Dec. 2, 1958 R. G. OEHMIG 2,862,258

REMOVABLE SASH

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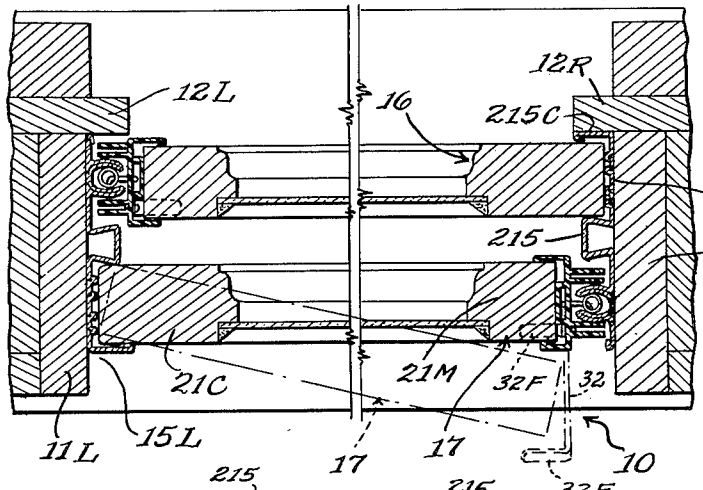
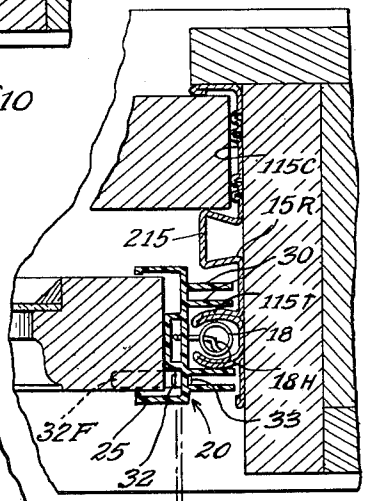


Fig. 1.

Fig. 2.



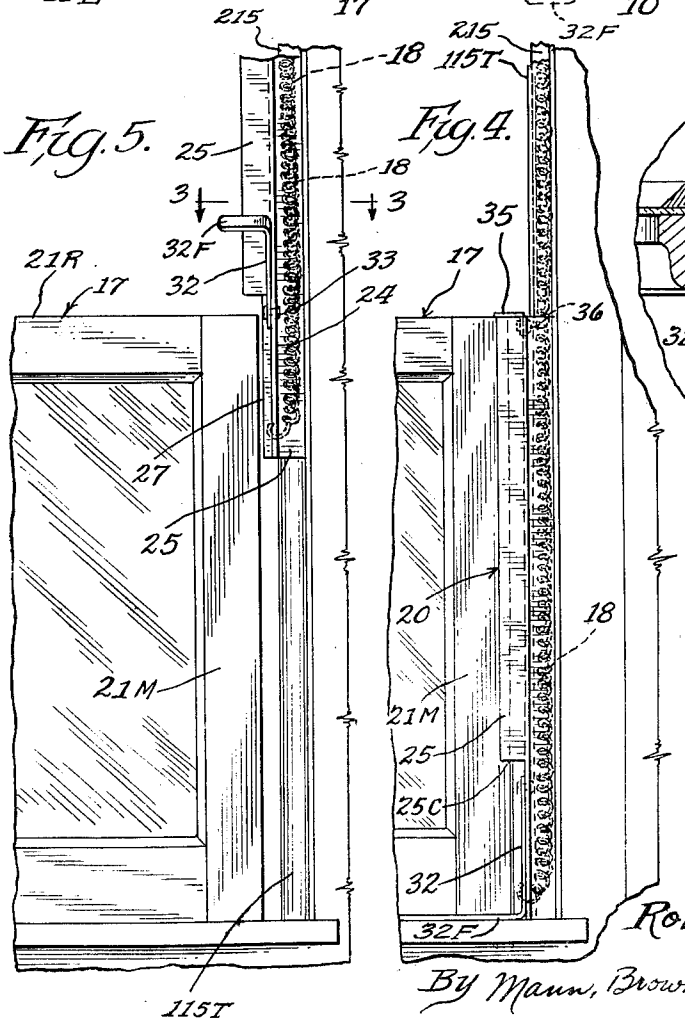


Fig. 5.

