May 11 , 1926. 1,584,309

A. M. LANE

WEATHER STRIP

Filed Nov. 26, 1924 2 Sheets-Sheet 1

Fig. 1.

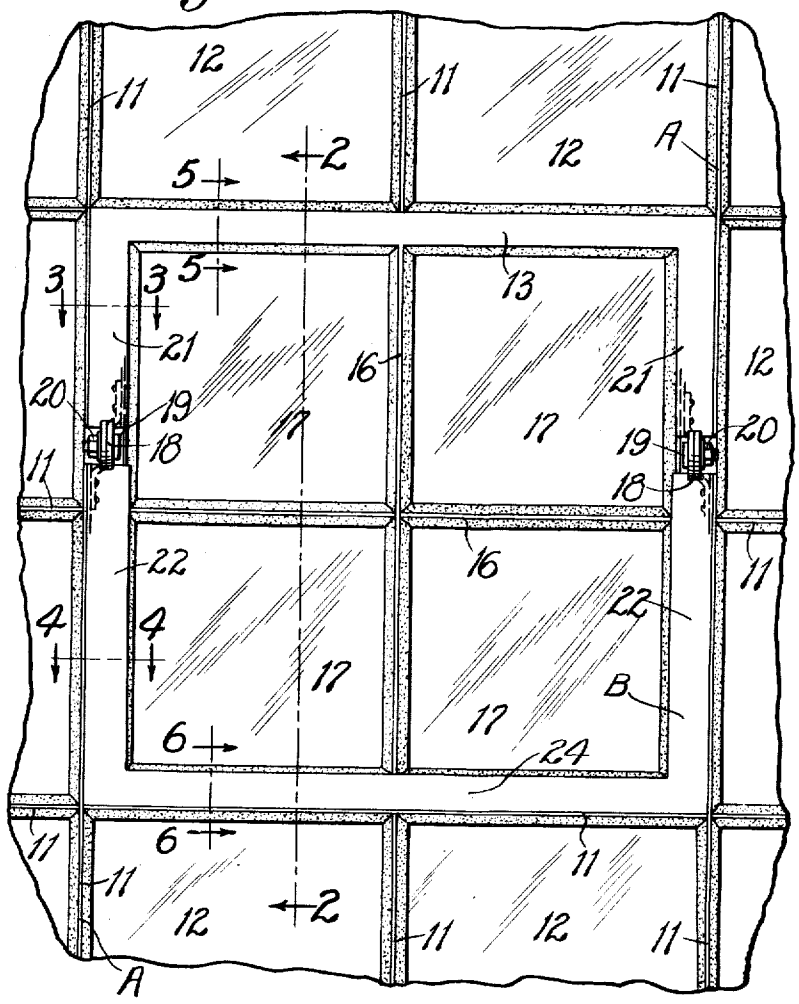


Fig. 2.

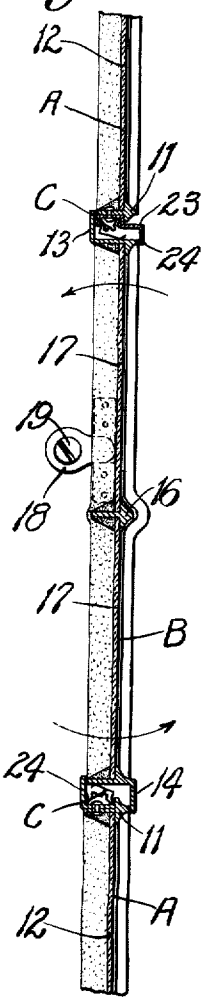
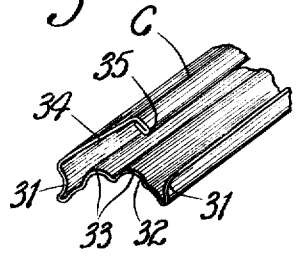


Fig. 7.



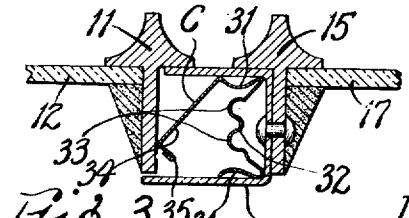


Fig. 3.

