

[54] REMOTE-CONTROLLED DEVICE FOR
RAPIDLY OPENING A SKYLIGHT

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49/163, 168

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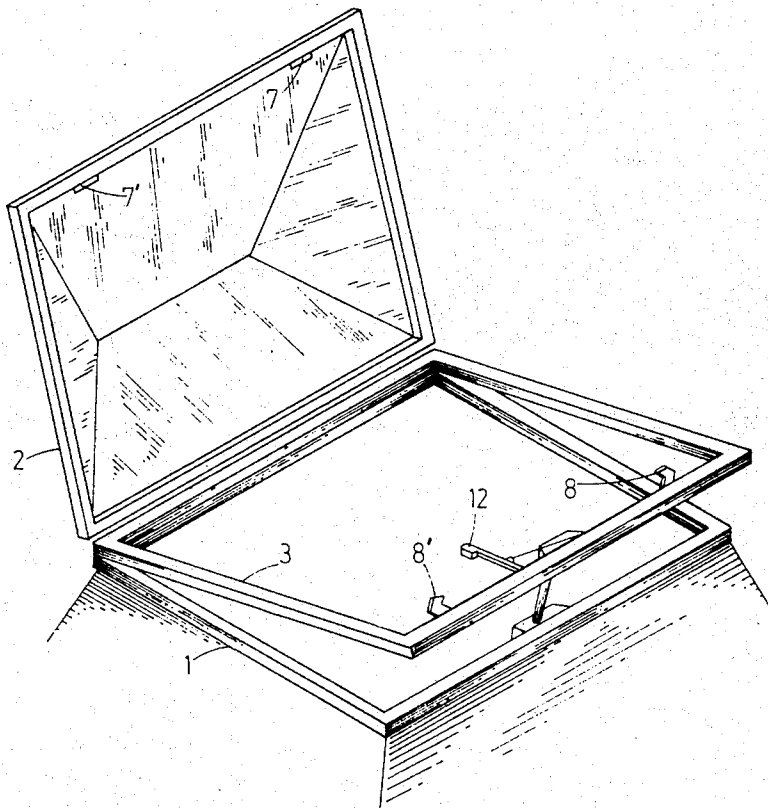
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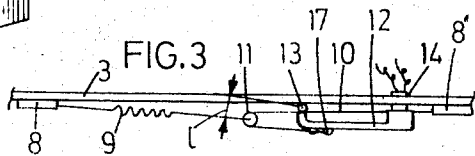
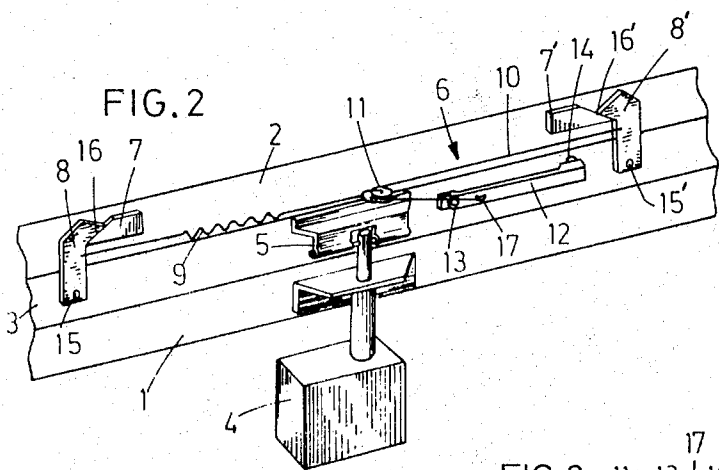
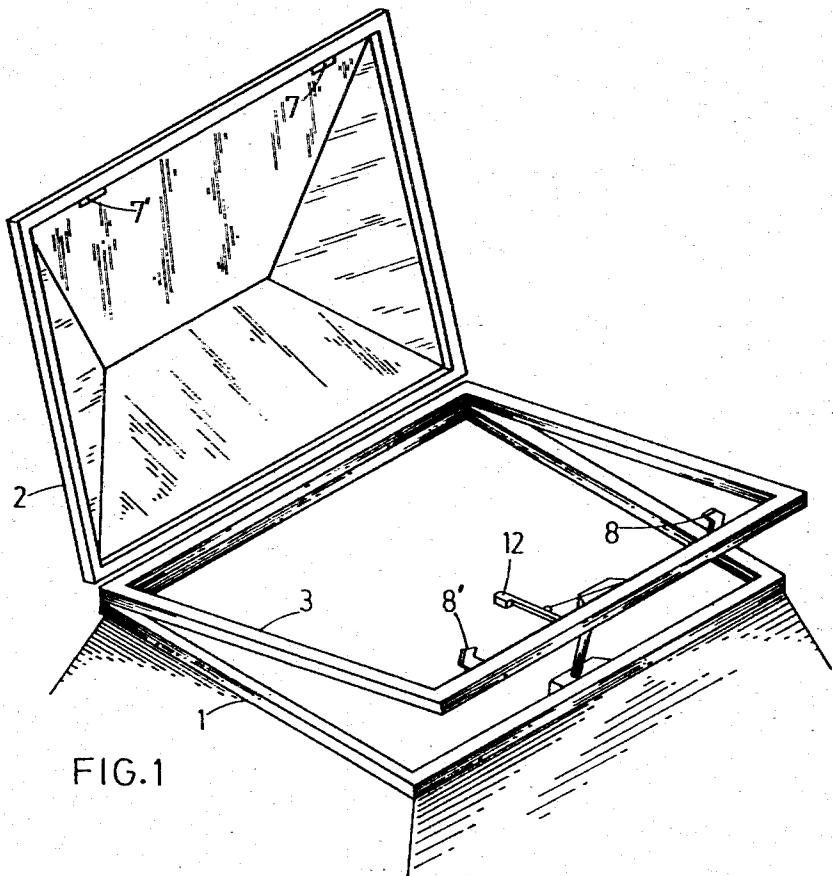
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ABSTRACT

