Feb. 18, 1930. L. M. CALDWELL 1,747,576

WINDOW CONSTRUCTION

Filed April 21, 1928 2 Sheets-Sheet 1

Fig. 1.

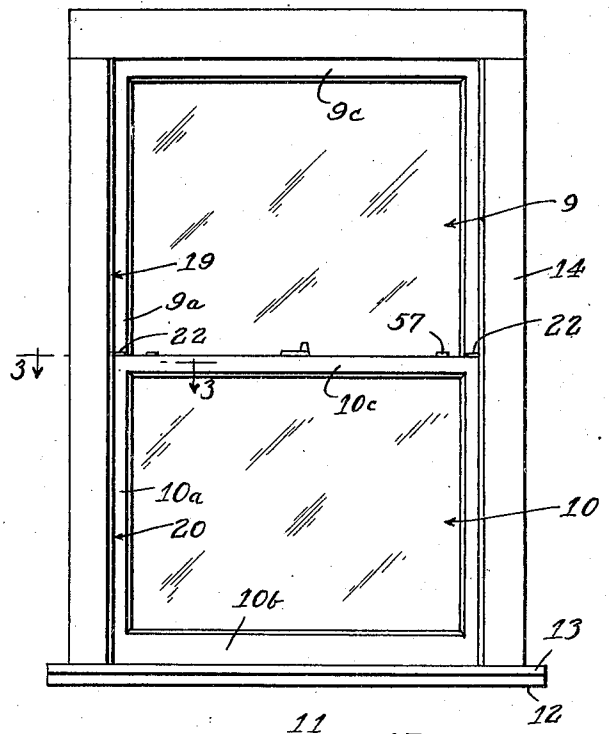
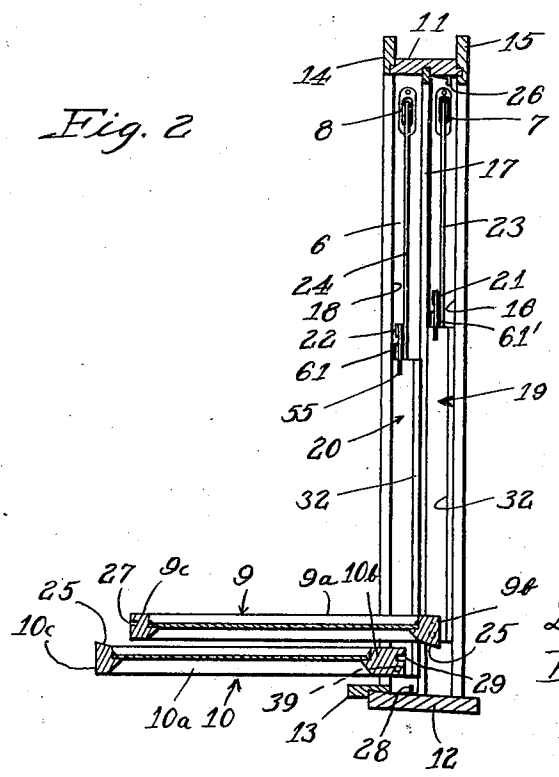


