July 14, 1931. L. M. CALDWELL 1,814,289

WINDOW

Filed March 25, 1929 2 Sheets-Sheet 1

Fig. 1.

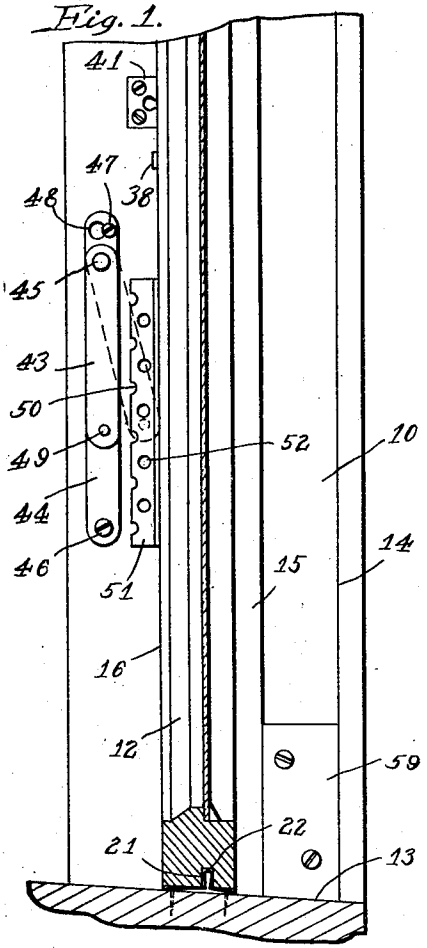


Fig. 2.

Inventor:
Leslie M. Caldwell
By Wilson & McCarroll
Attys.

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Fig. 3.

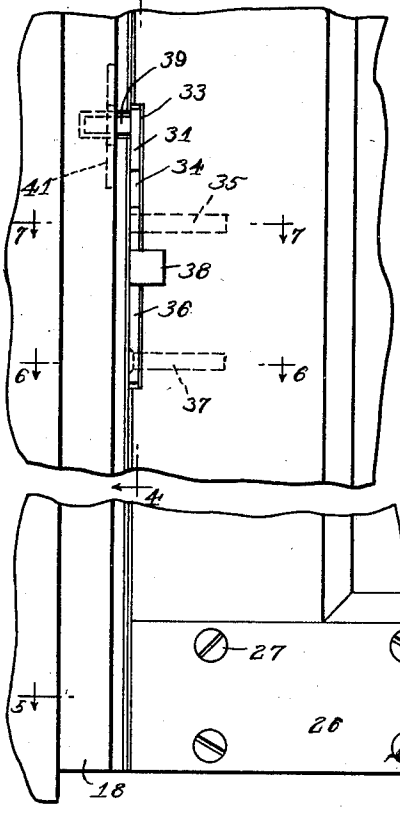


Fig. 4.

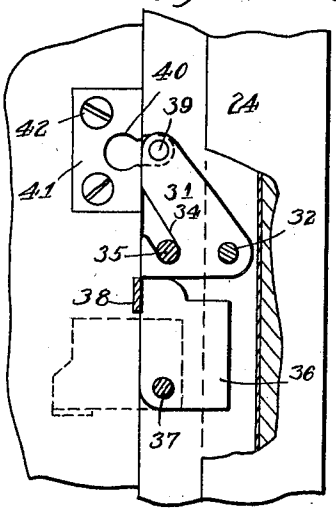


Fig. 8.

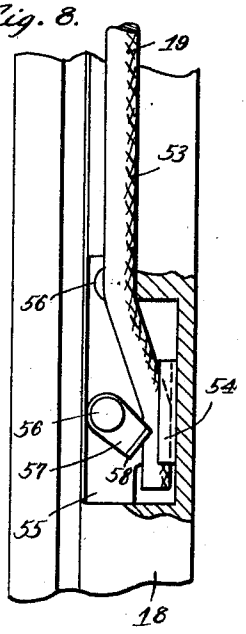


Fig. 5.

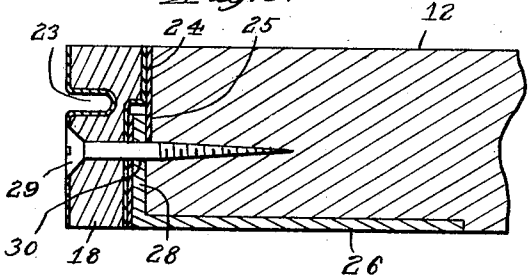


Fig. 6.

