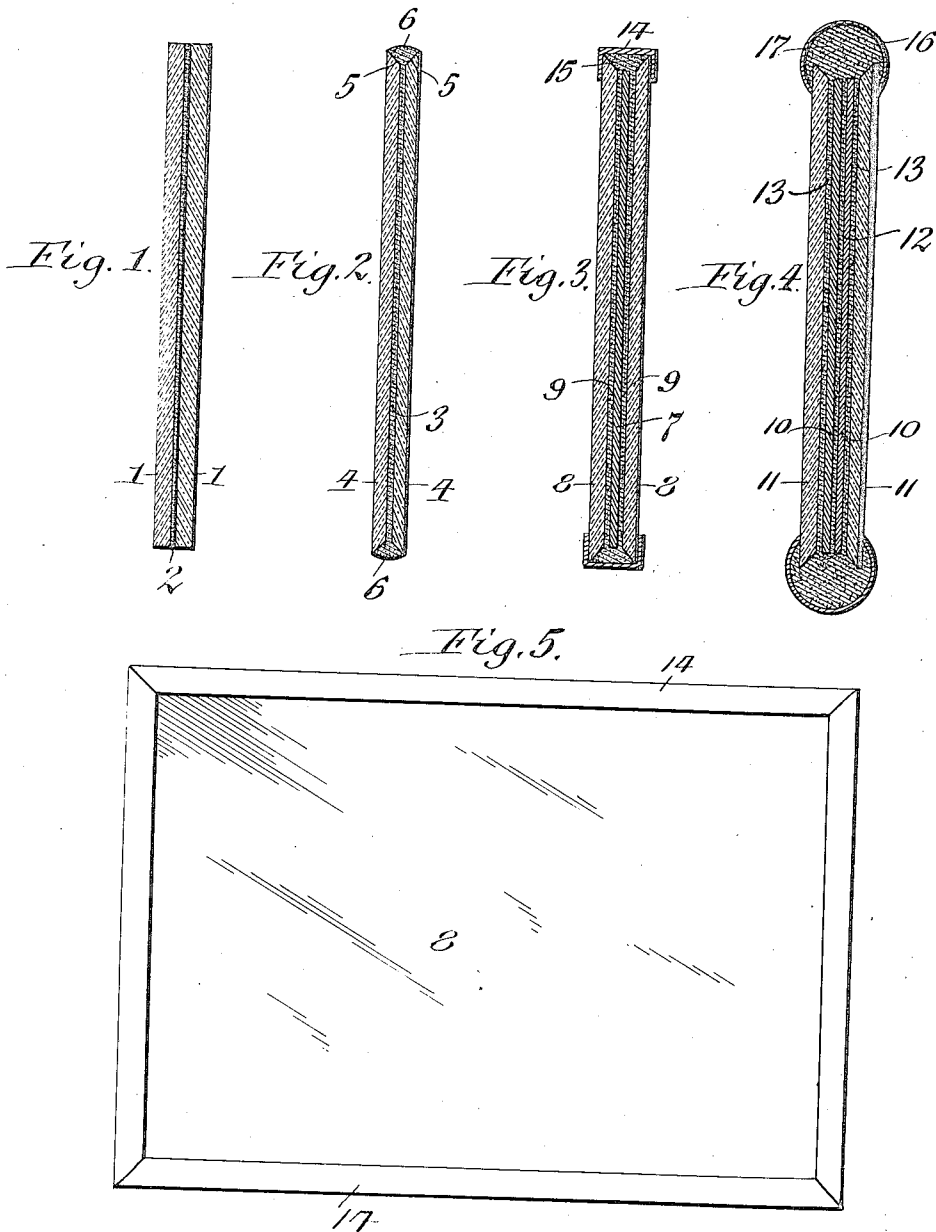


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TRANSPARENT PANE.
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1,224,530.

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TRANSPARENT PANE.

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To all whom it may concern:

Be it known that I, OTTO GOETZKE, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Transparent Panes, of which the following is a specification.

This invention relates to a transparent pane comprising a plate of glass which is provided with means whereby the glass when broken or cracked will not be dismembered to any considerable extent but remain practically intact and continue to serve as a pane notwithstanding that the same has been injured.

Heretofore this has usually been accomplished by embedding in the pane a glass wire fabric which holds together the several parts of the pane in case the same is broken or cracked. This, however, is objectionable on account of the difficulty of embodying a woven wire fabric in the glass and also the unsightliness of this fabric especially when used in high grade or finished work.

It is the object of this invention to reinforce or strengthen a pane having one or more plates of glass by means which are practically indestructible and hold practically all of the parts of a broken plate of glass in place but which are fully transparent so as not to obstruct the view through the pane or detract from its appearance, and to accomplish this purpose in an economical and comparatively inexpensive manner.

In the accompanying drawings: Figures 1, 2, 3 and 4 are vertical sections of different embodiments of my invention. Fig. 5 is a side elevation of a framed window constructed in accordance with one form of my improvements.

Similar characters of reference indicate corresponding parts throughout the several views.

