Feb. 14, 1950 J. P. PEARSE 2,497,515

GLAZING CONSTRUCTION

Filed July 7, 1945 2 Sheets-Sheet 1

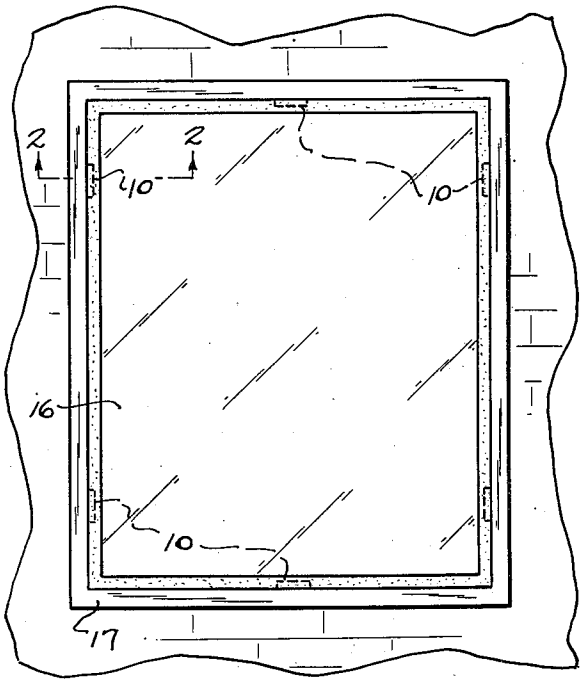

Fig. 1.

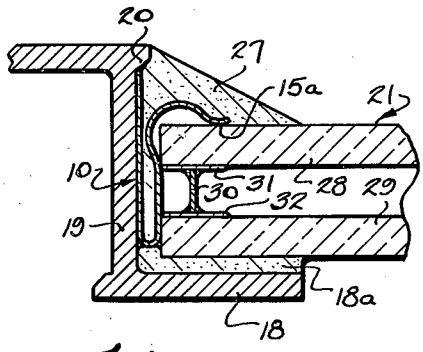

Fig. 2.

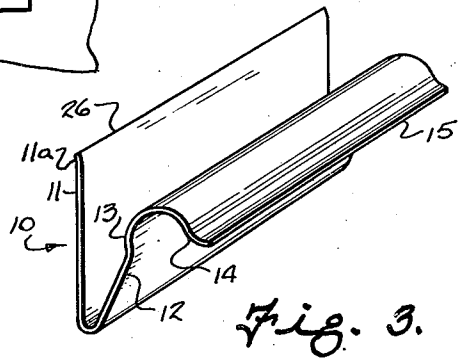

Fig. 3.

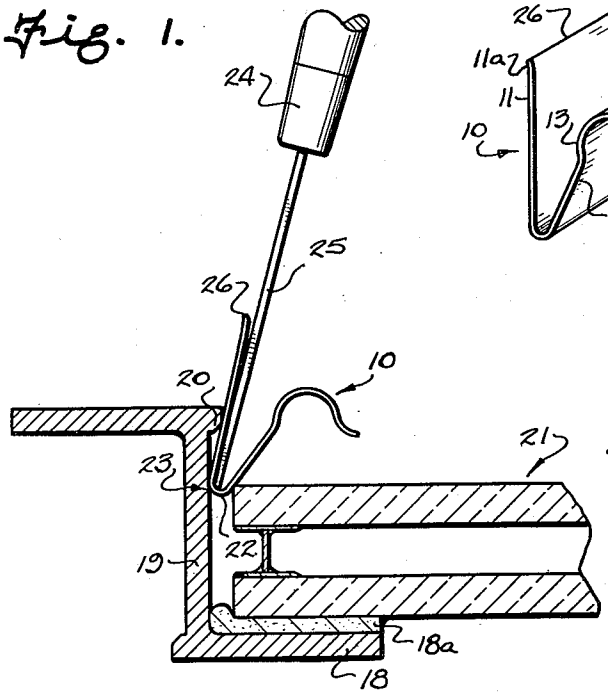

Fig. 4.

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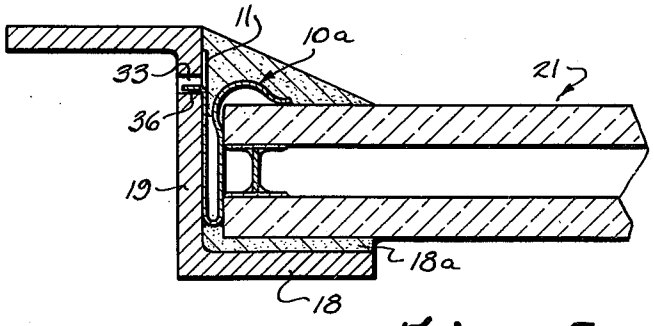


Fig. 5.

