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2,377,684

DOUBLE WINDOW CONSTRUCTION

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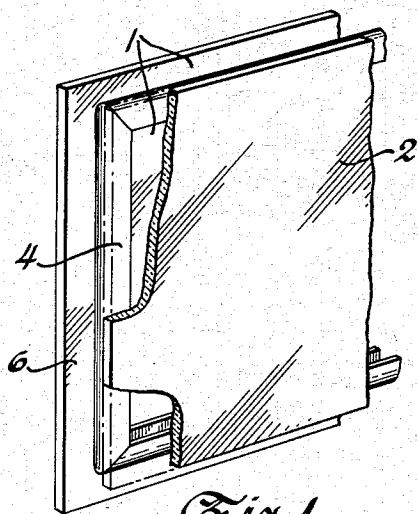


Fig. 1

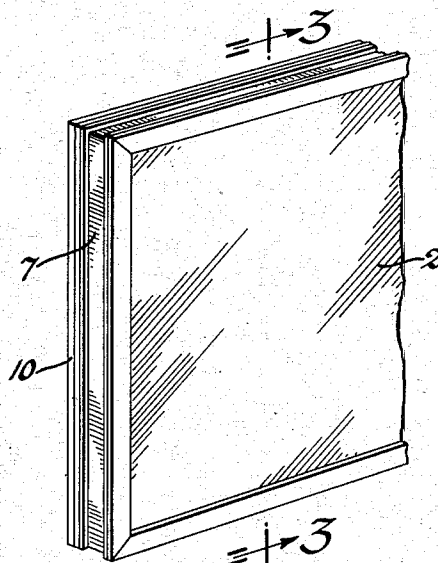


Fig. 2

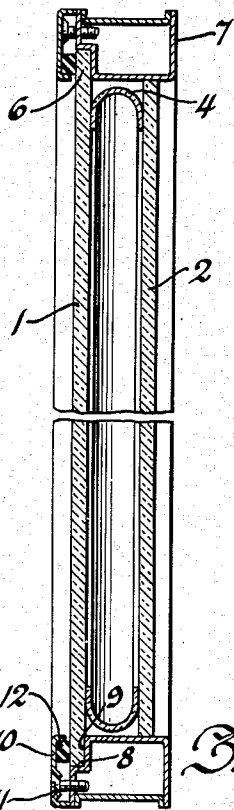


Fig. 3

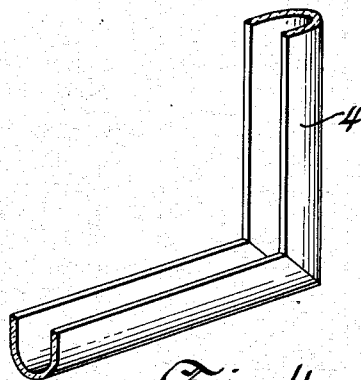


Fig. 4

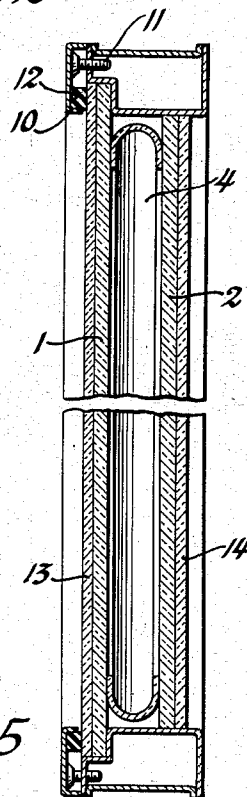


Fig. 5

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DOUBLE WINDOW CONSTRUCTION

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3 Claims. (Cl. 20—56.5)

This invention relates to a double window pane having a heat insulating air space between the panes, and especially suitable for use in aircraft. Double window panes in aircraft have to withstand considerable pressure and when the heat insulating air space between the panes is sealed the pressure differential between the air in the insulating air space and the outside atmosphere may vary widely as the aircraft changes its altitude of flight.

The object of the invention is a double window pane of transparent plastic material which is softer, more pliable and flexible than glass, has light weight with mechanical strength, and which will not fail with considerable pressure differential between the inner and outer surfaces of its panes.

