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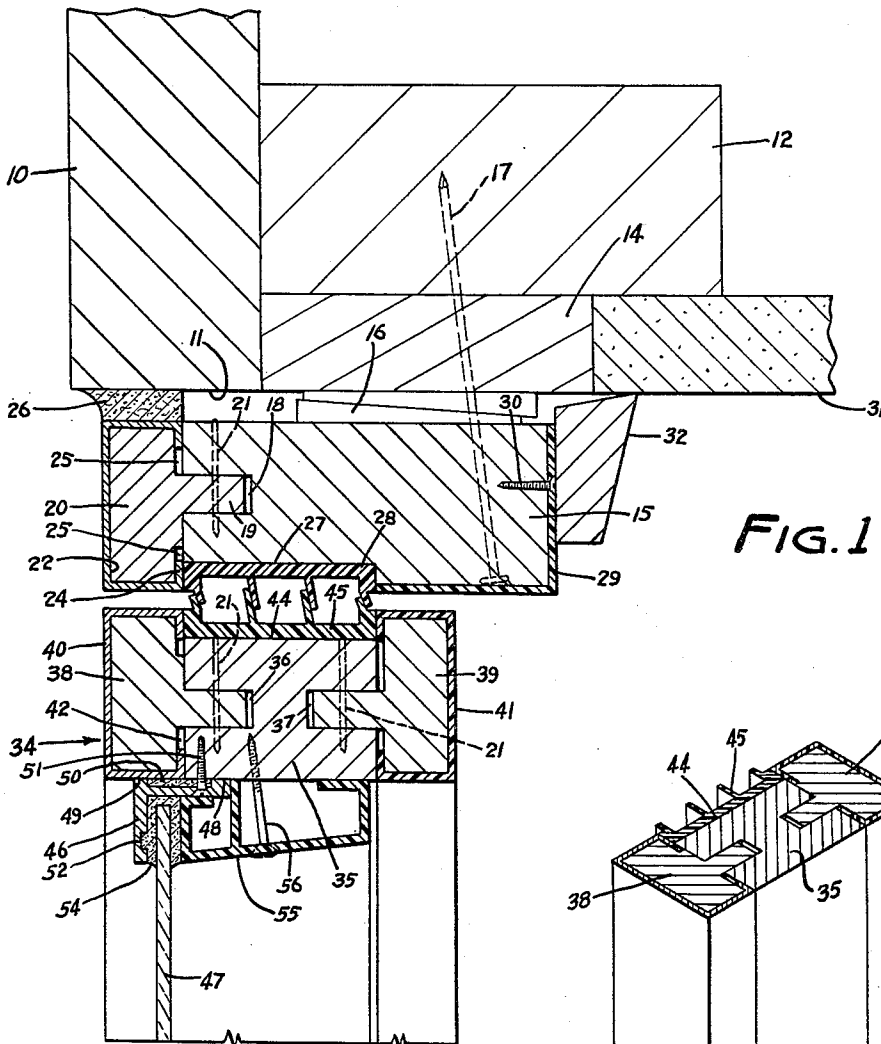


