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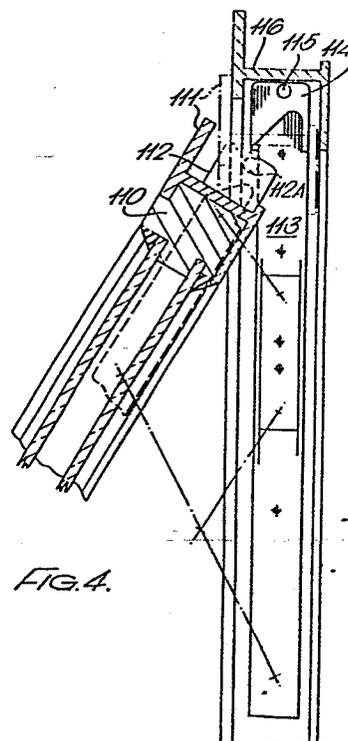
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54 **Alarm system.**

57 An alarm device (112) capable of emitting alarm signals is incorporated in the frame of a window or a door and cooperates with a magnet or other device (115) incorporated in the end of the hinge of the window. The alarm device (112) is completely concealed and contained in the window frame when the window is closed. As the window opens the device (112) comes out of the field of the magnet (115) and thus sets off the alarm.



ALARM-SYSTEM

This invention relates to an alarm system for use with windows and doors.

An object of the invention is to provide an alarm system which is not normally visible to anyone inspecting
5 the window or door and which is self-powered so that it does not require any external wiring or power supplies.

In accordance with the present invention there is an alarm system for a window or door comprising a miniature transmitter having its own power supply, the transmitter
10 being incorporated in a recess in the window surround or in an edge of the door or in adjacent mating structure in the window frame or door frame, the transmitter being operable by a switch of which one part is located on or adjacent the transmitter and the other part is located on adjacent
15 relatively movable structure, so that the switch is operated by opening movement of the door or window to activate the transmitter.

The transmitter may send out an ultrasonic or radio signal which may be used for example to operate a burglar
20 alarm or alert a control room giving an indication that the window or door has been opened.

When applied to a window the transmitter is preferably
25 located in a channel in the upper edge of the window surround so that it is hidden from view both when the window is closed and when the window is partially opened.

The term window surround is used to describe the frame containing the glass in the movable or opening part of the window. The term window frame is used to describe the fixed frame in the building which forms the window
30 opening.

The transmitter may be located adjacent one end of the surround and one part of the switch may be located at the upper end of the window hinge. For example the
35 switch in the transmitter may be a reed switch and a magnet may be located on the top end of a fixed part such

as the track of the adjacent hinge so that, as the window is opened, relative movement occurs between the magnet and the reed switch so as to operate the switch.

The hinges are preferably of the kind shown in UK
5 Patent Specification 2081803A.

There may be a night vent facility for such a window, so arranged that the partially opened window as used for night venting does not operate the switch and set off the alarm. This may be achieved by appropriate
10 relative positioning of the two parts of the switch.

Alternatively the transmitter may be arranged so as to emit a series of bleeps when the maximum night vent position is reached. Thus in opening the window to the night vent position, one opens the window until the
15 bleeps occur and then moves it back slightly.

The reed switch itself may have its contacts encapsulated in glass so as to avoid any problem of weathering.

One advantage of having the transmitter placed along
20 the top edge of the window in a channel which may be formed as part of the window surround, is that this is an area where there is usually space for inclusion of a transmitter and the space is not occupied by hinges or other mechanism. By making the transmitter the same
25 width as the normal window vent arm it can be arranged to fit in the cavity which conventionally runs around the surround of a metal framed window.

The transmitter may, in an alternative arrangement, be located adjacent one part of a two-part anti-bowing
30 wedge and the other part of the anti-bowing wedge may carry a magnet which will operate a reed switch in the transmitter. The anti-bowing wedge is preferably centrally located along the top edge of the window frame.

There may be mutual engaging features such as pips
35 and slots on the transmitter and the hinge top portion

so as to locate the transmitter in position.

In the accompanying drawings:

Figure 1 illustrates a known type of hinge which may be modified in accordance with this invention;

5 Figure 2 shows the necessary modification in simplified form;

Figure 3 is an elevation of a portion of a rectangular aluminium frame window incorporating the invention;

10 Figure 4 is a scrap elevation of the same window; and

Figure 5 shows an alternative form of the invention.

