April 14, 1964 O. STOTZ 3,128,509

WINDOW FRAME STRUCTURE

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FIG. 1

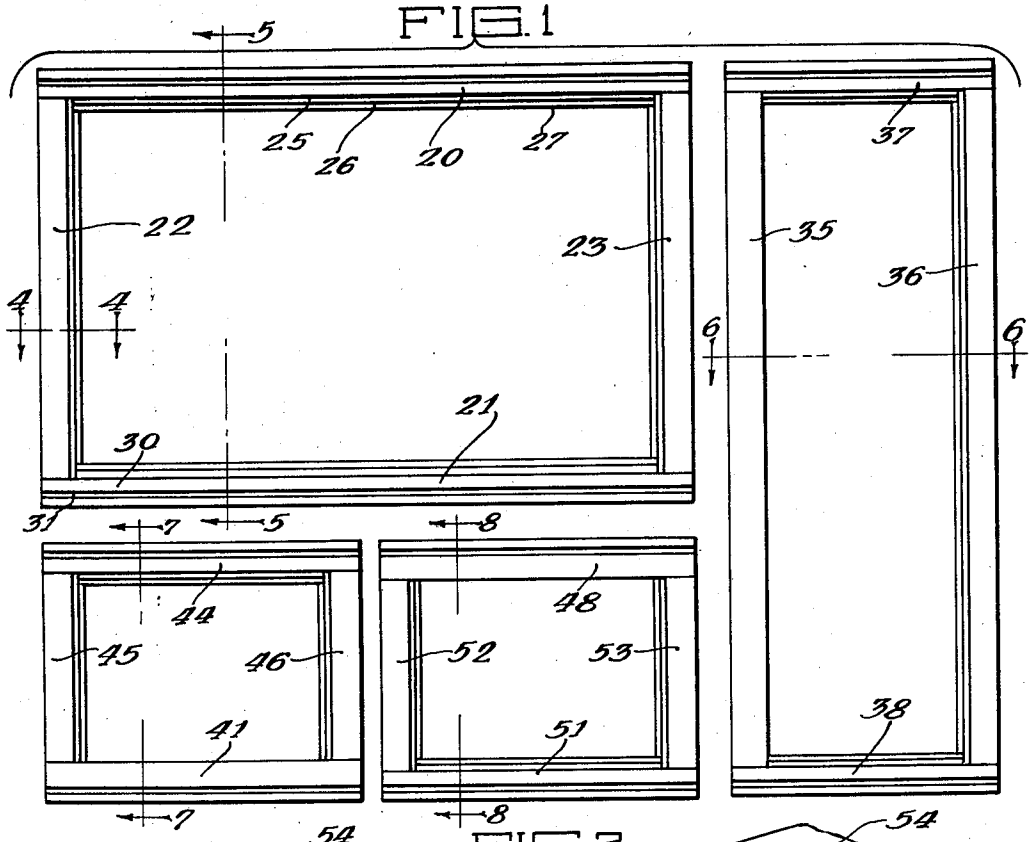


FIG. 2

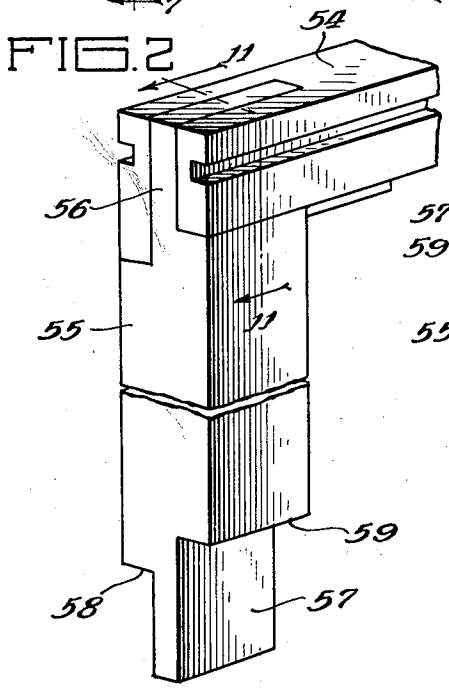