In a remote-controlled device for rapidly opening a skylight, between a movable frame and a fixed frame by the moment of triggering is provided a connection formed on the one hand between swinging hooks retained by control means mounted on the same frame and on the other hand, retaining stops mounted on the other frame, the control means being comprised of means pulling on the hooks to retain same in connecting position and of means for locking said pulling means.

4 Claims, 3 Drawing Figures





REMOTE-CONTROLLED DEVICE FOR RAPIDLY OPENING A SKYLIGHT

This invention has for object a device for rapidly opening a skylight which may be remote-controlled, which is very simple and which is very reliable.

It is indeed interesting in many cases to be able to operate from a distance notably in emergency cases, a device for rapidly opening a skylight.

Most known skylights comprise either manual or automatic devices for a slow opening, said devices being disconnectable to obtain a rapid opening, the connection being made either by a manual device or an electric device such as a powerful electromagnet directly to the fastening of the slow-opening means. This not only requires a large and consequently costly equipment, but also does not allow the arrangement of the device on the always narrower frames which are presently made both for reasons of economy and for reasons of aesthetics.

This invention brings a very simple solution to said problems by providing a device which on the one hand, is easily adapted on very narrow surface and which on the other hand, works with electric retaining means of low power and consequently also occupying very little space.

The device according to the invention is characterized mainly by the provision between a movable frame and a fixed frame by the moment of triggering, of a connection formed on the one hand between swinging hooks retained by control means mounted on the same frame and on the other hand, retaining stops mounted on the other frame, the control means being comprised of means pulling on the hooks to retain same in connecting position and of means for locking said pulling means.

Other details and features of the invention will stand out from the description given below by way of non-limitative example and with reference to the accompanying drawings, in which:

FIG. 1 shows diagrammatically a device for rapidly opening a skylight, after the operation of said device and releasing of the frame, said device being mounted with a slow-opening device.

FIG. 2 shows part of the frame shown in FIG. 1, bearing the various control devices.

FIG. 3 is a plan view of the rapid opening device shown in FIG. 2.

As shown in the drawing, the opening device comprises a fixed frame 1, a movable frame 2 and an intermediate frame 3.

The fixed frame 1 bears a control device 4 for the slow opening, which is hinged on the other hand on a support 5 which is attached to the intermediate frame 3, while on that same intermediate frame 3 are mounted the main members of the rapid-opening device 6 which engage retaining stops 7,7' which are mounted on the movable frame 2.

Said rapid-opening device 6 comprises hooks 8,8' which are retained, respectively, by a spring 9 and a cable 10 which passes around a pulley 11 to reach a swinging lever 12 the swinging axis 13 of which is located at the one end and which is retained at the other end by an electro-magnet 14.

The operation of the device is as follows:

the hooks 8,8' are normally retained in engagement with the stops 7,7' by the pulling action on the one

hand of the spring 9 and on the other hand of the cable 10, said pulling action being caused by bringing the lever 12 down alongside the intermediate frame 3, which causes the cable to pull on the pulley 11, said pulling being taken over by spring 9, said lever 12 being locked in position by the attraction of electro-magnet 14.

