March 27, 1928. 1,663,932

F. ZIGANEK ET AL

WINDOW CONSTRUCTION

Filed March 1, 1927 3 Sheets-Sheet 1

Fig. 1.

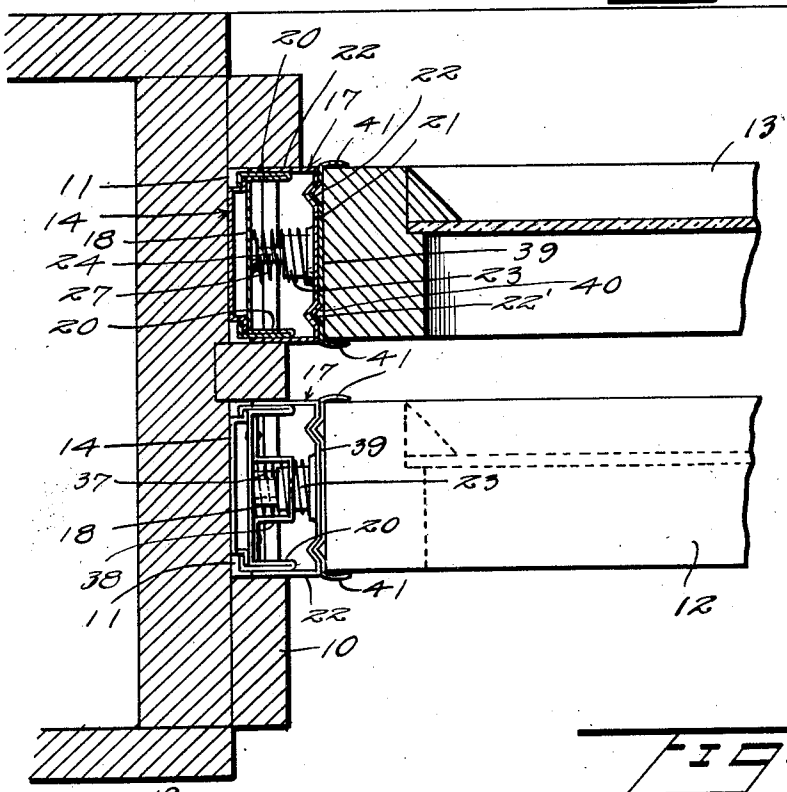


Fig. 7.

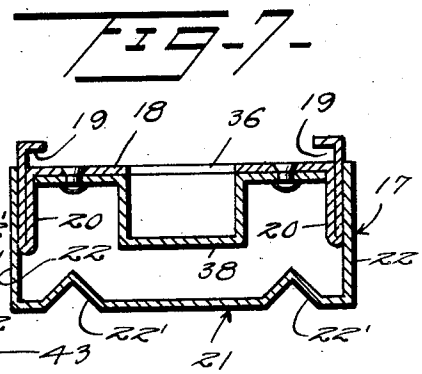
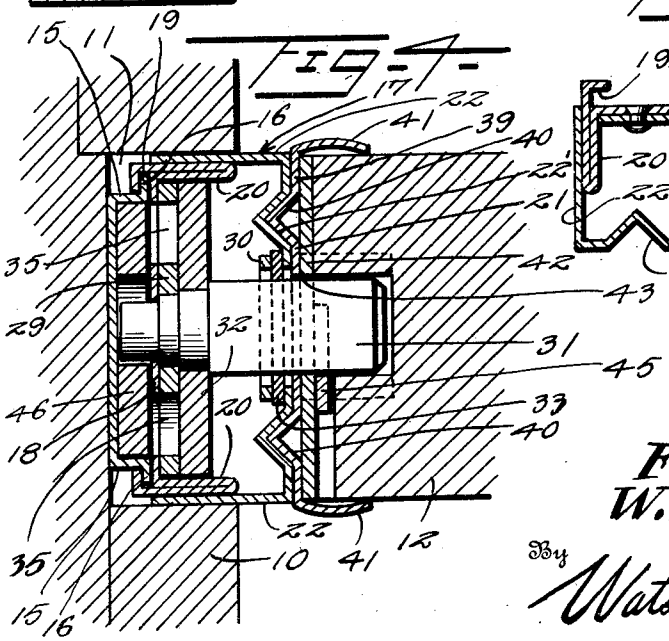


Fig. 4.



