

Dec. 28, 1965

W. HALLAUER
COMPOSITE FRAME

3,225,502

Filed Dec. 23, 1960

3 Sheets-Sheet 1

Fig. 1

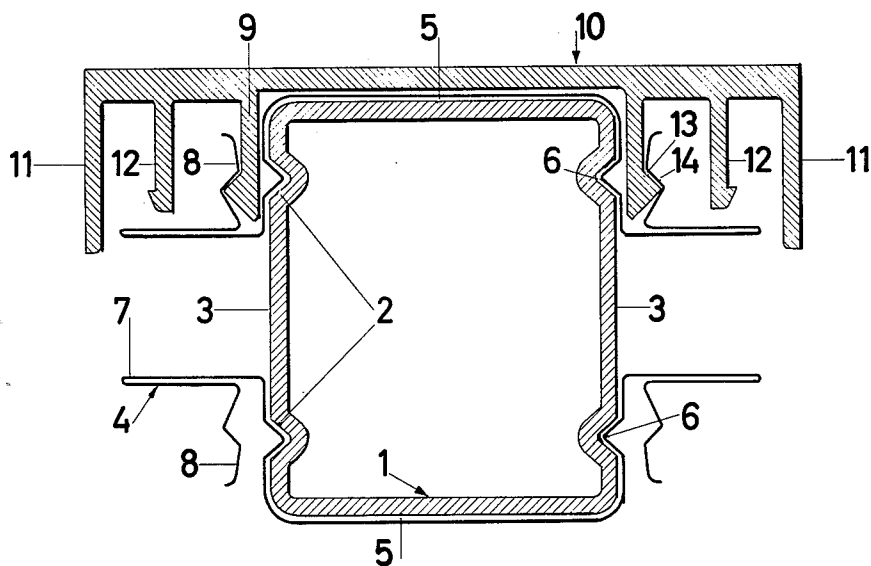


Fig. 4

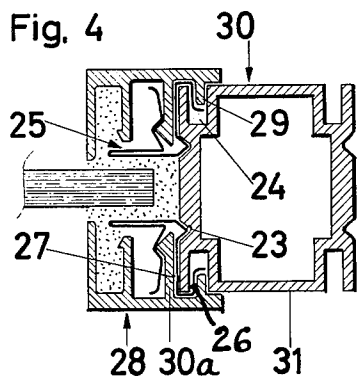


Fig. 6

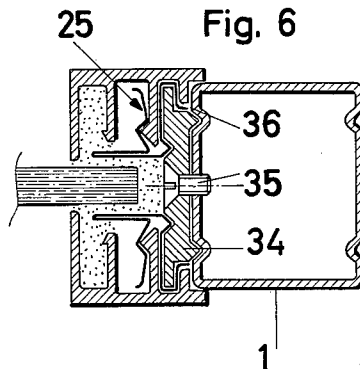
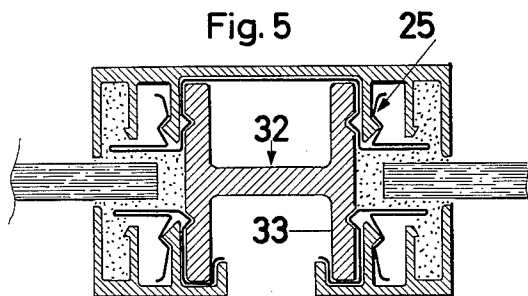


