Nov. 24, 1942. G. J. KURTZ 2,303,129

WINDOW CONSTRUCTION

Filed Dec. 30, 1939 3 Sheets-Sheet 1

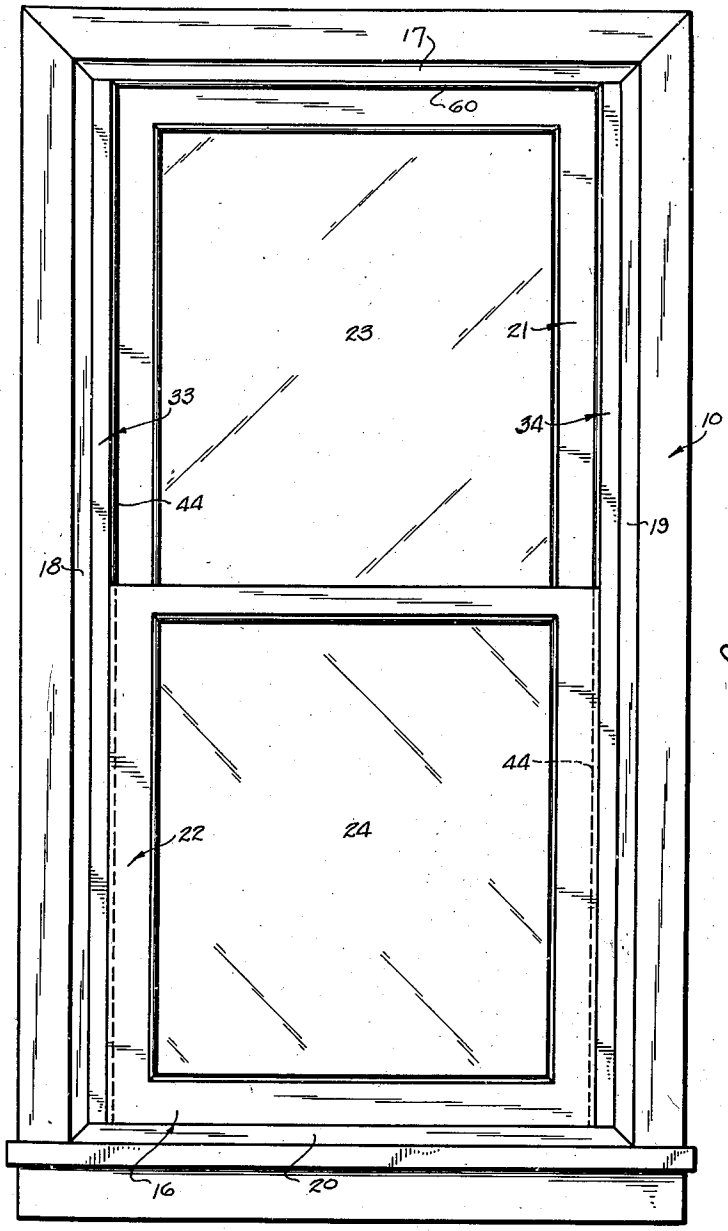

Fig. 1.

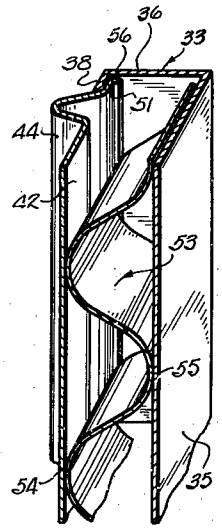

Fig. 4.

