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(71) Applicant: SECURISTYLE LIMITED
Regent House Clinton Avenue
Nottingham Nottinghamshire(GB)

(72) Inventor: Buckley, John Edward
12 Hillview Lane Twining
Tewkesbury Gloucestershire(GB)

(74) Representative: Grundy, Derek George Ritchie et al,
CARPMAELS & RANSFORD 43, Bloomsbury Square
London WC1A 2RA(GB)

(54) **Improvement in or relating to hinge assemblies.**

(57) A hinge assembly for pivotally mounting a door or window particularly applicable to friction supporting stays in which the window pivots on the stays bodily outwards.

The stay has a track 10 and a pivoted strut 16 which moves outwardly as the window opens. The track 10 carries one element 30 of a switch (e.g. a magnetic switch) and the strut 16 carries the other element 29. At one end of the fixed track 10 is mounted a burglar alarm or radio transmitter operable by the opening of the window which separates elements 29, 30.

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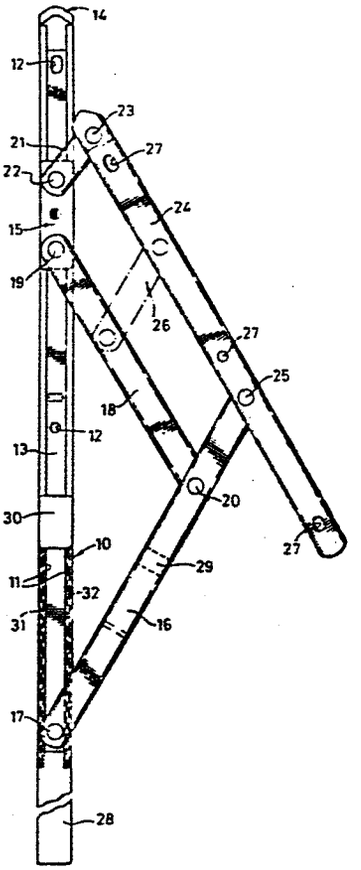
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"Improvements in or relating to hinge assemblies"

The invention relates to hinge assemblies of the kind used for pivotally mounting a door or window. The invention is particularly, but not exclusively, applicable to friction supporting stays for windows of the kind where, as the window pivots on the stays, the axis of pivoting of the window sash moves away from the window frame so that when the window is open both sides thereof are accessible from one side of the window frame.

It is often required, in burglar alarm systems, for the system to be triggered when the window is opened. For this purpose the normal practice is to provide sensors or switch operating elements on two co-operating parts of the window sash and fixed frame, separation of the sensors or elements as the window is opened being arranged to trigger the alarm system, the main circuitry of which may be mounted adjacent the window or at a remote location. Such an arrangement has the disadvantage that the sensors or switch elements must be correctly installed on the window sash and

frame and then electrically connected with the rest of the burglar alarm circuitry. Not only does this often require professional installation, but the possibility of slight error in positioning the elements can lead to the risk of inadvertent triggering of the burglar alarm system, giving a false alarm, due for example to slight movements of the window.

The present invention sets out to provide the incorporation of at least part of a burglar alarm system within a window or door hinge so that the correct relationship between the sensors of switch operating elements may be set during manufacture so that installation of the hinge assembly in the normal manner automatically provides the burglar alarm triggering system or, in a preferred embodiment, a complete burglar alarm for the window itself.

According to the invention, therefore, there is provided a hinge assembly, for pivotally mounting a door or window, comprising at least two components which move relatively to one another as the hinge is operated, and wherein there is mounted on the assembly electric burglar alarm circuitry, or a portion of such circuitry, which is rendered operable by movement of said components to a predetermined relative position or range of positions.

The burglar alarm circuitry mounted on the hinge assembly may include an aural and/or visual warning

device so that the unit is self-contained. Alternatively, the circuitry may be adapted for operative connection to a separately mounted aural and/or visual warning device or to control circuitry controlling such a device.

The burglar alarm circuitry mounted on the hinge assembly may include switch means actuated by sensors or actuating elements on one or both of said relatively moveable components.

The invention is particularly applicable to friction supporting stays, for windows, of the kind comprising a track for mounting on the window fram , a slider moveable along the track, a strut pivotally connected to the track, a brace pivotally connected between the slider and the strut, a link pivotally connected to the slider, and a bar, for mounting on the window sash, pivotally connected to the link and to the strut. In this case the sensors or actuating elements may be mounted on the track and strut so that the switch means are actuated by movement of the strut out of the closed position where it overlies the track.

