March 2, 1926. 1,575,012

G. R. SIEFKEN

METAL WEATHER STRIP

Filed Feb. 11, 1924 2 Sheets-Sheet 1

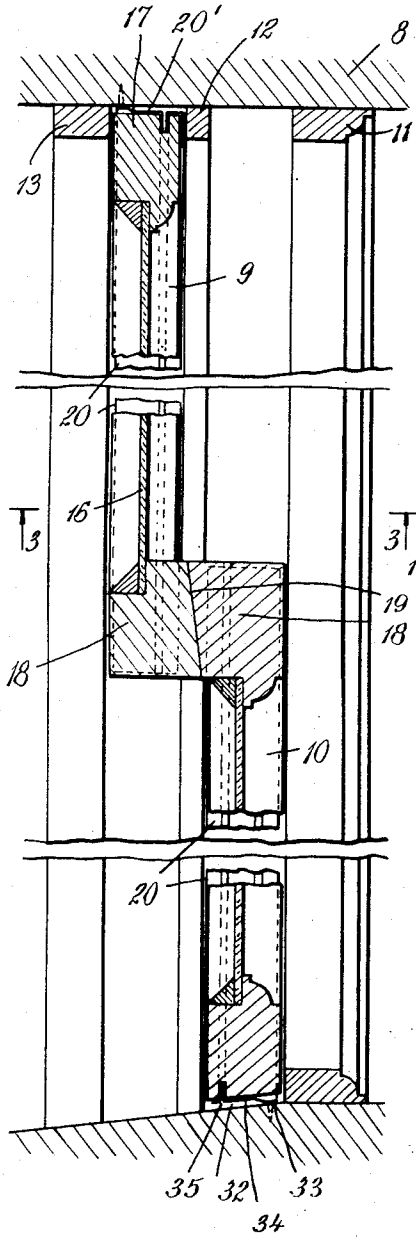


Fig. 1.

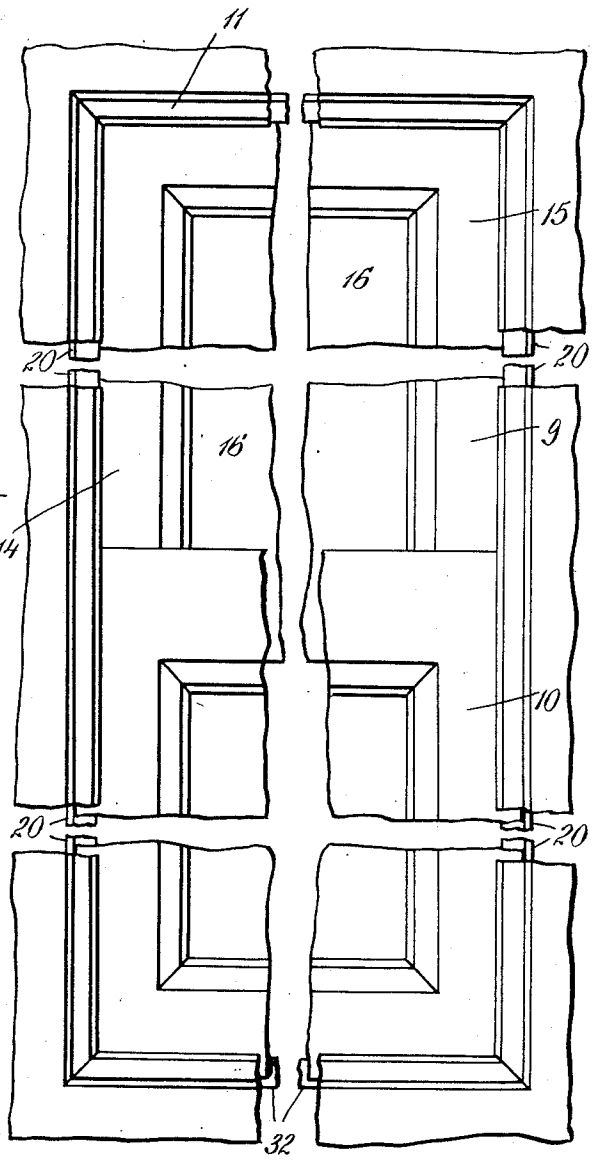


Fig. 2.