In Figure 1 is shown a known, hinge, or supporting stay of the kind described in detail in our UK patent
15 specification 2081803A.

The supporting stay comprises a channel-sectioned track member 10 having longitudinal inturned flanges 11. The track member is, in use of the stay on a side-hung window, normally secured horizontally to the
20 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
25 in the web 13 of the track member to receive fixing screws. At one end thereof the track member is closed by a plastics nosecap 14 which is plugged into the end of the track member and may be "staked" to the track member by deforming a part of the web, or by means of a
30 rivet. A slider 15 is slideable along the track member, and the detailed construction of the slider will be described later.

An elongate cranked metal strut 16 is pivotally connected to the track member 10, adjacent one end
35 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 5 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 rivet 25, to the extremity of the strut 16. A cross 10 link 26, shown in chain lines, 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 15 provided for this purpose.

In operation, the bar 24 may be swung from the angled position shown in Figure 1, 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 20 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 overlies the track member 10 when the window is in the closed position.

One end of the bar 24 is shaped, as indicated at 25 28 to cooperate with a cam surface 29 on the inside of the nosecap 14 so as to give a wedging effect as the stay moves into the closed position.

When the window is moved to the closed position there is a tendency for the brace 18 or strut 16 to 30 bind against the track 10. This is particularly so in the case of a side-hung window since the weight of the window sash tends to deflect the brace 18 and strut 16, and to a lesser extent the link 21, downwardly. To overcome any tendency of the parts to bind there is 35 mounted on the track member 10 a raiser block 31.

The raiser block 31 may be moulded from plastics, such as acetal resin, and is located in the channel-sectioned track member 10 between the rivet 17 and a stop 30. The stop 30 is deformed part of the web of the track member 10 provided to limit the movement of the slider 15 along the track member.

Figure 2 shows diagrammatically a modification of this hinge to incorporate parts of an alarm system. Bar 24 is attached to a frame or opening light 32 of a window. Hinge track member 10 has attached to it an end cap 33 incorporating a permanent magnet 34.

Along the upper edge of the frame 32 is mounted a transmitter 35 incorporating a reed switch 36.

A more detailed illustration of this arrangement is shown in Figures 3 and 4.

The window shown in Figures 3 and 4 has a surround which has an upper cross-member 110 with an upper channel section 111. The window is supported by a modified hinge of the general type shown in Figure 1 and in our patent specification 2081803A. In the channel 111 is located a self contained miniature transmitter 112 which incorporates a reed switch, the whole being encapsulated so as to resist weathering. The transmitter 112 includes its own dry cell battery supply.

At the upper end of the hinge track 113 is an end cap 114 incorporating a magnet 115. As seen in Figure 3 the transmitter is located some distance from the magnet 115 and so the reed switch will have closed to cause the transmitter to transmit a signal or give out an audible warning.

When the window is closed the transmitter 112 will be closely adjacent the magnet 115 so the reed switch 112A will be open so as to render the transmitter inoperative.

As can be seen from Figures 3 and 4 when the window is closed there is no way in which the transmitter

can be seen from outside because of the shape of the window surround and the top cross member 116 of the window frame, and the way in which the channel section 111 of the window surround overlays the upper window
5 frame member 116.

Although as shown applied to a window the principle can be used in exactly the same way on doors by providing a recess in the top of the door, with the magnet in the door header or door frame edge.

10 The positions of the reed switch and magnet may be reversed if desired.

It will be noted that there is no external wiring and indeed nothing to indicate the existence of the alarm system from the outside of the window or from the
15 inside. Even when the window is open it is very difficult to see the transmitter.

The transmitter may be a standard miniaturised transmitter adapted to fit in a rectangular box of the shape shown in the drawings and powered by a
20 conventional 12 volt battery such as GP23 Lighter Battery.

In Figure 5 is shown an alternative arrangement with the transmitter, reed switch and magnet incorporated in an anti-bowing wedge substantially in
25 the middle of the upper portion of the window.