FIG. 1

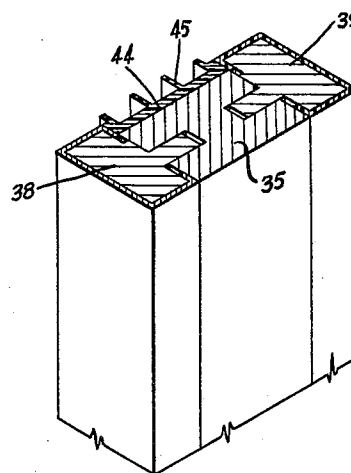


FIG.2

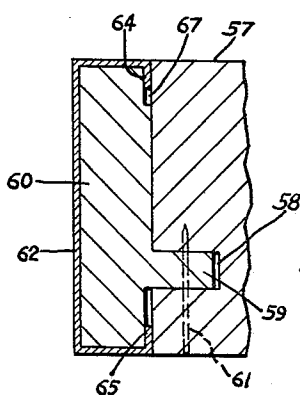


FIG. 3

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CONSTRUCTION ELEMENT

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2 Sheets-Sheet 2

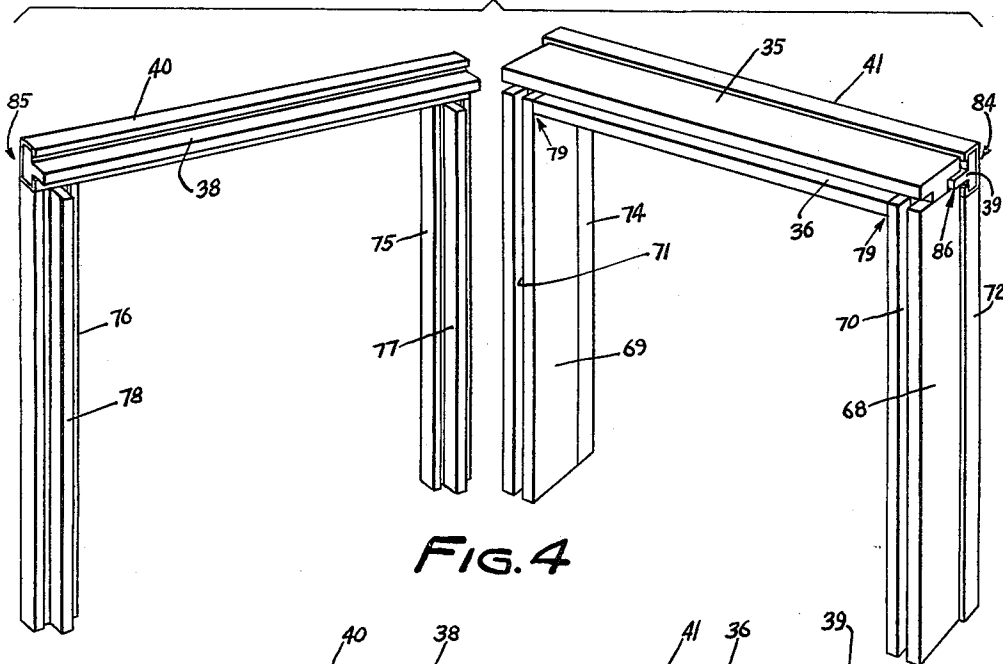


FIG. 4

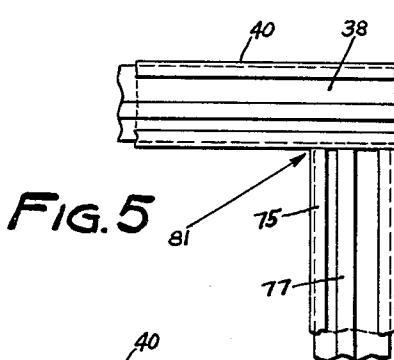


FIG. 5

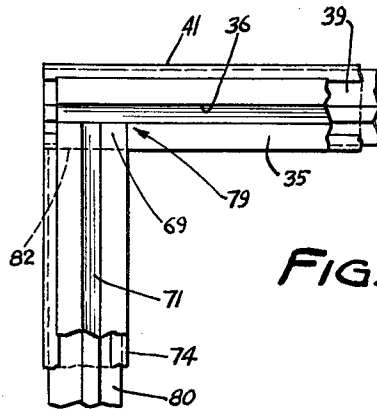


FIG. 6

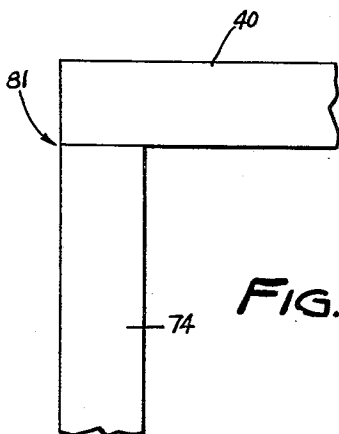


FIG. 7

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3,082,490

CONSTRUCTION ELEMENT

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4 Claims. (Cl. 20—11)

This invention is a construction element which consists of a basic frame portion that is grooved and to which is secured a tongued member which slidably fits inside an extrusion. The extrusion may be purely decorative or both decorative and weather resistant in order to serve both as a finish for and protection against the elements for the basic strength and insulation providing frame member. Also a part of this invention are the specific elements or building components that may be satisfactorily and advantageously made from the construction element herein.

