

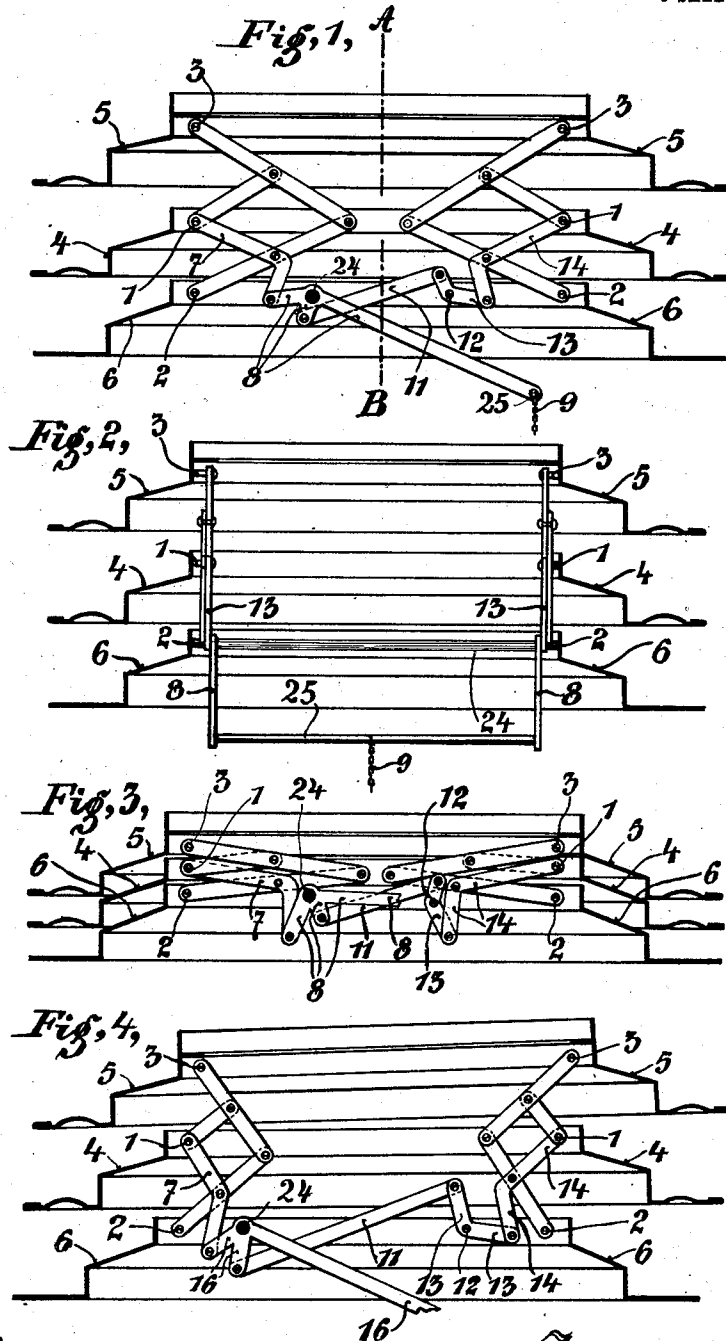
A. KLEIN.
ROOF LIGHT.

APPLICATION FILED JULY 7, 1911.

1,021,782.

Patented Apr. 2, 1912.