Fig. 4.

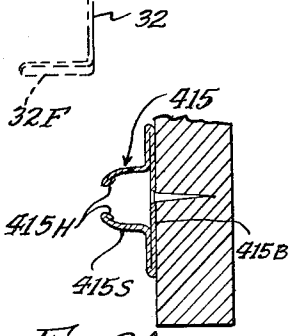


Fig. 2A.

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Fig. 3.

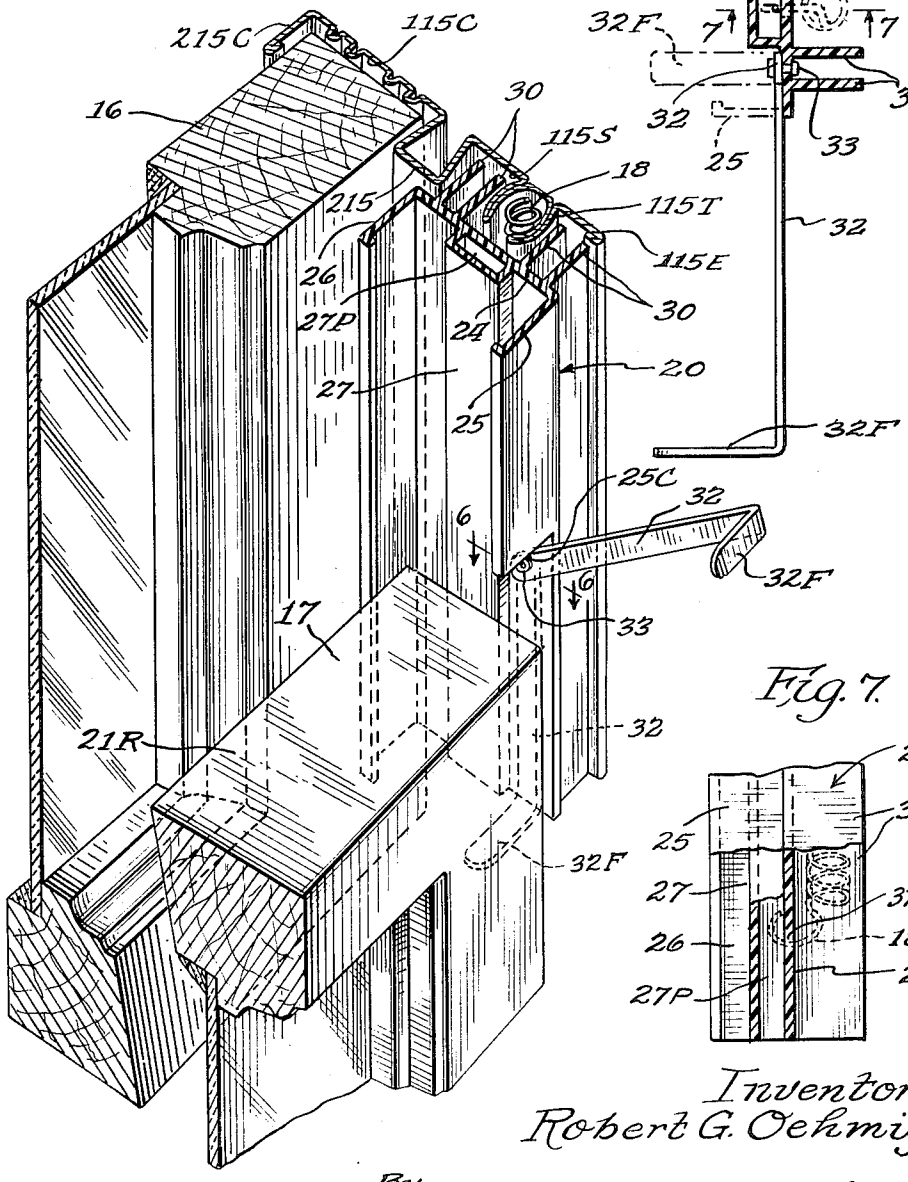


Fig. 6.

