

# United States Patent

[11] 3,596,021

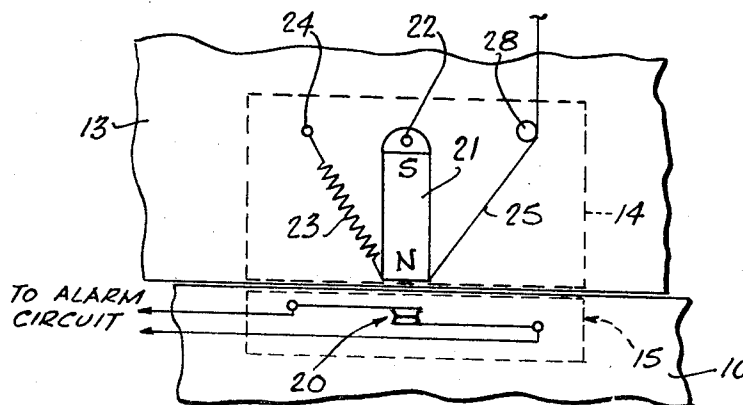
[72] Inventor **Benno Bensiyon Saul**  
5830 St. Luc, Apt. 16, Montreal, Quebec,  
Canada  
[21] Appl. No. **880,764**  
[22] Filed **Nov. 28, 1969**  
[45] Patented **July 27, 1971**  
[32] Priority **Dec. 2, 1968**  
[33] **Canada**  
[31] **036,658**

[56] **References Cited**  
**UNITED STATES PATENTS**  
920,123 5/1909 Fawcett..... 340/276  
2,526,206 10/1950 Dolan..... 200/61.93  
**FOREIGN PATENTS**  
1,089,075 12/1967 Great Britain..... 335/205

*Primary Examiner—Robert K. Schaefer*  
*Assistant Examiner—M. Ginsburg*  
*Attorneys—Peter Kirby and Charles P. Curphey*

[54] **BURGLAR ALARM OR THE LIKE**  
5 Claims, 4 Drawing Figs.  
[52] U.S. Cl..... **200/61.93,**  
335/205  
[51] Int. Cl..... **H01h 3/02**  
[50] Field of Search..... 200/61.93;  
335/205, 206; 340/276, 213

**ABSTRACT:** A magnetically operated switch is embedded in a frame member of a window or door, and is operable by the proximity of a magnet mounted on a cooperating movable member, thus detecting bodily movement of the movable member. The magnet is pivotable and arranged to operate the switch if it is displaced from its normal position. It is spring-urged away from normal position, but held therein by a cord extending across the face of a panel of the movable member, so that interference with such panel will actuate the switch and give an alarm.



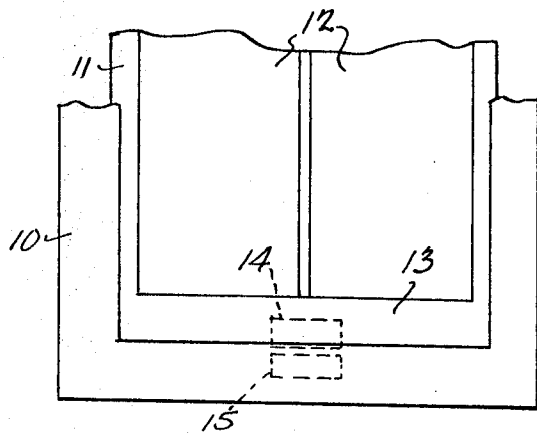


Fig. 1.

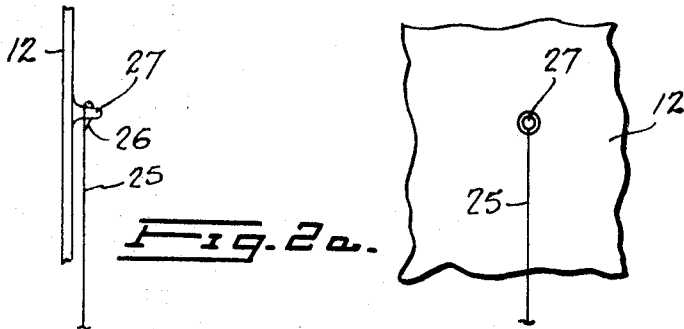


Fig. 2a.

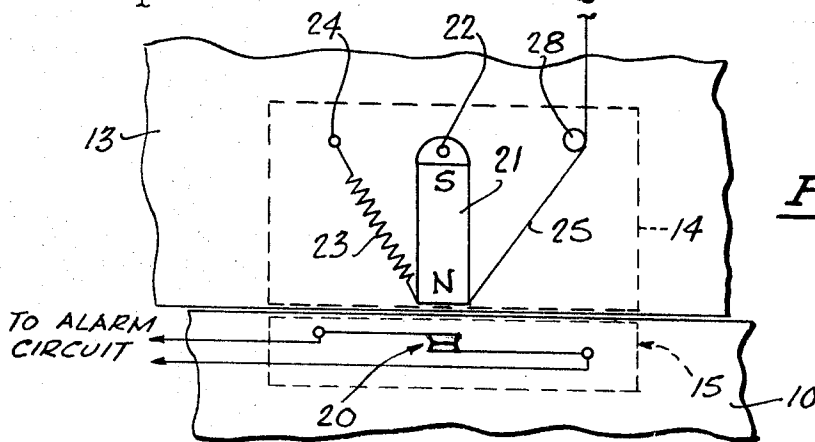


Fig. 2.