Another object of the invention is a double window pane constructed of a suitable transparent plastic such as acrylate resin, having the outer, exposed surfaces of the plastic panes faced with glass for durability.

The above and other objects of the invention will be apparent as the description proceeds.

According to the invention, the plastic panes are held in spaced relationship by a spacer of similar material, between and towards the edges of the adjacent surfaces of adjacent panes. The spacer is formed of strip material of U-shaped channel section and the parallel outside surfaces of the channel sectioned material are secured to the adjacent surfaces of adjacent panes by a suitable adhesive, which may be the liquid monomer of the polymerized material of the plastic panes or a solution thereof.

The drawing shows the various parts of a plastic double window pane unit and the manner in which they are assembled.

In the drawing

Figure 1 is a partly broken perspective view of part of a completed plastic double window pane unit.

Figure 2 is a perspective view showing part of a completed plastic double window pane unit installed in a suitable window frame.

Figure 3 is an enlarged section on line 3—3 of Figure 2.

Figure 4 is an enlarged perspective view showing a mitered joint between two adjacent sides of a spacer formed of plastic strip material of U-shaped channel section.

Figure 5 is an enlarged sectional view, similar to Figure 3, of a modification in which the plastic panes are faced with glass.

Referring now more particularly to Figures 1, 5

3, and 4, the rectangular panes of acrylate resin plastic 1 and 2 are held in separated relationship by a rectangular spacer 4 formed of four pieces of strip material of U-shaped channel section of which the ends are mitered as shown most clearly in Figure 4. The spacer is of such dimensions that the pieces of strip material of which it is formed are between and towards the edges of the adjacent surfaces of the adjacent panes 1 and 2 with the convex surface of the strip material to the outside of the insulating air space. The mitered joints are secured together, and the parallel outside surfaces of the channel sectioned pieces are secured to the adjacent surfaces of the adjacent panes by a suitable adhesive which may be the liquid monomer of the polymerized material of the double window pane unit, thereby sealing a heat insulating air space between the panes.

As shown, the plastic pane 1 is larger than the pane 2 to provide a peripherally extending flange 6 around the double window pane unit, for convenience of installation.

A suitable way of mounting the double window pane unit in a window frame by its peripherally extending flange is shown in Figure 3 in which it will be noted that the window frame 7 is provided with a recess 8 against the side 9 of which the flange 6 of the window pane unit may be clamped by metal strips 10 secured to the window frame 7 by screws 11, there being strips 12 of rubber or the like interposed between the flange 6 and the strips 10.

In the modification shown in Figure 5, the construction is similar to that of the remaining figures except that the outer exposed surfaces of the plastic panes 1 and 2 have been faced with sheets of glass 13 and 14 to provide a harder surface less likely to be marred by cleaning, or by dust or gravel or the like which may be blown or thrown onto it.

The sheets of glass 13 and 14 are secured to the plastic panes by a suitable transparent adhesive which may well be the liquid monomer of the polymerized material of the plastic panes or a solution thereof such as that used in the construction of the plastic double window pane unit itself.

It will be appreciated that in the construction of both modifications of the invention illustrated, the bonding of the parts together by the adhesive may be facilitated by the application of a certain amount of heat and pressure, and this may be applied in any suitable way.

I claim:

1. A double window structure of light weight

with mechanical strength, said window structure comprising spaced parallel panes of transparent plastic material, means to hold said panes in spaced relation comprising a strip formed from a material having substantially the same composition as the panes, located between the panes and adjacent the marginal edges thereof, said strip being of U-shape in cross-section having parallel sides and an unconfined part joining said sides, said joining part being bowed outwardly and said sides being secured to said panes by a suitable adhesive.

2. The combination according to claim 1 in which the panes and the spacing strip are of acrylate resin and in which the adhesive is a liquid monomer of the acrylate resin.

3. The combination according to claim 1 in which the outward exposed surfaces of the panes are faced with a relatively thin sheet of glass secured thereto by a suitable transparent adhesive.

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