Fig. 5



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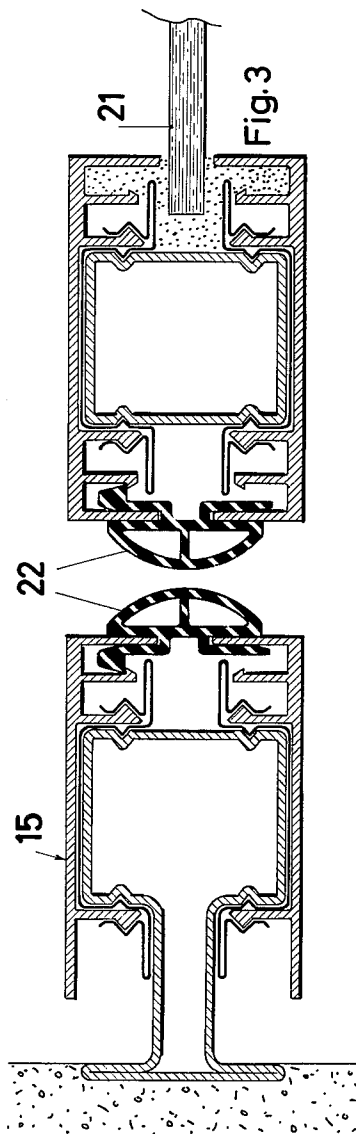
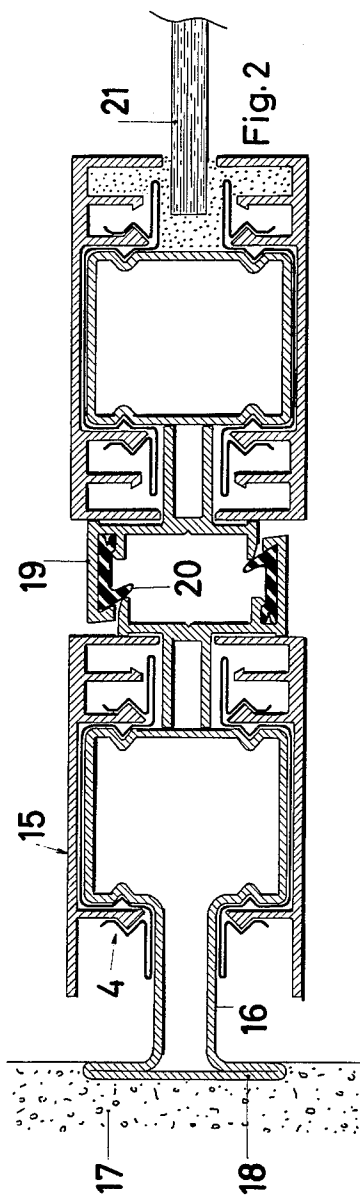
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Inventor :

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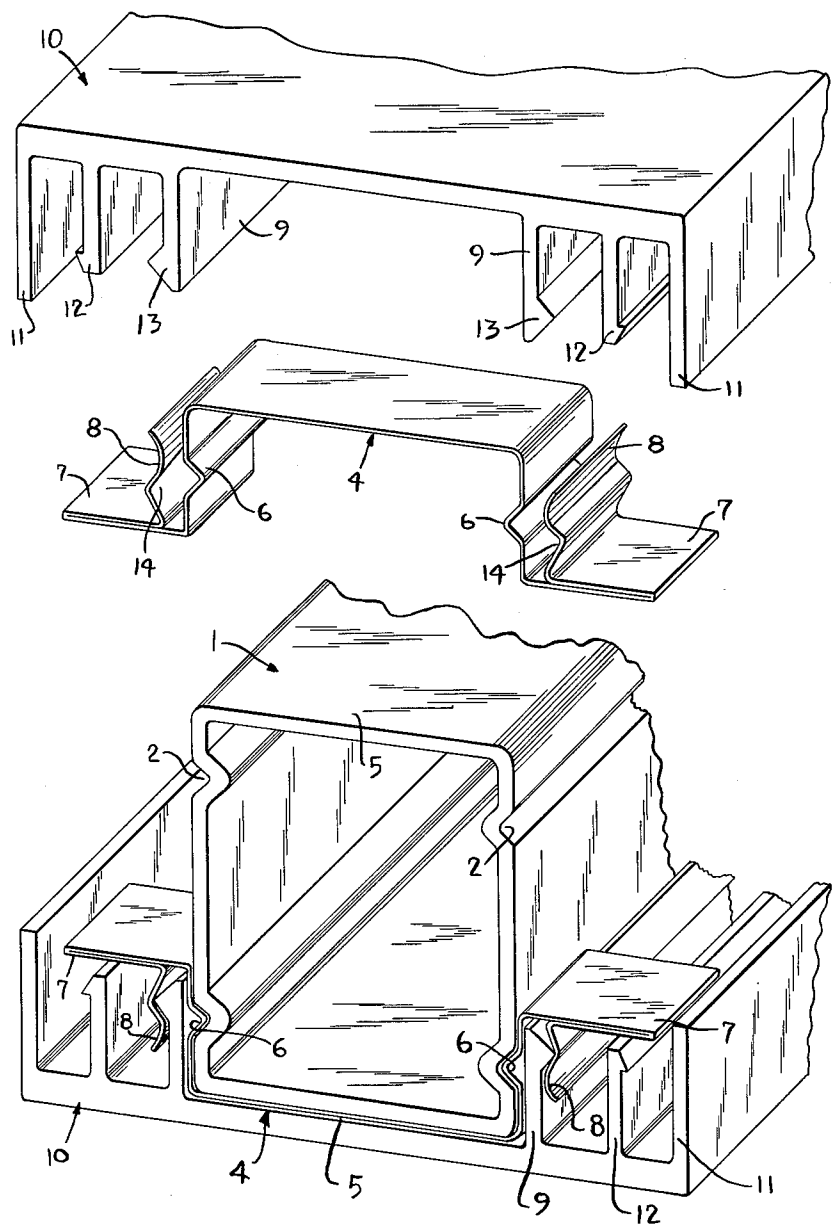
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Fig. 7



