Feb. 5, 1957 E. YODER 2,780,328

WINDOW-FRAME ELEMENTS

Filed Feb. 14, 1955 2 Sheets-Sheet 1

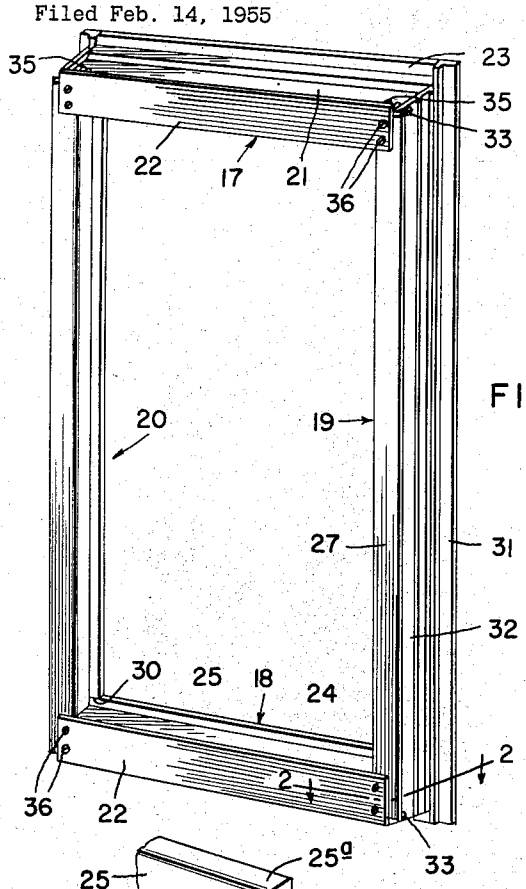


FIG. 1.

FIG. 2.

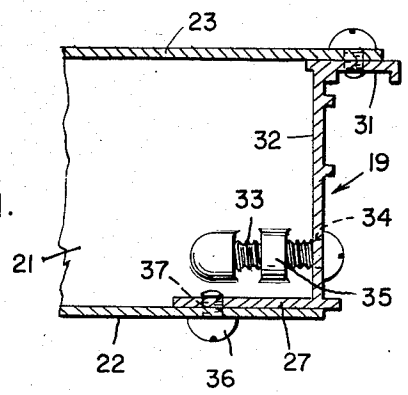
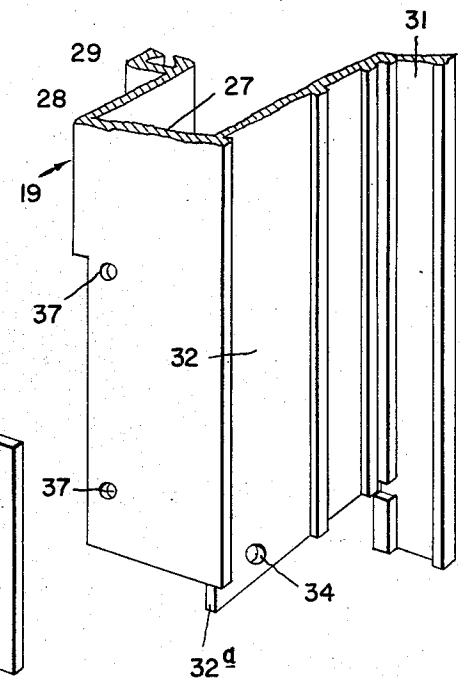


FIG. 4.



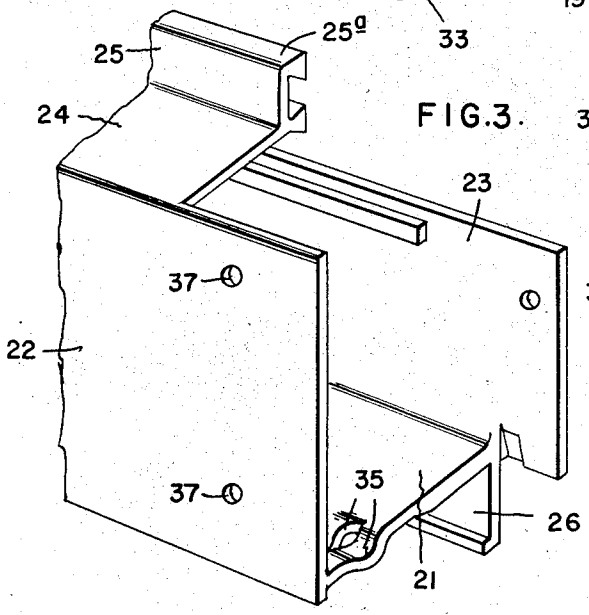


FIG. 3.

