

June 2, 1964

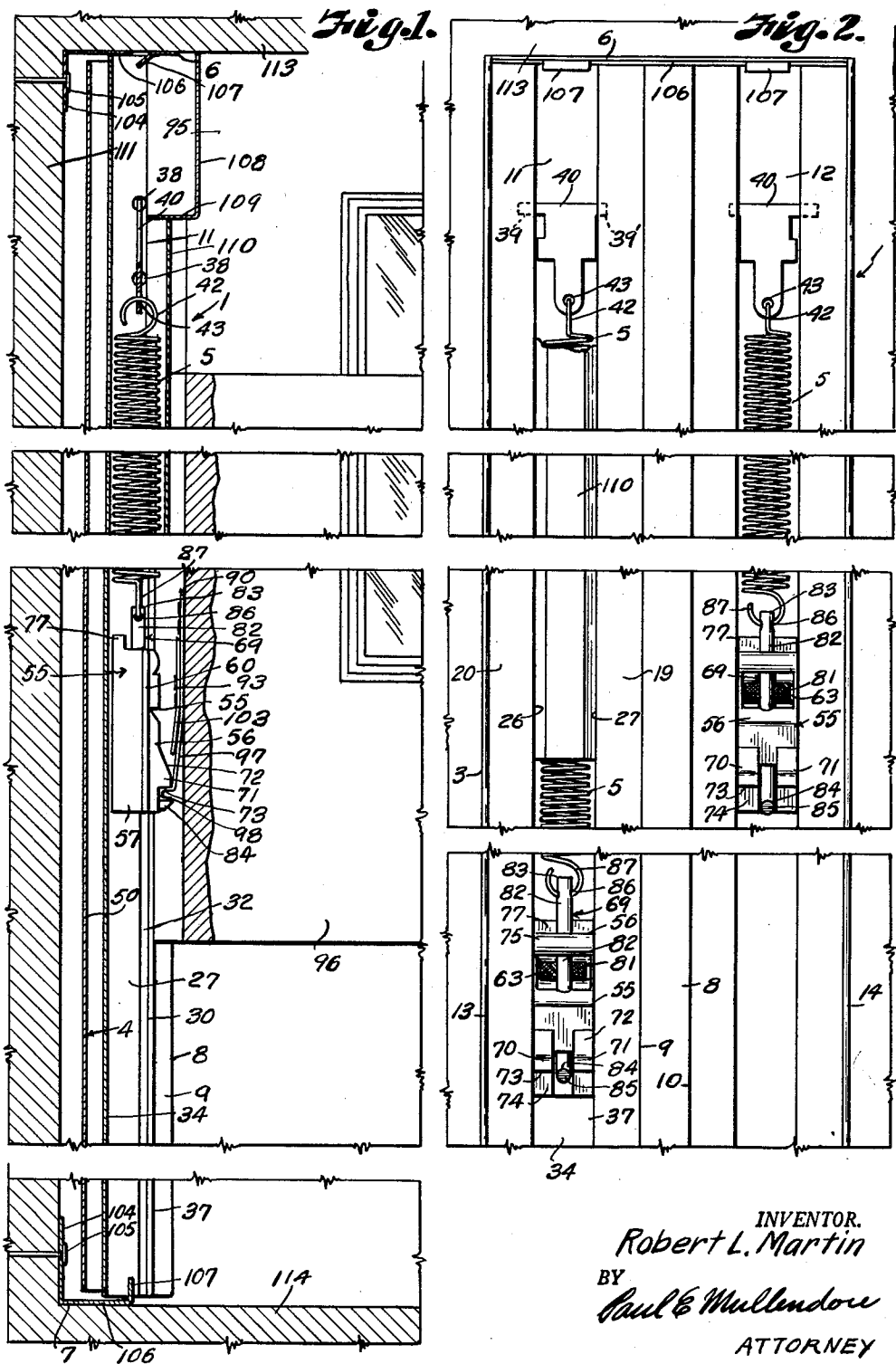
R. L. MARTIN

3,135,014

SASH BALANCE CONNECTOR

Filed June 30, 1960

4 Sheets-Sheet 1



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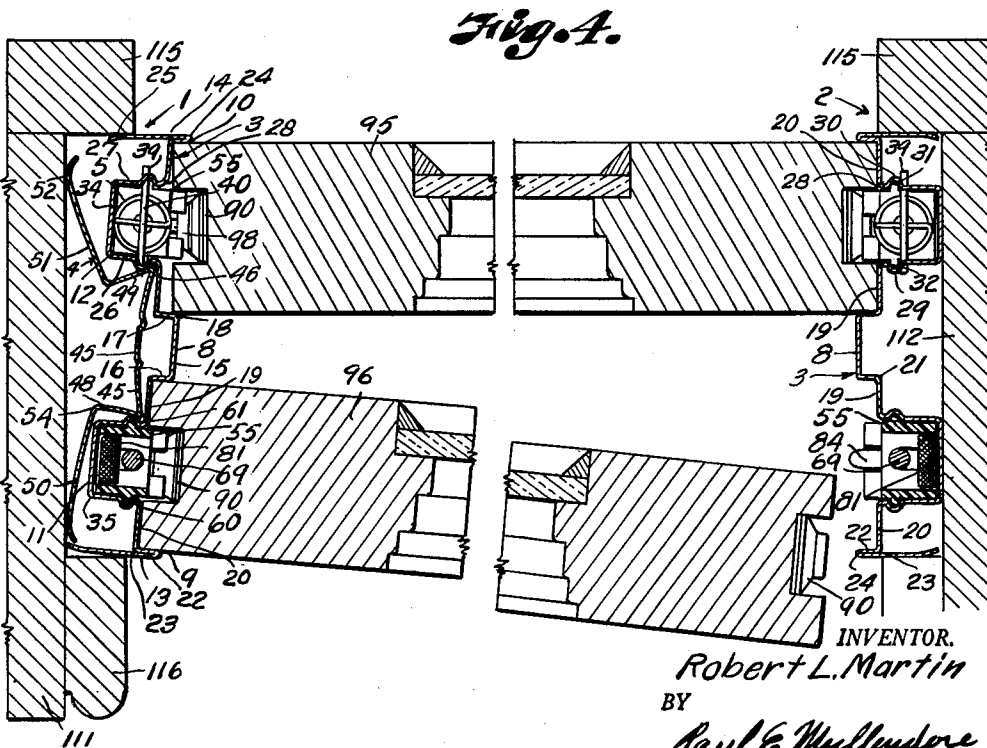
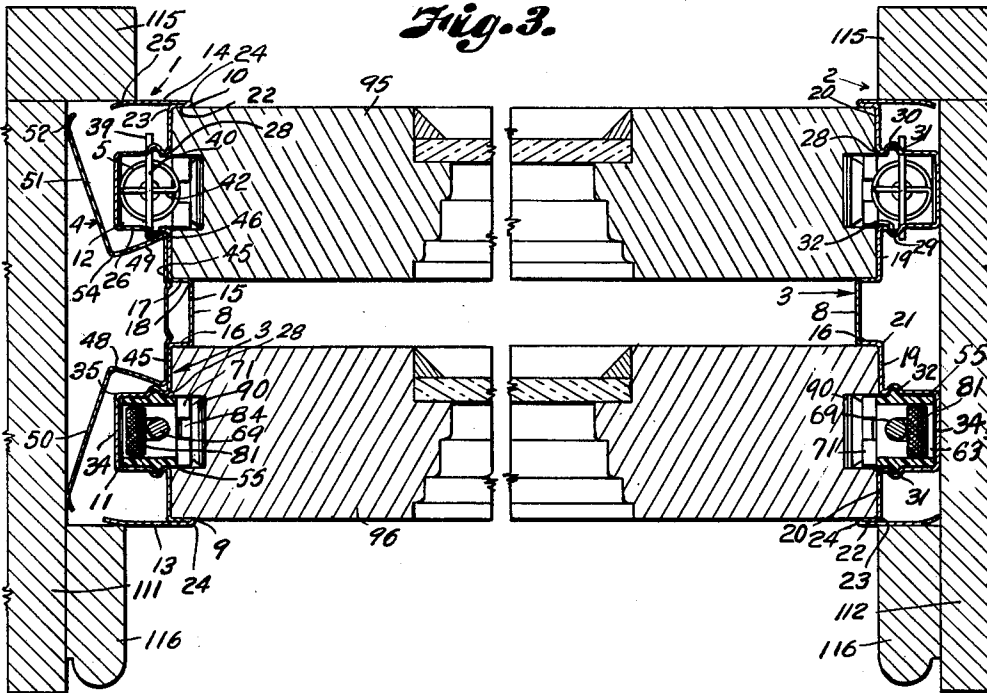
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4 Sheets-Sheet 2



