

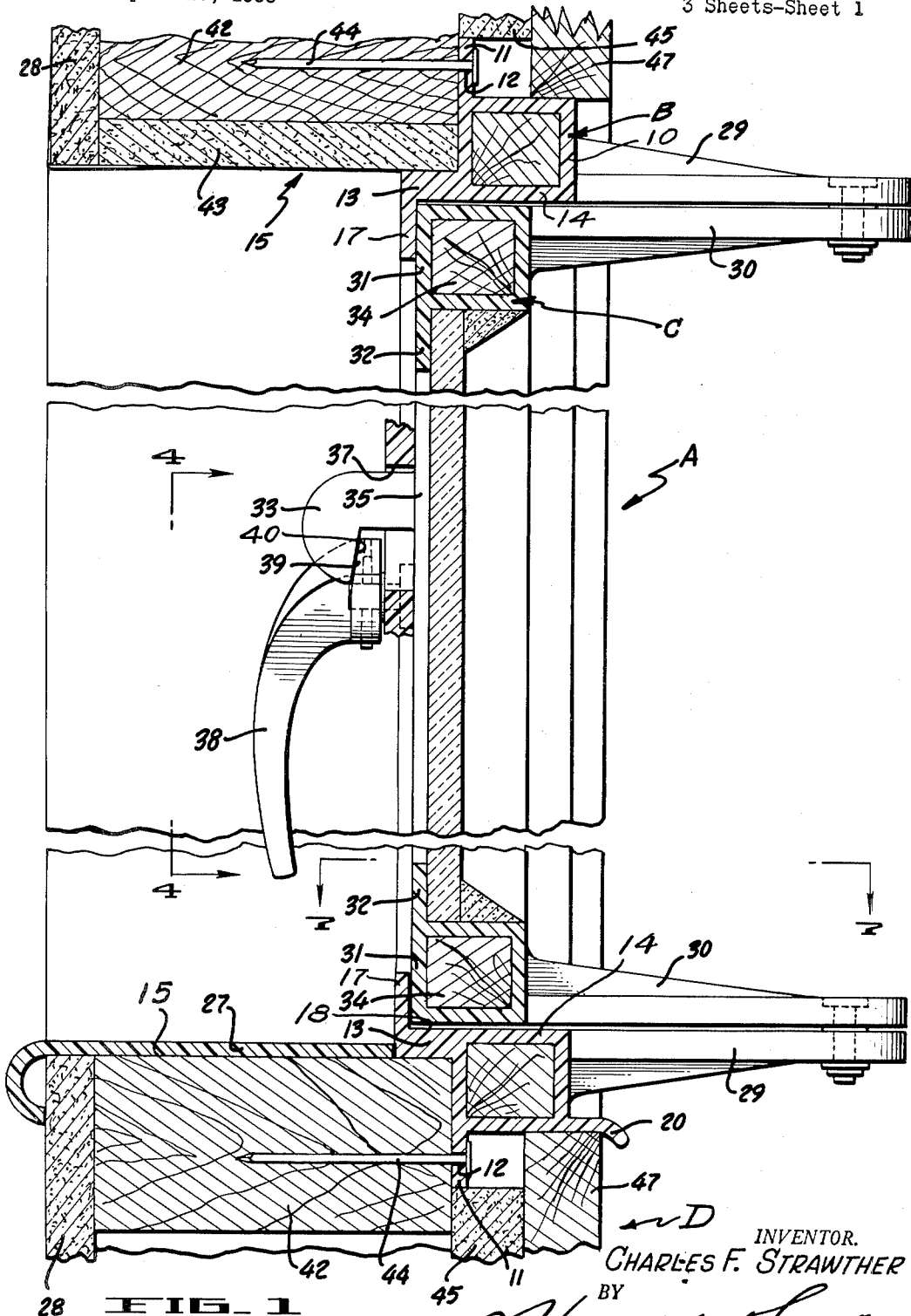
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C. F. STRAWTHER
PLASTIC WINDOW FRAME

