Jan. 20, 1970 A. DANOIS 3,490,176

WINDOW

Filed Jan. 3, 1967 2 Sheets-Sheet 1

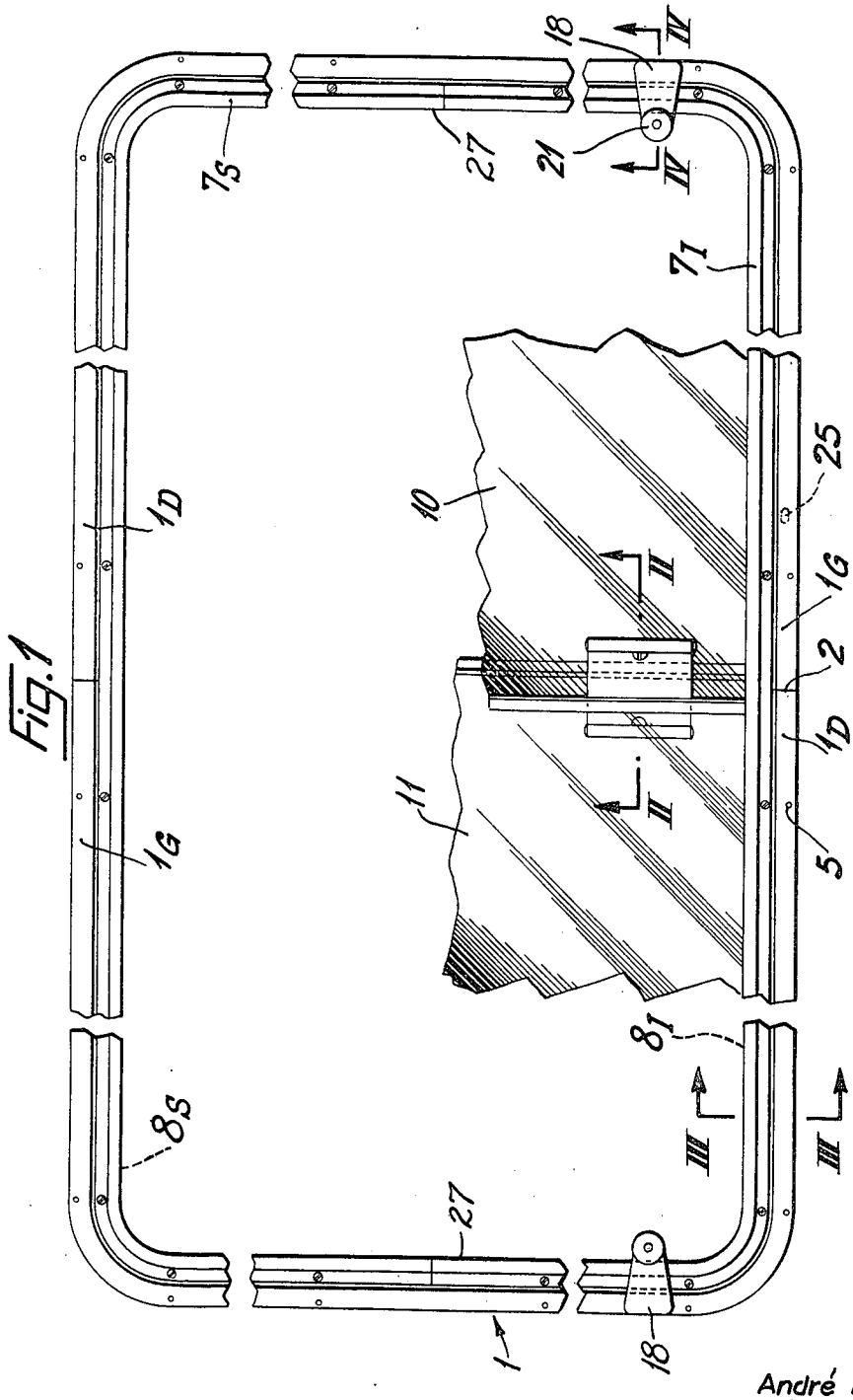


Fig. 1

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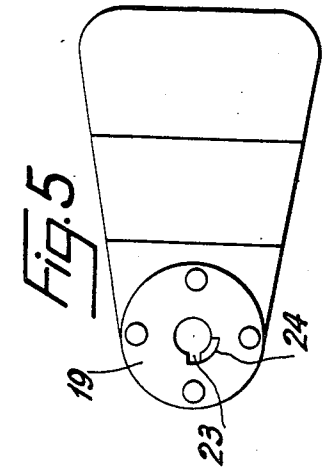