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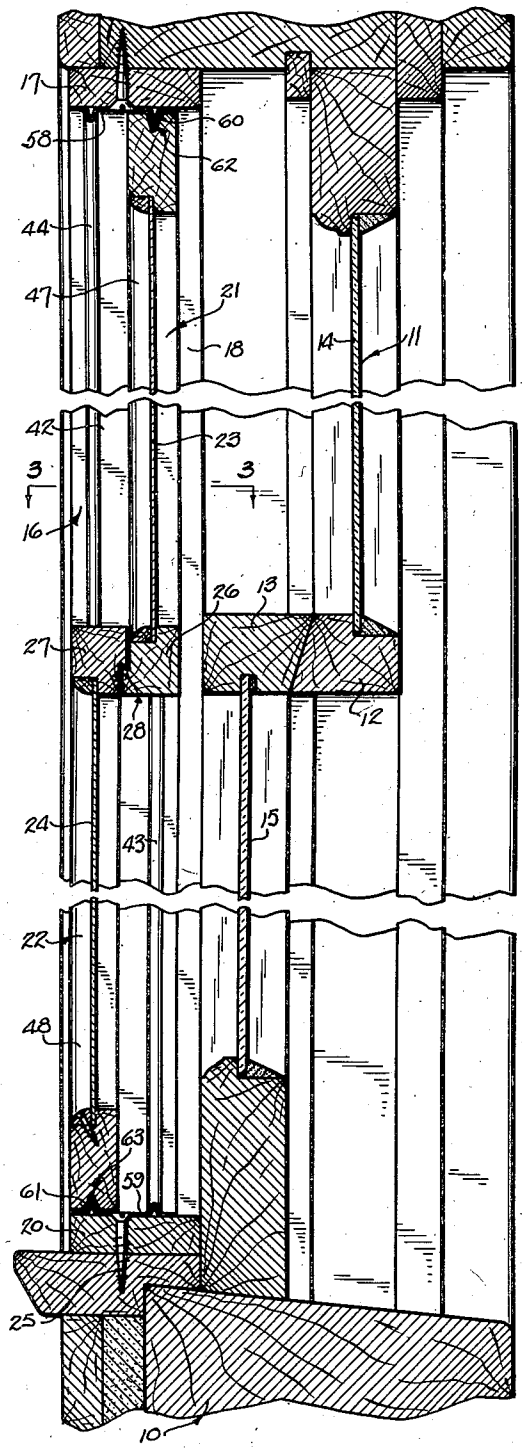

Fig. 2.

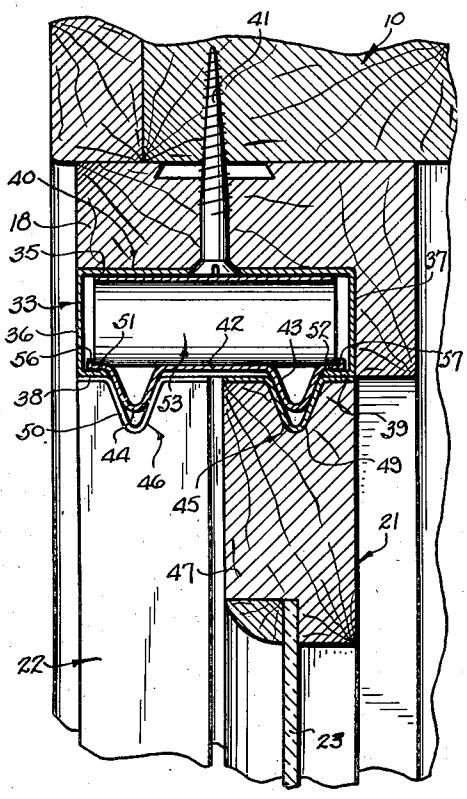

Fig. 3.

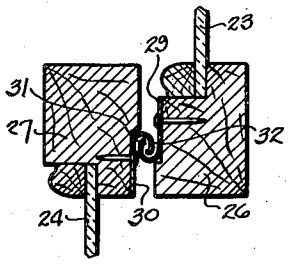

Fig. 5.