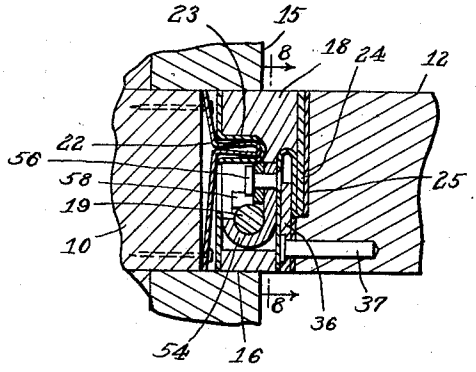
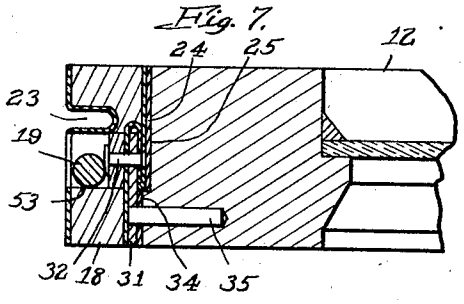


Fig. 7.



Inventor.
Leslie M. Caldwell
By Wilson & McCanna
Attys.

Patented July 14, 1931 1,814,289

UNITED STATES PATENT OFFICE

LESLIE M. CALDWELL, OF ROCKFORD, ILLINOIS

WINDOW

Application filed March 25, 1929. Serial No. 349,607.

This invention relates to improvements in windows and has particular reference to a window having at least the one sash thereof arranged to be swung inwardly to ventilating positions, and having both sashes arranged to be swung inwardly to cleaning positions.

One of the principal objects of the invention is to provide an extremely simple and practical form of means for quickly detachably securing the sash to its slides in normal upright position for sliding movement up and down and for quickly detachably securing the slides to the frame when the sash is swung inwardly either to ventilating or cleaning position. According to my invention, a dog is pivotally mounted on each of the slides alongside the sash, pins are provided on the sash to engage in slots in the dogs in the normal position of the sash, and a keeper is pivotally mounted on each side of the sash and arranged to be swung by hand into or out of a position holding the dogs locked to the pins, whereby to make the sash absolutely rigid with the slides for sliding movement up and down in the frame just like in an ordinary window. Then, too, fixed keepers are provided on the frame having slots therein adapted to receive pins projecting laterally from the dogs, the said dogs being arranged to be swung toward and away from the fixed keepers automatically in the swinging of the sash relative to the slides, by reason of the peculiar way in which the pins on the sash cooperate with the slots in the dogs.

Another important object of my invention is to provide a novel means for holding the sash in different ventilating positions, the said means being also arranged to serve to support the two sashes when they are lowered to cleaning position. Briefly stated, the means comprises a pair of toggle links mounted preferably on each side of the window frame, the one link being pivotally mounted on the frame and serving as a mounting for the other link, the first link being arranged to be quickly detachably secured to the frame against swinging movement when the other link is swung to different positions with respect thereto to hold the sash in different ventilating positions, and the first mentioned link being arranged to be detached to permit opening the toggle to substantially the combined length of the two links thereof when the same are to serve in the supporting of the sashes in cleaning position.

Still other features of my invention, such as the improved sash cord fastener and the reinforcement of the bottom corners of the sashes where they are pivotally mounted on the slides, will appear in the course of the following detailed description, in which reference is made to the accompanying drawings, wherein—

Figure 1 is a vertical section through a part of a window embodying my invention showing the lower sash in normal upright position;

Fig. 2 is a similar section showing a little more of the window, the two sashes being shown in full lines in horizontal cleaning position and the lower sash also in dotted lines in ventilating position;

Fig. 3 is a front view of the left hand side of the lower sash, an intermediate portion thereof being broken away to conserve space in the drawing;

Fig. 4 is a vertical section on the line 4—4 of Fig. 3;

Figs. 5, 6 and 7 are horizontal sections on the lines 5—5, 6—6 and 7—7 of Fig. 3, and

Fig. 8 is a vertical section taken approximately in the plane of the line 8—8 of Fig. 6.

