

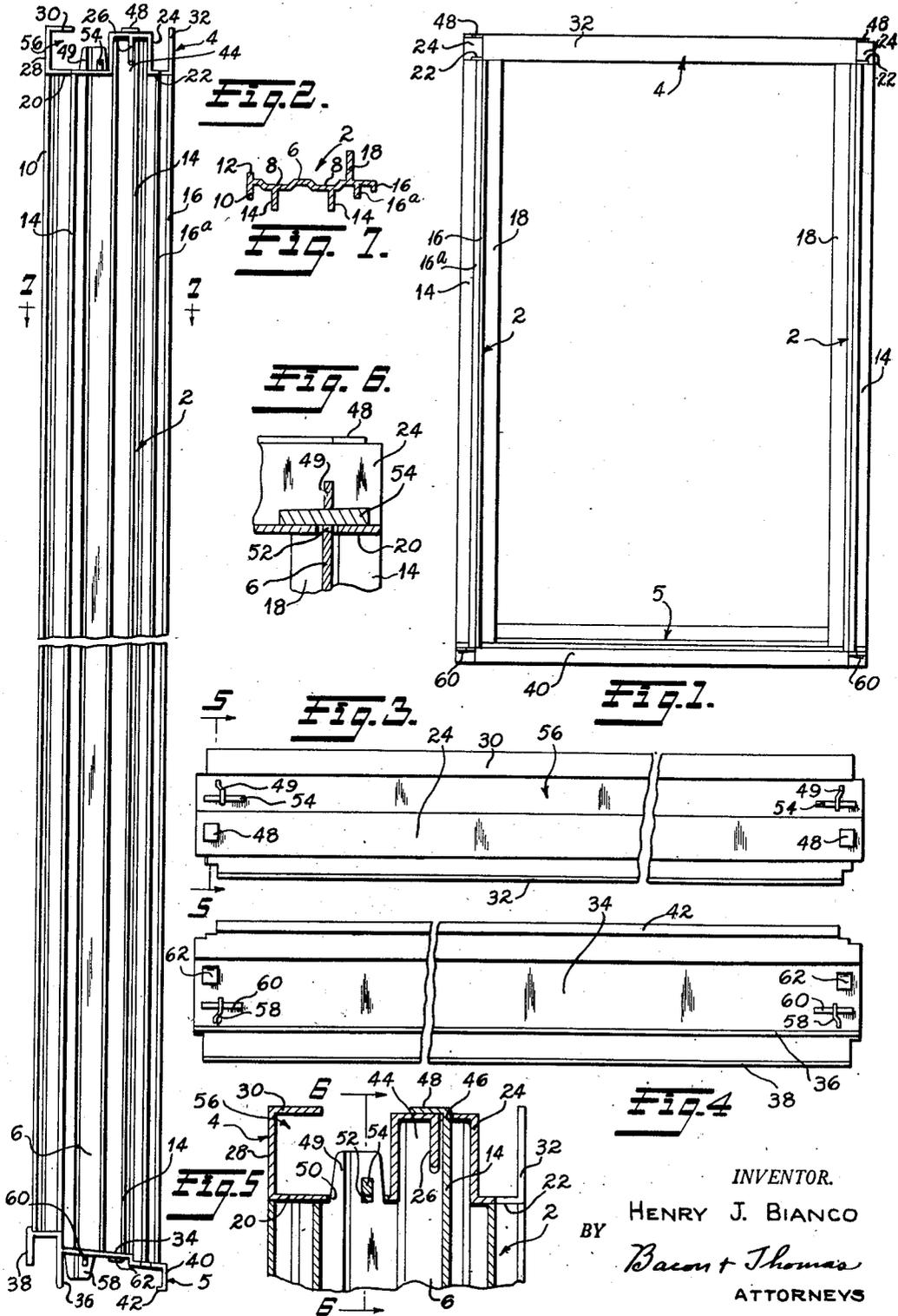
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WINDOW FRAME CONSTRUCTION

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This invention relates to frames and to the manner of construction thereof. While the drawings and description relate specifically to a window frame, it is to be understood that such description is merely by way of illustration. The invention may be incorporated in other frame structures such as doorways, casements, etc.