Fig. 7.

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REMOVABLE SASH

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6 Claims. (Cl. 20—52.2)

This invention relates to double hung spring balanced windows and particularly to spring balanced windows of this type wherein the sash are removable from the window frame.

Many kinds of removable double hung window structures have been proposed and made, and with each of these prior types of windows, certain objections have been found to be present. Thus, double hung windows have been provided wherein the sash are guided on metal sash guides, one or both of which are spring-pressed toward the edge of the sash so that there is a spring pressure laterally against the sash which exerts a holding action to maintain the sash in any desired position of vertical adjustment. Such sash are said to have yielding guides, and by pressing the sash laterally against the yielding guide, the sash may be disengaged from one of the sash guides so that it may be pivoted or swung inwardly at one edge and then may be moved edgewise to disengage the sash from the other guide. Such removable sash arrangements have been widely used, but it is found that where the spring pressure in the side guides is adequate to maintain the sash in any vertical position of adjustment, the lateral pressure that must be exerted for a removing operation is excessive so that as a practical matter the sash are very seldom removed for cleaning or like purposes.

Efforts have been made to reduce the necessary lateral pressure that is provided in the guideways by providing vertical springs disposed between the vertical edges of the sash and the guideways, thus providing a further counterbalancing or retaining force for the sash, but when this is done, there is a further complication of the removing operation because this requires that the counterbalance spring be disconnected from the sash in the course of a sash removing operation.

In view of the foregoing it is an important object of the present invention to provide a removable spring balanced sash structure wherein the mounting and removal operations are relatively simple and may be performed quite easily and without application of excessive forces. A more specific object of the present invention is to provide a spring-balanced double hung window structure in which the spring balance means act on the sash through an intermediate member that is so formed and related that it may be readily disconnected from the sash so that the sash may be quickly and easily removed from the window frame. Further objects of the present invention are to provide such a structure in which the sash guide and spring housing member may take any of the usual commercially available forms, and in which the sash may be removed without the exertion of lateral or edgewise pressures on the sash.

Another important object of the present invention is to provide a separately formed edge member for a window sash which may be quickly and easily associated with a sash and which cooperates with the conventional spring housing and sash guide member to provide an advantageous removable mounting for the window sash.

Other and further objects of the present invention will

be apparent from the following description and claims, and are illustrated in the accompanying drawings, which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

Fig. 1 is a plan sectional view showing a double hung window installation embodying the features of the invention;

Fig. 2 is an enlarged portion of Fig. 1;

Fig. 2A is an enlarged cross-sectional view showing another form of sash guide and spring housing with which the present invention may be employed;

Fig. 3 is a fragmentary perspective view taken in section along the line 3—3 of Fig. 5 and illustrating the cooperation of the sash guide, the sash and the intermediate edge member for the sash;

Fig. 4 is a fragmentary inside elevational view of the window structure with the lower sash in its normal closed relation;

Fig. 5 is a fragmentary inside elevational view similar to Fig. 4 and illustrating the parts in the positions which they assume when a sash is being removed from the window frame; and

Figs. 6 and 7 are fragmentary cross-sectional views taken respectively along the line 6—6 of Fig. 3 and the line 7—7 of Fig. 6.

For purposes of disclosure the invention is herein illustrated as embodied in a double hung window 10 having opposite jambs 11L and 11R which are of the simplified or plank type having outer stops 12L and 12R and having metal sash guides 15L and 15R mounted thereon to provide for guided vertical movement of the upper and lower sash 16 and 17.

