

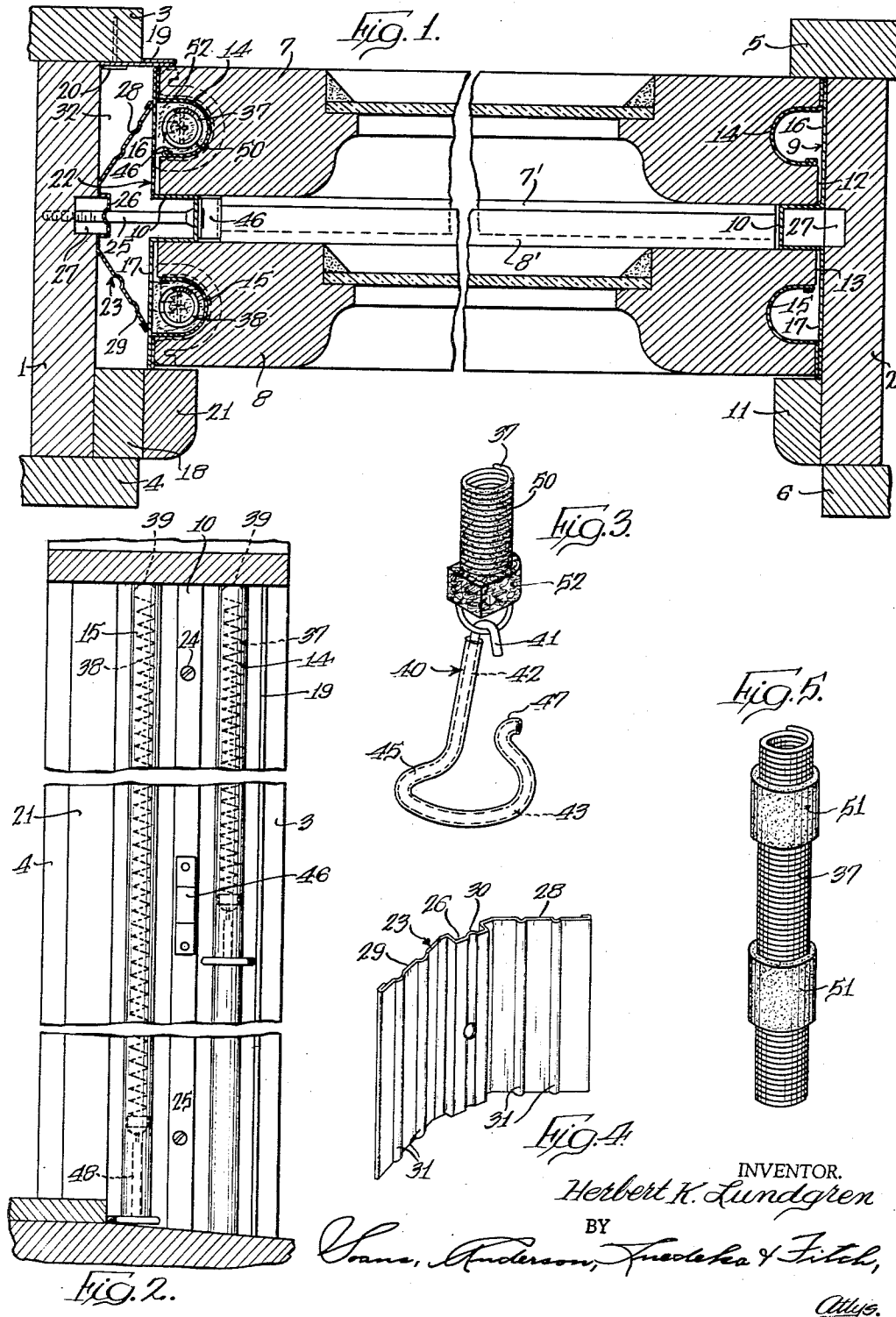
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H. K. LUNDGREN

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REMOVABLE MOUNTING FOR SLIDING SASH

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INVENTOR.

Herbert K. Lundgren

BY

Carne, Anderson, Fiedler & Fitch,

Attys.

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REMOVABLE MOUNTING FOR SLIDING SASH

Herbert K. Lundgren, Rte. 4, Box 828, Oshkosh, Wis.