2,753,603

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3 Sheets-Sheet 1



28 FIG. 1

INVENTOR.
CHARLES F. STRAWTHER

BY
Hansen and Lane
his ATTORNEYS

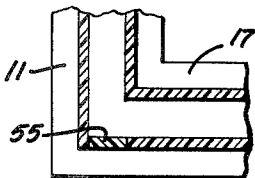
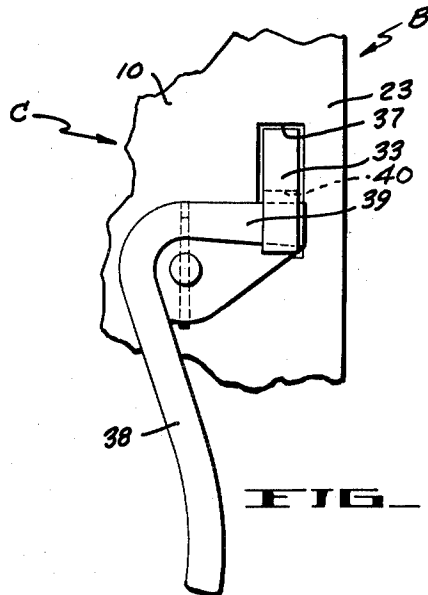
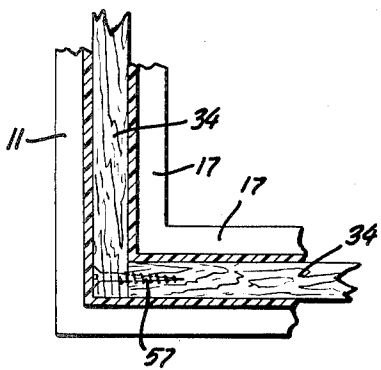
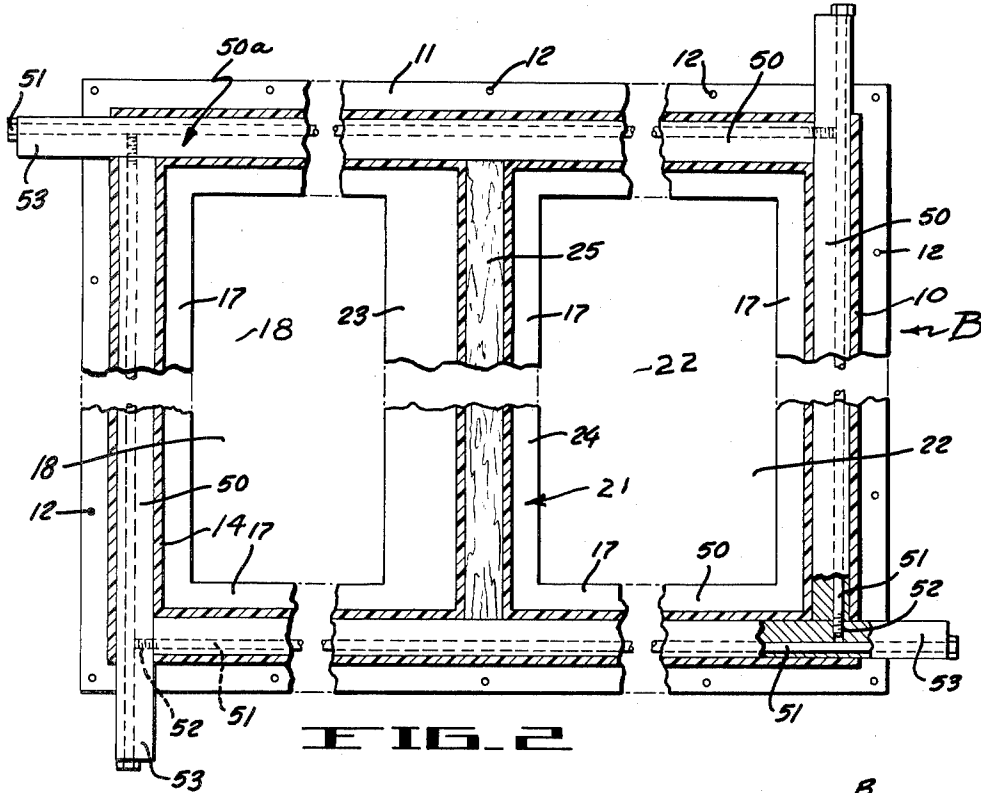
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3 Sheets-Sheet 2