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

The window frame illustrated is generally of standard construction having stiles 10 fitted with the usual sash pulleys for the upper and lower sashes 11 and 12 slidable up and down between the usual head jamb (not shown) and window sill 13. 14 is the blind stop for the outside of the upper sash 11, 15 is the parting strip between the upper and lower sashes, and 16 is the stop for the inside of the lower sash 12. The window illustrated conforms to the disclosure of my application, Serial No. 271,765 filed April 21, 1928, insofar as the provision of slides 17 and 18 for the upper and lower sashes 11 and 12 respectively is concerned. The upper sash, as

will presently appear, is pivoted by its bottom rail 11—*a* to a pair of slides 17 interposed between the side rails of the sash and the pulley stiles of the frame, and the lower sash 12 is likewise pivoted to a pair of slides 18 by its bottom rail 12—*a*. Means are provided, as will also be described presently, for quickly detachably locking the sashes to their slides in normal upright position for sliding movement up and down in the regular way, the sashes when detached being arranged to have swinging movement relative to the slides either to ventilating positions or cleaning positions. Sash cords 19 for the upper and lower sashes are connected, as will also presently appear, to the slides 17 and 18, and are threaded over the sash pulleys and equipped with sash weights on their free ends in the usual way. In passing, it will be remarked that the bottom rail 11—*a* of the upper sash, and the top rail of the lower sash, constitute the meeting rails, as they are generally called, these rails having inclined contacting edges 20 to provide a weather-tight joint in the usual way when the window is closed. A weather strip 21 on the sill 13 is arranged to enter a groove 22 in the bottom rail 12—*a* of the lower sash, and a similar weather strip is provided on the top jamb of the frame to enter a groove in the top rail of the upper sash to make the window weather-tight at these points when closed. In accordance with the disclosure in my other application, ribbed weather strips 22 are provided on the stiles 10 and have the ribs thereof arranged to enter grooves 23 provided therefor in the slides 17 and 18, these strips being of a standard form which are arranged to afford sufficient give to take care of the shrinking and swelling of the sashes under varying weather conditions so that the latter will not tend to bind in their ways but will always operate easily and quietly. Other weather strips 24 provided on the slides 17 and 18 are arranged to interlock with weather strips 25 provided on the side rails of the sashes 11 and 12 in substantially the same manner as disclosed in my other application. The interlocking of the strips 24 and 25 is not evident in the horizontal sections, Figs. 5 to 7, because these sections are taken at points where the interfitting weather strips have to have portions thereof cut away. Suffice it to say, however, that the interlocking of the weather strips 24 and 25 prevents outward swinging movement of the sashes 11 and 12 with respect to their slides 17 and 18, respectively, when they are in their upright position. The window of my invention, it will therefore appear, is of a completely weather-stripped design and affords the same protection for a building as any ordinary weather-stripped window.

In describing the features with which the present application is more particularly concerned, the description will be confined to the lower sash 12 and its slides 18, inasmuch as both sashes have substantially the same features embodied therein, and a description of one will, therefore, suffice for both.

Referring, first of all, to Figs. 3 and 5, it will be observed that a metallic strap 26 is fastened as by means of screws 27 to the lower corner of the sash which is suitably recessed as shown to receive the same. The strap has one end thereof bent at right angles as at 28 and fits in a recess in the side of the sash preferably behind the weather strip 25, which, as shown, is cut away at this point to accommodate the same. A long wood screw 29 passing through a hole provided therefor in the lower end of the slide 18, passes through a hole 30 in the bent portion of the strap 26 and into the lower corner of the sash for anchorage. Thus, the screws 29 serve a double function: they hold the slides in proper relation to the sash for the interlocking of the weather strips 24 and 25, and they also serve as trunnions for the sash to swing upon with reference to the slides. The straps 26 give good support to the screws and reinforce the lower corners of the sash.

The sash is arranged to be fastened in a quickly detachable manner to the slides by means of a pair of dogs 31 pivotally mounted on the slides as by means of rivets 32 passing through the weather strips 24 in the grooves of which the dogs 31 are entered (see Fig. 7), the weather strips 25 on the sash being cut away to accommodate the same, as appears at 33 in Fig. 3. Each dog 31 has an open ended slot 34 cut in the edge thereof for reception of the end of a pin 35 projecting from the side rail of the sash, the pin being driven into a hole provided therefor in the latter. The slot 34 in the normal position of the dog 31, as shown in Fig. 4, will not permit egress of the pin 35 therefrom so long as a keeper 36 pivoted as at 37 to the side rail of the sash engages the underside of the dog. A finger tab 38, projecting from the face of the side rail when the keeper 36 is in the full line position shown in Fig. 4, may be taken hold of when it is desired to pull out the keeper to the dotted line position shown in Fig. 4, when the sash is being unlocked to be swung relative to the slides either to a ventilating position or to a cleaning position. Even when the keepers 36 are pulled out, the sash is not free to swing inwardly because the dogs 31 are held against swinging inwardly by means of pins 39 projecting laterally from the outer ends of the dogs. These pins, if an attempt were made to swing the sash inwardly, would simply come into engagement with the stop 16, that is, the side of the guideways in which the slides are operable. The dog 31 is arranged, however, to swing inwardly relative to the slide when the pin 39 is brought into line with and allowed to enter the open end of a

