March 5, 1935. C. TRAUT 1,993,535

METAL FRAME STROM WINDOW

Filed May 4, 1931

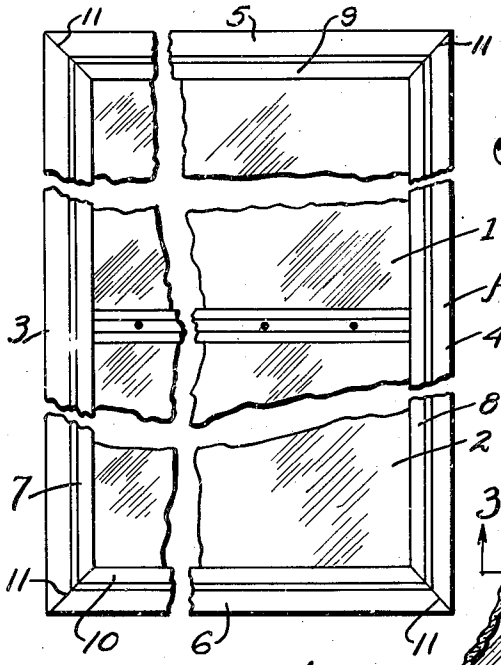


Fig. 1.

Fig. 2.

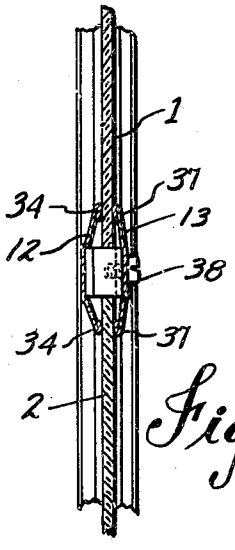


Fig. 4.

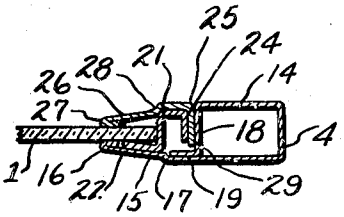


Fig. 3.

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METAL FRAME STORM WINDOW

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8 Claims. (Cl. 189—76)

My invention relates to windows, and more especially to comparatively light window sash structures.

One of my objects is to produce a relatively inexpensive structure of this kind which is readily assembled, especially with respect to mounting the glass plate or plates in the sash.

Another and more particular object is to provide a sash of the type of window screen frames so that my present invention, constructed as a storm sash, may readily be substituted for the window screen.

A further object is to construct a sash with the foregoing advantages, of sheet metal, in such a way that the various parts may be very easily bent, pressed, or otherwise formed of the sheet metal, and so that where the parts must be fastened together, the fastening may be done by very simple operations; and in general to make a sash mainly of sheet metal of low first cost, easy to install and maintain, and which is reliable and durable. Other objects will appear in the course of the following description.

I accomplish the above objects by the device illustrated in the accompanying drawing, in which:

Figure 1 is a front elevation showing in general the construction of my improved sash, intermediate parts being broken away for lack of space.

Fig. 2 is a fragmentary perspective view on an enlarged scale of parts of the sash about midway of its height at the right side as at A in Fig. 1, with one of the mullion strips removed and part of the glass strip broken away so as to reveal the interior details of the construction.

Fig. 3 is a partial horizontal cross section on the plane of the line 3, 3 of Fig. 2.

Fig. 4 is a partial vertical cross section through the mullion on the plane of the line 4, 4 in Fig. 2, but showing both mullion strips and the adjacent parts of both glass plates.

The sash shown for purposes of illustration of my invention comprises, as shown in Fig. 1, the upper glass plate 1, and the lower glass plate 2, surrounded by the upright side rails 3 and 4, the top rail and the bottom rail 6, which are provided with removable glass strips 7, 8, 9 and 10 respectively, holding the plates 1 and 2 in the sash frame; the sash rails and glass strips just mentioned being, as here shown, mitered together at the corners 11. It will be understood however, that the joining of the members at the corners may take any other well known form, and the present invention is not particularly concerned with or limited to any particular form of corner fastening. The two plates 1 and 2 have their edges midway of the height of the sash received in a transverse mullion, which comprises the mullion strip 12 at one side of the plates, which is fixed to the side rails 3 and 4 as will be described, and the mullion strip 13 bearing against the other sides of the plates 1 and 2, and suitably removably secured to the fixed strip 12, as also will later be described. The sash, of course, might be one with a single glass plate, in which case no mullion would be used, or may have more than the two plates shown, with the required number of mullions; and also it will be understood that while this sash is shown with one plate above another and the mullions transverse, sashes may be made with the plates succeeding horizontally with the mullion or mullions upright; or there may be crossing mullions. In any such cases my invention is applicable and will accomplish the objects above referred to.