More specifically, the invention relates to the structure of the frame components and to manner of assembling and securing them together.

In brief, the frame is made up of side members preferably comprising similar extruded aluminum or aluminum alloy shapes, a top horizontal member or lintel and a bottom member or sill. The side members consists of a web and vertical flanges, and the horizontal members consist of extruded shapes defining suitable surfaces for the interior of the frame and outwardly facing channels. The horizontal members are arranged to span and abut the ends of the side members and the latter are provided with projections extending through the horizontal members, some of which are adapted to be bent to lie against the outer surface of the horizontal members and others of which are provided with openings adapted to receive wedges bearing against the outer surface of the horizontal members to thus retain the entire assembly securely in assembled relationship. The arrangement of the projections or extensions of the side members is such that they accurately position the parts relative to each other to insure proper alignment without the necessity of employing highly skilled labor to assemble the frames.

It is, therefore, an object of this invention to provide a frame structure employing simple extruded shapes.

Another object of the invention is to provide a simple yet effective fastening means for tightly drawing together and locking different frame components in assembled relation.

Still another object of the invention is to provide, in a frame structure, fastening or locking means confined completely within the outline of the frame.

It is another object of this invention to provide a frame construction from extruded shapes wherein components of the frame engage each other in abutting relation but at points covering a relatively large area whereby to insure rigid right angular corners.

Other objects and advantages will become apparent to those skilled in the art as the description proceeds in connection with the accompanying drawings, wherein:

Fig. 1 is a front elevational view of the outside of a window frame constructed in accordance with the present invention;

Fig. 2 is a left side elevational view of the frame of Fig. 1 but on a much enlarged scale;

Fig. 3 is a top plan view of the frame of Fig. 1;

Fig. 4 is a bottom plan view;

Fig. 5 is a fragmentary sectional view taken substantially along the line 5—5 of Fig. 3 but drawn to a larger scale;

Fig. 6 is a fragmentary sectional view taken substantially along the line 6—6 of Fig. 5; and

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Fig. 7 is a transverse sectional view of a side member of the frame as taken along the line 7—7 of Fig. 2.

By way of example, a window frame constructed in accordance with the present invention comprises vertical side members 2, a horizontal top member or lintel 4 and a bottom member or sill 5. The side members 2 are preferably of extruded aluminum or aluminum alloy of a sectional shape substantially as shown in Fig. 7 having a web 6 extending from the front to the back of the frame and provided with a pair of shallow vertical channels 8. It will be understood, however, that the frame members may be made of any other suitable malleable metal, either extruded or rolled. The channels 8 lend rigidity to the web 6 while permitting a thin wall section and also provide space to receive the end of a latch, not a part of the invention claimed in this application but described and claimed in application Serial No. 364,986, filed June 30, 1953. At one edge of the web 6 is an integral flange 10 extending outwardly from the web a substantial distance and inwardly therefrom a relatively short distance to define an inwardly extending edge flange 12. The web 6 is also provided with a pair of outwardly directed vertical flanges 14, 16 and 16a, and a second inwardly directed vertical flange 18 spaced from the flange 12 but of considerably greater height than the flange 12. The flanges 12 and 18 are adapted to receive a removable track therebetween for sliding sash, as disclosed in my application Serial No. 365,056, filed June 30, 1953, and the flange 16a is adapted to serve as an abutment to aid mason in positioning bricks, etc. along the side members 2 so as to provide a groove for caulking compound as disclosed in my application Serial No. 364,985, filed June 30, 1953.

The upper horizontal member or lintel 4 is also preferably of extruded aluminum or aluminum alloy and is formed to a sectional shape clearly shown at the top of Figs. 2 and 5. The lintel has bottom walls 20 and 22 and a downwardly facing channel structure 24 therebetween. A flange 26 extends longitudinally within the channel 24 and defines a weather stripping bead for an upper window sash (not shown) in addition to adding rigidity to the lintel structure. The inner edge of the lintel comprises an upwardly extending flange 28 and an inwardly directed flange 30 substantially coplanar with the upper terminal edge of a flange 32 on the outer side of the lintel. The upper surface of the channel structure 24 is spaced below the plane defined by the upper surface of flange 30 and the edge of flange 32 a distance at least equal to the thickness of tab 48, to be described later.

