

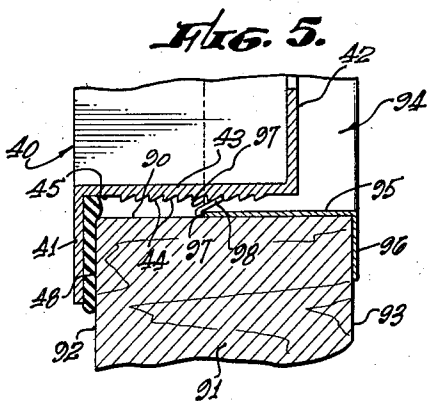
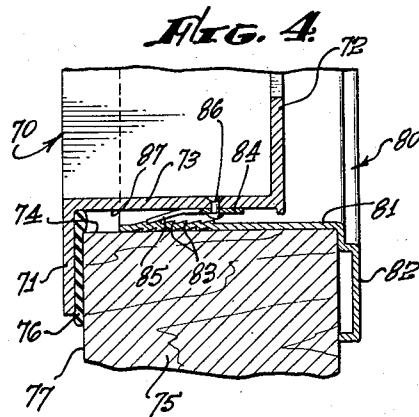
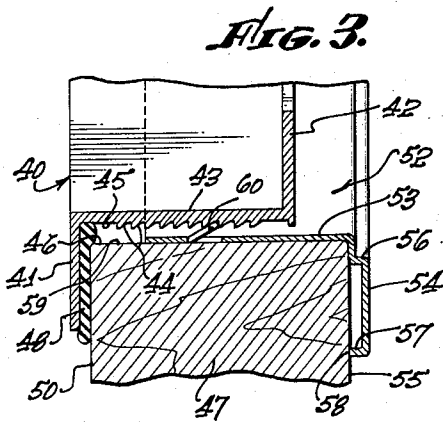
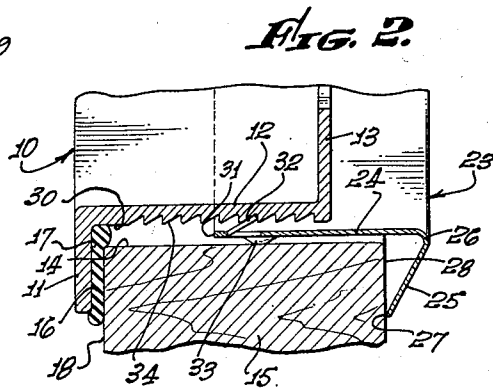
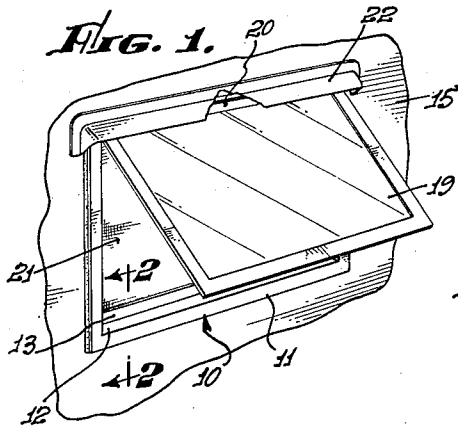
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WINDOW FASTENER CONSTRUCTION

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2,902,727

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 simple, reliable, efficient, and inexpensive fastening means are employed.

Another object of the invention is to provide improved means for securing one portion of a window frame to another portion of the frame and within an opening in a wall section provided therefor.

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

Still another object of the invention is to provide telescopically positioned prefabricated window frame portions together with novel means at least partially carried by at least one of said portions for permanently securing

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said portions together and within an opening provided therefor in a wall section.

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 perspective view showing a typical window frame arrangement for employing the fastening arrangement of this invention;

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

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

Figure 4 is another view similar to Fig. 2, and showing a further form of the invention; and

Figure 5 is still another view similar to Fig. 2, and showing a still further form of the invention.

With reference to the drawing, and with reference primarily to Fig. 1, the frame fastening arrangement hereof is adapted for utilization with prefabricated types of window frames, one form of which is shown in Fig. 1. As shown, the frame includes a generally rectangular frame portion 10 that has an outer face 11, an integral sill portion 12, and an integral, inwardly directed flange portion 13. The frame portion 10 is adapted for disposition within a suitable rectangular opening 14, Fig. 2, in a wall section 15, and the outer face 11 is adapted to overlie a periphery of the opening 14 to provide frame garnish. A resilient sealing strip 16 is disposed between an inner surface 17 of the outer face 11 and an outer surface 18 of the wall section 15 to provide for weather-tightness. The wall section 15 is of a finite thickness, and the surfaces of the opening 14 are at substantially right angles to the surfaces of the wall section. The frame 10 may be made from any suitable material as by extruded aluminum or the like.

