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X2570

LIGHT TRANSMITTING STRUCTURE WHICH MAY BE MADE  
TRANSPARENT OR TRANSLUCENT AT WILL

Filed Jan. 16, 1950

2 SHEETS—SHEET 1

Fig. 1.

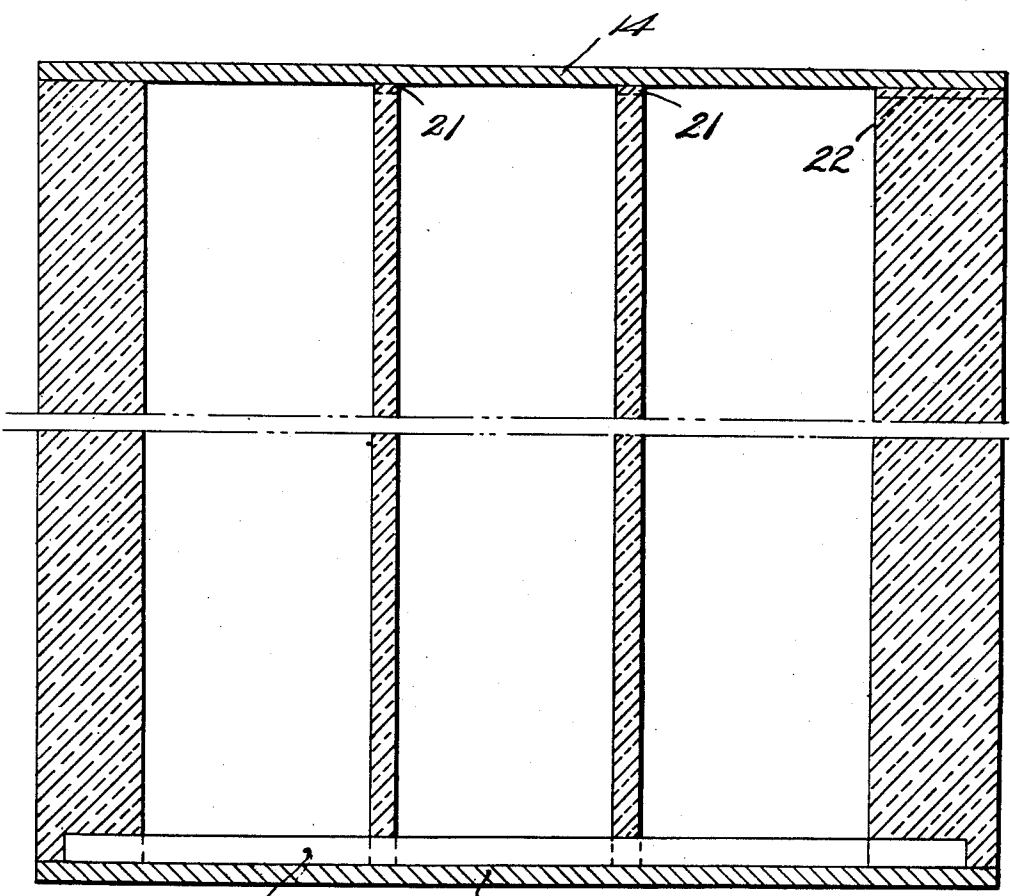
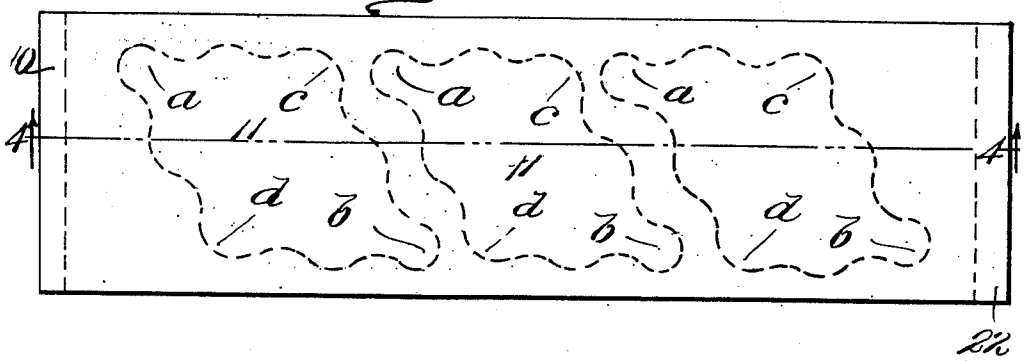


Fig. 4.