The anti-bowing wedge is a two part wedge designed to prevent bowing or sagging of the frame of the window surround. One part 201 of the wedge is mounted on the window surround 202. The other part 203 of the wedge
30 is mounted in the window frame. (omitted for clarity). A transmitter 204 is also located in the window frame and is held onto the wedge part 203 by pips 205 which engage in bores 206 to hold the transmitter in position. As before the transmitter 204 incorporates a reed
35 switch (not shown) and the permanent magnet 207 for

operating the reed switch is incorporated in the wedge part 201.

5 As the window closes the wedge parts engage to prevent bowing and the magnet 207 is then in close proximity to the reed switch in the transmitter 204. If the transmitter is switched on opening of the window causes the magnet 207 to move away from the transmitter 204 thus operating the reed switch and setting off the alarm circuit.

10 Transmitter 204 may, alternatively be mounted in the window surround instead of in the window frame, the permanent magnet then being mounted in the part of the wedge attached to the window frame.

Claims:

1. An alarm system for a window or door comprising a miniature transmitter having its own power supply, characterised by the transmitter (112,35) being incorporated in a recess (111) in the window surround (110) or in an edge of the door or in adjacent mating structure in the window frame or door frame, the transmitter (112,35) being operable by a switch of which one part (112A,36) is located on or adjacent the transmitter (112,35) and the other part (115,34) is located on adjacent structure (107) so that the switch is operated by opening movement of the door or window to activate the transmitter.
2. An alarm system according to claim 1 characterised by the transmitter (112,35) being adapted to send out an ultrasonic or radio signal.
3. An alarm system according to claim 2 characterised by said signal being used to operate a burglar alarm or alert a control room giving an indication that the window or door has been opened.
4. An alarm system according to any preceding claim characterised by being applied to a window, the transmitter (112,35) being located in a channel (111) in the upper edge (110) of the window surround so that it is hidden from view both when the window is closed and when the window is partially opened.
5. An alarm system according to claim 4 characterised in that the transmitter (112,35) is located adjacent one end of the surround and one part (115) of the switch is located at the upper end (113) of the window hinge.
6. An alarm system according to any preceding claim characterised in that the switch (112A,36) in the transmitter is a reed switch and a magnet (115,34) is located on adjacent fixed structure.
7. An alarm system according to claim 6 characterised

in that the adjacent fixed structure is a track (113,10) of an adjacent hinge so that, as the window is opened, relative movement occurs between the magnet (115,34) and the reed switch (112A, 36) so as to operate the switch.

5 8. An alarm system according to any of claims 4 to 7 characterised in that the window is of the kind which is supported on two sides by a pair of hinges which allow the window to move bodily out of and away from the window frame.

10 9. An alarm system according to claim 8 characterised in that the hinges each comprise a track member (10), a stay (16) pivoted to the track member(10), a slider (15) in the track member, a link (21) pivoted to the slider, a bar (24) pivoted to the link (21) and to the
15 stay (16) and a brace (18) pivoted to the slider and to the stay (16).

10. An alarm system according to any of claims 4 to 9 characterised by including a night vent facility for the window, so arranged that the partially opened window,
20 as used for night venting, does not operate the switch and set off the alarm or so arranged that the transmitter (112,35) emits a series of bleeps when the maximum night vent position is reached.