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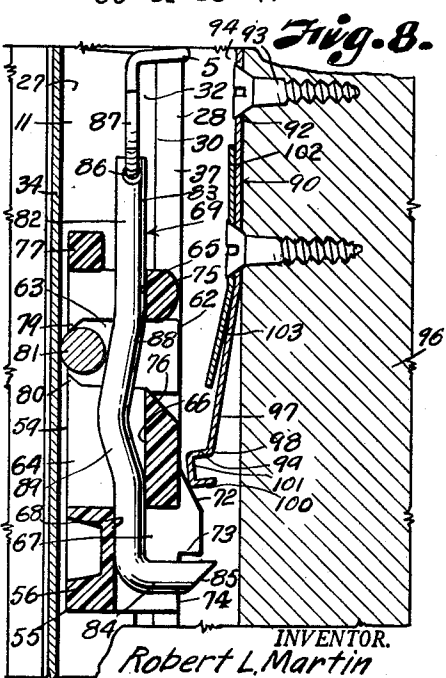
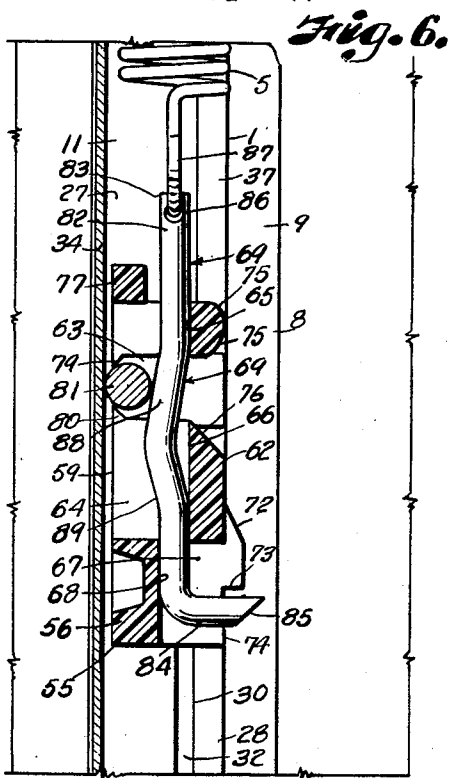
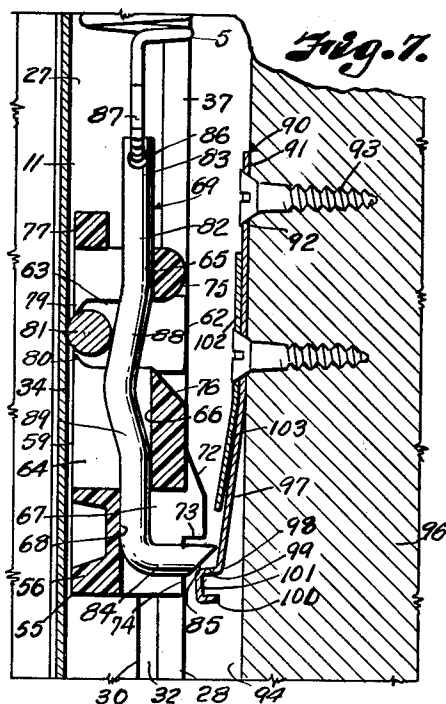
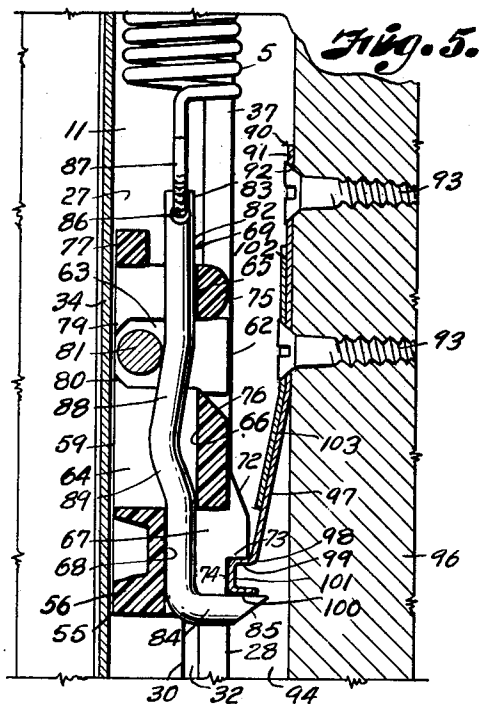
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SASH BALANCE CONNECTOR