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WINDOW CONSTRUCTION

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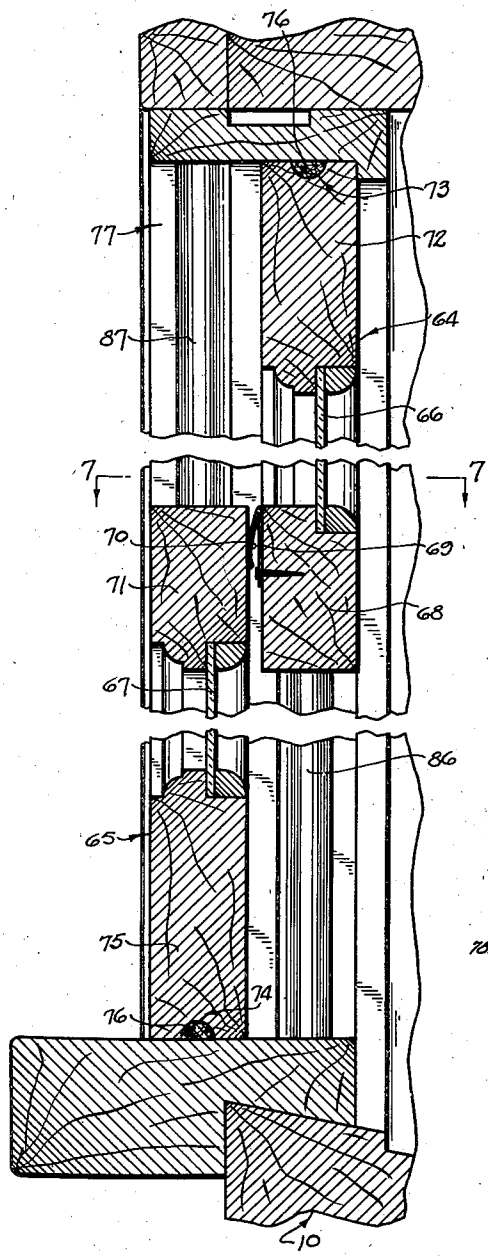

Fig. 6.

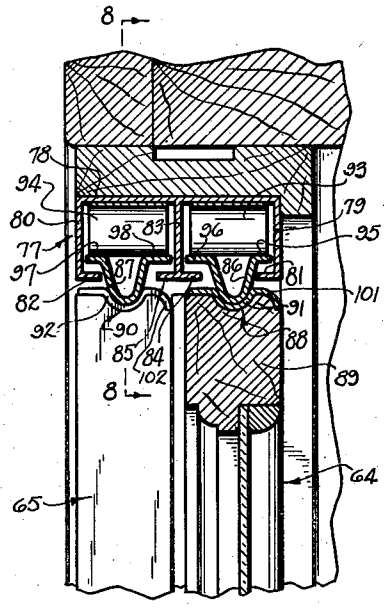

Fig. 7.

7.

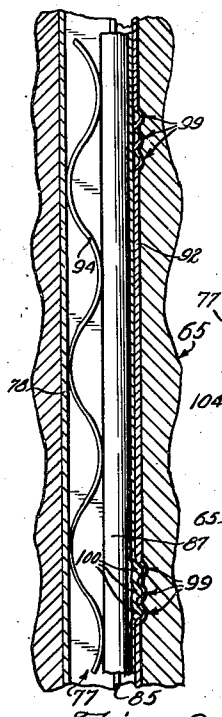

Fig. 8.

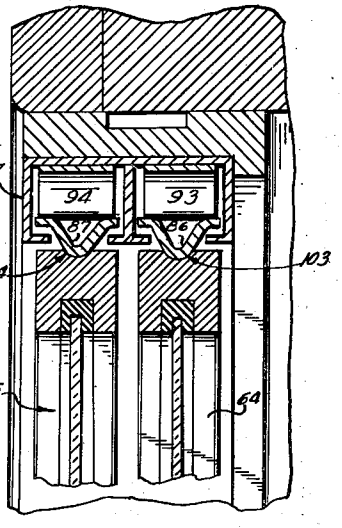

Fig. 9.

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UNITED STATES PATENT OFFICE

2,303,129

WINDOW CONSTRUCTION

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Application December 30, 1939, Serial No. 311,766

3 Claims. (Cl. 20—55)

The present invention relates broadly to windows in general and more particularly to an improved auxiliary window construction adapted to be removably associated with the conventional permanent window.

