

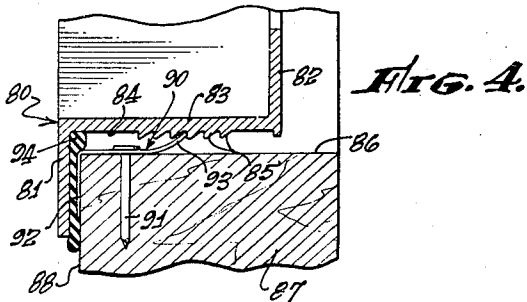
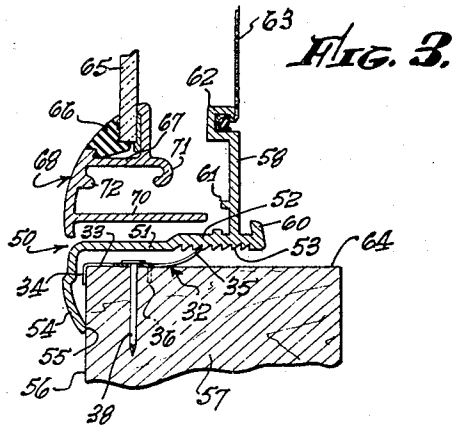
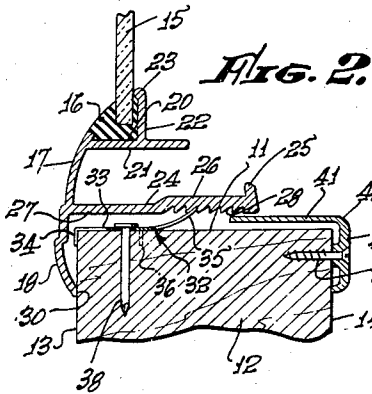
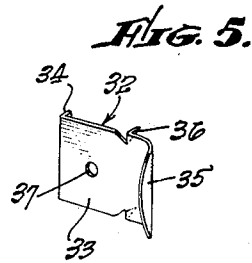
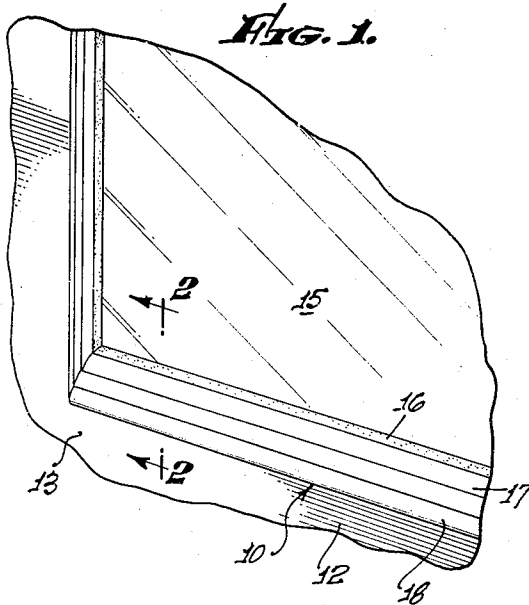
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WINDOW FASTENER CONSTRUCTION

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WINDOW FASTENER CONSTRUCTION

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The present invention relates generally to window frame fastening arrangements, and relates more particularly to such fastening arrangements wherein means are carried by a portion of the window frames or surrounding structure for permanently securing the frames in position in a wall section or the like.

When installing window frames, and particularly when fitting prefabricated types of window frames, serious problems have long existed relative to the methods for permanently securing these frames in place. It has been one usual practice to construct the window frames from individual components and to secure each of these components to a wall section as the frame is built up. Such a construction presents little difficulty from a securing standpoint, but is time-consuming and expensive. Through use of prefabricated frame sections that are adapted for insertion into opposite sides of an opening in a wall section, considerable time is saved in the installation thereof. However, in order to secure these prefabricated frames permanently in position in a wall opening, it has heretofore been necessary to employ fastening means such as nails, screws, and the like, that not only required considerable time for the installation but also detracted from the uninterrupted and smooth exterior appearance of the frame garnish.