FIG. 3

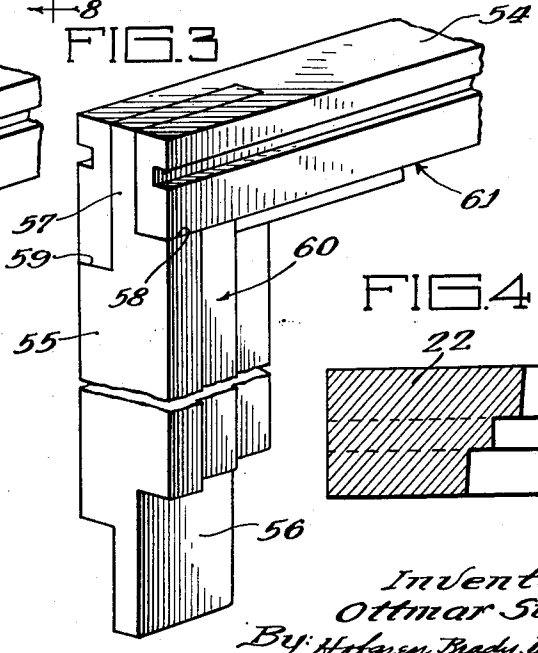


FIG. 4

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FIG. 5

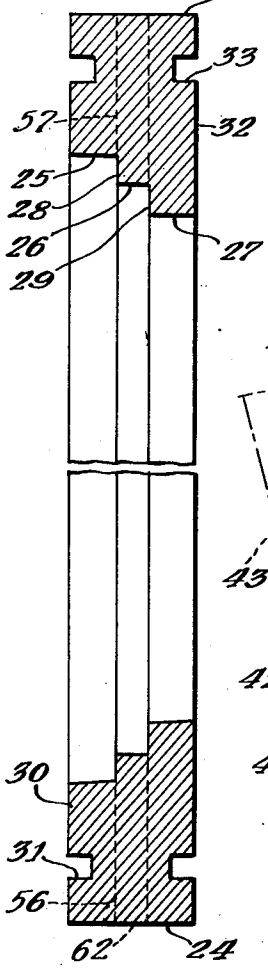
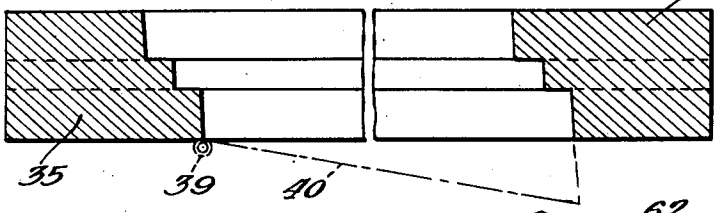