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3,225,502

COMPOSITE FRAME

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82,274/59

4 Claims. (Cl. 52—461)

When buildings are in course of construction a time usually arrives when it is desirable to be able to close the rooms to protect them from the effects of weather. Glass panes must be inserted in the windows as well as in glass doors or walls. However, it is preferable not to fix cover strips of aluminum or aluminum alloys or other high-priced material to the frames as long as workmen who can spoil these strips with mortar sprayers or otherwise are present. These strips are fitted when the rooms have been cleaned to a certain extent and the workmen have been replaced by other workmen whose activities will not damage the cover strips.

This provisional fitting of the glass panes in window and door frames is quite usual. In the methods used at the present time, the retaining means for the provisional fixing of the panes are secured by screws.

A glazing system has been known for a little time, in which metal fixtures of appropriate section are fixed by screws to the frames and cover strips with one or more resilient legs are snapped on to them. This system also requires holes to be bored and threaded, and the fixtures to be secured by screws, which increases the cost of construction to an appreciable extent, the more so because the bored and threaded holes are frequently blocked with dirt or damaged during the construction of the building.

My invention is concerned with composite frames which are intended for the reception of flat building elements, such as panes of glass, sheets of a plastic, sheet metal or flanges on door posts, and can be assembled in a more economical manner than the known frames.

According to my present invention a longitudinal frame member and a cover strip for it are held by spring clips, each clip embracing a part of the frame member and having a projection or recess mating with a corresponding recess or projection in or on the frame member, a projection or recess mating with a corresponding recess or projection in or on the flange of the cover strip, and a part extending parallel to the building element that is to be held by the frame, the flange serving to hold the mating projection and recess of the frame member and clip against disengagement in a direction perpendicular to the length of the frame member.

Each frame member may occupy a substantially rectangular area in cross section. Generally a complete frame is rectangular and consists of four such frame members, the ends of the members being assembled at the corners for instance by welding or by means of screws, each member being provided with one or more cover strips held by clips as set forth.

My invention will be better understood by reference to the accompanying drawing, which shows various embodiments according to it, and in which:

FIGURE 1 is a horizontal section through part of one frame showing the clips and one of the cover strips;

FIGURE 2 is a similar section through a door;

FIGURE 3 shows a similar cross-section through a swing door;

FIGURE 4 is a cross-section showing a modified form of spring clip;

FIGURES 5 and 6 are cross-sections showing further modifications; and

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FIGURE 7 is a fragmentary extended view, in perspective, showing the embodiment of FIG. 1 but with both cover strips illustrated.