Several attempts have been made heretofore in efforts to solve the fastening problems associated with the installation of prefabricated window frames. These attempts have taken the form of complex mechanical structures, many of which required the use of specially constructed openings in wall sections. The many components used in prior structures have necessarily made these structures expensive and have increased the possibilities that one or more of the components would be inoperative or poorly constructed. With increasing costs of construction labor, it is extremely important that installation time be reduced to a minimum commensurate with quality construction and reliable fastening means.

It is therefore one important object of the present invention to provide an improved fastening means for window frames.

It is a further object of the invention to provide a novel window frame fastening arrangement wherein very simple, reliable, efficient, and inexpensive fastening means are employed.

Another object of the invention is to provide improved means for securing a window frame to the wall forming an opening for a window.

A still further object of the invention is to provide an improved universal window frame fastening arrangement having means for continuously biasing fastening elements into tight engagement with each other.

Other and further important objects of the invention will become apparent from the disclosures in the following detailed specification, appended claims, and accompanying drawing, wherein:

Figure 1 is a fragmentary perspective view showing

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a typical corner construction for a window frame arrangement employing the fastening arrangement of this invention;

Fig. 2 is an enlarged fragmentary sectional view showing the present fastening arrangement, taken substantially as indicated by the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2, showing a modified form of the invention;

Fig. 4 is a view similar to Figs. 2 and 3, showing the fastening means of this invention as applied to one simplified frame element; and

Fig. 5 is a detail perspective view showing one form of clip means employed with the forms of the invention shown in Figs. 2 and 3.

With reference to the drawing, and with reference primarily to Fig. 1 thereof, a portion of a window frame structure is shown which includes a generally rectangular outer frame member 10 that is adapted for disposition within an opening 11 in a wall section 12. The wall section 12 has an outer surface 13 and an inner surface 14. The frame member 10 is adapted to provide a peripheral support for a glass pane 15 which may, in turn, be mounted in a resilient mounting and sealing structure 16, disposed thereabout.

The frame member 10 may comprise a rectangular integral structure or may be made from suitable sections that are joined at corners thereof. As shown, the frame member 10 of Figs. 1 and 2 comprises an integral structure that may be formed as by extruding aluminum, or the like. The exposed surfaces of the member 10 are formed with upper and lower portions 17 and 18 respectively, with each of these portions having suitable garnish or ornamentation thereon. The portion 17, at the upper free edge thereof, has a groove 20 in which the resilient sealing member 16 is adapted for disposition. A base portion 21 extends along the bottom of the groove 20 and inwardly therefrom, while an extension portion 22 is disposed at a right angle from the portion 21 to define a side of the groove 20. A free edge of the portion 22 is suitably rounded to provide a bead as at 23 that is adapted for engagement with an inner surface of the pane 15.

The frame member 10 further includes a sill portion 24 that is integrally disposed from the portions 17 and 18 at the junction thereof and extends substantially normal thereto. A lip 25 is provided along a free edge of the sill portion 24. The sill portion 24 is further provided with an area of increased thickness as at 26, and an outer surface 27 of the sill 24 is provided with a plurality of saw-tooth-shaped grooves or serrations 28 that are disposed in the area 26 and directed toward the portions 17 and 18. It is to be noted that the portion 18 of the member 10 has a free edge 30 that is adapted for contact with the outer surface 13 of the wall section 12 and that the portion 18, as well as the sill 24, is disposed in spaced relationship to both the outer surface 13 and the opening 11.

The grooves 28 may either be in the form of longitudinally spaced groups thereof or be continuous throughout the length of the frame member sections. In the present instance, the grooves 28 are provided in spaced groups for cooperation with a plurality of clips indicated generally at 32 and shown in detail in Fig. 5.

With reference primarily to Figs. 2 and 5, the clips 32 are preferably made from a resilient metallic material and include a relatively flat body portion 33 having a lip 34 along one edge thereof. The lip 34 is disposed at substantially a right angle to the body 33. The edge 35 of the end of the body 33 remote from the lip 34 is formed outwardly in a direction opposite from the direction of extension of the lip 34 and at an obtuse angle

relative to the body 33. Additionally, a pair of pointed prongs are struck from opposite side edges of the body 33 and extend therefrom in directions similar to the direction of extension of the lip 34. The body 33 is also provided with a central opening 37 for reception of a fastening means.