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Fig. 2.

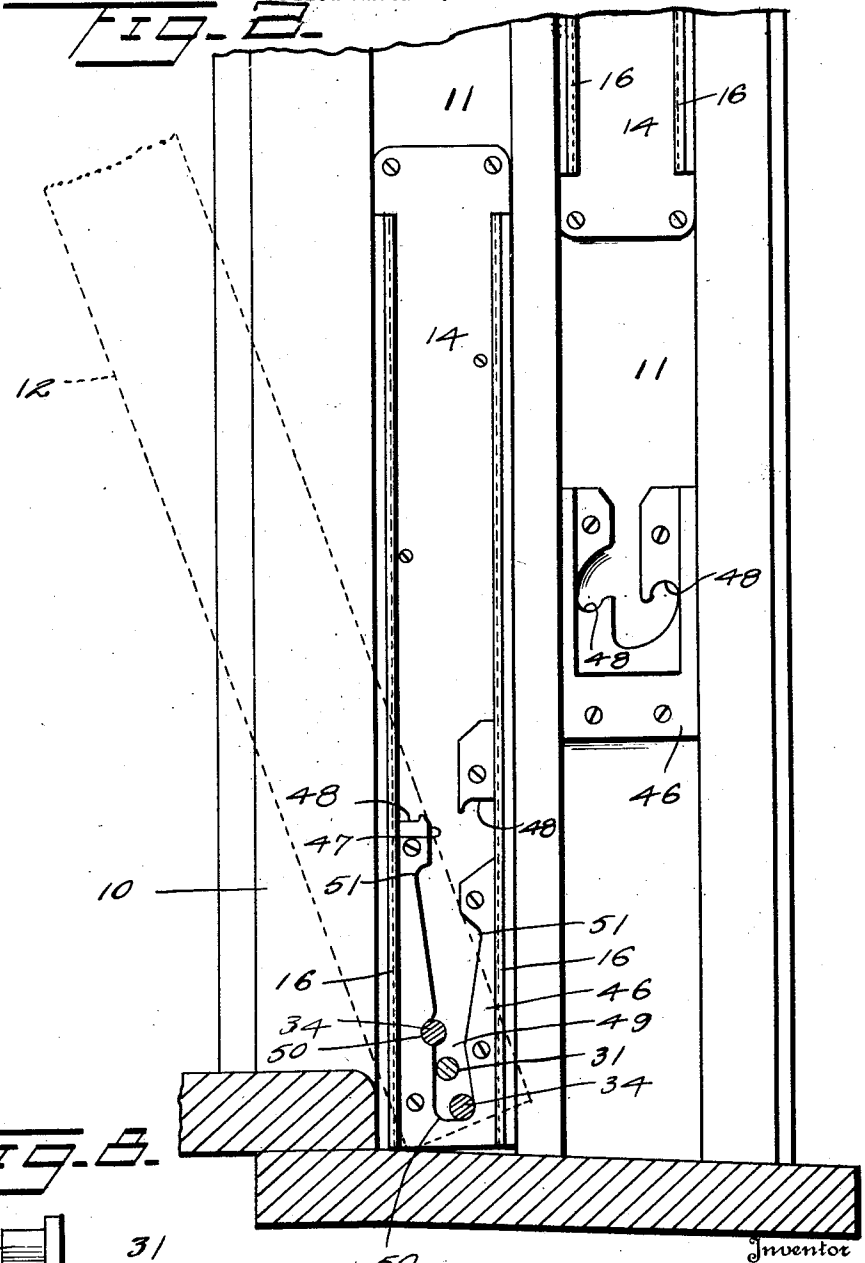
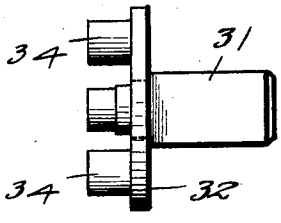


Fig. 3.