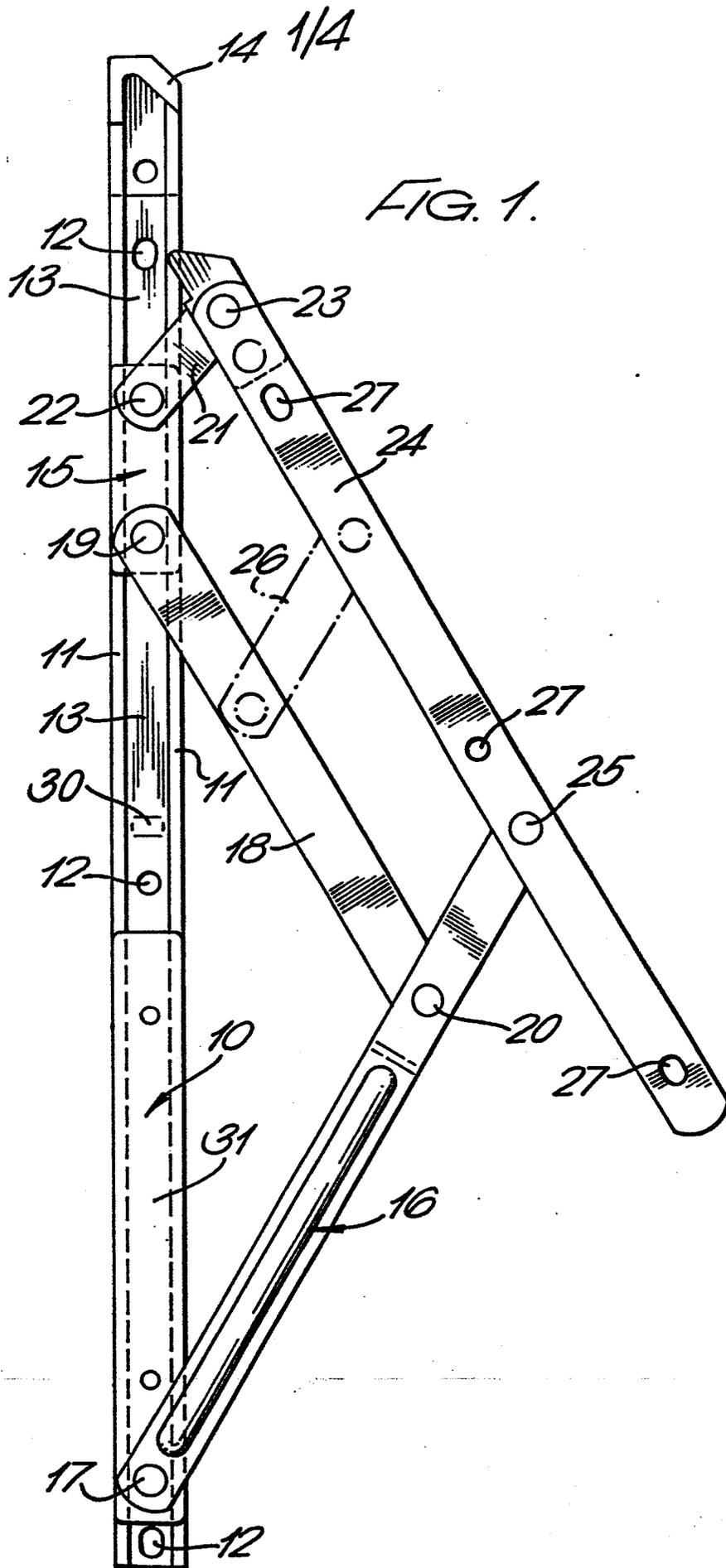
11. An alarm system according to claim 6 characterised
25 in that the reed switch (112A,35) has its contacts encapsulated in glass.

12. An alarm system according to claim 1 characterised by being applied to a window (202) incorporating a two-part anti-bowing wedge (201,203) and in which the
30 transmitter (204) is located adjacent one part (203) of the two-part anti-bowing wedge and the other part (201) of the anti-bowing wedge carries a magnet (207) which will operate a reed switch in the transmitter.

