

June 7, 1955

G. H. LENKE

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PANEL RELEASE STRUCTURE

Filed Nov. 26, 1951

3 Sheets-Sheet 1

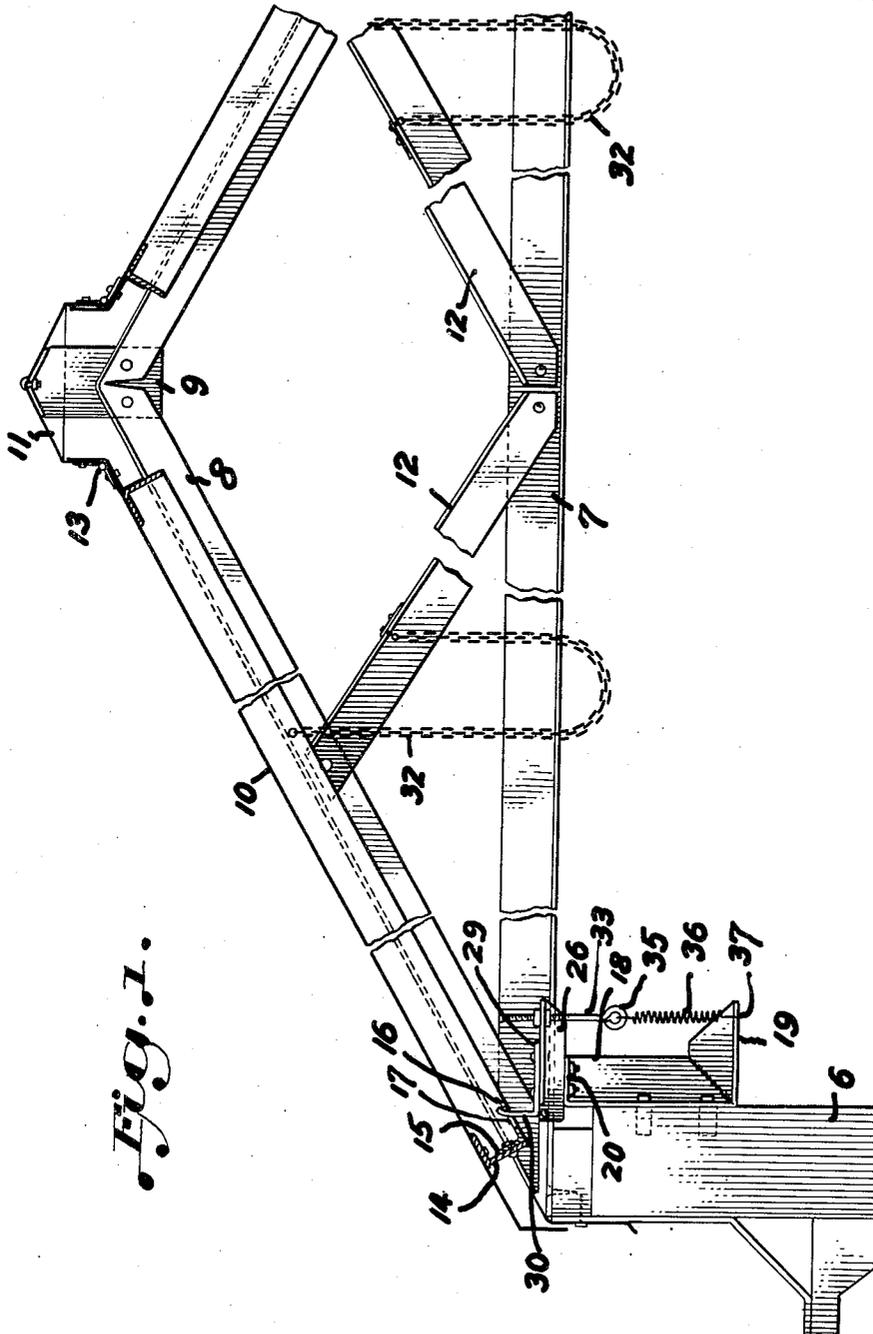


FIG. 1.