Fig. 5

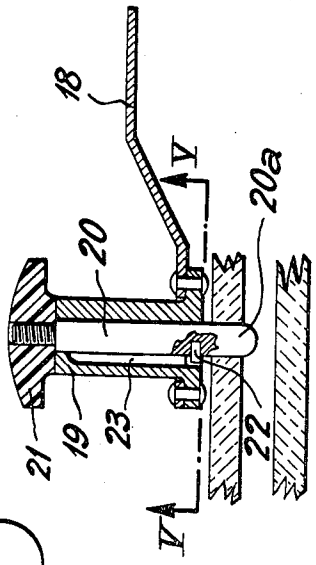


Fig. 4

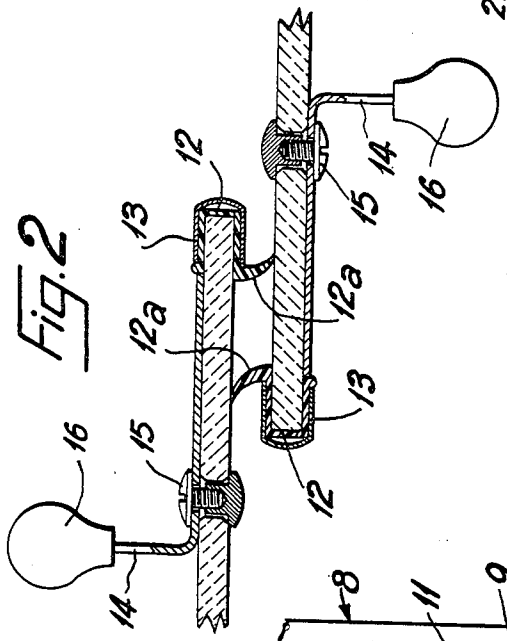


Fig. 2

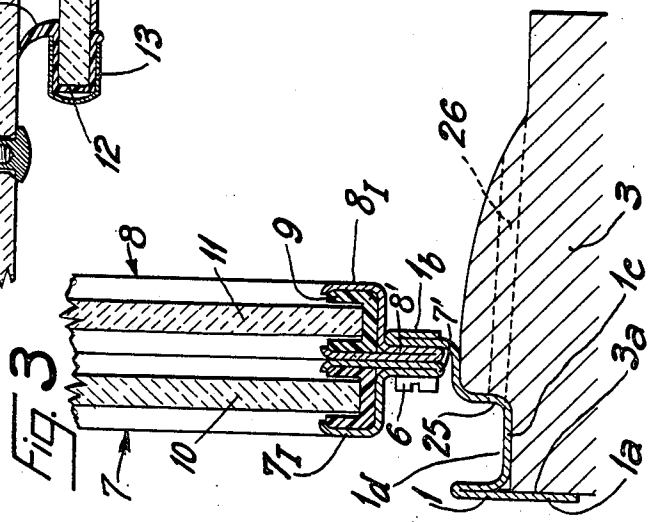


Fig. 3

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United States Patent Office 3,490,176
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3,490,176

WINDOW

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Filed Jan. 3, 1967, Ser. No. 606,787
Claims priority, application France, Jan. 11, 1966, 45,515
Int. Cl. E06b *3/46;* E05c *15/02;* E05d *13/04*
U.S. Cl. 49—449 7 Claims

ABSTRACT OF THE DISCLOSURE

Window-frame structure with an outer frame composed of two C-shaped sheet-metal sections and two inner frames each composed of two U-shaped sheet-metal sections, each inner frame accommodating a respective glass pane which is slidably held therein and can be independently locked to the lower part of a respective outerframe section; the inner frame sections can be detached from the outer frame for installation and removal of the panes.

