

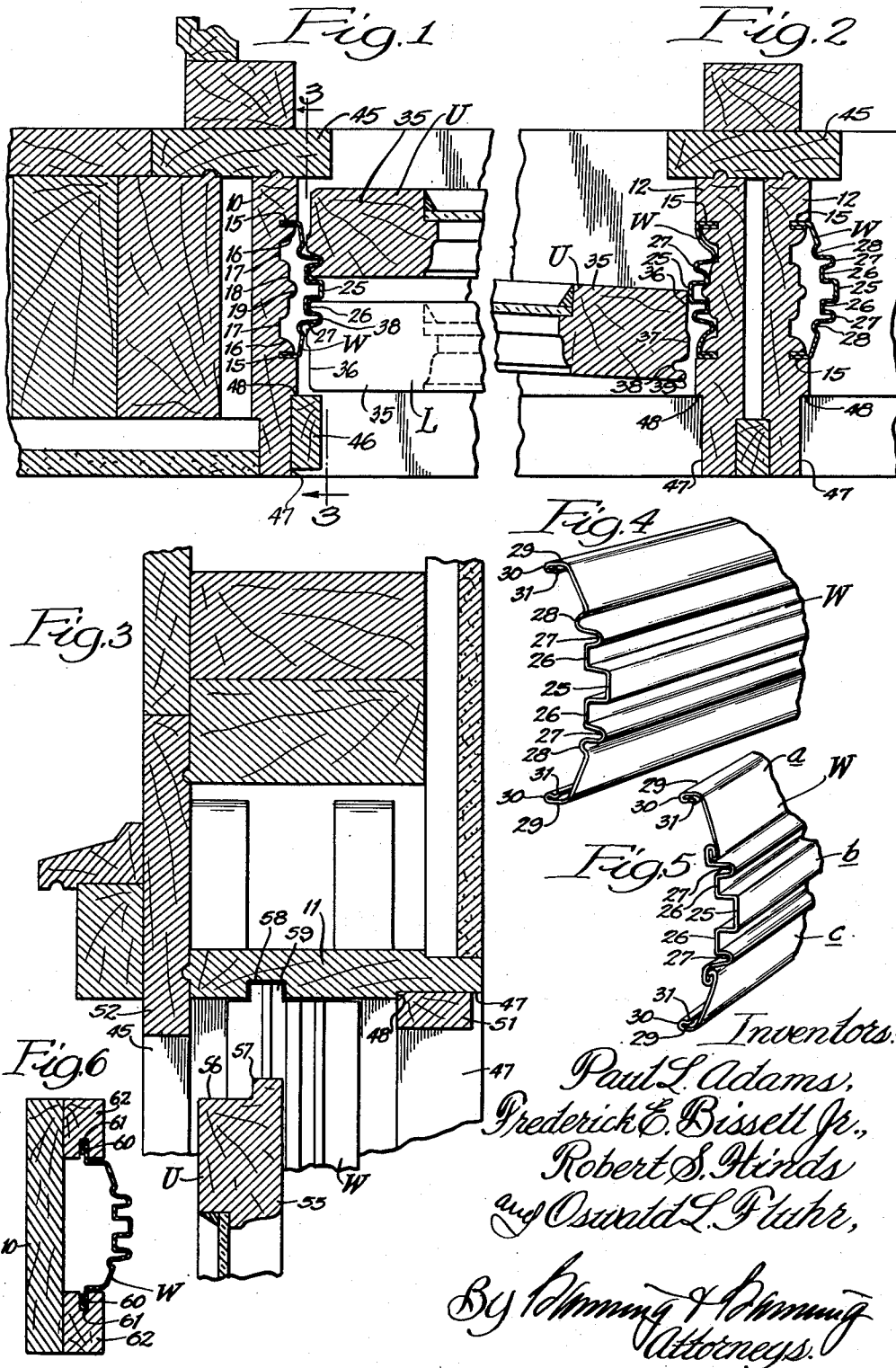
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WEATHER STRIP

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WEATHER STRIP

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The present invention relates to a weather strip adapted particularly for use with windows having one or more sliding sashes. The weather strip, which may be made of one or more pieces of metal, is interposed between the side jambs of the frame and the stiles of the sash, and cooperates therewith to furnish a guiding support, free of wood to wood contact, in all positions of the sash.