INVENTOR.  
*George H. Lenke,*  
BY *Quigley R. Brown*  
ATTY.

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G. H. LENKE

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3 Sheets-Sheet 2

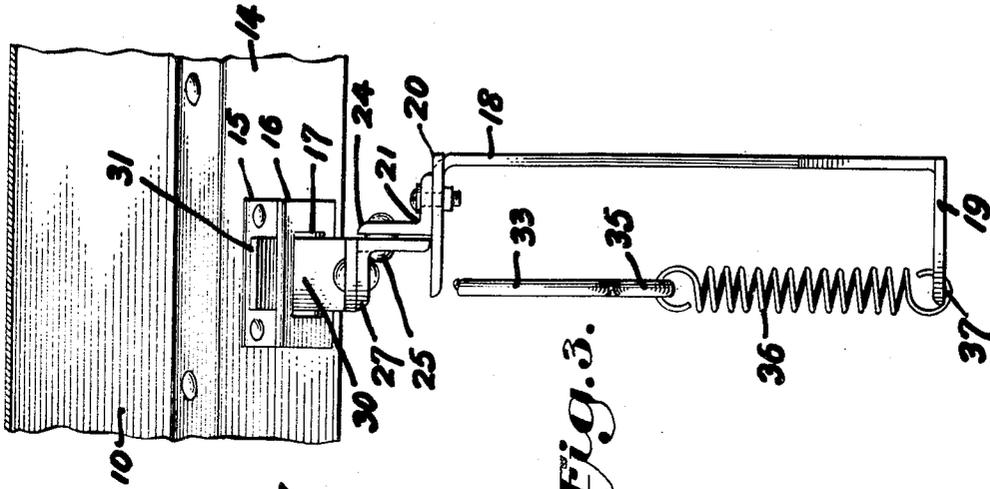


Fig. 3.

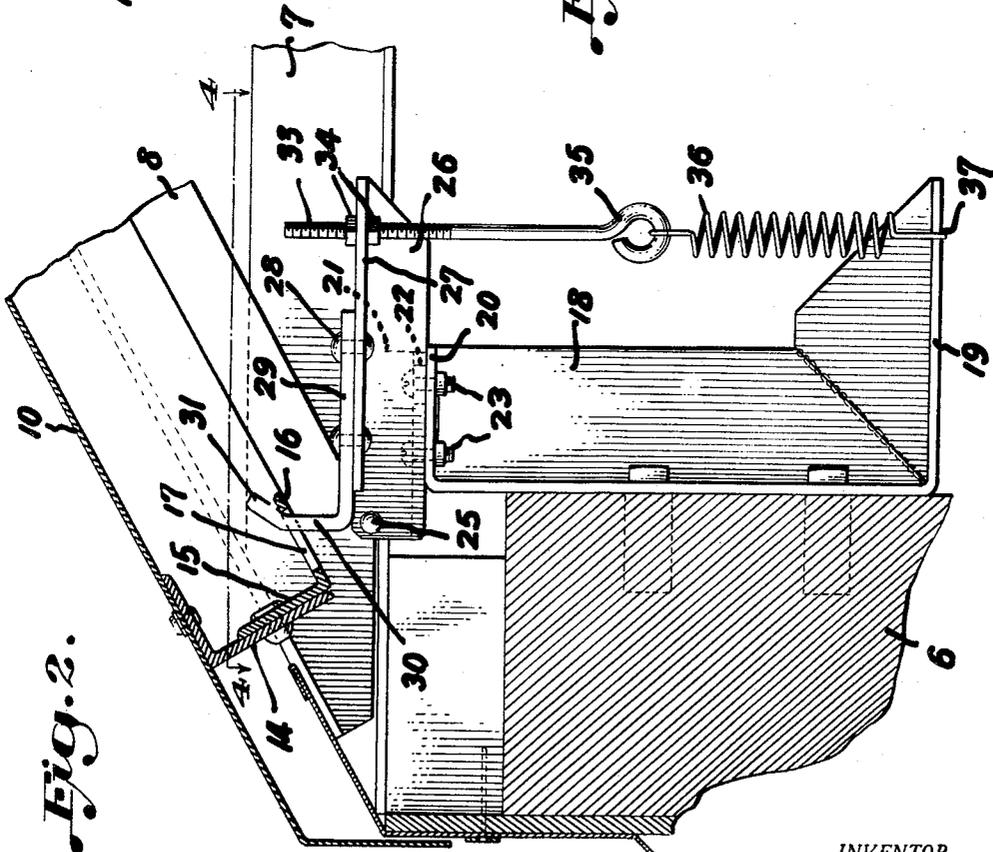


Fig. 2.