Fig. 2



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Fig. 3

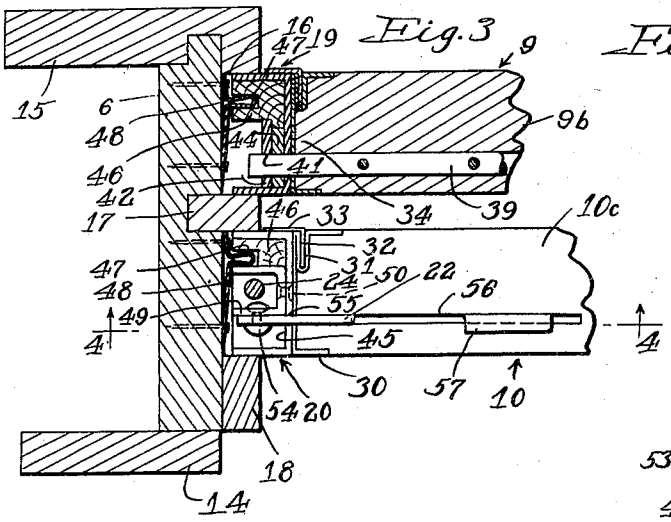


Fig. 5

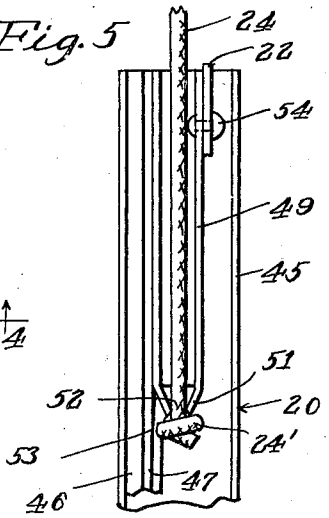
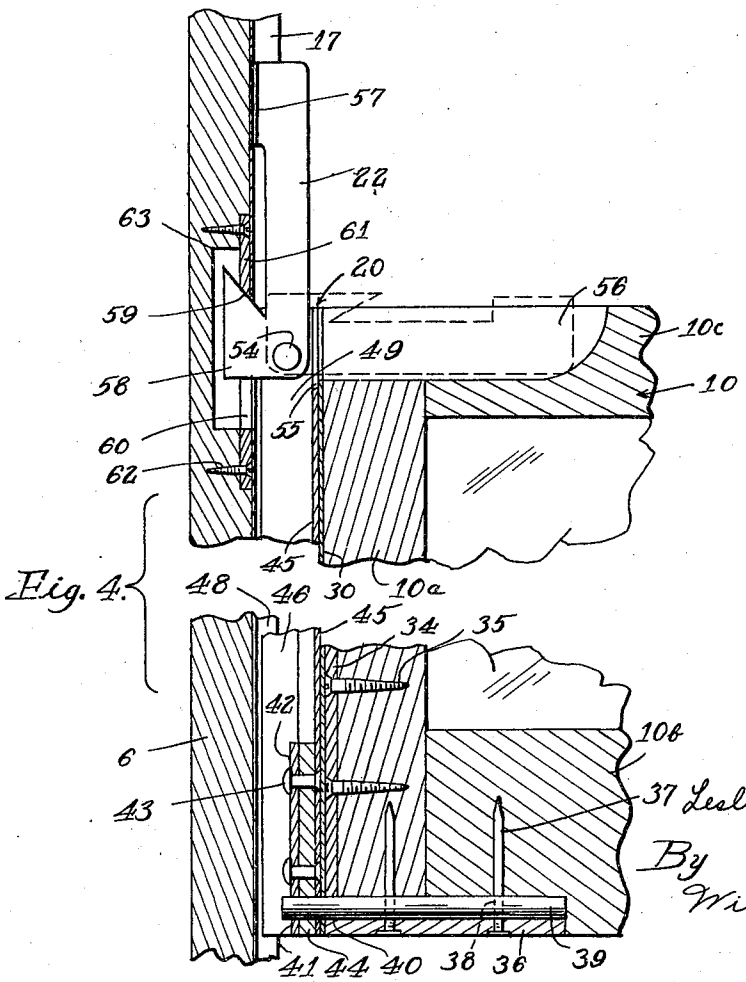


Fig. 4.



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UNITED STATES PATENT OFFICE

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WINDOW CONSTRUCTION

Application filed April 21, 1928. Serial No. 271,765.

This invention relates to a novel window construction permitting the swinging inwardly of the slidable sashes for the purpose principally of facilitating the washing of the outside thereof but also, in some instances, for the purposes of ventilation.

The principal object of the invention is to provide a window construction of the kind referred to permitting the use of window frames of standard construction, thereby avoiding extra expense being involved by reason of having to have the frames made special, and also permitting of completely weather-stripping the window according to present standard practice, while making provision for the shrinking and swelling of the sashes such that the same will always operate easily and quietly.

According to my invention each sash is provided with slides between the side rails thereof and the frame, the said sash being pivoted to the slides by its bottom rail so as to swing inwardly, and having means for quickly detachably securing the same to the sides by the top rail thereof, the last mentioned means being in the form of latches pivoted on the upper ends of the slides and swingable into and out of interlocking relation with the top rail of the sash. The latches serve an additional function, namely that of holding the slides against upward movement under the action of the sash weights when the sash is swung inwardly, means being provided on the pulley stiles for cooperation with the latches to prevent upward movement of the slides. The joints between the slides and the side rails of the sash are neatly weather-stripped, the weather-stripping serving to prevent outward movement of the sash when the same is swung upwardly into normal position, although, of course, the latches just referred to perform that function likewise when interlocked with the sash. The slides are of a special construction permitting the use of ribbed weather-stripping of a standard form which, besides serving its ostensible function, affords sufficient give to take care of shrinking and swelling of the sash under varying weather conditions, to the end that the same will always operate easily and quietly.