3 SHEETS—SHEET 1.



Witnesses:
Wolf Schmidt
Franz Hartung

Inventor:
A. Klein

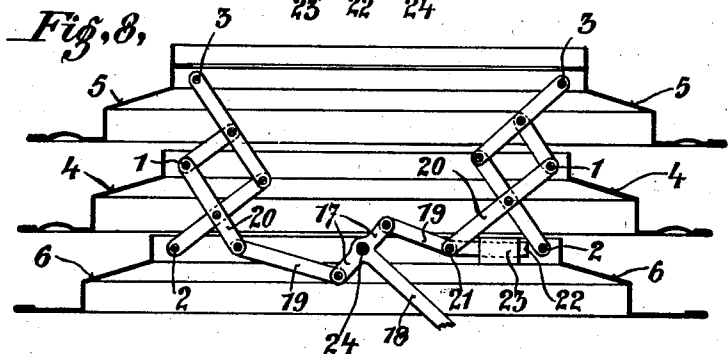
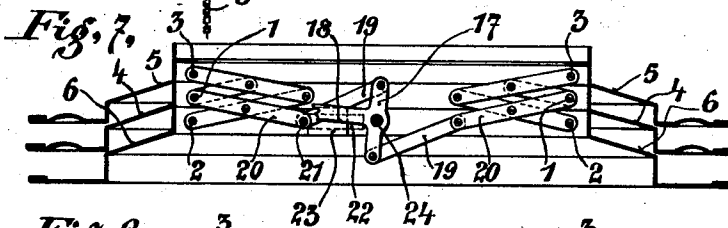
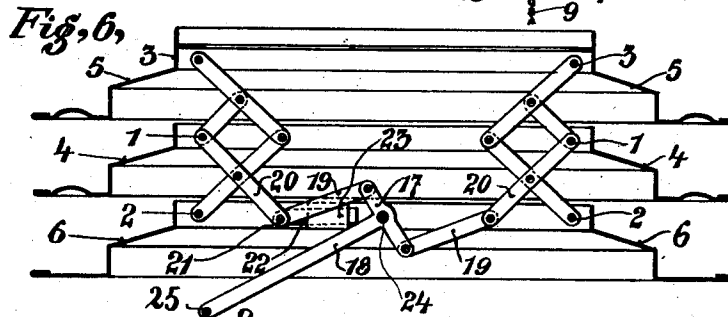
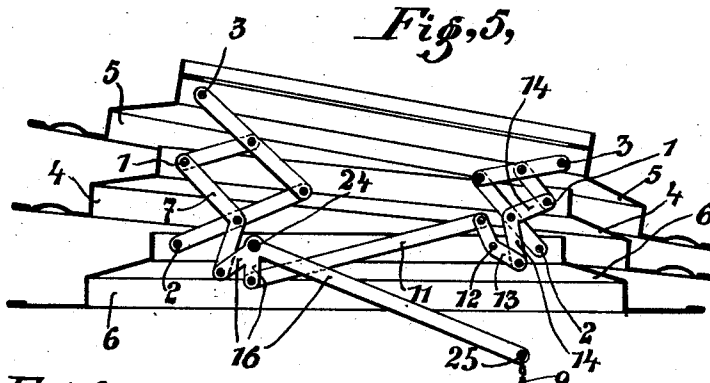
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3 SHEETS-SHEET 2.



Witnesses:
Adolf Tilmann
Franz Hartung

Inventor:
Alvin Klein

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3 SHEETS—SHEET 3.

