

Oct. 3, 1967

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3,344,573

WINDOW GLAZING SYSTEM

Filed May 17, 1965

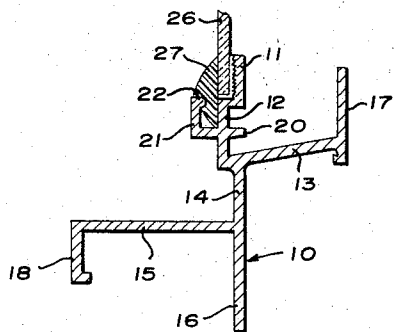


FIG. 1

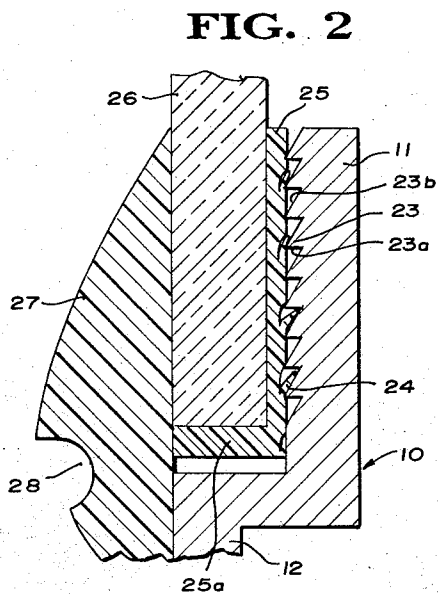


FIG. 2

FIG. 3

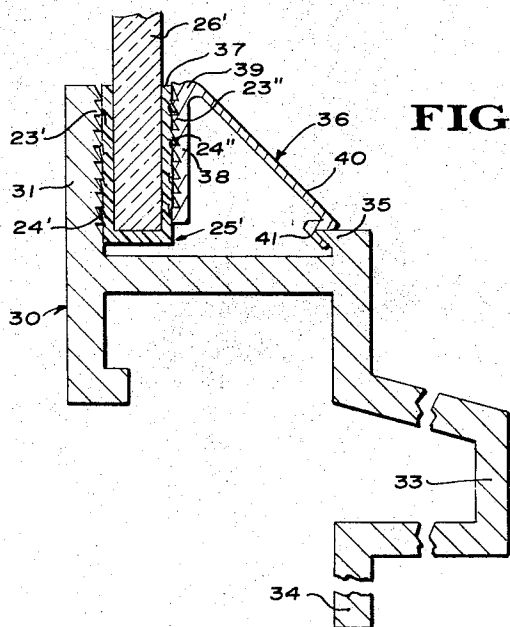
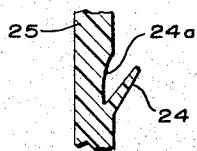


FIG. 4

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3,344,573

WINDOW GLAZING SYSTEM

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Filed May 17, 1965, Ser. No. 456,133

2 Claims. (Cl. 52—476)

ABSTRACT OF THE DISCLOSURE

The present invention relates to improvements in the glazing of prefabricated windows and the like, particularly those of the type extruded from thin sections of aluminum or plastic which rely for part of their rigidity after installation, upon the rigidity of the building wall to which they are secured.

In the past, in order to ship shop-glazed windows of this type, it has been necessary to reinforce the window frames for shipping as by bands of steel strapping secured around the frames and separated from direct contact with the frame members as by wood spacers. The only known alternative has been to actually bond the glass panes directly to the glazing flanges of the window frames so that the structural strength of the glass augments that of the frame. Otherwise, particularly in larger windows, the head, jamb, or sill sections would be susceptible to deforming outwardly away from the edges of the glass or inwardly into contact with the glass, whereupon the pane would be particularly vulnerable to breakage during handling in transit from the factory to the job site.

The expedient of strapping the windows prior to shipping has the objection of adding expense both at the factory and at the job site, while the alternative of bonding the glass to the frame has the objection of making the glass difficult to remove for replacement in case of breakage after installation. Accordingly, the principal object of the present invention is to provide an improved glazing system by which the structural strength of the glass can be used to help withstand distortion of the window frames during shipping and handling and in which the glass will be protected from direct contact with the frame, and yet which permits a pane to be easily replaced.