The foregoing and other features of my invention will appear in the course of the following detailed description in which reference is made to the accompanying drawings, wherein—

Figure 1 is an inside view of a window embodying my invention;

Fig. 2 is a central vertical section showing both sashes swung inwardly as, for example, when the same are to be washed;

Fig. 3 is a horizontal section on an enlarged scale taken approximately on the line 3—3 of Fig. 1, looking downwardly, the top rail of the lower sash appearing in elevation and the bottom rail of the upper sash being shown in section;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3, an intermediate portion of the sash and frame being broken away; and

Fig. 5 is a view looking at the inner side of the upper end of one of the slides.

The same reference numerals are applied to corresponding parts throughout the views.

The window frame illustrated is of ordinary standard construction consisting of pulley stiles 6 fitted with sash pulleys 7 and 8 for the upper and lower sashes 9 and 10, respectively. The upper and lower ends of the pulley stiles 6 are joined to the head jamb 11 and window sill 12, respectively, the latter having the usual stool 13 on the inside thereof. Inside and outside casings appear at 14 and 15, respectively. 16 is the blind stop for the outside of the upper sash 9, 17 is the parting strip between the upper and lower sashes 9 and 10, and 18 is the stop for the inside of the lower sash 10.

According to my invention the upper and lower sashes 9 and 10 have slides 19 and 20 interposed between the side rails 9^a and 10^a thereof and the pulley stiles 6 of the frame. The upper sash 9, as will presently appear, is pivoted by its bottom rail 9^b to the slide 19 and the lower sash 10 is likewise pivoted to the slide 20 by its bottom rail 10^b, and means are provided for locking the sashes to the

slides by their top rails 9^c and 10^c permitting quickly detaching or attaching each sash to its slides. The latch for the upper sash 9 appears at 21 and that for the lower sash at 22. The sash cords 23 and 24 for the upper and lower sashes pass over the pulleys 7 and 8, respectively, and cooperate, as will presently appear, with the slides 19 and 20, respectively. Sash weights are provided, of course, on the ends of the cords 23 and 24 in the usual way. Inasmuch as the details of construction of the upper and lower sashes and their cooperating guides are substantially identical, a description confined to the lower sash will suffice for both. In passing, it will be understood that the bottom rail 9^b of the upper sash 9 and the top rail 10^c of the lower sash 10 constitute the meeting rails, as they are generally called. The inclined contacting edges 25 of said rails provide a weather-tight joint in the usual way when the window is closed. The weather-strip 26 on the top jamb 11 is arranged to cooperate with the groove 27 on the top rail of the upper sash and similarly a weather-strip 28 on the sill 12 is arranged to cooperate with a groove 29 in the bottom rail of the lower sash to make the window substantially weather-tight when closed.