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Fig. 3,

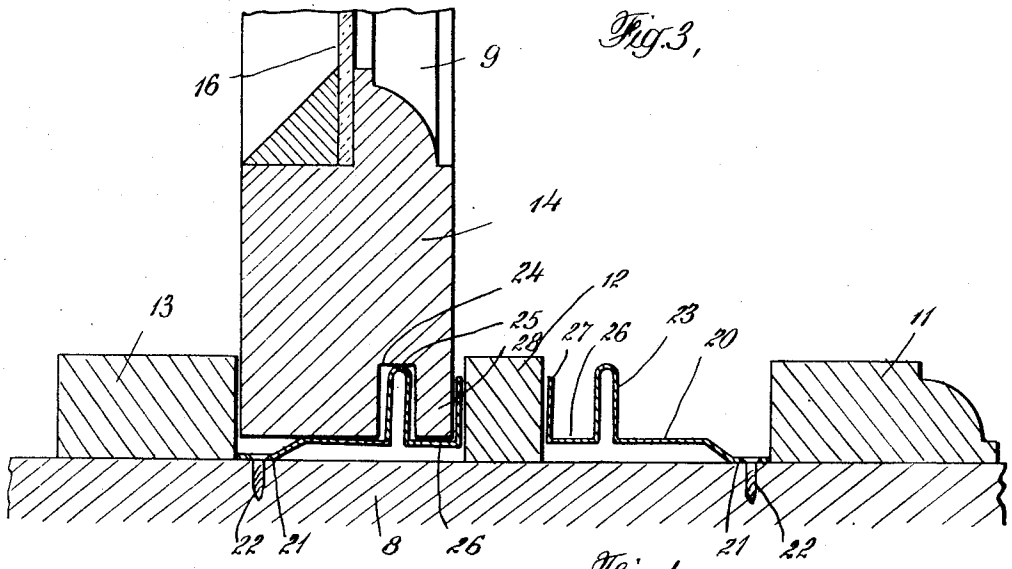


Fig. 4,

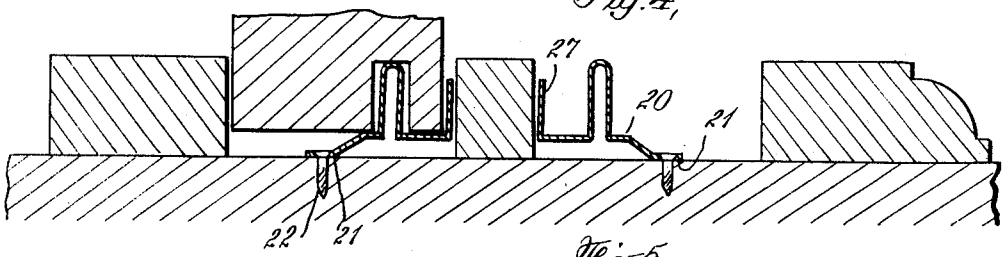
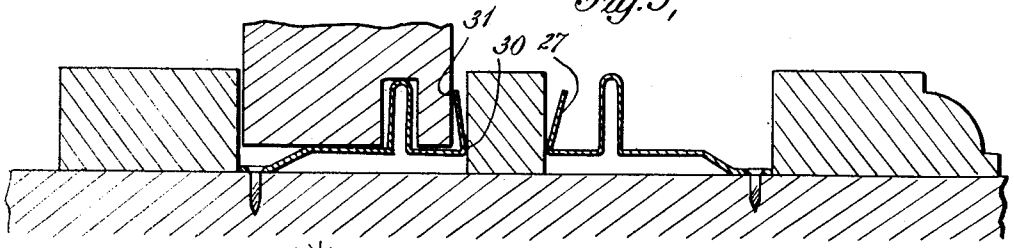