As shown in Fig. 1, the frame portion 10 may have a framed window 19 hinged thereto as at 20 and may additionally be fitted with suitable screening 21, or the like. A hood 22 may also be disposed over the hinged edge of the window and attached to the outer surface 18 of the wall section 15.

With reference primarily to Fig. 2, the frame portion 10 is secured permanently in position within the wall section opening 14 by means of a retaining member indicated generally at 23. The member 23 is generally rectangular and adapted for telescopic reception of an inner portion of the frame 10. The retaining member 23 has an elongated portion 24 that is adapted for disposition about the outer periphery of a portion of the sill 12 and an outwardly disposed flange 25 formed integrally therewith. The flange 25 is disposed at an acute angle relative to the portion 24 and is connected with the portion 24 as by a suitable rounded edge 26. An inner edge 27 of the flange portion 25 is bent inwardly for disposition against an inner surface 28 of the wall section 15.

It is to be noted that an outer surface 30 of the sill portion 12 is spaced from the opening 14 and is also spaced from the portion 24 of the retaining member 23. The portion 24 of the retaining member 23 is provided, adjacent an inner free end 31 thereof, with a plurality of tabs 32 that are struck therefrom and bent outwardly at an acute angle relative to the portion 24. Additionally, a plurality of detents 33 are formed in the member 24 intermediate the longitudinally spaced tabs 32. The detents 33 are adapted for engagement with the surfaces of the opening 14 to retain the portion 24 of the retaining member 23 in spaced relationship relative to the peripheral surfaces of the opening 14.

As shown in Fig. 2, the outer surface 30 of the sill portion 12 is provided with a plurality of parallel grooves

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or serrations 34, each having one angularly disposed side and a side positioned normal to the surface 30 to define a saw-tooth-like configuration. For purposes of the present invention, the grooves 34 are arranged in longitudinal groups or may be formed entirely about the periphery of the sill portion 12.

Upon assembly of the present frame arrangement, the frame portion 10 is first disposed within the opening 14 from one side of the wall section 15, while the retaining member 23 is disposed within the opening 14 from the other side of the wall section 15. The tabs 32 are adapted for disposition within the grooves 34 and are of sufficient resiliency to be constantly in engagement with one or another of the grooves 34. The angular disposition of the flange 25 on the retaining member 23 and engagement of the edge 27 thereof with the surface 23 of the wall section 15 serves to permit slight deformation thereof and a resilient urging of the tabs 32 into one of the grooves 34. This action serves to compress the sealing member 16 and provides a tight engagement of the window frame arrangement with the wall section and within the opening 14 therein. The compressible seal 48 aids in taking up any slack that might otherwise occur.

It is to be noted that the plurality of grooves 34 serve to permit use of the present frame structure with a variety of wall thicknesses and also serve to compensate for any tolerance differences in the construction of wall sections whereby, in all cases, to maintain the desired tight engagement between the frame structure and the wall section. To facilitate maximum adaptability to walls of different thicknesses, the seal 48 is adapted to be compressed a distance substantially in excess of the spacing between successive grooves 34.

With reference to the form of the invention shown in Fig. 3, an outer frame member is indicated generally at 40 and includes an outer face or flange portion 41 and an inner flange portion 42 integrally interconnected by means of a sill portion 43. The outer periphery of the sill portion 43 is provided with a plurality of parallel grooves 44 that are formed between outwardly disposed parallel projections or tabs from the outer surface 45 of the sill portion 43. The frame member 40 is adapted for disposition within an opening 46 in a wall section 47, there being a resilient sealing member 48 disposed between the face portion 41 and an outer surface 50 of the wall section 47.

A retaining member is indicated generally at 52 and includes an inwardly extending portion 53 and an outer face portion or garnish 54. The face portion 54 is disposed from an inner surface 55 of the wall section 47 by means of a pair of right-angle portions 56 and 57, with the portion 57 having a free edge 58 pressed against the surface 55. The inwardly extending portion 53 is adapted for contact with the internal surfaces 59 of the opening 46 and has a plurality of tabs 60 struck therefrom and adapted to mate with the grooves 44 in the frame portion 40. The operation, use, and characteristics of the form of the invention shown in Fig. 3 are similar to those described in connection with the form of the invention shown in Fig. 2.