Before now, most building components, such as windows and doors have been framed either in wood or in metal. There have been some discussions of making plastic frames for doors and windows, but it is believed such practice remains largely experimental. It has also been proposed before now to make metal covered, wooden door and window elements and there is substantial prior art suggesting such construction generally.

All of the prior art showing wood cored, metal covered building component frameworks have at least one major drawback, as far as widespread use in construction is concerned. Many previously suggested structures require forming the metal in such a manner that expensive special dies of some sort would be necessary for each size of window or door made. Others require thin metal edge portions to be slidably engaged in slots formed in the wood. While such structures are easily illustrated, they are assembled only with difficulty. This type of structure requires having the wood prepared for a given size window and the metal portions also similarly prepared and then slidably engaging one with the other, as slidably engaging great lengths of wood and metal in a manner would be highly impractical. Anyone who has attempted to slide a piece of metal into a slit in wood will appreciate the difficulty of attempting to assemble any except rather short spans in this manner. Almost inevitably the metal and the wood have a tendency to get out of line with each other causing the metal to dig into the sides of the wood slot and bind. The manufacturing difficulties listed cause the cost of these prior art units to be too great for general use.

Prior art structures in which the metal and wood are easily assembled have exposed screw or other fastening devices extending through the protective and decorative outside covering which substantially reduce the advantages otherwise to be gained thereby. For example, moisture will penetrate around these exposed fastener heads to attack the covered wood. Corrosion around the screw can progress to a degree that the screws no longer hold in the wood. As a result they may fall out and promote further opportunity for moisture to attack the wood frame portion of the structure to say nothing of seriously weakening the structure.

Some metal covered wooden frame windows of the prior art have concealed fastening means to hold the metal to the wood, but in every instance of such structures, the various pieces and parts needed in order to make the completely covered unit are so involved that the resulting structure must be nearly as expensive, if not more expensive, than structures entirely of metal. The advantage of low cost, therefore, is lost with this type of structure also. Furthermore, in every known

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instance of metal covered wooden windows employing concealed fastening means in the prior art, the corners are necessarily mitered by reason of the peculiar formation of the metal covers or the wood frame or both. Mitered corner construction requires precision cutting of a type that is more difficult than if the joints could be rabbeted or butt joints.

Nevertheless wood has certain inherent features that make it very desirable as a window and door frame material if it can be protected against weather. For example, wood is a rather good insulator as compared to metal. Wood windows are much less subject to condensation from being cold during winter weather than are metal windows, for example, which are relatively good conductors. Wood also is inexpensive as compared to metal. Furthermore, wood is easily worked with rather inexpensive equipment. On the other hand, metal has a tremendous advantage in that at least some of the noncorrosive metals provide window and door frames which resist deterioration from weathering with little or no attention for years on end. By combining metal and wood, with the latter providing strength and the former beauty and protection from the elements, much thinner metal members may be used than is true if the metal were used alone to provide the strength giving material in the frame. Thus while a combined window is more expensive than wood alone, it could be much less expensive than metal if a structure adapted to large scale production were devised. Furthermore, the combined wood metal structure has attributes superior to structures of either alone. If it were possible to make an economically sound combination of a wood core with protective and decorative metal exterior, substantial advantages would accrue. Consequently, in spite of the relatively unsatisfactory attempts to combine metal and wood that have been made in the past, this combination has remained a desirable goal of construction people and architects.

Accordingly the principal object of this invention is to provide a novel construction element that combines the advantages of both metal and wood.

It is a further object of this invention to provide such a construction element requiring relatively few dies for making numerous different size construction components.

Yet a further object of this invention is to provide a metallic covered construction element in which no securing means of the metallic portions to the wooden portion are made through the metal.

It is still another object of this invention to provide a metallic covered wooden cored construction element that is well adapted to mass production because it can be prepared in portions as long, as it is practical to have pieces of lumber. The combined metal and wood members are then cut as a single piece to construct any of various size building components.

It is still further object of this invention to provide a building construction element from which windows and doors may be made having channels formed around their peripheral edges without the necessity for milling such channels.

Another object of this invention is to provide a partially metallic covered wooden construction element that can be secured to a completely wooden frame providing excellent insulation qualities, and further permitting simple butt joints between the combined metal-wood portions.