The sill 5 is likewise preferably of extruded aluminum or aluminum alloy and is of a shape to define a stepped, outwardly sloping wall 34 and a downwardly directed flange 36. The inner edge of the sill 5 is also provided with a downwardly extending edge flange 38 and the outer portion of the sill comprises a downwardly directed flashing or flange 40 turned inwardly at its lower edge, as at 42. It is to be noted that the lowermost edge of the flange 36 and the inwardly directed edge 42 of flange 40 are substantially in the same horizontal plane which is angularly related to the general plane of the sloping wall 34.

The upper ends of the side members 2 are shaped to abut snugly against the bottom surfaces 20 and 22 of the lintel 4 and are provided with portions 44 extending upwardly and substantially filling the channel 24. The portions 44 are preferably notched to receive the rib or flange 26 in channel 24. As is clearly apparent from Figs. 2 and 5, the portion 44 of each side member includes one of the vertical, outwardly extending flanges 14. A portion of that flange 14 projects upwardly above the end of the web portion of portion 44 and through an elongated slot or opening 46 (see Fig. 5) in the uppermost wall of the channel 24. As shown in the drawings, the upwardly projecting extension or tab 48 of the flange 14 is bent

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over to lie snugly against the outer surface of the channel 24.

A portion 49 of the web 6 underlying the surface 20 of lintel 4 projects upwardly as a tab through a slot 50 in the lintel and is provided with a transverse opening 52 located in the part above the upper surface of the bottom wall of the lintel. A wedge 54 extends through the opening 52 and bears against the upper surface of the lintel wall 20 and is driven snugly into opening 52 to thereby further secure and clamp the lintel to the upper end of the side member 2.

It is to be noted that the slots 46 and 50 are accurately dimensioned, as to their width, to snugly receive the tabs or extensions of the side member without appreciable play or clearance laterally of the slots. Since the tab 49 extending through slot 50 is a portion of the web 6 and the tab 48 is a portion of flange 14, the slots and tabs are thus arranged in vertical planes at right angles to each other. The slot 50 thus accurately positions the side members relative to the lintel to accurately fix the width of the frame, while the tabs 48 accurately position the lintel and side members in a fore and aft direction to insure coincidence of the inner and the outer edges of the lintel and side members.

It is to be further noted that the tabs 49 extend upwardly into a channel 56 defined by a side of the channel 24 and the flange 28 and that the tabs 49 and wedges 54 are contained entirely within the channel 56 and thus do not project outwardly from the boundaries of the frame. The tabs 48, when bent downwardly as shown, define an outer surface substantially coincident with the plane defined by flange 30 and the upper edge of flange 32.

The lowermost end of each of the side members 2 is shaped complementary to the upper surface of the sill 5 and a lower portion of the web 6 projects downwardly through the sill and defines a tab 58 similar to the tab 49 previously described. A wedge 60 extends through a transverse opening in the tab 58 and bears against the lower surface of the wall 34 of the sill to hold the sill and side members in assembled relation in the same manner as the wedge 54 at the upper end of each side member. The lowermost end of the flange 14, which terminates at its upper end in tab 48, extends downwardly through the sill and is bent to the position shown to form a further locking tab 62. The tabs 58 and 62 extend through accurately dimensioned slots, the same as described in connection with the joint at the lintel, and thus accurately position the lowermost ends of the side members relative to the sill 5. It is to be noted here also that the tabs 58 and 62 are completely confined within the channel defined by the wall 34 of the sill and flanges 36 and 40 and thus do not project outwardly of the boundaries of the frame.

It is to be further noted that the ends of flanges 8, 14, and 16 bear against both the lintel and sill, in addition to the ends of web 6, and thus provide bearing over a substantial distance in each direction to accurately fix the angular relation between the side members and the lintel and sill, and thus insure maintenance of right angles at the corners of the frame.

While a single specific embodiment of the invention has been described, it is to be understood that the invention is not limited thereto but may embody modifications falling within the scope of the appended claims. Likewise, the invention is not limited to a window frame but is readily adaptable to door frames or other frames of a similar nature.