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4 Sheets-Sheet 3



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SASH BALANCE CONNECTOR

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4 Sheets-Sheet 4

**Fig. 9.**

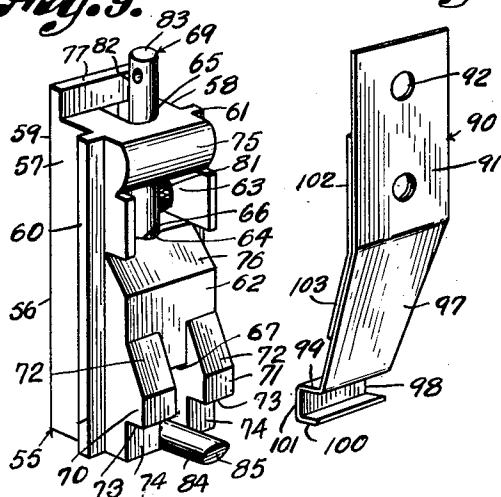


**Fig. 10.**

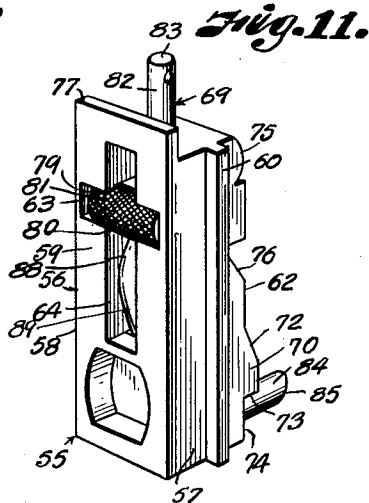


**Fig. 11.**

**Fig. 12.**

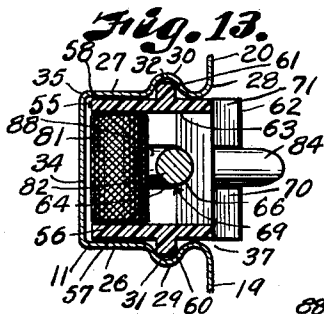
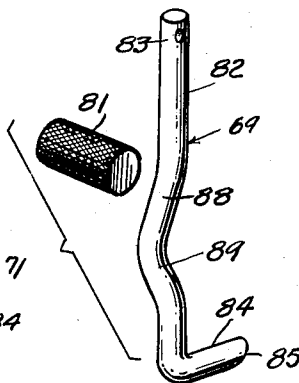


**Fig. 14.**

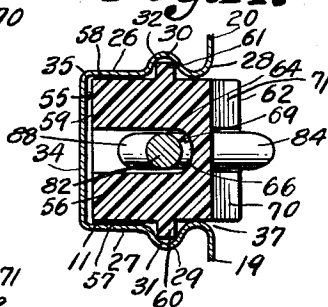


**Fig. 15.**

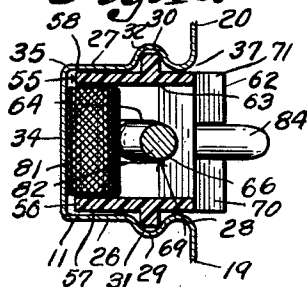
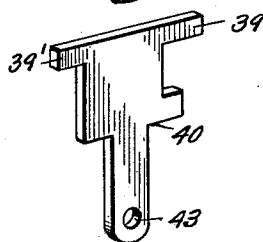


**Fig. 16.**



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3,135,014

## SASH BALANCE CONNECTOR

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Filed June 30, 1960, Ser. No. 40,097

5 Claims. (Cl. 16-197)

This invention relates to weather-seal guide and counterbalance assemblies for double hung window sash, particularly for sash of the removable type.