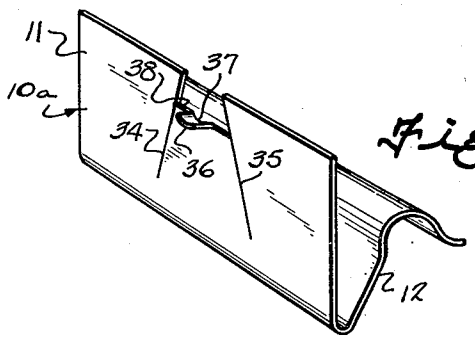


Fig. 6.

Fig. 8.

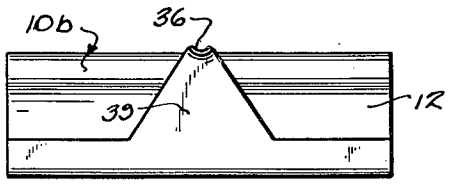
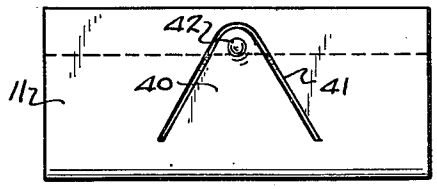


Fig. 7.



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2,497,515

GLAZING CONSTRUCTION

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Application July 7, 1945, Serial No. 603,671

3 Claims. (Cl. 189—77)

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The present invention relates to glazing constructions and more particularly to mechanical window pane retaining means for use therein.

In practically every kind of window glazing it is customary to use some sort of mechanical fastening or retaining means, in addition to the putty, for holding the glass in the sash; and such fastening means vary in structure from the well known triangular, sheet metal glaziers points used in wooden house sash to the more elaborate type of pane anchoring means that are necessary to meet the building code requirements in large city buildings.

According to this invention there is provided a novel type of device for this purpose, in the form of a spring clip of inexpensive and relatively simple construction, which combines ease of installation with extremely positive, permanent, and non-injurious retaining action.

An important object of the invention is the provision of a clip of the above character that is a universal one, in that it can be used with any standard metal sash and can be readily adapted to either a ledge or hole type of anchorage.

Another object is to provide a clip of this kind that engages both the edge and marginal portions of the window pane to hold it firmly but resiliently against both lateral and outward movement in the sash.

Still another object is the provision of a spring clip of this character that can be used with various kinds and thicknesses of window panes or lights, and which is particularly well adapted for glazing multiple glass sheet glazing units, such as "Thermopane," into a frame.

Other objects and advantages of the invention will become more apparent during the course of the following description, when taken in connection with the accompanying drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Fig. 1 is an outside view of a window in a building, with the spring clips of the invention indicated in broken lines;

Fig. 2 is a fragmentary sectional view taken substantially on the line 2—2 in Fig. 1;

Fig. 3 is a perspective view of the form of spring clip shown in Fig. 2;

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Fig. 4 is a view similar to Fig. 2, but showing the spring clip just about to be installed in the sash;

Fig. 5 is a view similar to Fig. 2 but showing a different type of sash and a modified form of clip;

Fig. 6 is a perspective view of the clip shown in Fig. 5; and

Figs. 7 and 8 are rear views of modified forms of spring clips.

Referring more in detail to the drawings one form of clip made, in accordance with the invention, especially to fit a ledge type of sash is shown in Fig. 3. As illustrated this clip, which is designated in its entirety by the numeral 10, is formed from a piece of sheet metal spring stock in a manner to cause it to assume a substantially V shape in cross section when not restricted or held under compression.

The clip is preferably shaped by a punch press operation from spring steel, Phosphor-bronze or similar material. I prefer Phosphor-bronze to spring steel because to get the latter to the desired shape it is necessary to use annealed stock and to subsequently heat treat it.

In the form of clip shown in Fig. 3 the rear leg 11 of the V is straight, while the forward leg 12 is bent over as at 13, and the bend then reversed as at 14, so that the upper end of this leg is shaped somewhat like a shepherd's crook, and provides a pressure flange 15 for resilient clamping engagement with the glass of the window pane.