INVENTOR.
 CHARLES F. STRAWTHER
 BY
Hansen and Lane
 Attorneys

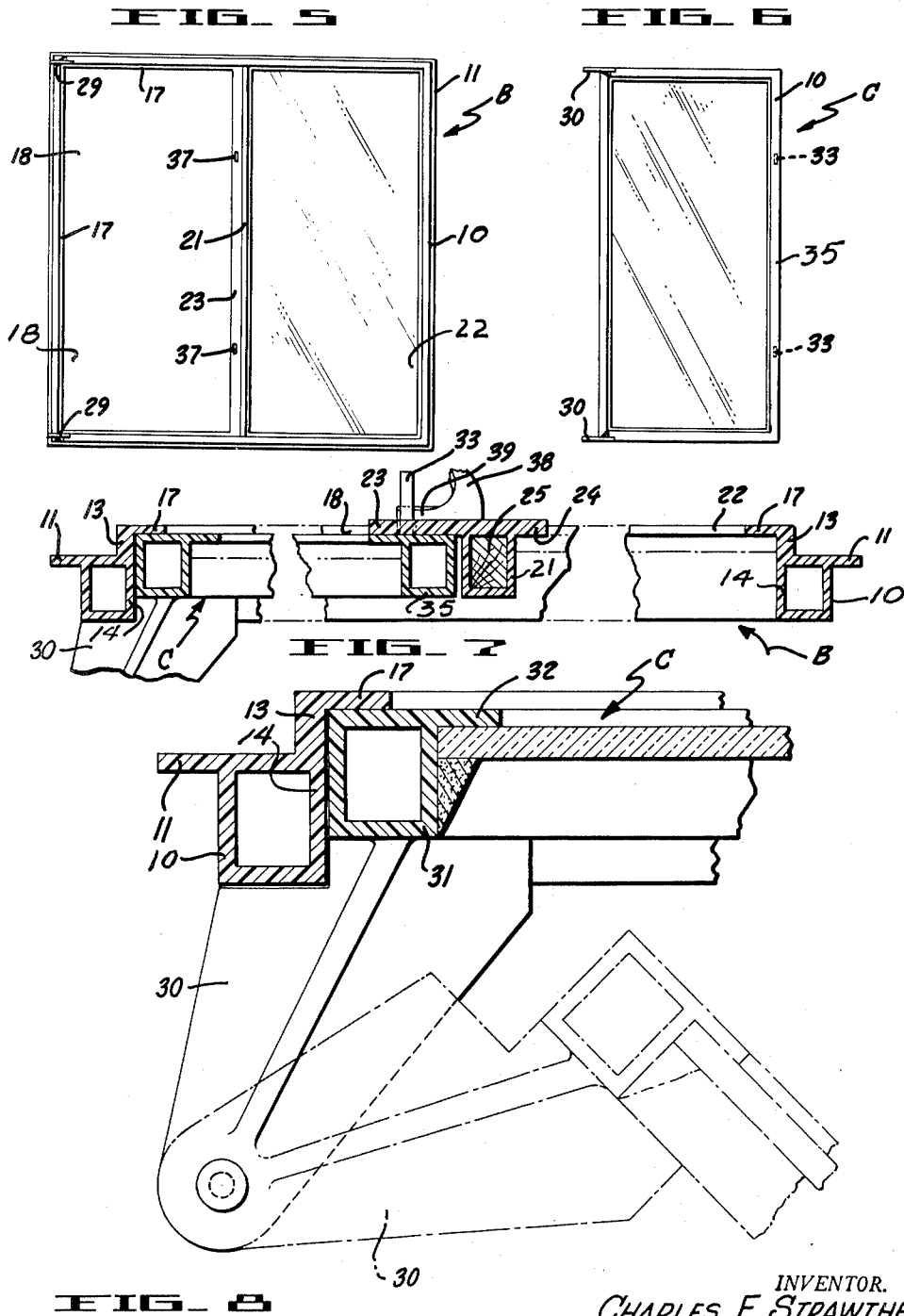
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3 Sheets-Sheet 3



INVENTOR.
CHARLES F. STRAWTHER
BY
Hansen and Lane
his ATTORNEYS

1

2,753,603

PLASTIC WINDOW FRAME

Charles F. Strawther, Los Gatos, Calif., assignor of one-half to Russell E. Longnecker, Los Gatos, Calif.