I claim:

1. In a frame, a pair of members disposed at right angles to each other, one of the said members comprising a web, and a flange projecting outwardly from said web in substantially perpendicular relation thereto, the other of said members having an inner surface of a contour corresponding to that of one end of the web of said one member, said one member having a tab projecting from

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said web and said flange, respectively, and said other member having openings through which said tabs project; and a wedge extending through at least one of said tabs and bearing against the outer surface of said other member, the other of said tabs being bent over onto said outer surface.

2. In a frame, a pair of members disposed at right angles to each other, one of the said members comprising a web, and a flange projecting outwardly from said web in substantially perpendicular relation thereto, the other of said members comprising a web having steps therein, said one member having an end of a contour corresponding to that of the inner surface of said other member, said one member having a tab projecting from said web and said flange, respectively, and said other member having openings through which said tabs project; and a wedge extending through at least one of said tabs and bearing against the outer surface of said other member, the other of said tabs being bent over onto said outer surface.

3. A frame as defined in claim 2, in which the web portion of said other member is inclined between said steps.

4. In a frame, vertical side members; horizontal members spanning and abutting the ends of said vertical side members; a pair of spaced extensions at each end of said vertical members, said extensions projecting through openings in said horizontal members, one of the extensions of each pair having an opening therethrough adjacent the outer surface of its corresponding horizontal member; and a wedge element extending through said opening and bearing against the outer surface of said horizontal member, the other member of each pair being bent laterally to lie against the outer surface of its corresponding horizontal member.

5. A frame as defined in claim 4, wherein said extensions are in the form of generally flat tabs and wherein said openings are elongated slots complementary in shape to said tabs, the slots of each pair and the portions of said tabs therein lying in vertical planes extending perpendicular to each other.

6. A frame as defined in claim 4, wherein said side members each include a generally flat vertical web portion and vertical flanges perpendicular to said web portion, the extensions of each pair comprising an integral vertically projecting portion of said web and of one of said flanges, respectively.

7. A frame as defined in claim 4, wherein each of said horizontal members includes a channel facing outwardly of said frame, said one of said extensions projecting into said channel, the projecting portion of said extension and said wedge element lying entirely within said channel.

8. A frame as defined in claim 4, wherein each of said horizontal members includes flanges directed outwardly of said frame, each of said extensions being entirely inwardly of the outermost portions of said flanges.

9. In a window frame, vertical side members each comprising a vertical web and vertical flanges perpendicular to said web; a horizontal lintel spanning and abutting the upper ends of said side members, said lintel comprising a thin walled member having at least one upwardly open channel and at least one downwardly open channel, the upper end of said side members being of a shape complementary to the bottom configuration of said lintel with a portion of its web and at least one flange extending upwardly into said downwardly open channel and another portion of said web underlying said upwardly open channel, said web having an integral extension extending through said lintel with a portion of its web and at least one flange extending upwardly into said downwardly open channel and another portion of said web underlying said upwardly open channel, said web having an integral extension extending through said lintel into said upwardly open channel, said extension having an opening extending therethrough; and a wedge

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element projecting through said opening and engaging the bottom of said upwardly open channel, said one flange having an integral extension projecting through said lintel and being bent to lie against an outer surface thereof.

10. A window frame as defined in claim 9, wherein said side members and said lintel are of extruded malleable metal.

11. In a metal window frame, vertical side members each comprising a vertical web and vertical flanges generally perpendicular to said web and extending on opposite sides thereof with certain of said flanges spaced inwardly from the side edges of said side members; horizontal members spanning and abutting the ends of said vertical side members; interlocking means on said members securely holding said horizontal members in abutment with the ends of said vertical members, said horizontal members having surfaces in abutment with ends of said web and said flanges, whereby to hold said members in fixed angular relation to each other.

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12. A window frame as defined in claim 11, wherein said holding means are in the form of generally flat tabs extending from the ends of said web and one of said flanges and through elongated slots in said horizontal members complementary in shape to said tabs, said slots being disposed at each corner of said frame and the portions of said tabs therein lying in vertical planes extending perpendicular to each other.

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