With reference to FIG. 3, it is noticed that the cable exerts on lever 12 a reduced stress as it has but a leverage 1, which allows to use for retaining said lever 12, an electro-magnet 14 with a very small power and thus of very small size. Said leverage 1 is however large enough to cause as soon as the attraction of the electro-magnet 14 ends, the lever 12 to swing about the swinging axis 13 thereof to the position shown in FIG. 1. Consequently the cable 10 uncoils on pulley 11 until the spring 9 has completely returned to the rest position thereof and any retaining stress has disappeared from the hooks 8,8', said hooks may then swing about the respective pivot 15,15' thereof to release the stops 7,7' and consequently the frame 2. Said release is normally performed by frame opening means (not shown) which tend continuously to separate the movable frame 2 from the intermediate frame 3. The stops 7,7' exert thereby continuously a pressure against the hooks 8,8' to cause said hooks to swing about the pivot 15,15' thereof, the hook surfaces 16,16' engaging the stops being so slanted that a push on the hooks 8,8' be possible with a releasing thereof and causes the hooks to swing about the pivot 15,15' thereof.

In the closed position of the frame, said pressure is opposed by the pull exerted by the above-described device.

As shown in FIGS. 1 and 2, use will advantageously be made of said device in combination with a skylight slow-opening device which is used for the normal ventilating. In such a case the frame comprises the casing, while the frames 2 and 3 retained by the locking of the rapid-opening device, act as leaf.

It is to be noted that this device operates in any case even when as shown in FIG. 1, the slow-opening device has already been operated.

It will also be noticed that the cable 10 is attached to the lever 12 in a point 17 which is located adjacent the swinging axis 13 to enable a large enough force to be exerted on said lever when the attraction of electro-magnet 14 disappears to cause swinging of said lever while retaining a small leverage.

There has been described a retaining device with two hooks, but it is clear that it would be possible to obtain said retaining for small-size frames with but one hook, the spring then being directly connected to the lever without using a cable nor a pulley.

The invention has been described as applied to an opening device which comprises both a slow opening and a rapid opening and in such cases use will be made according to the invention, of two different opening levels, that is a fixed frame or casing 1 bearing the slow-opening means 4 which act both on a movable frame or leaf 2 and on an intermediate frame 3 locked to said movable frame by a rapid-opening device 6, while when said rapid-opening device is operated, the intermediate frame 3 acts as casing and releases the movable frame 2 which under the action of the frame opening means, will preferably open at 90° relative to the intermediate frame 3. It is however quite clear that when said slow-opening means are not used, the frame 3 will

act as casing and there will be obtained but one opening level.

It is also quite clear that to insure besides the remote control by means of an electro-magnet (said control being made with a simple switch which cuts off the electromagnet circuit), an automatic opening control of the skylight, it is but necessary to cut in the pulling circuit comprised of the spring and the cable, an element which melts when exposed to heat.

It must be understood that the invention is in no way limited to the above embodiments and that many changes may be brought therein without departing from the scope thereof as defined by the appended claims.

I claim:

1. A remotely controlled device for rapidly opening a skylight, comprising:
 - a. a first frame adapted to be mounted to a roof opening;
 - b. a second frame pivotally mounted to said first frame;
 - c. said skylight mounted on said second frame;
 - d. a pair of spaced stop means mounted on said second frame;
 - e. a pair of spaced hooks pivotally mounted on said first frame, each hook having an engaging portion at one end thereof remote from the pivotal mounting of the hooks on said first frame, the engaging portions of the two hooks facing one another and adapted to retainably engage the stop means when the skylight is closed;
 - f. a retaining lever having one end pivotally mounted on said first frame;
 - g. an electro-magnet mounted on said first frame, the other end of said retaining lever being held in contact with said electro-magnet when the latter is energized;
 - h. connecting means coupled between said pair of hooks and attached thereto between the pivotal

mounting of each hook and the engaging portion of each hook, said connecting means having a length varying with the position of said retaining lever between a first position in which its other end is in contact with said electro-magnet and a second position in which its other end is pivoted away from said electro-magnet, and

- i. spring means interposed in said connecting means to exert a force on said retaining lever to pivot said lever to its second position upon the electro-magnet being deenergized.

2. A remotely controlled device as recited in claim 1, wherein the connecting means comprises a pulley and a cable, said cable passing over said pulley and being attached at one end to one of said pair of hooks and at the other end to said retaining lever; said spring means being attached at one end to the other of said pair of hooks and at the other end to said pulley; said spring means exerting a force on said pulley in a direction opposite to the force exerted thereon by the cable when the skylight is closed and the electro-magnet is energized.

3. A remotely controlled device as recited in claim 1, further comprising: a third frame fixably mounted on the edge of an opening to be closed by said skylight; said first frame being mounted between said third frame and said second frame, and a slow-opening mechanism associated with said third and first frames for effecting slow and partial opening of said first frame with respect to said third frame.

4. A remotely controlled device as recited in claim 2, further comprising: a third frame fixably mounted on the edge of an opening to be closed by said skylight; said first frame being mounted between said third frame and said second frame, and a slow-opening mechanism associated with said third and first frames for effecting slow and partial opening of said first frame with respect to said third frame.

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