FIG. 6



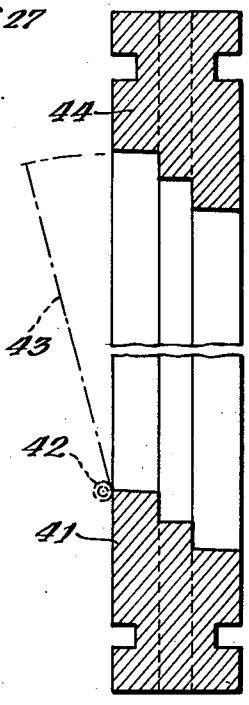


FIG. 7

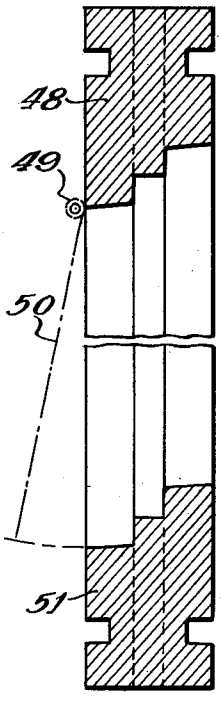


FIG. 8

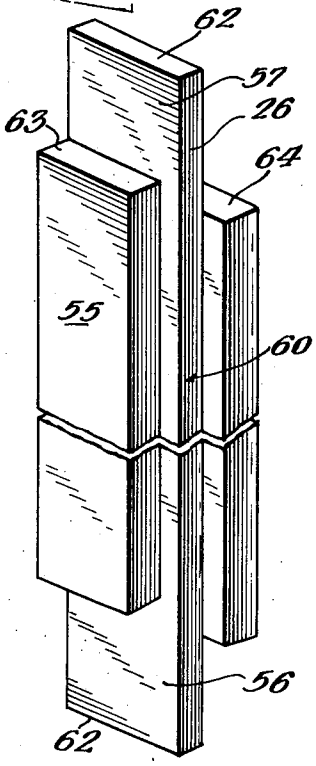


FIG. 9

FIG. 11

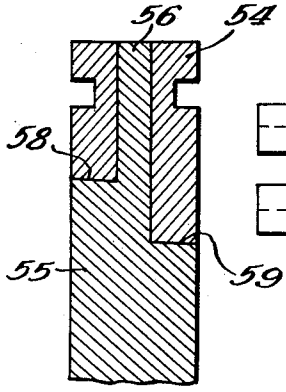
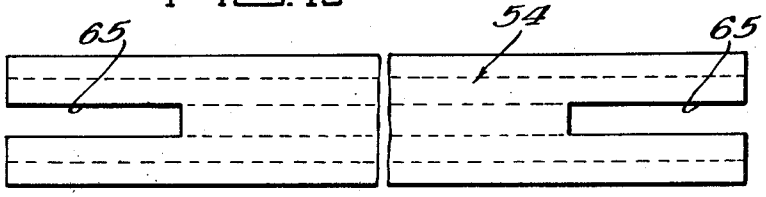


FIG. 10



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FIG. 12

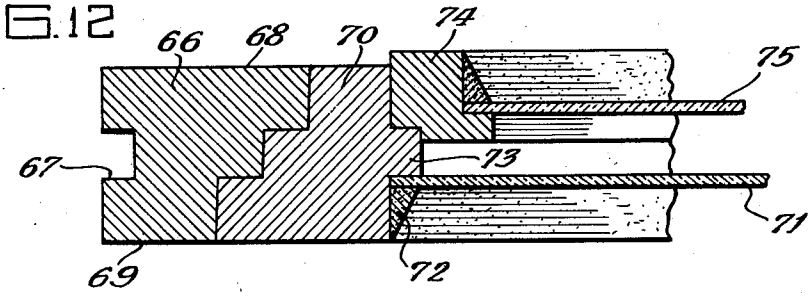


FIG. 13

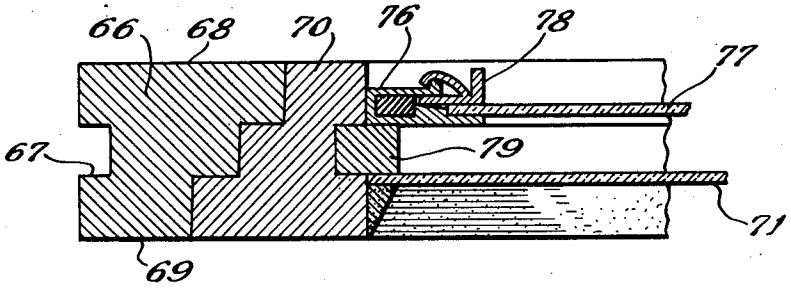


FIG. 14

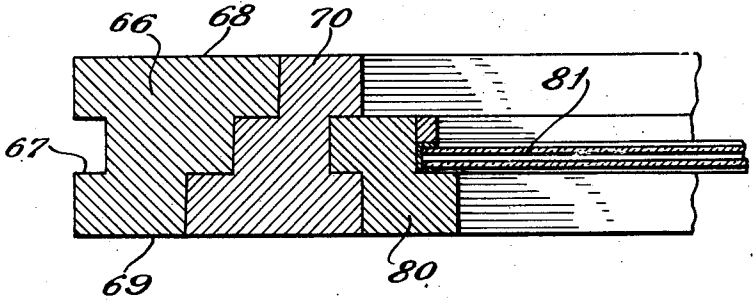
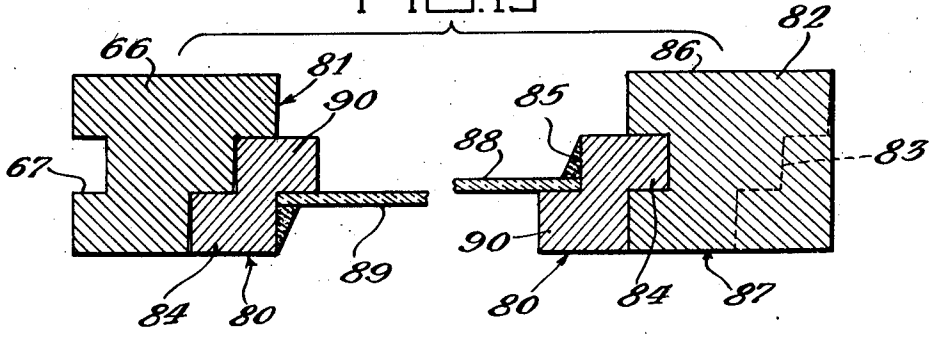