The present invention relates to a window-frame structure adapted to be installed in a wall opening of a dwelling house, preferably in an opening provided in advance in a prefabricated wall of a building.

According to the invention the frame of this window comprises an outer frame element constituted by a section formed from a folded sheet-metal strip and at least one inner frame element likewise constituted by a folded sheet-metal section which receives a glass pane and is fixed by its periphery to the said outer frame element.

Thus, with the aid of a single inner frame element and one pane it is possible to obtain a window with fixed pane; but it is equally possible, with the aid of two coupled inner frame elements fixed to the same outer frame element to obtain an opening window with the aid of two panes each of which occupies only part of one of these inner frame elements and is capable of sliding in the latter.

The section of the outer frame element preferably comprises a flange for fixing it to the building and a flange for supporting the inner frame elements.

In a preferred embodiment of the invention the window is of rectangular shape and has rounded corners, so that the sections of the outer as well as the inner frame elements may be continuous and bent at right angles in the corners of the window. Moreover, in order to avoid any necessity for welding or mounting the sections, the outer as well as the inner frame may consist of two parts merely joined end to end, the joints being situated on the different sides of the window as regards the outer frame and the inner frame or frames.

In order to make possible the easy replacement of a pane in the case of breakage, the joints of the inner frames are situated in a horizontal plane so that the frame sections are in two parts, one corresponding to the upper and the other to the lower part of the pane.

Thus it will be sufficient to dismantle only the upper portion of an inner frame in order to insert a pane in the lower portion and then to hold this pane in place during the re-assembly of the said upper portion of the inner frame.

The following description, given with reference to the accompanying drawing and by way of a non-limiting example, will help to understand how the invention may be put into practical effect. In the drawing:

FIGURE 1 is a view, in elevation, of a window according to one embodiment of the invention;

FIGURE 2 is a sectional view on the line II—II of FIGURE 1;

FIGURE 3 is a sectional view on the line III—III of FIGURE 1;

FIGURE 4 is a sectional view on the line IV—IV of FIGURE 1; and

FIGURE 5 is a view taken in the direction of the arrow V in FIGURE 4.

As shown in the accompanying drawing a window comprises an outer frame **1** formed by two C-shaped halves **1D** and **1G**, connected end to end two vertical junctions **2**.

As shown more particularly in FIGURE 3, the sections of the outer frame are composed of a strip of suitably folded sheet metal so as to comprise two peripheral flanges, i.e. an outer flange **1***a* and an inner flange **1***b*, the flanges being integrally connected by a flat portion **1***c*. The re-entrant angle between the outer flange **1***a* and the flat portion **1***c* enables the frame to be supported on an inner bounding surface **3***a* of an opening provided in the wall **3** of a structure, for example a facing wall.

The outer face of the portion **1***c* as shown is shaped to form a gutter **1***d* which is for collecting condensation from the window panes and also serves to reinforce the connection with the opening of the building by improving the quality of the joint in this region.

The two frame sections **1D** and **1G** of the outer frame may be fixed to the wall **3** by screws inserted through apertures **5** in the flange **1***d*. Condensation in the gutter **1***a* is adapted to drain a hole **25** and through a duct **26**.

The inner peripheral flange **1***b* is bent back on itself to provide a reinforcement and inner frames **7** and **8** are secured thereto by screws **6**. Each of the inner frames comprises an upper, invertedly U-shaped half **7S** and **8S** respectively and a lower, U-shaped half 7_I and 8_I respectively, formed of sheet metal folded into Y-section, the two inner frame sections meeting at two horizontal junctions **27** offset from junctions **2**. Sections 7_I, 8_I form peripheral ribs **7'**, **8'** juxtaposed on one side of flange **1***b* and traversed by the fastening means **6**.

In the longitudinal groove formed by each Y-section there assembled a U-shaped lining **9** in which rests the edge of a respective glass pane **10** and **11**.

The linings **9** ensure a tight joint between each pane and its frame and also facilitate the sliding of these panes in the frames. For this purpose these may advantageously consist of a super-polyamide such as that known commercially as Nylon.