Fig. 9,

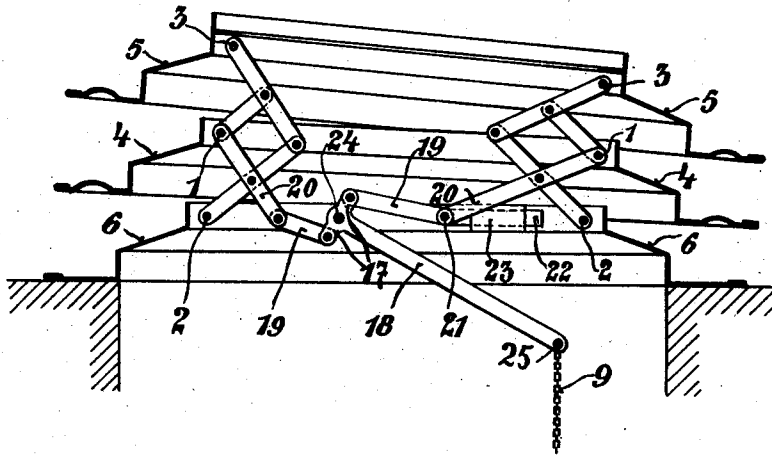


Fig. 10,

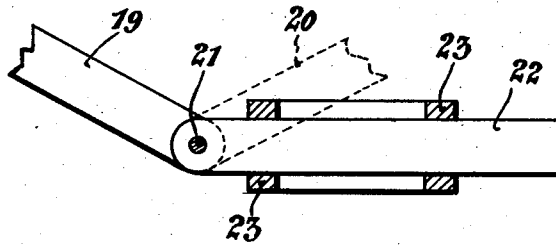
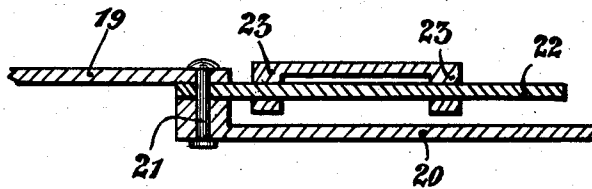


Fig. 11,



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UNITED STATES PATENT OFFICE.

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ROOF-LIGHT.

1,021,782.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed July 7, 1911. Serial No. 637,316.

To all whom it may concern:

Be it known that I, ALBIN KLEIN, a subject of the Emperor of Germany, residing at Erfurt, Germany, have invented certain
5 Improvements in Roof-Lights, of which the following is a specification.

The present invention relates to improvements in the operating mechanism of roof-lights of the kind composed of a plurality
10 of superposed louvered frames carried by a system of lazy-tongs levers.

The invention consists in the various details of construction and combination of the levers as hereinafter set forth and claimed
15 and illustrated in the accompanying drawings of which—

Figure 1 represents a sectional view of one construction, the roof-light being shown open, Fig. 2, a section on the line A—B of
20 Fig. 1, and Fig. 3, a view similar to Fig. 1, the roof-light being closed. Figs. 4 to 6 are sectional views, each of a somewhat modified construction, Fig. 7 is identical with
25 Fig. 6, the elements being shown in a different position. Figs. 8 and 9 are further modifications, while Figs. 10 and 11 are sectional views of a steadying element employed in the last three constructions.

The louvered frames 4, 5 and 6 are carried by four sets of lazy-tongs levers, one set being provided for each corner of the frames. The sets are arranged in pairs working in parallel planes. Each pair has a common actuating lever, and both actuating levers have their outer ends connected
30 by a horizontal rod 25 (Fig. 2) carrying a chain 9 or some other pull-element by means of which all the levers may be simultaneously operated for opening out the frames.
35 The lazy-tongs levers are pivoted at 1, 2 and 3 to the different frames, and the actuating levers may either be connected to a shaft 24 mounted across the stationary frame 6 so as to strengthen the latter, or to independent pivots connected to the same frame. In addition to the long arm connected to the rod 25, each actuating lever is fitted with two short arms each of which
40 is connected to a different set of lazy-tongs levers.
45

In Figs. 1 to 5 the lowermost lever 7 or 14 of each set has its lower arm set at an angle to the rest of the lever and, while the bent arm of the lever 7 is pivoted directly
50 to its allotted arm on the actuating lever,