13. An alarm system according to claim 12 characterised
35 in that the anti-bowing wedge (201,203) is centrally

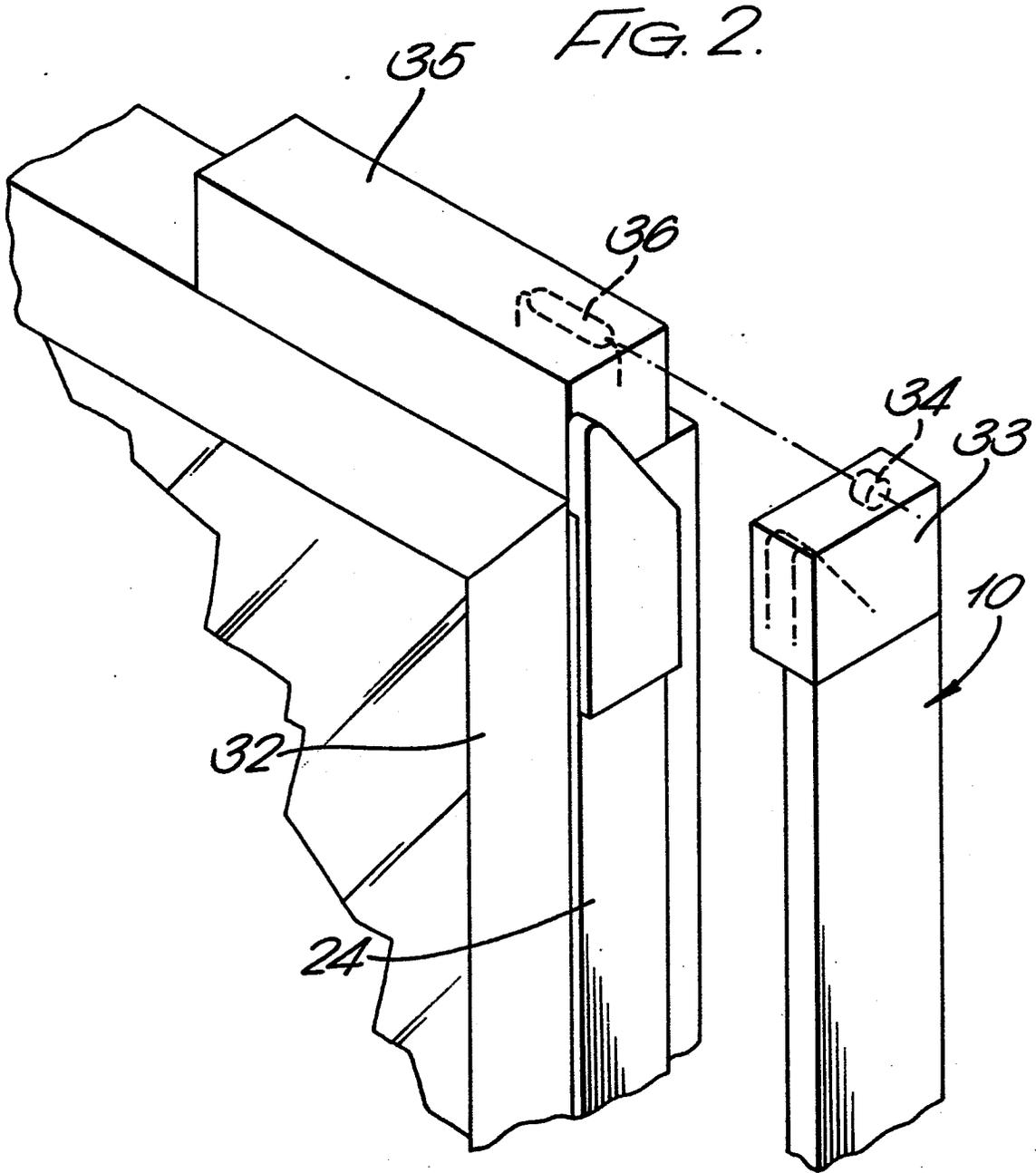
located along the top edge of the window frame.

14. An alarm system according to claim 5 characterised
by including mutual engaging features (205,206) on the
transmitter and the hinge top portion so as to locate
5 the transmitter in position.



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FIG. 2.



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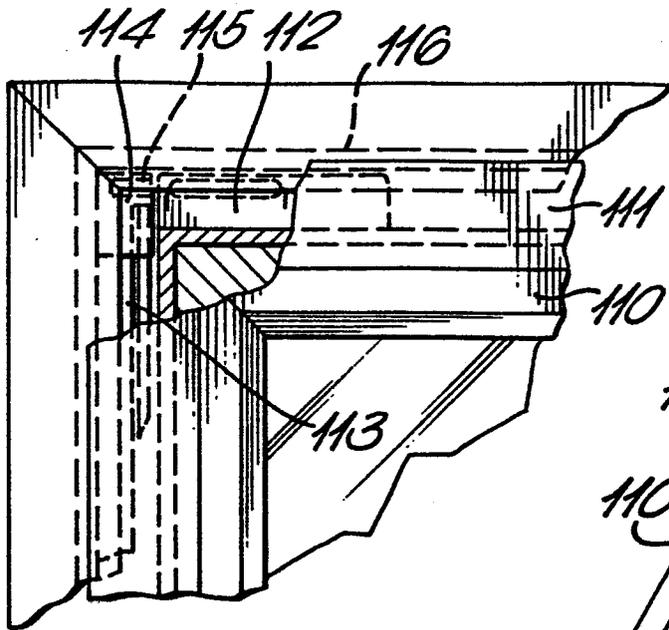


FIG. 3.

