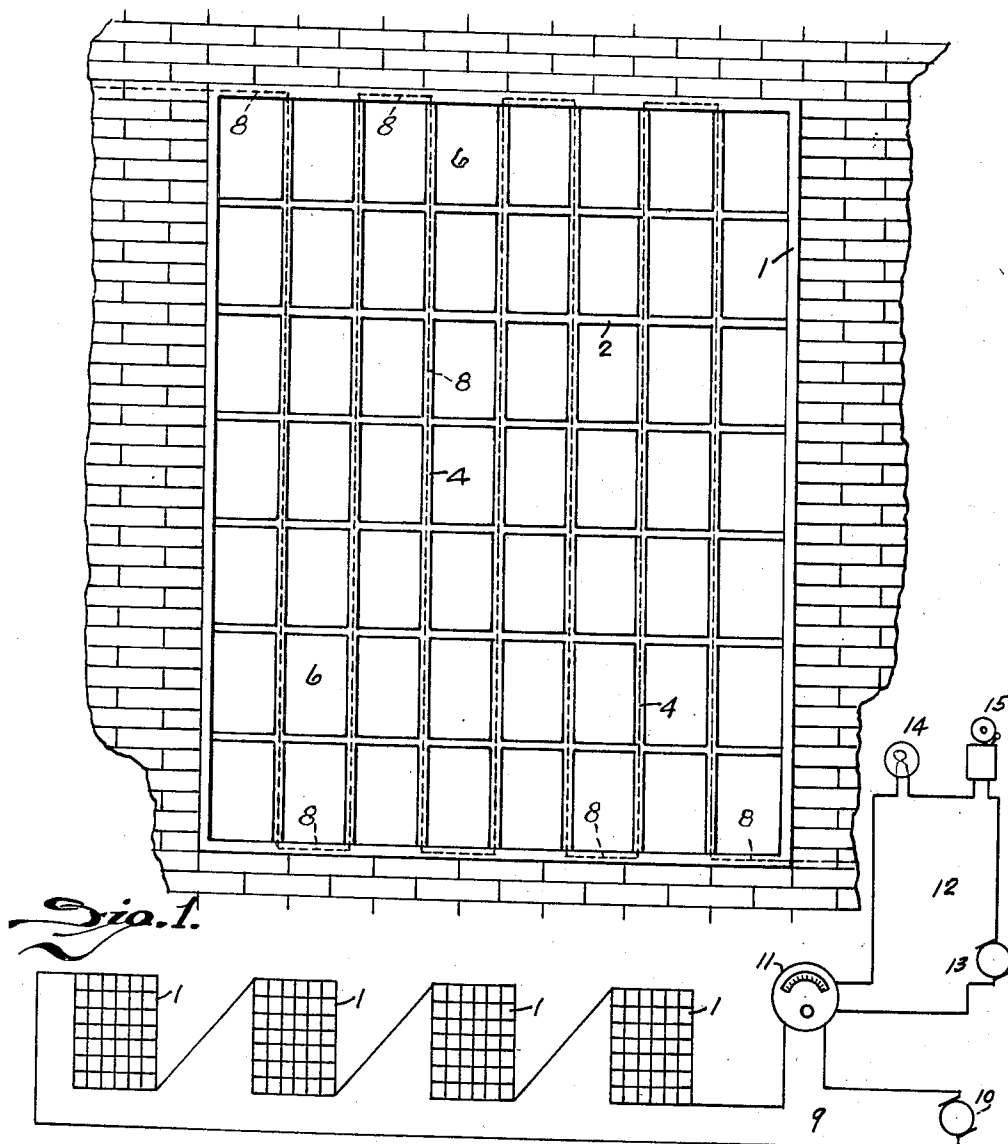


Fig. 2.