It has been heretofore customary to position the ordinary storm windows outwardly of the regular permanent windows and also to install them from the outside of the building. This procedure is of course objectionable, due to the fact that the usual storm windows are relatively heavy and quite cumbersome to handle, and this is especially true in the installation of storm windows in large apartment and office buildings.

An aim of this invention is to provide a complete auxiliary window assembly adapted to be arranged inwardly of the regular permanent window and which can be readily and conveniently installed from the inside of the building. Although not limited to any specific use, this invention is of particular utility in connection with the double glazing of relatively large buildings, as it effectively overcomes one of the principal objections heretofore advanced against the use of storm windows in tall structures; namely, the difficulty, inconvenience, and expense of installing them from the outside in the fall and taking them down in the spring.

Another object of the invention is the provision of a complete auxiliary window assembly which can be readily and conveniently installed in the usual window casing from the inside thereof to present a neat, attractive appearance and which may also be readily removed for purposes of replacement, cleaning, or repair.

Another object of the invention is the provision of an auxiliary window which can be installed in the regular window casing without the use of unsightly and cumbersome hangers or other supporting means and which allows for the installation and removal of the window without difficult mechanical operation.

A further object of the invention is the provision of an auxiliary window embodying a frame having relatively slidable upper and lower sashes removably mounted therein, together with novel means for guiding said sashes during sliding movement thereof and for effectually retaining them at any desired level of their sliding range without necessitating the use of counterweights or other counterbalancing devices.

A further object of the invention is the provision of an auxiliary window wherein the means for guiding and retaining the sashes in their sliding movement are of a novel construction which permits the said sashes to be quickly and conveniently installed in or removed from the frame.

A still further object of the invention is the provision of an auxiliary window of rugged, strong, and simple construction, relatively inexpensive to manufacture, and which may be assembled and installed with a minimum amount of time and labor.

Other objects and advantages of the invention will become more apparent during the course of the following description, when taken in connection with the accompanying drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Fig. 1 is a front view of an auxiliary window assembly constructed in accordance with the invention;

Fig. 2 is a vertical transverse section through the auxiliary window showing it associated with a regular permanent window;

Fig. 3 is a horizontal transverse section through the auxiliary window taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a perspective sectional view of a portion of one of the stiles;

Fig. 5 is a modified type of means for sealing the meeting rails of the sashes;

Fig. 6 is a vertical transverse section through a modified type of auxiliary window also embodying the invention;

Fig. 7 is a horizontal section taken substantially on line 7—7 of Fig. 6;

Fig. 8 is a vertical section taken substantially on line 8—8 of Fig. 7; and

Fig. 9 is a view similar to Fig. 7 but showing another type of construction.

With reference now to the drawings, and particularly to Figs. 1 to 5 inclusive, the numeral 10 designates a conventional window casing in which is mounted the usual double-hung window 11 comprising the upper and lower relatively slidable sashes 12 and 13 glazed with the panes of glass 14 and 15 respectively.

Also mounted within the casing 10, inwardly of the permanent window 11, is the improved auxiliary window 16 provided by the present invention. The auxiliary window 16 comprises a rectangular frame including the head jamb 17, vertical side jambs 18 and 19 and a sill member 20. Arranged within the frame are the relatively slidable upper and lower sashes 21 and 22

glazed with the panes of glass 23 and 24 respectively.

When installing the auxiliary window 16 within the window casing 10, the sashes 21 and 22 are first preferably mounted within the frame in the manner hereinafter described, and the assembly then inserted into the casing from the inside thereof and secured in place by screws or the like 25.