Referring now more particularly to Figs. 3–5, it will be seen that the lower sash 10 has the frame thereof constructed substantially entirely of wood, with the side rails 10^a reduced in cross-section substantially to the extent of the cross-section of the slides 20 arranged to cooperate therewith, this being with a view to keeping the over-all width of the sides of each sash about the same as the width of the side rails on any ordinary sash and thereby retain the same neat appearance. Inasmuch as both slides and parts cooperating therewith are substantially of identical construction, a description of one will suffice for both. Each side rail has the edge thereof covered by a substantially channel-shaped metallic weather-strip 30 conformed along the outer edge thereof to provide a recess 31 extending longitudinally thereof to receive the inturned flange 32 of a weather-strip 33 suitably mounted on the edge of the slide 20 on the outer side of the latter. The weather-strip 30, when secured in place on the side rail in any suitable manner, provides substantial reenforcement for the sash. The lower end of the strip 30, as shown in Fig. 4, covers a metallic right-angle strap 34 fastened, as by means of screws 35, to the edge of the side rail, the inturned end 36 of said strap being arranged to be fastened, as by means of screws or nails 37, to the side and bottom rails of the sash. The bottom rail and the lower end of the side rail are suitably recessed to receive the end 36 of the strap. The strap affords considerable reinforcement for the lower corner of the sash which, of course, bears the brunt of the load in the swinging movement of the sash as, it is thought, will readily appear. The screws or nails 37 pass through holes 38 in a pintle 39 which has one end thereof passed through holes in the strip 30 and strap 34 at 40 and projecting substantially from the sash so as to serve as one of two trunnions whereon the sash is arranged to be pivotally supported. The bearing 41 receiving the pintle 39 is provided in the form of a hole in the plate 42 riveted, or otherwise suitably secured as at 43, with another plate 44 to the web of the channel iron 45 forming the body portion of the slide 20. The plate 42, as will be found on observation of sash 9 in Fig. 3, cooperates with the plate 44 to receive the rabbeted edge of a wooden strip 46 which fills substantially one-half of the trough in the channel strip 45 and extends from end to end therein. The strip 46, besides being held by the plate 42, is secured to the channel 45 suitably by screws or nails, not shown. The strip has a groove 47 cut longitudinally in the inner side thereof to receive the rib of a ribbed weather-strip 48 mounted on the pulley stile 6. The latter is of a standard construction and is arranged to afford sufficient give to take care of the shrinking and swelling of the sash under varying weather conditions. In other words, the slides 19 and 20 for both sashes will never tend to bind in their ways but will always permit easy and quiet raising and lowering of the sashes. Before proceeding with a description of the novel means which I have provided for quickly detachably interlocking the slides either with the sashes or with the window frame, attention may be called to the short narrow channel strip 49 fastened, as by means of rivets 50, to the web of the channel 45 at the upper end of the latter (see Fig. 5). The sash cord 24 extends through the trough of the channel 49 and has the knotted end 24′ lodged in the eye formed by the bent-in lower ends of the flanges 49, as appears at 51. Sufficient space is left at 52 between the bent-in edges to permit the insertion of the sash cord and the removal thereof. It will be observed that the upper end of the strip 46 is cut away at one side of the groove 47, as appears at 53, to accommodate the edge of the channel 49. The channel 49 is arranged to provide one side of the groove 47, as best appears from observation of sash 10 in Fig. 3.

The latches 21 and 22, referred to earlier in this description, constitute the means for selectively interlocking the slides 19 and 20 with the sashes 9 and 10, respectively, or with the window frame. Referring principally to the latch 22 appearing in Figs. 3–5, it will be observed that the same is pivotally mounted on one flange of the channel 49 on the outside thereof, as by means of a rivet 54, and that the web of the channel 45 has a slot 55 cut

therein to permit swinging the latch to a horizontal position at right angles to the slide 20 into a recess 56, in the form of a saw slot cut into the top of the lower sash 10, that is, in the upper end of the side rail 10^a and into the top rail 10^c. The latch 22 is shown in the horizontal position in dotted lines in Fig. 4 and in such position it will be evident that the slide is interlocked with the sash so that the latter is rigidly and securely held against swinging movement. There is no danger of the window rattling. The latch 22 has the free end thereof enlarged to form a tab 57, the edge of which may, if desired, be bent at right angles to the plane of the latch (see Fig. 3) so as to facilitate withdrawing the latch from the recess 56 when unlocking the sash for swinging movement. The inner end of the latch 22 is enlarged to form a tooth 58, one edge of which is cut at an acute angle to the longitudinal axis of the latch, as appears at 59. The tooth 58 is arranged to be received in a vertical slot 60 cut in a keeper plate 61 fastened, as by means of screws 62, to the pulley stile 6. The latter is recessed, as appears at 63, to accommodate the tooth 58. It will be evident that when the latch 22 is swung to the full line vertical position shown in Fig. 4 to unlock the sash 10 for swinging movement, the tooth 58 thereof is arranged to enter the slot 60 so as to hold the slide 20 against upward movement under the action of the sash weight. The acute angle of the edge 59 of the tooth 58 causes the latch 22 to make wedging engagement with the keeper plate and serves to hold the slide securely in place in its way. The latches 21 for the slides 19 of the upper sash 9 are arranged, as appears in Fig. 2, to interlock with keeper plates 61′.

