Oct. 14, 1952 H. B. FORESMAN 2,613,407

WEATHER STRIPPING

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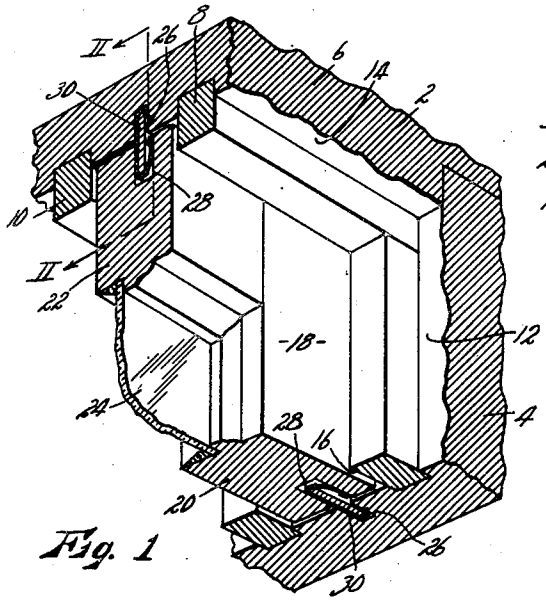


Fig. 1

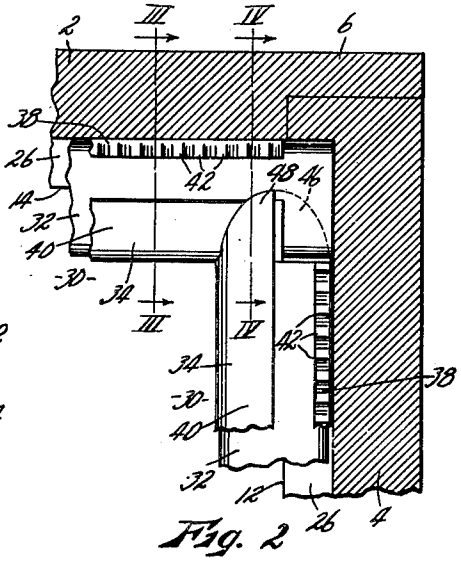


Fig. 2

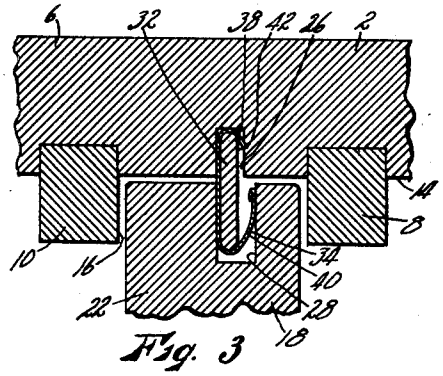


Fig. 3

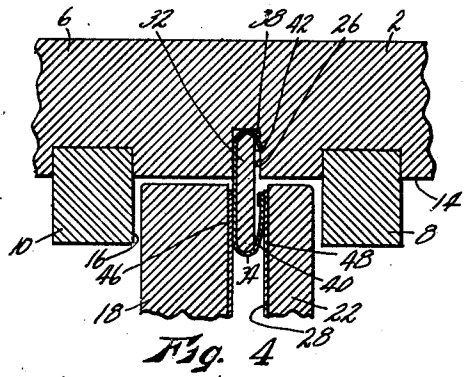


Fig. 4

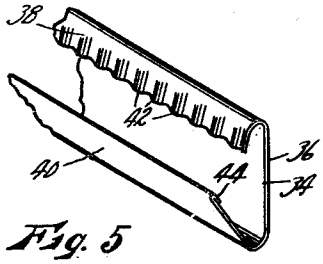


Fig. 5

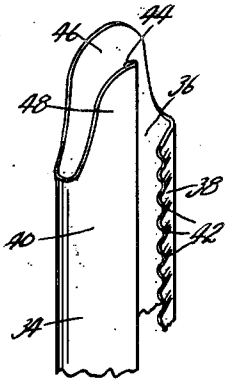


Fig. 6

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WEATHER STRIPPING

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8 Claims. (Cl. 20—69)

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This invention relates to weather stripping for windows and incorporates improvements over the weather stripping covered by my U. S. Letters Patent No. 1,971,603, issued August 28, 1934.