Inventor
Ervin Yoder

By Arthur Middleton

ATTY.

Feb. 5, 1957 E. YODER 2,780,328

WINDOW-FRAME ELEMENTS

Filed Feb. 14, 1955 2 Sheets-Sheet 2

FIG.5.

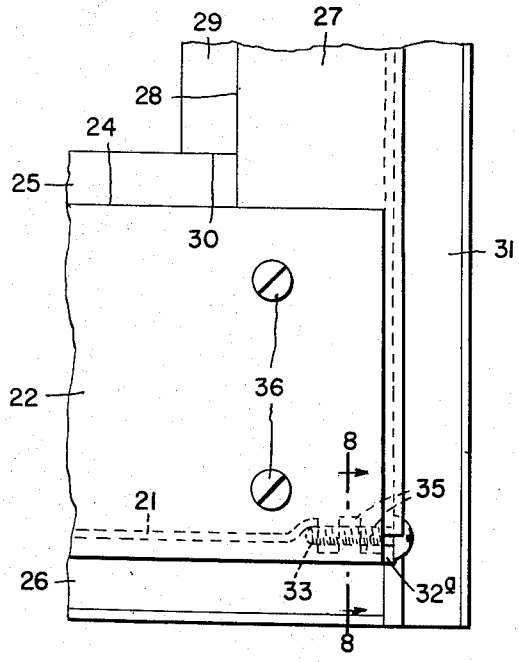


FIG.6.

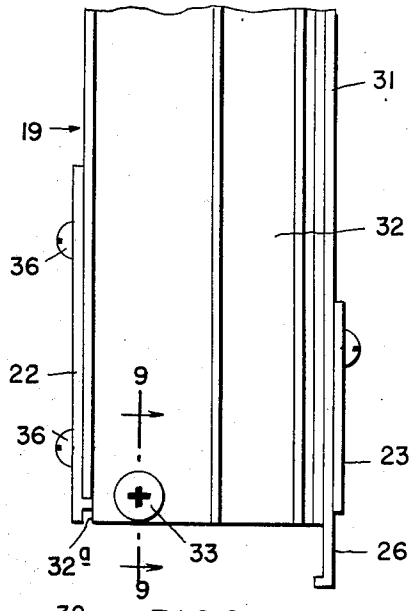
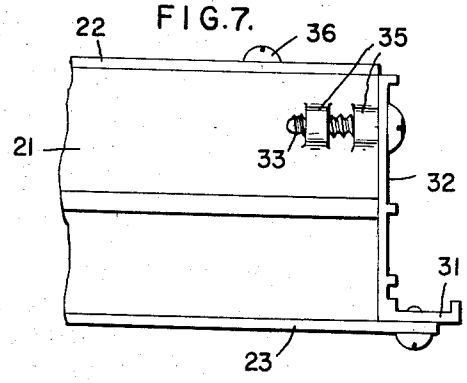


FIG.7.



32

FIG.8.

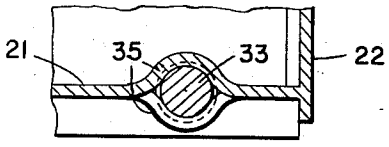
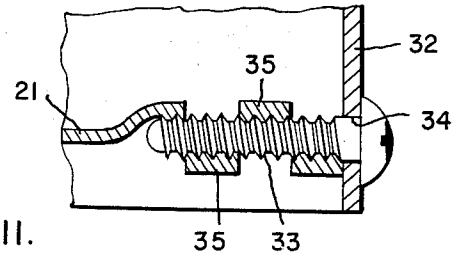


FIG.9.



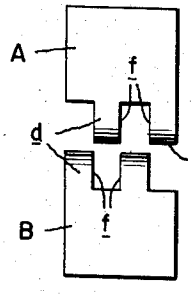


FIG.10.

FIG.11.



Inventor

Ervin Yoder

By Arthur Nissken

ATTY.

United States Patent Office 2,780,328 Patented Feb. 5, 1957

2,780,328

WINDOW-FRAME ELEMENTS

Ervin Yoder, Hialeah, Fla., assignor to Ware Laboratories, Inc., Miami, Fla., a corporation of Delaware

Application February 14, 1955, Serial No. 487,760

5 Claims. (Cl. 189—75)

This invention relates to improvements in window frames of the type that comprise extruded metal top, bottom and vertical side members all produced at the factory in the proper lengths and form and to receive threaded fastening members ready to be connected and installed in a window opening.