The present improvements are directed to a weather strip of this character which provides in itself an effective means for preventing ingress of weather around each sash, it eliminates noise and rattle which is an incident to the usual play or loose fit of a sash within its guides, it promotes free sliding movement of each sash so as to facilitate its adjustment to any desired position, it maintains a constant, but light, pressure against the sash due to the resiliency in the material from which it may be formed, thereby compensating automatically for contraction or expansion of the sash with changes in weather conditions, of wear incident to use, etc., and it makes for ready installation of the sashes within the opening of a window frame and for removal therefrom, whenever necessary, all with a minimum of effort and time. These and various other objects as will hereinafter appear are realized from the improved construction of weather strip embodying our invention of which certain suggestive modifications are set forth in the accompanying drawing in the manner following:

Figure 1 is a detail in horizontal section taken through one jamb of a window frame and through one stile of the upper of a pair of sliding sashes mounted therein;

Fig. 2 is a detail in horizontal section taken through a window mullion having upon opposite sides thereof the present weather strip, one of which, with no sash in place, is expanded to about its limit, and the other of which, with a sash in process of being fitted thereinto, is compressed to about its limit;

Fig. 3 is a detail in vertical section taken on line 3—3 of Fig. 1;

Fig. 4 is a perspective fragmentary view looking toward one end of the present weather strip;

Fig. 5, which is a similar view, shows a multi-piece construction of weather strip; and

Fig. 6 is a detail in horizontal section showing a side jamb with which is associated a weather strip of modified form.

Referring now particularly to Figures 1-3, I have shown a window frame comprising a side

jamb 10, a head jamb 11, and a mullion 12, defining openings in one of which is slidably mounted a pair of upper and lower sashes U and L, respectively. The side jamb is formed with a plow of special contour terminating in opposite saw kerfs 15. This plow is characterized by a pair of shoulders 16, one adjacent each kerf, and to the inside of each shoulder is a low channel 17, the two channels lying at the base of a raised panel 18 having a rib 19 extending outwardly therefrom in its medial region. Substantially this same plow contour is formed on opposite sides of the mullion 12 (see Fig. 2). Because of identical conditions existing in the side jambs and mullions, so far as concerns the weather strip of our invention, the term "jamb," as hereinafter used, refers to a mullion as well.

The weather strip W, best shown in Fig. 4, is desirably made of spring metal having a degree of resiliency which is requisite for the purposes of this invention. As shown, it is in the form of a plate bent to provide a relatively square rib defining a parting stop 25 which extends centrally along opposite sides of channels 26 to the outside of which are beads 27 which upstand adjacent troughs 28 beyond which the strip continues oppositely to terminate in parallel side flanges 29, each having a reverse bend 30 to provide an inner ply 31 which is normally spaced slightly from the flange. The weather strip presents, from side to side, a generally bowed contour when free of compression, as indicated in Fig. 4.

The stiles 35 of the upper and lower sashes which are mounted within the window frame have each a special contour adjacent the weather strip, the two contours being alike but reversed. As best shown in Fig. 2, each stile is rabbeted as 36 for perhaps half its width inwardly from one face beyond which is a raised surface 37 which terminates adjacent a channel 38 which is bordered on the proximate sash face by an edge 39 in the form of a rib which stands out a distance about equal to the rabbeted surface 36. When such a sash is to be fitted into a window opening equipped with the weather strip of our invention, one of the stiles is first brought to position against its associated weather strip. The lower sash which normally occupies a position inwardly of the upper sash is fitted within the window opening from the inside thereof, the upper sash being normally fitted into the window opening from the same side thereof. The sash indicated in Fig. 2, which is the upper outside sash, requires that its remaining stile be further

moved past the associated weather strip, which is here shown as under compression.

The special plow contour of the side jamb permits the weather strip to be somewhat flattened by pressure of the window stiles without transversely compressing or otherwise distorting its centrally ribbed portion because, its two transversely yieldable trough-bent portions 28, which extend below the juncture of its outwardly bowed side and central portions, ultimately occupy positions to the outside of the central panel 18, the parting stop in the center then being in register with the central rib 19 which is free to enter therein from the reverse side. Such a contour of plow provides for whatever inward movement of compression is made by the weather strip, and at the same time leaves a sufficient stock in the side jamb to afford ample strength and reinforcement thereto.

Each weather strip is fitted over the plow of the side jamb with its two flanges 29 inserted within the saw kerfs 15. In accommodating these flanges the inner ply 31 is placed under compression in which condition it remains after insertion within the kerf so as to exert against the confining walls a substantial friction whereby to prevent accidental dislodgment of the weather strip. When so positioned, the weather strip stands out from the contour of the plow a maximum distance about as shown at the right of Fig. 2. Under compression, the weather strip may be moved against the plow contour of the side jamb until a position is reached substantially as indicated at the left of Fig. 2, where it will be observed that the channels 26 are in direct engagement with raised panel of the side jamb. At this point the sash stile which still remains to be fitted in place, as already explained, is advanced through a movement path of which one position is indicated in Fig. 2. While undergoing this movement the weather strip is required to compress, but after the sash has reached its final position, the rib 39 will have slid across the parting stop 25 so as to lie opposite the channel 26, permitting the weather strip in consequence to expand outwardly to complete the interfitting, all as shown in Fig. 1. The sash under such conditions is maintained free of contact with the side jambs, in spaced relation thereto, being supported slidably by the weather strips which act to guide each sash in its up and down movements, whenever desired.