Referring to FIGURE 1 of the drawings, one frame member is shown at 1 and is of tubular metal, approximately rectangular in cross-section. Four longitudinal recesses 2, which run in pairs approximately opposite one another, are made in the member 1 in those longitudinal surfaces 3 which are at right angles to the plane of a flat building element to be held by the frame (see for instance the glass pane 21 in FIG. 2).

Resilient clips 4 are so formed that they can be pushed over the low longitudinal surfaces 5 which are parallel to the plane of the flat building element. Each clip 4 includes a connecting section and two leg sections at the opposite ends of the connecting section. Each leg section has a projecting rib 6, and these ribs 6 snap into opposite grooves 2 in the frame member. Each clip also has on both sides a part 7 which includes a flat section that runs at right angles to the grooved plane of the frame 1 and in a plane parallel to the flat building element. Each flat section of the part 7 consists of metal doubled on itself and carries an end section with a recess 14 that forms a locking element. The end section includes a part 8 that is parallel to the surfaces 3.

A cover strip 10 overlaps the same longitudinal side 5 of the frame member 1 as the resilient clip 4 and has two projections, such as flanges 9, one on each side, with projecting locking members 13. When the cover strip is pushed on, the flanges 9 pass between the parts 8 and the frame member 1, and the locking members 13 enter the recesses 14 and are resiliently engaged. The flanges 9 then prevent disengagement of the ribs 6 from the recesses 2 by movement of the cover strip in a direction at right angles to the axis of the frame member 1. No mechanical fastening devices such as screws are necessary.

If the glass panes or other building elements are to be provisionally inserted and the cover strips of the frames are to be put on later, short sections of cover strip can be pushed on to the clips for securing them and can be removed later before the cover strips are put on. Of course, other strip sections can be used for this purpose provided they have the necessary dimensions and also a flange 9.

The frame member 1 can be made of any suitable material having the necessary strength and may have shapes other than that illustrated in FIG. 1. It is possible to make the frame of solid wooden rods. Preferably, however, metal sections are used for this purpose, but tubes of synthetic resin may also be used.

The spring clips need not have the shape shown in FIG. 1, provided that they have the essential characteristics set forth above. The free edge of the projecting part 8 is preferably bent, as shown in FIGS. 1 and 7 of the drawing, in order that the flanges 9 of the cover strip can be easily pushed in. The clips are preferably made of rust-proofed spring steel of about 0.5 mm. thickness. Their length is not critical and may be for instance 2 to 3 cm. Generally, two or three clips may be sufficient on each frame member 1; they are preferably disposed near the corners. On short frame members (e.g. 20 cm. long) only one clip may be necessary for fastening one cover strip. I have found that a distance of about 70 to 80 cm. between the clips is satisfactory, but the distance may be also shorter or longer.

As shown in the drawing, the visible surfaces of the cover strips 10 are quite flat. They need not be flat, however, but can be of any suitable shape and colour. Neither the flanges 11 nor central flanges 12 are abso-

lutely necessary, and if they are present they may take various forms.

The ribs 13 can also be formed in various ways. They may even be replaced by grooves in which projections of the spring clips 4 engage, but this is not as suitable as the construction shown in FIG. 1.

Frames according to my invention, as shown for example in FIGURE 1 and FIGURE 7, can be used for many different purposes. For immovable glass walls any desired number of frames can be assembled beside and one above another, glass panes being inserted in each frame. Those parts of the frame at the edges of the glass wall can be modified in such a way that they can be embedded in an adjacent wall of the building. FIG. 2 shows a horizontal section through such a frame together with the clips 4 and the cover strips 15. The tube which forms the frame has a projection 16 provided with a flange 18 which can be cemented into the brick-work 17. A glass pane can then be inserted on the side of the frame opposite the projection.