A still further object of this invention is to provide a partially metallic covered wooden construction element that can be secured together with nailing elements of a common length.

It is a still further object of this invention to provide a construction element which combines metallic and wooden components held in operative relationship with

each other by being secured to a base frame; whereby no attaching or securing elements need be inserted through the combination wood and metallic elements one to the other.

It is a still further object of this invention to provide building components made of construction elements combining wood and metal as set out herein.

Yet another object of this invention is to provide a building construction element to be used to make construction components of varying sizes and requiring only a single basic die for both inside and outside cover portions.

A still further object of this invention is to provide an angle member which serves as an exterior glass stop when constructing windows from construction elements of this invention.

Still additional objects of this invention are inherent in the particular structures shown and described herein.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

This invention will be described with reference to the drawings in which corresponding numerals refer to corresponding parts and in which:

FIGURE 1 is a vertical sectional fragmentary view of a portion of a building and a window mounted therein taken through the head section of the window sash with portions of the structure deleted to conserve space; broken lines illustrate hidden parts;

FIGURE 2 is a reduced, fragmentary, isometric view of a portion of the sash illustrated in FIGURE 1 but with the glass stops, both front and back, and glass deleted;

FIGURE 3 is a section taken through a modified form of the building construction element; it is drawn to the same scale as FIG. 2; broken lines illustrated hidden parts;

FIGURE 4 is an exploded, fragmentary, isometric view of a basic frame member with both interior and exterior decorative elements, one of which is shown secured and the other of which is in exploded position to illustrate how they fit together; the figure is drawn to a scale smaller than that of FIGURE 2;

FIGURE 5 is a fragmentary, inside elevational view of a corner of a tongue member and its covering elements showing the butt joints between the vertical and horizontal elements; broken lines illustrate hidden parts; the scale used is that of FIGURE 4;

FIGURE 6 is an elevational view of the frame member and one of the tongue and cover members as positioned in the right hand portion of FIGURE 4, illustrating how the base frame members are joined together as compared to the covered tongue members which are held together only by being secured to the base frame; broken lines illustrate hidden parts; the scale used is that of FIGURE 4; and

FIGURE 7 shows an external fragmentary elevational view of a corner drawn to the scale of FIGURE 4.

Referring to the drawings and specifically to FIGURE 1, the invention is illustrated as being incorporated into a window for a building. In FIGURE 1, 10 designates the exterior material of a building having an opening 11 therein which is surrounded by the usual framing structure 12 and 13. Within the opening in the building is shown secured a window outlining frame. This frame is designated generally by 15 and it is secured in the opening 11 in the customary manner as by the aligning wedges 16 and the spikes 17. The stationary frame portion 15 is unusual in that it is provided with a groove 18 at its leading face into which the tongue 19 of a tongued member 20 fits and is held therein by a nail-

ing element such as that illustrated at 21. A very satisfactory nailing element is a commercially available staple that may be applied by gun.

A covering for tongued element 20 consists of the flange channel member 22 having the flanges 24, and it will be noted that the flanges are of such a length that while they extend toward the tongue 19 they always are shorter than the distance from the outside of the channel members 22 to the tongue. Consequently, they leave a noticeable or even substantial clearance, as at 25, between the ends of the flanges 24 and the nearest approaching portion of tongue 19 of tongued member 20. This clearance at the end of the flanges minimizes the contact between the wood member 20 and the flanged channel member 40 when they are being assembled.

At 26 there is shown a seal between the frame surrounding the window sash and the building proper 10 which seal consists of a sticky, elastic, non-drying caulking compound. Frame member 15 has a reduced portion designated 27 which provides with the tongued portion 20 and the covering channel member 22 on one side a sort of channel 27 into which resilient weatherstripping element designated 28 is secured by any suitable means.

The inwardly spaced portion of frame element 15 is covered by an angle extrusion 29 held in place by any suitable means such as screws 30. Member 31 designates a ceiling in the room in which the window opens while 32 designates a finished molding strip closing the gap between the frame and the ceiling on the inside in a conventional manner.