INVENTOR

Alfred M. Lane

by Cameron & Cameron

HIS ATTORNEYS.

May 11 , 1926. 1,584,309

A. M. LANE

WEATHER STRIP

Filed Nov. 26, 1924 2 Sheets-Sheet 2

Fig. 4.

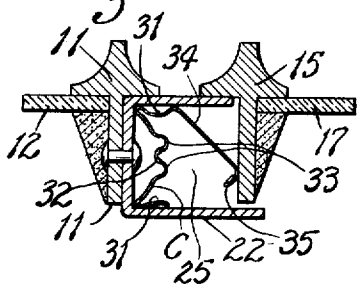


Fig. 5

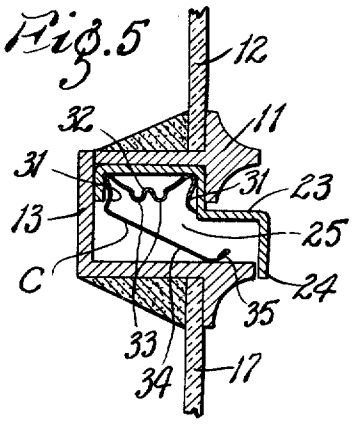


Fig. 6.

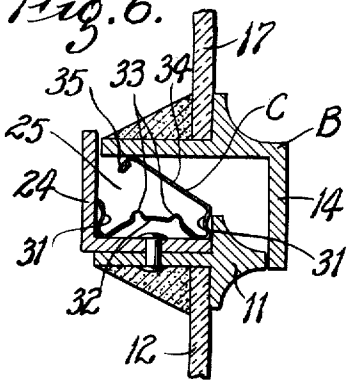


Fig. 8

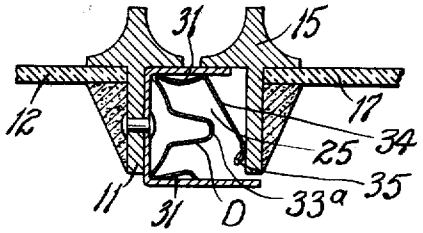


Fig. 9.

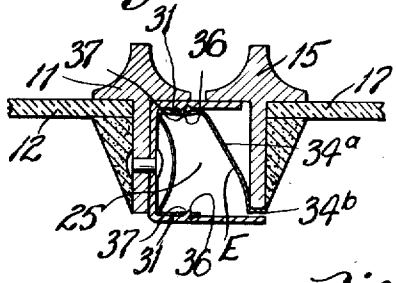


Fig. 10.

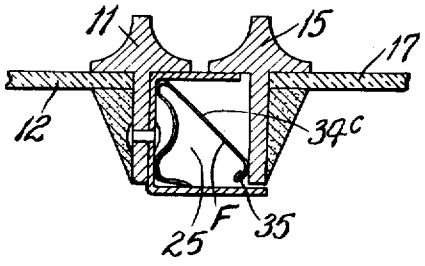
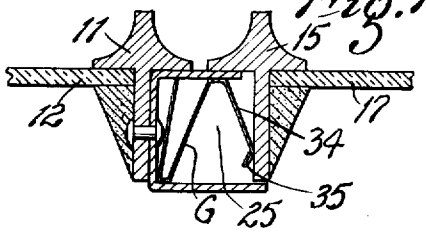


Fig. 11.



INVENTOR

Alfred M. Lane

by Lane & Lane

HIS ATTORNEYS

Patented May 11, 1926. 1,584,309

UNITED STATES PATENT OFFICE.

ALFRED M. LANE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO MONARCH METAL PRODUCTS COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

WEATHER STRIP.

Application filed November 26, 1924. Serial No. 752,309.

This invention relates to metal weather strips particularly adapted for metal windows equipped with swinging sashes.