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This invention relates to means for removably mounting sash and it is particularly concerned with the removable mounting of slidably mounted sash such as the more or less conventional double-hung sash used in residential and other building construction.

The main objects of the invention are to provide a simple but effective and durable sash balancing means for removably mounting slidable sash in a window frame; to provide such removable sash mounting means embodying simple structural parts which may be easily manufactured at low cost and which may be quickly and easily mounted in a window frame by ordinarily skilled carpenters or other building mechanics without special training or experience; and in general, it is the object of the invention to provide a highly practicable means for removably mounting slidable sash with a minimum of special construction.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing wherein there is illustrated a removable sash mounting and weatherstripping means embodying a selected form of the invention.

In the drawing:

Fig. 1 is a horizontal cross section through a double-hung vertically slidable window structure;

Fig. 2 is an elevational view of one side of the frame structure embodying means for removably mounting and weatherstripping slidably mounted sashes in accordance with the present invention; and,

Figs. 3, 4 and 5 are perspective illustrations of elements employed in the structure.

In the drawings, the side members of an ordinary window frame construction are indicated at 1 and 2, the members 1 extending between an outside stop 3 and an inside trim member 4, and the member 2 extending from an outside stop 5 to an inside trim member 6. These frame elements represent construction according to conventional practice and standardized specifications. Upper and lower sashes, respectively indicated at 7 and 8, are slidably mounted in the frame, these sashes having meeting rail portions 7' and 8' respectively, on their lower and upper edges in the usual manner.

A combination guide and weatherstripping member 9 is fastened on the face of the frame side member 2, said member 9 being provided with a parting stop formation 10 which cooperates with the outer stop 5 and with an inner stop 11 to form guideways 12 and 13 in which the adjacent sides of the sashes 7 and 8 are slidable. The member 9 is preferably made of relatively light weight, somewhat springy sheet metal, aluminum for example, and it may also be provided with transversely resilient, hollow, weatherstripping ribs 14 and 15. The weatherstripping ribs 14 and 15 are here shown as being located approximately midway of the width of the respective guideways 12 and 13, for entrance into suitable grooves provided in the respective sash sides, the fit of the ribs in such grooves being made sufficiently tight to prevent

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the free flow of air between the sash sides and the weatherstripping ribs. The metal member 9 includes flat bottom plate portions 16 and 17 on opposite sides of the parting stop 10 and respectively opposite the sashes 7 and 8.

Both sides of the frame may be initially manufactured alike in accordance with standardized specifications. However, a wood strip 18 is applied to the inner margin of the side member 1 and a thin but fairly rigid metal extender strip 19 is nailed as indicated at 20 to the inside face of the outer stop 3. An inner stop strip 21 is fastened on the filler strip 18. The strips 18 and 21 on the inside, and the strip 19 on the outside cooperate to deepen the frame recess 32 over the side frame member 1. Hence, special frame construction is not required. However, if preferred, the outer stop 3 may initially be made wide enough to make the frame recess of the indicated increased depth without using the extender strip 19 and the members 18 and 21 may be replaced by a unitary strip.

Another combination guide and weatherstripping member 22 of the same construction as the member 9 is positioned in said recess and the adjacent side edges of the sashes 7 and 8 are slidably received in a guideway formed between said member 19 and the parting stop formation 10 for the outer sash 7, and in a guideway formed between said parting stop and said inner members 18 and 21 for the inner sash 8.

Said member 22 is yieldingly supported in engagement with the adjacent sash edges and in spaced relation to the frame side member 1 by means of a spring element 23. This spring element 23 is made of flat spring metal stock, stainless and rust-proof spring steel, spring brass, bronze, aluminum, and other non-rusting metals being suitable. The metal spring plate 23, if of bronze, may be very thin, for example .009 inch in thickness, and is quite light and flexible. This spring member is preferably employed in lengths corresponding to the vertical dimension of the frame side and is anchored in place by means of a pair of ordinary wood screws which pass through holes provided in the parting stop portion 10 of the weatherstrip member 22 and in the spring member 23 adjacent their upper and lower ends as indicated at 24 and 25 in Fig. 2.