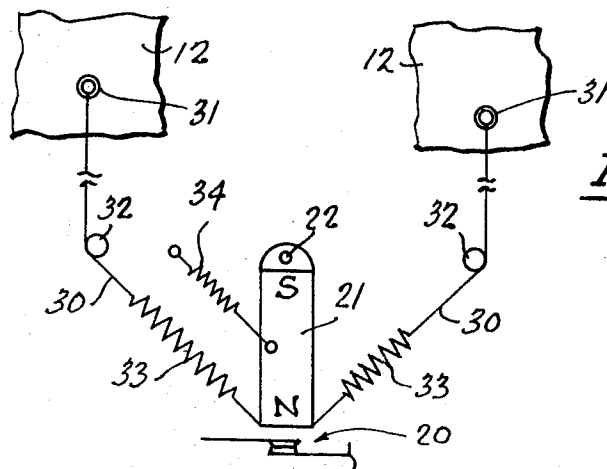


Fig. 3.

**BURGLAR ALARM OR THE LIKE**

This invention relates to improvements in detection systems, and in one form is more particularly directed towards a burglar alarm system for providing protection to areas of buildings having relatively movable parts, such as windows, doors and the like.

In its specific form, the invention is directed towards an improvement in a window protection device for the detection of intrusion into a building through such window, or an unauthorized escape from the building.

It is already well known to mount a magnetically operated reed switch on one section of a window assembly and to position a small permanent magnet on a second section of the window assembly, such sections being moved relatively to each other between a pair of conditions, i.e. open and closed. For example, the switch may conveniently be mounted on the fixed window frame, while the magnet is mounted on the window itself, these magnetically cooperating components being so located on these fixed and movable sections of the window assembly, respectively that, when the window is closed, the magnet lies closely adjacent the switch as to cause it to be actuated by the magnetic field. This switch can be wired into an alarm system that is sensitive to release of the switch, so that an opening movement of the window, resulting in the movement of the magnet away from the switch, triggers the alarm system.

One drawback of this type of device, however, is that it provides no protection against the glass of the window being broken or having a portion cut out of it. In other words, such a device is only operable to trigger the alarm when the window is itself bodily moved, whereas in practice it may well be possible for an intruder to cut a sufficient section out of the window to gain entry to the building.

The object of the preferred form of the present invention is to provide an improvement in a device of the general type described above, which has the added feature of detecting such a cut in the glass, even though there is no relative movement of the window sections themselves. It is a further object of the present invention to achieve this improved operation without sacrifice of the normal operation, namely detection of relative movement of the window sections.

Examples of the invention are illustrated diagrammatically and by way of example in the accompanying drawings. It is to be understood that such illustration of the invention is given by way of example in the only and not way of limitation of the broad concepts of the invention, which latter are defined in the appended claims.

In the drawings:

FIG. 1 is a fragmentary view of a window assembly, indicating a typical location for a device of the present invention;

FIG. 2 is a cutaway view illustrating the principal components of a first embodiment of the invention;

FIG. 2a is a fragmentary side view of the upper part of FIG. 2; and

FIG. 3 shows an alternative to FIG. 2.

FIG. 1 serves merely to indicate a typical location for a device according to the present invention, without attempting to show any details thereof. This drawing shows a sash-type window frame 10 in which a window 11 is vertically slidable, the window having panes of glass 12 in the usual way. The magnet assembly to be further described below can conveniently be embedded in the lower horizontal member 13 of the window, as indicated by the broken lines 14 while the cooperating switch assembly, as indicated by the broken lines 15, can conveniently be located in the fixed frame 10 at a location immediately adjacent the magnet assembly 14, at least when the window is in the closed condition shown. As will be readily apparent, if the window 11 is moved up to open condition, the assemblies 14 and 15 become remote from one another, so that the magnet will no longer have any effect on the switch.

Alternatively, the same concept can be applied to a casement-type window or to a door, and indeed to any structure having a pair of relatively movable sections, where such movement is to be detected and where one of such sections includes a portion susceptible to interference, e.g. a glass pane or a door panel.

FIG. 2 shows the components of an arrangement according to the invention. Magnetically operated switches are conventional and the switch 20 has therefore only been shown in diagrammatic form in this figure. Such switch 20 is located adjacent one pole of a permanent magnet 21 which thus serves to close the contacts of the switch 20 under this proximity condition. The magnet 21 is pivotally mounted on the member 13 at 22 and is urged for clockwise rotation by a stressed tension spring 23, one end of which is attached to the free end of the magnet 21, while the other end is secured to the member 13 at 24. The magnet 21 is prevented from pivoting, however, by a tension element in the form of a cord 25 that is also attached to the magnet's free end but at a location to act in opposition to the spring 23. The cord 25 is extended around a post 28 to a loop 26 at its remote end (FIG. 2A), such loop being hooked over a fixed member 27 which may for example be a suction cup secured to a typical window pane 12.

