

June 23, 1953

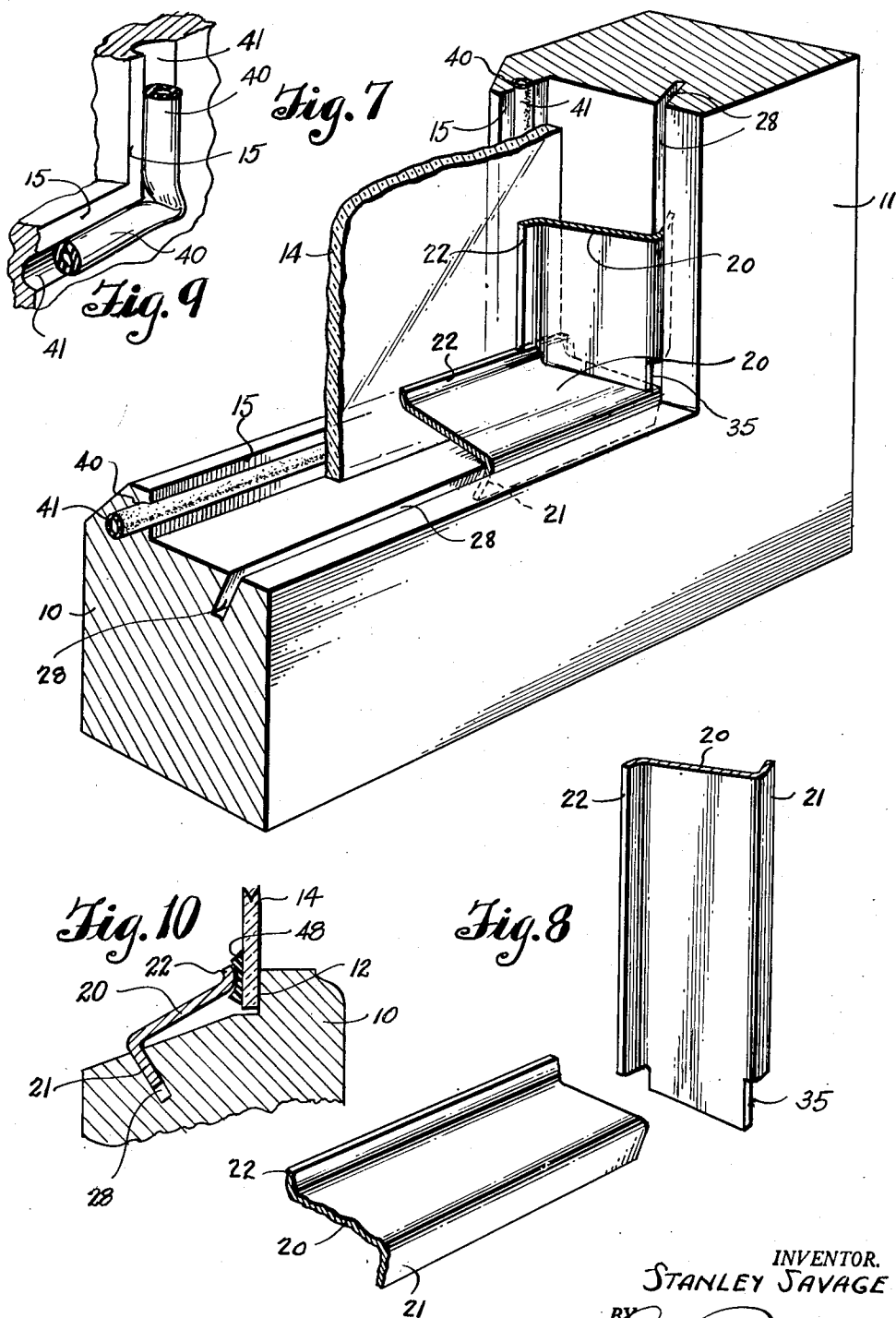
S. SAVAGE

2,642,632

WINDOW FRAME CONSTRUCTION

Filed Nov. 13, 1951

2 Sheets-Sheet 2



INVENTOR.
STANLEY SAVAGE

BY

Cook & Robinson
ATTORNEYS

UNITED STATES PATENT OFFICE

2,642,632

WINDOW FRAME CONSTRUCTION

Stanley Savage, Seattle, Wash.

Application November 13, 1951, Serial No. 255,998

3 Claims. (Cl. 20—56.4)

1

This invention relates to window construction and has reference more particularly to improvements in means for the securing and sealing of glass panes in the openings of window sashes.

It is the principal object of this invention to provide a novel sash construction, in combination with parts of novel construction that makes possible the securing of a glass pane in a sash opening in an effective and permanent weather-sealed joint without the use of putty.