In modern windows, the sash are slidably mounted in combination weather-seal guides that are coextensive with the jambs at opposite sides of the window frame. One of the guides is usually attached to its jamb, while the other guide is resiliently contained in a recess at the opposite side of the frame to establish a weather-seal with the edge faces of the window sashes and at the same time provide for freely guided movement of the sash. The sash are usually counterbalanced by coil springs attached at their upper ends to the upper ends of the guides and at the lower ends to the sash.

This type of mounting is adapted for removal and replacement of the sash for cleaning, painting, and other purposes, because the yieldably backed guide permits sufficient lateral movement of the sash to free the edge faces of the sash from the sashways to disconnect the sash from the balance springs. However, when the sash are disconnected, the springs fly back and jerk the sash connections out of position, so that they cannot be readily reconnected with the sash when the sash are to be replaced. If the springs are controlled to prevent snap-back, the controls are usually gripping devices that are intended to set and grip the guides automatically under action of the balance springs when the catches on the sash disengage from the parts of the connection attached to the balance springs, but the balance springs are so active that they usually fly back before the gripping devices can set themselves, or the gripping devices set so securely that they damage the guides. Another difficulty is that when triggers are used to release the gripping devices upon replacement of the sash, care must be used to locate the connections on the sash with the triggers, otherwise the sash connections do not properly engage the triggers. Another difficulty is that the gripping mechanisms are usually pivoted within carriers attached to the balance springs and are slidable with movement of the sash in necessarily small guide grooves in the sash guides. Consequently, spring actuated pivoted pawls, triggers, and similar parts do not make satisfactory gripping devices.

It is further obvious that since the weather-seal guides should be constructed of substantially light, springy material for maintaining sealing contact between the frame and the sash, it has been difficult to establish a satisfactory contact of the toothed gripping devices because of yieldability of the material.

Various attempts have been made to overcome these difficulties, but in most instances the results have not been satisfactory because of complication in construction of the guides, high cost of manufacture, difficult installation, high installation cost, and short life of the parts.

Therefore, the principal objects of the present invention are to overcome the above mentioned difficulties by providing a weather-seal guide and counterbalance assembly wherein the parts are of rugged construction and employ a rolling wedge action.

Other objects of the invention are to provide a single piece guide incorporating balance spring housing portions and sashway portions integrally connected by folds provided in a single elongated sheet metal strip of proper width; to provide opposite sides of the spring housing

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portions of the guides with longitudinal corrugations that enhance the rigidity of the folds that connect the sides of the spring housings with the sashway portions of the guides and which provide guide grooves for tongues on the respective sides of the carrier elements to back the wedging action of the gripping devices; to provide a guide construction that permits of shallow sashway portions for facilitating removal of the sash; to provide connections between the balance springs and sashes which include roller elements and wedge elements therefor that are attached to the balance springs and on which the carrier elements are adapted to slide when controlling the action of the roller elements during engagement and disengagement of the sash; and to provide for insertion of the sash in any position in the frame, either above or below the level of the carrier elements, and yet be automatically engaged therewith.

Another object of the invention is to provide weather-seal and spring balance units adapted for supporting a sash at both sides thereof.

In accomplishing these and other objects of the invention as hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

FIG. 1 is an elevational view, partly in section, of one side of a window equipped with a weather-seal and spring balance unit embodying the features of the present invention, the height of the figure being shortened by omitting sections therefrom, and the inner sash being shown in raised position, but with the movable guide in sealing contact therewith.

FIG. 2 is a face view of the jamb of the window frame, showing the sash removed.

FIG. 3 is a horizontal section through the window, the section through the outer sash being taken at one elevation and the section through the inner sash at a lower elevation, and illustrating the sashes connected with the balance springs and the guides in sealing contact with the edge faces of the sash.

FIG. 4 is a section similar to FIG. 3, but showing the inner sash being removed.

FIG. 5 is an enlarged fragmentary section showing the connection of one of the sashes with the counter balance spring.

FIG. 6 is a similar section showing the sash removed and the parts in position for holding the counter balance position.

FIG. 7 is a similar section showing the sash inserted with the catch thereon being engaged with the wedge element of the connection from below.

FIG. 8 is a section similar to FIG. 7 but showing the catch on the sash moving into engagement from above.

FIG. 9 is an enlarged perspective view of the parts of the connection that are carried by the balance spring, as viewed from the sash side thereof.

FIG. 10 is an enlarged perspective view of the sash catch.

FIG. 11 is a perspective view similar to FIG. 9, with the parts viewed from the opposite side thereof.

FIG. 12 is a perspective view of the wedge and roller elements of the connection.

FIG. 13 is a horizontal section through the carrier elements taken at the level of the roller element and with the associated portion of the sash guide showing the parts with the roller in free position.

FIG. 14 is a similar section taken just below the roller element.

FIG. 15 is a fragmentary section similar to FIG. 13, but showing the roller element in wedge position.

FIG. 16 is a perspective view of one of the balance spring anchors for securing the upper ends of the springs to the sash guides.

Referring more in detail to the drawings:

The combination weather-seal and spring balance assemblies for a window includes a movable unit 1 and a fixed unit 2. The movable unit 1 comprises a weather-seal and guide member 3, a resilient backing or spring member 4, balance springs 5, and upper and lower bracket members 6 and 7 as the principal parts thereof.

The fixed unit 2 includes only a weather-seal and guide member 3 and balance springs 5 as the principal parts thereof. The weather-seal and guide members 3 for the respective units are of identical construction, with the exception that they are rights and lefts, due to the inclination of the sill of a window.

The weather-seal and guide member 3 is produced from a single strip of sheet material having the necessary width and strength and is shaped to provide a central parting stop portion 8, sashway portions 9 and 10 including spring housing portions or guideways 11 and 12, and outer side flange portions 13 and 14. The parting stop portion 8 has a web 15 corresponding with the width of an ordinary parting stop, and relatively shallow side flanges 16 and 17 connected therewith by bends or folds 18. The side flanges 16 also constitute adjacent sides of the sashway portions 9 and 10.