The above identified patent shows a weather strip comprising a rigid, metal, sheathed strip adapted to fit securly in a groove provided therefor in the window frame and to project into a matching groove provided therefor in the window sash or casement, the metal sheathing being resiliently expansible to provide a substantially air-tight seal in said sash groove. One object of the present invention is the provision of a corner joint for a weather strip of the class described whereby substantially all leakage of air between the frame and the sash at the corners thereof is prevented.

Another object is the provision in a weather strip of the character described wherein the rigid strip body member is secured loosely in the window frame groove by the metal sheath, whereby the strip may be tilted transversely in said groove. This permits additional transverse displacement of the window sash groove from the window frame groove, which is caused by warpage or poorly fitting parts, without interfering with the proper engagement of the weather strip in the window sash groove.

A further object is the provision of novel means for securing the weather strip in the window frame groove.

Other objects are simplicity and economy of construction, efficiency and dependability of operation, and ease of installation.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the drawing, wherein—

Figure 1 is a fragmentary perspective view of the corner portion of a window frame and sash of ordinary wooden construction, showing weather stripping embodying the present invention installed therein.

Figure 2 is an enlarged fragmentary section taken on line II—II of Fig. 1, with the window sash omitted.

Figure 3 is a fragmentary section taken on line III—III of Fig. 2, with the window sash included.

Figure 4 is a fragmentary section taken on line IV—IV of Fig. 2 with the window sash included.

Figure 5 is a perspective view of an end portion of the metal sheath adapted to be inserted in the top rail of the window frame.

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Figure 6 is a perspective view of an end portion of the metal sheath adapted to be inserted in the stile of the window frame.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies to a window frame of ordinary wooden construction and including a vertical stile 4 and top rail 6. Another stile, not shown, parallel to stile 4, and a sill, not shown, parallel to top rail 6, complete the frame. A pair of uniformly spaced apart stop bars 8 and 10 are affixed to the inner faces 12 and 14 of stile 4 and top rail 6 and extend the full lengths thereof, forming therebetween a groove 16 in which window sash 18 or casement slides. Said sash includes a side member 20, a top member 22, and a glass pane 24 carried thereby. A groove 26 is formed in the inner faces 12 and 14 of stile 4 and top rail 6, said groove extending around the frame, and being parallel to and intermediate stop bars 8 and 10. A matching groove 28, somewhat wider than groove 26, is formed in the outer edges of sash members 20 and 22. Grooves 26 and 28 are adapted to carry the weather strip 30, as hereinafter described.

The weather strip 30 comprises a flat elongated body member 32 made of a rigid material such as wood, fiber, or the like and having its longitudinal edges rounded, and a sheath 34 made of a thin, resilient sheet metal such as brass, Phosphor bronze, or the like. The width of body member 32 is substantially greater than the depth of groove 26. The sheath 34 comprises a strip of sheet metal having a central portion 36 disposed against one side of body member 32 and having its longitudinal edge portions bent around the edges of body member 32 to provide outwardly inclined flanges 38 and 40 disposed on the opposite side of the body member. The narrower flange 38 has its free edge portion crimped in a serpentine manner to form teeth 42. The wider flange, 40, has its free edge folded on itself as at 44 to dress and reinforce the edge.

The composite weather strip 30 is mounted in groove 26 of the stile 4 and top rail 6 by pushing the edge portion thereof immediately adjacent flange 38 into said groove, as shown in Figs. 11 to 4. As the strip enters the groove, flange 38 folds against body member 32, but when the strip has been fully inserted, said flange is urged resiliently outwardly so that teeth 42 thereof bite into the side wall of groove 26, thus securing the weather strip against removal. The window frame is, of course, usually

made of wood and in any case should be of a material soft enough to receive teeth 42. The portion of the weather strip extending outside of groove 26 is adapted to be received in groove 28 of the window sash, as best shown in Fig. 3. Resilient flange 40 bears against one side wall of said groove and urges the sash laterally till the opposite wall of said groove rests against the central or back portion 36 of sheath 34, thus forming a substantially air-tight seal. Flange 40 could also urge the sash against stop bar 8 without departing from the spirit of the invention.