The operation of the window of my invention is thought to be clear from the foregoing description. However, it may be well to state that the keeper plates 61 and 61′ are located, as shown in Fig. 2, so that the lower sash 10 has its slides 20 arranged to be locked to the window frame in such a position that the sash, in swinging inwardly, clears the stool 13, the upper sash 9, in turn, having its slides 19 arranged to be locked to the window frame at a slightly higher elevation so that the sash 9 swings inwardly over sash 10. Any suitable means may be provided, if desired, for supporting the sashes in their horizontal or substantially horizontal positions to facilitate the matter of washing, and, if desired, suitable means may be provided whereby the sashes may be supported in intermediate positions as, for example, for the purposes of ventilation.

It is believed the foregoing description conveys a clear understanding of my invention and that it will be appreciated that I have provided a comparatively simple and economical construction and that the same is moreover thoroughly practical for general application. While reference has been made in the description to various specific details of construction it should be understood that the same are capable of a certain amount of modification without departing seriously from the invention. For that reason the appended claims should be construed so as to cover all legitimate modifications and adaptations which may occur to those skilled in the art to which the invention relates.

I claim:

1. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways, and window sashes each having a pair of trunnions at the lower end thereof received in bearings in the lower ends of a pair of slides, a latch pivotally mounted on the upper end of one of the slides for swinging movement in the plane of the sash in the normal position of the latter, said sash having a recess in the top thereof to receive a portion of the free end of said latch when the latter is swung into a horizontal position whereby to interlock the sash with the slide to prevent swinging movement thereof, said latch having a projection thereon at the pivoted end thereof and a keeper plate mounted on said frame provided with an opening adapted to receive said projection when the latter is swung into a vertical position whereby to hold the slide against upward movement relative to the frame while permitting swinging movement of the sash.

2. In a window construction as set forth in claim 1 wherein each slide has a sash cord arranged to be connected therewith, a channel strip mounted on the upper end of each slide with the trough thereof open to the back of the slide, one of the flanges of said channel strip providing pivotal mounting for the latch associated with the slide, and the free end of the sash cord being received in the trough of the channel strip with the knot thereof engaging the ends of the flanges whereby to join the sash cord to the slide in a quickly detachable connection.

3. In a window construction as set forth in claim 1 wherein each slide has a sash cord arranged to be connected therewith, a channel strip mounted on the upper end of each slide with the trough thereof open to the back of the slide, one of the flanges of said channel strip providing pivotal mounting for the latch associated with the slide, the lower ends of the flanges of said channel strip being bent inwardly toward each other to form an open-sided eye, and the free end of the sash cord being received in the trough of said channel with the knot thereof engaging the eye whereby to join the sash cord to the slide in a quickly detachable connection.

4. A window construction as set forth in claim 1 wherein the edge of the projection on said latch arranged to cooperate with the

keeper on the frame is inclined at an acute angle with respect to the rest of the latch and away from the free end thereof substantially as shown whereby to have wedging engagement with the keeper for the purpose described.

5. In a window construction of the character described, the combination of a window frame providing ways therein, slides operating up and down in said ways, window sashes pivotally mounted on said slides to swing inwardly relative to the frame, as for cleaning or ventilating purposes, interlocking weather-strips on the outer edges of said slides and the side rails of the sashes making the joints between the sashes and the slides weather-tight, the said weather-strips serving also in a measure to prevent outward swinging movement of said sashes, means for detachably interlocking the sashes with the slides to prevent inward swinging movement of the sashes, and compressible weather-strips in the ways serving to make the joints between the slides and the frame weather-tight, said strips being also arranged to serve as a yielding means for accommodating shrinking and swelling of the sashes under varying weather conditions whereby to permit easy sliding and swinging movement of the sashes at all times.

6. In a window construction comprising a frame and slides operable in ways therein, a window sash having trunnions at the lower end thereof for pivotal mounting on the slides, each of said trunnions comprising a pintle received in a recess in the bottom of the sash and having the end thereof projecting from the sash sufficiently to serve as a trunnion, and an angular strap secured to and reenforcing the bottom corner of the sash, said strap having the pintle confined thereby and passing through a hole provided therein, and one or more of the fasteners for securing the strap to the sash being arranged to pass through holes provided in the pintle whereby to secure the same in place on the sash.

