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THERMAL BARRIER AND CONNECTOR MEMBER FOR
INNER AND OUTER WINDOW FRAMES
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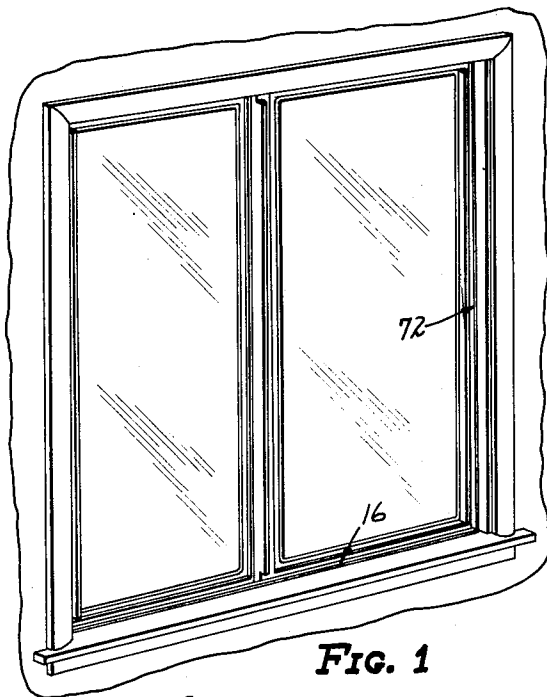


FIG. 1



FIG. 2

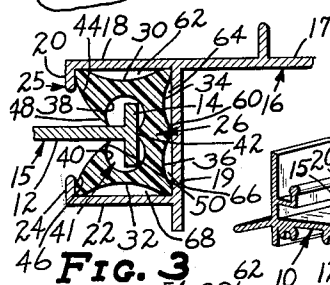


FIG. 3

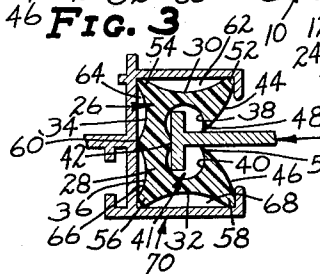


FIG. 4

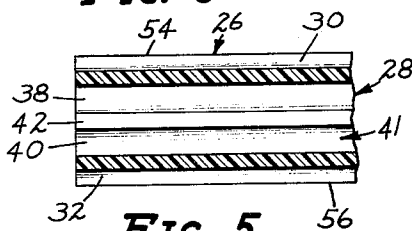


FIG. 5

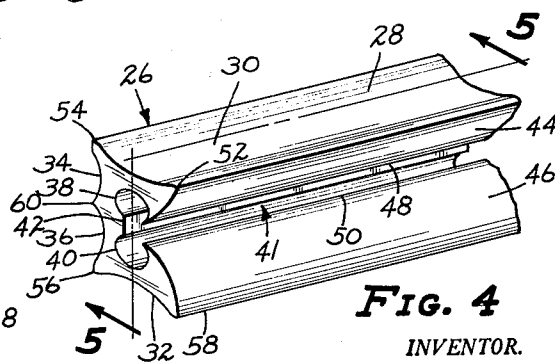


FIG. 6

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THERMAL BARRIER AND CONNECTOR MEMBER FOR INNER AND OUTER WINDOW FRAMES

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3 Claims. (Cl. 189-75)

The invention relates to an improvement in window construction and more particularly to a thermal barrier connection between an outer sill and frame mounting storm sashes and an inner sill and frame mounting the prime sashes.

With the advent of metal windows for residential as well as commercial construction, the undesirable condition arose, particularly in the northern climes, in which condensation collects on the inside metal frame which under some conditions results in frost forming on the inside frame. This is particularly due to the high degree of conductivity of the metal forming the frames. The frames and sills are connecting and there is conduction from the outer to the inner. A further undesirable condition is the heat loss conduction through the metal from the inner frame to the outer frame.