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2 Claims. (Cl. 20—11)

The present invention relates to window structures, and pertains more particularly to a plastic window frame and sash.

The invention provides an inexpensive, simple window frame and sash structure of plastic material which may be mounted as a unit in a suitably framed opening provided therefor in a building structure.

The invention also provides a strong, rigid window structure of plastic material having a wooden core element embedded therein to stiffen and strengthen the structure.

A further object of the invention is to provide a plastic window frame structure of rectangular box section having flanges extending therefrom at predetermined angles to facilitate mounting the frame in a window opening and to provide reinforcement and stiffening for the box section portion of the frame.

It also is an object of the invention to provide a window frame structure and a separately made sill for adhesive attachment to a lower run of the frame, thereby to produce a substantially unitary frame and sill structure.

Another object of the invention is to provide an improved coring arrangement for use in the manufacture of plastic window frames.

It is a still further object of the invention to provide a core structure for use in the molding of plastic window frames which facilitates the molding of an entire window frame in a single operation.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, wherein:

Fig. 1 is a vertical transverse sectional view through a window frame and sash embodying the invention, the parts being shown as they would appear mounted in a frame type of building structure, portions being broken away to increase the scale of the drawing.

Fig. 2 is a vertical, longitudinal sectional view in reduced scale of a window frame with both removable and permanent core members embedded therein, portions being broken away.

Fig. 3 is a fragmentary sectional view of a modified type of frame from that illustrated in Fig. 2, the core being of a type which remains embedded in the window frame after the molding process has been completed.

Fig. 3A is a view similar to Fig. 3 showing the coreless construction of Fig. 2 after the core openings are sealed off.

Fig. 4 is a fragmentary elevational view of portions of the sash and frame having the locking handle and latch hook mounted thereon as they would appear looking in the direction of the arrows 4—4 of Fig. 1.

Fig. 5 is an elevational view in reduced scale of the exterior side of the window frame illustrated in Fig. 1.

Fig. 6 is a similarly reduced elevational view of the exterior side of the sash for mounting in the window frame illustrated in Fig. 5.

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Fig. 7 is a sectional view in reduced scale taken along line 7—7 of Fig. 1, portions being broken away.

Fig. 8 is an enlarged sectional view similar to the left-hand portion of Fig. 7 showing the hinge structure of the sash and frame illustrated therein, the sash being shown in closed position in solid lines and in open position in broken lines.

Referring to the drawings in detail, a complete window structure A comprises a frame B and a sash C hingedly mounted thereon. The frame B comprises a rectangular marginal frame portion 10 of box sectional shape having a marginal nailing flange 11 formed integrally therewith, and co-extensive with the interior side of the box sectional frame portion 10. Nail holes 12 are provided at desired intervals throughout the length of the marginal nailing flange 11.

A thickened flange portion 13 is also formed integrally with the box sectional frame portion 10. The flange 13 is co-extensive with the wall 14 of the box sectional portion 10 to extend into a framed opening 15 in the building structure provided to receive the window A. A sash stop flange 17 (Figs. 1, 2, 5, 7 and 8) is provided entirely around the sash opening 18 in the frame B to act as a stop for the sash C hingedly mounted in the frame B in a manner to be described later herein.

A drip lip 20 (Fig. 1) is formed integrally with the bottom of the box sectional portion 10 which extends across the bottom of the window frame. This drip lip 20 is provided to carry rain or other water flowing downwardly over the window outwardly beyond the exterior surface of the building wall D in which the window is mounted.