If an intruder attempts to cut or break the glass, the tension in the cord 25 will be lost and the magnet 21 will be allowed to rotate clockwise about its pivot 22, thus moving it away from the switch 20 a distance sufficient to ensure that it will no longer act thereon to hold the contacts closed. Such contacts will accordingly open and trigger the alarm circuit.

The cord 25 can conveniently be a very fine nylon or similar strong cord which will be almost invisible. Aesthetically it will be much more pleasing than the ugly heavy tapes that are now commonly placed on window panes to protect them against intruders. Moreover, it will facilitate cleaning of the glass by comparison to such tape construction since the cord 25 can readily be removed from the member 27, subject, of course, to first turning off the alarm circuit. This arrangement can also be installed much easier and more quickly than the tapes.

The foregoing remarks assume that breaking or cutting of the glass will cause loss of tension in the cord 25. It is also possible that such interference will produce an increase in the tension, which effect will be seen to act similarly to open the switch 20 by drawing the magnet counterclockwise against the action of the spring 23. In other words, it is not merely a loss of tension, but any appreciable variation in the tension cord 25 to which the system is sensitive.

FIG. 3 shows an alternative construction in which a pair of cords 30 extend from suction cups or like fixings 31 secured to a pair of panes 12 or to two different areas of a single pane 12, to extend around posts 32 and be connected to opposite sides of the free end of the magnet 21 which is pivoted as before at 22, stressed tension springs 33 being interposed between the cords 30 and the free end of the magnet 21. In this construction, if the balance between the tensions in the two cords 30 is upset, either by release or increase of tension in one or other of the cords, the magnet will be moved one way or the other out of its central, switch-operating position to release the switch 20.

If desired, to cater for the possibility that tension may be lost simultaneously in both the cords 30, there can be employed a small biasing spring 34 connected to urge the magnet 21 for rotation in either chosen direction away from its central position. The lack of symmetry that this biasing spring represents, can readily be absorbed during normal operation, by providing for a slightly greater tension in the cord 30 acting on the other side of the magnet 21, or by providing for some compensating asymmetry in the strengths of the two springs 33.

While the embodiment described shows the switch contacts closed by the effect of the magnet, the magnet-induced actuation could take the form of an opening of the switch contacts.

I claim:

- 1. In a structure having a pair of sections relatively movable with respect to each other between two conditions, and in which a first of said sections includes a portion susceptible to interference; a system for detecting such relative movement and for detecting such interference, said system comprising: 5
  - a. a magnet
  - b. means mounting said magnet on said first section to be movable between at least two positions thereon.
  - c. a magnetically operable switch mounted on the other of said sections at a location closely adjacent said magnet 10 when said magnet is in a first of its said positions for actuation of said switch by said magnet when said sections are in the first of said conditions and for release by said magnet when said sections are in the second of said conditions, 15
  - d. resilient means connected to said magnet to provide a first force acting thereon to urge said magnet to a second of its said positions, in which second position said switch is released even when said sections are in said first condition, and 20
  - e. such further means connecting to said magnet for providing a balancing force on said magnet to hold it in its first position against the action of said first force,
  - f. such further means comprising a tension element extending from said magnet to said susceptible portion for 25 sensing interference therewith and for representing such interference as a variation of tension in said element with consequent unbalancing of the forces acting on the magnet and movement of the same away from its first position to release said switch. 30
- 2. The structure of claim 1, wherein said tension element comprises a fine cord and said portion susceptible to interference is a fragile panel to which an end of said cord remote from the magnet is connected. 35
- 3. The structure of claim 1,
  - g. wherein said magnet is movable between three positions,

40

45

50

55

60

65

70

75

- said first switch actuating position being a central position, and
- h. wherein the other two positions are located on opposite sides of such central position whereby decrease of tension in said element allows the magnet to move to its said second position while increase of such tension moves the magnet to its third position, in which third position said switch is released even when said sections are in said first condition.
- 4. The structure of claim 1 further including
  - g. a second tension element extending to an area of said susceptible portion spaced from that to which the first-mentioned tension element extends,
  - h. said resilient means being connected between one side of the magnet and one of said tension elements,
  - i. and a second resilient means connected between the other side of the magnet and the other said tension element,
  - j. said first position of the magnet being a central position consequent upon substantially balanced forces being exerted on said magnet by said two resilient means, said second position of the magnet being displaced in one direction from said central position,
  - k. and said magnet having a third position displaced in a opposite direction from said central position, in which third position said switch is released even when said sections are in said first condition, movement of said magnet to one of said second and third positions resulting from unbalance in a respective direction of the forces exerted on said magnet by said two resilient means consequent upon variation of tension in at least one of said tension elements.
- 5. The structure of claim 4, further including
  - 1. third resilient means biasing said magnet to one of said second and third positions, upon simultaneous and equal release of tension in said tension elements.