The sashway portions each include inner and outer webs 19 and 20 that are spaced apart by the spring housing portions 11 and 12, the inner webs 19 being connected with the side flanges 16 by bends or folds 21, while the outer webs 20 have flanges 22 connected therewith by folds 23, the flanges 22 being of a depth corresponding to the depth of the inner side flanges 16. The side flanges 13 and 14 of the guide are connected with the flanges 22 by return bends 24, whereby the side flanges extend along the flanges 22 for resiliently engaging the blind and finish stops of a window, as later described. In order to promote contact of the flanges with the blind and finish stops, the free marginal edges thereof are curved inwardly as indicated at 25.

The spring housing portions 11 and 12 have spaced apart side walls 26 and 27 that connect with the inner edges of the webs 19 and 20 by folds 28, and formed in the side walls immediately adjacent the folds 28 are corrugations 29 and 30 providing inwardly facing grooves 31 and 32. Portions of the corrugations 29 constitute means for retaining the resilient backing member 4, as later to be described.

The spring housing portions of the guide also include rear walls 34 that are connected with the side walls 26 and 27 by folds 35. The spring housings have open fronts 37 (see FIG. 2). It is obvious that a guide member folded as described has substantial rigidity in the longitudinal direction thereof, and particularly along the sides of the open fronts 37 by reason of the folds 28 and the adjacent corrugations 29 and 30, and this rigidity maintains the shape and dimensions of the open fronts of the spring housing portions. The guide members 3 when thus formed closely engage the blind and finish stops of the window frame and form weathertight seals therewith.

The upper ends of the guide members are cut at right angles with respect to the sides thereof, but the lower ends are cut on an angle corresponding to the slope of a window sill. The upper portions of the side walls 26 and 27 of the spring housing portions are provided with a vertical series of apertures 38 (see FIG. 1) for passing projections 39-39' on hangers 40 for anchoring the upper ends of the spring balances 5.

The upper and lower ends of the guide member of the fixed unit 2 are provided in the rear walls of the spring housing portions thereof with openings to pass fastening devices (not shown) by which the fixed unit 2 is attached to the side jamb of the window frame.

The spring housing portions are outside of the sashways 9 and 10, so that it is not necessary to provide the sash with the usual deep side grooves or to provide a relatively large movement of the movable unit when effect-

ing clearance of the sash with respect to the spring housings.

Another important feature is the relatively shallow depth of the sashways 9 and 10, which eliminates the relatively deep recessing of the side jamb. In fact, recessing of the side jamb is not necessary, since ample space is provided within the depth of the ordinary blind and finish stops while maintaining ample sealing contact of the outer flanges 13 and 14 with the blind and finish stops, as best illustrated in FIGS. 3 and 4.

The counterbalance springs 5 comprise elongated coils having the endmost convolutions shaped to provide hooks 42 at their upper ends for engaging in openings 43 of the hangers 40 (FIGS. 1 and 16). The lower ends of the springs have hooks to connect the sashes, as later described.

The resilient backing member 4 of the movable unit is also formed of a strip of sheet metal having spring-like characteristics to retain the shape thereof (see FIG. 16). The backing member has a normally flat web portion 45 of a width to bridge the parting stop portion 8 of the guide member and overlies the inner web portions 19 of the sashways. The web terminates in bends 46 providing inwardly converging flange portions 48 and 49, which in turn terminate in laterally flaring wings 50 and 51, the outer edges of which are curved as at 52 to provide substantially linear bearing contacts with the face of the jamb, as later to be described. The wings 50 and 51 are connected with the inwardly converging flanges by bends 54 on which the wings are adapted to flex, as shown in FIG. 4. When the backing member 4 is applied to the guide member 3, the bends 46 engage under the adjacent corrugations 29 to retain the members in assembly. The resilient backing members 4 are of a length to extend substantially the full length of the guide member, and, while being resilient, form a substantially stable support for positioning and stabilizing the guide member in sealing contact with the edges of the sash and to shift the sash into sealing contact with the fixed unit at the opposite side of the frame.

The connections between the counterbalance springs and the window sash include carriers or slides 55. Each carrier comprises a body 56 which may be formed of suitable material, preferably a synthetic plastic, such as nylon, and has substantially flat side faces 57 and 58 adapted to slide upon the side walls 26 and 27 of the spring housing portions of the guide members, and substantially flat rear faces 59. Projecting from the side faces 57 and 58 are tongues 60 and 61 that slidably engage within the grooves 31 and 32 of the corrugations 29 and 30 to support the rear faces 59 in substantially close relation with the rear walls 34 of the spring housings, and the front faces 62 in protrusion from the open fronts 37 of the spring housings, as best shown in FIGS. 1 to 6, inclusive. The body of each carrier has a transverse opening or slot 63 that extends through the rear and front faces 59 and 62. The opening 63 is intersected transversely by a narrower longitudinal recess 64 opening through the rear face 59 but terminating short of the front face to provide bearing surfaces 65 and 66, respectively, above and below the opening 63. The longitudinal recess 64 terminates short of the lower end of the body of the carrier to accommodate a recess 67 opening from the front face 62 and lapping the recess 64 and connected therewith at the point of overlap. The bottom of the recess 67 is thus offset from the bearing surface 66 to provide an oppositely facing bearing surface 68. A longitudinal passageway is thus provided by the overlap which extends entirely through the carrier for slidably containing a wedge element 69 in contact with the bearing surfaces, as best illustrated in FIGS. 5 to 8, inclusive.