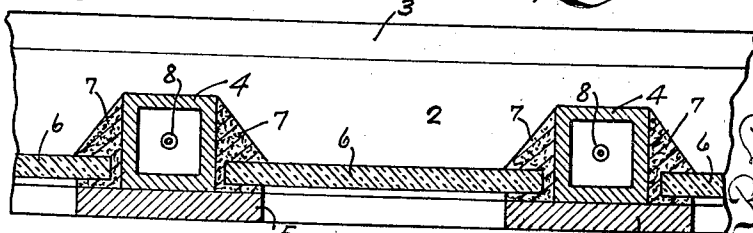
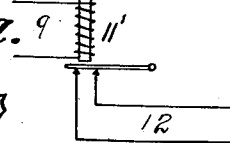


Fig. 3.

Fig. 2a.



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3 Sheets-Sheet 2

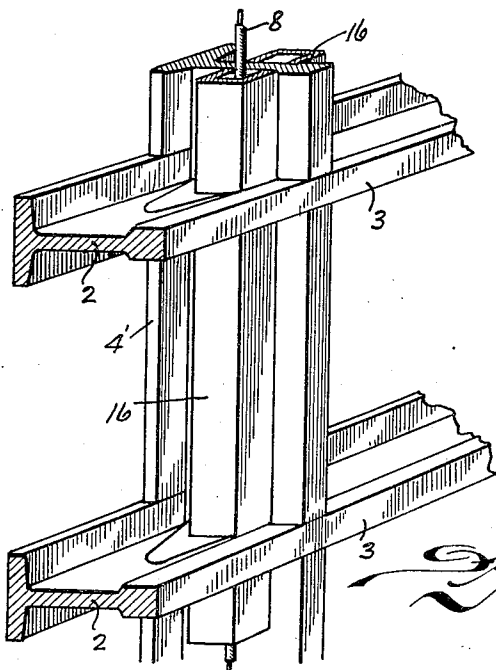
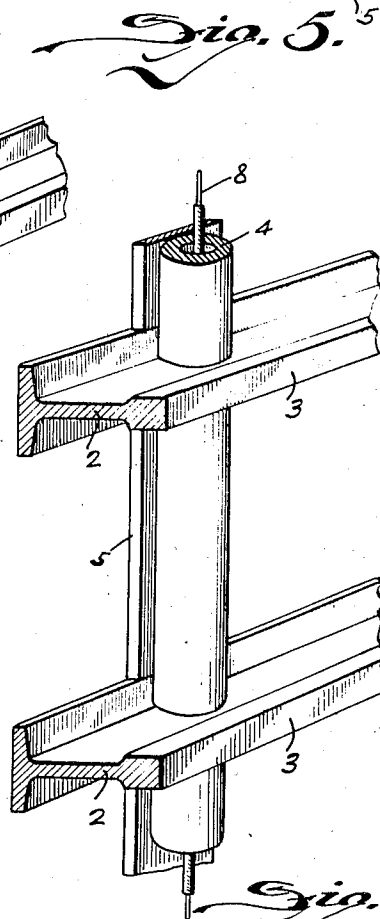
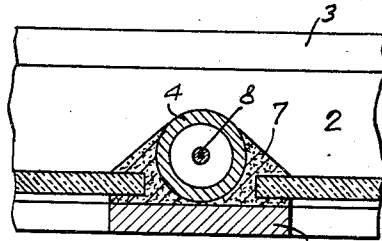
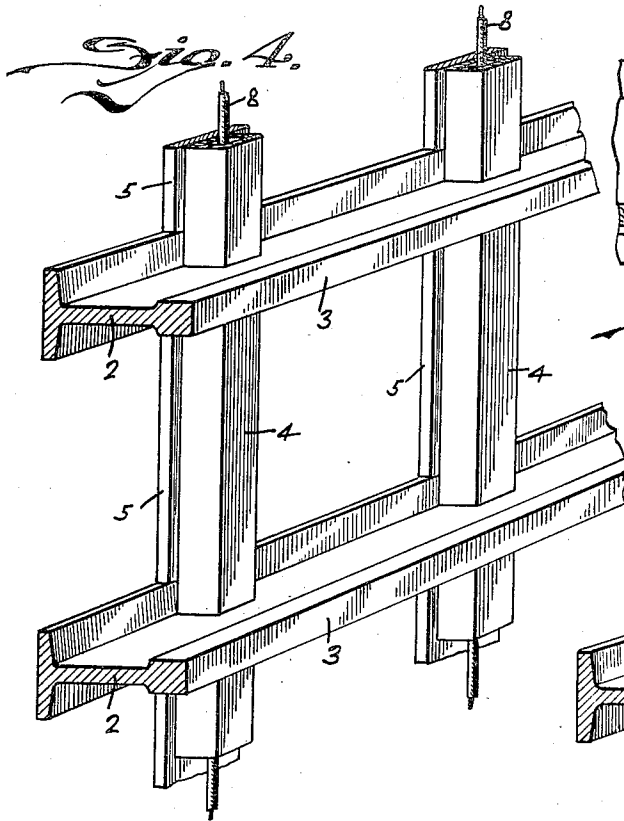