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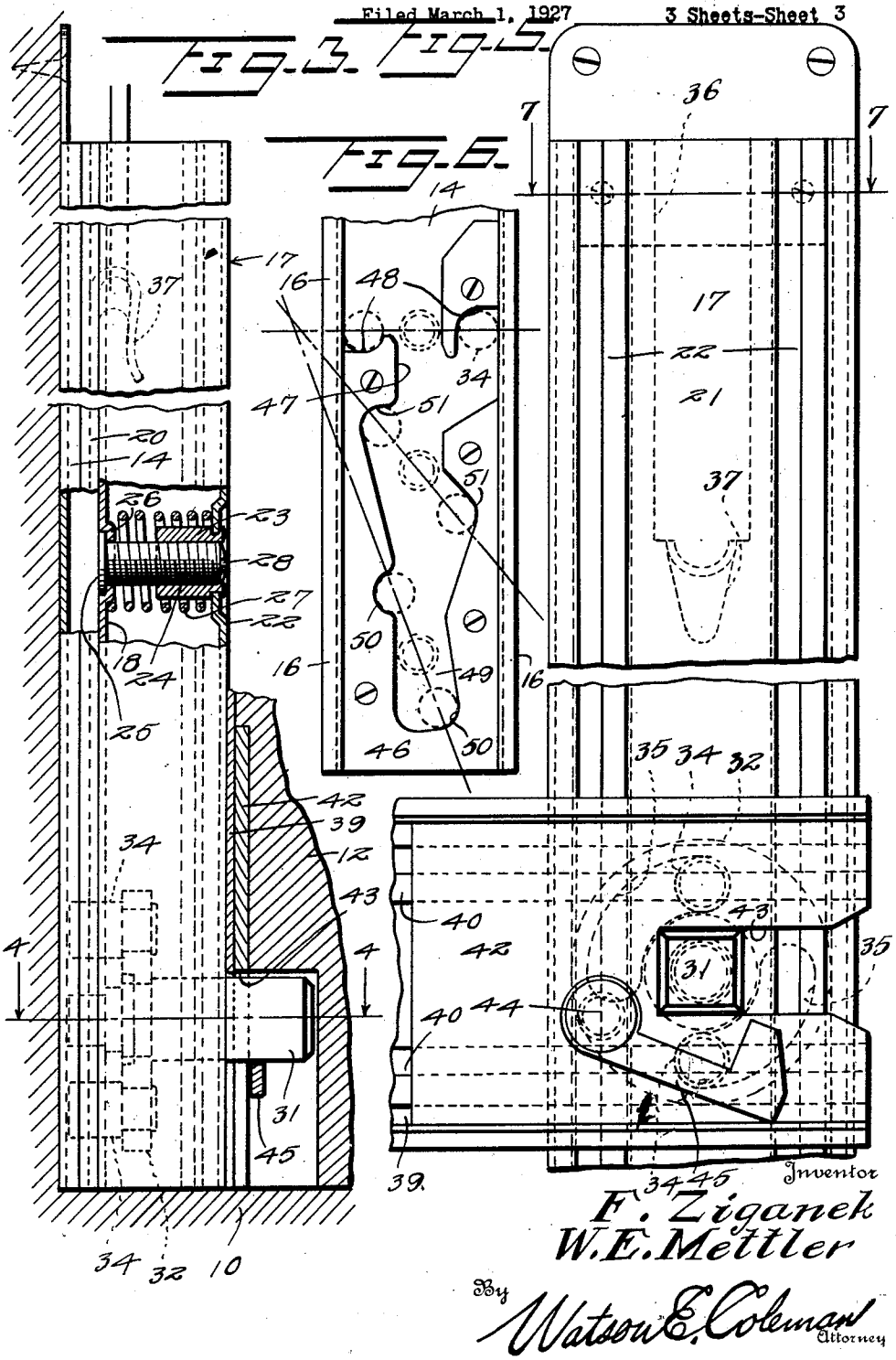
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WINDOW CONSTRUCTION

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Fig. 3. Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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WINDOW CONSTRUCTION.

Application filed March 1, 1927. Serial No. 171,860.