As shown in Fig. 2, a plurality of clips 32 are secured to the wall section 12 as by nails 38, or the like, that are positioned through the openings 37 in the clips. The position of the clips along an edge of the wall section opening 11 is determined by the position and longitudinal spacing of the groups of parallel grooves 28. When in position, the lip 34 is adapted to contact the outer surface 13 of the wall section 12, and the body 33 of the clip is positioned in contact with the peripheral surfaces of the opening 11. The edges 35 of the clips project outwardly from the surfaces of the opening 11 from end parts of the clips that form an acute angle therewith. The prongs 36 are adapted for insertion into the material of the wall section and together with the lip 34 serve to prevent any rotational movement of the clips about the nails 38.

Thus it may be seen that the free edges 35 of the clips are positioned for cooperation with one or another of the parallel grooves 28 in the sill portion 24 of the frame member 10. The frame member is thereby retained in a permanent position within the wall opening 11 by this means, and the plurality of grooves 28 permit use of the window frame fastening arrangement with a variety of wall thicknesses. Additionally, the portion 18 of the frame member 10 is resilient, being adapted for slight deformation to exert a biasing action and to maintain the edges 35 of the clips in tight permanent contact with one or another of the grooves 28.

With further reference to the form of the invention shown in Fig. 2, a trim strip 40 is disposed over the surface of the wall opening 11 adjacent the inner surface 14 thereof. This trim strip includes an inwardly extending portion 41 and an outwardly disposed flange portion 42, there being screws 43 disposed through suitable openings in the portion 42 for securing the strip to the wall section 11. It is to be noted that the inwardly extending portion 41 of the trim strip has a free end that is disposed between the free end of the frame member sill portion 24 and the surface of the opening 11. The structure illustrated in Figs. 1 and 2 is particularly suited for fixed type windows with permanent glass panes therein.

With reference to the form of the invention shown in Fig. 3, this form of window frame fastening arrangement is primarily suited for use with windows of the type having movable glass panes, screens, or the like. In this form of the invention, a frame member is indicated generally at 50 and includes a sill portion 51 having a thickened area as at 52 with a plurality of grooves 53 formed in one side thereof. A resilient outer flange portion 54 is formed integrally with the sill portion 51 and has a free end 55 that is adapted for engagement with an outer surface 56 of a wall section 57. The frame 50 further has an inwardly extending portion 58 disposed adjacent a free end of the sill portion 51, there being a lip 60 formed on this free end of the sill. A pair of ribs 61 extend from adjacent sides of the sill 51 and the portion 58, and the inner free end of the portion 58 is provided with a U-shaped configuration as at 62 for receiving the edge of an insect screen 63.

The clips 32 are utilized to retain the frame 50 in a permanent position within an opening 64 in the wall section 57, with the free ends 35 of the clips being adapted for engagement with one or another of the grooves 53 in a manner similar to that described in connection with the form of the invention shown in Fig. 2.

With further reference to Fig. 3, a pane of glass 65, or the like, has an outer periphery thereof retained in a sealing structure 66 that is, in turn, retained in a

groove 67 in a pane-supporting frame 68. The outer surface of the frame 68 is suitably contoured for adjacent disposition and cooperation with the outer surface of the flange portion 54 of the frame member 50 to provide a smooth external appearance when the window is closed. The member 68 is further provided with an elongated rib 70 that is adapted for cooperation with the ribs 61 on the member 50, to provide a labyrinth type seal against the passage of wind and moisture when the window is in a closed position. Additional strength for the extrusion forming the member 68 is gained by provision of an inwardly rolled portion 71 and a longitudinal bead 72.

