

June 12, 1928.

1,673,393

H. E. CAMPBELL

AUXILIARY SEALING MECHANISM FOR WINDOWS

Filed Oct. 22, 1927

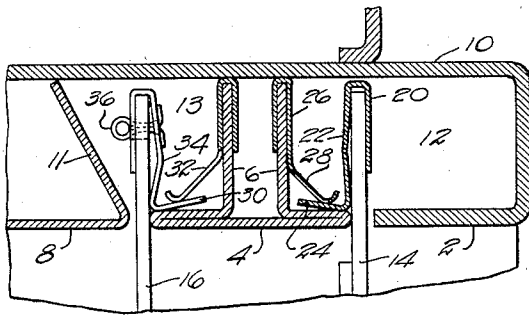


FIG. 1.

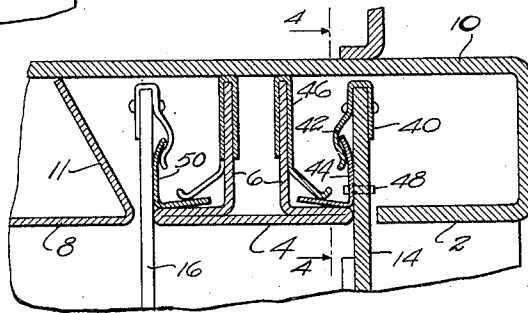


FIG. 3.

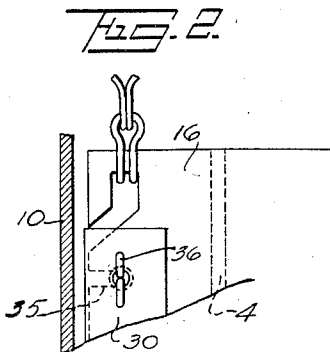


FIG. 2.

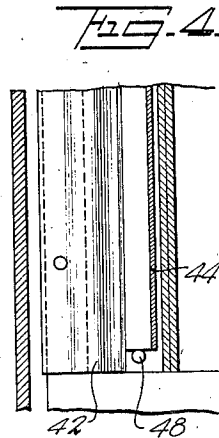


FIG. 4.

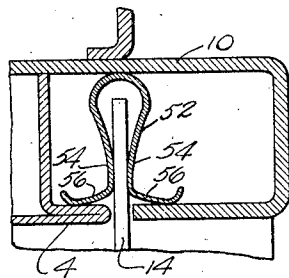


FIG. 5.

INVENTOR
Harry E. Campbell.
BY *Crane & Mann*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

HARRY E. CAMPBELL, OF BALTIMORE, MARYLAND, ASSIGNOR TO CAMPBELL METAL WINDOW CORPORATION, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

AUXILIARY SEALING MECHANISM FOR WINDOWS.

Application filed October 22, 1927. Serial No. 227,960.

The present invention relates to windows of the type in which the jambs have vertical openings through their inner face which lead to enlarged chambers within the jambs and the sashes have plates which extend into these openings. One form of such window is described in detail in my Patent No. 1,549,711, dated August 11, 1925. The particular object of the present invention is to provide means for making a more secure air seal between the sash plates and the jambs. This application contains subject matter derived from my earlier application Serial No. 165,526, filed February 3, 1927.

In considering the possibilities of air leakage between the sashes and jambs of a window of the type referred to, it must be borne in mind that when the window is closed the chamber surrounding the edge of the upper sash plate is open to outdoor air below the upper sash. This outer chamber may therefore be referred to as a cold chamber. In the same way, the chamber into which the lower sash extends, is open to the room above the lower sash and therefore is a warm chamber. When one is seeking to reduce the possibility of air leakage to a minimum, it is obvious from the foregoing that provision must be made to prevent air from getting into the room from the chamber which surrounds the upper sash, and from getting from outdoors into the chamber that surrounds the lower sash. This is a problem distinct from that of water leakage at the time of a driving rain, for due to the enlarged chambers into which the edges of the sash extend, the water will practically all drop out of the air before it can follow the circuitous route referred to and get into the room.

An ordinary vertical sliding sash should have some freedom of movement in two directions: one, the transverse direction or horizontal movement in the plane of the sash, and the other, an in and out movement, that is, horizontal movement in the plane of the jamb face. If either of these movements is restricted by direct spring pressure tending to prevent such movement, an undue amount of friction will be created, and the window will be hard to operate; on the other hand, a certain amount of horizontal frictional resistance, particularly against transverse movement, is sometimes an advantage,

for unless field adjustments are to be made, a considerable clearance must be provided on the sides of the sashes to take care of distortion of the jambs during erection, and this will tend to permit the window to rattle or to become canted and bind, which may be largely prevented by providing frictional resistance against such transverse movement.