A mullion 21 (Figs. 2, 5 and 7) divides the frame B into two openings, the sash opening 18 and a second opening 22. The mullion 21 is of box sectional shape with a sash stop flange 23 extending into the sash opening 18 and a glazing flange 24 extending into the opening 22. The mullion 21 preferably is formed with a rectangular wooden core strip 25 (Fig. 2) molded permanently therein. This core strip 25 greatly increases the strength and rigidity of the mullion and also improves and simplifies the molding procedure for the frame B as will be brought out later herein.

A sill 27 (Fig. 1) of plastic material preferably is formed separately from the plastic window frame B. The sill 27 may be attached to the frame B after the frame B is mounted in the building wall D by means of suitable plastic adhesive of any of a number of well known types. The sill 27 preferably is placed after the interior of the building has been plastered, or finished, as the case may be, with suitable material such as plaster-board 28.

A pair of hinge support arms 29, 29 are formed integrally with the frame B to extend outwardly from one side of the sash opening 18 therein. The sash C is provided with a corresponding pair of hinge arms 30, 30 (Figs. 1, 7 and 8). The sash hinge arms 30, 30 are formed to register with the frame hinge arms 29, 29 when the sash is closed as shown in Figs. 1 and 7 and in solid lines in Fig. 8. The sash C has a marginal frame portion 31 of box sectional shape (Fig. 1). This box sectional frame portion 31 of the sash C may be reinforced by wooden core strips 34 permanently molded in place during the molding of the sash C in the same manner as that described previously herein for the window frame B.

The sash C has a glazing flange 32 (Figs. 1 and 8) formed entirely around the interior marginal edge of the box section frame portion 31.

For locking the sash C in closed position, a pair of inwardly extending latch hooks 33, 33 (Figs. 1, 4 and 6) are formed on the interior face of the stile 35 of the sash

C on its free edge. A pair of slotted openings 37, 37 (Figs. 1, 4 and 5) are provided in the mullion flange 23 of the frame B to register with and receive the hooks 33, 33 when the sash is closed.

A pair of cam locking handles 38, 38 are pivotally mounted upon the interior face of the mullion 21 (Figs. 1, 4 and 7). Each locking handle is provided with a cam-shaped nose 39 (Figs. 1 and 4) which may be swung to enter a notch 40 in the side of its associated locking hook 33 to draw the sash C tightly inwardly against the mullion flange 23 and stop flange 17 on the frame B. If desired, conventional types of casement actuating hardware, not illustrated, may be provided to control the opening and closing of the sash C and to hold it in adjusted position.

In mounting the window A in a building structure, the usual window opening 15 in the building wall D (Fig. 1) is framed in with usual headers 42, 42 above and below the opening, respectively. The height of the opening 15 should be sufficient to receive the thickened flange 13 of the frame B as explained previously herein, plus a strip 43 (Fig. 1) of the interior finishing material. The marginal flange 11 seats flat on the exterior faces of the members 42, 42 which frame the opening 15. With the window frame B mounted in the building opening 15 as shown in Fig. 1, nails 44, 44 are driven through the holes 12 provided therefor in the laterally extending flange 11 and into the building structure.

In the event that any low spots are found in the seating surface for the marginal nailing flange 11, they may be trued up by the insertion of shims, not shown, between the window frame and the framing members 42, 42 in a conventional manner.

Suitable material for molding the window structures of the present invention comprises unsaturated polyester with monomer styrene. For providing additional strength in the finished product, it is also desirable to incorporate glass fibers in the finished product. This can be done in accordance with well known molding practice, for example, by lining the mold with glass fibers before injecting the plastic molding material therein.

If desired, windows of most sizes, other than the large view type windows, may be shipped and mounted in fully glazed condition and with the sash C hingedly mounted therein. This is due to the fact that the overall weight of the complete plastic window assembly A, even when fully glazed, is not excessive. This is a double advantage since it permits the glazing to be done at the factory with resultant savings in ultimate costs and adds greatly to the rigidity of the window which insures proper alignment and operation of the window when mounted.