The spring member 23 may be made in many forms. At this time, it seems preferable that it embody a central, shallow U-shaped base portion 26 of sufficient width to span or straddle the empty parting stop groove 27 which is provided in the frame sides in accordance with standard specifications. Flanges or wings 28 and 29 in the nature of rebent portions of the legs of said U-shaped base portion extend at angles of about 45° to the plane of the bottom wall of said U-shaped base portion, these flanges or wings 28 and 29 being thereby disposed approximately perpendicularly to each other in the free or unstressed condition of the member. The elements or parts of the spring member are preferably connected by rounded corners or bends as illustrated, rather than by sharp corners or bends so as to avoid danger of breaking or cracking the metal. Also, the preferred rounded corners contribute better spring action by avoiding the restrictive effects of sharp bends. The bottom of the base portion and the wings, and the spring unit in its entirety, may be somewhat stiffened longitudinally by forming ribs such as indicated at 30 in the base and at 31 in the wings.

The spring unit 23 is seated with the legs of its base portion bearing on the frame side on opposite sides of the groove 27 and with its flanges or wings 28 and 29 extending in outwardly diverging relationship into edge engagement with the flat bottom portions 16 and 17 respectively of the weatherstrip member 22. The spring member is preferably under partial compression, that is

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to say that the wings 28 and 29 are displaced from their free positions toward the plane of the base 26, between said frame side 1 and the weatherstrip member 22 when the sashes are in place so as to cause the guide and weatherstrip member 22 to be snugly seated against the adjacent side edges of the sashes and so as to maintain tight engagement between said spring member and the opposed frame side 1 and said guide member 22 to prevent air from leaking in or out between these parts. The force of the spring member 23 transmitted to the sashes also tends to maintain the latter snugly seated on the weatherstrip member 9 at the other side of the frame.

The member 1 may be considered a fixed bottom member and the member 22 a false bottom member in the frame recess 32 in that the said member 22 is depressible in said recess between the outer stop extender 19 and the inner filler strip 18 and stop 21. The guide and weatherstrip member 22 is freely movable along the anchor screws 24 and 25.

To remove the sashes 7 and 8 they are forced edgewise toward the frame side 1, thereby depressing the weatherstrip and guide member 22 in the recess 32, to an extent sufficient to withdraw the opposite sides of the sashes from the guideways 12 and 13 and to permit such opposite edges to be swung laterally inwardly from the frame, after which the depressed sides may readily be withdrawn from the frame to effect complete removal of the sashes from the frame. When the sashes are removed, the anchoring screws hold the weatherstrip member 22 and the spring member 23 in place and it will be evident that the said screws 24 and 25 may be adjusted to limit or determine the inward position of the member 22.

Removal of the sashes may readily be effected from the inside thereof. When the sash 8 is to be removed, it is adjusted to a partially open position so that it may be grasped at both its top and bottom ends whereupon it may be removed, as already explained. When the inner sash 8 is removed, free access to the outer sash 7 is available and said outer sash may then readily be removed in the same manner as said inner sash. When one of the sashes is moved edgewise against the pressure of the spring 23, the member 22 will tend to rock and flex somewhat about a vertical axis, the pressure being applied mainly against the flange or wing of the spring which is directly opposite to the edge of the sash being moved. Such rocking and flexing of the member 22 is readily permitted by providing sufficiently large openings therein to freely receive the screws 24 and 25.

At the depressible sides of the sashes, their meeting rails 7' and 8' are cut off short of the parting stop 10 and a sealing member 46 is suitably fastened to the stop to fill the space between the stop and the adjacent ends of said rails 7' and 8'. This sealing member 46 is of a length approximately corresponding to the vertical dimensions of the adjacent ends of said meeting rails so that when the sashes are in an open position preliminary to removing or installing the same, the ends of the respective meeting rails will be spaced above or below said sealing member and spaced from the parting stop so as to permit the aforesaid edgewise depression of the sashes without engagement of the ends of said meeting rails with said parting stop. This avoids denting and otherwise damaging of the parting stop incident to removal or insertion of the sashes.