Projecting from the front face 62 of the carrier on the respective sides of the lower recess 67 are lugs 70 and 71 having downwardly and outwardly sloping upper faces 72 and having their bottom faces forming shoulders

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73 at right angles with stop faces 74 on the respective sides of the recess. The upper portion of the front of the carrier above the opening 63 is transversely rounded as at 75. The carrier, below the opening 63, is preferably beveled as at 76. The carrier also has a transverse rib 77 extending transversely of the upper end thereof to reinforce the sides of the carrier. The opening 63 has upper and lower transverse lips 79 and 80 on the rear face side to retain a roller element 81, later to be described. The wedge element 69 includes a shank portion 82 of circular cross section and of sufficient length to extend through the longitudinal recess 64 and have an end 83 projecting therefrom. The opposite end of the shank terminates in a laterally projecting foot portion 84 that extends forwardly through the opening of the lower recess 67 and between the lugs 70 and 71 to form a movable abutment that cooperates with the shoulders 73 in engaging the spring catches on the sashes, as later described. The outer end of the foot portion 84 is preferably beveled as at 85 on its under side and in a direction opposite to the bevels of the lugs 70 and 71 to facilitate movement of the spring catches as hereinafter described.

The projecting end 83 of the shank has a transverse opening 86 for connecting the hook 87 on the lower end of the counterbalance springs 5 therewith. The shank 82 has an angularly offset portion 88 to provide a linear wedge portion for contacting the roller element 81 that is positioned within the transverse opening 63 so that when the wedge element is in the position illustrated in FIG. 6, the roller is pushed outwardly between the lips 79 and 80 to engage the rear wall of the spring housing. The angular portion of the shank curves inwardly as at 89 to join with the lower portion thereof. The roller element 81 is of a size to roll freely when the wedge element is in the position illustrated in FIG. 5, so that the carrier slides freely in the spring housing, but when the wedge element is in the position shown in FIG. 6, the roller is firmly wedged against the wall 34 of the spring housing. The roller preferably has the surface thereof suitably knurled to enhance the gripping action.

The sash catches 90 are best illustrated in FIG. 10 and each includes a plate portion 91 having openings 92 for passing fastening devices such as screws 93 to secure the catches in the bottom of grooves 94 (see FIG. 5) provided in the edges of the window sashes 95 and 96. Extending angularly from the plate portion 91 in a downward and outward direction is a resilient tongue 97 terminating in a transverse lug 98 that is formed by shaping the terminal of the tongue to provide upper and lower shoulders 99 and 100 and a stop face 101. In order to restrict flexibility of the tongue 97 in an outward direction, the catch also includes a relatively rigid plate 102 that is held in contact with the plate portion 91 by the lower of the fastening devices 93 and which has a downwardly and outwardly directed tongue 103 extending along the resilient tongue to restrict flexibility of the resilient tongue in an outward direction, but to allow ample flexibility of the resilient tongue in direction of the edge of the sash. The brackets 6 and 7 have flanges 104 that are secured to the jamb by fastening devices, such as nails 105 (FIG. 1). The brackets also have flanges 106 that extend inwardly of the window frame and have ears 107 that limit outward movement of the movable unit 1 when the sash are removed from the frame.

Stops 108 are provided to limit upward movement of the inner sash (FIG. 1) and are retained by the grooves 31 and 32. The lower ends of the stops have an inwardly turned flange 109 against which the upper rail of the sash is adapted to abut. When the inner sash is in closed position, the balance springs 5 therefor would be exposed through the open fronts of the spring housings, however, these springs may be covered by strips 110, also supported by the grooves 31 and 32 (FIG. 1).

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A window frame best adapted for the present invention includes side jambs 111 and 112 connected at their upper ends by a header jamb 113 and at their lower ends by a sill 114. Fixed to the outer edges of the jambs are blind stops 115 which cooperate with finish stops 116 that are attached to the inner edges of the jambs.

The weather-seal and guide units for the respective sides of a window are assembled at the factory, so that they can be quickly and easily installed on the job with a minimum of skill and time. The shanks 82 of the wedge elements 69 are inserted into the longitudinal recesses 64 with the foot portions 84 thereof passing into the recess 67 of the carriers 55 with the ends of the foot portions 84 passing between the lugs 70 and 71. The rollers 81 are then pressed between the lips 79 and 80 into the recesses 63 where they are backed by the shank portions 82 of the wedge elements. The assembly is then attached to the counterbalance springs 5 by engaging hooks 87 into the apertures 86 of the projecting ends 83 of the wedge elements 69. The carriers are then applied to the guide members by sliding them into one of the open ends of the spring housings, with the guide ribs 60 and 61 thereon passing within the grooves 31 and 32. The hangers 40 are secured to the hooks 42 on the upper ends of the counterbalance springs. The hangers 40 are secured to the guides by passing the longer projections 39 through one of the openings 38 of a pair of openings while the body of the hangers are held at right angles to the guides, so that the projections 39' can enter the opposite openings 38. Then by turning the hangers on pivotal axes of the projections, the bodies of the hangers will enter the spring housings and be retained therein as shown in FIG. 2. The stops 108 and cover strips 110 are inserted in the spring housings to cover the counterbalance springs for the lower sash 96. The resilient backing member 4 is applied by placing the web portions 45 thereof in position to be forced between the spring housings 11 and 12 until they seat under the corrugations 29 and 30. The guide member at the opposite side of the frame, of course, is not equipped with a resilient backing member, but the cover strip and sash stop are applied thereto. The brackets 6 and 7, together with catches 90 and the necessary fastening devices, such as the nails 105, or screws, may be packaged with the assembled units.