Fig. 6.

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3 Sheets-Sheet 3

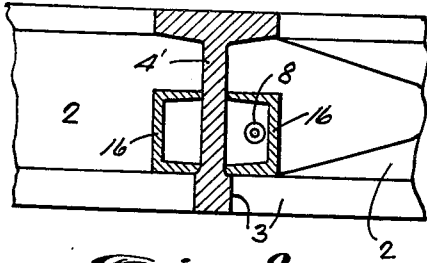


Fig. 8.

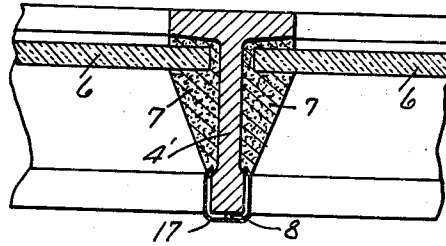


Fig. 9.

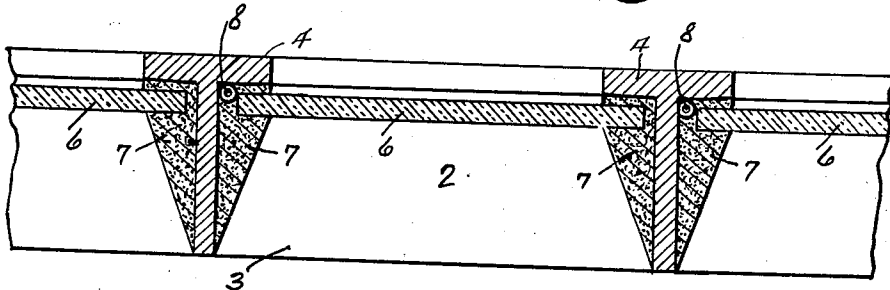


Fig. 10.