INVENTOR.  
*George H. Lenke*  
BY *Winghart*  
ATTY.

June 7, 1955

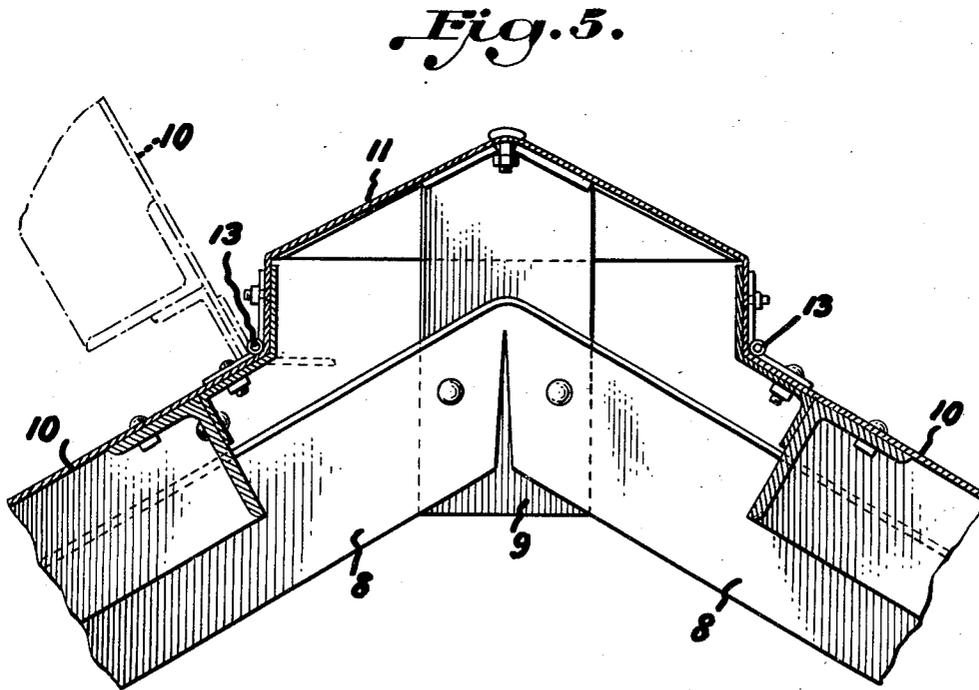
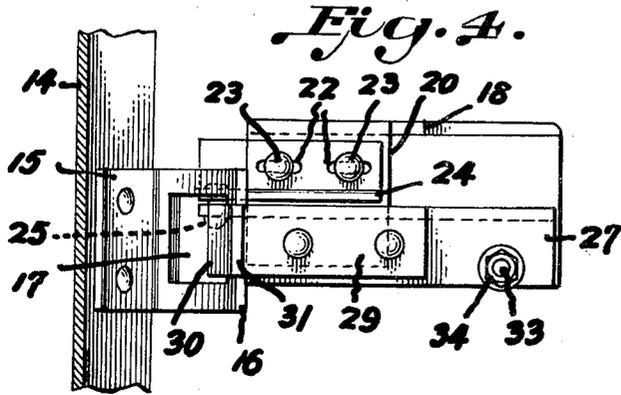
G. H. LENKE

2,710,211

PANEL RELEASE STRUCTURE

Filed Nov. 26, 1951

3 Sheets-Sheet 3



INVENTOR,  
*George H. Lenke.*  
BY *Quigley*  
ATTY.

1

2,710,211

PANEL RELEASE STRUCTURE

George H. Lenke, Chicago, Ill., assignor of one-half to Julius J. Ohliss, Oak Park, Ill.