It is also an object of the invention to provide weather sealing strips and pane securing strips of novel kind in conjunction with a sash of special construction that permits the glazing of window openings, and also the removal of broken glass and its replacement to be easily, readily, and economically accomplished.

It is a further object of my invention to provide window pane securing strips that may be easily and readily applied to the sash to secure the glass panes in place and which, under all ordinary conditions of use of the window, will remain tight and secure without use of securing nails or screws, and which can be easily and readily removed when such is desired for repair or replacement of glass panes.

Another object of the invention is to provide the sash and also the pane securing strips with novel details of construction that, in the functional application of the securing strips to the sash, coact to cause the strips to function as holding wedges, and to serve both to insure the tight weather sealing of the joint about the pane and also the firm holding of the strips against displacement due to their pane securing pressure.

Yet another object of the present invention resides in the use of resilient rubber tubing, or the like, as sealing strips between the glass panes and sash shoulders, to insure ample resiliency and to eliminate the requirement for beveling the ends of strips for joining at the corners of the sash openings.

Further objects of the invention reside in the details of construction of parts of the sash and securing strips and in their combination and mode of use, as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is an elevation of a portion of a window sash as seen from the inside, with glass pane secured and sealed in an opening thereof by means embodying the present invention; parts of the pane and securing strips being broken away to better show the shoulder about the sash opening against which the joint sealing strip

2

and pane are disposed and clamped by the securing strips.

Fig. 2 is an enlarged, cross-sectional view, taken on line 2—2 in Fig. 1, showing the relationship of the shoulder, glass pane, joint sealing strip and the pane clamping and securing strip with its anchoring flange applied to a channel in the sash rail.

Figs. 3 and 4, respectively, are cross-sectional views through a part of a sash rail, showing different modifications or forms of joint sealing strips that may be used in lieu of that shown in Fig. 2 for the weather sealing of the joint between shoulder and pane.

Fig. 5 is a cross-sectional view through a division bar, showing details of the bar and the use therewith of a joint sealing strip of tubular form.

Fig. 6 is a cross-sectional view of a metal sash, showing the present invention as applied thereto.

Fig. 7 is a perspective view of a portion of wooden sash, and pane, showing the engaging of adjacent end portions of the pane securing strips at a corner of the sash opening.

Fig. 8 is a perspective view showing the adjacent end portions of a side and a horizontal securing strip.

Fig. 9 is a perspective view illustrating the bending of a tubular rubber strip for its application to a corner of a sash.

Fig. 10 is a sectional view of a sash rail showing the application of the pane securing strip at the outside of the pane.

It is usually the case in sash construction, that the glass panes are applied to the sash openings from the outside of the sash. There are advantages, however, in being able to glaze, or repair broken windows from the inside, and therefore I have herein illustrated the principal forms of the invention as being for the inside application. The invention, however, is not limited only to inside glazing but is likewise applicable to glazing from the outside of the sash, and for this reason I have shown, in Fig. 10, a sash detail that is designed for what I refer to as outside glazing. It is required, however, for either inside or outside glazing that shoulders be provided about the sash openings against which the panes can seat, and faced toward the side from which the glazing is to be done, and that channels of special form be provided in the sash members that define the openings, spaced inwardly from the shoulders as will hereinafter be fully described.

In the present drawings, Figs. 1 to 7 show constructions that are especially applicable for inside glazing while Fig. 10 shows a form of construction best suited for outside glazing. However, either of these can be applied either to inside or outside glazing and it is not the in-

tent that the present invention, as broadly stated, be confined to either inside or outside glazing operations.

Referring more in detail to the drawings—

In Fig. 1, I have shown a portion of a window sash comprising a lower cross rail 10, opposite side rails 11—11 and a horizontal upper cross rail or division bar 12; these various parts defining a rectangular sash opening 13 in which a glass pane 14 is disposed and secured by securing means constituting the subject-matter of this invention. Also, it is shown in Fig. 1 that each of those parts defining the sash opening is formed with an inwardly facing shoulder 15; the shoulders of all parts being in the same vertical plane to serve as the outside retaining means for the glass pane as applied to the sash opening from the inside.

To effectively seal the joint between the glass pane and the shoulder, a flat, flexible strip 16 of rubber, or other suitable joint sealing material of the character of rubber, is disposed between the shoulder 15 and the peripheral portion of the outer surface of the glass pane, as has been shown in Fig. 2. This joint sealing strip extends entirely about the opening 13, and it may be made as a continuous strip, or it may comprise separate strips or pieces extended along each of the four edges of the pane, and suitably joined at the corners of the opening.