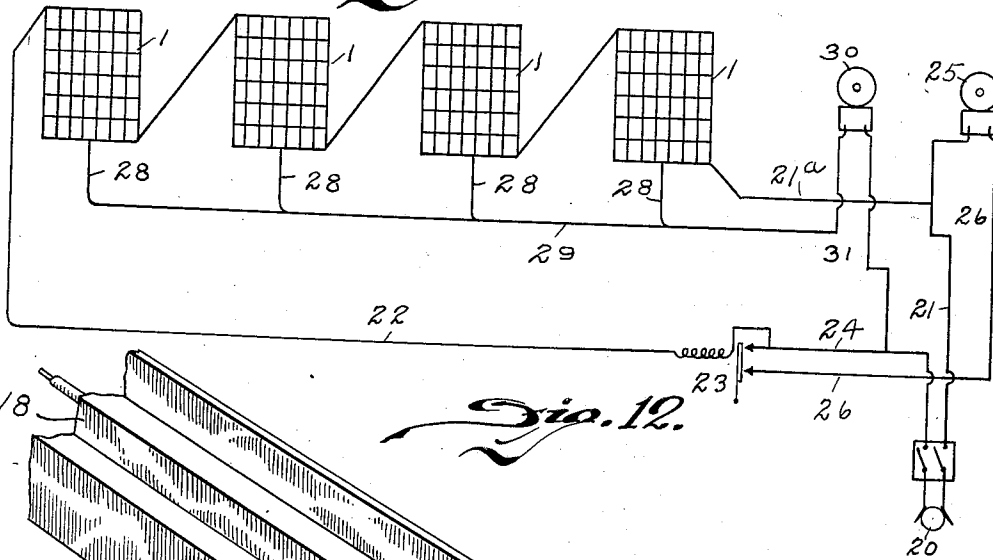


Fig. 12.

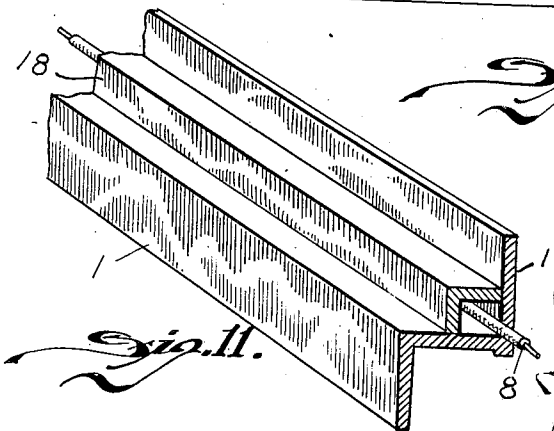


Fig. 11.

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UNITED STATES PATENT OFFICE

2,101,040

ALARM SYSTEM FOR DETENTION WINDOWS

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Application November 19, 1930, Serial No. 496,708

2 Claims. (Cl. 189—64)

This invention relates to detention or guard grilles for windows and doors of prisons, warehouses, and the like, and particularly to a concealed signal system embodied therein, whereby neither escape nor entrance can be effected by breaking or cutting the guard bars without signalling an alarm.

In the present construction a lead wire of insulated conductor of an electric circuit is enclosed and concealed in or otherwise made a part of successive bars of the grille or window structure, the circuit when energized operating through a relay to hold open, and hence inoperative, a second electric circuit containing an alarm signal, whereby in the event the first circuit is interrupted by cutting or breaking of a guard bar and the electric conductor carried thereby, or the circuit in any other manner deenergized the alarm circuit will be automatically closed by the relay and the alarm signal energized.

The object of the invention is to simplify the structure as well as the means and mode of operation of alarm systems for prisons, warehouses, and the like, whereby they will not only be cheapened in construction, but will be more efficient in operation, automatic in action, capable of being easily installed, and unlikely to become disarranged or out of repair.

A further object of the invention is to provide a signal system directly incorporated with the grille or window bar, which will be concealed and protected against tampering and injury or manipulation.

A further object of invention is to provide a form of guard grille or window structure and bar therefor adapted to receive therein the conductor wires of an electric circuit in such relation that the bars cannot be cut, broken, removed or severed without opening the electric circuit.

A further object of the invention is to provide a protective alarm system for detention or guard windows or grilles which will be automatically energized in the event of injury, breakage, removal or cutting of the window or grille bars.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation or their equivalents as hereinafter described and set forth in the claims.

Referring to the accompanying drawings, Fig. 1 is a front elevation of a detention or guard

window or grille for a prison or warehouse window adapted to prevent either entrance or escape, in which is incorporated, as diagrammatically indicated, an electrical circuit. Fig. 2 is a somewhat diagrammatic view illustrating the interconnection of a succession of detention or guard windows or grilles into a single alarm signal system. Fig. 2a is a fragmentary view of the relay circuit.