This invention relates to window constructions and has for an important object thereof the provision of a window construction wherein the sash are readily removable and at the same time when the sash are in their normal positions, a weather-proof structure is provided.

A further and more specific object of the invention is to produce a window construction, wherein the sash are both vertically slidable and pivotally movable and when shifted pivotally to a predetermined position, are automatically released, so that they may be removed for reglazing or for facility in cleansing the same.

A further object of the invention is to produce a window of the character just described, wherein at least one of the sash may be shifted to a number of intermediate positions affording ventilation openings.

These and other objects we attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of our invention and wherein:—

Figure 1 is a transverse sectional view through one side of a window constructed in accordance with our invention;

Figure 2 is a vertical sectional view therethrough, the resilient strips and sash of one window being indicated in dotted lines and the position of the lugs of this window illustrated in section;

Figure 3 is an enlarged side elevation partially in section of one of the sash and the associated mechanism;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is an inner face view of one of the sash mechanism, the sash being removed to illustrate the operation of the latch;

Figure 6 is an inner face view of one of the sash controlling plates, the construction lines illustrating different positions which may be taken by the sash;

Figure 7 is a section on the line 7—7 of Figure 5;

Figure 8 is a side elevation of the latch.

Referring now more particularly to the drawings, the numeral 10 generally designates the stiles of a window frame, providing the usual inner and outer channels 11 for lower and upper sash 12 and 13. In accordance with our invention, within each of these channels, we mount a weather-strip 14 in the form of a trough, the bottom wall of which is secured to the base of the channel and the side walls 15 of which have outturned flanges 16.

Engaged with this weather-strip is a compressible strip, generally designated at 17. This compressible strip comprises a base 18 having upon its weather-strip confronting face opposed channels 19 receiving the outturned flanges 16 of the weather-strip and having at its side edges walls 20. A cover plate 21 is provided having at its side edges walls 22 slidably embracing the outer faces of the walls 20 of the slidable base plate 18. The cover plate 21 is formed with longitudinally extending grooves 22′ in its sash confronting face, the purpose of which will hereinafter appear.

At longitudinally spaced points, the cover plate 21 has formed therein openings in which are affixed nuts 23, into which are threaded bolts 24 which are directed through the base plate 18 and have their heads 25 rotatably seated in depressions formed in the outer face of this base plate, as at 26. Surrounding the bolts between the base plate 18 and cover plate 21 are springs 27, which constantly urge the cover plate outwardly and serve to maintain the heads 25 seated in the recesses 26. These heads may, however, extend into the trough of the weather-strip 14 if, for any reason, the cover plate 21 is forced toward the base plate 18. The ends of the bolts are slotted, as at 28, so that a screw-driver may be employed in the inner face of the cover plate to adjust the maximum distance between the base and cover plates and accordingly the tension with which the springs force the cover plate into engagement with the sash.

At one end, both the base plate 18 and cover plate 21 are reinforced by plates 29 and 30. In the base and cover plates and reinforcing plates 29 and 30, aligned openings are formed through which are rotatably directed a shaft 31. This shaft has secured thereto a disk 32, which abuts the reinforcing plate 29 of the base plate 18 and inwardly of this reinforcing plate is squared. For this reason, the openings of the reinforcing plate 30 and the cover plate 21 will not be sealed by the shaft and accordingly a washer 33 fitting the shaft and of greater size than the openings is interposed between the cover plate and plate 30. Outwardly of the disk 32, the shaft is round and fits the opening of the base plate through which it

passes. The disk has secured thereto diametrically opposed lugs 34, which extend through arcuate slots 35 formed in the base plate 18 and its reinforcing plate 29 and into the trough of the weather-strip 14. The slots 35 limit rotation of the shaft 31 to 90°.

At the opposite end of the member 17, the base plates 18 are slotted with slots 36 opening through the ends of the base plates and the inner end walls of these slots are formed to provide hooks 37 for engagement with the sash rope of the usual counterweights. At the end of the plate 18, it is reinforced by a bridge plate 38 which spans the slot 36.