The panes **10** and **11** each extend a little beyond half of the lateral width of the window opening so that they overlap at the vertical middle zone of the opening. In order to ensure weather tightness at the overlap, the vertical inner edge of each pane is provided with a sealing strip **12** of rubber-like material, each strip being disposed along an edge of the pane and having a lip **12***a* which, by virtue of its resilience, is pressed against the other pane. Each sealing strip is held in place by a U-section clip **13**.

Each U-section clip **13** fits around a metal plate **14** (FIG. 2) which is secured to the pane by a single bolt **15**. The metal plate has an outwardly extending arm having a handle **16**, at its free end for effecting the horizontal displacement of the panes.

When in closed position the panes are adapted to be independently immobilized by respective locks shown in FIGS. 4 and 5.

As shown, each lock is supported by an arm **18** fixed to the lower part of a respective section **1D**, **1G** (FIG. 1) of the outer frame **1**. The lock comprises a tubular holder **19** in which there is mounted a detent pin **20** having a knob **21** secured to one end, the other end **20***a* of this pin being adapted to pass through a hole in the corresponding pane.

The pin **20** has a lug **22** engaging an axial groove **23** in the tubular element **19**, the groove terminating on the

side adjacent the pane in a segmental recess **24** which constitutes a bayonet lock for the catch **22**.

Normally, one or both panes may be opened as required, the pane **10** on the right (FIG. 1) is displaced to the left after the release of the corresponding lock.

The pane **11** on the left (FIG. 1) is displaced toward the right, after the release of its lock, so that the two panes may be cleaned from the outside by reaching out with one's arms through the free spaces on the sides of the inner window frames.

In order to insert or replace the panes, their lower edges are assembled in the lower frame sections 7_I,8_I and are then shifted sideways and locked by the locking pins **20**. Afterwards all that has to be done is to cap the upper edges of the panes with the upper halves **7S**, **8S** of their frame sections and to fix the latter by means of suitable screws.

The panes are preferably a few millimetres thick and are hardened, in order to make them more resistant to impact.

For windows with a fixed pane only one frame **7** or **8** is used, which would occupy the whole area of the frame **1**.

Obviosuly, modifications may be made to the embodiments described here, especially by the substitution of equivalent technical means, without thereby departing from the scope of the present invention as defined in the appended claims.

I claim.

1. A window-frame structure comprising an outer frame; two substantially coextensive inner frames each consisting of a lower section and a complementary upper section receivable in said outer frame; fastening means for detachably mounting each of said sections in said outer frame; and a pair of window panes each insertable into the lower section of a respective inner frame in the absence of the corresponding upper section, said panes being retainable in the structure by fitting said upper sections to said panes and attaching said upper sections to said outer frame; said outer frame consisting of a profiled member forming an inner peripheral flange engageable by said fastening means and an outer peripheral flange securable to a wall having an opening to receive the structure, said inner frames being profiled members with respective outer peripheral ribs juxtaposed on one side of said inner peripheral flange, said fastening means passing through both said ribs into engagement with said inner peripheral flange.

2. A structure as defined in claim **1** wherein each of said panes occupies less than the full area of the corresponding inner frame, said panes overlapping each other in a position of closure, at least one of said panes being slidable in its inner frame for opening the window.

3. A structure as defined in claim **2** wherein both said panes are slidable in their respective inner frames, further comprising first and second locking means for independently arresting said panes in their position of closure and immobilizing said panes in said lower sections during attachment and reattachment of said upper sections.

4. A structure as defined in claim **3** wherein said outer frame consists of complementary lateral sections, each of said locking means being mounted on a lower part of respective lateral section.

5. A structure as defined in claim **1** wherein said outer frame forms a gutter between said outer and inner peripheral flanges on the side of said juxtaposed ribs.

6. A structure as defined in claim **1** wherein said profiled members consist of sheet metal.

7. In a window-frame structure, in combination, an outer frame composed of two generally C-shaped halves and an inner frame composed of two generally C-shaped halves nested in said outer frame, the halves of said outer frame adjoining each other along a first parting line, the halves of said inner frame adjoining each other along a second parting line perpendicular to said first parting line.

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J. KARL BELL, Primary Examiner

U.S. Cl. X.R.

49—141, 413, 504; 52—204, 658