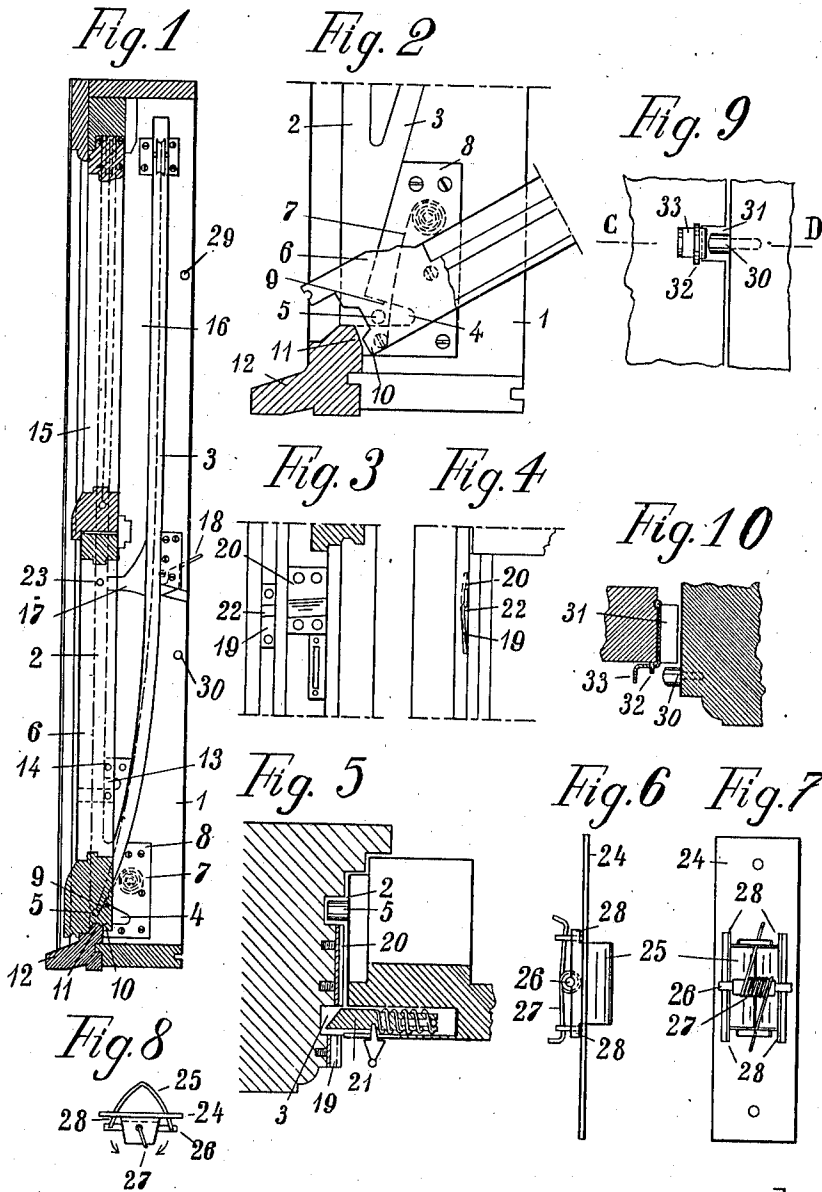


R. BIEL.
WINDOW.

APPLICATION FILED MAY 28, 1909.

970,980.

Patented Sept. 20, 1910.



Witnesses:

Arthur Hennrich
Hugo von Menthay

Inventor.

Richard Biel

UNITED STATES PATENT OFFICE.

RICHARD BIEL, OF ITZEHOE, GERMANY.

WINDOW.

970,980.

Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed May 28, 1909. Serial No. 498,942.

To all whom it may concern:

Be it known that I, RICHARD BIEL, a subject of the German Emperor, and resident of Itzehoe, Germany, have invented certain new and useful Improvements in Windows, of which the following is a specification.

My invention relates generally to windows and particularly to sash-windows of the English casement type.

A primary object of my invention is to provide an improved sash-window which differs from known forms in that the bottom end of each longitudinal groove opens into a transverse groove into which the pin attached to the sash is positively introduced in the lowest position of the sash owing to the sash meeting with a resistance at the bottom of the frame when being tilted.

Some illustrative embodiments of my invention are represented by way of example in the accompanying drawing, wherein:—

Figure 1 is a vertical section through my improved sash-window, and Fig. 2 is a like view of the lower part on a larger scale showing the bottom sash tilted over; Fig. 3 is a side elevation of the left jamb-lining with a modified form of the device enabling the sash to be opened, and Fig. 4 is a front elevation of the device shown in Fig. 3, whereas Fig. 5 is a section through the left jamb-lining showing the device according to Figs. 3 and 4 in position of the sash allowing the same to be raised; Fig. 6 is a side elevation of a movable guide, Fig. 7 a rear elevation of same, and Fig. 8 a top plan view of the same; Fig. 9 shows a modification of the opening device of the sash in plan, and Fig. 10 is a section in the plane C—D in Fig. 9.

Referring firstly to Figs. 1 and 2, the inner faces of the side walls of window frame 1 are provided with grooves 2, 3 meeting near their lower ends and terminating in a substantially horizontal cavity or recess 4 designed to receive the bottom guide pin 5 of sash 6. In the center of this recess 4 guide pin 5 presses against the free end of a spring 7 which tends to prevent the sash being rocked, said recess being protected from undue wear by a metal plate 8 cut away correspondingly.