One of the principal objects of the present invention is to produce a simple and efficient weather strip for metal windows of the swinging sash type which can be easily and cheaply applied without any alteration of the frame or sash and without the use of separate fastening members for securing the strip in place. Other objects are to prevent rattling, to assure an easy movement of the sash when the sash or frame expands or contracts due to temperature changes and at the same time maintain a weather proof joint between the meeting edges of the frame and sash. The invention consists principally in the weather strip and in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is an interior side view of a portion of a window frame having a horizontally pivoted sash or ventilator, a weather strip embodying my invention being shown applied thereto;

Fig. 2 is a vertical section through the window on the line 2—2 in Fig. 1;

Fig. 3 is an enlarged horizontal section through the vertical meeting edges of the frame and sash, the section being taken above the sash pivots on the line 3—3 in Fig. 1;

Fig. 4 is a similar section taken below the sash pivots on the line 4—4 in Fig. 1;

Fig. 5 is an enlarged vertical section taken through the upper horizontal meeting edges of the frame and sash on the line 5—5 in Fig. 1;

Fig. 6 is a similar section through the lower horizontal meeting edges of the frame and sash on the line 6—6 in Fig. 1;

Fig. 7 is a fragmentary perspective view showing a section of the strip detached; and

Figs. 8, 9, 10 and 11 are horizontal sections similar to Fig. 4 showing strips of modified form.

In the accompanying drawing, my invention is shown in connection with a steel ventilator window unit A having a horizontally pivoted steel sash or ventilator B arranged to swing outwardly at the bottom and inwardly at the top; but the invention is applicable to other types of swinging windows having metal frames and sashes.

The window frame A shown in the drawing comprises spaced horizontally and vertically disposed steel mullions 11 forming rectangular open spaces in which are fitted glass panes 12. The mullions 11 are of T-shaped section, forming rabbets in which the panes of glass are held by means of putty or clips. A rectangular open space of the desired size is left in the window frame A and in this opening is mounted the sash B. The head, jamb, and sill members 11, which frame the sash opening, are of T-shaped section and are arranged with their head portions facing outwardly.

The frame of the sash B is made up of metal bars comprising top and bottom rails 13 and 14 of angle section and side rails 15 of T-shaped section; and the sash is divided into rectangular open spaces by horizontally and vertically extending mullions 16 of T-shaped section. Glass panes 17 are set in these spaces and are held therein in a manner similar to those in the frame openings. The middle portion of the sash B is attached to the vertical frame bars at each side of the sash opening to swing in a vertical plane by means of hinges 18 which are secured flatwise to the adjacent faces of the webs of the vertical frame and sash bars 11 and 15, respectively. One of the leaves of a hinge is secured to the frame bar 11 and the other leaf is secured to the adjacent sash bar 15, the two leaves being held together by means of a horizontal pivot in the form of a cap screw 19 which extends through registering openings in the two leaves and is held there by means of a nut 20.

The side rails 15 of the sash B are provided above the hinges 18 with members 21 of substantially channel-shaped section; and the jamb members 11 of the frame A are provided below said hinges with members 22 of the same cross-sectional shape as the channel members 21. The webs of the upper channels 21 are riveted or otherwise positively secured to the stems of the side rails 15 of the sash B; and the channels 22 located below the hinges 18 are secured in a like manner to the stems of the jamb members 11. The inner and outer side flanges of the upper channels 21 extend behind the respective head and stem portions of the jamb

members 11 of the frame A; and the inner and outer side flanges of the lower channels 22 extend behind the respective head and stem portions of the side rails 15 of the sash B. In consequence of this arrangement, the upper and lower channels 21 and 22 serve to cover the joints between the side rails of the sash and the jamb rails of the frame and also serve as stops to prevent the sash from swinging beyond its vertical position when closed.

The angle bar top rail 13 of the sash extends from side to side thereof with its vertical flange innermost and extending upwardly so as to overlap the inner edge of the stem of the adjacent head rail of the frame, which head rail has a channel-shaped member 23 riveted or otherwise rigidly secured flatwise to the under side of its stem portion. The outer flange of said channel member 23 is extended outwardly beneath the head of the adjacent head rail of the frame and is thence bent downwardly, as at 24, so as to overlap the outer edge of the horizontal flange of the top rail of the sash in the closed position thereof.