An object of the invention is to provide an improved window frame of the type referred to in which the horizontal top and bottom frame members and the vertical side members are so formed and of such relative cross-sectional size and having their adjoining end portions so shaped as to interfit and overlap one with another to afford a construction that can be quickly assembled and installed in a window opening by unskilled labor and will afford a strong, satisfactory, serviceable construction.

In order to provide for threaded engagement of threaded connector members with some of the relatively thin extruded metal members at corner portions of the window frame, it has heretofore been proposed to provide some of the frame members with spaced longitudinal ribs or flanges projecting from a face thereof to receive therebetween the shank of a threaded connector member, the longitudinal ribs or flanges extending throughout the full length of said member.

Another important object of the invention is to provide an extruded metal frame member with improved socket forming means thereon along only end portions thereof for receiving the shanks of threaded connector members and which will function more efficiently than the prior construction referred to and will avoid the necessity for providing longitudinal ribs on the frame members or increasing the thickness of the walls thereof to provide a socket for receiving the threaded connector members so that a substantial saving in the amount of metal required and reduction in the cost of producing the frame members will be effected.

The invention, with other objects and advantages thereof and the particular construction, combination and arrangement of parts comprising the same will be understood from the following detailed description when considered in connection with the accompanying drawings forming part hereof and illustrating one embodiment of the invention.

In the drawings:

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

Fig. 2 is a detail fragmentary horizontal section on an enlarged scale on the line 2—2 of Fig. 1;

Fig. 3 is a detail perspective view on a greatly enlarged scale of an end portion of the bottom member of the frame;

Fig. 4 is a detail perspective view of an end portion of one of the vertical side members;

Fig. 5 is a detail front elevation of the lower right hand corner portion of the frame;

Fig. 6 is a detail end elevation of the construction shown in Fig. 5;

Fig. 7 is a detail bottom plan view of the construction shown in Fig. 5;

Fig. 8 is a detail transverse vertical section on the line 8—8 of Fig. 5;

Fig. 9 is a detail vertical section on the line 9—9 of Fig. 6;

Fig. 10 is a front elevation of cooperating cutting and punching dies for forming the series of struck-out arcuate portions on some of the frame members;

Fig. 11 is an end elevation of the die members shown in Fig. 10.

Referring to a detail description of the particular embodiment of the invention illustrated in the drawings, the construction shown comprises top and bottom horizontal members and vertical side members generally designated respectively 17, 18, 19 and 20, all constructed of extruded aluminum alloy or other suitable metal. Each of the horizontal top and bottom members 17 and 18 is of general U-section channel form having a base or intermediate wall 21 and front and rear vertical side walls 22 and 23, said top and bottom members being disposed with their open sides facing toward the interior of the frame. As shown in Fig. 3 of the drawings, the rear side wall of each of the top and bottom members at each end extends a short distance beyond the adjacent end of the front side wall and the base of said member. The front side wall 22 of each of the top and bottom horizontal members 17, 18 has a longitudinal flange 24 extending rearwardly from its inner edge, said flange having a relatively narrow inwardly directed extension portion 25 extending substantially parallel with the front side wall 22 of said member, the flange 24 and the inwardly directed extension portion 25 terminating at each end thereof a short distance inwardly of the corresponding end of the front side wall 22 of the member. The horizontal top and bottom members 17, 18 each also has a longitudinal flange 26 extending outwardly from the bottom face of its base or intermediate wall 21 throughout the length of the same in a vertical plane slightly inwardly of the vertical plane of the rear side wall 23 of the member and parallel therewith.

The vertical side members 19 and 20 are each of general L-shaped form in cross section and disposed with their open sides facing inwardly with the narrower wall 27 thereof at the front side of the frame. Each of the vertical side members 19 and 20 has a longitundinal flange 28 extending rearwardly from the outer edge of the narrower front wall 27 thereof and said flange has an inwardly directed extension portion 29 terminating at each end 30 short of the corresponding end of the flange 28. Each vertical side member also has a longitudinal flange 31 extending outwardly from the outer edge of its broader wall 32 at right angles to the same and in the same vertical plane with the outwardly extending flanges 26 on the bases 21 of the members 17 and 18. The distance between the outwardly extending flange 31 and the front narrower wall 27 of each of the vertical side members 19 and 20 is slightly less than the distance between the front and rear vertical side walls 22 and 23 of said member, the opposite end portions of the vertical side members 19 and 20 fitting between adjoining end portions of the front and rear side walls 22 and 23 of the top and bottom members 17 and 18 with the rearwardly extending flanges 28 on the front walls 27 of the side members fitting against the ends of the rearwardly extending flanges 24 and the extension portions 25 thereof, and with the ends 30 of the inwardly directed extension portions 29 of the flanges 28 fitting upon outer edge portions 25^a of the inwardly directed extension portions 25 of the flanges 24 of the front side walls 22 of the horizontal top and bottom members.