FIG. 15



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3,128,509

WINDOW FRAME STRUCTURE

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Filed Apr. 13, 1962, Ser. No. 187,432
6 Claims. (Cl. 20—11)

This invention relates to a new and improved frame construction for windows of the type used primarily in home construction.

A rough window opening in a building whether the building be of masonry, wood, stone, or other construction has a window frame set therein to receive a sash carrying the window light or glazing. In recent years a wide choice of materials has been available for the formation of the window frames including steel treated in various ways, the lighter alloys and metals including aluminum, as well as lumber of various grades. The present invention is concerned with a novel construction of a wood frame which materially lowers the cost of producing window frames by the expediency of making the frame members of a universal configuration. Wood frame members are generally formed from lumber which is milled to a desired shape. In the present invention a single milling setup can prepare frames for various windows. The lumber may be milled in long lengths and simply cut to form the square or rectangular openings comprising the window frames.

It is therefore the principal object of this invention to provide a new, improved and more economical wooden window frame construction.

Another object is to provide a novel wood frame for a window so constructed that the frame member is equipped with a rabbeted inner surface with the ends of the frame elements being so formed as to permit the facing of the rabbets toward the inside or outside of the frame as desired.

Another object is to provide a universal frame member for windows which by means of assembly alone may accommodate different window hanging styles.

A further object is to provide a novel wood frame member which may be given a single lengthwise milling in order to provide a standard shape suitable for receiving casement, hopper, awning, fixed and double-hung window styles.

Other objects, features and advantages of the present invention will be apparent from the following description of a preferred embodiment illustrated in the accompanying drawings, in which:

FIGURE 1 is a composite elevational view of a plurality of window styles made in accordance with the frame members of this invention, with the sashes removed for clarity of illustrating the frame construction;

FIGURE 2 is a fragmentary perspective view of one corner of a frame construction on an enlarged scale illustrating the details of joining two frame members;

FIGURE 3 is similar to FIGURE 2 showing the upright frame member in FIGURE 2 joined to the horizontal frame member at the opposite end of the former;

FIGURE 4 is a sectional view through the frame member taken substantially along the line 4—4 in FIGURE 1;

FIGURE 5 is a vertical sectional view through the fixed window frame member shown in FIGURE 1 at generally line 5—5 therein;

FIGURE 6 is a horizontal sectional view through the casement window frame shown in FIGURE 1 generally along line 6—6 therein;

FIGURE 7 is a vertical sectional view through the hopper window frame shown in FIGURE 1 generally along line 7—7 therein;

FIGURE 8 is a vertical sectional view through the awning window frame shown in FIGURE 1 taken generally along line 8—8 therein;

FIGURE 9 is a broken perspective view of a frame member of the present construction with tongues at the ends thereof;

FIGURE 10 is a broken plan view of a frame member of the present invention with grooves at the ends thereof;

FIGURE 11 is a fragmentary sectional view through the junction of a pair of frame members taken substantially along line 11—11 in FIGURE 2; and

FIGURES 12, 13, 14 and 15 are generally horizontal sectional views through a window frame member showing the assembly of various sashes and glazings therein.

It is the intention of the present invention to mill relatively long lengths of window frame members and thereafter cut such long lengths into the shorter lengths required to make up a specific window frame. The length of each frame member may be chosen as to its outside dimensions in the resulting frame. In other words, if the rough opening into which a window frame it to be placed is three feet six inches wide, the top and bottom frame members may be cut to this length. After individual frame members are selected as to their length, they may be given a standard end treatment to permit their assembly with similar frame members making up the rectangle of the rough frame. As illustrated in FIGURE 1, various types of windows may be accommodated by the inclusion of the present frame member on all four sides thereof. A fixed window frame may include top and bottom members 20 and 21 joined to left hand member 22 and right hand member 23, together forming a rectangular opening. Each frame member has a similar shape in that it is possible that each frame member 20, 21, 22 and 23 could have been cut from a single length of milled frame stock.