The lower rail 14 of the sash comprises a metallic bar of angle section which extends from side to side of the sash and is arranged with its vertical flange outermost and extending downwardly so as to overlap the outer edge of the head portion of the sill rail of the frame. The sill rail of the frame has one flange of an angle bar 24 riveted or otherwise secured to the upper portion of its stem, the other flange of said angle being disposed innermost and extending upwardly across the inner edge of the bottom rail of the sash. By this arrangement, the angle 24 cooperates with the shouldered head portion of the sill member of the frame to form an upwardly opening channel 25. The overlapping portions of the head and sill members of the sash and frame act as stops for the sash and also close the joints between said members in a manner similar to the channels 21 and 22.

The weather strip C shown in Fig. 7 of the accompanying drawing comprises a strip of resilient sheet metal provided with side marginal flanges 31 that are curved or bowed inwardly in directions transverse to their length: and the body or web portion 32 of said strip is bowed or bent transversely between said side marginal flanges and is preferably provided with laterally spaced corrugations 33 which extend lengthwise of the strip from end to end thereof. The purpose of the bowed and corrugated web portion of the strip is to increase its resiliency in directions transverse to its length. One side flange of the strip C is extended at an angle across the web of the strip to form a resilient sealing flange 34, whose free end portion is curved inwardly at a reverse inclination and is stiffened or reinforced by a sharp rebend 35.

As shown in the drawing, the strips C are mounted in the channels 21, 22, 23 and 25 located between the adjacent edges of the sash and frame and serve to mount a weather proof joint therebetween. The resilient strips are made wider than the width of the channels in which they are to be placed, but are contractible transversely of their length so as to permit said strips to be sprung in the channels. After the strips are sprung in the channels, the resiliency from their state of tension causes the bowed side marginal flanges of the strip to press against the channels along two lines and thereby retain the strips in position. When thus positioned, the resilient free sealing flanges 34 of the strips bear against the adjacent faces of the joints between the meeting edges of the frame and sash and thereby serve to weatherproof the same.

The construction described has numerous advantages. It minimizes the time and expense of applying the strip by eliminating the necessity of altering the sash or frame and by enabling the strip to be readily applied without the use of separate fastening members; it prevents rattling and assists in holding the sash open at the desired angle; and it operates to maintain a weatherproof joint between the meeting edges of the frame and sash.

In the modification shown in Fig. 8, the bowed web portion of the strip D is provided with a single corrugation 33^a.

The modified strip E shown in Fig. 9 has a bowed web portion formed without corrugations; and the resilient flange 34^a is shown terminating in an outstanding flange portion 34^b adapted to be engaged by the inner edges of the sash in the closed position thereof. The inner faces of the side flanges of the channel member are formed with burrs or projections 36 which extend into openings 37 provided therefor in the side flanges of the strip and thereby prevent outward movement of said strip with relation to said channel.

Fig. 10 shows a strip F having a bowed web portion and a resilient flange 34^c which projects from the marginal edge of said web portion, instead of extending from the outer edge of one side flange as shown in Figs. 7 to 10, inclusive.

In the modification shown in Fig. 11, the body portion of the strip G is longitudinally doubled to form an inclined two-ply body portion of greater width than the width of the channel. These inclined flanges are adapted to be wedged in between the side walls of the channel to retain the strip therein.

Obviously, the construction hereinbefore described admits of considerable variation

without departing from the invention, and I do not wish to be limited to the precise arrangements shown and described.

What I claim is:

1. The combination of a frame member and a closure member mounted therein, of a one-piece weather strip arranged between the meeting edges of said members, one of said member having a channel adapted to receive said strip, said strip being adapted to frictionally engage both sides of said channel and the adjacent face of the other member.

2. The combination of a window frame member having a sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels so as to press against both sides of said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member.

3. The combination of a window frame member having a pivoted sash member, of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a transversely curved or bowed web portion provided with outstanding side marginal flanges adapted to bear against the side walls of the channel provided therefor, one of said side marginal flanges being extended across the flanged side of said strip to form said sealing flange.