The broader wall 32 of each of the side members 19

and 20 has end portions 32a which project a short distance outwardly beyond the ends of the front narrower wall 27 of the member and which fit against the adjoining ends of the bases or intermediate walls 21 of the top and bottom frame members 17, 18, and the outwardly extending flanges 31 on the broader walls 32 of the vertical side members project a short distance beyond the ends of the broader walls 32 and fit against the ends of the flanges 26 that extend outwardly from the outer faces of the bases or intermediate walls 21 of the top and bottom members.

At the corners of the window frame the end portions of the top, bottom and side members are secured to each other by screws 33 extending transversely of the side members 19 and 20 through apertures 34 in the walls 32 thereof and in threaded engagement with the bases or intermediate walls 21 of the top and bottom members 17 and 18, the connection of the adjoining end portions of the frame members at all corners of the frame being the same, the corner joint structure at the lower right hand corner of the frame being shown in detail in Figs. 3, 4, 5 and 7. In accordance with the present invention, threaded engagement of the screws 33 with the relatively thin base or intermediate walls 21 longitudinally thereof, is provided for by providing the base or intermediate wall 21 of each of the top and bottom frame members on each end portion thereof with a row or series of similar struck-out transversely disposed arcuate strip portions 35 extending along the same inwardly from its outer end. The arcuate strip portions 35 project laterally alternately from opposite side faces of the base 21 in staggered relationship as shown, the same having a common central axis and jointly forming a socket to receive one of the connector screws 33, the latter being of the type that when turned up under pressure in the sockets formed by the rows of arcuate strip portions 35, the same will cut their own threads therein.

In Figs. 10 and 11 of the drawings are shown cooperating reciprocating die members A, B by which the rows of arcuate strip portions 35 are struck out from the bases 21 of the top and bottom members 17 and 18. Each die member as shown, has a row of spaced punching heads or elements *d* that have transversely curved outer faces *e* and shearing side edges *f*, the elements *d* of the die elements being disposed in staggered relationship. As will be understood, as the die members A, B are forced together from opposite sides of the material, the row of arcuate strips 35 will be cut and puched out therefrom.

In addition to the connector screws 33, the adjoining end portions of the window frame are connected by short screws 36 engaging threaded apertures 37 in overlapping portions of the front side wall 22 of the top and bottom members 17, 18, and the narrower front walls 27 of the vertical side members 19 and 20.

As will be understood, the longitudinal flanges 26 and 31 that extend outwardly from the frame members, are adapted to be secured in the customary manner to the studding or other wall structure of the window opening to fasten the window frame therein.

It will be noted that the particular cross sectional form and relative size of the frame members providing for the special interfitting and overlapping of parts of adjoining end portions of the horizontal top, bottom, and vertical side members with each other, as hereinbefore set forth, is such as to provide an especially strong, substantially rigid frame structure that can be quickly assembled and installed by unskilled labor. The particular socket forming means provided on each end portion of the top and bottom frame members for receiving the shanks of the connector screws 33 will afford an efficient anchorage for the connector screws so that a strong adjustable connection of parts is provided and this is accomplished without the necessity of providing pairs of longitudinal ribs extending the full length of the members or by increasing the thickness of the relatively thin walls of the frame members in any way, a material saving in the amount of material required and reduction in the cost of production being obtained in this way.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within the metes and bounds of the claims or that form their functional as well as conjointly cooperative equivalents, are therefore intended to be embraced by those claims.

I claim:

1. A window frame comprising horizontal top and bottom members and vertical side members, the top and bottom members each being of general U-section channel form with their open sides facing toward the interior of the frame, the front side wall of each of the top and bottom members having a longitudinal flange extending rearwardly from its inner edge, said flange terminating at each end a short distance inwardly of the corresponding end of the front wall of the member, the vertical side members each being of general L-shaped form in cross section having one of its walls of greater width than the other, and the vertical side members being disposed with their open sides facing inwardly and with the narrower wall thereof positioned at the front side of the frame, said vertical side members each having a longitudinal flange extending rearwardly from the outer edge of said narrower front wall, and each of the side members having a longitudinal flange extending from the outer edge of the broader wall thereof at right angles thereto, the distance between said last mentioned flange and the front narrower wall of each side member being slightly less than the distance between the front and rear walls of the top and bottom members, the opposite end portions of said last mentioned longitudinal flange and narrower front wall of each of said side members fitting between and against end portions of the front and rear walls of the top and bottom members with the ends of the narrower front wall of each of the side members fitting against the inner faces of the intermediate walls of the top and bottom members, and with the rearwardly directed flange of the vertical side members fitting against the ends of the rearwardly extending flanges on the front side walls of the top and bottom members, and means detachably securing the end portions of the side frame members to adjoining end portions of the top and bottom members against movement laterally outwardly therefrom.

