United States Patent [19]

Minton

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[54] **ELECTRIC SCREEN PROTECTION**

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[51] **Int. Cl.** **G08b 13/00**

[58] **Field of Search** ..... 340/273, 274, 276, 256; 200/61.08, 61.84, 61.13, 42 R, 52 R; 160/10

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[57] **ABSTRACT**

Projections having sharp edges are struck out of the peripheral frame of a screen. An electrical conductor is attached to plural projections and traverses the screen, so that a nominal physical force exerted upon the conductor will cause it to break at a sharp projection. A circuit is connected to the conductor to actuate an alarm upon the conductor being broken.

1 Claim, 4 Drawing Figures

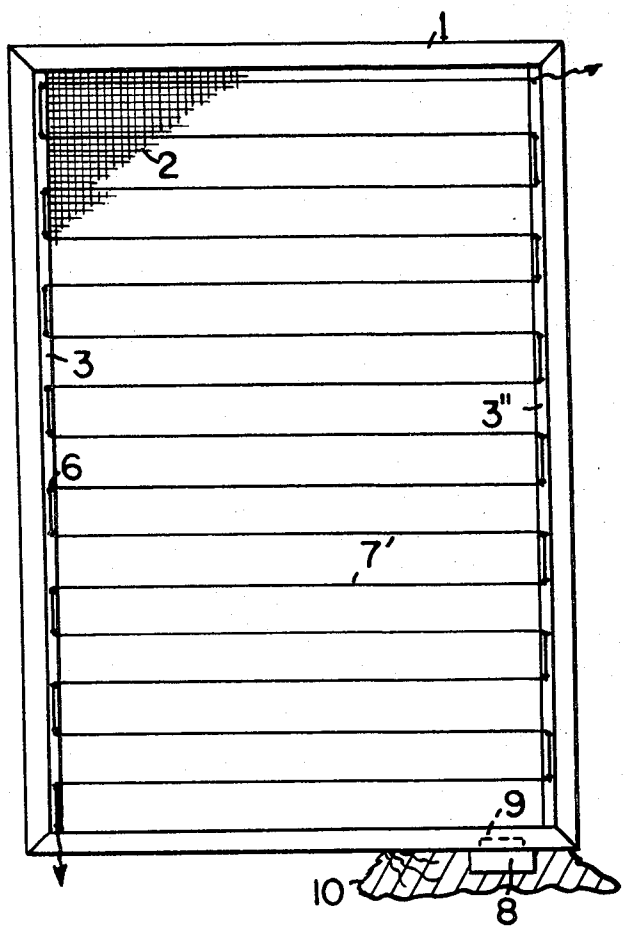


FIG. 1.

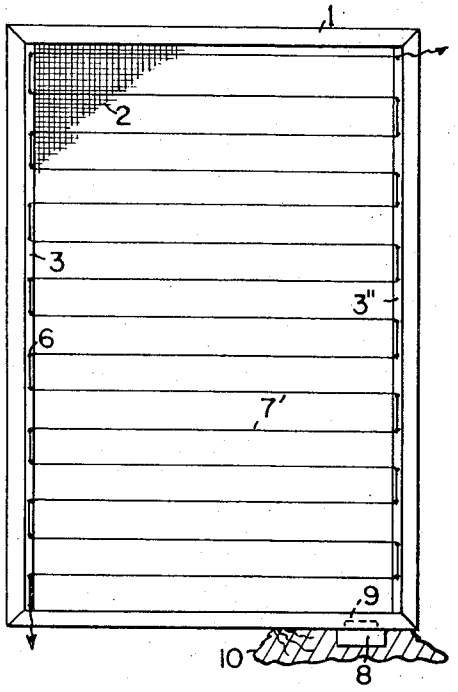


FIG. 2.