Describing the details of the present example specifically, the sash rails, as the side rail 4 in Fig. 2, is practically of L-shape, one of the members 14 which forms the sash rail proper being of rectangular tubular shape to afford the required bulk and strength for the outer structure of the sash, while the other member 15 of the L extends in across the sash inclining inward toward the middle of the thickness of the sash, and having along its inner edge a bead 16 turned in the same direction. Also, this member 15 has a compound bend 17 where it starts to incline some distance inwardly of the sash from the inner wall 18 of the tubular member 14, which wall has a flange 19 turned inwardly of the sash, with its inner edge along the compound bend 17. This flange 19 is secured to the inwardly extending member 15 preferably by spot welds 20, as clearly shown in Fig. 2.

On the side of the inner inclined part of the member 15, which is toward the middle of the thickness of the sash, is fastened a U-shaped member 21, with the bottom of the U toward the other face of the sash; one side of the U having an extension 22 along the inclined part of the member 15. It is by this extension 22 that the member 21 is secured to this part 15, also preferably by spot welding, as at 23 in Fig. 2.

The other side 24 of this U is thus presented parallel with the inner side 18 of the outer rectangular cross section of the rail, and it is spaced inward from this side 18, and also its edge is free from the opposite inner part 19 of the structure, so that this U-shaped member is resiliently held throughout its length in its

spaced relation to the inner wall 18, leaving the slot 25 opening at the opposite face of the sash.

The glass strip 26 is of approximately L-shape cross section, with one member opposite the member 15 and of substantially the same formation, having at its inner edge a bead 27 turned toward the member 15, and having the compound bend 28 fitting in over the inner corner of the U-shaped member 24; while the other element 29 of this L-shape fits into the slot 25 and is gripped between the wall 18 and the side 24 of the U-shaped member by virtue of having the slot 25 left, by the spacing of this member from the slot 18, normally slightly narrower than the thickness of the element 29 which it is to receive, whereby the U-shaped member 21 must yield somewhat upon insertion of the element 29, and will grip this element 29 holding the glass strip 26, firmly in the sash.

The glass plate 1 has its edge portion between the inner edge beads 16 and 27, of the members 15 and 26 respectively, and its edge may rest against the adjacent side of the U-shaped member 21. By having the parts properly proportioned, this glass plate 1 will be held firmly between the two members 15 and 26, the latter member or glass strip 26 being held firmly in the sash merely by the frictional engagement or gripping in the slot 25, without requiring any other fastening means.

The fixed member 12 of the mullion is attached to the inner member 15 of the sash rail by means of a cleat 30, having spot welds 31 fixing it inside the fixed mullion member 12, and being bent at 32 to fit over the bead 16 of the member 15, beyond which it has its terminal part fixed to this member 15 by a spot weld 33. This mullion member is of shallow channel shape, the middle part being parallel with the plane of the sash, and its lateral portions being inclined like the member 15 of the sash rail, and having beads 34 turned in across their inner sides at their edges to bear against the edge portions of the plates 1 and 2. It is in the middle parallel part that the cleat is secured. Also in this middle part lugs 35 are secured by spot welds 36, each lug being formed of a metal strip bent into U-shape, with end parts of the U bent outward, which end parts have the spot welds 36. The removable mullion strip 13 is of substantially the same cross section as the fixed strip 12, with beads 37 bearing against the other sides of the plates 1 and 2, and its middle part fitting on the lugs 35, and having openings through which screws 38 pass into threaded openings in the bottoms of the U-shapes of the lugs 35. The ends of this removable mullion strip 13 fit snugly against the beads 27 of the inner edges of the glass strips 26, but do not necessarily overlap them or engage them in any way to hold the glass strips in position. It will be seen that the lugs 35 extending between the adjacent edges of the plates 1 and 2, act as a support for the upper plate 1, or should the mullion be upright, these lugs act as spacers for the plates; so that in any case the lugs 35, together with the other three sides of the space formed by the inner sides of the U-shaped members 21, confine the glass plates 1 and 2 in position with the desired closeness.