With reference to the form of the invention shown in Fig. 4, an outer frame member 70 is provided with an outer face flange 71 and an inner flange 72 that are integrally interconnected by means of a sill portion 73. The frame member 70 is adapted for disposition within an opening 74 in a wall section 75, there being a resilient sealing member 76 disposed between an inner surface of the face portion 70 and an outer surface 77 of the wall section 75. A retaining member, indicated generally at 80, has an inwardly extending portion 81 and a flange portion 82. The flange portion 82 has a construction and function similar to those of the flange portion 54 in the form of the invention shown in Fig. 3.

As shown in the drawing, the inwardly extending portion 81 of the retaining member 80 is provided with a

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plurality of saw-toothed grooves 83 that are disposed in parallel relationship and formed therein. A clip member 84, having a free tab end 85, is secured to the sill portion 73 of the frame member 70 by means of a rivet 86, with the tab portion 85 being disposed at an acute angle to an outer surface 87 of the sill portion 73. Thus, the tab portion 85 of the clip 84 is adapted for cooperation with one or another of the parallel grooves 83, to retain the frame member 70 and the retaining member 80 in position within the opening 74.

With reference now to the form of the invention shown in Fig. 5, it is to be noted that this form employs the frame structure 40 as utilized in the form of the invention shown in Figs. 2 and 3. This frame structure 40 is adapted for disposition within an opening 90 in a wall section 91 having an outer surface 92 and an inner surface 93. A retaining member, indicated generally at 94, has an inwardly extending portion 95 and an outer flange portion 96. The portion 95 is adapted for disposition in contact with surfaces of the opening 90, while the flange portion 96 is adapted for disposition against the inner surface 93 of the wall section 91. The portion 94 has an inner edge 97 with a plurality of spaced tabs 98 originally extending beyond the outer edge 91 and bent partially to overlie an inner surface of the portion 95 and to describe an acute angle therewith. As shown, the tabs 98 are adapted for cooperation with the parallel grooves 44 in the frame member 40 to retain the frame member and the retaining member 94 in position within the opening 90.

In all of the various forms of the invention disclosed herein, the tabs employed with the retaining members are resiliently biased into contact with the cooperating parallel grooves, or serrations, and the outwardly disposed flanges on the retaining members serve to bias the tabs resiliently into contact with one or another of the grooves. Such retaining arrangement is employed on all sides of the frame member. Permanent disposition of the frame arrangement within a wall section opening is thereby assured, the installation of the frame arrangement requiring very little effort or time inasmuch as the inner and outer openings are disposed in locked relationship with each other for the particular thickness of the wall section, with the fastening means being resiliently maintained in tight engagement to insure weathertight sealing about the frame arrangement and a rigid permanent construction.

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.

The invention claimed is:

1. 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: flange means forming a portion of said frame structure and engageable with one of said side surfaces of said wall section; sill means forming another portion of said frame structure and disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; compressible retaining means disposed between said sill means and said wall section, said retaining means compressibly engaging said sill means and the adjacent peripheral surface of said opening, thereby resiliently urging said sill means away from said adjacent peripheral surface; and means for securing end portions of said retaining means normally fixed relative to said sill means and said wall section, said retaining means serving to retain said flange means dis-

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posed in fixed relationship relative to said one of said side surfaces of said wall section.

2. 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: flange means forming a portion of said frame structure and engageable with one of said side surfaces of said wall section; sill means forming another portion of said frame structure and disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; compressible retaining means angularly disposed between said sill means and said wall section, said retaining means compressibly engaging said sill means and the adjacent peripheral surface of said opening, thereby resiliently urging said sill means away from said adjacent peripheral surface; and means for securing end portions of said retaining means normally fixed relative to said sill means and said wall section, said securing means for one of said end portions being a rigid connection, the angular disposition of said retaining means serving to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

3. 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: flange means forming an integral portion of said frame structure and engageable with one of said side surfaces of said wall section; sill means forming another integral portion of said frame structure and disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; compressible clip retaining means angularly disposed between said sill means and said wall section, said clip retaining means compressibly engaging said sill means and the adjacent peripheral surface of said opening, thereby resiliently urging said sill means away from said adjacent peripheral surface; and means for securing end portions of said clip retaining means normally fixed relative to said sill means and said wall section, said securing means for one of said end portions being a rigid connection, said angular disposition of said clip retaining means serving to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

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: flange means forming an integral portion of said frame structure and engageable with one of said side surfaces of said wall section; sill means forming another integral portion of said frame structure and disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; resilient clip retaining means angularly disposed between said sill means and said wall section, said clip retaining means compressibly engaging said sill means and the adjacent peripheral surface of said opening, thereby resiliently urging said sill means away from said adjacent peripheral surface; and means for securing end portions of said clip retaining means normally fixed relative to said sill means and said wall section, said securing means for one of said end portions being a rigid connection, said clip retaining means being bendable relative to said one of said end portions, said angular disposition of said clip retaining means serving to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