In using these clips 10 to glaze a window, a plurality of them are inserted between the edges of the pane and the sash or window frame, at spaced intervals around the periphery thereof. For example, in the case of the window shown in Fig. 1, two clips are used between the light 16 and the steel sash 17 on the long or vertical sides, and one clip is used along each of the relatively shorter horizontal sides.

The very simple manner in which these clips can be snapped into position is shown in Fig. 4. The sash illustrated there is of the type that includes an inside flange 18 and a second flange or web 19 at right angles to the inside flange. A ledge or shoulder 20 is provided at the end of the web 19 and runs completely around the sash. In glazing this type of sash with the clips

10, the glass pane or glazing unit 21 is put into position where it rests loosely in the sash against a layer of so-called "back putty" 18a on the inside flange 18. The unit is then secured in place by installing the proper number of clips 10 around it.

This is done in each case by placing the clip with the apex 22 of its V in the space 23 between the edge of the glazing unit and the ledge 20 of the sash. A putty knife 24 is then placed with its blade 25 as shown in Fig. 4 and, by exerting proper pressure, the clip 10 can be readily forced down between the frame and the edge of the glazing unit. Finally, when the upper edge 26 of the leg 11 of the clip slips under the ledge 20, the clip will snap into place in the position shown in Fig. 2. In order to insure positive engagement of the edge 26 beneath the shoulder 20, the straight leg 11 may be bent slightly to the rear at its upper end as shown at 11a in Fig. 3.

With all of the clips installed, the legs 11 and 12 of each one will be compressed, causing the clip to assume more of a U shape in cross section (Fig. 2). Because of this, each clip will be exerting lateral pressure against the edges of the glazing unit, and at the same time the pressure flange 15 of the clip will be exerting a considerable resilient force tending to hold the glazing unit 21 against the inside flange 18 of the sash. To finish the glazing job, putty 27 is applied in the usual manner to cover the clip and preferably to fill at least a part of the space between the legs 11 and 12.

A minimum number of these clips will hold a glass pane or heavy glazing unit tightly but yieldably in place and will resist a surprising amount of pressure acting to force the light out of the sash.

As already indicated the spring clips of this invention can be adapted to hold either single glass sheet or double glazing units of varying thicknesses in a sash. However, they have proved to be particularly satisfactory in connection with special multiple glass sheet glazing units of the type produced by the Libbey-Owens-Ford Glass Company under the name Thermopane.

A Thermopane unit has been illustrated as being glazed into the sash of Fig. 2, and the details of construction of this type of unit are fully set forth in the patent to Haven et al. 2,235,681, dated March 18, 1941. Briefly stated, however, Thermopane is an hermetically sealed, all glass-metal unit made up of two or more sheets of glass 28 and 29, secured together in spaced face to face relation to one another to form a dead air space therebetween, by means of a metal separator strip 30 soldered to metallized coatings 31 and 32 around the marginal portions of the glass sheets.

Some difficulty has been experienced when these Thermopane units are glazed into a sash with the ordinary wire type of spring clips now available on the market. This is because these prior art clips have point contact with the surface of the glass at or closely adjacent its edge, or line contact at a similar location and at right angles to the separator strip 30. Such localized pressure sets up a continuous strain on the bond between the glass and metal in the area adjacent the "point strain" and is a potential source of venting of the unit.

With the present clip, however, there is no contact at all at the corner formed by the junction of the face and edge of the outside glass sheet; and the pressure exerted by the pressure flange 15 is spread out over a considerable area as more or less line contact at 15a which is directly over or inwardly of the joint between the separator strip and the glass.

In Figs. 5 and 6 the clip has been shown as applied to another standard type of steel sash. This sash is very similar to the one shown in Figs. 2 and 3 except that it does not have the shoulder or ledge 20. However, it is provided with openings or holes 33 (Fig. 5) at intervals along the length of the web 19, which holes are intended to serve as anchorages for the mechanical fastening means.

In order to accommodate the clips 10 (designated 10a here) to function in this different type of sash, it is only necessary to modify them in the manner shown in Fig. 6. That is by slitting the rear leg 11, from the top down, along two slightly angled lines as shown at 34 and 35, and to then bend over the tongue 36 thus formed as at 37. In order to insure the tongue being of the proper size and shape to fit the round holes 33, it is desirable to cut it down as shown at 38 and to bend it into a slightly dished or cupped shape.