It may be seen that the window frame 50 may be prefabricated with the pane 65 and frame 68 hingedly attached thereto, and that it is thereafter only necessary to install a plurality of spaced clips 32 and to insert the prefabricated structure into the opening 63 in the wall section 57 for permanent installation of the window and secure fastening within the opening. If desired, the trim strip 40 may also be used with the form of the invention shown in Fig. 3.

With reference now to the form of the invention shown in Fig. 4, a simplified form of frame member 80 is illustrated that is similar to the form of the invention shown in Fig. 3. The frame member 80 includes an outer flange portion 81 and an inner flange portion 82 that are interconnected by means of an integral sill portion 83. The outer surface 84 of the sill portion 83 is provided with a plurality of outwardly disposed parallel projections or ribs 85 which define saw-tooth-shaped grooves therebetween. The frame member 80 is adapted for disposition in an opening 86 in a wall section 87 that has an outer surface 88.

A plurality of clips 90, corresponding to the number of longitudinally spaced groups of ribs 85, are attached to the wall section 87 as by suitable nails 91, there being flange portions 92 on the clips that are adapted to overlie the outer surface 88 of the wall section 87, and free bent-up ends 93 that are adapted for engagement with the grooves formed by the ribs 85. Similar sets of clips and grooves are arranged on all sides of the frame member. In assembly of the frame member 80 into the wall section 87, a resilient compressible sealing strip 94 is disposed between the flange portion 81 and the outer surface 88 of the wall section 87, with a portion of the sealing strip overlying the flange portions 92 of the clips 90.

It is to be noted that the clips lie on the same side of the window wall as the frame member that is provided with the serrations. For this reason, when the outer surface of the wall is flat, only one serration is necessary to provide the desired locking action. In this case, the serrations on each side of the wall frame are collinear, and all the serrations lie in a plane parallel to the plane of the frame. The serrations may be in the form of a single groove having, in effect, spaced groove-defining sections or parts that are engaged by the respective clips.

It may thus be seen that a simple, easily and rapidly installed, and efficient window frame fastening arrangement is provided. The arrangement hereof also presents an attractive appearance and permanently retains the frame members in the openings provided in wall sections.

Although only a limited number of particular forms of this invention have been specifically described herein in detail, it will be obvious that the invention is not limited thereto, but is capable of a wide variety of mechanical embodiments. Accordingly, various changes which will now suggest themselves to those skilled in the art may be made in the material, form, details of construction, and arrangement of the elements without departing from the scope of the invention as defined by the appended claims.

4. In a fastening arrangement for permanently securing a window frame structure in an opening in a wall section, peripheral surfaces of said opening being disposed substantially normal to opposite, substantially parallel side surfaces of said wall section: an integral flange forming one portion of said frame structure, said flange being disposed for engagement with one of said side surfaces of said wall section; a sill forming another integral portion of said frame structure; a plurality of parallel saw-tooth-shaped grooves disposed in spaced, longitudinally disposed groups in an outer peripheral surface of said sill portion of said frame structure; a plurality of clips secured to and carried by said peripheral surfaces of said opening, said clips having free end portions disposed at an acute angle relative to said peripheral

7. In a fastening arrangement for permanently securing a window frame structure in an opening in a wall section, peripheral surfaces of said opening being disposed substantially normal to opposite, substantially parallel side surfaces of said wall section: an integral flange forming one portion of said frame structure, said flange being disposed for engagement with one of said side surfaces of said wall section; a sealing strip disposed between said flange and said one side surface; a sill forming another integral portion of said frame structure; a plurality of parallel saw-tooth-shaped grooves disposed in spaced, longitudinally disposed groups in an outer peripheral surface of said sill portion of said frame structure; a plurality of clips secured to and carried by said peripheral surfaces of said opening, said clips having resilient free end portions disposed at an acute angle relative to said peripheral surfaces of said opening, an edge of each said free end portion being adapted for engagement with one of said grooves; flange means on

said clips, said flange means being adapted to engage said one side surface of said wall section between said frame member flange and said one side surface; integral groove means for mounting a glass pane in said frame structure; and a plurality of prongs struck from said clips and adapted for disposition into parts of said wall section forming peripheral surfaces of said opening. 5

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