With the above problem in mind, it is an object of this invention to provide a connection construction for the outer frame and the inner frame, whereby there is little or no conduction of heat or cold from the outer frame to the inner frame. It is a further object to provide a frame connecting device which locks the inner and outer frames together and at the same time provides a thermal barrier. The present invention provides a minimum of opposed metal surface area of the connected frames thereby minimizing radiation of heat from one frame to the other frame at the point of connection. It is also an object to provide a construction for accomplishing the above without the aid of screws, clips or the like which conduct cold and produce condensation.

It will not be here attempted to set forth and indicate all of the various objects and advantages incident to the invention, but other objects and advantages will be referred to in, or else will become apparent from, that which follows.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals refer to like parts throughout.

In the drawings forming part of this application:

FIGURE 1 is a perspective view of one type of window construction employing the invention.

FIGURE 2 is an enlarged perspective view of portion of a corner of the frame construction shown in FIGURE 1.

FIGURE 3 is an enlarged sectional view on the line 3-3 of FIGURE 2.

FIGURE 4 is a perspective view of a length of the thermal barrier and connector member.

FIGURE 5 is longitudinal sectional view on the line 5-5 of FIGURE 4.

FIGURE 6 is a sectional view on the line 6-6 of FIGURE 2.

Referring to the drawings, and particularly to FIGURE 2, the numeral 10 designates an outer sill member which has formed on the inner edge thereof the extension portion 12. The extension portion 12 has formed on the inner edge thereof the right angularly disposed flange portion 14. The extension portion 12 and the flange portion 14 form an extension T 15.

The inner sill 16 includes the base portion 17 from which extends the upper extension portion 18 which terminates in the upper narrow depending flange portion 20. Depending from the base portion 17 is the vertical por-

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tion 19 and extending at right angles from the vertical portion 19 and parallel to the extension portion 18 is the lower extension portion 22. The lower extension portion 22 terminates in the lower narrow upwardly extending flange portion 24 which aligns with the upper flange portion 20.

The upper extension 18, the lower extension 22, the vertical portion 19 together with the upper and lower flange portions 20 and 22 respectively, form a partial box formation or member 25 as part of the inner sill 16.

The numeral 26 designates the thermal barrier connector member which is formed of a rigid plastic and includes the elongate substantially rectangular body member 28 having the concave upper surface 30 extending from edge to edge and the opposed concave lower surface 32 extending from edge to edge. The inner side of the member 26 is formed with the parallelly disposed concave grooves 34 and 36 which extend to the edges. Longitudinally and internally of the member 26 are the intersecting cylindrical holes 38 and 40 which form a single recess 41 and also form the longitudinally extending narrow flat area 42. The member 26 is also formed with inwardly converging upper and lower surfaces 44 and 46, respectively, which intersect with the cylindrical holes 38 and 40 to form the longitudinally extending extension-contacting lip edges 48 and 50.

The concave surfaces 30, 32, 34 and 36 together with the inwardly converging surfaces 44 and 46 form the four longitudinally extending sharply defined horn or wing formations 52, 54, 56 and 58 and the ridge portion 60 intermediate the wings 54 and 56.

The thermal barrier connector member 26 is formed of a size whereby the outermost ends or points of the wing portions 52, 54, 56 and 58 define a cross-sectional area slightly larger than the inner cross-sectional area of the partial box formation 25. The member 26 is mounted in the box formation 25 of the sill 16 by forcing the same thereto. The burr edge of the metal forming the formation 25 shears off any excess material on the wing edges 52, 54, 56 and 58 and including the top of the ridge 60. Such insertion assures a tight fit of the member 26 in the partial box formation 25. Before the member 26 is forcibly inserted into the partial box member 25, the flange portion 14 of the extension 12 is positioned within the recess 41, and then the same together with the member 26 are both mounted in the box formation 25 as outlined above. The width of the recess 41 is slightly larger than the width of the T head portion 14 and the distance between the lip edges 48 and 50 is slightly less than the thickness of the extension 12 whereby contact of the lip edges is made with the extension 12. This forms a seal.