Fig. 5,



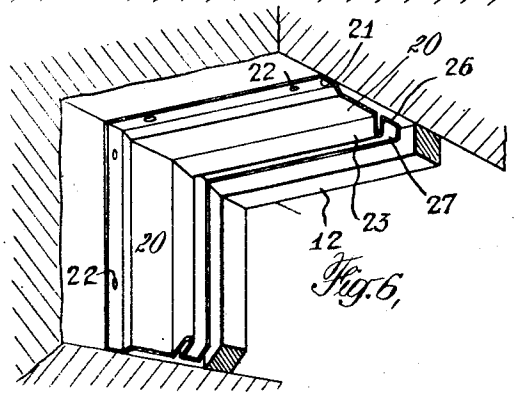


Fig. 6,

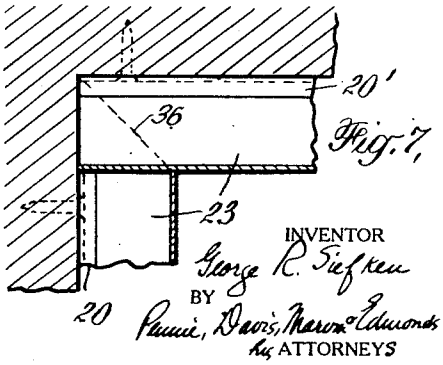


Fig. 7,

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Patented Mar. 2, 1926. 1,575,012

UNITED STATES PATENT OFFICE.

GEORGE R. SIEFKEN, OF NEW YORK, N. Y.

METAL WEATHER STRIP.

Application filed February 11, 1924. Serial No. 691,949.

To all whom it may concern:

Be it known that I, GEORGE R. SIEFKEN, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Metal Weather Strips; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to metal strips for windows and especially to strips of this type which may be used in windows in which the sashes slide within the window frame.

In designing metal weather strips which are to be applied to a sliding window, several important considerations must be borne in mind. For instance, it is essential that these strips should make good contact with the window sash throughout its length without, however, making it difficult to move the window when it is to be opened or closed. Also it is desirable that the strip should be so designed that it can be applied with a minimum of labor and without the necessity of accurately fitting the parts. With wooden window frames and sashes the parts are frequently irregular in dimensions and the wood swells and shrinks so that in all such windows it is necessary to provide a certain amount of room for such variation. This leaving of play-room between the sash and the frame results in leakage and any strip for use in such windows should be formed so that such leakage is prevented without preventing the changes in the parts produced by weather conditions. The weather strip should also provide what may be termed an exterior contact; that is, a contact between the surfaces of the parts rather than between portions of the two members which have been channeled or grooved for the purpose, and it is also desirable that this contact should be made between wood and metal so that the contacting surface will not wear away.

The present invention is intended to provide a weather strip which offers the several advantages above pointed out and is inexpensive to manufacture on account of the small amount of material used, and also to install, by reason of the small amount of labor required. Furthermore, it requires but little alteration in the sash of the window and when in place it affords a convenient means of making a tight contact between the sash and the sill when the window is closed.