As can be seen in FIGURE 5, each frame member has an outer surface 24 which may be flat as illustrated or provided with a caulking groove as shown incorporated in the frame members in FIGURES 12 through 15. The opposite surface of the wood frame is provided with a stepped surface forming rabbets intended to mate with a similarly shaped sash to keep water out while permitting the window to be opened and closed. As seen in FIGURE 5, the stepped surface is composed of three surfaces 25, 26 and 27 facing toward the center of the frame like the steps of a staircase with joining surfaces 28 and 29 therebetween extending generally in the plane of the frame. In all of the frame members of this invention the surfaces forming the rabbets on the inside of the frame are the same. Each includes the center surface 26 both centered relative to the thickness of the frame members and being located in the center of the frame. The inner and outer faces of the frame may be flat or provided with grooves to receive facing material such as is usual in trimming out a window opening. In the fixed window shown in FIGURES 1 and 5, the outer surface 30 is provided with a facing receiving groove 31 and the inner surface 32 is similarly provided with a groove 33. These grooves may be omitted if desired so that the surfaces 30 and 32 would be perfectly flat as illustrated in FIGURES 12 to 15. It should be noted that in the fixed frame window, all of the rabbeted surfaces face the exterior of the frame member. The top, bottom and side rails of the frame are thus assembled with the rabbets facing the outside of the building.

A casement type window is shown on the right hand side of FIGURE 1 and involves relatively long upright frame members 35 and 36 with a top rail 37 and bottom rail 38 completing the rectangle. In this form of window there is a vertical hinge such as illustrated in FIGURE 6 diagrammatically by the circle 39 indicating a swinging of the frame member by the dotted line 40 toward the outside of the building. In this form the rabbeted surface on the vertical rail 35 faces toward the inside of the building in order that the sash may swing away from the

surfaces without binding. The other three rails 36, 37 and 38 must have their rabbeted surfaces facing toward the outside of the building in order that the sash may swing out of the opening about the hinge 39. The same frame members may be used to form the frame for the casement window as are used for the fixed window. The difference lies in the fact that the frame member 35 is switched end for end in order to face the rabbets thereof toward the inside of the building rather than the outside.

The frame members may also be used to make frames for a hopper window such as illustrated at the bottom left hand side of FIGURE 1 where the bottom rail 41 is intended to receive a hinge 42 (FIGURE 7) so that the window can swing toward the dotted line position 43 out of the frame. The upper rail 44 as well as each side rail 45 and 46, respectively, have their rabbeted surfaces facing in the same direction being opposite to the direction faced by the rabbets of the bottom rail 41. Hopper type windows ordinarily swing toward the inside of a home so that the bottom rail 41 may have its rabbeted inner surface facing the outside of the building causing rain to naturally drain toward the outside.

An awning type window is generally thought of as the reverse of a hopper type. In this instance the top rail 48 is provided with a hinge 49 so that the window can swing outwardly along a dotted line position 50 as indicated in FIGURE 8. The bottom rail 51 as well as the side rails 52 and 53, respectively, have their rabbeted surfaces facing outwardly so that the sash can swing freely out of the frame. The upper rail 48 has its rabbets facing inwardly opposite the manner in which the other rail members are oriented.

The key to the formation of various types of window frames including those described above lies in the reversibility of the frame members with respect to each other permitting the facing of the rabbet surface inwardly or outwardly of the frame as desired. This construction is illustrated in FIGURES 2 to 4 and 9 to 11. Referring first to FIGURES 2 and 3, an upper rail member 54 is shown joined to an upright rail member 55. The central rabbeted surface 26 has the same width as a tongue 56 received in a cooperating groove in the horizontal rail 54. At the bottom of the upright member in FIGURE 2 a tongue 57 is shown extending below a pair of shoulders 58 and 59. This tongue 57 may be inserted in the groove in the horizontal member 54 in order to face the rabbeted surface on the upright frame member in the opposite direction. Such a result is shown in FIGURE 3 where the upright frame member has been reversed in position showing that the rabbeted surface generally indicated 60 faces toward the same side as does the rabbeted surface generally indicated 61 on the horizontal member.