The sash guides 15L and 15R as shown in Figs. 1, 2 and 3 to 5 are formed from sheet metal to provide both inner and outer sash guide means, and in the present instance, one of these means is more or less conventional while the other of such means includes a vertically extending spring housing. This results in a final structure wherein the sash 16 and 17 are each counterbalanced by an elongated coil spring 18 at but one edge thereof. With particular reference to Fig. 3 of the drawings, it will be noted that a conventional sash guide groove 115C is provided while a second sash guide groove 115S is provided near the other edge of the metal sash guide 15R, and these grooves are separated by an intermediate metal parting stop 215. The remote side of the groove 115C is provided by a flange 215C so that one edge or stile of a window sash may ride in the groove 115C between the flange 215C and the parting stop 215.

In providing the spring-balanced side of the strip 15R, the metal of the strip is doubled to form two side members of curved cross section that define an elongated spring housing tube 115T that has a slot at its outer or forward edge through which the lower end of the spring 18 housed in the tube may be connected with a sash. The upper end of such a spring 18 is connected to the tube 115T in a conventional manner so that the spring 18 may impart an upwardly yielding force to a sash that is connected thereto. Beyond the tube 115T, to the right in Fig. 3, the metal of the strip is extended as at 115E, but this edge of the strip does not have a flange like the flange 215C since the function of such a flange is accomplished, in this instance, by engagement of the sash or associated part with the tube 115T.

As will be evident in Fig. 1 of the drawings, the strips

15R are identical with the exception that such strips on opposite jambs 11L and 11R are mounted in reversed directions so that the spring tube of the guide 15R is disposed in position for cooperation with the inner sash 17, while the spring 115T of the guide 15L is positioned for cooperation with the outer sash 16.

Under the present invention, edge sash 16 and 17 is associated with the related spring tube 115T and the spring 18 thereof in a detachable manner such that the sash may be readily removed, and this is accomplished in each instance through the association of an edge member 20 with the related edge of the sash 16 or 17. Thus, as will be evident in Fig. 1, and with particular reference to the inner sash 17, such sash 17 has stiles 21C and 21M, and the stile 21C is of the normal size and shape so that it may cooperate with the conventional guide groove 115C. The other stile 21M however is modified by cutting away the outer edge portion thereof to form a stile that is somewhat narrower than the stile 21C, and it is this modified stile 21M of the inner sash 17 that is associated with the spring tube 115T and the guide groove 115S through the intermediary of the edge member 20.

The edge member 20 is provided with means for engaging the guide 15R and with means for embracing the adjacent edge of the stile 21M, while as will be described hereinafter, the spring 18 is connected to its lower end to the edge member 20, and means are provided on the edge member 20 for releasably holding the sash 17 in position in the edge member 20 so that the counterbalancing force of the spring 18 is applied through the edge member 20 to the sash 17.

Thus, as shown in detail in Figs. 3 and 6, the edge member 20 is formed as an extrusion and preferably the material used is relatively rigid plastic material. The edge member 20 comprises a main wall 24 with flanges 25 and 26 at its edges, and the flanges 25 and 26 cooperate with the wall 24 to provide a shallow groove adapted to receive the edge of the stile 21M with the flanges 25 and 26 firmly engaging the inner and outer faces of the stile. Centrally of the groove that is thus formed a clearance rib 27 is provided, this rib being formed to provide a central opening or passage 27P. The rib 27 is relatively shallow and rectangular in form, and it functions to provide clearances that are needed as will be hereinafter described.

On the opposite side of the wall 24 means are provided for engaging the spring tube 115T of a guide member, and this engagement is embracing in nature so that spring tube 115T serves as a guiding means for longitudinal sliding movement of the edge member 20 along the tube 115T. Such means as herein shown are provided by four parallel ribs 30 that extend longitudinally of the wall 24 in spaced relation, and the two inner ribs 30 are the ones that directly embrace and engage the spring tube 115T. One of the other ribs 30 engages the parting stop 215, while the other outer rib serves merely as a filler which spans the space between the wall 24 and the base portion 115E of the guide.