FIG. 2 is a horizontal section through part of a fixed door frame and a door in which special abutment sections 19 and rubber seals 20 are used to exclude draughts. 21 is a glass pane which is fixed in the door by means of putty or plastic material.

FIGS. 3 shows, also in horizontal section, part of a swing door and a fixed frame with rubber seals 22 between them.

In FIG. 1, the sides 5 of the frame 1 are entirely covered by the strips 10, the lower strip being not shown in the drawing. It may be preferred to fit the cover strips only at the two edges of the sides 5, for example in order to obtain a decorative effect or to manage with a smaller surface of cover strip. For this purpose it is necessary to use another form of spring clips. The clip cannot then cover the entire side of the frame, and one of its arms must be supported at some point other than the outer edge of the supporting frame.

FIG. 4 shows a construction in which such a modified clip is used. A frame member 30 has, in addition to a groove 23, a deep recess 24 in which both a bent part 26 of a spring clip 25 and also a flange 29 of a cover strip 28 engage. Two arms 26 and 27 of a U-shaped part of the clip 25 do not extend over the entire side of the frame member 30, as is the case in FIG. 1, but only over a narrow edge part. In this case the clip 25 is secured by the flange 29 and a flange 30a of the cover strip 28. A surface 31 remains free because the cover strip does not extend to the other edge of the frame 30.

FIG. 5 shows a construction in which the supporting frame is assembled from I-section members 32. With this frame cover strips fitted only at the edges of the frame, or those of the kind shown in FIG. 1, may be used. The lower side of the figure shows two narrow cover strips, whereas the upper side of the figure shows a single wide cover strip. In the construction shown on the lower side of FIG. 5, and also that of FIG. 4, it is not necessary to provide grooves in the side of the frame on which the edge of the pane or other element is received. This side can be flat and the grooves can be formed in the recess 24 or on the surface 33 of the frame 32.

The frame members need not be made in a single piece. When cover strips which do not extend completely over the sides of the frame are to be fitted, it may be advantageous to use rectangular tubes as shown in FIG. 1, and to fix to them attachments which, with the rectangular sections, form recesses for the fixing of the clips and the cover strips.

FIG. 6 shows an arrangement of this kind. In this figure a frame member 1 is used to which attachments 34 are fixed by means of screws 35. A rail can be used as the attachment, but it is preferable to use shaped sections, the width of which is approximately the same as that of the clips 25, e.g. 2 to 3 cm. The attachment

pieces 34 form with the frame member 1 a composite frame member having a recess 36 which corresponds to the recess 24 of the frame 30 in FIG. 4.

The snapping of ribs into grooves can be more easily effected with a frame of this kind than the snapping of narrow projections into holes or hole-like recesses. When the clips are pushed on it is not necessary to insert them at definite places but there is a space for movement to one side or the other. Nevertheless, it may be advantageous to provide the parts to be fastened not with grooves or with ribs which snap into grooves, but with small projections which engage in corresponding, preferably round, holes or indentations in the frame and serve the same purpose as the grooves and ribs. A construction of this kind has the advantage that, for example, a rectangular tube with flat surfaces can be used. Then, instead of the grooves 2 as shown in FIG. 1, there may be holes or recesses in which small projections engage.

Obviously the projections on the clips may be discontinuous instead of continuous and engage in continuous or interrupted grooves.

As already stated, when making a frame, the frame members are assembled at the corners for instance by welding or by means of screws, but the cover strips are generally not assembled at the corners, they are secured separately to the frame and abut at the corners; they may be also removed separately.