As illustrated in Fig. 2, the lower sash 22 of the auxiliary window is arranged forwardly of the upper sash 21, with the horizontal meeting rails 26 and 27 of the upper and lower sashes respectively overlapping one another. Any suitable means may be provided for sealing the meeting rails 26 and 27 to provide a weather-tight joint. For example, the inner adjacent faces of the lower rail 26 of the upper sash and the upper rail 27 of the lower sash may be oppositely rabbeted as at 28 to provide complemental inter-engaging portions which form a tight seal (Fig. 2). On the other hand, as shown in Fig. 5, the bottom rail 26 of the upper sash may be provided with a strip of insulating material 29 and the upper rail 27 of the lower sash with a strip of insulating material 30; the free edge portions of the two strips being turned in opposite directions as at 31 and 32 respectively, so that upon closing of the sashes they interlock with one another to provide a weather-proof seal.

As stated above, the upper and lower sashes 21 and 22 are mounted for vertical sliding movement relative to one another and are readily removable from the frame whenever desired for cleaning, repair, or replacement. To this end, there are carried by the vertical side jambs 18 and 19 of the frame, the hollow metal stiles 33 and 34 respectively. Each stile 33 and 34 is in the form of a vertical channel member which extends throughout the height of the window frame and comprises a back wall 35 and opposite side walls 36 and 37 which terminate in the relatively narrow inturned flanges 38 and 39 respectively, said flanges being spaced from one another to provide a vertical opening therebetween which faces inwardly of the window. The side jambs 18 and 19 of the frame are preferably rabbeted as at 40 to receive the stiles 33 and 34 which can be secured in place by screws or the like 41.

Extending between the flanges 38 and 39 of each stile and closing the opening therebetween is a guide plate 42, said plate being formed with the spaced outwardly projecting vertical guide tongues 43 and 44 which are adapted to be received within vertical grooves 45 and 46 in the side rails 47 and 48 of the upper and lower sashes 21 and 22 respectively. To facilitate the sliding movement of the sashes upon said tongues and also minimize wear, the grooves 45 and 46 in said sashes may be provided with metal linings 49 and 50 respectively. As shown in Fig. 3, the guide tongues 43 of the opposed guide plates 42 are adapted to be received within the grooves 45 in the upper sash, while the tongues 44 are adapted to be received within the grooves 46 in the lower sash.

The opposite marginal edge portions 51 and 52 of each guide plate 42 are received behind the flanges 38 and 39 of the respective stile 33 or 34. For the purpose of urging the respective guide plate 42 outwardly to maintain the tongues thereof within the grooves in the sashes there is arranged within each stile a spring member 53. This spring member consists of a corrugated metal strip extending vertically within the stile and of such formation that every other ridge 54 thereof bears against the guide plate 42 while the alternate ridges 55 bear against the back wall 35 of the stile. In this way, the spring member serves to normally urge the guide plate 42 outwardly to maintain the tongue portions thereof in engagement with the sashes. The marginal edge portions 51 and 52 of each guide plate, engaging flanges 38 and 39 of the respective stile, serve to limit the outward movement of said guide plate. The longitudinal edges of the guide plates are also preferably turned rearwardly as at 56 and 57 and serve to hold the spring members 53 in place and prevent lateral shifting thereof.

With this construction, the sashes 21 and 22 can be moved vertically relative to one another to any desired position and will be firmly held in adjusted position by the frictional engagement of the tongues 43 and 44 with the metal linings 49 and 50 in the grooves 45 and 46 of the sashes. Therefore, no counterweights or other counterbalancing devices are required to hold the sashes in position. When it is desired to install the sashes 21 and 22 in the frame, it is simply necessary to force the guide plates 42 rearwardly against the action of the spring members 53 so that the sashes can be properly positioned therebetween, whereupon the guide plates will be forced outwardly by the spring members to urge the guide tongues 43 and 44 thereof into the grooves 45 and 46 in the sashes. On the other hand, when it is desired to remove the sashes, it is only necessary to force the guide plates rearwardly against the action of the spring members whereupon the sashes can be disengaged from the tongues and the removal thereof readily effected. When the guide plates 42 are forced rearwardly, the corrugated spring members 53 of course tend to flatten out and when outward pressure upon the guide plates is removed the spring members automatically return to normal position.