Fig. 3 is a sectional plan view, and Fig. 4 is a detail perspective view of a portion of a detention or guard window or grille, showing the relation of the component bars and the association of the insulated electrical circuit conductor therewith. Figs. 5 and 6 are similar sectional plan and detail perspective views illustrating a modification wherein round guard bars are employed in one direction in lieu of the rectangular bars shown in the preceding figures.

Figs. 7 and 8 are respectively a sectional plan view and a detail perspective view illustrating a further modification of the detention window or grille construction. Fig. 9 is a detail plan view of a further modification wherein the insulated electrical conductor is contained within a channel shaped guard clenched about the outer margin of the bar. Fig. 10 is a sectional plan view of a construction wherein the rabbeted bars receive the insulated electrical conductor in the angle of the rabbets wherein it is protected and concealed by the overlying window glass and sealing material. Fig. 11 is a detail perspective view of the protective means for the circuit wire at the top and bottom of the window structure. Fig. 12 is a diagrammatic view of a modification of the electrical circuits.

Like parts are indicated by similar characters of reference throughout the several views.

Whereas many forms of resistant windows or grilles for detention or for exclusion purposes have been devised, such as tool proof steel bars of special shapes and bulk and specially fabricated joint constructions, yet, given the means and opportunity such bars, however heavy, may be cut or broken. The present invention provides for the use of comparatively light construction of less expensive material, and relies for prevention of escape or entrance, as the case may be, not alone upon the strength of the material, but upon an alarm system so incorporated in the window structure that the grille or mullion bars cannot be cut, broken or otherwise removed without setting in operation the alarm system. In addition to its function of affording an alarm in the event an attempt is made

to cut or break the bars of the grille or window structure, the knowledge of existence of the system will have a psychological effect in discouraging attempts to break the bars or to tamper with the window.

While the present invention is primarily designed as a detention window for jails, reformatories and the like to prevent escapes, the construction will also find a wide range of application and usefulness as a protective grille or window for warehouses, and the like, to prevent unauthorized entrance.

Referring to the accompanying drawings, wherein is shown the preferred, but obviously not necessarily the only forms of embodiment of the invention, 1 indicates a window structure or grille comprising transversely arranged parallel spaced bars. The customary or standard spacing is such as to afford intermediate openings of approximately six by nine inches. While the particular shape of the bars is not essential nor material, the structure being applicable to bars of various transverse contours, in the construction as illustrated the transverse bars 2 are preferably of standard T-bar construction, affording oppositely disposed rabbets to receive window glass, the margin of the stem flange of the T-bar being preferably, though not necessarily, enlarged as indicated at 3.

In the forms of construction illustrated in Figs. 3 and 4 the vertical bars 4 of the grille or window structure 1, are of rectangular tubular form, having comparatively heavy walls. The web or stem flanges of the transverse bars 2 are provided with spaced openings through which the vertical tubular bars 4 extend. These tubular bars 4 are continuous throughout the height of the window or grille. Interposed between the transverse T-shaped bars 2 and extending parallel with the vertical tubular bars 4 to which they are preferably attached by welding, are fillers or spacing strips 5 as shown more particularly in Figs. 3 and 4 which project laterally beyond the tubular bars 4 to form lateral rabbets agreeing with and in the plane of the rabbets of the transverse T-bars 2 to receive panes 6 of window glass. These window panes 6 are cemented or puttied in place in the usual manner as indicated at 7. The side of the window or grille formed by the head flanges of the T-bars 2 and the filler or spacing strips 5 is preferably the inner side, thus disposing the tubular vertical bars 4 at the outer side and hence less accessible to a person confined behind the grille. Obviously if the sash or grille is used as a protective window for warehouses it would be turned in reverse relation with the vertical tubular bars at the inner side thereof. It is, however, quite immaterial and the sash may be turned in either direction.