The sash 34 is movably mounted in the frame in a suitable manner not material herein to the disclosure of this invention, and it is neither shown nor described. The sash grooved frame member 35 has grooves 36 and 37 to receive the tongues of the tongued members. Into these grooves fit the tongues of the tongued members 38 and 39. Each tongue member is covered by a flanged channel member; the one for tongue member 30 being designated 40 and for 39, 41. The flange channel member 40 is illustrated as being made of a metallic extrusion which is both decorative and weather resistant; 41 is a similarly shaped extrusion but here cross hatched to show plastic. As in the case of the frame surrounding the sash, extrusion 40 has the flanges which extend toward and stop short of the tongue element 38 thus leaving the clearance 42. Upon examining the flange channel members 22, 40 and 41 it will be apparent that they are all the same shape. Consequently, a single extrusion die may be used to make all of these parts of the sash and the stationary frame within which the sash is mounted. It is conceivable that both the inside and the outside could be made in either metallic or plastic material and the alternatives for the inside and outside are here shown solely for the purpose of illustrating that either material is suitable for making the flange channel members. The tongue members 39 and 38 are held to the frame by nailing means identical to that used with the frame above and hence identified by the same designations 21.

The frame that makes up the sash is provided on the inside with an angle member designated 46 which serves as an exterior stop for the glass or pane member 47. Angle member 46 has a pair of parallel ridges or rails designated 48 and 49 on opposite edges of a portion of the angle member adjacent to the sash frame, and these rails leave a space between them into which is inserted a sticky, resilient, non-drying, caulking compound 50 before this angle member is secured to the sash element in any suitable manner, as by the screw 51. Thus, a structure which is used both in the frame surrounding the window and the window sash may be employed as a covering for the tongue members 20 and 38, no special extrusion having an exterior glass stop need be employed for the sash. The angle member also has a groove in its leg that extends inwardly from the frame of the sash to serve as a glass stop. This groove is designated 52. The

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same sort of sticky, resilient, non-drying, caulking compound used at 26 is used at 54 to glaze the sash.

A plastic stop member 55 is provided for the inside support of the glass 47, and it is secured to the frame in any suitable manner as by a finishing screw 56.

As shown clearly in FIGURE 2, the two tongued members are wider than the grooved frame members between the tongued members so that a channel 44 is formed between the two tongued members having the edge of the frame member 35 forming the bottom of the channel. The flanged channel members may be made to extend at only one side by having the tongues off center while the grooves in the frame are centered. This channel is useful for receiving the weatherstripping 45. Furthermore, the channel for this weatherstripping need not be milled, as it is formed automatically by the difference in width between the tongued members covered with the flanged channel extrusions and the frame elements.

In FIGURE 3 is shown a mild modification of the structure illustrated herebefore in that the groove frame member 57 is substantially thicker than any of the groove frame members discussed so far. For this reason, it is important to offset the groove 58 so that the tongue 59 of the tongued member 60 is close enough to one edge of the frame member 57 for a nailing element of common length such as the one designated 61 can reach through to the tongue to secure it in the groove. It will be noted that the flange channel member 62 has the same length flanges as at 64 and 65 as is found on the smaller flange channel members such as the ones designated 22 and 40. For this reason tongue 59 may be offset in one direction from the other far enough to bring it close to the edge of the frame member 57 which permits a nailing element even of common length to reach the tongue. As is also shown in FIGURE 3, when the tongue 59 is offset any substantial distance, the tongued member 60 is provided with a ledge portion 66 which is of a thickness about equal to that of the metal of the flange channel member 62 so that there is adequate support for the tongue member against the frame member. This shelf structure is even more important in situations such as those shown in FIGURES 1 and 2 where the flange is unsupported by the frame. Nevertheless, there is a clearance provided as at 67 which allows the flange channel member to be slipped over the tongue member easily when preparing stock for use in manufacturing all kinds of building components.

The structure as shown in FIGURE 3 is principally for the purpose of illustrating the off-centered tongue structure which is possible when the flanges are kept short. It also suggests, however, that the technique described herein for securing protective and decorative trim to basic wood framing could be used with furniture or other wooden structures to which metal or other decorative trim is desired to be mounted in a manner in which no apparent securing is required.