5. 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 paral-

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lel side surfaces of said wall section: flange means forming an integral portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another integral portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a plurality of substantially parallel grooves disposed longitudinally in an outer periphery of said sill means and facing toward said peripheral surfaces; and a plurality of tabs fixed between said sill means and said peripheral surfaces of said opening and disposed at an acute angle relative to said peripheral surfaces, said tabs being formed in members rigidly engaging said peripheral surfaces, each said member being adapted for engagement in one of said grooves in said sill means to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

6. A fastening arrangement as in claim 5, wherein said members and their tabs located between said sill means and said peripheral surfaces, serve to space said sill means from said peripheral surfaces of said opening.

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: flange means forming a portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a plurality of substantially parallel grooves disposed longitudinally in an outer periphery of said sill means; a retaining member having one portion disposed at least partially between said sill and said peripheral surfaces of said opening and another portion disposed in engagement with the other side surface of said wall section; and a plurality of tabs carried by said one portion of said retaining member, each said tab being adapted for engagement in one of said grooves in said sill means to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section, parts of said retaining member adjacent the respective tabs firmly engaging the adjacent parts of said peripheral surfaces and spacing said sill from such peripheral surfaces.

8. A fastening arrangement as in claim 7, wherein said parallel grooves disposed at the periphery of said sill means are faced toward said peripheral surfaces of said opening.

9. 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: flange means forming an integral portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another integral portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a plurality of substantially parallel grooves disposed longitudinally in an outer periphery of said sill means and faced toward said peripheral surfaces of said opening; a retaining member having one portion disposed at least partially between said sill means and said peripheral surfaces of said opening and another portion disposed in engagement with the other side surface of said wall section, said one portion firmly engaging said peripheral surfaces; and a plurality of tabs carried by said one portion of said retaining member and disposed at an acute angle thereto, each said tab being

adapted for engagement in one of said grooves in said sill means to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

10. 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: flange means forming an integral portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another integral portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a plurality of substantially parallel saw-tooth-shaped grooves disposed in longitudinally spaced groups in an outer periphery of said sill means; a retaining member having one portion disposed at least partially between said sill means and said peripheral surfaces of said opening and spacing said sill means from said peripheral surfaces of said opening, and another portion disposed in engagement with the other side surface of said wall section, said one portion of said retaining member firmly engaging the adjacent parts of said peripheral surfaces; and a plurality of tabs carried by a free edge of said one portion of said retaining member and disposed at an acute angle thereto, each said tab being adapted for engagement in one of said grooves in said sill means to retain said flange means disposed in fixed relationship relative to said one of said side surfaces of said wall section.

11. 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: flange means forming an integral portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another integral portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a plurality of elongated substantially parallel saw-tooth-shaped grooves disposed in longitudinally spaced groups in an outer periphery of said sill means; a retaining member having one portion disposed at least partially between said sill means and said peripheral surfaces of said opening to space said sill means from said peripheral surfaces of said opening, and an-

other portion resiliently disposed in engagement with the other side surface of said wall section, said one portion of said retaining member firmly engaging the adjacent parts of said peripheral surfaces; a plurality of tabs carried by a free edge of said one portion of said retaining member and disposed at an acute angle thereto, each said tab being adapted for engagement in one of said grooves in said sill means to retain said flange means and said another portion of said retaining member in permanent engagement with said side surfaces of said wall section; and a sealing strip disposed between said flange means and said one of said side surfaces of said wall section.

12. 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: flange means forming an integral portion of said frame structure and disposed in engagement with an area of one of said side surfaces of said wall section adjacent said opening; sill means forming another integral portion of said frame structure, said sill means being disposed in substantially parallel spaced relationship relative to said peripheral surfaces of said opening; a retaining member having one portion disposed at least partially between said sill means and said peripheral surfaces of said opening to space said sill means from said peripheral surfaces and another portion resiliently disposed in engagement with the other side surface of said wall section, said one portion of said retaining member firmly engaging the adjacent parts of said peripheral surfaces; a plurality of substantially parallel saw-tooth-shaped grooves disposed in longitudinally spaced groups in said one portion of said retaining member adjacent a free edge thereof; and a plurality of spaced clips carried by said sill means and forming an acute angle with an outer peripheral surface thereof, each said clip being adapted for engagement with one of said grooves in said one portion of said retaining member to retain said flange means and said another portion of said retaining member in permanent engagement with said side surfaces of said wall section.

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