Application November 26, 1951, Serial No. 258,208

1 Claim. (Cl. 292—92)

This invention is a panel release structure for use in connection with the swinging or movable panels of a building structure, the primary object of which is to permit the normally closed panel to release itself for swinging movement when the air pressure within the building exceeds certain limits, or if the reduction of normal atmospheric pressure occurs upon the exterior of the building.

The invention is directed particularly, but not necessarily limited, to a skylight structure, wherein the normally closed skylight panels automatically open to relieve the air pressure within the building when such pressure reaches a predetermined degree.

A further object of the invention is to provide means for adequately mounting the panels in the building structure for swinging or opening movement, also novel means for rigidly maintaining the panels securely in normal closed position but operating instantly and effectively to release the panel for swinging movement when the air pressure within the building becomes excessively high.

A further and particular object of the invention is the novel construction, arrangement and mounting of the panel release mechanism to insure tight sealing of the panel under all normal conditions, and which may be readily operated to reset or relatch the panel after normal atmospheric conditions obtain.

With the foregoing objects in view, together with others which will appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawing, and particularly pointed out in the claims.

In the drawings:

Fig. 1 is a fragmentary transverse sectional view taken through a building structure of the pitched roof type and illustrating as applied thereto a movable skylight panel all arranged in accordance with the invention,

Fig. 2 is a similar sectional view on an enlarged scale and showing more clearly the details of the panel latching structure.

Fig. 3 is an end view from the interior of the building and looking in the directions at right angles to the structure shown in Fig. 2,

Fig. 4 is a detail fragmentary view illustrating in top plan the latch structure as disclosed in Fig. 2, the view being taken substantially upon the line 4—4 thereof, and

Fig. 5 is a detail transverse sectional view illustrating the hinged mounting of one end of the panel.

Generally stated, the invention resides in the particular mounting and securing of movable panels, such as skylights of buildings, side wall panels, doors or windows, such as sash constructed of metal or other materials, and may equally as effectively be used in connection with partition members of building structures. In the construction to be described, the movable member is illustrated and detailed as being pivoted at one end, but it will be understood that the pivotal mounting may be at either end or centrally thereof.

2

In the drawing, 6 indicates the side wall of a conventional building, which wall supports at its upper end a transversely disposed strut or beam 7, which strut will extend to the opposite wall (not shown) of the building structure. The pitch roof of the building includes the angle beams 8 resting at their outer ends upon the side walls of the building and firmly secured at their inner ends to the ridge beam 9 disposed longitudinally of the building structure. The angle beams of the roof structure may be provided in any desired number and are spaced apart sufficiently to receive between them the various skylight panels identified generally at 10. The ridge beam 9 will be enclosed by the ridge cap 11, and the angle beams 8 are reinforced by the struts 12 secured at their inner end to the transverse truss or beam members 7 as shown.

The skylight panels 10 are hingedly mounted at their upper ends as at 13 to the ridge structure so as to be capable of swinging from normally closed or roof sealing position to an open position at a predetermined time. It will be understood that the panels 10 will be provided in the desired number throughout the length of the roof and that they will be so constructed as to interfit between the angle beams 8 and the ridge and side walls of the structure so as to completely and adequately seal the roof structure under normal conditions.

The lower or free end of each of the panels 10 is provided with a transversely disposed angle bar 14, to which is secured an angular keeper member 15. This keeper member includes a plate portion 16 disposed substantially parallel to the plane of the panel 10, and having therein a latch opening 17.

Mounted upon the interior of the building and preferably to the wall 6 thereof and adjacent to each of the panels is a support 18, formed preferably of angle metal as shown. This support provides at its lower end an inwardly projecting arm 19 and at its upper end a similarly disposed base 20, both of which are disposed in substantially horizontal position.

The base member 20 slidably supports an angle bar 21, the base flange of the angle bar having spaced longitudinal slots 22 to receive bolts 23 secured to the base 20. This slot and bolt arrangement is such as to permit the angle bar 20 to have limited sliding movement in a horizontal direction transversely of the building structure.