The installation and operation of the clips 10a are identical with that described in connection with clips 10 except for the manner in which they are anchored against the sash. It will also be noted that the clip 10a can be used with a ledge type sash, such as shown in Fig. 2, as well as with the plain web type of Fig. 5, even though the ledge type sash is not provided with holes 33. In such a case the tongue 36 can simply be bent out of the way. Of course if a sash is provided with a ledge and with holes as well, the clips 10 can engage both and give a double anchoring action.

A type of clip similar to 10a, but which will fit only in a sash that is provided with holes, is shown at 10b in Fig. 7. This clip is identical with clip 10a except that the cuts 34 and 35 are extended from their lower ends out toward the opposite edges of the leg 12 and the part thus cut out is removed to leave a triangular shaped upright 39.

An alternate form of clip that will fit both ledge and hole types of anchorage is illustrated in Fig. 8. In this form a triangular piece 40 is separated from the leg 12 on all but one side by the cuts 41, and a dimpled projection 42 is struck out near the apex of the triangle to fit into a hole in lieu of a tongue as shown in the other forms.

Although I prefer a sheet metal clip for this purpose, I can also form a wire type of spring clip to the same general shape to give some if not all of the results desired.

It is to be understood that the forms of the invention herewith shown and described are to be taken as illustrative embodiments only of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A mechanical fastening means for glazing a window pane into a sash comprising a spring clip of resilient sheet material bent into substantially V shape in cross section to provide a pair of connected but diverging legs, one of which is adapted to engage the sash and the other of which is adapted to engage the window pane, said second-mentioned leg being of a shape resembling a shepherd's crook in cross section having a straight pressure portion adjacent the apex of said V and having its free end bent first toward the first-

mentioned leg to form a pressure relieving portion and then bent away from said first-mentioned leg to form a pressure flange, whereby when said clip is forced into position between the sash and the edge of the window pane with the first-mentioned leg in contact with the sash the straight portion of the second-mentioned leg will exert lateral pressure against the edge of the window pane to center it in the sash the pressure flange will exert perpendicular pressure against the marginal portion of a face of the window pane to hold the pane in the sash and the pressure relieving portion will be in surrounding relation to and out of contact with the adjacent longitudinal corner of said window pane.

2. The combination with a sash having a clip retaining portion and a window pane loosely mounted in said sash, of a mechanical fastening means comprising a spring clip of resilient sheet material bent into substantially V shape in cross section to provide a pair of connected but diverging legs, one of which engages the sash and the other of which engages the window pane, said first-mentioned leg having a portion thereon engaging the clip retaining portion of the sash, and said second-mentioned leg being of a shape resembling a shepherd's crook in cross section having a straight pressure portion adjacent the apex of said V and having its free end bent first toward the first-mentioned leg to form a pressure relieving portion and then bent away from said first-mentioned leg to form a pressure flange, whereby when said clip is forced into position between the sash and the edge of the window pane with the first-mentioned leg in engagement with the sash the straight portion of the second-mentioned leg exerts lateral pressure against the edge of the window pane to center it in the sash the pressure flange exerts perpendicular pressure against the marginal portion of a face of the window pane to hold the pane in the sash and the pressure relieving portion is in surrounding relation to and out of contact with the adjacent longitudinal corner of said window pane.

3. The combination with a sash having a clip anchoring opening and a window pane loosely mounted in said sash, of a mechanical fastening means positioned in the space between the sash

and the edge of the pane comprising a spring clip of resilient sheet material that has been bent into substantially V shape in cross section to provide a pair of connected but diverging legs, one of which is in contact with the sash and the other of which is in contact with the window pane, said first-mentioned leg being substantially straight and having a struck out portion entering the clip anchoring opening in the sash and slits partially separating the portion of the leg containing the struck out portion from the main body of the leg, and said second-mentioned leg being of a shape resembling a shepherd's crook in cross section having a straight pressure portion adjacent the apex of said V and having its free end bent first toward the first-mentioned leg to form a pressure relieving portion and then bent away from said first-mentioned leg to form a pressure flange, whereby when the clip has been forced into position between the sash and the edge of the window pane the struck out portion in said first-mentioned leg enters the anchoring opening in the sash to retain the clip in operative position, the straight portion of the second-mentioned leg exerts lateral pressure against the edge of the window pane to center it in the sash, the pressure flange exerts perpendicular pressure against the marginal portion of a face of the window pane to hold said pane in the sash and the pressure relieving portion is in surrounding relation to and out of engagement with the adjacent longitudinal corner of said window pane.

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