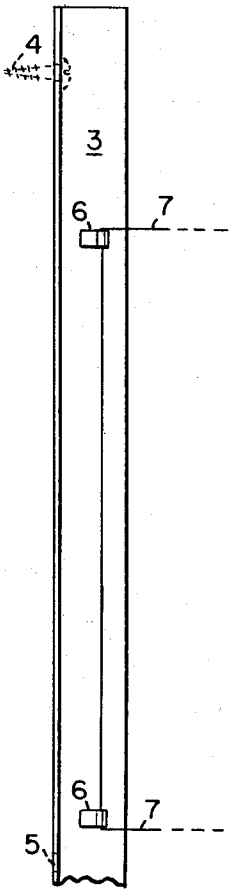


FIG. 4.

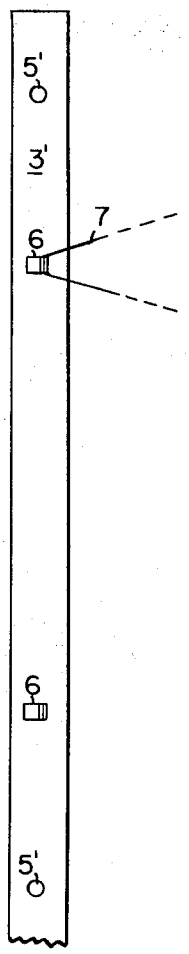
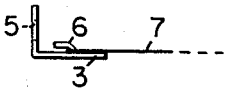


FIG. 3.



ELECTRIC SCREEN PROTECTION

BACKGROUND OF THE INVENTION

This invention pertains to intrusion alarms, and more particularly to an electrically conductive structure associated with a screen, grating, or similar closure of an opening.

The anti-intruder protection art typically employs a closed electrical circuit as the essence of the protection system. When this circuit is broken by an intruder an alarm is set off.

Prior art conductive structures have been relatively rugged, so that cutting has been required on the part of the intruder before the electrical circuit would be opened; or, an individual adjustment of wires was required to establish and maintain a non-alarm condition. Such was a relatively complicated and costly construction and one that would be difficult to maintain.

SUMMARY OF THE INVENTION

Plural relatively sharp projections are struck out of a metal or equivalent periphery associated with a screen, such as a window screen. These may be formed when a new screen-frame assembly is manufactured, the projections typically being a few inches apart along opposite sides thereof. Alternately, these projections may be formed in metal or equivalent strips, which are thereafter fastened to opposite sides of existing screen frames. For wooden frames the strip has a right-angle cross-section; for metal frames it is a narrow planar strip.

A fine wire is strung between the projections, traversing the screen, such that any tampering with the screen, even leaning upon it, will break the wire at one or more of the sharp projections and so open a normally closed burglar alarm circuit that is connected to the wire.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a front elevation of a typical completed installation.

FIG. 2 shows a plan view of a representative portion of a strip intended for fastening to a wooden screen frame.

FIG. 3 shows an end view of the same.

FIG. 4 shows a plan view of a representative portion of a strip intended for fastening to a metal screen frame.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, numeral 1 indicates a rigid frame, normally of wood or a similar material, upon which a screen 2 is stretched. This is typically a planar assembly for covering a window or an equivalent opening in a building. Suitable known means are provided for removably attaching the screen frame to the building.

In one embodiment metal strips 3 and 3'' are peripherally related to the screen by being secured to opposite inner sides of frame 1 by screws 4. The screws pass through holes 5, which are spaced on the order of 7 inches along the short side of the angle. Strips 3 may be placed completely around the frame, but such close coverage is usually not required.

Projections 6 are punched up from the material of the long side of the angle, as is best seen in FIG. 3, by means of a punch die that shears the metal on three sides and raises the tab so formed above the inner surface of the angle. The open end of the tab is formed to

be approximately parallel to the surface of the angle. No attempt is made in manufacturing to round-off the edges of the projection, since these are to cut the wire when intrusion is attempted.

A fine but insulated wire 7 is installed in a cross-work pattern as shown in FIG. 1, using the several projections. A rectilinear configuration has been shown, with the segments of the single length of the wire passing parallel across the screen. By off-setting strip 3' half the distance between projections and making a direct return of wire 7, as shown in part in FIG. 4, a diamond-like pattern can be created.