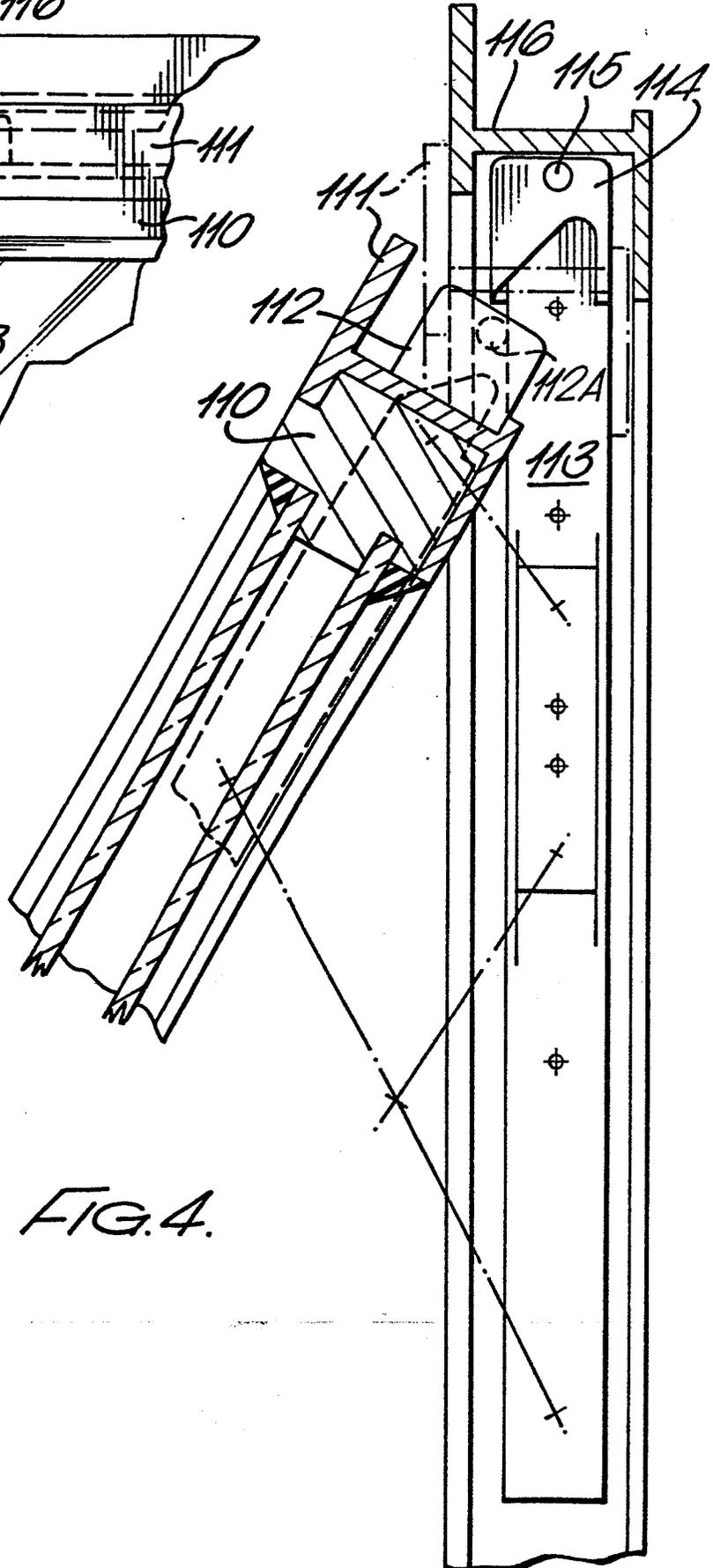
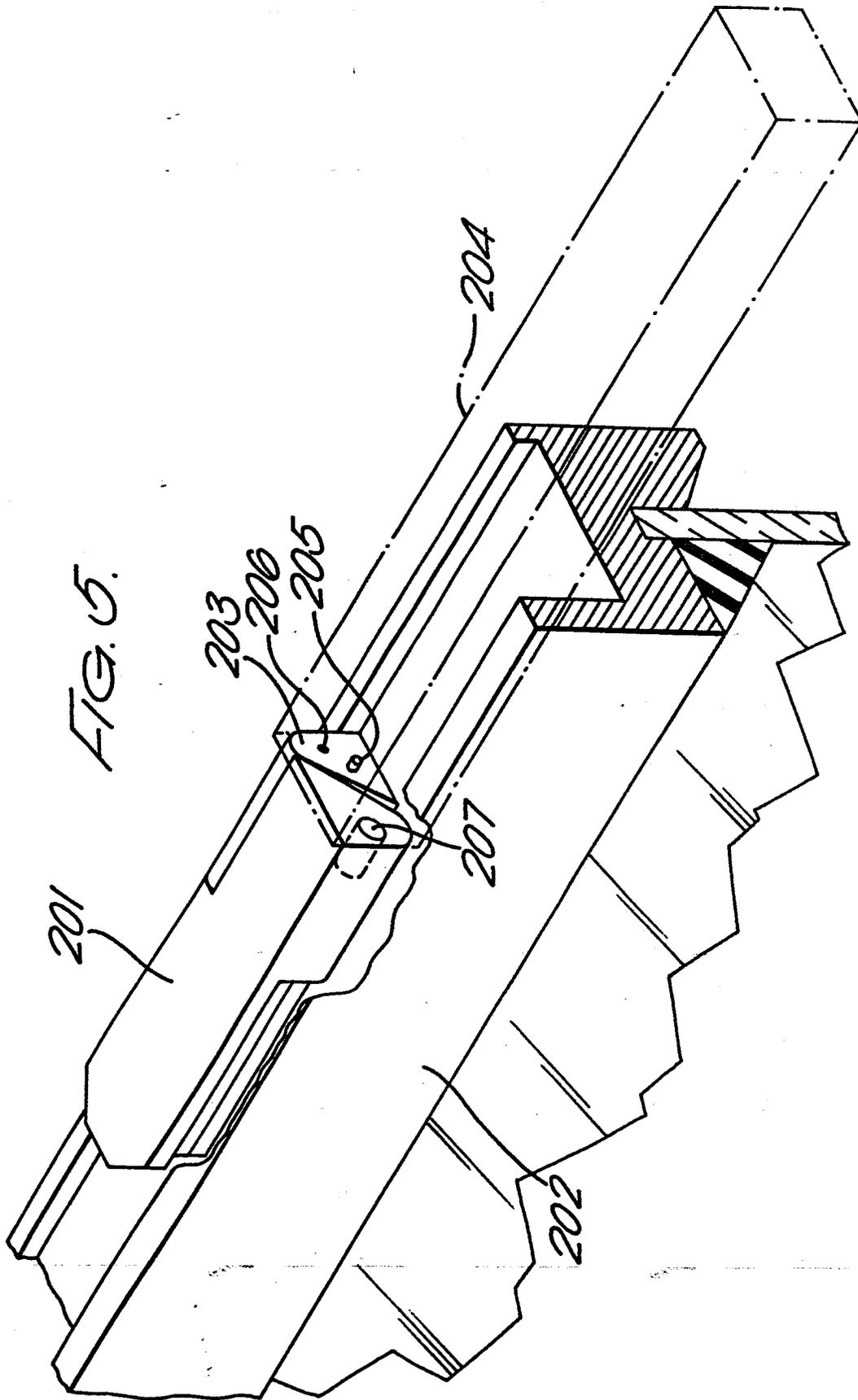


FIG. 4.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	US-A-3 778 806 (G.J. WILLIAMS) * Figure 2; column 3, lines 26-37 *	1	G 08 B 13/08
A	---	3,4	
Y	DE-A-2 436 225 (STANLEY WORKS) * Figure 4; page 9, lines 4-34 *	1	G 08 B 13/08
A	---	2,3	
P,A	US-A-4 438 430 (A.G. YOUNG et al.) * Figure 1; column 2, lines 30-62 *	1	G 08 B 13/08
A	---	1-3,6 11	
A	US-A-4 335 375 (D.D. SCHAEFFER) * Figure 2; column 3, lines 16-68 *	1-3,6 11	G 08 B 13/08
A	---		
A	DE-B-1 703 002 (A. SCHMID) * Figure 3; column 1, lines 6-46 *		
A	US-A-3 986 183 (A. FUJIWARA) * Figure 3 *		

The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 13-02-1985	Examiner BREUSING J
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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