that of the lever 14 is connected to its actuating arm through the medium of a link 11 and a bell-crank lever 13, the latter being pivoted at 12 to the frame 6. In Figs. 1 to 3 the short arms of the actuating levers 8
55 are turned to the same side of the long arm and are set at a narrow angle to one another, the length of the arms being adjusted so that, when the chain 9 is pulled, the frames are opened out uniformly at both
60 ends. When the roof is slanting it is usual to open out the lower ends of the frames to a greater extent than the upper ends, the better to exclude the weather. For this purpose the arrangement shown in Fig. 4
65 may be resorted to, the construction of the actuating lever 16 being here somewhat modified. If the slope of the roof is very steep, the difference in the opening out should be greater still, for instance as shown
70 in Fig. 5, where the lazy-tongs levers are shorter at one end of the frame than at the other. The latter arrangement has the effect, not only of opening out the lower ends of the frames more than the upper ones, but
75 also of tilting the raised set of frames backward, as shown in Fig. 5. In the remaining constructions the lowermost levers 20 of the lazy-tongs are straight, and all are
80 connected to the short arms 17 of the actuating levers 18 by means of links 19. The arms 17 are set in opposite directions and at about right angles to the lever 18.

The difference between the constructions shown in Figs. 6, 7 and 8 is merely that the actuating levers are set in opposite directions. In Fig. 9 this construction of the levers is adapted for opening out the frames more at one end than at the other, the lower arms of the levers 20 being of different
85 lengths and so also the links 19. Also in this case the raised set of frames is tilted backward. In the three latter constructions means are provided for steadying the lazy-tongs levers. This steadying arrangement, which is shown more clearly in Figs. 10 and 11, consists of a slide 22 fitted in a guide-way 23 and pivoted at 21 together with one
90 of the levers 20 to the link 19. One such slide is provided for each pair of lazy-tongs.
95 These slides are not subjected to any great stress and do not therefore appreciably increase the previously slight friction.

Although only two movable frames 4 and 5 are in the drawings, any convenient num-
100

ber of such frames may be employed, the lazy-tongs being correspondingly extended.

I claim:—

- 5 1. In a roof-light of the character described, the combination with a series of superposed louvered frames, of four sets of lazy-tongs levers, each set supporting the frames at a different corner, the sets being connected in pairs working in parallel
10 planes, an actuating lever for each pair, and connections between the two actuating levers for the simultaneous operation of all the sets of lazy-tongs levers and opening out of the frames, substantially as set forth.
- 15 2. In a roof-light of the character described, the combination with a series of superposed louvered frames, of four sets of lazy-tongs levers, each set supporting the frames at a different corner, the sets being
20 connected in pairs working in parallel planes, an actuating lever for each pair pivoted to the lowermost, stationary frame, each actuating lever having a long and two short arms, the short arms being connected
25 to different sets of lazy-tongs levers, a rod connecting the long arms of the two actuating levers, and a pull-element on said rod for operating the levers and opening out the frames, substantially as set forth.
- 30 3. In a roof-light of the character described, four sets of lazy-tongs levers connected in pairs working in parallel planes, an actuating lever for each pair, each actuating lever having a long and two short
35 arms, a link connecting the short arm of each actuating lever with a different set of lazy-tongs levers, and a rod connecting the long arms of the actuating levers for the

simultaneous operation of the same, substantially as and for the purpose set forth. 40

4. In a roof-light of the character described, four sets of lazy-tongs levers connected in pairs working in parallel planes, an actuating lever for each pair, each actuating lever having a long and two short
45 arms, a link connecting the short arm of each actuating lever with a different set of lazy-tongs levers, a slide movably held in a stationary guide-way, said slide being pivoted to one of the links for steadying the
50 lazy-tongs, and a rod connecting the long arms of the two actuating levers for the simultaneous operation of the same, substantially as set forth.

5. In a roof-light of the character described, the combination with a series of superposed louvered frames, of four sets of lazy-tongs levers, each set supporting the frames at a different corner, the sets being
55 connected in pairs working in parallel planes, an actuating lever for each pair, and connections between the two actuating levers for the simultaneous operation of all the sets of lazy-tongs levers and opening out
60 of the frames, the levers being made shorter at one end of the frames than at the other so as to open out the frames differently at the opposite ends and at the same time tilt
65 the raised series of raised frame backward, substantially as and for the purpose set
70 forth.

ALBIN KLEIN.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."