slot 40 provided in a keeper plate 41 fastened as by means of screws 42 to the window frame. The slot 40 is deep enough to permit the dog 31 to swing to such a position that the slot 34 will permit egress of the pin 35 therefrom and thus permit the sash to swing freely with reference to the slide. As a matter of fact, in operation, the lower sash is raised slightly to bring the pins 39 into line with the slots 40 and at the same time bring the bottom rail of the sash high enough to clear the weather strip 21, whereupon the swinging inwardly of the sash causes the dogs 31 to be swung automatically to enter the pins 39 in the slots 40, the pins 35 serving by cooperation with the sides of the slots 34 to swing the dogs 31 in that manner. It will also be evident that when the sash is being swung back to normal upright position, the pins 35 will again enter the slots 34 and move the dogs 31 back to the position shown in Fig. 4 where the pins 39 of said dogs are withdrawn from the slots 40 of the keepers 41. The dogs 31, in other words, require no attention whatever on the part of the operator; he simply brings the sash to the proper position before attempting to swing the sash inwardly, and when he returns the sash to normal position, the dogs 31 are automatically retracted from locking engagement with the keepers on the frame. There is obviously nothing in this quickly detachable fastening apt to get out of order or require any attention whatever. It is positive in its action, at least semi-automatic in its operation, and makes the window substantially burglar-proof, since there is no way of anyone possibly withdrawing the keepers 36 from locking position from the outside of the sash.

When the sash is swung inwardly it may be held in different ventilating positions or in cleaning position by means of toggle links 43 and 44 provided preferably on both sides of the window frame. The link 43 is pivoted at one end as at 45 to the link 44 near the free end of the latter, the link 44 being fastened, as indicated at 46, to the window frame for swinging movement from the upright position shown in Fig. 1 and in dotted lines in Fig. 2, to the full line extended position shown in Fig. 2. The link 44 is normally held in upright position by the projection of the headed end of a stud 47 on the window frame through the small end of a keyhole slot 48 provided in the end of the link 44. When the link 44 is held in upright position, the link 43 may be swung about its pivot 45, as for example, to the dotted line position shown in Fig. 2 where the pin 49 projecting laterally from the free end of the link 43, engages in one of a series of notches 50 provided in the edge of a keeper plate 51 suitably fastened to the side rail of the sash. Obviously, the sash may be set in different ventilating positions by entering the pin 49 in different notches of the keeper plate, as desired. When it is desired to support the sash in cleaning position, the link 44 is simply detached from the pin 47 to permit its extension to the full line position shown in Fig. 2, and under such circumstances the pin 49 in the free end of the link 43, which is then coextensive with the link 44, is arranged to be entered through one of a series of holes 52 provided in the keeper plate. It is not strictly necessary to provide both notches and holes in the keeper plate inasmuch as one or the other may be provided, notches alone being sufficient if they are provided deep enough to insure a good hold, especially with the sash in cleaning position. It is believed evident that this means for supporting the sash in different ventilating positions or in cleaning position is of a very practical form and easy to manipulate, besides being extremely simple in construction and economical to manufacture. I might also add that the link 43 may be swung with reference to its companion link 44 toward the sash, as indicated in dotted lines in Fig. 1, for engagement either in one of the slots 50 or holes 52 if it is desired to lock the window in a certain raised position where it cannot be raised farther from the outside, thus, the toggle linkage serves, too, in the nature of a burglar lock. With that thought in mind, it will be seen that the links 43 and 44 may be provided in conjunction with a keeper plate 51 in connection with an ordinary non-tiltable window, simply as a burglar lock.

In conclusion, attention is directed to Figs. 6 and 8, wherein I have shown a very simple and practical sash cord fastener. The end of the sash cord 19 extends through a groove 53 provided in the slide a portion of the length thereof, usually reaching from the upper end to about the middle of the slide. The end of the cord is received in a channel-shaped recess provided by a curved flange 54 of a plate 55 fastened as by means of rivets 56 to the weather strip 24. The one rivet 56 provides a pivotal mounting for a dog 57 having the free end thereof bent at right angles as shown at 58 adjacent the flange 54. The bent end 58 of the dog is arranged to bite into the cord 19, as indicated in Fig. 8, in which figure it will be evident that the greater the pull exerted on the cord becomes, the more the dog 57 is caused to bite into the end thereof. In that way there is avoided the necessity for making a knot on the end of the sash cord, and the large recess otherwise necessitated for the accommodation of the knotted end of the cord is obviated and a slide of proportionately smaller cross-section can be used, thus making for a neater appearing window.