With the thermal barrier connector 26 in position in the partial box formation 25, it will be seen that dead air pockets 62, 64, 66 and 68 are formed at the concave grooves 30, 32, 34 and 36 respectively. These dead air pockets form insulative areas which prevent conduction from one metal sill to the other. Further, it will be noted that the member 26 only contacts the partial box formation 25 at the very outer pointed extremities 52, 54, 56, 58 and 60 of the same, thereby leaving an absolute minimum of contacting material for conduction. In addition, it will be noted that the extension portion 12 of the T section 15 is engaged between the lip edges 48 and 50 and with the flange or T cross portion 14 within the longitudinal recess 41 formed by the holes 38 and 40, the extension cannot be removed. As a result of the above, the sill 10 is securely connected to the prime sill 16 with an absolute minimum of possible conduction from one to the other without the aid of screws, clips or the like. It will be seen that the surface area of the extension 12 and enlarged end portion 14 presents a minimum

of opposed areas from which heat may be radiated from one member to the other.

Referring again to FIGURE 2, and also FIGURE 6, the outer side frame 70 and the inner prime frame 72 are formed with substantially the same construction as the sill 10 and the sill 16 and the connection of the frames is made with the same barrier connector 26. Likewise with the top frame. It will therefore be seen that the inner and outer frames of the window A are connected at their entire peripheral adjacent edges by a thermal barrier member 26 without the aid of screws, clips or the like, with a minimum of contact of barrier member and frame and with the additional insulation consisting of the dead air space pockets heretofore described.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a thermal barrier and connector for inner and outer window frames, a preformed elongated body member having longitudinal rigidity and a fixed longitudinally extending internal recess, said body member having a fixed longitudinally extending opening leading into said internal recess, the width of said longitudinally extending opening being less than the width of said internal recess, the outer wall surfaces of said body member formed with longitudinally extending grooves defining longitudinal outer corner edges, said internal recess adapted to receive an enlarged portion of an extension member of an outer window frame with the extension member extending from the enlarged portion outwardly from the internal recess through the longitudinally extending opening, the width of said longitudinally extending opening being less than the width of the enlarged portion of the extension member, said body member adapted for endwise insertion into an elongated partial box construction of an inner window frame with said outer corner edges of said body member in pressing contact with the internal surface of the partial box construction when the same is inserted therein to thereby connect the frames together with dimensional stability and substantially insulate one from the other.

2. In a window construction the combination of an outer pane-carrying frame member formed with an elongated extension member having an elongated enlarged outer portion, an inner pane-carrying frame member having an elongated box formation formed with a longitudinally extending opening, a thermal barrier connector member including a preformed elongated rigid body

member having a substantially rectangular cross-section and a longitudinally extending internal recess, said body member having a longitudinally extending opening leading into said internal recess, said enlarged outer portion of said extension member of a width greater than the width of said longitudinally extending opening of said body member, the extent of the cross-sectional area of said rigid body member being substantially that of the internal cross-sectional area of said box formation said body member positioned in said box formation with said extension member extending through said longitudinally extending openings of said body member and said box formation with said enlarged portion within said internal recess of said body member to thereby connect said outer frame with said inner frame with dimensional stability and maintain heat conduction therebetween at a minimum.

3. In a window construction the combination of an outer pane-carrying frame member formed with an elongated extension member having an elongated enlarged outer portion, an inner pane-carrying frame member having an elongated box formation formed with a longitudinally extending opening, a thermal barrier connector member inserted in said box formation and including a preformed elongated longitudinally rigid body member having a substantially rectangular cross-section and a longitudinally extending internal recess, said body member having a longitudinally extending opening leading into said internal recess, said enlarged outer portion of said extension member of a width greater than the width of said longitudinally extending opening of said body member, the outer wall surfaces of said body member formed with longitudinally extending grooves defining longitudinal outer corner edges in pressing contact with internal corners of the box formation thereby rigidly supporting said connector barrier in said box construction with said extension member extending through said longitudinally extending openings of said body member and said box formation with said enlarged outer portion within said internal recess of said body member to thereby connect said outer frame with said inner frame with dimensional stability and maintain heat conduction therebetween at a minimum.

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