In making the frame for any particular window the standard milled frame member is simply cut to length and thereafter given an end treatment involving either a tongue or a groove selected in order to mate with the other members of the frame. In FIGURE 9 the upright frame member is shown. The tongues 56 and 57 have a width equal to the width of the central rabbet surface 26. The end 62 of each tongue is square with the side of the rail. A shoulder is formed on either side of each tongue. One shoulder 63 is spaced from the end of the tongue a distance equal to the width from the outside surface 24 of the frame member to the nearest rabbet surface 25 (FIGURE 5). The shoulder 64 on the opposite side of the tongue is spaced a greater distance from the end thereof. The spacing is such that the distance is equal to the longest distance across the frame member, from the outer surface 24 to the innermost rabbet surface 27. As may be noted, the corresponding shoulders at the opposite end of the frame member are on opposite sides of the tongue 56. In mating either end of the frame member shown in FIGURE 9 with a correspondingly grooved frame member the tongue will fill the groove and the shoulders will abut the corresponding rabbeted surfaces on the mating frame member. The end joint of two frame members is thus solid and may be pinned in the usual fashion. The grooved frame member 54 is illustrated in FIGURE 10 as having a groove 65 at each end having a depth equal to the width of the tongues 56 and 57.

In a fixed window type of frame as shown in FIGURE 1, all of the joints at the corners of the frame will be formed as shown in FIGURE 3 so that the rabbeted surfaces face inwardly. This same joint will appear at the top of the hopper window frame shown in the lower left hand corner of FIGURE 1, at the bottom corners of the awning window frame shown in the center of FIGURE 1, and on the right hand side of the casement window frame shown on the right hand side of FIGURE 1. The remaining joints of the window frames illustrated where the rabbets of one frame member face inwardly and the rabbets of the other face outwardly are formed as illustrated in FIGURE 2 of the drawings. It may be immediately apparent that the reversal of the position end for end of one frame member may easily be used to make this frame difference.

The manner in which various sashes may be incorporated in the frame members just described is illustrated in FIGURES 12 to 15. A frame member 66 is in each instance provided with a variation in the sash incorporated therewith. Each frame member has a caulking groove 67 on its outer surface whereas the inner and outer surfaces 68 and 69, respectively, are perfectly flat. A sash member 70 may be equipped with various panes. In FIGURE 12 a permanent glazing 71 held in by putty 72 is mounted against a glazing strip 73 integral with the sash 70. A wooden storm sash 74 may also be mounted on the sash frame 70 in order to carry a storm glazing 75. In FIGURE 13 the storm glazing may be a completely separate metal frame member involving an aluminum extrusion 76 in which a storm pane 77 is retained by a mechanical retainer 78. The retainer fastens by its resiliency at the frame 76 to retain the glaze in place. In this instance a glazing strip 79 is separate from the sash 70 in order to receive the glazing 71.

In FIGURE 14 a separate frame member 80 generally Z-shaped in section is shown as attached to the sash 70 in a manner to allow a reversal of the frame as far as the inner and outer surfaces are concerned. A thermopane type of double glazing 81 may be mounted on the sash frame 80 united with the main frame of the sash. The importance of the frame member 80 may be appreciated in a consideration of the construction illustrated in FIGURE 15. The sash frame 66 is shown with the groove 67 therein and the rabbet surface 81 as is usually employed in making a large quantity of windows all of which require the rabbeted surface. On the right hand side of FIGURE 15 the sash frame stock 82 is shown in its condition before the milling along the dotted line 83 which provided the rabbeted surfaces. In certain instances a combination of windows within a single frame might require a single rail of the frame to have its rabbets faced inwardly and outwardly. Such an example would be a fixed window frame beside which there is an awning type in which the top rail 20 (FIGURE 1) of the fixed window and the top rail 48 of the awning window have rabbets faced in opposite directions. This may be accomplished by the use of the frame member 82 prior to the milling of the rabbet surfaces 83 by the inclusion of the frame member 80 with the caulking groove 67. A nose 84 on member 80 will fit the caulking groove to provide the rabbet surfaces 85 on member 80 facing toward the surface 86 or alternately toward the surface 87 of the frame member as desired. In such instance a glazing 88 may be directly incorporated against the member 80 or any of the combinations shown in the other figures employed as desired. The member 80 may be reversed side for side to fit into the rabbet surface 81 of a standard stock frame 66 as illustrated on the left hand side of FIGURE 15. In this instance a glazing