The operation of the window of my invention should be clear from the foregoing description. Attention is called to the fact that in Fig. 2 the lower sash 12 is shown in

full lines in cleaning position and that in this position it serves to support the upper sash when the latter is swung to a similar position. Stops 59 are preferably provided in the lower ends of the ways for the slides 17 to be engaged by the slides when the upper sash is in proper position with relation to the lower sash to be swung to cleaning position.

It is believed the foregoing description conveys a clear understanding of my invention and, while reference has been made to various specific details of construction, it should be understood that the invention is capable of a certain amount of modification without sacrificing many of the important advantages to which attention has been called. For that reason, the appended claims have been drawn to cover all legitimate modifications and adaptions and should be so construed.

I claim:

1. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, and a weather strip on the inner side of each slide interlocking with a weather strip on the side rail of the sash serving to hold the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for swinging movement in a plane parallel to the plane of swinging movement of the sash, there being, in the case of the sash and dog elements, a lateral projection provided on the side of the one element arranged to enter a recess provided therefor in the dog, the dog being arranged when moved to a certain position with the projection engaged in the recess to serve to hold the sash in upright position and against inward swinging movement relative to the slides, and a keeper on the frame, there being in the case of the keeper and dog elements, a recess provided in the one element, and a lateral projection on the other element arranged to be received in said recess when the sash is swung out of normal upright position whereby to hold the slides against movement.

2. A window construction as set forth in claim 1 including a keeper pivotally mounted on at least one side of the sash in a predetermined spaced relation to the last mentioned projection, said keeper having a part thereof arranged to engage a part of the dog when the sash is in normal upright position to hold the dog with the projection engaged in the recess positively against swinging movement and thereby lock the sash in upright position.

3. In a window construction of the character described comprising a window frame providing ways therein, slides operable up and down in said ways and preferably weather stripped to afford a weather-tight sliding fit in the ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, there being interlocking weather strips on the slides and sash for a weather-tight joint therebetween serving also to hold the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash, there being, in the case of the sash and dog elements, a lateral projection provided on the side of the one element arranged to enter a recess provided therefor in the other element, the dog being arranged when moved to a certain position with the projection engaged in the recess to serve to hold the sash in upright position and against inward swinging movement relative to the slides, and a keeper on the frame, there being, in the case of the keeper and dog elements a recess provided in the one element, and a lateral projection provided on the other element arranged to be received in said recess when the sash is swung out of normal upright position whereby to hold the slides against movement.

4. A window construction as set forth in claim 3 including a keeper pivotally mounted on at least one side of the sash in a predetermined spaced relation to the last mentioned projection, said keeper having a part thereof arranged to engage a part of the dog when the sash is in normal upright position to hold the dog with the projection engaged in the recess positively against swinging movement and thereby lock the sash in upright position.

5. In a window construction of the character described comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, a flat sheet metal dog of generally triangular form pivotally mounted on at least one of the slides between the slide and the side of the sash, the pivot thereof being at one base angle of the triangle and permitting inward swinging movement of the dog in a plane parallel to the plane of swinging movement of the sash, a lateral projection provided on the dog at the apex angle of the triangle, a keeper on the frame having a recess provided therein for reception of said projection when the dog is swung inwardly from a normal position with reference to the slide, said dog having a recess provided therein at the other base angle of the triangle, and a lateral projection on the side of the sash arranged to enter said recess, the dog being arranged when moved to a cer-

tain position with the projection engaging in the recess to serve to hold the sash against inward swinging movement with reference to the slides.

6. A window construction as set forth in claim 5 including a flat sheet metal keeper pivotally mounted on the side of the sash between the sash and the slide for swinging movement in the plane of the dog, said keeper being mounted in a predetermined spaced relation to the lateral projection on the sash and being arranged to be swung to and from a position where it engages the dog with the projection held in the recess of the dog whereby positively to lock the sash against swinging movement with reference to the slides.

7. In a window construction of the character described comprising a window frame providing ways therein, slides operable up and down in said ways and preferably weather stripped to afford a weather-tight sliding fit in the ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, there being interlocking weather strips on the slides and sash for a weather-tight joint therebetween serving also to hold the sash against outward swinging movement with reference to the slides, a flat sheet metal dog of generally triangular form pivotally mounted on at least one of the slides between the slide and the side of the sash, the pivot thereof being at one base angle of the triangle and permitting inward swinging movement of the dog in a plane parallel to the plane of swinging movement of the sash, a lateral projection provided on the dog at the apex angle of the triangle, a keeper on the frame having a recess provided therein for reception of said projection when the dog is swung inwardly from a normal position with reference to the slide, said dog having a recess provided therein at the other base angle of the triangle, and a lateral projection on the side of the sash arranged to enter said recess, the dog being arranged when moved to a certain position with the projection engaging in the recess to serve to hold the sash against inward swinging movement with reference to the slides.