The glass panel or pane 14 is of such dimensions as to be easily received in the sash opening and to overlap the sealing strip. The pane is held firmly against the weather sealing strip thus to seal the joint. It is to be noted in Fig. 2 that the strip 16 extends just slightly above the shoulder 15 and preferably is beveled along its exposed edge, as shown, to readily drain water therefrom.

To secure the pane 14 in place, and tightly pressed against the rubber strip 16 to insure a tight, weather sealed joint, I have provided metal securing strips 20, presently described in detail, which have their inner longitudinal edges applied against the inside surface of the glass pane, opposite the rubber strips and their outer longitudinal edges anchored in the sash rails by means shown in the various sectional views. It is to be understood that the strips 20 take the place of securing points and putty to hold the pane in place and they co-act with the shoulders and rubber strips to seal the joint between pane and sash.

It will here be mentioned that in some instances it may not be required or desired that joint sealing strips be employed. In such cases, the glass panes would be fitted about their edges flatly against the shoulders.

The pane securing strips 20 are applied along opposite side edges and also along top and bottom edges of the opening, and are separate from each other and individually applied. However, they are so applied that there is a securing interlock effected. For example, it is best that the top and bottom strips be first applied to the sash, then the opposite side strips be fitted in place, and when in place, they operate to hold the horizontal strips from being displaced or removed. It is necessary then that the opposite side strips be first removed from the sash before the top and bottom strips can be withdrawn.

Each strip 20 comprises a thin, substantially flat strip of metal, bent parallel to its outer longitudinal edge to form an anchoring flange 21 that is turned laterally at an angle of 90°, or approximately that angle, relative to the body portion of the strip, and is also bent parallel to its inner edge to form a laterally curved flange 22; this latter

flange being turned in a direction opposite that of flange 21. The width of the strip usually is about $\frac{3}{4}$ " but may be more or less and the opposite edge flanges extend about $\frac{1}{4}$ " therefrom but likewise may be more or less. The securing strips 20 at the top and bottom of the sash opening can be square cut at their ends, as indicated in Fig. 8, but it is desirable, for the sake of appearance and better fit, to cut the ends of the opposite side strips in such manner that a close joint will be provided where they engage the horizontal strips. The method of cutting the ends of the strips is shown in Fig. 8, and their relationship when fitted together is as shown best in Fig. 7.

In order to properly apply the pane retaining strips 20 to the sash, the various parts of the latter that define the sash opening 13 are formed along lines spaced substantially inwardly from and parallel to the shoulders 15 with narrow, deep cut channels 28. These channels, in cross-sectional appearance as seen in the various views, are inclined inwardly toward the plane of the glass pane, and are adapted to receive the flanges 21 of the pane securing strips therein in an easy fit. Also, the width of the strips 20 is such that when the latter are applied to the sash, with the anchor flanges 21 thereof applied to and pressed within the channels 28, the curved flanges 22 along their inner or opposite edges will bear against the inside surface of the glass pane directly opposite the joint sealing strips 16, and the pressure will be such that the rubber strip will be somewhat compressed and the joint between glass and shoulder effectively sealed.

The compressed rubber joint sealing strips then exert an inward pressure against the strips 20 that operates to effect a binding action of the anchor flanges 21 against walls of the channels 28 in which they are closely fitted. It will be understood by reference to the various cross-sectional views that the strips 20 are angularly inclined relative to the glass pane and outward force applied against the higher edges of the strips by the panes tends to lift that edge and creates the binding action of the flanges 21 in the channels.

In this connection it will be explained that in the event that spring metal strips be used, the relationship of parts and mode of application of the securing strips 20 provides that the strips upon being applied, will be placed under a certain amount of spring tension that operates to supplement the wedging pressure of the strip to give additional joint sealing effectiveness and also to cause the strip flange 21 to bind more tightly against the walls of the containing channel 28. For example, in reference to the showing in Fig. 2: in applying the securing strip 20 it is first placed approximately in the dotted line position, with the flange 21 thereof just started into the channel 28 and its inner edge rested against the glass pane. Then by pressing downwardly against the outer flanged edge of the strip, the strip is moved to its full line position and in moving to this position, it is caused, by reason of the inward slope of channel 28, to move toward the glass pane, thus causing the glass to be pressed very tightly against the sealing strip 16 and the latter compressed. Also, if the strip 20 be of a hard metal, it will be placed under tension that causes the lower edge of flange 21 to dig into the inside wall of the containing channel, and the upper edge to press tightly against the outer wall of the channel along its top portion. The proper inclination of the channel 28 and the

5

proper bending of flanges 21 and 22 on the securing strips 20 can result in any desired and necessary pressure against the glass pane incident to the application of the strip to the sash.