After the window A has been mounted in the window opening 15 as described previously herein, usual sheathing material 45 (Fig. 1) may be nailed in place. In the illustration of Fig. 1, this sheathing material is conventional panel-board commonly used for this purpose. The exterior finish material, such as wooden siding 47 (Fig. 1) then may be applied in a conventional manner over the sheathing 45.

For making the hollow type of window construction shown in Figs. 2, 7 and 8, elongated core members 50 (Fig. 2) of rectangular cross sectional shape are secured together in end-to-side abutting relation by means of elongated bolts 51 to form a rectangular core 50a. The bolts 51 are inserted in holes provided therefor lengthwise of the core members 50 and are screwed into threaded holes 52 provided therefor in the sides of the core members against which the ends of the respective core members abut to draw the core members into tightly abutting relation.

The end of each core member 50 opposite that which abuts against the side of its adjacent core member extends outwardly as at 53 beyond the box-frame portion

of the window frame B or sash C in which the core members 50 of appropriate size are embedded during molding. The sides of the core members 50 are smoothly finished so as to facilitate the withdrawal of these members endwise from the frame or sash when it is molded. These core members preferably are tapered slightly toward their abutting ends to provide the necessary draft to facilitate their withdrawal from the molded product.

After the frame B or sash C has been molded, and the core members 50 have been withdrawn, the openings through which the core members were withdrawn are sealed (Fig. 3A) by fitting pieces 55 of plastic material into these openings, and adhesively securing these pieces in position therein.

In the modified structure shown in Fig. 3, wooden core strips 34, 34 are secured together at their corners as by screws 57 and are molded permanently into the window or sash structure, as shown in Figs. 1 and 3. This wooden core type of construction is much stronger and more rigid than the hollow come type shown in Figs. 2, 7 and 8 and is especially desirable for the larger sizes of windows.

Regardless of whether the frame B is of the hollow or solid core type, if it has a mullion 21 therein (Figs. 2 and 7) the mullion preferably is reinforced with a wooden core strip 25 embedded permanently therein.

The plastic window of the present invention can be quickly and easily molded as a complete unit in a very simple manner. Any desired color of plastic may be used, and the window will retain this color indefinitely. However, if desired, the window may be painted to match the general color scheme of the building in which it is mounted.

The complete sash and frame structure for the smaller and medium size windows which are most commonly used in residences or for individual offices in office buildings can be made for a material cost of a few dollars apiece. The molding costs also are low, since the molds used are of simple, straight-line conformation and the draws, except for the cores 50, are all short and on straight surfaces. A minimum amount of simple coring is required for making the hollow type structure shown in Figs. 2, 7 and 8, while in the wooden core structure shown in Figs. 1 and 3 no core removal at all is required.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims.

1. A plastic window structure comprising an integrally molded plastic window frame having a marginal frame portion of box sectional shape and rectangular configuration for fitting onto the marginal planiform face of a building around a window opening therein, a marginal plastic nailing flange molded integrally with the frame portion and co-planar with the interior face of said box section portion of the window frame to overlie an additional portion of the marginal building face for securing the frame to the building, a plastic drip flange integral with the lower run of the box section frame portion and extending exteriorly therefrom, and a plastic sash seat comprising a marginal flange molded integrally with the frame portion and formed to extend interiorly from the centrally inward face of the box section portion of the window frame and thence centrally inward into the frame in a plane substantially parallel to the nailing flange.

2. A plastic window structure comprising an integrally molded plastic window frame having a frame portion of box sectional shape and rectangular configuration for fitting onto the marginal planiform face of a building

around a window opening therein, a marginal plastic nailing flange molded integrally with the frame portion and co-planar with the interior face of said box section portion of the window frame to overlie an additional portion of the marginal building face for securing the frame to the building, a plastic drip flange integral with the lower run of the box section frame and extending exteriorly therefrom, a plastic mullion of box sectional shape molded integrally with the window frame, a wooden strip filling the box sectional mullion and extending into the window frame, and a plastic sash seat comprising a marginal flange formed to extend interiorly from the centrally inward face of the box section portion of the window frame and thence centrally inward into the frame in a plane substantially parallel to the nailing flange, said sash

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seat being integral with the box section portion of the window frame.

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