It will be seen that in the original assembly of the sash and its plates 1 and 2, or in case of replacement of one of the plates, the operation is made very simple because the glass strips 27 may be simply forced into holding position in the grooves 25 and the mullion strip 13 may be screwed on; or for removal of a plate the mullion strip 13 may easily be removed by removing the screws 38, and the glass strips 27 may readily be pried out of their holding positions. It will be noted that these strips when being inserted, have their beaded edges 27 presented to the glass plate, and then the free side portion 29 is forced down into the groove 25; and in removing the strip the reverse of this operation preferably is employed, first prying the strip loose from the groove 25 rather than acting upon the strip adjacent to the glass.

I have illustrated and described a preferred example of my invention specifically as is required, but it will be understood that modifications may occur and that I am not limited to such precise disclosure, but what I claim as new and desire to secure by Letters Patent, is:—

1. In a window-sash frame, a sash rail comprising a member to engage one side of the window glass, having a flat wall spaced out from and facing the adjacent edge of the glass, an element fixed on said member and having a flat part between said wall and said edge of the glass, spaced in from said wall, leaving a slot and having an element with one edge free, forming a wall of the slot, and a second member having a part to engage the opposite side of the glass, and a second part with a straight flat surface fitting in said slot, whereby said members hold the adjacent edge of the glass solely by virture of the fitting of said second part in said slot and the pressure of said wall element thereon.

2. In a window-sash frame, a sash rail comprising a member to engage one side of the window glass, having a flat wall spaced out from and facing the adjacent edge of the glass, opening in the facing direction of the opposite side of said glass, a transversely resilient element fixed on said member and having a flat part between said wall and said edge of the glass, spaced in from said wall, leaving a slot with flat sides, and a second member having a part to engage the opposite side of the glass, and a second flat part gripped in said slot.

3. In a window-sash frame, members to straddle the window glass, having elements extending across the edge of the glass, the element of one member lapping outside the element of the other member, and a second element on said one member lapping inside the element of said other member, at least one of said lapping elements of said one member resiliently engaging the lapped element of the other member in a flat plane.

4. In a window-sash frame, members to straddle the window glass, having elements extending across the edge of the glass, the element of one member lapping outside the element of the other member, and a second element comprising a U-shaped cross section with an extension from one side of the U fixed to said one member adjacent to the glass, with the bottom of the U toward the other member, and the other side of the U free from the one member and bearing out against the inner side of the element of said other member in a flat plane.

5. In a window-sash frame, members to straddle the window glass, having elements extending across the edge of the glass, the element of one member lapping outside the element of the other member, said one member being of sheet metal so bent that its outside lapping element is of tubular cross-section, and a second element comprising a U-shaped cross section with

an extension from one side of the U fixed to said one member adjacent to the glass, with the bottom of the U toward the other member, and the other side of the U free from the one member and bearing out against the inner side of the element of said other member in a flat plane, with a flange extending inward and fixed to an inner portion of said one member.

6. In a window-sash frame, members to straddle the window glass, having elements extending across the edge of the glass, the element of one member lapping outside the element of the other member, and a second element on said one member lapping inside the element of said other member in a flat plane, mullion pieces to straddle the glass, one mullion piece having at its end an extension fixed to the inner side of said one straddling member, and a plurality of extensions inward past the plane of the adjacent side of the glass, and means for attaching the other mullion piece to said extension, said mullions being slightly concave in relation to the glass.

7. In a window-sash frame, members to straddle the window glass, having elements extending across the edge of the glass, the element of one member lapping outside the element of the other member, and a second element on said one member lapping inside the element of said other member in a flat plane, mullion pieces to straddle the glass, one mullion piece having at its end an extension fixed to the inner side of said one straddling member, and a plurality of extensions inward past the plane of the adjacent side of the glass, and means for attaching the other mullion piece to said extensions, this other mullion piece being out of retentive engagement with said other straddling member, whereby this other straddling member and this other mullion piece are independently removable from said frame both mullions being concave in relation to the glass.

8. In a window-sash frame, a sash rail comprising a member to engage one side of the window glass, having a flat-walled slot along and spaced from the adjacent edge of the glass, at least one wall of said slot being supported along its outer edge near the opening of the slot and having its inner edge free of the bottom of the slot, whereby said one wall is yieldingly mounted, and a second member having a part to engage the opposite side of the glass, and a flat part frictionally held in said slot under pressure of said yieldingly mounted wall.

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