The window frame includes a blind stop 45 upon the outside and an inside stop 46, which, by preference, is fitted against a rabbeted surface 47 having a shoulder 48 that maintains the inside stop in spaced relation to the proximate window sash. While there is no wood to wood contact in this construction, the weather strip closes all space around the stiles of the sash so that no opening is left for the ingress of weather. The rabbet 47 may be extended also into the head jamb 11 (see Fig. 3) where an inside stop 51, similarly spaced from the proximate sash, is shown. Also the head blind 52 which is aligned with the blind stop 45 occupies a position in spaced relation to the upper outer sash U.

The top rail 55 of the upper sash is shown in Fig. 3 as having a rabbet 56 extending into its upper and outer faces to provide an upwardly extending shoulder 57 along the rear portion of its top surface. In the head jamb 11 is a plow 58 aligned with the shoulder 57 and of a size to receive the latter when the upper sash is adjusted to its topmost position. This interfitting

of the shoulder 57 and plow 58 makes for a tight connection between the top rail of the upper sash and the head jamb. In addition, we utilize the plow 58 for receiving a tongue 59 that is extended beyond the upper end of the weather strip W when the latter is fitted into its position upon one of side jambs. By reason of the projection of this tongue into the plow the weather strip is positively locked at this end against shifting movement relative to the side jamb, irrespective of the interconnection of the weather strip flanges with the saw kerfs, as already explained.

Another form of the present weather strip is illustrated in Fig. 5 wherein it will be observed that it is here produced from three interlocked pieces a, b, and c, the centrally ribbed piece b providing the parting stop 25 and the two guiding beads 27, and the side strips a and c supplying the two ply marginal flanges 29. Where the center piece joins to its two associated side pieces, interlocking bends are provided, so that the resulting structure may yield transversely at these joints and function substantially the same as that of Fig. 4 already described at length. In Fig. 6 the weather strip is the same as that shown in Fig. 4 (or, optionally, Fig. 5) except that its marginal edges 60 (which may be of two ply construction, if desired) are out-turned to extend oppositely in substantially the same plane to fit within aligned saw kerfs 61 which are provided in mouldings 62 that are supported upon and joined to one of the side jambs 10. In this case the weather strip is initially compressed sufficiently to permit sequential insertion of its marginal flanges into the two saw kerfs following which the expansive resiliency of the metal acts to maintain the weather strip in its operative position.

By the construction of guide strip herein described each sash is supported thereon, in wood to metal contact, free, clear and independent of each other and of any stops in all conditions of compression of said strip. The weather strip thus serves primarily as a guide and, because of its transverse resiliency between its outwardly bowed side portions and the window guiding centrally ribbed portion under varying degrees of compression, a light, but constant, pressure is maintained against the stiles of each sash at all times without causing bending from distortion of the guide or looseness, with consequent rattles and noise, is prevented. In this way ingress of weather is also resisted, and the weather strip is equally effective under varying conditions of humidity, climate, etc., which are mostly responsible for contraction and expansion in the window frame and also in the sashes mounted therein, any variations in the clearance between the sashes and the frame being compensated for automatically because of the resilient properties of the weather strip.

In fitting the weather strip in place against a side jamb it is desirable, as already explained, to provide a plow whose contour is such as to accommodate the weather strip when flattened, as when a sash is being moved in or out. It is important, however, that the jamb be not weakened through the loss of any substantial part of its stock. This applies particularly to its transverse width which initially is the smallest dimension. To meet this condition the plow is deepest at remote points adjacent the shoulders 16 and, in between, the raised panel carries a rib 19 at

which point the full thickness of the jamb is sub-

stantially maintained. The ability of the jamb to resist warping is therefore preserved without appreciable impairment. The shoulders adjacent the saw kerfs afford ample strength to the jamb at this point where considerable strain is imposed by the two ply side edges of the weather strip which are maintained under compression after insertion into the saw kerfs.