4. The combination of a window frame member having a pivoted sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a web portion having corrugations extending longitudinally thereof and provided with outstanding side marginal flanges adapted to bear against the side walls of the channel provided therefor, one of said side marginal flanges being extended across the flanged side of said strip to form said sealing flange.

5. The combination of a window frame member having a pivoted sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a longitudinally doubled body portion provided with outstanding side marginal flanges adapted to press against the side walls of said channel provided therefor.

6. The combination of a window frame member having a pivoted sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a web portion having outstanding side marginal flanges adapted to engage the side walls of the channel provided therefor, one of said side flanges being extended across the flanged side of said strips to form said sealing flanges, the sides of said channels being provided with longitudinally spaced projections adapted to engage longitudinally spaced openings in the side flanges of said strips.

7. The combination of a window frame member having a pivoted sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a central web portion provided with side marginal flanges that are curved or bowed inwardly toward each other in directions transverse to their length and are thus adapted to engage the side walls of said channel along two lines.

8. The combination of a window frame member having a pivoted sash member of resilient metal weather strips arranged between the meeting edges of said members, one of said members having channels adapted to receive said strips, said strips being adapted to be sprung in said channels and having resilient sealing flanges adapted to bear against the adjacent faces of the other member, each of said strips comprising a central web portion provided with side marginal flanges that are curved or bowed inwardly towards each other in directions transverse to their length, said web portions being bowed or bent transversely between said side marginal flanges in the direction in which said side marginal flanges extend.

9. A metal weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange.

10. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said side marginal flanges being curved or bowed inwardly toward each other in directions transverse to their length.

11. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said web portion being bowed or bent transversely between said side marginal flanges in the direction in which said side marginal flanges extend.

12. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said web portion being bowed or bent transversely between said side marginal flanges in the direction in which said marginal flanges extend, said bowed web portion being provided with a longitudinally extending hollow rib that projects toward said sealing flange.

13. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said side marginal flanges being curved or bowed inwardly toward each other in directions transverse to their length, and said web portion being bowed or bent transversely between said bowed side marginal flanges in the direction in which said side marginal flanges extend.

14. A resilient weather strip comprising a web portion having an outstanding flange, said flange being extended across the web portion of said strip on the flanged side thereof to form a resilient sealing flange, said web portion being formed with a horizontally extending hollow rib that projects toward said sealing flange.

Signed at St. Louis, Missouri, this 22nd day of November, 1924.

ALFRED M. LANE.

10. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said side marginal flanges being curved or bowed inwardly toward each other in directions transverse to their length.

11. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said web portion being bowed or bent transversely between said side marginal flanges in the direction in which said side marginal flanges extend.

12. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said web portion being bowed or bent transversely between said side marginal flanges in the direction in which said marginal flanges extend, said bowed web portion being provided with a longitudinally extending hollow rib that projects toward said sealing flange.

13. A resilient weather strip comprising a web portion having outstanding side marginal flanges extending in the same direction, one of said side marginal flanges being extended across the flanged side of said strip to form a resilient sealing flange, said side marginal flanges being curved or bowed inwardly toward each other in directions transverse to their length, and said web portion being bowed or bent transversely between said bowed side marginal flanges in the direction in which said side marginal flanges extend.

14. A resilient weather strip comprising a web portion having an outstanding flange, said flange being extended across the web portion of said strip on the flanged side thereof to form a resilient sealing flange, said web portion being formed with a horizontally extending hollow rib that projects toward said sealing flange.

Signed at St. Louis, Missouri, this 22nd day of November, 1924.

ALFRED M. LANE.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,584,309, granted May 11, 1926, upon the application of Alfred M. Lane, of St. Louis, Missouri, for an improvement in "Weather Strips," an error appears in the printed specification requiring correction as follows: Page 4, lines 50 and 51, claim 14, for the word "horizontally" read *longitudinally;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of June, A. D. 1926.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,584,309, granted May 11, 1926, upon the application of Alfred M. Lane, of St. Louis, Missouri, for an improvement in "Weather Strips," an error appears in the printed specification requiring correction as follows: Page 4, lines 50 and 51, claim 14, for the word "horizontally" read *longitudinally;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of June, A. D. 1926.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.