Disposed interiorly of the hollow or tubular bars 4 and extending progressively through succeeding bars of the grille or window is an insulated electrical conductor 8, which forms a part of an electrical circuit 9 having its source of supply of electrical energy 10 and having contained therein a circuit closer or relay controlling a second electrical circuit. The conductor 8 is extended transversely through the frame of the window or grille alternately at opposite ends, thus making the conductor 8 continuous. Where the conductor extends parallel to the frame member of the grille, it will be protected in the same manner as when parallel to the grille or window bars. Fig. 11 shows one method of protection,

but it is understood that protection of the conductor at this point may be accomplished by any of the means herein described. A number of windows or grilles may be connected in series, as shown in Fig. 2, into a single protective circuit 9.

The insulated electrical conductor 8 is completely enclosed and concealed within or otherwise made a part of the bars of the window or grille in such a manner that no one of the bars of which it forms a part can be cut or broken without also cutting or breaking the conductor wire 8. The circuit 9 is a normally closed circuit. The breaking of the conductor 8 opens the circuit and thereby deenergizes the circuit closer or relay 11, which is normally held inoperative by the influence of the current in the circuit 9. The release of the circuit closing switch or relay 11 upon the opening of the primary circuit 9 closes an alarm circuit 12 having therein a source of electrical energy 13, and which may include one or more alarm signal devices, such as a signal light 14 or an electric bell 15. Thus the breaking or removal of the window or grille bars, and the consequent breaking of the conductor 8 contained therein automatically sets into operation the signal device 14 or 15, which may be located at some remote point.

In Figs. 5 and 6 the construction illustrated is quite similar to that shown in Figs. 3 and 4, except that the vertical bars 4 are round or cylindrical in form instead of rectangular. These bars 4 are tubular as before described, and enclose the insulated electric conductor 8. Filler or spacing strips 5 are interposed between the head flanges of the transverse bars 2 in registry with the vertical bars 4 in the manner before described.

In Figs. 7 and 8 there has been shown a standard metallic window construction, wherein the window bars may also form the detention or jail bars. These bars, extending in transverse direction, are of similar contour or cross-sectional form, and are interlocked with each other in any suitable manner. Disposed adjacent to the vertical bars 4' of the construction as illustrated in Figs. 7 and 8, are channel bars 16, within the recess of which is located the insulated electrical conductor 8. One or both of the channel bars 16 at opposite sides of the vertical bars 4' extend continuously through suitable openings in the transverse window or grille bars 2. The insulated electrical conductor 8 is disposed at only one side of the vertical window or grille bars 4', the channel bar 16 at the opposite side of the vertical bar, being but a "dummy" to effect a symmetrical appearance, and also to better conceal the insulated electrical conductor 8 since it cannot be ascertained in which of the channel bars 16 the conductor may be located. Obviously any attempt to cut, break, or otherwise remove one of the bars 4' necessarily entails the cutting or breaking of the contiguous channel bars 16 through which the conductor 8 extends, and consequently the latter will also be cut or broken, thereby opening the control circuit 9.

Instead of providing a housing or special enclosure for the insulated electrical conductor wire in the event that bars of the standard or conventional T bar type are employed, to duofunctionally serve as jail bars, and also for supporting panes of window glass the insulated electrical conductor 8 may be disposed in the

angle of the rabbets and cemented or otherwise anchored to the bar as shown in Fig. 10, where it is confined and concealed by the overlying window pane 6, and the body of cement or sealing material 7. If desired the grille or window bars 4' may be longitudinally grooved within the angle of the rabbet of the bar to form a seat to receive the conductor wire 8. When employed for jail or detention purposes the window or grille is arranged with the head flanges of the bars innermost, and the stem flanges of the bars projecting outwardly. In such position the conductor 8 is quite inaccessible to a prisoner confined behind such grille or window and could be reached only by breaking the window glass 6, which in itself would prove a "tell tale" and indicate tampering. To protect the conductor at the top and bottom of the window intermediate succeeding bars, it is extended outside the marginal frame 1 of the window structure where it is encased in a protective angle bar 18 as shown in Fig. 11.