In most instances, the extent of edgewise movement required to free a sash from a guideway will not be in excess of about $\frac{5}{8}$ of an inch, which is approximately the depth of the weatherstripping formations 14 and 15 in one practical embodiment of the described structure. In some instances, this weatherstripping formation may be made somewhat shallower, say about $\frac{1}{2}$ inch, to correspond to the depth of the parting stop 10 so that the

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required extent of edgewise movement to free the sashes would be correspondingly reduced.

The guide and weatherstripping member 22 (and also the opposite member 9) extends the full length of the frame opening to form full length guideways for the sashes. The spring plate 23 is of substantially the same length as the member 22 so as to provide a seal along the entire lengths of these parts against air flow between the member 23 and the frame side 1 and between said member 23 and the member 22.

The described diverging wing form of spring plate provides an easy acting spring which has coplanar free edge portions for adequate bearing engagement with both sides of the guide member 22, and an intermediate connecting base portion spaced from the plane of said free edges for bearing engagement with the side of the frame.

At the side 2 of the window frame, the weatherstripping member 9 is seated flat on and suitably secured to the side member 2 so that air cannot easily pass between the weatherstripping member 9 and the frame side member 2. The tubular weatherstripping formations 14 and 15 provide draft proof seals with the side edges of the sashes.

Counterbalancing springs 37 and 38 are housed in the hollow weatherstripping ribs 14 and 15 of the yieldably supported guide strip 22. The upper ends of said springs are anchored to the upper ends of the back plate portions 16 and 17 of the member 22 by bending the upper end coils of such springs to vertical planes and hooking the same over the upper ends of said back portions 16 and 17 as indicated at 39 in Figure 2. The lower ends of these springs are separably connected to the respected sashes. To that end clips or hangers such as shown in Fig. 3 are provided.

The hanger shown in Fig. 3 is designated 40 in its entirety and is suitable for detachably connecting the lower end of the spring 37 to the bottom of the outer sash 7. Said hanger or clip 40 comprises a stiff wire member bent to provide an upper end hook 41, a downwardly extending leg 42 and a lower end ring 43. The hook 41 of the hanger is engaged with the lower end eye of the counterbalancing spring 37 within the weatherstripping and spring housing formation 14, the leg 42 depending within said housing. The ring 43 is formed with a straight rear portion 45 which extends laterally from the lower end of the depending portion 42 along the bottom plate portion 16 and between the same and the free edge 46 of the housing 14 to connect with the main body of the ring 43 which is disposed around the outside of the housing 14 and terminates in a rebent free end portion 47. The ring 43 is bent into a horizontal plane which is disposed at a slightly acute angle relative to the plane of the hanger leg 42.

The provision of the straight rear portion 45 of the hanger with its flat bearing engagement on the back plate 16 serves to prevent rocking or twisting of the hanger so that the ring part 43 is maintained in approximate concentric relation to the housing. The rebent free end 47 of the ring serves to provide non-scratching engagement of the hanger with the adjacent portion of the plate 16.

The bottom edge of the sash 7 will rest on said ring 43 so that downward movement of the sash will be resisted by the tension of the spring 37. It will be observed that the sash is not fixedly connected to the hanger 40 but merely seats thereon so that when removing the sash from the window frame, the sash is merely withdrawn from its seated position on the hanger. The hanger will, of course, remain in assembled relation to the spring housing.

When returning a sash to its place in the window frame, the bottom edge of the sash is initially seated on the hanger ring 43, the latter being pulled downwardly against the tension of its spring to a convenient level for such seating of the sash. The sash side is then inserted in its guideway and pressed edgewise into the recess 32 until

the opposite side of the sash may be swung into alignment with its guideway whereupon the sash is permitted to move in the opposite direction into such guideway. Since the tension of the spring 37 or 38 will maintain the hanger seated against the bottom of the sash, there is no need for fixedly attaching the hanger to the sash. To avoid interference with the movement of the inner sash to fully closed position, the bottom of the inner sash may be recessed sufficiently to receive the thickness of the ring 43.

The inner sash 8 is similarly connected to its counterbalancing spring 38 by a hanger 48 which is of formation similar to that of the hanger 40 except that if the hanger 40 be considered right hand the hanger 48 will be left hand. Also, it is preferred that the hanger 48 embody a somewhat longer depending leg 42 so as to permit some reduction in the length of the counterbalancing spring 38.