In carrying out this objective, the invention aims to provide a glazing system which is economical, provides a reliable and effective weather seal, and is easy to assemble.

A further object is to provide a glazing system giving added protection to the glass before installation in the frame and making it safer to handle.

The means by which the foregoing objects and other advantages, which will be apparent to those skilled in the art, are accomplished are set forth in the following specification and claims and illustrated in the accompanying drawings. Reference is now made to the accompanying drawings in which:

FIG. 1 is a transverse sectional view through the head, sill or jamb sections of a glazed window frame assembly embodying the present invention.

FIG. 2 is a detail view of part of FIG. 1 to an enlarged scale.

FIG. 3 is a blow-up of a toothed portion of the glazing strip as shown in FIG. 2; and

FIG. 4 is a transverse sectional view through part of a glazed window frame assembly of a modified construction embodying further teachings of the invention.

Referring to FIG. 1, for purposes of example, the present invention is shown applied to a window frame

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10 fabricated from extruded aluminum or plastic head, jamb and sill sections of like cross-section which are mitered at the corners and welded or otherwise secured together to form a unitary endless frame defining a light opening bordered by a planar glazing flange 11. From the outer edge of this flange 11 the frame section jogs in the outdoor direction at a rebate 12 and then branches indoors by a web 13 and continues outwardly in the general plane of the glazing flange as an intermediate web 14. The latter in turn branches outdoors by a web 15 and continues outwardly as a nailing flange 16. Trim flanges 17-18 are provided at the opposite longitudinal edges, respectively, of the webs 13 and 15, and the rebate 12 is formed with an inside rib 20 and an outdoor retaining angle 21 which terminates with a rounded retaining lip 22 directed in the indoor direction.

As part of the present invention the glazing flange 11 has its outdoor face serrated to give a transverse saw-tooth configuration forming endless tooth ribs 23 which extend continuously around the light opening in concentric relation to one another. The front face 23a of each tooth 23 is perpendicular to the plane of the window while the back face 23b of the tooth slopes toward the center of the window at about 30°, for example, with respect to the window plane.

Cooperating with the teeth 23 on the glazing flange are multiple teeth 24 presented by glazing strips 25, also comprising part of the present invention. These strips 25 may be extruded from flexible polyvinyl and are bonded by a suitable adhesive along the periphery of the indoor face of the lite 26 for the window. It is preferred that the glazing strips be elled to give an outturned lip 25a which is bonded to the outer edge of the pane. In applying the glazing strips to the pane, they are mitered at the corners so that respective of their teeth 24 become substantially continuous around the lite.

Also preferred is to have spacing between the teeth 24 different than between the teeth 23 so that it will be impossible for the crests of successive of the teeth 24 to line up with the peaks of any two of the teeth 23. In this manner, as illustrated in FIG. 2, fitting of some of the teeth 24 into the serrations between the teeth 23 is assured. This interfit is also aided by making the teeth 24 moderately flexible and shaped so that their back or outer faces 24b have about the same slope as the back faces 23b of the teeth 23. At the root of each of its teeth 24 the glazing strip 25 is preferably formed with a respective recess 24a (FIG. 3) having the same cross-section as the teeth. The purpose of these recesses 24a is to provide relief for any tooth 24 which might become wedged between the crest of one of the glazing flange teeth 23 and the glazing strip 25. This is illustrated by the upper two teeth 24 in FIG. 2.

To hold the pane and glazing strip unit 25-26 against the glazing flange 11, there is provided a removable retainer which may comprise moderately elastomeric glazing beads 27 having a generally segmental cross-section. These beads may be formed, for example, of a polyvinyl elastomer or Neoprene, and each has its arcuate face formed with a longitudinal groove 28 to receive the retaining lip 22.

After the glazing strips 25 have been bonded to the pane 26, assembly of the window can be readily performed, either before or after installation, by holding the pane centered against the glazing flange 11 and then wedging the glazing beads 27 toward the periphery of the window between the retaining lip 22 and the outdoor face of the rebate 12 until the groove 28 is occupied by the retaining lip. The glazing beads are preferably mitered at the corners of the window and per-

form a weather seal function as well as serving as a retainer for the pane.