The weather strip which we have disclosed herein requires no nails or screws for its fastening, but utilizes its own resiliency to exert frictional pressure against the confining walls of saw kerfs into which the two ply marginal edges of the weather strip are fitted. This makes for ease and simplicity in installation, and throughout a long period of use, while the sliding sashes remain in place, the weather strips will remain confined in their operative positions without any liability of displacement or dislodgement.

Throughout the specification and claims reference to our weather strip should be understood as including a structure of one piece as shown in Fig. 2, or of more than one piece as shown in Fig. 5, and no distinction between these two forms is intended, or to be inferred, unless the language used should clearly so indicate.

I claim:

1. In combination, a window frame side jamb plowed from end to end to provide a pair of spaced channels and, to the outside thereof, a pair of saw kerfs, and between the channels an outwardly extending rib, together with a spring metal weather strip having a generally transversely bowed contour with side edges of two plies normally in spaced relation, adapted, when compressed, to be entered and remain frictionally confined within the saw kerfs of the jamb, the weather strip having longitudinal bends adapted to provide a central parting stop and on opposite sides thereof a pair of beads with a trough to the outside of each lying opposite the plowed channels in the jamb wherein the troughs may be received when the weather strip is compressed to nearly flattened state.

2. In combination, a window frame side jamb plowed from end to end to provide a pair of spaced channels and, to the outside thereof, a pair of saw kerfs, and between the channels an outwardly extending rib, together with a spring metal weather strip having a generally transversely bowed contour with side edges of two plies normally in spaced relation, adapted, when compressed, to be entered and remain frictionally confined within the saw kerfs of the jamb, the weather strip having longitudinal bends adapted to provide a pair of spaced beads with a trough to the outside of each lying opposite the plowed channels in the jamb wherein the troughs may be received when the weather strip is compressed to a nearly flattened state.

3. In a window frame, a side jamb, a spring metal weather strip transversely bowed outwardly from the longitudinal center of said jamb with the opposite side edges thereof secured to said jamb inwardly of the opposed edges thereof, said strip including inclined outer side portions and longitudinal bends therebetween, said bends providing a central parting stop for a pair of sashes and a trough and bead adjacent each side of the stop adapted to yieldably support and guide the pair of sashes adjacent said stop and in spaced relation to said jamb.

4. In combination, a window frame jamb having spaced parallel saw kerfs in a face thereof,

a weather strip of resilient sheet metal including marginal yieldable flanges frictionally engaged within said kerfs, the weather strip intermediate said flanges being normally bowed outwardly of said face and having outward projections for supporting, guiding, and spacing a pair of window sashes and the face of said jamb being conformed between said kerfs for compression of the weather strip substantially within the plane of said face for installation of the pair of sashes from the same edge of the jamb.

5. A yieldable sheet metal weather strip for window sashes including parallel marginal flanges, and a body portion outwardly bowed from corresponding edges of said flanges, the body portion including side portions in angular relation to said flanges, a central outwardly directed sash parting stop, an outwardly directed sash engaging bead at each side of said parting stop, and an inwardly directed sash receiving channel intermediate the parting stop and each of the beads.

6. A yieldable sheet metal weather strip according to claim 5, wherein said angular side portions are connected with said beads through interlocking reverse bends in adjacent marginal portions thereof.

7. In a window frame having a jamb, a weather strip of resilient sheet material having side portions for anchoring engagement with the face of said jamb, said strip being transversely bowed away from the face of said jamb and having its central portion provided with a plurality of longitudinal ribs for yieldably supporting and guiding a pair of window sashes thereon in spaced relation to said jamb, and said strip being reversely bent toward the faces of said jamb at the junction of said side portions with said central portion to provide maximum compressibility of said bowed strip toward said jamb with minimum distortion of the centrally ribbed portion thereof.

8. In combination with a window frame having a pair of opposed side jambs with each of which is assembled a pair of spaced stops defining therewith a shallow channel in facing relation to the opposed channel, a pair of sliding sashes having grooved stiles receivable between the side jambs in spaced relation thereto and to the stops assembled therewith, and a resilient guide associated with each jamb affording a slidable mounting for the sash within the facing channels, each guide being formed of sheet metal transversely bowed outwardly to remain spaced from the jamb for a substantial portion of its transverse dimension and having its opposite longitudinal side edge portions fixedly secured to the jamb, said guide having a longitudinally ribbed central portion with the ribs thereof complementary to the grooves in the adjacent sash stiles for coacting therewith with substantially uniform frictional resistance to sustain the sash in a position within the window frame in spaced relation to the jamb and the stops assembled therewith, each guide being reversely bent between said side and central portions so as to render said portions yieldable transversely of the strip when the strip is under compression in response to swelling or shrinking, respectively, of the sash under varying weather conditions.

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