In order to seal the bottom of the lower sash 22 and the top of the upper sash 21, the head jamb 17 and sill 18 of the frame may also be provided with metal weather strips 58 and 59 secured in place by screws or the like and provided with tongues 60 and 61 which are received within grooves 62 and 63 in the top rail of the upper sash and bottom rail of the lower sash respectively. These grooves 62 and 63 may also be metal lined if desired.

From the above, it will be seen that there has been provided an auxiliary window which is not only of simple and relatively inexpensive construction but which is also strong and rugged. Also, that the auxiliary window can be installed in the regular window casing without the use of unsightly and cumbersome hangers or other supporting means so that it may be installed and removed readily and conveniently with a minimum amount of time and labor. Further, that the auxiliary window can be installed in the usual window casing from the inside thereof to present a neat, attractive appearance. If preferred, instead of making the auxiliary window out of a combination of wood and metal it can be made entirely of metal with the various sections being preferably of extruded stock. In such case, the wooden frame of the auxiliary window may be omitted so that the metal stiles 33 and 34 constitute the sides of the frame and the metal strips 58 and 59 the top and bottom thereof respectively. If desired, the top and bottom members

of the frame could also be of the same construction as the stiles 33 and 34.

In Figs. 6, 7, and 8 is illustrated a modified auxiliary window construction. The window therein disclosed also includes the relatively slidable upper and lower sashes 64 and 65 glazed with the panes of glass 66 and 67 respectively. Secured to the inner face of the bottom rail 68 of the upper sash 64 is a flat metal strip 69 having a reversely bent spring portion 70 which is adapted to engage the inner face of the top rail 71 of the lower sash 65 to provide a weather-tight joint between the meeting rails of the upper and lower sashes. The top rail 72 of upper sash 64 is provided with a longtiudinal groove 73 and a similar groove 74 is provided in the bottom rail 75 of lower sash 65. Inserted within the grooves 73 and 74 is a suitable insulating material 76 which engages the top and bottom of the frame containing the sashes to also provide weather-tight joints when the sashes are closed.

The upper and lower sashes 64 and 65 which, as stated above, are mounted for vertical sliding movement relative to one another are arranged between and carried by hollow metal stiles 77 which are quite similar to the metal stiles 33 and 34 described above. As best shown in Fig. 7, each stile comprises a vertical channel member extending throughout the height of the window frame and including a back wall 78 and opposite side walls 79 and 80 which terminate in the relatively narrow inturned flanges 81 and 82 respectively. In this form of the invention, the channel member is provided midway between the opposite side walls 79 and 80 with a substantially T-shaped reinforcing member comprising a web 83 parallel with the side walls 79 and 80 and formed at its outer end with the oppositely directed flanges 84 and 85 disposed in alignment with the inturned flanges 81 and 82. The oppositely directed flanges 84 and 85 cooperate with flanges 81 and 82 respectively to form vertical openings therebetween which face inwardly of the window.

Arranged between the flanges 81 and 84 is the vertical guide tongue 86 and a similar guide tongue 87 is disposed between the flanges 82 and 85. The guide tongues 86 of the opposed stiles 77 are adapted to be received within grooves 88 in the side members 89 of the upper sash 64, while the guide tongues 87 are received within grooves 90 in the side members of the lower sash 65. To facilitate vertical sliding movement of the sashes and also to minimize wear thereon, the grooves 88 and 90 may be provided with metal linings 91 and 92 respectively. For the purpose of urging the guide tongues 86 and 87 outwardly to maintain them within the grooves 88 and 90 in the upper and lower sashes, there are arranged within each stile the two spring members 93 and 94 similar to the spring member 53. The spring member 93 is arranged behind the guide tongue 86, while the spring member 94 is arranged behind the guide tongue 87. As shown in Fig. 8, each spring member consists of a corrugated metal strip extending vertically within the stile. The guide tongue 86 is provided along its vertical edges with oppositely directed flanges 95 and 96 which engage the flanges 81 and 84 respectively on the stile to limit the outward movement of said tongue Smilar flanges 97 and 98 are carried by the guide tongue 87 to engage the flanges 82 and 85 respectively on the stile.