Preferably the burglar alarm circuitry is incorporated in a module which is detachably mounted on the hinge assembly. In the case of a friction supporting stay of the kind referred to above, the module may be detachably mounted on one end of the track.

The following is a more detailed description of an

embodiment of the invention, reference being made to the accompanying drawing which is a plan view of a friction supporting stay for a window, shown in a partly opened position.

The supporting stay is basically of a known kind and comprises a channel-sectioned track member 10 having longitudinal in-turned flanges 11. The track member is, in use of the stay on a side-hung window, normally secured horizontally to the window frame, two stays being provided at the top and bottom respectively of the window frame. In the case of a top-hung window the track members are secured vertically to the window frame at each side of the upper part of the window. Fixing holes 12 are provided in the web 13 of the track member to receive fixing screws. At one end thereof the track member is closed by a plastic nose cap 14. A slider 15 is slideable along the track member.

An elongate cranked metal strut 16 is pivotally connected to the track member 10, adjacent one end thereof by a rivet 17. An elongate brace 18 is pivotally connected at one end by a rivet 19, to the slider 15 and at the opposite end thereof, by a rivet 20, to a part of the strut 16 intermediate the ends thereof. A link 21 is pivotally connected to the slider 15 by a rivet 22 at a location spaced from the rivet 19. The opposite end of the link 21 is pivotally connected by a rivet 23 to one end of a bar 24, which is in turn

pivotally connected, intermediate its ends, by a pivot 25 to the extremity of the strut 16. A cross link 26 may be pivotally connected between the brace 18 and the bar 24 parallel to the strut 16, if required.

The bar 24 is, in use, connected to the bottom member of the window sash frame and fixing holes 27 are provided for this purpose.

In operation, the bar 24 may be swung from the angled position shown in the drawing, in which the window is open, to a closed position where the bar 24 overlies the track member 10 and the window is closed. The dimensions of the elements of the stay, and the positions of the rivets, are so chosen that the strut 16, brace 18 and link 21 also overlie the track member 10 when the window is in the closed position.

Plugged in to one end of the track member 10 is a module 28 containing burglar alarm circuitry. The circuitry may include an aural and/or visual alarm, or the circuitry may comprise part of the control circuitry for a remote burglar alarm system. Whichever is the case, the alarm is rendered operable by the co-operation of elements 29 and 30 mounted on the strut 16 and track member 10 respectively. The arrangement is such that when the window is in the closed position the element 29 is in alignment with the element 30 and when the window is opened the movement of the element 29 away from the element 30 operates

switch means to actuate the burglar alarm.

Any known form of switch-actuating co-operating elements may be employed. For example, one of the elements may comprise a magnet and the other element a Hall effect device. Alternatively the magnet on one element may be arranged to co-operate with a reed switch on the other element, or the two components may comprise the cooperating components of an inductive or capacitive actuating device. In a further alternative arrangement, a mercury switch may be provided on the strut 16 alone being so orientated that the switch is operated by swinging movement of the strut from the closed position to the open position.

In each case the co-operation of the elements, or the operation of the mercury switch, controls the circuitry in the module 28 to achieve the required warning effect.

It will be appreciated that in the above described arrangement the sensors or operating elements 29 and 30 may be mounted on any two other components of the stay which move relatively to one another in such manner that the elements are brought into and out of cooperating relation as the stay is operated. For example, the element 30 on the track member 10 may be arranged to cooperate with an element on the slider 15 or on either of the components 18 or 24.

The module 28 may incorporate any of the desired conventional features of a burglar alarm and alternative

modules may be provided according to the features required. For example, the module itself may contain a buzzer and a battery powering the buzzer, or alternatively it may include a signalling device, such as a radio, light or ultrasonic transmitter, for activating a separate burglar alarm system. It might also include a switch or push button for rendering the alarm inoperative, so that the lawful occupant of the premises may open the window without the alarm being triggered. The control for deactivating the alarm may be in the form of code buttons which require to be pressed in a predetermined sequence in order to effect deactivation.

As previously mentioned, in the case where the premises incorporate a centralised burglar alarm system the module 28 can be arranged to provide an output to the central system upon opening of the window.

The element 30 is connected to the module 28 by wiring 31,32 which may conveniently be hidden inside the inturned flanges 11.

Although the invention has been described in relation to a particular form of friction stay, in its broadest aspect it is applicable to other types of stay and indeed to conventional butt hinges or any hinge of the kind having two components which move relatively to one another upon operation of the hinge.

Claims:

1. A hinge assembly, for pivotally mounting a door or window, comprising at least two components which move relatively to one another as the hinge is operated, and, mounted on the assembly, electric burglar alarm circuitry, or a portion of such circuitry, which is rendered operable by movement of said components to a predetermined relative position or range of positions.

