Dec. 6, 1966 F. W. HETMAN 3,289,377

INSULATED FRAME AND CONNECTOR THEREFOR

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FIG. 1

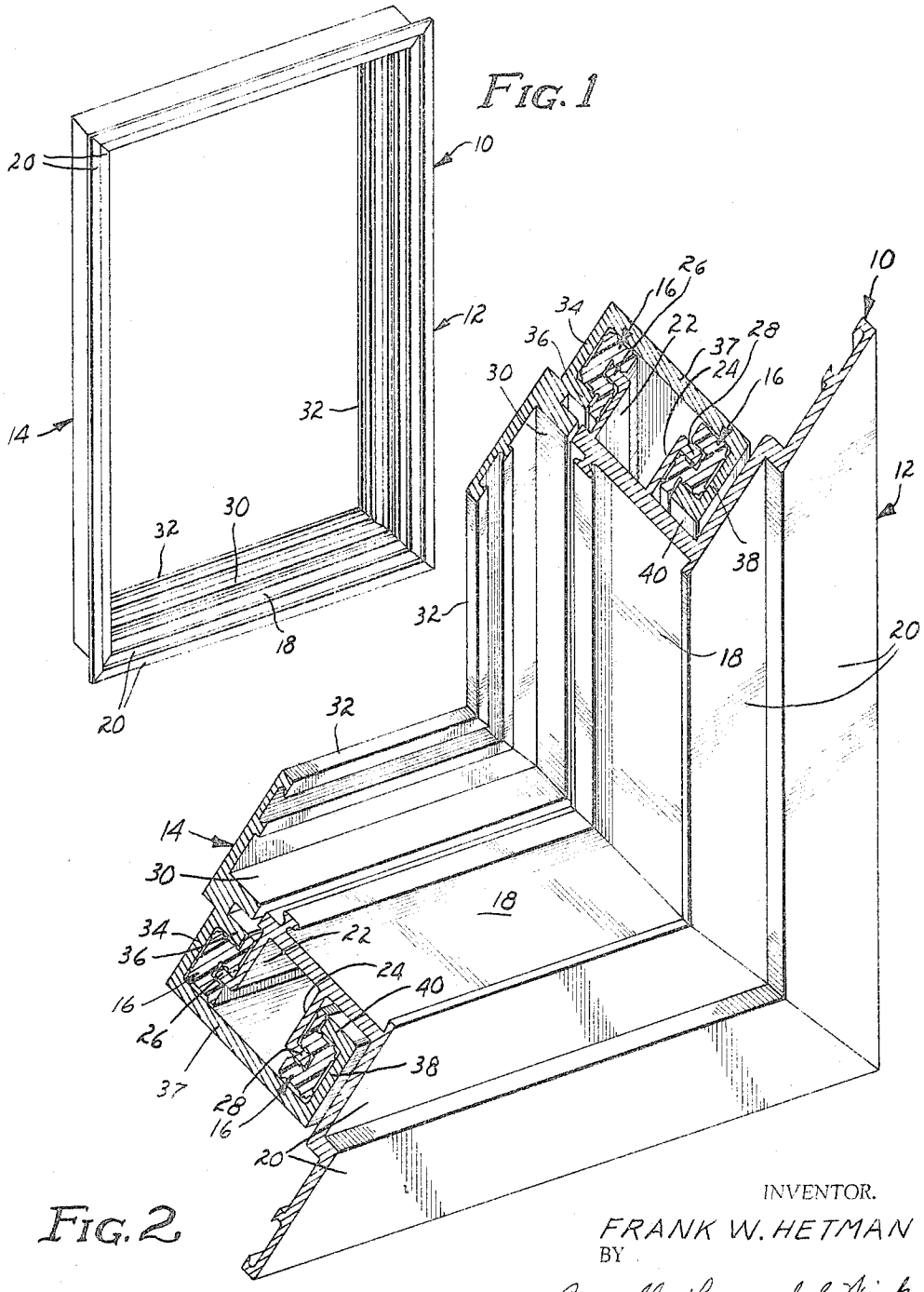


FIG. 2

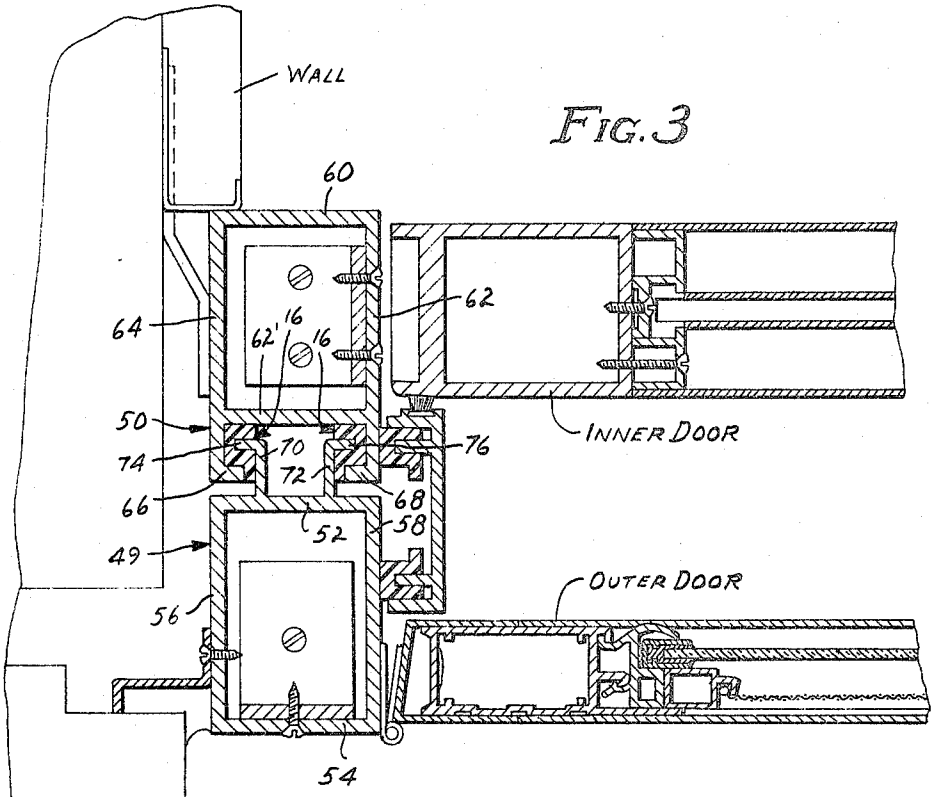
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FIG. 3



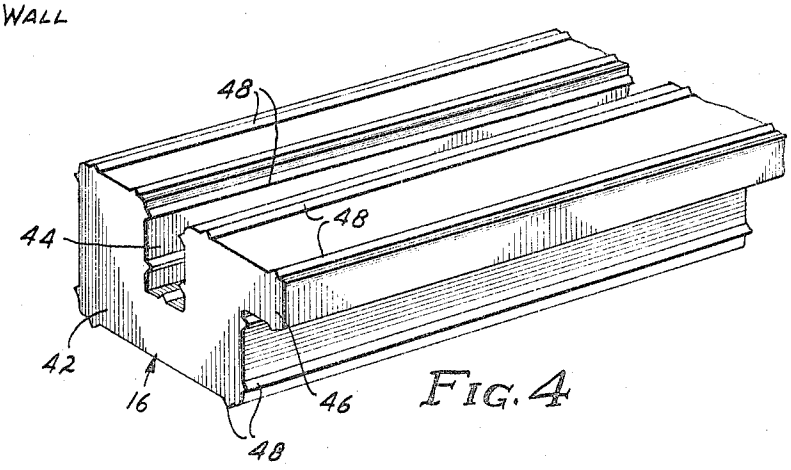


FIG. 4

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INSULATED FRAME AND CONNECTOR THEREFOR

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2 Claims. (Cl. 52—656)

The invention relates to an improvement in window and door construction and more particularly to a combined rigid connection and thermal barrier between inner and outer framing members for windows and doors.

With the advent of metal frames for windows, the undesirable condition arose, particularly in the northern climes, in which condensation and ice forms on the inside metal frame which under some conditions results in frost forming on the inside frame. This is due to the high degree of conductivity of the metal forming the frames. The frames are connected by sashes and there is conduction from the outer to the inner. This is also true where door frames are made of metal. In addition, there is a heat loss due to conduction through the metal from an inner frame to an outer frame.

It is an object of this invention to provide a connection construction for an outer and inner frame whereby there is little or no conduction of heat or cold from the outer to the inner frame.