The hanger and spring are assembled with the spring housing by first hooking the hanger on the lower end of the spring and then threading the hanger downwardly along the spring housing from the upper end thereof, the spring following the hanger downwardly, and finally engaging the upper end loop 39 of the spring with the upper end of the wall or plate 16.

To prevent the production of scraping noise between the hangers 40 and 48 and the portions of the plates 16 and 17 against which they bear when the respective sashes are moved up or down, the hangers are preferably covered with a coating or tube of suitable non-metallic material. Some of the present commercially available tough and wear resisting plastic materials may advantageously be employed for the indicated purpose. One practical construction is to preheat the hanger to a suitable temperature, dip it to the extent desired in a bath of a plastic material known as vinyl-plastisol so as to provide the desired coating, and then cure or dry the coating in a hot oven. The hook 41 need not be covered, it being observed that the hook 41 is normally held out of sliding contact with the spring housing, but said hook may be covered if desired.

The springs may also have their outer surfaces suitably coated to prevent noise making contact with the inside of its housing and the adjacent plate 16 or 17. Such coating may be in the form of a fiber flock 50 (Fig. 3) suitably adhered to the outer surfaces of the springs 37 and 38 throughout their lengths, such flock permitting the coils of the spring to separate as required when the springs are stretched. Another arrangement is to secure a plurality of suitable non-metallic sleeves such as indicated at 51 in Fig. 5, to portions of the springs, such sleeves being separable from each other as an incident to such stretching of the springs as occurs when the sashes are moved downwardly. Such sleeves may consist of preformed non-metallic material and they should be fitted tightly around the spring so as to remain in selected positions in the spring and the sleeves may be initially positioned either end to end or at spaced intervals along the length of the spring. Such sleeves may be formed by wrapping adhesive tape strips around the springs. To further prevent noisy contact of the spring with the surrounding parts, a piston-like plug 52 (Fig. 3) of felt or other suitable material may be seated on the lower eye of each spring, the hanger hook 41 serving to prevent displacement of such plug. The plug may be shaped to fit

in the interior of the spring housing and it may have a flat side to ride against the adjacent plate element of the guide strip. Such plug may be slitted to fit on the spring eye.

This application is a division of my copending application Serial No. 409,082, filed February 9, 1954, which is a continuation-in-part of my prior application Serial No. 383,828, filed October 3, 1953, now abandoned.

Various changes in the described structure may be made while retaining the principles thereof.

I claim:

1. A sash balancing mechanism for a slidably mounted sash, comprising a counterbalancing spring enclosed in a housing having an elongated plate part and an elongated hollow element connected at one side to said plate part and provided at its other side with a free edge in spaced relation to said plate part to provide a slot which affords access to the interior of said housing, the sash being slidable lengthwise along said housing, and a hanger connected to the lower end of said spring within said housing, said hanger including a portion extending outwardly from said housing through said slot and provided with a ledge part which extends transversely around the outside of said elongated hollow element for guidance thereby in position for seating against a portion of the sash.

2. A sash balancing mechanism for a slidably mounted sash, comprising a counterbalancing spring enclosed in a housing having an elongated plate part and an elongated hollow element connected at one side to said plate part and provided at its other side with a free edge in spaced relation to said plate part to provide a slot which affords access to the interior of said housing, the sash being slidable lengthwise along said housing, and a hanger formed of metal wire bent to provide a hook engageable with said spring within said housing, a ring part at the lower portion of said hanger which externally encircles said hollow element to provide a ledge for seating against a portion of the sash, and an arm part of said hook which extends through said slot into said housing and connects said ring part to said hook.

3. A balancing means for a sash slidably mounted in a window casing, said balancing means comprising a vertically extending housing adapted to be mounted on the casing and having a vertically extending slot which affords access to the interior of the housing, the sash being slidable lengthwise along said housing, a counterbalancing spring extending lengthwise within said housing and supportingly connected adjacent the upper end thereof, and a hanger connected to the lower end of said spring within said housing, said hanger having a part projecting outwardly from said housing through said slot and provided with a ledge part which extends transversely around the outside of said housing for guidance thereby in position for seating against a portion of the sash.

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