With the construction illustrated in Figs. 1 to 4, the upper and lower sashes are adapted to be held in desired adjusted position by friction between the guide tongues and the said sashes. However, means may be provided, as shown in Fig. 8, to mechanically hold the sashes in desired adjusted position without the use of counterweights or other cumbersome or expensive hangers. As therein disclosed, the metal linings 91 and 92, for the grooves 88 and 90 in the sashes, and the guide tongues 86 and 87 are provided with complemental interlocking portions 99 and 100 respectively. These interlocking portions are punched in the guide tongues and metal linings in the form of complemental protuberances and recesses, with the protuberances 100 in the guide tongues being received within the recesses 99 in the metal linings. The protuberances 100 are preferably arranged in series at spaced points vertically of the guide tongues and one or more series of recesses 99 may be formed in the metal linings of the grooves in the sashes.

Upon raising or lowering of either sash, it will be apparent that when the recesses 99 are brought opposite the protuberances 100, the action of the spring members 93 and 94 will force the guide tongues outwardly and cause the protuberances to snap into the recesses. When this occurs, the sash will be securely held in properly adjusted position and yet can be readily raised or lowered. Thus, upward or downward pressure upon the sash will simply cause the guide tongues 86 and 87 to be forced rearwardly against the action of the spring members 93 and 94 whereupon the protuberances 100 will be disengaged from the recesses 99. In forming the complemental protuberances and recesses, it is preferred that the guide tongues be first fitted within the metal linings and the said protuberances and recesses then simultaneously produced by a punching operation.

In order to facilitate the positioning of the sashes 64 and 65 in place between the stiles 77, the inner edge portions of the metal linings 91 and 92 for the grooves in the sashes may be rounded as at 101 and 102 so that the said sashes can be more easily slipped past the guide tongues 86 and 87.

The window construction disclosed in Fig. 9 is substantially the same as that illustrated in Fig. 7, with the principal exception that the grooves 103 and 104 in sashes 64 and 65 respectively are not provided with metal linings. If desired, however, the side members of the sashes can be formed with recesses to receive protuberances formed on the guide tongues 86 and 87. Complemental interlocking portions may also be employed in the construction illustrated in Fig. 2.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred embodiment of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. An auxiliary window structure, comprising, a rectangular frame, spaced stiles carried by said frame, each stile including a channel member having a back wall and opposite side walls terminating in relatively narrow inturned flanges spaced from one another to provide a vertical opening therebetween which faces inwardly of the window, a guide plate extending between said flanges and closing the opening therebetween, said guide plate being formed with spaced out-

wardly projecting vertical guide tongues extending substantially the entire length of the respective stile and also having portions received behind the inturned flanges on said stile, upper and lower sashes positioned between said stiles and having grooves receiving the guide tongues therein and upon which the sashes are relatively slidable, one sash being slidable upon one pair of opposed guide tongues and the other sash upon the other pair of opposed guide tongues, and spring means arranged within each stile engaging the respective guide plate and urging the guide tongues thereof outwardly to maintain them in the grooves in said sashes.

2. An auxiliary window structure, comprising a rectangular frame, spaced stiles carried by said frame, each of said stiles including a channel member having its open side facing inwardly of the window, a pair of spaced vertical guide tongues carried by each stile and projecting outwardly therebeyond, upper and lower sashes positioned between said stiles and having grooves receiving the guide tongues therein and upon which the sashes are relatively slidable, one sash being slidable upon one pair of opposed guide tongues and the other sash upon the other pair of opposed guide tongues, spring means arranged within said stiles and urging said guide tongues outwardly to maintain them within the grooves in said sashes, metal linings in the grooves in said sashes, and complemental interlocking protuberances and recesses formed in said guide tongues and metal linings for holding the said sashes in desired adjusted position.

3. An auxiliary window structure of the character defined in claim 2, in which the inner edge portions of the metal linings of the grooves in the sashes are rounded to facilitate the association of said sashes with the guide tongues.

GEORGE J. KURTZ.