It is a further object to provide a frame connecting device which locks the inner and outer frames rigidly together and at the same time provides a thermal barrier allowing for free expansion and contraction of parts thereby connected. The present invention provides a minimum of opposed metal surface of the connected surfaces thereby minimizing radiation of heat from one frame to the other in the area of connection.

It is a still further object to provide an interlocking connector for frame members which lends itself readily to a flexible assortment of assemblies in windows and doors. The connector also allows movement of the joined frame members when exposed to expansion and contraction due to temperature variance.

It is a further object to provide a method of securing the connector of vinyl in the frame members by extruding the connector and during the extrusion process stretching the vinyl, then inserting the connector into the frame members and heating the same. As a result the vinyl connector assumes its original dimensions and tightens the connection of the members.

It is a still further object to provide a connector member for accomplishing the above without the aid of screws, clips and 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 acompanying 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 a portion of a corner of the frame construction shown in FIGURE 1.

FIGURE 3 is a sectional view of a door jamb employing the invention.

FIGURE 4 is a greatly enlarged perspective view of a length of the thermal barrier connector.

Referring to the drawings in particular, the numeral **10** designates a window construction which includes an outer frame **12** and an inner frame **14** each including a sash and joined together by means of the separator and connector thermal barrier members **16**.

The outer frame **12** includes the outer sash portion **18** and extending from the sash **18** at substantially a right angle thereto is the outer lip formation **20**. Extending outwardly from the sash portion **18** are the spaced first and second flange portions **22** and **24**, respectively, and the second flange portion **24** is spaced from the lip **20**. The first and second flange portians **22** and **24** are each formed with the right angular short lip portions **26** and **28**, respectively, at the outer free ends thereof.

The inner frame **14** includes the narrow inner sash portion **30** and extending from the inner sash at substantially a right angle thereto is the inner lip formation **32**. Extending from the inner sash portion **30** at substantially a right angle thereto is the inner side wall portion **34**.

The numeral **36** designates an inner short flange extending at a right angle from the wall portion **34**. The inner side wall portion **34** terminates in a bottom wall portion **37** formed at a right angle thereto. The bottom wall portion **37** terminates in the right angularly disposed outer side wall **38** in spaced opposed relationship to the inner side wall **34**. The outer side wall **38** terminates in the right angularly disposed outer short flange **40** in spaced opposed relationship to the inner short flange **36**.

The inner short flange **36**, the inner side wall **34**, the bottom wall **37**, the outer side wall **38** and the outer short flange **40** constitute a partial box construction.

As heretofore indicated, the numeral **16** designates the one-piece separator and connector thermal barrier and it includes the main elongated body portion **42** which is substantially rectangular in cross-section and formed with the longitudinally extending recess **44** together with the lip portion **46** extending from one edge thereof. The surfaces of the connector thermal barrier **16** are formed with the fine ridges **48** which engage with the inner surfaces of the two frame members which creates a tight fit of the connector thermal barrier **16** with the frame members.

The inner frame member **14** and the outer frame **12** are connected together with a pair of separator and connector thermal barrier members **16**, one of the same being located between the inner short flange **36** and the bottom wall portion **37** with the lip portion of the member **16** abutting the outer edge of the short flange **36**. The short lip portion **26** of the flange portion **22** of frame **12** fits snugly within the recess **44** of the member **16**. A second connector thermal barrier member **16** is positioned for engagement with the short flange **40** and bottom wall **37** and the lip portion **28** within the recess **44** of the member **16**. The lip **46** of the member **16** abuts the short flange **40** and is up against the flange portion **24**. Thus, the flanges **22** and **24** of the outer frame **12** are held within the partial box construction formed by the bottom wall **37**, the inner side wall portion **34**, the outer side wall **38** and the inner short flange **36** together with the outer short flange **40**.

With the above described construction the inner frame **14** is rigidly connected to the outer frame **12** with no metal to metal contact of the frames and with a minimum of opposed metal surfaces which could afford any possible conduction. In addition there is no screw, clip or the like type of connection which could conduct heat. Further, the connector thermal barrier member not only connects the frame members and prevents heat conduction, but it allows longitudinal movement of the joined frame members when exposed to expansion and contraction due to temperature variance.