With the window frame 10 glazed as above described, the interlock between the teeth 24 on the pane assembly 25-26 and the teeth 23 on the glazing flange 11 not only serves as a weather seal after installation but resists outward distortion of the frame 10 relative to the pane 26 in the plane of the latter during transit to the job site; i.e. before the window frame has the benefit of the support of nails passing through its nailing flanges 16 into the building structure surrounding the rough opening for the window. The interlocking teeth 23-24, after installation of the window, also resist inward displacement of the pane relative to the window frame as might be caused by the force of wind gusts during a storm.

In addition, the glazing strips 25 protect the raw edges of the pane 26 from direct contact with the frame 10 should the latter momentarily distort from shock during transit, or should the building settle against the head of the window sometime after installation. Furthermore, the glazing strips also help to protect the glass before being mounted in the window frame and make the panes safer to manually handle.

Directing attention to FIG. 4, there is illustrated a modified extruded window frame section 30 having its glazing flange numbered 31. This frame has a central web 32 extending outdoors from the glazing flange and then extends outwardly away from the center of the window by a molding 33 and a planar nailing flange 34. At its outer edge the web 32 has an inner retaining lip 35 for a snap-on glazing bead 36. To the above described extent, the frame 30 is of conventional design.

By the present invention the glazing flange 31 is given a sawtooth configuration in the same manner as the afore-described glazing flange 11. The resulting teeth 23', as before, interfit with teeth 24' of a glazing strip 25' which is identical to the strip 25 except that it is channel shaped to also provide an outdoor strip portion 37 opposed by a retaining flange 38 on the glazing bead 36. This retaining flange 38 and the glazing strip wall 37 are formed, respectively, with teeth 23'' and 24'' which are identical to the teeth 23', 24' except that they are aimed in the opposite direction. The glazing bead 36 is completed by a center web 40 which intersects the toothed flange 38 at an acute angle elbow 39 and at its outer edge bends inwardly and then slopes outwardly to provide a locking lip 41 to fit behind the retaining lip 35.

As before, the glazing strip 25' is bonded around the rim of the pane 26'. The resulting unit can be readily installed by holding it against the glazing flange 31 of the frame 30, and then snapping the glazing beads 36 into place. In this regard, the latter are flexible enough at the elbow 39 to permit insertion and removal in the conventional manner.

In the FIG. 4 embodiment the teeth 23'-24' function in the same manner as the teeth 23-24 in the other embodiment while the additional teeth 23''-24'' not only serve as an exterior weather seal, but also resist displacement of the glazing beads 26 relative to the pane 26'.

The present invention has been discussed for purposes of example with regard to window frames, but is also applicable to doors, vents, and other glazed panels.

It is thought that the invention will have been clearly understood from the foregoing detailed description. Changes within the spirit of our teachings may be resorted to without departing from the invention and it is accordingly our intention that the hereto annexed claims be given a scope in their construction fully commensurate with the broadest interpretation to which the employed language admits.

What we claim is:

1. In combination, a unitary frame presenting a light opening, a unitary light assembly covering said light opening and bearing against the rim thereof, said light assembly comprising a pane and glazing strip means bonded thereto, said rim and glazing strip means presenting peripheral interfitting teeth, the spacing between the teeth of said glazing strip means being different from the spacing between the teeth on said rim, and removable retainer means carried by said frame for holding said light assembly against said rim.

2. In combination, a unitary frame presenting a light opening, a unitary light assembly covering said light opening and bearing against the rim thereof, said light assembly comprising a pane and glazing strip means bonded thereto, said rim and glazing strip means presenting peripheral interfitting teeth, the teeth on the rim being sloped away from the light opening and having back faces opposing the crests of the teeth on said glazing strip means and sloped front faces generally parallel to the slope of said light assembly teeth, and the spacing between the teeth of said light assembly being different from the spacing between the teeth on said rim, and removable retainer means carried by said frame for holding said light assembly against said rim.

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