In the simplest form of my invention, as shown in Fig. 1, the same comprises two panes 1 of glass or a similar transparent fragile material, and a transparent retaining film or sheet 2 of a suitable tough adhesive and resilient cement or similar material such as glucose arranged between the plates of glass so as to adhere firmly thereto and form practically an integral part thereof. This retaining film may be applied to the oppos-

ing sides of the plates of glass while in a freely liquid state and then allowing the same to dry to a viscous condition. This retaining film does not interfere with the transparency of the pane as a whole but if the latter should be struck or injured by any object the retaining film operates to cushion the blow against the pane so as to reduce the fracture and it also serves to hold the several pieces of glass together so that they do not become disconnected, thereby preserving the pane practically intact so that its function as a closure or window is maintained notwithstanding that the glass portion of the pane has been injured.

If desired the pouring of a liquid retaining film 3 between two plates 4, 4 of glass may be facilitated and an increase obtained in the firmness or strength of the connection between the marginal parts of the film and these plates by beveling the inner corners or the edges of the glass plates so that the bevels of the opposing plates converge inwardly, as shown at 5 in Fig. 2. This inwardly converging space formed between the edges of the glass plates permits of readily pouring the liquid film between the plates and also produces an enlargement or bead 6 on the marginal parts of the film which materially cushions this pane at its edges and enables the same to withstand greater shocks when mounted in a frame without liability of disintegration of the glass plates or impairing the general efficiency of the pane.

Instead of depending solely upon the transparent film for holding the fragments of glass together in the event that the glass plates are cracked or broken a supporting plate 7 of non-fragile transparent material such as celluloid or mica may be arranged between two glass plates 8, 8 and transparent films 9, 9, of cement of the character described may be interposed between opposite sides of the supporting plate and the glass plates, as shown in Fig. 3. This cement operates to securely connect the non-fragile supporting plates and the glass plates, so that these various elements form practically a unit and prevent the glass, if cracked or broken, from flying apart.

A further modification of this construction is shown in Fig. 4 in which two transparent supporting plates 10, 10 of any suitable non-fragile material such as celluloid

or mica are arranged side by side between two glass plates 11, 11 and a central transparent film 12 of cement is arranged between the opposing sides of the two supporting plates, and two transparent films 13, 13 of cement are arranged between the transparent supporting plates and the glass plates, the several members being connected adhesively with each other so as to practically form an integral mass which constitutes a pane and may be used for windows or for other purposes.

When the transparent cement in the construction shown in Figs. 3 and 4 has become dry or viscous or substantially so the celluloid or mica supporting plate and these films between the glass plates form a very strong, tough resilient and durable connection between the glass plates which operates effectively to hold the several pieces of glass together in the event that the same become broken and fractured and these celluloid or mica plates together with the films of cement also form a cushion which operates to check the force of a blow delivered against the pane and reduce the extent of the fracture of the glass to a minimum. By this means the pane will be maintained in its entirety or unperforated condition notwithstanding that the same is cracked or broken and thereby enables the pane to continue in service until the same can be replaced by a new one.

If desired this pane may be constructed in any suitable shape or contour, Fig. 5 being one example of the various forms in which the same may be made and as there shown the pane has the form of an oblong rectangle.

The pane may also be mounted in any suitable manner either in a frame or secured in the opening intended to receive the same. In case the pane is mounted in a frame the latter may be so constructed that its several members are of rectangular channel-shape in cross section, as shown at 14 in Fig. 3 and the edges of the pane may be arranged in the concaved sides of these frame members, as shown in this figure, and secured therein in any suitable manner, for instance by the cement which connects the glass and celluloid plates, as shown at 15. Any other suitable cross sectional form of frame may, however, be employed, if desired, for instance, as shown in Fig. 4, the frame 16 has its members constructed in the form of a round tube one side of which is slotted to permit of inserting the edge of

the pane within the tubular frame member and securing the same therein by the cement 17 which connects the plates 10, 11, or by any other suitable means.

In the event that the pane is of oblong form the frame may be of corresponding forms, as shown in Fig. 5.

In all of the various forms of my invention which are shown in the drawings and described in the foregoing part of the specification the reinforcement of the glass portion thereof is effected by means which are not only transparent so as not to detract from the appearance of the window in which the same may be mounted, but the same also operates to cushion or deaden the blow which may be delivered against the pane and thus minimize the fracture and prolong the usefulness of the pane wherever the same is installed.

I claim as my invention:

1. A transparent pane comprising two or more glass plates having beveled edges converging inwardly, a sheet of celluloid between said glass plates coated on both sides thereof with transparent glucose, and means for retaining a triangular body of soft glucose within said beveled edges and joining the beveled edges of said glass plates together.

2. A transparent pane comprising a plurality of glass plates having beveled edges converging inwardly, a sheet of celluloid between said plates coated on both sides thereof with soft transparent glucose, and means for retaining and inclosing a shock absorbing cushion of soft glucose in the beveled end spaces of said plates.

3. A transparent pane comprising two glass plates having beveled edges converging inwardly, a celluloid plate arranged between said glass plates, and a soft transparent cushion of glucose cement, filling the beveled spaces at the edges of said plates, thence running on and connecting the opposite sides of said celluloid plate with said glass plates and means at the edges of said glass plates for permanently inclosing the said glucose cushions.

4. A transparent pane including, in combination, two glass plates coated on their interior opposite surfaces with transparent glucose, a celluloid plate between said glass plates, cushioning means between the edges of said glass plates and means holding the edges together.

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