What I claim is:

1. In a frame, for use in holding at flat building element extending in one plane, the combination of a longitudinal rigid frame member having two opposite sides perpendicular to said plane and spaced apart from each other for a distance, said frame member defining between said sides a surface parallel to said plane, and having in at least one of said sides a recess extending in said longitudinal direction, at least one rigid cover strip mounted to said frame member and including two substantially parallel projections defining a gap, at least one of said projections being a flange, and at least one spring clip resiliently connecting the cover strip removably to the frame member, said flange including a locking element, said spring clip including at least two U-shaped parts side by side and interconnected in inverted relative position having a common interconnecting leg, the first of said U-shaped parts being open at the bottom and the second being open at the top, said first U-shaped part engaging at least a portion of said surface of said frame member parallel to said plane, the common leg having a projecting rib engaging resiliently the said recess of the said one side of the frame member, the said flange of the cover strip being engaged in the second U-shaped part of the clip thereby retaining the engagement of the said projecting rib of the said common leg in said recess, the exterior leg of the said second U-shaped part of the clip having a locking element engaging resiliently said locking element of said flange of said cover strip, the said second U-shaped part of the clip having at its bottom an adjacent flat section extending parallel to said plane and being adapted to engage said building element.

2. In a frame, for use in holding a flat building element extending in one plane, the combination of a longitudinal rigid frame member having two opposite sides perpendicular to said plane and spaced apart from each other for a distance, said frame member defining between said sides a surface parallel to said plane, and having in at least one of said sides a recess extending in said longitudinal direction, at least one rigid cover strip mounted to said frame member and including two substantially parallel projections defining a gap, at least one of said projections being a flange, and at least one spring clip resiliently connecting the cover strip removably to the frame member, said spring clip including a connecting section positioned adjacent and engaging

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at least a portion of said surface of said frame member, two leg sections connected to said connecting section each extending adjacent a side and perpendicularly to said plane, said clip thereby embracing said frame member on portions of said sides, said cover strip surmounting across said gap at least a portion of said surface of said frame member, with the projections disposed adjacent the exterior of said leg sections of said clip, at least the one leg section of said clip adjacent said one side including a flat section extending parallel of said plane and adapted to engage said building element, and an end section extending alongside said one leg section and being spaced from the exterior thereof for a certain space and defining a locking element and engaging with said one leg section the flange of said cover strip in said space, said one leg section having a projecting rib engaging resiliently a recess of said one side thereby removably emplacing the clip on the frame member, said flange including a locking member resiliently engaging said locking element of said end section, and said flange extending along said one leg section to a point thereof near said projecting rib restraining lateral outward movement of said one leg section thereby retaining the engagement of said projecting rib in said recess.

3. In a frame, as claimed in claim 2, said frame comprising a body having at least one recess receiving a projection.

4. In a frame, for use in holding a flat building element extending in one plane, the combination of a longitudinal rigid frame member of rectangular cross-section having two opposite sides perpendicular to said plane and spaced apart from each other for a distance and having recesses extending in said longitudinal direction, said frame member having a third side between said two opposite sides, at least one rigid cover strip mounted to said frame member and including two substantially parallel flanges defining therebetween a gap, and at least one spring clip resiliently connecting the cover strip removably to the frame member, said spring clip being U-shaped and including a connecting section adjacent said third side of said frame member, two leg sections connected to said connecting section and

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each being positioned adjacent one of said opposite sides perpendicularly to said plane, said clip thereby embracing said frame member on portions of at least some of said three sides, said cover strip surmounting said frame member across said gap with the flanges positioned adjacent the exterior of said leg sections of said clip, said clip including adjacent each leg section a flat section extending parallel of said plane and adapted to engage said building element, and an end section extending alongside said leg section and being spaced from the exterior thereof for a certain space and defining a locking element and engaging with said leg section a flange of said cover strip in said space, each leg section with its end section forming a U-shape inverted with respect to that formed by the connecting section with the leg sections, each of said leg sections forming a projecting rib engaging resiliently a recess of a side thereby removably emplacing the clip on the frame member, each flange including a locking member resiliently engaging said locking element of said end section, and each flange extending along a leg section to a point thereof near said projecting rib restraining lateral outward movement of said leg section thereby retaining the engagement of each projecting rib in the respective recess.

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