The outer end of the upstanding flange 24 of the angle member 21 pivotally supports as at 25 an angle bar 26 of the latch mechanism, the said angle bars 21—26 being disposed in parallelism with one another. The top flange 27 of the angle member 26 has secured thereto as by rivets or bolts 28 a latch plate 29, the outer end of which has an upstanding arm 30 with a slightly inturned or inclined latch nose 31 at its upper end. The latch is so constructed and mounted upon the building as to normally dispose the latch arm 30 with its nose 31 passing through the latch opening 17 and engaging the plate portion 16 to rigidly maintain the panel 10 in closed or sealed position upon the roof. The inclination of the nose 31 with respect to the latch plate 16, however, is such that upon rocking the latch structure in an upward direction upon its pivot 25, the nose 31 will be moved to such position as to permit the panel 10 to swing upwardly upon its hinge 13, thus freeing the panel from engagement with the roof structure. The limit the outward swinging movement of the panel, a chain or cable 32 of proper or desired length is secured at one end to a part of the building frame, such as one of the struts 12, and at its opposite end to the panel 10 as shown more particularly in Fig. 1 of the drawings.

The means governing the operations of the latch includes a threaded bar or rod 33 passing through a suitable opening in the free end of the angle bar 26. Lock nuts

3

34 threaded upon this bar, one upon each side of the angle member 27, permit vertical adjustments of this rod. The lower end of the rod is provided with an eye 35 to which is secured the upper end of a compression spring 36, the lower end of which is secured to the arm 19 as at 37. By means of the adjusting nuts 34, the tension of the spring 36 may be readily adjusted, and it will be understood that lighter or heavier compression springs may be employed if desired. The tension of spring 36 is such as under normal conditions to maintain the swinging latch structure in lowered or operative condition with the latch nose 31 engaged with the latch plate 16 through the opening 17. If air pressure within the building and operating against the panel 10 becomes sufficient to overcome the tension of spring 36, the edge of the plate portion bearing against the inclined nose 31 of the latch arm will cause the latch structure in its entirety to rock in an upward direction upon its pivot 25, thus disengaging the nose of the latch from within the plate opening. The panel 10 being thus released may swing under this same air pressure to open position thereby releasing the air pressure within the building. Once the panel is released, the compression spring 36 will return the latch mechanism to its lowered or operative position, and the latches may be readily reset to secure the panels in closed position as will be readily understood.

By providing the bolt and slot connection between the base plate 20 and the supporting angle bar 21, it is apparent that accurate adjustments between the latch nose and the keeper opening may be readily made.

It will be understood that the construction here described is adapted for use particularly in connection with buildings where explosions or abnormal air pressures within the building might tend to damage or wreck the same. Moreover, the invention is useful in releasing the pressure within the building in instances where damage might occur by a reduction of atmospheric pressure upon the exterior of the building due to climatic conditions. The particular construction and mounting of the panels and the latch mechanism enables the structure to be installed by comparatively simple methods and at a minimum of expense, and the construction and assemblage of the various parts is such as to minimize the opportunity for wear or derangement under all normal conditions.

4

The structure herein shown and described is a preferred embodiment of the invention, however, it will be understood that variations in the construction, arrangement and assemblage of the various parts may be resorted to if desired without departing from the spirit of the invention as defined by the claim.

I claim:

In a latch structure, a housing having an opening therein and a panel to normally fit over and close said opening, an apertured keeper plate secured to said panel and disposed substantially parallel with the plane of said opening when said panel is in closed position, an angle bar supported on one of its sides in said housing in a plane parallel with the plane of said opening and having longitudinally disposed slots therein, bolts extending through said slots and anchored in said housing, an arm pivoted at one end to the other side of said angle bar for swinging movement at right angles to the plane of said opening, a latch member secured to said arm to project through said keeper plate opening, a camming latching nose on the outer end of said latch member overhanging an edge of said keeper aperture frictionally and slidably engaged with said edge when the panel is in closed position, a spring normally holding said arm with said latching nose in engagement with said keeper edge, and means for varying the tension of said spring.

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