In order to rock sash 6, it has only to be pushed down as far as possible in the groove 2 or 3 and then tilted forward when it rocks forward under the action of its own weight. But it is only necessary to tilt the sash a

very slight amount to cause it to be automatically secured against the draft of the cord of the counterpoise. Namely, it only requires a slight inclination of the sash for guide pin 5 to be brought under the edge 9 at the junction of groove 2 and recess 4, as at the lower edge of the bottom side of the sash is a special rim 10 which rests against the face 11 of the sill molding 12 and in consequence of the displacement of the axis of rotation of the sash caused thereby, guide pin 5 is moved into recess 4. On the other hand, the tendency of the pressed spring 7 is to place the sash upright by forcing the guide pin out of the cavity. As the edge 9 projects considerably and only just allows guide pin 5 to pass, all possibility of the sash swinging down of its own accord or of its being pulled up by the pull of the counterpoise is thus avoided.

When the lower sash cannot for any reason be raised sufficiently high, as in the case of round-headed windows, in order to swing the top sash under the elevated lower sash, another cavity or recess 13 similar to the lower recess 4 may be arranged at a suitable part of groove 3 and protected by a similarly cut plate 14, as shown in dotted lines. Obviously, in this event this plate must separate the top part of groove 2 from the lower part so that the top sash can be rocked parallel with the lower sash. Of course the sashes have a guide pin at their upper ends as well as those at their lower ends, the former serving for guiding the sashes, and the latter as pivots. In this illustrative embodiment the fillet 16 between the two grooves 2 and 3 has in it a transverse groove 17 through which the upper guide pin 23 can slide so that the sash in question can be tilted. The two sashes are kept in their closed position by a Z-shaped bolt 18 which engages in a cavity in the jamb-lining.

Referring to Figs. 3, 4 and 5, instead of the branch groove 17 (Fig. 1), I preferably use an angular metal strip 19 at the outer edge of the jamb-lining and a somewhat curved metal strip 20 on the fillet 16 separating the grooves 2 and 3. In a corresponding position on the sash is placed a beveled spring-pressed bolt 21 pressing on the strip 20 when the sash is closed. These strips 19 and 20 form abutments which prevent the sash tilting automatically at the wrong time. They are arranged, relatively to the sash in its lowest position, in which this can

only be tilted inward, at the height of the bolt 21. The latter is pressed against the strip 20 with a somewhat tensioned spring, in order that it can snap into the groove when the sash is pulled and here serves as a guide pin when the sash is pulled upward. Further, the bolt 21 cannot be entirely withdrawn into its cavity but its front edge always projects say 4 mm. from the edge of the sash. This is so that the sash cannot tilt inward when it is pushed upward, when the bolt 21 might perhaps be unintentionally drawn back. It should only be possible to tilt the sash down in its lowest position, and to this end I arrange an angular strip 19 on the fillet between the groove 2 and the front edge of the jamb-lining. The angle 22 of this strip is so deep that the bolt 21 can pass through the same. If desired bolt 21 may be provided on the jamb-lining and strips 19 and 20 on the sash; or, as shown in Figs. 9 and 10, a pin 30 may be attached to the lower part of casing 1, the end of the pin projecting into a recess or cavity 31 in a corresponding part of the sash, to prevent the sash from being tilted inwardly except in its lowest position; the end of the cavity can be closed by a band spring 33, for example, fastened to the sash by the eye 32.

The recess 22 is arranged in strip 19 in such manner that bolt 21 cannot slide through it but must first be drawn back before the sash can be lowered.

The branch groove 17 can be dispensed with if use is made of the spring guide or catch shown in Figs. 6, 7 and 8, instead of the guide pin 23. This spring guide is screwed onto the edge of the sash and comprises a slotted metal plate 24 having upper and lower lugs projecting therefrom at right angles, and a curved pointed plate 25 movably mounted on said plate 24. This plate 25 has a pin 26 lying across its outer edges 28, said pin being surrounded by a spring 27 which connects it with the lugs of the slotted plate 24. The ends of the outer edges 28 of plate 25 prevent this from falling through the slot in plate 24, and at the same time they form the pivot of the curved plate 25, this latter moving to one side or the other when the sash is opened or closed as indicated by the arrows in Fig. 8.

I claim:—

1. In a sash window of the character de-

scribed, the combination of a frame having longitudinal, lateral grooves terminating in two lateral, transverse, substantially horizontal recesses, a sash having two rims on either side of, and normally projecting below the top of, the bottom transverse member of said frame, and two lateral pins at the bottom of said sash movable in said grooves and said recesses.

2. In a sash window of the character described, the combination of a frame having longitudinal grooves terminating below in a transverse recess, a spring in said frame projecting into said recess, a sash having limbs normally embracing the bottom member of said frame, and a pin arranged on the side of said sash, movable in said groove and said recess, and adapted to abut against said spring when said sash is tilted in the lowest position thereof.

3. In a sash window of the character described, the combination of a frame having longitudinal grooves terminating below in a transverse recess, said longitudinal grooves being connected above said recess by a transverse groove, a spring in said frame projecting into said recess, a sash having limbs normally embracing the bottom member of said frame, and a pin arranged on the side of said sash, movable in said groove and said recess, and adapted to abut against said spring when said sash is tilted in the lowest position thereof, and a guide arranged on the side of said sash movable in said longitudinal grooves and in said transverse groove.

4. In a sash window of the character described, the combination of a frame having longitudinal grooves terminating below in a transverse recess, a spring in said frame projecting into said recess, a sash having limbs normally embracing the bottom member of said frame, and a pin arranged on the side of said sash, movable in said groove and said recess, and adapted to abut against said spring when said sash is tilted in the lowest position thereof, and guiding means movable in said longitudinal grooves.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses:—

RICHARD BIEL.

Witnesses:

ERNEST H. L. MUMMENHOFF,
OTTO W. HELLMRICH.