Each sash includes two side plates 39, which are rigidly secured thereto and coact with the cover plates 21 of the resilient strip 17. These sash plates, as they may be termed, have longitudinally extending V-shaped ribs 40, which slide in the V-shaped grooves 22′ of the cover plates and the edges of the side plates are preferably provided with flanges 41 which engage the front and rear faces of the sash frame and serve to conceal mechanism associated with the sash plate, as hereinafter described. Each sash plate, at its lower end, is reinforced by a latch plate 42 and both the sash plate and latch plate are formed with a longitudinally extending slot 43 of the same width as the squared portion of the shaft 31. The sash frame is correspondingly grooved, so that the ends of the shafts 31 may extend thereinto. The latch plate 42 is located upon the sash confronting face of the sash plate and has pivoted to its inner face at 44 a latch 45, which will engage with the shaft 31 and hold it in the inner end of the slots 43. This latch is loosely mounted upon its pivot and so attached thereto that when the sash is horizontally disposed, the latch will fall, by gravity, to a position where its bill clears the slot 43, so that the shafts 31 may be engaged or disengaged from the sash. It will be obvious that since the portion of the shaft which engages the sash is square, the shaft will rotate as the sash is rotated.

Secured to each stile channel is a plate 46. This plate may be either directly secured to the bottom wall of the channel or be secured within the trough of the weather-strip. In the present instance, the plate associated with the lower sash channel, is located in the trough while the plate of the upper sash channel is secured directly to the wall of the channel. Each plate 46 has a vertically extending slot 47 through which the lugs 34 and inner end of the shaft 31 may enter when the associated sash is vertically disposed. Each plate has associated with its slot 47 oppositely directed coves 48 into which the lugs 34 may extend to permit the sash to be rotated from vertical to horizontal position. When the sash rotates at horizontal position, these lugs engage against the walls of the cove and their movement is checked thereby. This movement is additionally checked by the engagement of the lugs with the ends of the slots 35. In the present instance, the slot 47 of the plates 46 associated with the lower sash channels are disclosed as having a downward extension 49 having at vertically spaced points pairs of coves 50 and 51 into which the lugs 34 may move and the walls of which check movement of the lugs when the sash has a slight inclination with respect to the window frame. These pairs of coves provide a means for setting the window at ventilating positions, such as that indicated in Figure 6. The lowermost cove of the pair 50 preferably aligns with the lower end of the slot so that this ventilating position may be assumed without elevating the sash.

It will be obvious that in a window construction of this character, the ordinary rattling noises resulting from looseness of the sash will be eliminated, as the springs of the compressible strips will maintain a constant and firm engagement between the plates 21 and 39. The lower sash may be swung to either of two ventilating positions, where they are arranged at an acute angle to the resilient strips 17 or they may be rotated to a position where they extend at right angles to these strips. When they are rotated to this position, the latches 45 disengage from the shafts 31, so that the sash may be bodily disengaged from the window to permit the same to be re-glazed, cleansed or the like. The upper sash may be similarly removed.

A construction of this character will be weatherproof and afford at all times a complete draft seal. Since this construction is obviously capable of a certain range of change and modification without materially departing from the spirit of the invention, we do not limit ourselves to such specific structure except as hereinafter claimed.

We claim:—

1. In a window, opposed stiles, a sash therebetween and members operatively slidably engaging each stile having pivots engaging the adjacent sides of the sash permitting rotation of the sash from a position where it aligns with the members to a position where it is disposed at an angle thereto and latches preventing longitudinal movement of the sash with relation to the pivots automatically disengaging the pivots to permit such movement when the sash is in the last named position.

2. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash, said members slidably engaging the stile, pivot elements rotatably engaged with the members and having squared portions engaging in slots formed in the adjacent faces

of the sash, said slots fitting said squared portions and opening through one end of the sash and latches pivotally connected with the sash and engaging said squared portions to prevent disengagement of the squared portions from the slots while the sash is aligned with or at an acute angle to said members, said latches when the sash is rotated to a position where it is at right angles to the members, moving, by gravity, to a position permitting withdrawal of the sash from the pivots.

3. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash, said members slidably engaging the stile, pivot elements rotatably engaged with the members and having squared portions engaging in slots formed in the adjacent faces of the sash, said slots fitting said squared portions and opening through one end of the sash and latches pivotally connected with the sash and engaging said squared portions to prevent disengagement of the squared portions from the slots while the sash is aligned with or at an acute angle to said members, said latches when the sash is rotated to a position where it is at right angles to the members, moving, by gravity, to a position permitting withdrawal of the sash from the pivots, said members yieldably resisting rotation of the sash.

4. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash, said members slidably engaging the stile, pivot elements rotatably engaged with the members and having squared portions engaging in slots formed in the adjacent faces of the sash, said slots fitting said squared portions and opening through one end of the sash, latches pivotally connected with the sash and engaging said squared portions to prevent disengagement of the squared portions from the slots while the sash is aligned with or at an acute angle to said members, said latches when the sash is rotated to a position where it is at right angles to the members, moving, by gravity, to a position permitting withdrawal of the sash from the pivots, and means carried by said stiles and coacting with means carried by the pivots in one position of the sash for limiting rotation of the sash when the sash is at right angles to the members.

5. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash, said members slidably engaging the stile, pivot elements rotatably engaged with the members and having squared portions engaging in slots formed in the adjacent faces of the sash, said slots fitting said squared portions and opening through one end of the sash, latches pivotally connected with the sash and engaging said squared portions to prevent disengagement of the squared portions from the slots while the sash is aligned with or at an acute angle to said members, said latches when the sash is rotated to a position where it is at right angles to the members, moving, by gravity, to a position permitting withdrawal of the sash from the pivots, and means carried by said stiles and coacting with means carried by the pivots in one position of the sash for limiting rotation of the sash when the sash is at right angles to the members, said means comprising a lug on the pivot and a plate on the stile, said plate having a slot through which said lug may pass and having a cove communicating with said slot into which said lug may be extended to permit rotation of the sash with relation to the members, the walls of the cove providing means limiting the rotation of the sash.

6. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash, said members slidably engaging the stile, pivot elements rotatably engaged with the members and having squared portions engaging in slots formed in the adjacent faces of the sash, said slots fitting said squared portions and opening through one end of the sash and latches pivotally connected with the sash and engaging said squared portions to prevent disengagement of the squared portions from the slots while the sash is aligned with or at an acute angle to said members, said latches when the sash is rotated to a position where it is at right angles to the members, moving, by gravity, to a position permitting withdrawal of the sash from the pivots, the pivots having lugs extending through the stile confronting faces of the members, the stiles having plates secured thereto, said plates having slots through which said lugs may pass and having coves communicating with said slots into which said lugs may be extended to permit rotation of the sash with relation to the members, the walls of the coves providing means limiting the rotation of the sash.

7. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash and slidably engaging the stile, pivot elements connecting said members and the sash rotatably engaged with the members and held against rotation with relation to the sash and means carried by said stiles and coacting with means carried by the pivots in one position of the sash for limiting rotation of the sash when the sash is at right angles to the members.

8. In a window, opposed stiles, a sash therebetween, members arranged between each stile and the adjacent side of the sash and slidably engaging the stile, pivot elements connecting said members and the sash rotatably engaged with the members and held against rotation with relation to the sash and means carried by said stiles and coacting with means carried by the pivots in

one position of the sash for limiting rotation of the sash when the sash is at right angles to the members and in another position of the sash limiting rotation of the sash with relation to the members while the sash is at an acute angle to the members.

9. In a window, opposed stiles, a sash therebetween, members operatively slidably engaging each stile and pivotally connected with the adjacent sides of the sash, said members being formed in two sections telescopic upon one another in a direction transverse to the sash, one of said members operatively slidably engaging the stile, the other of said members confronting the sash, springs urging said members apart, means upon the sash engaging said members whereby the sash engaging sections of the members are urged toward the stiles when the sash is moved out of alignment with the members and screws having heads rotatably engaging the stile engaging members and threaded stems having threaded engagement with the sash confronting members.

In testimony whereof we hereunto affix our signatures.

FERDINAND ZIGANEK.
WILLIAM E. METTLER.