7. In a window construction comprising a frame providing slideways, a sash arranged for sliding and swinging movement in said frame, a pair of slides for said sash each of which is disposed in a slideway between the frame and the side rail of the sash, each of said slides comprising a channel strip disposed with the trough opening toward the frame, a trunnion provided on the bottom of the sash received in a bearing in the web of the channel strip, a short narrow channel strip at the upper end of said slide channel disposed in the trough of the channel with the webs of the channels secured together, the last mentioned channel being arranged to receive the free end of a sash cord with the knot thereof lodged at the lower end of the channel against the ends of the flanges thereof whereby to provide a quickly detachable connection between the cord and the slide, and a latch pivotally mounted on one of the flanges of the last mentioned channel at the upper end thereof and swingable in the plane of the sash in the normal position of the latter, said sash having a recess in the top thereof to receive the latch.

8. A window construction as set forth in claim 7 including a wooden strip fitting in the trough of the slide channel and having a longitudinally extending groove therein opening at the back of the slide, and a ribbed weather-strip in the slideway on the window frame having the rib thereof received in said groove.

9. In a window construction as set forth in claim 7 wherein the latch has the pivoted end thereof enlarged to form a tooth arranged to serve as a catch, a keeper plate mounted in the slideway on the window frame and having an opening arranged to receive said tooth whereby to hold the slide against upward movement relative to the frame.

10. In a window construction of the character described, the combination of a window frame providing ways therein, slides operating up and down in said ways, window sashes pivotally mounted on said slides to swing inwardly relative to the frame, as for cleaning or ventilating purposes, means for holding the sashes against swinging movement relative to the slides arranged when released to permit inward swinging movement thereof, and compressible weather-strips in the ways serving to make the joints between the slides and the frame weather-tight, said strips being also arranged to serve as a yielding means for accommodating shrinking and swelling of the sashes under varying weather conditions whereby to permit easy sliding and swinging movement of the sashes at all times.

11. In a window construction of the character described, the combination of a window frame providing ways therein, slides operating up and down in said ways, window sashes pivotally mounted on said slides to swing inwardly relative to the frame, as for cleaning or ventilating purposes, interlocking weather-strips on the outer edges of said slides and the side rails of the sashes making the joints between the sashes and slides weather-tight and serving also to prevent outward swinging movement of the sashes relative to the slides, means for detachably interlocking the sashes with the slides to prevent inward swinging movement of the sashes, and weather-strips in the ways of said window frame providing sliding weather-tight joints between the slides and the frame, the slides being movable laterally relative to the strips in the shrinking and swelling of the sashes under varying weather conditions whereby easy sliding and swing-

ing movement of the sashes is insured at all times.

12. In a window construction of the character described, the combination of a window frame providing ways therein, slides operating up and down in said ways, window sashes pivotally mounted on said slides to swing inwardly relative to the frame, as for cleaning or ventilating purposes, means for holding the sashes against swinging movement relative to the slides arranged when released to permit inward swinging movement thereof, and weather-strips in the ways of said window frame providing sliding weather-tight joints between the slides and the frame, the slides being movable laterally relative to the strips in the shrinking and swelling of the sashes under varying weather conditions whereby easy sliding and swinging movement of the sashes is insured at all times.

13. In a window construction comprising a frame and slides operable in ways therein, a window sash having trunnions at the lower end thereof for pivotal mounting on the slides, each of said trunnions comprising a pintle mounted in the lower end of the sash and projecting therefrom for bearing in the slide adjacent the sash, and a strap secured to and reinforcing the bottom corner of the sash having one end thereof bent at right angles and fitting on the side of the sash, said strap having the aforesaid pintle passing through a hole provided in the latter portion thereof to provide good support therefor.

14. In a window construction comprising a frame providing slideways, a sash arranged for sliding and swinging movement in said frame, a pair of slides for said sash each of which is disposed in a slideway between the frame and the side rail of the sash, each of said slides comprising a channel strip disposed with the trough opening toward the frame, a trunnion provided on the bottom of the sash received in a bearing in the web of the channel strip, and a short narrow channel strip at the upper end of said slide channel disposed in the trough of the channel with the webs of the channels secured together, the last mentioned channel being arranged to receive the free end of a sash cord with the knot thereof lodged at the lower end of the channel against the ends of the flanges thereof whereby to provide a quickly detachable connection between the cord and the slide.

In witness of the foregoing I affix my signature.

LESLIE M. CALDWELL.