In lieu of seating the conductor 8 in the angle of the mullion or grille bar 4' this conductor 8 may be disposed at the extreme outer margin of the bar flange 4' as shown in detail in Fig. 9, where it is enclosed in a sheet metal channel 17, clenched about the margin of the bar.

While it would be quite possible to insulate the vertical bars from each other at alternate ends, thus making the bars themselves a part of the electrical circuit, such a construction would not be practical or feasible for detention purposes since it would afford the opportunity of wiring around the bar being cut, which possibility is obviated and prevented by the construction hereintofore described wherein the conductor wire is concealed in an inaccessible position, but in continuous parallel relation with the succeeding bars.

The provision of placing the wire in the rabbet of the bar is not only economical, but possesses considerable other merit. Relays are obtainable which are exceedingly sensitive and operate upon a small fraction of an ampere of current, and hence the wires may be of high resistance and of very small diameter. When drawn tight and shellacked or cemented in the rabbet of the bar beneath the glass and putty or cement, it would be almost impossible to tap the wire by lifting it from the bar and attaching a bridging wire to shunt out of circuit a portion of the window. To prevent the short circuiting of a portion of the window by scraping the insulation from the wire at separate points and so grounding the wire on the bars so that current would be carried through a part of the structure while other bars were being cut, the system illustrated in Fig. 12 is provided, wherein each window is grounded to one side of a control circuit and if the conductor wire be grounded upon the window at any point this circuit is completed and an alarm energized.

In Fig. 12 there are shown three inter-related circuits having a common source 20 of electrical energy. In the primary circuit, current flows from one side of the generator 20 through the switch to the line 21 and 21^a to the series of windows, returning through the line 22 through the coil of the relay magnet 23 and line 24 to the opposite side of the generator. If this circuit is broken the relay 23 is deenergized and the alarm circuit is closed. In such case the current flows from the generator through the switch and line

21 to the alarm 25, returning through the line 26 to the relay switch, which being closed, the current continues through the line 24 back to the opposite side of the generator. These are in effect the same circuits as 9 and 12 shown in Fig. 2. Each window structure is grounded through a line 28 on a third circuit conductor 29 the opposite side of which circuit is common with the primary circuit and includes the lines 21 and 21^a and the wiring of the several window structures. The line 29 is connected through an alarm 30 and line 31 with the line 24 and thence to the generator. In the event that insulation is scraped from a conductor wire of the window structure whereby the wire becomes grounded on a window bar, this last described circuit is closed and the alarm 30 energized. In such case current flows through from one side of the generator through the lines 21 and 21^a to the window structures and thence through the conductors parallel with the bars until the point of contact or ground of the conductor upon the bar is reached. The current then flows through the window bars to the lead 28 and through line 29 to the alarm 30 and thence back to the generator through lines 31 and 24, thus completing the circuit and energizing the alarm.

The various circuit wires are embedded in the building walls or otherwise encased and concealed so as to be entirely inaccessible.

From the above description it will be apparent that there is thus provided a device of the character described, possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described our invention we claim:

1. A window assembly for penal institutions including a plurality of transversely disposed duofunctional muntin and detention bars T-shaped in cross section dividing the window into a plurality of spaces at least some of which are glazed and rectangular hollow bars extending adjacent to the stems of some of the T-bars, said bars cooperating with each other to prevent the escape of a human body through the window assembly.

2. A detention window assembly, a plurality of parallel bars, T-shaped in cross section and a plurality of transversely disposed bars, said bars dividing the window into a plurality of spaces some of which are glazed and a plurality of hollow bars intersecting said T-bars and extending parallel to said transversely arranged bars, said bars cooperating with each other to prevent the egress of a human body through said window assembly.

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