In one form of construction which embodies the invention, the weather strip is formed of a strip of metal which is to extend the length of the sash. This strip has an offset flange along one edge, extending throughout its length, the plane of this flange being a short distance to one side of the plane of the strip. The strip is held in place by means of securing devices such as screws which are driven in to the window frame through suitable holes distributed along the flange. Near the opposite edge of the strip the latter is bent to form a tongue which extends beyond the plane of the strip in the opposite direction from the offset flange previously mentioned. Beyond this tongue there is a narrow portion of the strip which lies in the plane of the main body and at the end the edge of the strip is turned at an angle. In installing this strip a groove is formed lengthwise of the outer face of the sash, this groove being formed so as to receive the tongue of the strip. The groove is so placed that when the tongue enters the groove the angular flange at the edge of the strip will overlie the lateral wall of the sash. It will be seen that the strip is held rigidly in place along one edge only so that the opposite edge along which the tongue and annular flange are formed is held resiliently in place. The amount of the offset is sufficient to take up the play-room allowed between the sash and the frame and if the window swells or shrinks the strip will always make a good contact with it. The flange formed along one edge of the strip which is turned at an angle to the plane of the strip may be given such a form as to provide a double contact in addition to that provided by the tongue in the groove. For this purpose the main body of the strip will extend a slight distance beyond the edge of the sash and the angular flange will be formed by bending the material so that the line of union betwen the flange and the body portion of the strip will bear against the parting strip mounted on the window frame while the free edge of the flange will bear against the side wall of the sash. Since the angular flange is formed by bending the metal in the manner described, any swelling of the sash or frame is readily compensated for by the yielding of the parts of the strip.

In the accompanying drawings I have il-

lustrated that embodiment of the invention which is now preferred.

Fig. 1 is a vertical cross section of a window frame showing a pair of sashes in place therein,

Fig. 2 is a face view of the parts illustrated in Fig. 1,

Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1,

Figs. 4 and 5 are views similar to Fig. 3, but showing modified forms of the strip,

Fig. 6 is a view in perspective showing a corner of the window frame, and

Fig. 7 is a cross sectional view of a detail of the strip in the corner.

Referring to these drawings, the frame 8 which is of the usual oblong form is shown provided with two sashes 9 and 10. The sash 9, which is the upper sash, is placed in the outer edge of the frame and the two sashes are similar in construction. The frame is provided with an inner stop 11, a parting strip 12, and an outer stop 13. The parting strip with the stops forms a pair of channels extending throughout the length of the frame in which the two sashes are slidably mounted. Each sash has a pair of side members 14 and 15, which lie in one of the channels and each sash is provided with the usual pane of glass 16. Each sash also has an end member 17 and meeting member 18, these members being formed with inclined surfaces 19 which cooperate to make a tight joint when both sashes are in their extreme endwise positions.

The weather strip which forms the subject matter of the present invention is intended to be used in the channels formed in the side members of the frame so as to provide a means for preventing leakage between the side members of the sashes and the window frame. This weather strip may also be used for the same purpose across the bottom and top of the frame. This strip which is illustrated more clearly in Fig. 3 consists of a strip of metal, the body portion of which is designated as 20. This strip is to extend the length of the sides of the sash and along one edge it is formed with a flange 21. This flange is offset and lies in a plane which is spaced a slight distance to one side of the plane of the main body of the strip. A series of holes are formed in the flange throughout its length and through these holes are driven securing means, here illustrated as screws 22. These screws are driven into the window frame 8 and the strip has a width substantially equal to the width of the channel formed in the frame in which the sash moves so that the strip is secured by the screws along one edge of the channel. The strips will preferably be secured along the edge of the channel adjacent the stops 11 or 13.