When the edge strip 20 is being prepared for association with a sash, strip 20 is cut to a length equal to the vertical height of the sash, and the inner flange 25 is cut away as at 25C near its lower end to provide clearance space for a releasably locking member 32. The locking member 32 is formed from sheet metal in a strip-like form with an inturned arm 32F at its lower end. The other end of the locking member 32 extends along the face of the wall 24 between the edge of that wall and the hollow rib 27 and is pivoted at 33 to the wall 24 by a rivet that is extended through the wall 24 and into the space between the adjacent pair of ribs 30. It will be noted that when thus mounted, the locking member 32 has the body thereof or main portion thereof located opposite the hollow internal rib 27 so that the stile 21M, when it is cut off to fit into the edge member 20, will have its edge spaced from the wall 24 in an amount sufficient to provide clearance space into which the locking member 32 may be swung to the dotted line position shown in Fig. 3. This dotted line position of the locking member 32 constitutes the locking or effective position of the locking member 32, and the member 32 is moved to this relationship after the sash has been moved upwardly into place in the guide groove that is formed between the flanges 25 and 26. The sash is shown in this relationship in Fig. 4 of the drawings, and it will be noted that an angle member 35 is held in position on the edge member by a rivet 36 so as to be located on the edge member 20 at the upper end thereof. In this position the angle member 35 acts as a stop against which the upper edge of the sash 17 may bear, and when the sash has been moved upwardly into the edge member 20 to the extent determined by the stop 35, the locking member 32 may be moved downwardly to its locking position wherein the end portion 32F of the locking member underlies and engages the lower edge of the sash. When this has been done, the edge member 20 and the sash will move together, and the coil spring 18 will act as a counterbalance means for the sash.

It has been pointed out that the upper end of the spring 18 is attached to the guide strip 15R as by hooking the end loop of the spring over the upper end edge of the guide member. The lower end of the spring 18 is attached to the edge member 20 by extending the lower hook 18H of the spring 18 through an opening 37 formed in the wall 24 midway between the edges thereof. When the opening 37 is thus formed, the end portion of the hook 18H will extend through the opening 37 into the passage 27P and will thus be prevented from coming into contact with the sash 17 as it is moved into or out of the edge member 20.

As shown in Figs. 1, 2 and 3, the metal guide member is shown as being of a full width construction that provides both the inner and outer runways and an intermediate metal parting stop 215. It is important to observe however that the present invention is not at all limited to the use of such a full width metal guide member. Thus the two sash runways on each jamb may be provided by independently formed metal guide means, or if desired, one edge of each sash may be guided in a conventional sash guide groove, while the other edge that is to have the counterbalancing force applied thereto may be guided and mounted by a sash guide and spring housing member 415 of the type that is shown in Fig. 2A. This guide is of conventional construction and is made from sheet metal to provide a base wall 415B that has return bends at its edges that extend inward, parallel to the base 145B and are then bent outwardly to provide opposite sides 415S of a spring housing, the sides of the spring housing being hemmed at 415H in accordance with the usual practice.

In the installation of the structure of the present invention, the side guides and spring housing guides are first put into proper place in the window frame, and with the springs 18 are located in the spring housing tubes and anchored at their upper ends near or at the tops of the spring housing tubes. Then edge members 20 are put into place so as to embrace the spring housing tubes, and the lower ends of the edge members 20 are connected to the lower ends of the spring 18 by inserting the hooks 18H through openings 37 in the edge members. When the parts are thus assembled, the action of the springs 18 will of course draw both of the edge members 20 to their upper positions.

The outer sash 16 is then put into place by moving the stile 21C of the sash laterally and at an angle into the conventional groove such as the right hand groove 115C of Fig. 3. The other edge of the sash may be swung outwardly so that the upper portion of the stile 21M of the sash moves beneath the cut away edge 25C of the edge member 20, thus to locate the stile 21M

opposite the lower portion of the wall 24 of this particular edge member 20. The sash is then moved upwardly into the groove that is defined by the flanges 25 and 26, and such upward movement is continued until the upper edge of the sash strikes the upper stop or abutment 35. The locking member 32 is then shifted downwardly from the full line position of Fig. 3 to the dotted line of Fig. 3, and when this is done the end 32F of the locking member moves into position beneath the lower edge of the sash. The sash and the edge member 20 are thus effectually connected together so that the spring 18 acts upon the edge member 20 to impart the counterbalancing action to the sash.