8. A window construction as set forth in claim 7 including a flat sheet metal keeper pivotally mounted on the side of the sash between the sash and the slide for swinging movement in the plane of the dog, said keeper being mounted in a predetermined spaced relation to the lateral projection on the sash and being arranged to be swung to and from a position where it engages the dog with the projection held in the recess of the dog whereby positively to lock the sash against swinging movement with reference to the slides.

9. In a window construction of the character described comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, means for holding said sash selectively in tilted ventilating position or in substantially horizontal cleaning position, comprising a pair of toggle links pivotally connected together, the one link being pivoted at one end to the side of the window frame for swinging movement in a plane parallel to the plane of swinging movement of the sash, the other link being pivoted to the first link at the free end thereof, a keeper on the sash arranged to have detachable connection with the free end of the last mentioned link, and means for detachably holding the first link in fixed substantially upright position.

10. A structure as set forth in claim 9 wherein the second named link is swingable in either direction with reference to the first named link when the latter is in fixed substantially upright position, the second named link being thereby arranged to be swung inwardly toward the window sash when the latter is in normal upright position to make detachable connection with the keeper on said sash to hold the same locked in a raised position, substantially as described, and being arranged to be swung outwardly toward the sash when the latter is in tilted position to make detachable connection with the keeper on said sash to support the same in tilted position.

11. In a window construction of the character described comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, means for holding said sash selectively in tilted ventilating position or in substantially horizontal cleaning position, comprising a pair of toggle links pivotally connected together, the one link being pivoted at one end to the side of the window frame for swinging movement in a plane substantially parallel to the plane of swinging movement of the sash, the other end of said link having a keyhole slot therein and there being a stud mounted on the window frame for detachably engaging in said slot to hold the link in substantially upright fixed position, the other link being pivoted to the first link near the slotted end thereof for swinging movement with reference thereto, and a keeper on the side of the window sash arranged to have detachable connection with the free end of the last mentioned link.

12. In a window, the combination with a window frame and a sash slidable up and down in ways in said frame, of means for detachably locking the window in a raised position comprising a link pivotally mounted on the frame at one side of the sash and arranged to be swung toward the sash, and a

keeper mounted on the side rail of the sash adjacent the link and arranged to have detachable connection with the free end of the link.

13. In a window, the combination with a window frame and a sash slidable up and down in ways in said frame, of means for detachably locking the window in a raised position comprising a link pivotally mounted on the frame at one side of the sash and arranged to be swung toward the sash, said link having a lateral projection on the free end thereof, and an elongated keeper member mounted on the side rail of the sash and having a plurality of longitudinally spaced recesses provided therein wherein the lateral projection on the link is arranged to be selectively engaged to hold the window in different raised positions.

14. In a window comprising a frame and slides operable in ways therein, a window sash having a trunnion mounting at the lower end thereof on the slides, each of said trunnion mountings comprising 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 between the latter and the slide, and a screw passing through a hole provided in the lower end of the slide and through a registering hole provided in the bent end of the strap and screwed into the bottom corner of the sash whereby to hold the slide in proper relation to the sash while affording a trunnion for the sash, the strap serving at the same time not only to reinforce the bottom corner of the sash but also to provide good support for the trunnion screw.

15. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, a dog pivotally mounted on at least one of said slides and disposed between the slide and the sash for swinging movement in a plane parallel to the plane of swinging movement of the sash, means on one side of said dog for cooperation with the sash for holding the sash in upright position and against swinging movement relative to the slides when the dog is in a certain position, a keeper on the frame, and means provided on the other side of the dog for cooperation with the keeper to hold the slides against movement relative to the frame when the dog is in another position.

16. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, a dog pivotally mounted on at least one of said slides and disposed between the slide and the sash for swinging movement in a plane parallel to the plane of swinging movement of the sash, means on one side of said dog for cooperation with the sash, such as a projection on the one member arranged to enter a recess provided in the other member, for holding the sash in upright position and against swinging movement relative to the slides when the dog is in a certain position, with said projection engaged in said recess, a keeper on the frame, and means provided on the other side of the dog for cooperation with the keeper, such as a projection provided on the one member received in a recess provided in the other member, to hold the slides against movement relative to the frame when the dog is in another position.

17. A window construction as set forth in claim 15, including a member on the sash cooperating with the dog and serving to hold it against movement from the first mentioned position and serving to securely lock the sash in upright position and against swinging movement relative to the slides.

18. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, and interlocking weather strips on the slides and the side rails of the sash making the joints between said parts weather-tight and serving also to prevent outward swinging movement of the sash relative to the slides from normal upright position, a dog pivotally mounted on the weather strip of at least one of said slides and disposed between the slide and the sash for swinging movement in a plane parallel to the plane of swinging movement of the sash, means on one side of said dog for cooperation with the sash for holding the sash in upright position and against swinging movement relative to the slides when the dog is in a certain position, a keeper on the frame, and means provided on the other side of the dog for cooperation with the keeper to hold the slides against movement relative to the frame when the dog is in another position.

19. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, a dog pivotally mounted on at least one of said slides and disposed between the slide and the sash for swinging movement in a plane parallel to the plane of swinging movement of the sash, means on one side of said dog for cooperation with the sash arranged to cause the dog to be swung to and from slide locking position in the swinging movement of the sash relative to the slides, a keeper on the frame, and means provided on the other side of the dog

for cooperation with the keeper when the dog is in slide locking position, whereby to hold the slides against movement relative to the frame.

20. In a window construction comprising a window frame providing ways therein, slides operable up and down in said ways, a window sash trunnioned on the slides for swinging movement relative thereto from normal upright position, and interlocking weather strips on the slides and the side rails of the sash making the joints between said parts weather tight and serving also to prevent outward swinging movement of the sash relative to the slides from normal upright position, a dog pivotally mounted on the weather strip of at least one of said slides and disposed between the slide and the sash for swinging movement in a plane parallel to the plane of swinging movement of the sash, means on one side of said dog for cooperation with the sash for swinging the dog on its pivot to and from slide locking position in the movement of the sash relative to the slides, a keeper on the frame, and means provided on the other side of the dog for cooperation with the keeper in the slide locking position of the dog to hold the slides against movement relative to the frame.

21. In a window comprising a frame having ways therein, a window sash, a pair of slides on opposite sides of said sash operable in the aforesaid ways and arranged to pivotally support the sash, weather strips on the side rails of the sash interlocking with weather strips on the slides to make the joints between the sash and slides weather-tight and also prevent outward swinging movement of the sash relative to the slides, and a pair of coaxially disposed screws or the equivalent at one end of said slides providing trunnion mountings for the sash on the slides, each of said screws passing through a hole provided in the same end of the slide and through registering holes in the weather strips and screwed into the corner of the sash, whereby to hold the slide in proper relation to the sash while affording a trunnion for the sash, the said strips serving to reenforce the end of the slide and sash in the vicinity of the trunnion screw and also provide good support for said screw.

22. A window construction as set forth in claim 15, including a locking member mounted on at least one side rail of the sash adjacent the dog on the slide and arranged to be moved to locking position in which position it holds the dog against movement and securely locks the sash in upright position against swinging movement relative to the slides.

23. In a window construction of the character described comprising, a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, means for holding the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, a keeper on the frame, there being, in the case of the dog and keeper elements, a recess provided in the one element and a projection on the other element arranged to be received in said recess when the dog is moved to slide locking position, means for moving the dog to slide locking position in the inward swinging movement of the sash relative to the slides, and means on at least one side of the sash adjacent the dog on the slide for holding the dog in retracted position and locking the sash against swinging movement with reference to the slides.

24. In a window construction of the character described comprising, a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, means for holding the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, a keeper on the frame, there being, in the case of the dog and keeper elements, a recess provided in the one element and a projection on the other element arranged to be received in said recess when the dog is moved to slide locking position, the said dog being arranged to swing inwardly from retracted position to slide locking position, and means on at least one side of the sash adjacent the dog on the slide for holding the dog in retracted position and locking the sash against swinging movement with reference to the slides.

25. In a window construction of the character described comprising, a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, means for holding the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, a keeper on the frame, a locking part moved with the dog in the swinging movement thereof and arranged to cooperate with the keeper to lock the slide against

movement, the dog being arranged to swing inwardly from retracted position to slide locking position, means whereby the dog is arranged to be swung inwardly to slide locking position in the inward swinging movement of the sash relative to the slides, and sash locking means carried on at least one side of the sash adjacent the dog on the slide arranged to lock the dog in retracted position and to lock the sash against swinging movement with reference to the slides.

26. In a window construction of the character described comprising, a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, means for holding said sash against outward swinging movement with reference to the slides, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, a keeper on the frame, a locking part moved with the dog in the swinging movement thereof and arranged to cooperate with the keeper to lock the slide against movement, the dog being arranged to swing inwardly from retracted position to slide locking position, and sash locking means carried on at least one side of the sash adjacent the dog on the slide arranged to lock the dog in retracted position and to lock the sash against swinging movement with reference to the slides.