The strip is also formed with a bend 23 which provides a tongue. This tongue lies near the free end of the strip and is adapted to enter a groove 24 formed in the side member 14. The tongue is somewhat narrower than the groove, although slightly deeper. This causes the tongue and groove to contact only along the rounded edge of the tongue as at 25, and there is considerable play between the sides of the tongue and the groove so that any swelling of the wood will not cause binding between the tongue and the groove. Beyond the tongue the strip has a portion 26 which lies substantially in the plane of the main body portion 20 and then terminates in an angularly disposed flange 27. This angular flange is intended to lie between the side wall of the side member 14 and the adjacent face of the parting strip 12. In the drawings the proportions of the parts have been somewhat exaggerated for purposes of clearness, and the side members 14 of the sash are shown as making a much looser fit in the channel in the window frame than is actually the case. Under ordinary circumstances, the angular flange 27 will make contact with the side wall of the member 14. It will be seen that with this construction there is provided what is substantially a double tongue and groove connection between the sash and the frame. One of the grooves is the groove 24 into which enters the tongue 23. The other groove is formed by the outer wall of the tongue 23, the portion 26 of the strip, and the flange 27, and the tongue which enters this groove is the part 28 of the sash which is defined in part by the outer wall of the groove 24 and the side wall of the side member of the sash. With the strip secured only along one edge the metal has certain resilience which tends to force the tongue into the groove so as to insure a good contact and the main body of the strip as at 20 also contacts with the end wall of the side member of the sash at all times. This contact, being between wood and metal, is much superior to a metal-to-metal contact as the wearing away of the two surfaces is greatly reduced. With this arrangement also the strip has an exterior contact with the sash by means of the angular flange 27, and since this flange does not extend beyond the exposed face of the parting strip the flange is protected from damage. Although a much greater playroom may be provided for than is normally the case, still the resilience of the strip will insure that a good contact is made with the sash at all times and this regardless of swelling or shrinking. This feature of resilience also provides a cushioning effect as the wood swells and prevents the sash and frame from binding. Since the strip may readily be mounted in place and only requires the

formation of a single groove or channel in the frame, the amount of labor required in providing a window with these strips is reduced to a minimum. Also the strip itself requires a minimum amount of material while at the same time providing the desirable double tongue and groove construction previously referred to. The excellent contact which the strip makes with the sash prevents wind or water from entering between the sash and the frame and this exclusion of water also results in a great reduction in sash warpage.

In Fig. 4 there is illustrated a slightly modified form of construction which differs from that previously described only in a reduction in width of the strip. With this form the body portion 20 is quite narrow and the offset flange 21 by which the strip is secured in place to the frame lies approximately at the center of the channel in the frame rather than along one side thereof. In other respects the construction is the same, however, and in general this may be said to represent merely a cheaper form of construction in which the principles of the invention are utilized.

In Fig. 5 the strip in general respects, is the same as that illustrated in Fig. 3 and above described. However, in the previous forms the angular flange 27 was intended to lie substantially parallel with the side wall of the side member of the sash, making contact therewith over considerable area, instead of along a definite line. In the present construction, however, the angular flange 27 is shown as being bent back slightly toward the tongue so that the strip makes contact with the parting strip along the line 30 which is the line of union of the angular flange with the main body of the strip. The free edge of the angular flange makes contact with the side wall of the side member of the sash along the line 31 so that with this construction there is formed a double contact in the space between the parting strip and the side member. This space, for purposes of illustration, has been somewhat exaggerated but the same double contact is provided for even though the space is somewhat smaller than is shown. In other respects, however, the strip is the same and may be made in either the wide or narrow forms illustrated in Figs. 3 and 4 respectively. It has been illustrated in the wide form in which it is secured to the channel near one or the other of the stops.

It is customary to provide window frames not only with strips lying in the channels in which the sash is moved, but also across the head and the sill of the frame so that when the sashes are moved to their extreme endwise positions leakage is prevented around the ends of the sashes. The strip used for this purpose is illustrated in Fig. 1 at 32, and has an off-set flange 33, as previously described, the main body portion 34, and the tongue 35. It will be seen in Fig. 1 that the inner stop 11 extends across the top and bottom of the frame, while the outer stop 13 extends across the top of the frame but is not used at the bottom. The parting strip 12 also extends across the top of the frame but not across the bottom. The strip 32 which is placed so as to cooperate with the cross member of the lower sash is preferably not provided with the angular flange 27 since this flange would be exposed to view on the outer face of the sash, but the strip 20′ may be in all respects similar to the strips previously described since the angular flange will now lie between the side wall of the cross member of the sash and the parting strip 12. The strips 32 are of dimensions similar to those used in the longitudinal channels in the frame and the groove 24 which extends along these side members may also be extended across the end members of the sash. Since the tongues 35 and 23 will lie in the same plane some provision must be made to permit their intersection without leaving gaps through which leakage may occur. For this purpose the tongue 35 as is shown in Fig. 7, extends across the frame without alteration, while the tongue 23 is cut away at an angle in the corners as at 36 to form a slot in the strip through which the tongue 35 may project. This arrangement produces a substantially continuous tongue around three sides of the sash and with the sashes properly grooved to cooperate with this continuous tongue, leakage is prevented around all parts of the window. If desired, the inclined surfaces 19 formed on the meeting members of the two sashes may also be provided with inter-locking strips of any suitable form which further insures that no leakage will occur between these members.