FIGURE 4 illustrates the method of securing the entire structure together. Only the grooved frame elements such as the one 35 and corresponding vertical pieces 68 and 69 are joined together. The groove 36 in the head piece 35 joined by grooves 70 and 72 form a groove extending around the frame. These frame members are rigidly secured together in the usual manner as by nailed rabbeted joints. The horizontal inside trim member comprising the flange channel member 41 and its corresponding tongue member 39 are matched equivalent vertical flange channel members as at 72 and 74. These vertical members are secured to their corresponding vertical frame members but only to the frame members by means of the tongue. The horizontal exterior flange channel member and its corresponding horizontal tongue member 38 having matching vertical flanged channel members as at 75 and 76, each provided with a tongue member 77 and 78 respectively. As shown in FIGURE 4, these members are merely aligned adjacent one another but are not

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secured to each other. They, like the inside trim members, are held in their correct relationship by the tongues of the members 38, 77 and 78 extending into the grooves 36, 70 and 71.

As shown clearly in FIGURES 4 and 6, frame members 35 and 69 are rabbeted together as at 79 to form a solid and rigid joint. The flanged channel members, however, as illustrated particularly in FIGURES 5, and 6 have only butt joints between them as shown clearly at 81 in FIGURE 5 and 82 in FIGURE 6. While the tongued members are all rigidly secured to the various grooved frame members, there is no securing tongued members directly. The flanged channel members are secured to the tongued members solely by reason of being longitudinally slidable onto them; the flanges gripping the tongue members to prevent their being moved relative to the tongue members except longitudinally. For this reason, there may be movement between the flanged channel members and the tongued members as when metal is used for the flanged channel members, and they expand and contract in response to temperature change at a different rate than the wood. The reverse is also true when the wood might well expand and contract as the result of the change in moisture conditions. The metal need not move with the wood, nor the wood with the metal.

The joints 81 and 82 could be either vertical or horizontal. Since the flanged channel members are held on only by the flanges gripping the tongued members, however, it is considered better practice to have the butt joints 81 and 82 extend horizontally rather than vertically. The open end of the flanged channel members, such as those indicated at 84 and 85 in FIGURE 4, are covered with now commonly known and used sticky, resilient, non-drying caulking compound, a good example of which is sold commercially under the name "Tremco" which effectively seals this portion of the wood structure against attack by moisture. Such caulking compound is also inserted between all the joints 81 and 82 before the tongue members and their accompanying flanged channel members are assembled to the frame elements.

FIGURE 7 illustrates one corner on either side of the structure illustrated in FIGURES 4, 5, and 6, as it would appear once assembled and looked at in elevation.

In FIGURE 4, the end of the tongue of tongue member 39 extends into the channel that is formed by having the tongued members and their accompanying flanged channel members extending beyond the frame structure. This portion 86 of the tongue of tongue member 39 would be trimmed off in order to leave a clear channel extending entirely around the sash elements to receive the weatherstripping.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A building element comprising: a frame member grooved both front and back; a pair of flanged channel members; tongued members longitudinally slidable within each of said flanged channel members and having the tongues thereof protruding outward through the space between the ends of the flanges of said flanged channel members; the tongues of said tongued members extending in the grooves of said frame members and means engaging said tongues and frame member for retaining the tongues of said tongued members in the grooves of said frame member, said flanged channel members being held on said tongued members by having the flanges thereof embrace said tongue members closely and being gripped between said frame and tongued members when the tongues of the latter are secured in the former; and said tongued members being secured in engagement with each other solely by being secured to said frame member.

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2. The building construction element of claim 1 in which there is clearance between the ends of the flanges of said flanged channel members and base of the tongues of said tongued members.

3. The structure of claim 1 in which said tongue members extend sideways farther than said frame members whereby a channel is formed between said tongue members with the side of frame members at the bottom of said channel.

4. A construction element joint comprising: first 10
grooved frame member; a second grooved frame member rigidly joined to said first grooved frame member; a first weather resistant channel member; a first tongue secured to said first channel member extending therefrom in the same direction as the channel legs thereof and farther 15
than said channel legs; said tongue fitting within and held in the groove of said first grooved frame member; a second weather resistant channel member; a second tongue

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secured to and extending from said second channel member identically to said first tongue with relation to first said channel member; said second tongue fitting within the groove of said second frame member and held therein; whereby said channel members are held in a butt joint against each other solely by being secured to said grooved frame members.

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