The details of the essential structure are shown in FIGS. 2 and 3. Wire 7 has a thin but tough electrical insulation on its outer surface, such as teflon, which is available from DuPont, or irradiated vinyl, which is available from the International Telephone & Telegraph Co. (ITT).

While it is desired that the wire shall be severed by physical stress caused by an attempted intrusion, it is not desired that electrical connection be made at more than one place, and normally preferably none, between the wire and metal strip 3. Otherwise, electrical conduction would exist between certain parts of the whole length of wire to both strips 3 and 3'. If certain other parts of the whole length of wire were broken by intrusion electrical conduction between the ends of the whole wire would still obtain, and an alarm would not be sounded.

In an alternate embodiment, projection-carrying means 3 may be fabricated of a hard and tough plastic, such as nylon, also available from DuPont. Additionally, the nylon material may be reinforced with glass fibers, or equivalents known to the trade. The projections 6 are punched into the desired shape by means of a hot die, or the projections may be cast in the strip, which is then also cast. With this structure cross-conduction between wire 7 and strips 3 and 3' is not possible, and one break in the wire is certain to give an alarm condition.

The wholly flat embodiment of FIG. 4 is suited for application to metal-framed screens, metal-framed windows without screens, or other structures where a recess is absent.

The pattern of conductor 7 may be the same as is shown in FIG. 2. However, in FIG. 4 the configuration shown at one projection 6 is for a diamond pattern of the wire.

Holes 5' are provided at approximately every eight inches for fastening the strip to the frame involved. Metal screws, rivets, or equivalent fastenings may be used.

Aluminum may be used for the metal in the embodiment of FIG. 4, while galvanized steel is suitable for the angle embodiment shown in FIGS. 2 and 3. Hard drawn commercial copper is another suitable material. Among the plastics the nylon and equivalents previously mentioned are suitable. The flat strip is designated 3'. Stainless steel may also be used.

An auxiliary device, such as a known magnetic switch, having magnet 9 imbedded in frame 1, is also provided in the series alarm circuit. Removal of the frame from its proper place removes the magnet and allows the magnetically actuated contacts within the switch 8 to open; thus preventing an intruder from removing the whole screen and frame despite the fact

that he might arrange an auxiliary closed circuit for wire 7.

The ends of conductor 7 have been indicated with arrows in FIG. 1, for connection into the series alarm circuit. However, contact buttons may be installed on frame 1 and mating buttons upon the surrounding sill, shown in part at 10, so that upon the authorized removal of the frame, disconnection of connecting wires will not be required.

Wire 7 is useful in a range of diameters, such as from No. 26 American Wire Gauge to No. 34 (0.016 inch to 0.006 inch diameter).

Fine wire having insulation colored to blend with the screen color protected may be used where the protection is to remain a secret; conversely, large wire having contrasting colored insulation may be used where the protection is to serve as a warning to those who would break in.

The diameter of the wire may be suited to the rigor of the surroundings. For maximum protection in a favorable environment, fine wire may be used. Where certain pressures upon the wire are to be tolerated, as tree branches moving in the wind, large wire should be used.

In addition to the usual planar screen previously considered herein, the screen or surface protected by electric wire 7 may be curved, in which case the wire pattern is applied ot the outer convex surface of the screen, to be supported thereby.

I claim:

1. In a normally closed protective circuit having alarm means responsive to opening said circuit, the combination comprising;

a. a substantially planar screen frame (1) having a mesh screen (2) with wires,

b. separate strip-like projection-carrying means (3 or 3') peripherally attached to said screen frame and having a plurality of spaced sharp projections (6), few with respect to the number of said wires, and

c. a single electrical conductor (7) included in said circuit, threaded totally across but separate from said mesh screen between said projections, lying in a plane parallel to that of said mesh screen, and electrically insulated therefrom,

whereby physical displacement of said conductor causes it to be severed by at least one of said sharp projections.

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