The improved weather strip which has now been described will be seen to include the several desirable features previously set forth. It provides for a double tongue and groove construction in which the contact is between wood and metal; it provides for an unbroken contact between the frame and the sides and head or sill strip. Furthermore, the strip is designed to permit swelling or shrinking without losing its effectiveness; it is cheaply constructed and installed, and requires but a minimum of labor in grooving the sash; it reduces sash warpage by reason of its effective contact by which leakage of water is prevented, and it obviates binding between the sash and the frame.

I claim:

1. The combination of a window frame provided with a channel, a sash having a side member entering the channel, this side member having a groove formed lengthwise

in its outer face, and a strip lying in the channel and secured along one edge to the bottom of the channel, this strip having a lengthwise fold forming a tongue entering the groove in the side member and terminating beyond the tongue in a flat flange extending at an angle to the main body of the strip and lying between the side of the channel and the side of the side member of the sash.

2. The combination of a window frame provided with a stop and a parting strip forming a channel, a sash having a side member entering the channel but having a loose fit therein, this side member having a groove formed lengthwise in its face, and a metallic strip lying in the channel and having one edge secured to the portion of the frame forming the bottom of the channel, the strip having a lengthwise fold forming a tongue entering the groove in the side member and terminating at its free edge in a flat angular flange lying along the side wall of the side member between the latter and the side of the channel, the main body of the strip between its secured edge and the tongue lying in contact with the end wall of the side member.

3. The combination of a window frame provided with a channel, a sash loosely fitting in the channel and slidably mounted therein, this sash having a side member provided with a groove extending lengthwise in the end wall of the member adjacent the frame, and a strip lying in the channel between the end wall and the frame, the strip having an off-set flange along one edge secured to the bottom of the channel and having a lengthwise fold forming a tongue entering the groove and a flat flange extending at an angle to the main body of the strip along the free edge of the latter and lying along the side wall of the side member between the latter and the side of the channel, the main body portion of the strip between the off-set flange and the tongue lying in contact with the end wall of the sash.

4. The combination of a window frame having a lengthwise channel, a sash having a side member fitting loosely in the channel and having a lengthwise groove in the end wall near one edge of the latter, and a metallic strip disposed within the channel and secured along one edge to the bottom of the channel, this strip being folded lengthwise to form a tongue entering the groove in the side member and terminating in a flat angularly disposed flange extending between the side member and the side wall of the channel, the free edge of this flat flange lying spaced inwardly from the edge of the channel.

5. The combination of a window frame provided with a stop and a parting strip forming a channel, a sash having a side member fitting loosely in the channel and formed with a lengthwise groove in its end wall facing the bottom of the channel, and a metallic strip lying within the channel and secured along one edge to the bottom thereof, this strip being folded lengthwise to form a tongue entering the groove in the side member and terminating in a flat angularly disposed flange lying between the side member and the parting strip, the free edge of the flange contacting with the side wall of the side member and the line of union of the flange with the main body of the strip contacting with the parting strip.

6. The combination of a window frame provided with a stop and a parting strip forming a channel, a sash having a side member fitting loosely in the channel, and a strip secured to the frame in the channel and having a main body portion bearing against the end wall of the side member over an extended area and terminating in an angular edge flange lying between the side wall of the side member and the side wall of the channel, this flange bearing against the side wall of the side member along its free edge and against the side wall of the channel along its line of union with the main body portion of the strip.

In testimony whereof I affix my signature.

GEORGE R. SIEFKEN.