I have found that a window of the type referred to can be made very tight and at the same time easy to operate if in a sash construction of the type specified there are provided members having portions bent to form an approximate right angle, which members are held with one leg in sliding contact with a sash plate and the other leg in sliding contact with a portion of the parting strip adjacent the opening through which the sash plate extends, so as to close any gap between the sash plate and parting strip. The method of holding these legs in contact with the specified members should be such that the members can move relative both to the sash and the jamb in order that the sash plate is not prevented from moving either in a transverse direction or in and out. The auxiliary sealing mechanism comprising such a member may be made in either one, two or three pieces, and the member having a portion bent in the form of a right angle may either be made the entire height of the jamb or may be made the height of the sash with which it contacts. If such member is less than the height of the jamb, provision should be made so that such member will cover substantially all of the joint between the sash and the jamb when the sash is closed; for example, such member may be made to move with the sash; or it may be made so that it will either move with the sash or stay in place relative to the jamb, depending on the amount of friction generated. In such case the sash should be provided with some mechanism such as a pin which will bring the sealing member into the proper position when the window is closed.

In the accompanying drawings, I show various embodiments of my invention illustrating different manners in which the same may be applied. In these drawings, Fig. 1 is a sectional view through the jamb showing two slightly modified methods of utilizing a two-piece structure; Fig. 2 is a sec-

tional view showing a face of the lower sash hand, if the members are used in the form of Fig. 1; Fig. 3 is a view corresponding to Fig. 1 showing a three-piece sealing mechanism; Fig. 4 is a sectional view on line 4—4 of Fig. 3, and Fig. 5 is a fragment of a sectional view corresponding to Fig. 1 showing a one-piece device.

The numeral 2 represents the outdoors portion of the inner jamb wall; 4 is the parting strip which is provided with two legs 6, and 8 represents the indoors portion of the inner jamb wall. A partition 10 is made integral with the portion 2 and forms chamber 12 for the upper sash. In the embodiment here illustrated, the indoors portion of the inner jamb wall 8 is given a return bend 11 forming a chamber 13 for the lower sash. It is not necessary to have the chamber 13 separated from the rest of the inside of the jamb unless structural reasons make this expedient. The balance of the jamb is not here illustrated but a manner in which it may be made is shown in my said Patent No. 1,549,711.

The upper sash is here designated by the numeral 14 and the lower sash by the numeral 16. The parts thus far described are shown in other patents which have been issued to me and are not covered by the present case except as they enter into the combination thereof. These parts are common to all of the figures of the drawings.

In Fig. 1 I show a sealing mechanism made in two pieces. Here the upper sash 14 fits into a hook shaped member 20 which has a leg 22 adapted to lie substantially parallel with the face of the sash 14, and a leg 24 substantially at right angles to the leg 22, which is adapted to lie substantially parallel to the rear face of the parting strip 4. A member 26 is bent around one of the legs 6 and is provided with an arm 28 adapted to make sliding contact with the leg 24 of member 20 and hold it against the rear face of the parting strip 4. The member 20 may be made either the full height of the jamb or it may be carried by the sash as will be described in connection with Fig. 2, or it may be made substantially the length of the sash and be free either to move with the sash or stay in place by the jamb as will be described in connection with Fig. 4.

The lower sash 16 goes into a hook shaped member 30 similar to member 20 except that the member 30 is here illustrated as being of a length about equal to the height of the lower sash and also is shown as having a substantial clearance away from partition 10. A member 32 corresponding to member 26 is used to hold the leg 34 of member 30 in contact with the rear face of a parting strip 4. The device will be operative if members 20 and 26 are made either of spring material such as brass or bronze or of a softer material such as zinc; on the other

hand, if the members are used in the form of members 30 and 32, spring metal should be employed and there should be substantial friction between member 30 and sash 16.

With either form of arrangement, the sashes are substantially free to move in the direction of the plane of the jamb face as far as permitted by the clearances between the members 2 and 4 and 4 and 8 respectively; in other words, there is no tendency for the sashes to bind against these members. In the same way the sashes can move in a transverse direction until their edges strike against the hook shaped members which they carry and press these hook shaped members against partition 10. With the arrangement shown in connection with the upper sash, member 20 practically fills the space between the rear wall of parting strip 4 and partition 10, so that transverse movement is limited directly by partition 10. In the case of the lower sash, the tendency for transverse movement of the sash will be somewhat impeded by the friction between the sash and member 30. After the sash strikes the back of the hook formed on member 30, further transverse movement will cause member 32 to be put under tension and finally the transverse movement will be limited by partition 10. If member 32 is made relatively stiff the sash will substantially float against this member.