When installing the assembled units, the fixed unit 2 is passed into the recess at the right-hand side of the frame and secured at the upper and lower ends by screws. Upon tightening of the screws, the rear walls of the spring housings thereof seat against the face of the jamb 112, and the side flanges 14 and 13 form seals with the corresponding blind stop 115 and finish stop 116, as shown in FIGS. 3 and 4. The brackets 6 and 7 are inserted within the upper and lower corners at the opposite sides of the frame, with the flanges 104 seating squarely against the inner face of the jamb 111 and the ends fitting between the stops 115 and 116. When the brackets are in position, they are secured by driving the nails 105 through the opening of the flanges 104 and into the jamb 111.

The movable unit 1 is then easily inserted by passing the lower end of the guide member over the ears on the lower bracket 7 so that the ears pass into the lower open ends of the spring housings. The entire unit is then moved inwardly toward the jamb 111 with sufficient pressure being exerted on the upper ends so that the upper rear walls of the spring housings pass under the resilient ears 107 of the upper bracket 6. When the wings 50 and 51 of the resilient backing member 4 make contact with the jamb 111, the guide member is resiliently supported in its proper position.

With the counterbalance springs 5 relaxed, the carrier elements 55 are free to be shifted up and down on the shanks 82 of the wedge elements 69. However, the movement is limited in the upward direction by the curved

portions 89 of the wedge elements engaging the bottoms of the longitudinal recesses 64 and in a downward direction by the gripping rollers 81 being carried into wedging engagement with the wedge portions 88 of the wedge elements, which action brings the rollers 81 into engagement with the web portions 34 of the spring housings 11 and 12.

Before inserting the sash, the carrier elements 55 are pulled downwardly within the spring housings 11 and 12 to stretch the counterbalance springs 5. This may be accomplished by pulling down on the foot portions 84 of the wedge elements 69. During this movement, the carrier elements 55 drag in the grooves 31 and 32 to hold the carrier elements 55 in their upper position on the shanks of the wedging elements 69, thereby leaving the rollers 81 free so that the assembly can be moved downwardly in the guides when tensioning the counterbalance springs. However, upon release of the pulldown pressure on the foot portions 84 of the wedge elements 64, the counterbalance springs 5 start reverse movement of the wedging elements 69, but the drag on the carrier elements 55 detains the rollers 81 so that during the initial movement the wedge portions 88 force the rollers 81 into gripping engagement with the rear walls 34 of the spring housings to stop snap back of the counterbalance springs 5 and to hold the counterbalance springs 5 in their stretched condition.

The catches 90 are applied in proper position in the edges of the grooves 94 of the sash and secured by the screws 93. The sash are now ready to be inserted in the guides. The lefthand side of a sash will be inserted in its proper guideway of the resiliently mounted unit 1 and sufficient lateral pressure is applied against action of the backing spring 4 to cause shifting of the guide toward the jamb 111 an amount sufficient to permit the opposite side of the sash to be passed into the guide groove of the fixed unit 2. The sash may be inserted without regard to the position of the foot portions 84 of the wedge elements, that is, the sash may be inserted with the catches 90 either above or below the foot portions 84 of the wedge elements 69. Assuming that the catches are above the foot portions 84 of the wedge elements, the sash is moved downwardly in the guides as shown in FIG. 8 to bring the lugs 98 of the catches 90 into contact with the beveled faces 72 of the lugs 70 and 71. As soon as the lugs 98 of the catches 90 engage the faces 72, they cause the resilient tongues 97 to flex inwardly toward the bottom of the sash grooves, with the lugs moving downwardly of the beveled faces 72 and over the faces 71 until the shoulders 100 of the lugs engage the projecting foot portions 84 of the wedge elements 69. Then on further downward movement of the sash, the wedge elements 69 begin to move therewith to move the wedge portions 88 from wedging contact with the rollers 81, thereby freeing the rollers 81.

The drag of the carrier elements 55 will cause the carrier elements to lag so that space is opened between the foot portions 84 of the wedge elements 69 and the shoulders 73 of the lugs. As soon as this space opens sufficiently to accommodate the lugs 98 of the catches, the stored-up action in the tongues 97 brings the shoulder portions 99 of the lugs under the shoulders 73 to connect securely the carrier elements with the sash, whereupon the sash is securely connected with the counterbalance springs and may be moved freely up and down the guides (see FIGS. 1 and 5) without causing engagement of the gripping rollers 81. This is obvious for the reason that the lugs 98 of the catches prevent any relative movement between the wedge elements 69 and the carrier elements 55.

After the sashes have been placed in the window, they may be readily removed. This is effected by first sliding the sash to the left against action of the backing spring 4 a sufficient distance for the opposite edge of the sash to clear the fixed guide. When this occurs, the lug 98 on

the catch 90 at that side of the sash slides from between the foot portion 84 of the wedge element 69 and the shoulder 73 of the carrier element. The counterbalance spring 5, being under tension, starts shifting of the wedging element 69 to bring the wedge portion 88 thereon into wedging engagement with the roller 81 to wedge the roller 81 outwardly and effect grip thereof with the rear wall 34 of the spring housing substantially at the point of release of the sash, whereupon tension is held in the spring to prevent return of the spring to relaxed condition. When the opposite edge of the sash is withdrawn from the unit 1, a like action takes place to hold the tension in the counterbalance spring at that side of the window. When the sash is to be replaced, the operation is the same as that previously described for the initial insertion of the sash.

Should the sash be placed in a position so that the lugs 98 of the catches 90 are below the foot portions 84 of the wedging elements 69 (see FIG. 7), raising of the sash brings the lug portions 98 into contact with the beveled portions 85 to press the resilient tongues of the catches inwardly toward the bottom of the sash grooves to permit passing of the lugs. Then upon downward movement of the sash, engagement of the catches is re-established as previously described (see FIG. 5).