It will be noted that groove 40 is of substantially greater width than the thickness of weather strip body member 32, in order that said groove will engage the weather strip properly as the sash slides in the window frame, even though poor construction or warping may cause a transverse displacement of the sash and frame grooves. Furthermore, it will be noted that since groove 26 is wider than the weather strip is thick, the weather strip may be tilted transversely in said groove, thereby permitting a still greater misalignment of grooves 26 and 28 without interfering with the proper engagement of the weather strip in groove 28. While body member 32 serves to strengthen and support sheath 34, the sheath is mounted and retained in groove 26 independently of the body member, and serves to retain the body member in the groove.

The joining of the weather strips at the corners of window frame 2 is best shown in Figs. 2 and 4. The sheath 34 of the weather strip carried by window frame top rail 6 extends substantially flush with the inner face 12 of stile 4. Sheath 34 of the weather strip carried by stile 4 extends substantially flush with the outer edge of the strip carried by top rail 6. The back portion 36 and flange 40 of the sheath of the stile weather strip are formed respectively to prevent longitudinally extending spaced apart tabs 46 and 48, said tabs being disposed on opposite sides of the top rail weather strip and respectively in contact with back portion 36 and flange 40 of said top rail weather strip. The ends of said tabs extend substantially flush with the inner face 14 of top rail 6, and said tabs are rounded as shown so as to maintain a close, substantially air-tight contact with the top rail weather strip. Thus the corner joint, which in many types of weather stripping, is a source of a large amount of air leakage, is effectively sealed. The flanges 40 of the contiguous strips are always in close contact, and remain so regardless of the degree to which they may be flexed during operation of the window. Neither is the seal appreciably affected by the tilting movement of the strips in the window frame groove 26, previously described. The top rail strip is effectively linked to the stile strip by its inclusion between tabs 46 and 48, and moves therewith. It will be noted also that tabs 46 and 48 extend in the direction of movement of sash 18 in the window frame. This virtually eliminates the possibility of the tabs being caught and bent or deformed by the movement of the sash.

Thus it is apparent that a weather strip having several advantages has been produced. It is extremely simple and economical, being comprised of only two parts. The corners are sealed effectively. It will function efficiently even where the sash and frame fit poorly, due to the tiltability of the strips in the window frame. The means for securing the stripping in the frame is single and effective, and permits the above described tilting movement.

While I have disclosed a specific embodiment of my invention, it is apparent that many minor changes of construction and operation could be made without departing from the spirit of the invention.

What I claim is:

1. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and a sash carried slidably in said frame and having a groove formed in the edge thereof wider than and matching with said frame groove, a weather strip comprising a rigid, elongated body member thinner than the width of said frame groove positioned in both of said grooves, and a resilient sheet metal sheath substantially encasing said body member, said sheath being formed to present teeth adapted to engage the walls of said frame groove to secure said sheath in said groove, and said sheath having a continuous longitudinal portion projecting transversely within said sash groove to engage yieldably a wall of said sash groove, whereby the opposite wall of said groove is urged against the opposite side of said sheath.

2. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and a sash carried slidably in said frame and having a groove formed in the edge thereof wider than and matching with said frame groove a weather strip comprising a rigid elongated body member thinner than the width of said frame groove positioned in both of said grooves, and a resilient sheet metal strip bent to form a sheath substantially encasing said body member, the edge portions of said strip forming opposed longitudinal flanges disposed on one side of said body member and inclined outwardly therefrom, the flange within said frame groove being formed to engage securely the walls of said groove to secure the sheath in the frame, and the flange within the sash groove being adapted to engage yieldably the walls of said sash groove.

3. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and a sash carried slidably in said frame and having a groove formed in the edge thereof wider than and matching with said frame groove a weather strip comprising a rigid elongated body member thinner than the width of said frame groove positioned in both of said grooves, and a resilient sheet metal strip bent to form a sheath substantially encasing said body member, the edge portions of said strip forming opposed longitudinal flanges disposed on one side of said body member and inclined outwardly therefrom, the flange within said frame groove being formed to present outwardly inclined teeth adapted by the resilience of the flange to be urged into biting engagement with the wall of said frame groove, and the flange within the sash groove being adapted to engage yieldably the wall of said sash groove.

4. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and a sash carried slidably in said frame and having a groove formed in the edge thereof wider than and matching with said frame groove a weather strip comprising a rigid elongated body member thinner than the width of said frame groove positioned in both of said grooves, and a resilient sheet metal strip bent to from a sheath substantially encasing said body

member, the edge portions of said strip forming opposed longitudinal flanges disposed on one side of said body member and inclined outwardly therefrom, the flange within said frame groove having its free edge portion crimped in a serpentine manner to form outwardly inclined teeth adapted to be urged into biting contact with the side wall of said frame groove, and the flange within said sash groove being adapted to engage yieldably the side wall of said sash groove.

5. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and having vertical stiles and a top rail, and a sash slidably carried in said frame and having a groove formed in the outer edge thereof matching with said frame groove, a weather strip carried in said top rail groove and the matching sash groove, said weather strip comprising an elongated body member carried in both of said grooves and a resilient sheet metal sheath substantially encasing said body member, said weather strip being secured in said top rail groove and said sheath having a laterally offset portion within said sash groove adapted to engage yieldably a slide wall of said groove, a similar weather strip secured in the stile groove of said window frame and engaging the corresponding sash groove, the sheath of said stile weather strip having longitudinal projections at the end thereof contiguous with said top rail weather strip, and projections being adapted to overlap opposite sides of the sheath of said top rail strip to form a substantially air-tight joint therewith.

6. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and having vertical stiles and a top rail, and a sash slidably carried in said frame and having a groove formed in the outer edge thereof matching with said frame groove, a weather strip carried in said top rail groove and the matching sash groove, said weather strip comprising an elongated body member carried in both of said grooves and a resilient sheet metal sheath substantially encasing said body member, said weather strip being secured in said top rail groove and said sheath having a continuous longitudinal flange disposed within said sash groove, said flange being inclined outwardly to engage yieldably a side wall of said sash groove, a similar weather strip secured in the stile groove of said window frame and engaging the matching groove of said sash, longitudinal projections on the flange and opposite side portions of the sheath of said stile weather strip at the end thereof contiguous with said top rail weather strip, said projections overlapping respectively the flange and opposite side portions of said top rail weather strip to form substantially an air-tight joint therewith.

7. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and having vertical stiles and a top rail, and a sash slidably carried in said frame and having a groove formed in the outer edge thereof matching with said frame groove, a weather strip carried in said top rail groove and the matching sash groove, said weather strip comprising an elongated body member carried in both of said grooves and a resilient sheet metal sheath substantially encasing said body member, said weather strip being secured for transverse tilting movement in said top rail groove and said sheath having a laterally offset portion within said sash groove adapted to engage yieldably a side wall of said sash groove, a similar weather strip pivotally secured in the stile groove of said window frame and engaging the corresponding sash groove, the sheath of said stile weather strip having longitudinal projections at the end thereof contiguous with said top rail weather strip, and projections being adapted to overlap opposite sides of the sheath of said top rail strip to form a substantially air-tight joint therewith.

8. For use in connection with a window structure including a frame having a groove formed in the inner face thereof and having vertical stiles and a top rail, and a sash slidably carried in said frame and having a groove formed in the outer edge thereof matching with and wider than said frame groove, a weather strip carried in the top rail groove of said frame and the matching sash groove, said weather strip comprising a flat, elongated rigid body member thinner than said top rail groove disposed in both of said grooves, and a sheet metal strip bent to form a sheath for said body member, said strip having its longitudinal central portion disposed against one side of said body member and its edge portions bent around the edges of said body member to form opposed outwardly inclined flanges of different widths on the opposite side of said body member the narrower of said flanges being disposed within said frame groove and having its free edge portion crimped to form teeth adapted to be forced by the resilience of said flange into biting engagement with the side wall of said frame groove, and the wider of said flanges being disposed within said sash groove and adapted to engage yieldably a side wall of said sash groove, a similar weather strip mounted in like manner in the stile grooves of said window frame and engaging the matching grooves of said sash, the wider flange portion and the opposite wall portion of the sheath of the stile weather strip being formed to present longitudinally extending tabs at the end thereof contiguous with said top rail weather strip, said tabs being rounded overlapping the wider flange portion and back wall portion respectively of the sheath of said top rail weather strip to form a substantially air-tight seal therewith.

HARRY B. FORESMAN.

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The following references are of record in the file of this patent:

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