27. In a window construction of the character described comprising, a window frame providing ways therein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, interlocking weather strips on the slides and side rails of the sash serving to hold the sash against outward swinging movement with reference to the slides from upright position, a dog pivotally mounted on the weather strip on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash, a keeper on the frame, a locking part moved with the dog in the swinging movement thereof and arranged to cooperate with the keeper to lock the slide against movement, the dog being arranged to swing inwardly from retracted position to slide locking position, means whereby the dog is arranged to be swung inwardly to slide locking position in the inward swinging movement of the sash relative to the slides, and sash locking means carried on at least one side of the sash adjacent the dog on the slide arranged to lock the dog in retracted position and to lock the sash against swinging movement with reference to the slides.

28. In a window construction of the character described comprising, a window frame providing ways herein, slides operable up and down in said ways, and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, interlocking weather strips on the slides and side rails of the sash serving to hold the sash against outward swinging movement with reference to the slides from upright position, a dog pivotally mounted on the weather strip on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash, a keeper on the frame, a locking part moved with the dog in the swinging movement thereof and arranged to cooperate with the keeper to lock the slide against movement, the dog being arranged to swing inwardly from retracted position to slide locking position, and sash locking means carried on at least one side of the sash adjacent the dog on the slide arranged to lock the dog in retracted position and to lock the sash against swinging movement with referecne to the slides.

29. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, said dog being pivoted off center so that it tends normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto.

30. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, said dog being pivoted off center so that it tends normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto, said means cooperat-

ing with the dog to hold the same in retracted position.

31. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for inward swinging movement with reference thereto from normal upright position, a weather strip on each of said slides interlocking with a weather strip on the side rail of the sash serving to hold the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on the weather strip of at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, said dog being pivoted off center so that it tends normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto.

32. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for inward swinging movement with reference thereto from normal upright position, a weather strip on each of said slides interlocking with a weather strip on the side rail of the sash serving to hold the sash against outward swinging movement with reference to the slides, a dog pivotally mounted on the weather strip of at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, said dog being pivoted off center so that it tends normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto, said means cooperating with the dog to hold the same in retracted position.

33. In a window of the character described comprising, a window sash trunnioned for swinging movement relative to the frame from normal upright position, means for holding said sash in different angular positions comprising, a pair of toggle links pivotally connected together, the one link being pivoted at one end to the side of the window frame for swinging movement in a plane parallel to the plane of swinging movement of the sash, the other link being pivoted to the first link at the free end thereof, a keeper on the sash arranged to have detachable connection with the free end of the last mentioned link and means for detachably holding the first link in fixed substantially upright position.

34. A structure as set forth in claim 33 wherein the second named link is swingable in either direction with reference to the first named link when the latter is in fixed substantially upright position, the second named link being thereby arranged to be swung inwardly toward the window sash when the latter is in normal upright position to make detachable connection with the keeper on said sash to hold the same locked in a raised position, substantially as described, and being arranged to be swung outwardly toward the sash when the latter is in tilted position to make detachable connection with the keeper on said sash to support the same in tilted position.

35. In a window of the character described comprising, a window sash trunnioned for swinging movement relative to the frame from normal upright position, means for holding said sash in different angular positions comprising a pair of toggle links pivotally connected together, the one link being pivoted at one end to the side of the window frame for swinging movement in a plane substantially parallel to the plane of swinging movement of the sash, the other end of said link having a keyhole slot therein and there being a stud mounted on the window frame for detachably engaging in said slot to hold the link in substantially upright fixed position, the other link being pivoted to the first link near the slotted end thereof for swinging movement with reference thereto, and a keeper on the side of the window sash arranged to have detachable connection with the free end of the last mentioned link.

36. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for swinging movement with reference thereto from normal upright position, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, the said dog when not otherwise constrained tending normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto.

37. In a window construction of the character described, comprising a window frame providing ways therein, slides operable up and down in said ways and a window sash trunnioned on the slides for swinging movement with reference thereto from normal

upright position, a dog pivotally mounted on at least one of said slides for inward swinging movement in a plane parallel to the plane of swinging movement of the sash and between the slide and the side rail of the sash, the said dog when not otherwise constrained tending normally to swing inwardly to slide locking position, a keeper on the frame cooperating with the dog in slide locking position to hold the slide against movement relative to the frame, and means for locking the sash to the slide against swinging movement with reference thereto, said means cooperating with the dog to hold the same in retracted position.

In witness of the foregoing I affix my signature.

LESLIE M. CALDWELL.