89 may be employed on either side of the nose 90 or an insert such as illustrated in FIGURE 13 may be employed. The complete versatility of the frame stock for making up windows of wood is thus illustrated and may be readily understood. The present combination may be used for a double-hung window where the upper pane of the window is held stationary and mounted outside of the main frame member. The sliding window then is caused to slide upon the rabbeted surfaces provided in the main frame.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom for some modifications will be obvious to those skilled in the art.

I claim:

1. A wooden frame member for window construction, comprising: top, bottom and side frame members arranged and connected in a generally rectangular fashion to form a frame for a window, each frame member having the same asymmetrical cross-sectional shape including inner stepped surfaces forming rabbets, alternate members in said frame having tongues at each end and the other members in said frame having mating grooves to receive said tongues, said tongues on said alternate members being centered on said frame member and having an end surface square with the length of the frame member, said tongues having an outwardly extending shoulder on each side generally parallel with said end surface, said shoulders being spaced from said end surface distances generally equal to the shortest and longest distances respectively across the frame member to said rabbets, said shoulders being arranged oppositely in relation to said tongues at opposite ends of the frame member providing for assembly of the frame members with the rabbets facing inwardly or outwardly of the frame as desired.

2. A frame member as specified in claim 1 in which the stepped surface has three outwardly facing rabbet surfaces, the central rabbet surface extends to the end of the frame member forming one edge of each tongue with the opposite edge of each tongue being a continuation of the outer surface of the frame member, each of said tongues when assembled with a complementary frame member, completely filling a groove and aligning the outer surface of the grooved frame member with the end surface of each tongue.

3. The construction as indicated in claim 1 in which each of the frame members is provided with a groove in the surface opposite said rabbets, and said grooves in adjacent frame members being aligned to form a continuous groove around the frame for anchoring the frame in a rough opening.

4. A wooden frame member for window construction, comprising: top, bottom and side frame members arranged and connected in a generally rectangular fashion to form a frame for a window, each frame member having the same asymmetrical cross-sectional shape including inner stepped surfaces forming rabbets, alternate members in said frame having tongues at each end and the other members in said frame having mating grooves to receive said tongues, said tongues on said alternate members being centered on said frame member and having an end surface square with the length of the frame member, said alternate frame members having an outwardly extending shoulder on each side of each tongue generally parallel with said tongue end surface, one shoulder at each end of a frame member being spaced from said end surfaces of the tongue a distance generally equal to the greatest distance between a rabbeted surface and the outer surface of the frame members, said one shoulder being on opposite sides of the frame members at opposite ends thereof, and the remaining shoulder being spaced from said end surface of the tongue a distance generally equal to the shortest distance between a rabbeted surface and the outer surface of the frame members permitting assembly of frame members together with the stepped surfaces facing inwardly or outwardly of the frame.

5. The frame construction as specified in claim 4 wherein said frame member includes a sash carrying a rabbeted inner frame having a width generally equal to the width of said frame member and step means to receive glazing.

6. A wooden frame member for window construction, comprising: top, bottom and side frame members arranged and connected in a generally rectangular fashion to form a frame for a window, each frame member having the same asymmetrical cross-sectional shape including three inner stepped surfaces forming rabbets, alternate members in said frame having tongues at each end equal in width to said center step and the other members in said frame having mating grooves to receive said tongues, said tongues on said alternate members being centered on said frame member and having an end surface square with the length of the frame member, said alternate frame members having an outwardly extending shoulder on each side of each tongue generally parallel with said surface, one of said shoulders being spaced from said tongue end surface a distance generally equal to the shortest distance across the frame member to said rabbets, and the other shoulder being spaced from said tongue end surface a distance generally equal to the longest distance across the frame member to said rabbets, said shoulders on one side of the frame member being spaced from the end of the respective tongue unequal distances providing for assembly of the frame members with the rabbets facing inwardly or outwardly of the frame as desired.

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