2. A window frame comprising horizontal top and bottom members and vertical side members, the top and bottom members each being of general U-section channel form with their open sides facing toward the interior of the frame, the rear side wall of each of the top and bottom members at each end extending a short distance beyond the adjacent end of the front side wall and the intermediate wall of said member, the front side wall of each of the top and bottom members having a longitudinal flange extending rearwardly from its inner edge, said flange terminating at each end a short distance inwardly of the corresponding end of the front wall of the member, the vertical side members each being of general L-shaped form having one of its walls of greater width than the other and the vertical side members being disposed with their open sides facing inwardly and with the narrower wall thereof disposed at the front side of the frame, said vertical side members each having a longitudinal flange extending rearwardly from the outer edge of said narrower front wall, and each of the side members having a longitudinal flange extending outwardly from the outer edge of the broader wall thereof at right angles thereto, the distance between said last mentioned flange and the front narrower wall of each side member being slightly less than the distance between the front and rear walls

of the top and bottom members, the opposite end portions of said last mentioned longitudinal flange and narrower front side wall of the side members fitting between and against end portions of the front and rear walls of the top and bottom members with the rearwardly directed flange of the vertical side members fitting against the ends of the rearwardly extending flanges on the front side walls of the top and bottom members, the broader wall of each of the L-shaped vertical side members at each end projecting a slight distance beyond the ends of the narrower front wall of the side members and overlapping and fitting against corresponding adjoining ends of the intermediate walls of the top and bottom members, and means detachably securing the end portions of the side frame members to adjoining end portions of the top and bottom members against movement laterally outwardly therefrom.

3. A window frame comprising horizontal top and bottom members and vertical side members, the top and bottom members each being of general U-section channel form with their open sides facing toward the interior of the frame, the front side wall of each of the top and bottom members having a longitudinal flange extending rearwardly from its inner edge, said flange having a relatively narrow inwardly directed extension portion extending substantially parallel with the front side wall of said member, said flange and said inwardly directed extension portion terminating at each end thereof a short distance inwardly of the corresponding ends of the front wall of the member, the vertical side members each being of general L-shaped form in cross section having one wall thereof of greater width than the other, and the vertical side members being disposed with their open sides facing inwardly with the narrower wall thereof disposed at the front side of the frame, said vertical side members each having a longitudinal flange extending rearwardly from the outer edge of its narrower front wall, said last mentioned rearwardly extending flanges each having an inward extension, said side members each having a longitudinal flange extending outwardly from the outer edge of the broader wall of the side member at right angles thereto, the distance between said last mentioned flange and the front narrower wall of each side member being slightly less than the distance between the front and rear

walls of the top and bottom members, the opposite end portions of said last mentioned longitudinal flange and narrower front wall of each of the side members fitting between and against end portions of the front and rear walls of the top and bottom members with the rearwardly directed flange of the vertical side members fitting against the ends of the rearwardly extending flanges of the top and bottom members, and with said inward extensions of the rearwardly extending flanges on the vertical side members overlapping and fitting upon end portions of the inward extensions on the rearwardly extending flanges of the front walls of the top and bottom members, and means detachably securing the end portions of the side frame members to adjoining end portions of the top and bottom members against movement laterally outwardly therefrom.

4. A window frame of the construction defined in claim 2 and in which the means detachably securing the end portions of the side frame members to adjoining end portions of the top and bottom members comprises threaded connector members, each extending transversely through an end portion of one of the side frame members and longitudinally of and in threaded engagement with an end portion of the base of the adjoining frame member.

5. A window frame of the construction defined in claim 2 and in which the intermediate wall of each of the top and bottom members has a longitudinal flange extending outwardly from the outer face thereof throughout the length thereof in a vertical plane slightly inwardly of the vertical plane of the rear side wall of the member, and the outwardly extending flange on the broader wall of each of the L-section side members projects below the base of the adjoining longitudinal channel member and fits against one end of the outwardly extending flange on the bottom face of the base of the adjoining frame member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,130,399	Rapinski	Sept. 20, 1938
2,612,097	Pollman	Sept. 30, 1952