In FIGURE 3 is illustrated how the invention may be applied to the jamb of a door framing. The numeral 49 designates a door jamb section which is connected to the jamb section 50. The jamb section 49 includes the end walls 52 and 54 and the side walls 56 and 58. The jamb section 50 includes the end wall 60, the intermediate wall 62', the side walls 62 and 64 together with the inner short flange 66 formed at a right angle to the side wall 64 and the outer short flange 68. The intermediate wall 62' together with a portion of the side walls 62 and 64 and the inner and outer short flanges 66 and 68, respectively, form a partial box construction. The jamb section 49 further includes the spaced flange portions 70 and 72 secured to and extending from the end wall 52. The flange portions 70 and 72 are also spaced from the walls 56 and 58, respectively, and the flange 70 is formed with the outwardly turned short lip portion 74 while the flange 72 is formed with the outwardly turned short lip portion 76.

The lips 74 and 76 are interlocked in spaced relation with the short flanges 66 and 68, respectively, by means of the connector thermal barrier members 16 in the same manner as the lips 26 and 28 are interlocked in spaced relation with the inner short flange 36 and the outer short flange 40, respectively. As a result of the above construction the door jamb sections 49 and 50 are rigidly joined together with no metal to metal contact and with a minimum of opposed metal surfaces which could afford possible conduction. The frame construction and the connector thermal barrier members 16 not only connect the jamb sections and prevent cold conduction and resultant condensation, but it allows movement of the joined sections when exposed to expansion and contraction due to temperature variance. This is of special importance where the frame is of the split type as herein shown.

The thermal barrier connector member 16 may be formed of extruded vinyl plastic or other insulating material and streatched during the process of extrusion. Then, after the barrier-connector 16 is in place in the frame members as described, it is heated and as a result the barrier-connector 16 is caused to assume its larger original dimensions thereby producing an extremely tight connection of the members.

The invention is not 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 window construction, an inner pane-carrying frame member, an outer pane-carrying frame member, said inner frame member having a bottom wall, an inner side wall connected to said bottom wall, an outer side wall connected to said bottom wall, an inner short flange extending inwardly from said inner side wall, an inner sash connected to said inner side wall, an outer short flange extending inwardly from said outer side wall, said outer pane-carrying frame member having an outer sash portion, a first flange extending from said outer sash portion, a second flange extending from said outer sash portion spaced from said first flange, each of said first and second flange portions having a lip portion extending therefrom, first and second thermal barrier-connector members each including an elongated body member having a recess

formed longitudinally therein and a lip extending therefrom, and longitudinally thereof, said first thermal barrier-connector member positioned within said inner short flange and said bottom wall of said inner frame with said lip of said first flange of said outer sash extending into said recess of said first thermal barrier-connector, said lip of said first thermal barrier-connector member positioned adjacent said inner short flange of said inner frame and said first flange of said outer frame, said second thermal barrier-connector member positioned within said outer short flange and said bottom wall of said inner frame with said lip portion of said second flange of said outer sash extending into said recess of said second thermal barrier-connector member, said lip of said second thermal barrier-connector member positioned adjacent said outer short flange of said inner frame and said second flange of said outer frame to thereby rigidly connect said inner frame member with said outer frame member with a minimum of heat conduction therebetween.

2. In a framing construction for windows, an inner pane-carrying frame member, an outer pane-carrying frame member, said inner frame member having a bottom wall, an inner side wall connected to said bottom wall, an outer side wall connected to said bottom wall, an inner short flange extending inwardly from said inner side wall, an inner sash connected to said inner side wall, an outer short flange extending inwardly from said outer side wall, said outer pane-carrying frame member having an outer sash portion, a first flange extending from said outer sash portion, a second flange extending from said outer sash portion spaced from said first flange, each of said first and second flange portions having a lip portion extending therefrom, first and second thermal barrier-connector members, each including an elongated body member having a recess formed longitudinally therein, said first thermal barrier-connector member positioned within said inner short flange and said bottom wall of said inner frame, with said lip of said first flange of said outer sash extending into said recess of said first thermal barrier-connector, said second thermal barrier-connector member positioned within said outer short flange and said bottom wall of said inner frame with said lip portion of said second flange of said outer sash extending into said recess of said second thermal barrier-connector member, to thereby rigidly connect said inner frame member with said outer frame member with a minimum of heat conduction therebetween.

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