2. A hinge assembly according to claim 1 and in which the burglar alarm circuitry mounted on the hinge assembly includes an aural and/or visual warning device so that the unit is self-contained.

3. A hinge assembly according to claim 1 or claim 2 in which the circuitry is adapted for operative connection to a separately mounted aural and/or visual warning device or to control circuitry controlling such a device.

4. A hinge assembly according to any preceding claim and in which the burglar alarm circuitry mounted on the hinge assembly includes switch means actuated by sensors or actuating elements on one or both of said relatively moveable components.

5. A hinge assembly according to any preceding claim in the form of a friction supporting stay for a window of the kind comprising a track for mounting on the window frame, a slider moveable along the track, a strut pivotally connected to the track, a brace pivotally connected between the slider and the strut, a link pivotally connected to the slider, and a bar, for mounting on the window sash, pivotally connected to the link and to the strut, the sensors or actuating elements being mounted on the track and strut so that the switch means are actuated by movement of the strut out of the closed position where it overlies the track.

6. A hinge assembly according to any preceding claim

and in which the burglar alarm circuitry is incorporated in a module which is detachably mounted on the hinge assembly.

7. A hinge assembly according to claim 6 when appended to claim 5 in which the module is detachably mounted on one end of the track.

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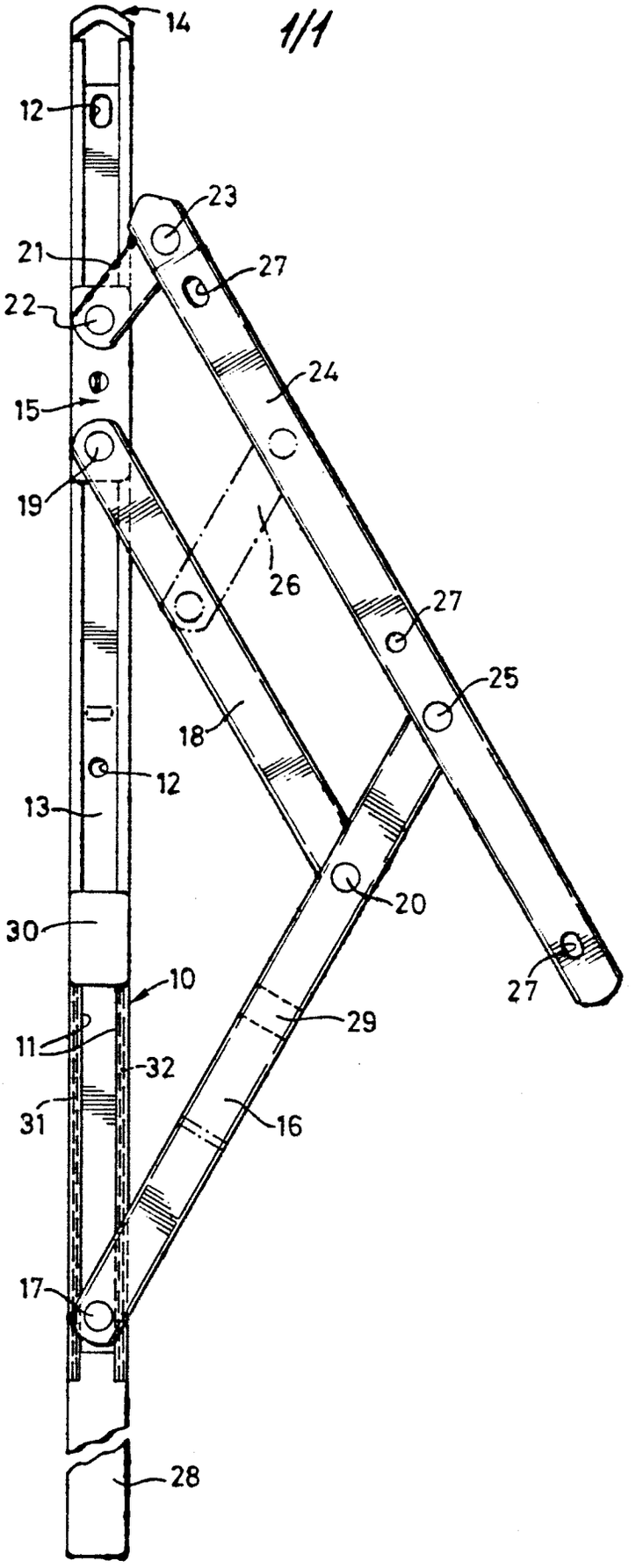
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