As has been stated, member 30 is intended to move with the sash 16. In order to cause such combined movement and at the same time permit the sash to move horizontally relative to member 30, this member is provided with a slot 35 (see Fig. 2) through which passes a cotter pin 36.

In Figs. 3 and 4 the sealing mechanism is illustrated as made in three pieces. The upper sash 14 carries a hook shaped member 40 having an arm 42 adapted to press against one leg of the angle member 44 and hold this leg in contact with the sash 14. A member 46, similar to the member 26 already described, hooks about a leg 6 of parting strip 4. In connection with the upper sash, member 44 is illustrated as being substantially the length of the sash but instead of being carried by the sash, it is free to move either with the sash or to remain in place held to the jamb. In order to insure member 44 being in proper position when the window is closed, the upper sash 14 is provided with a pin 48 which will push member 44 into the proper position as the window is shut. In connection with the lower sash 16, a member 50 is provided similar to member 44 but is here illustrated as extending the entire height of the jamb. The cooperating parts are the same as in connection with member 44 except that the pin 48 is omitted.

In Fig. 5 I show a one-piece device comprising a U-shaped member 52 into which

the sash 14 extends. This member has two portions 54 adapted to lie substantially parallel with the faces of the sash 14 and in sliding or frictional contact with the sash, and two legs 56 substantially at right angles to the portions 54 which are adapted to press against the rear face of the inner jamb wall and parting strip. Member 52 is intended to make substantially sliding contact both with partition 10 and the said rear faces of both the inner jamb wall and parting strip. Member 52 may either be made to extend the full height of the jamb or it may be carried by the sash as illustrated in Fig. 2 or it may be utilized in connection with pin device illustrated in Figs. 3 and 4.

It is to be understood that the foregoing are intended to be illustrative of various manners in which my invention may be applied and that other modifications may be made without departing from the spirit of my invention.

What I claim is:

1. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, members each adapted to move bodily in a horizontal plane relative to such openings and held substantially in contact with a face of a sash plate inside the jamb and adapted to slide horizontally relative to such sash plate, and means for causing each such member to make substantially a sliding contact with a jamb member adjacent such an opening.

2. A structure as specified in claim 1 in which said members are connected to the sash plates in such a way that they will move vertically with the sash plates.

3. A structure as specified in claim 1, in which the means for causing such members to make substantially a sliding contact with jamb members adjacent the openings comprises a portion of such members adapted to contact with a portion of the jamb removed from said opening.

4. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, members embracing edges of the sash plates and held substantially in contact with such plates in such a way as to permit relative transverse movement between the two, which members are adapted to make substantially rubbing contact with inside walls of said chambers, and spring means for causing such members to make sliding contact with jamb members adjacent said openings.

5. A structure as specified in claim 4, in which the spring means comprises members attached to the parting strips and adapted to contact with portions of the auxiliary sealing members substantially in the plane of the jamb.

6. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, auxiliary sealing members adapted to embrace edges of the sash plates and to move horizontally relative thereto, projections carried by each of such auxiliary sealing members extending out on the side towards the parting strip, and flexible members attached to the parting strips adapted to make sliding contact with such projections.

7. A structure as specified in claim 6, in which said flexible members are made of spring metal.

8. A structure as specified in claim 6 in which said auxiliary sealing members are adapted normally to make substantially sliding contact with walls of said chambers removed from said openings.

9. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, auxiliary members carried by said sash plates adapted to move a limited horizontal distance relative to such sash plates against frictional resistance and spring means for limiting the freedom of movement of such auxiliary members in a horizontal direction.

10. A structure as specified in claim 9, in which the auxiliary members embrace the edges of the sash plates.

11. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, members each having a portion bent to form an approximate right angle with one leg in sliding contact with a sash plate and the other leg in sliding contact with the parting strip adjacent one of said openings whereby leakage of air into or out of said enlarged chamber between such sash plates and parting strips is largely prevented.

12. A structure as specified in claim 11 in which said members are adapted to move vertically relative to the jamb and in which means is included for causing each of such members, when the window is closed, to con-

tact with substantially the full height of the sash plate with which it cooperates.

13. In a window of the type having jambs, openings through the inner walls of the jambs, a parting strip forming part of the inner jamb wall between such openings, separate enlarged chambers back of such openings and sashes having plates adapted to extend through such openings, members inside said chambers of a height substantially as great as that of a sash adapted to contact with a sash member and with the

parting strip, means whereby each such member is held substantially in contact with said parting strip, and means adapted to cause such member to contact with a sash member without holding the sash plate in contact with the edge of one of said openings.

14. A structure as specified in claim 13, in which the said members inside said chambers are adapted to move relatively to the sash plates.

HARRY E. CAMPBELL.