A feature of this invention resides in the fact that the securing strips 20 will, under the pressure they apply to the pane, maintain their securing position after once being pressed into place, but may be easily and readily removed if first pried out from the channels 28 by applying a lifting force only at the outer edge of the strip. Therefore, in order that such force can be easily applied, I have provided recesses 35 in the flange 21 at the ends of the side strips, as shown in Figs. 7 and 8, that make it easily possible to extend a tool, such as the end of a screw driver, beneath the strip to pry it outward. With the outward prying of the strip, the binding tension is relieved and the strip becomes more easily removable.

To apply a pane in the sash of Fig. 1, the rubber strips 16 are first placed in position about the opening, then the glass pane 14 is applied to the opening and against the rubber strips. Then, the metal strips 20 are applied as has been explained; all operations being easily and rapidly accomplished.

Various forms of joint sealing strips may be used. In Fig. 3, I have illustrated a sealing strip 16a of channel form that is most easily applied to the edge of the glass pane before it is seated. This strip has an outside wall approximately of the same height as the shoulder 15 and a short inside wall that permits the inner edge of the metal securing strip 20 to be properly engaged against the glass without interference by the sealing strip.

In Fig. 4, I have shown a sealing strip 16b of channel form, fitted to the edge of the glass pane, wherein the inside wall of the strip is of the full height of the outside wall, and the curved edge 22 of the securing strip 20 is engaged tightly thereagainst, thus to provide an effective weather sealed joint both at inside and outside of the glass.

In Fig. 5 I have shown a modified construction, wherein the shoulders 12 of a metal division bar 12 are formed with semi-cylindrical channels 40 in which a rubber tube 41 is seated for use as the joint sealing strip; this type of construction being especially desirable for use in metal sash but not confined thereto. This use of a tubular sealing strip has also been shown in the wooden sash construction of Fig. 7.

In Fig. 6, I have shown the present invention as applied to a metal sash rail 45 of extruded strip form, and employing the joint sealing tube 41 of Fig. 5, seated in a semi-cylindrical channel 40 as in Fig. 5.

In Fig. 10, I have shown a construction designed for outside glazing. In this design, the shoulders 12 face outwardly and no joint sealing strip need be used between pane and shoulder, however, a joint sealing strip 48 has been applied between the flange 22 of the securing strip 20 and the glass. Otherwise, the combination is as previously described except that the sill portion of the sash might preferably be downwardly inclined for better drainage.

In each of these various alternative forms or modifications, the glass panes 14 are secured by metal strips 20 like, or of the same general character, of that shown and described in connection with Figs. 1 and 2, and it is to be understood that the strips 20 may be of rigid, stiff

6

metal or other suitable material, or might be of spring metal.

The advantages residing in use of the present means and method of making windows, are various. The glazing of sash can be accomplished more quickly and repair or replacement of panes easily and readily accomplished from the inside of the window. There is a special advantage in the use of the tubular rubber strips 41, as they may be bent at right angles without cutting and then fitted in the shoulder channels as has been shown in Fig. 9. Thus leaky joints are avoided and much time saved in the applying of the joint sealing strips.

The width of strip 20 can be more or less, as may be required for various types of construction.

The construction is readily applicable to wooden and also metal sash.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters-Patent, is:

1. A window sash formed with an opening containing a window pane; the bounding members of the said opening being formed with shoulders against which side faces of edge portions of the window pane are seated and with narrow and relatively deep channels parallel with the shoulders and spaced outwardly from the pane and extending into the sash members at an incline toward the plane of the pane, and pane securing strips applied within the sash opening along the edge portions of the pane, each strip comprising a substantially flat rigid bar disposed at an angle to the pane and along one longitudinal edge bearing against a surface of the pane in opposed relationship to the corresponding pane seating shoulder and there being a laterally turned flange along the other longitudinal edge of the bar removably applied within the corresponding channel to an extent that effects the wedging of the bar against the pane and causes the flange thereon to be tilted transversely in the channel and bind against opposite side walls of the channel to hold the bar against the pane and the flange against accidental release from the channel.

2. A combination as recited in claim 1 wherein the said shoulders are longitudinally grooved and flexible joint sealing strips are contained in the grooves and the confronting side faces of edge portions of the pane are seated thereagainst and form weather proof joints under the holding pressure of the retaining strips.

3. A window as recited in claim 1 wherein the flat bar portions of the retaining strips are formed along their pane engaging longitudinal edges with rounded laterally turned flanges directed in a direction opposite the direction of the said anchoring flanges.

STANLEY SAVAGE.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
589,600	Hendricks	Sept. 7, 1897
1,158,306	Schmid	Oct. 26, 1915
1,344,610	Bailey	June 29, 1920
1,534,705	Harris	Apr. 21, 1925
2,453,343	Reilly	Nov. 9, 1948

FOREIGN PATENTS

Number	Country	Date
988,609	France	May 9, 1951