The inner sash may then be put in place by a similar but laterally reversed manipulation of the parts, and this completes the assembly of the window installation.

When the sash are to be removed for cleaning or other purposes, the foregoing procedure is reversed, the inner or lower sash being first removed, after which the upper or outer sash may be removed. It will be evident of course that with respect to the inner sash that such sash must be moved first to the upper position before releasing the locking member 32, this being necessary in order to provide necessary clearance for downward withdrawal of the inner sash from its associated edge member.

From the foregoing description it will be apparent that the present invention provides an improved spring balanced removable-sash window structure in which the removal of the sash may be accomplished quickly and with great ease. It will also be apparent that the present invention enables the sash to be removed without application of lateral forces to the sash, and thus the removal of the sash may be accomplished by inexperienced workers.

Thus, while I have illustrated and described a preferred embodiment of my invention it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appending claims.

I claim:

1. In a window structure having a frame with opposed sash guide means one of which comprises a primary guide groove and the other of which comprises a vertically slotted spring housing, an edge member having guide means embracing said spring housing for relative longitudinal sliding movement and having means thereon facing said primary guide groove and providing a secondary sash receiving groove, a spring in said spring housing anchored at its upper end on said housing and at its lower end on and near the lower end of said edge member, a sash having its opposite edges disposed slidably in the respective grooves, upper and lower stop means on said edge member for holding said edge member on said sash, and means mounting said lower stop means for movement to a released position whereby said sash may be moved downwardly out of said secondary groove.

2. In a window structure having a frame with opposed sash guide means one of which comprises a primary guide groove and the other of which comprises a vertically slotted spring housing, an edge member having elongated guide means on one side slidably embracing said spring housing and having means on its other side providing a secondary sash receiving groove, a spring in said spring housing anchored at its upper end on said housing and at its lower end on said edge member, a sash having its opposite edges disposed slidably in the respective grooves, and means for interconnecting said edge member and the sash for holding said edge member releasably on said sash.

3. In a window structure having a frame with opposed sash guide means one of which comprises an elongated primary guide and the other of which comprises a vertically slotted spring housing, the improvement that comprises an edge member having guide means on one side embracing said spring housing for slidable guiding said member for longitudinal sliding movement along said housing and having guide means on its opposite side for engagement with the edge of a sash to guide said edge member and the sash for longitudinal sliding movement, a spring in said spring housing anchored at its upper end on said housing and at its lower end on said edge member, and stop means on said edge member for releasably holding said edge member in a fixed relation on such a sash.

4. In a window structure having a frame with opposed sash guide means one of which comprises a primary groove and the other of which comprises a vertically slotted spring housing, an edge member having guide means embracing said spring housing and having means thereon facing said guide groove and providing a secondary sash-receiving groove, a spring in said spring housing anchored at its upper end on said housing and at its lower end on said edge member, stop means on the upper portion of said member to limit upward movement of a sash into said secondary groove, and releasable locking means on said edge member for engaging a lower portion of a sash to hold the same in said secondary groove.

5. In a window structure having a frame with an opposed sash guide means one of which comprises a primary guide and the other of which comprises a vertically slotted spring housing, an edge member having guide elements on one side embracing said spring housing and having means on the other side providing a secondary sash-engaging guide, a spring in said spring housing anchored at its upper end on said housing and at its lower end on said edge member, and means on said member for releasably holding said edge member in position on a sash to guide and counterbalance such sash.

6. An edge member for use in removably mounting a vertically sliding sash in a window frame, said member comprising an elongated wall having flanges projecting from the edges to define a sash receiving groove on one side of said wall, projecting parallel ribs in spaced relation on the other side of said wall defining a space within which a spring housing may be slidably positioned, one of said flanges being cut away near one end of said member, and a locking member swingably mounted on said side of said wall for engaging a horizontal edge surface of a sash.

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