What I claim and desire to secure by Letters Patent is:

1. A connector for removably connecting a balancing spring with a sash slidable within the sashway of a weather-seal guide having an open front housing within the sashway for containing the balancing spring, said connector including a slide to reciprocate within the housing and having a transverse slot and an upper vertical recess intersecting the transverse slot on a side of the slide facing a part of the housing opposite the open front and said slide having a lower recess in the side facing said open front and in connection with the upper recess, said recesses terminating to provide respectively an upper bearing portion and a lower bearing portion, a gripping roller having relatively loose support in said transverse slot for engaging the part of the housing opposite said open front, means on sides of the slide for engaging sides of the housing to retain the slide in the housing, a wedge element having a shank for connection to the balancing spring and extending vertically through the slide in contact with said bearing portions, said shank having an offset portion in the upper recess and movable across said slot for contacting the roller for wedging the roller against said part of the housing upon relative movement of the slide and wedge element under initial contraction of the balancing spring, a lateral foot on the lower end of the shank projecting outwardly from the lower recess and through the open front of the housing, said slide having lugs projecting from respective sides of the lower recess to provide shoulders on the under sides thereof, and a catch for attachment to the sash and having a resilient tongue provided with a part engageable between the foot of the wedge element and said shoulders on the slide to connect the balancing spring with the catch and take up the relative movement between the wedge element and the slide for freeing the roller during raising and lowering of the catch under action of the balancing spring, said catch being adapted to be withdrawn on removal of the sash to free the wedge element under action of the balancing spring for wedging the gripping roller into contact with the said part of the housing to hold tension on the balancing spring when the catch is withdrawn.

2. A connector for removably connecting a balancing spring with a sash slidable within the sashway of a weatherseal guide as described in claim 1, wherein the lugs on the slides have downwardly sloping cam faces opposite said shoulders and the projecting foot portion of the wedge element has an upwardly sloping cam face to facilitate entrance of the said part on the catch whether

the catch is initially placed above or below the slide when replacing the sash.

3. A connector for removably connecting a balancing spring with a sash slidable within the sashway of a weatherseal guide as described in claim 1, and a guard forming a part of the catch for backing the resilient tongue to assure disengagement of said part when the catch is withdrawn from between the wedge and said shoulders.

4. A connector for removably connecting a balancing spring with a sash slidable within the sashway of a weatherseal guide having an open front housing within the sashway for containing the balancing spring, said connector including a slide to reciprocate within the housing and having a transverse slot and an upper vertical recess intersecting the slot on a side of the slide facing a part of the housing opposite the open front and said slide having a lower recess in the side facing said open front and in connection with the upper recess, said recesses terminating to provide an upper bearing portion and a lower bearing portion respectively, a gripper roller having relatively loose support in said transverse slot for engaging the part of the housing opposite said open front, means on the sides of the slide and engageable with the housing to retain the slide in the housing, a wedge element having a shank for connection to the balancing spring and extending vertically through the slide in contact with said bearing portions, said shank having an offset portion in the upper recess and movable across the slot for contacting the roller for wedging the gripper roller against said part of the housing upon relative movement of the slide and wedge element under initial contraction of the balancing spring, a lateral foot on the lower end of the shank projecting outwardly from the lower recess and through the open front of the housing, said slide having lugs projecting from the sides of the lower recess to provide shoulders on the under sides thereof, and a catch for attachment to the sash and having a resilient tongue portion terminating in a transverse lug for engaging between the foot of the wedge element and said shoulders on the slide to connect the balancing spring with the catch and take up the relative movement between the wedge element and the slide for freeing the roller during raising and lowering of the catch under action of the balancing spring, said catch being adapted to be withdrawn on removal of the sash to free the wedge element under action of the balancing spring for moving the wedge element relatively to the slide to cause the offset portion to wedge the gripping roller into contact with said part of the housing to hold tension on the balancing spring when the catch is withdrawn, and said transverse lug being reengageable with said foot portion to retract said wedge element and re-

engage the transverse lug under said shoulders of the lugs on the slide for freeing the gripping roller.

5. A connector for removably connecting a balancing spring with a sash slidable within the sashway of a weatherseal guide having an open front housing in the sashway for containing the balancing spring and having grooves at sides of the open front, said connector including a slide to be contained within the housing and having tongues on sides thereof for engagement in said grooves to retain the slide in the housing, said slide having a transverse slot and an upper vertical recess intersecting the transverse slot on a side of the slide facing a part of the housing opposite the open front and said slide having a lower recess in the side facing said open front and in connection with the upper recess, said recesses terminating to provide respectively an upper bearing portion and a lower bearing portion, a roller having relatively loose support in said transverse slot for engaging the part of the housing opposite said open front, a wedge element having a shank for connection to the balancing spring and extending vertically through the slide in contact with said bearing portions, said shank having a cam portion intermediate said bearing portions and contacting the roller for wedging the roller against said part of the housing upon relative movement of the slide and wedge element under initial contraction of the balancing spring, a lateral foot on the lower end of the shank projecting outwardly through the lower recess and through the open front of the housing, said slide having lugs projecting from the side of the lower recess to provide shoulders on the under sides thereof, and a catch for attachment to the sash and having a part engageable between the foot of the wedge element and said shoulders on the slide to connect the balancing spring with the catch and take up the relative movement between the wedge element and the slide for freeing the roller during raising and lowering of the slide under action of the balancing spring, said catch being adapted to be withdrawn on removal of the sash to free the wedge element under action of the balancing spring for wedging the gripping roller into contact with said part of the housing to hold tension on the balancing spring when the catch is withdrawn.

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