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2 SHEETS—SHEET 2

*Fig. 3.*

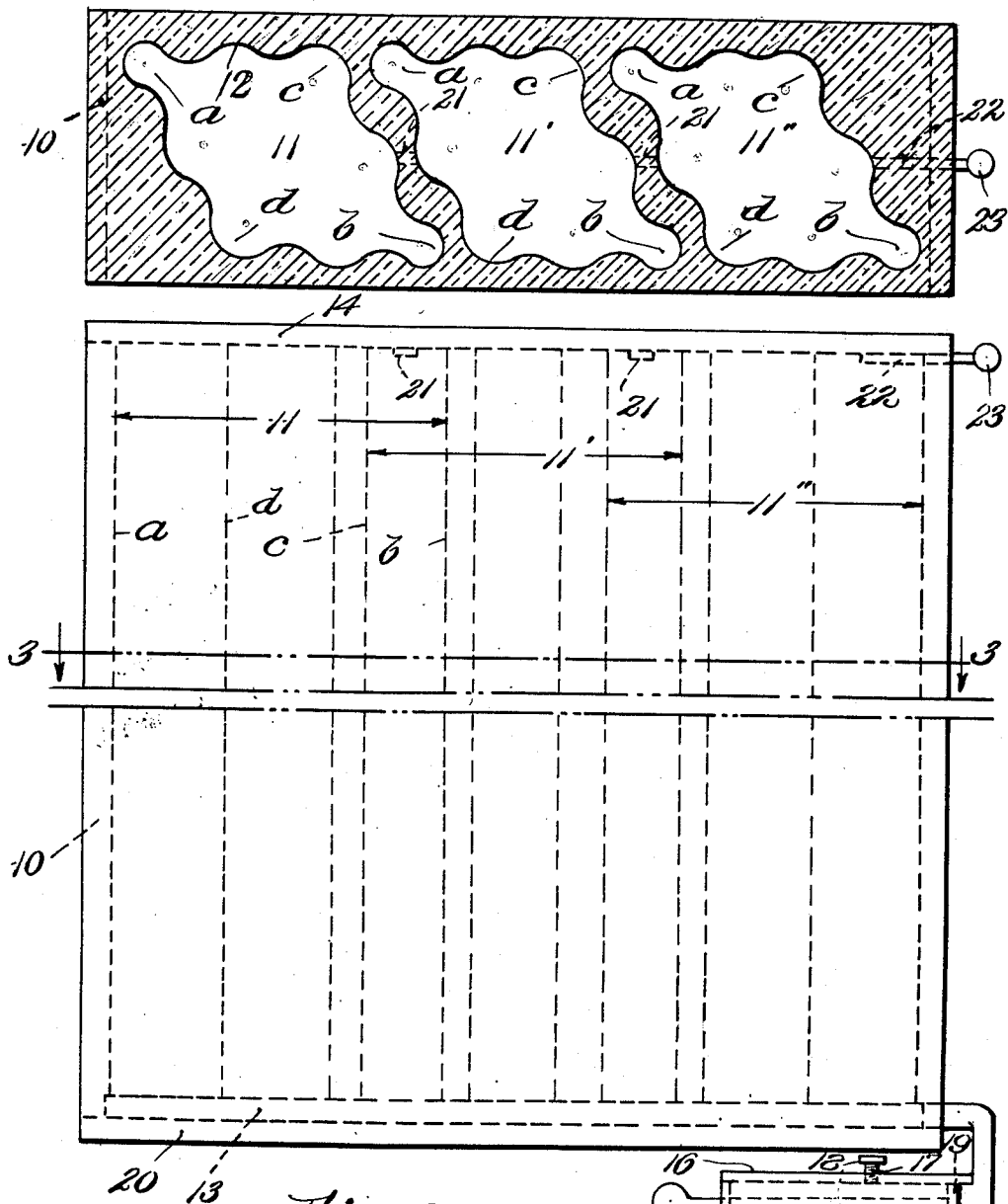
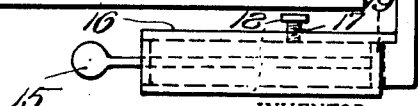


*Fig. 2.*



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## UNITED STATES PATENT OFFICE

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LIGHT TRANSMITTING STRUCTURE WHICH  
MAY BE MADE TRANSPARENT OR TRANSLUCENT AT WILL

Salvatore De Lisio, Boston, Mass.

Application January 16, 1950, Serial No. 138,922

1 Claim. (Cl. 88-60)

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This invention relates to light transmitting structures which may be made transparent or translucent at will.

The primary object of my invention is to provide an integral light transmitting structure that is normally translucent by virtue of the nature and configuration of partially overlapping ducts embodied in a panel and is readily made transparent by filling such ducts with a liquid having the same refractive index as the material of said panel, and which has great strength and rigidity by virtue of the fact that the common wall of each proximate pair of ducts is an integral part of said panel.

In the drawings accompanying and forming a part of this specification,

Figure 1 is a plan or end view of a light transmitting structure embodying my invention.

Fig. 2 is a vertical front elevation.

Fig. 3 is a horizontal transverse section taken on the line 3-3 of Fig. 2.

Fig. 4 is a vertical longitudinal section taken on the line 4-4 of Fig. 1.

In the particular drawings selected to illustrate my invention and the principle underlying the same, such drawings to be considered as illustrative, merely, and not restrictive, 10 represents an integral panel provided with a plurality of parallel ducts 11, 11', 11'', shown, in the present instance, as three in number, although it will be obvious that any number of ducts may be employed, said ducts being partially overlapping in the direction of the light impinging upon said panel to prevent the passage of all but a small part of such light through said panel without passing through one or more of said ducts. The walls of each duct are scalloped, corrugated or roughened, or otherwise treated to render the panel translucent normally, that is, when the ducts are not filled with a liquid having the same index of refraction as the material of the panel. In the present instance, the ducts are shown as corrugated, as indicated at 12. The said ducts extend throughout the panel in one dimension, the vertical dimension, in the present instance, although they might be disposed horizontally. The lower end of each duct is open and is disposed in communication with a supply duct 13. The upper surface of the panel is sealed by a plate 14 which is fused or otherwise secured to the walls of the panel to make a water-tight joint. Suitable means, preferably pump means 15, may be employed to force a suitable liquid in the supply duct 13. In the present instance, the cylinder

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16 is filled through the opening 17 when the threaded stopper 18 is removed and the piston 19 is at the extreme left-hand end of its travel and then, the stopper 18 being replaced, the movement of the plunger to the right-hand end of its stroke, will force into all ducts the necessary liquid, the amount of which ordinarily will be comparatively small.

In the present instance, the panel is shown as secured to the base 20, which may be of plastic, wood or metal, the junctures being, of course, water-tight. The preferred material for the panel is glass, although other materials, such as transparent plastic may be employed.

In order to permit the water to rise in the parallel ducts, a bleeder must be employed to permit the exit of air from the ducts 11, 11', 11'', and, in the present instance, I have shown means affording communication between the several parallel ducts, together with means affording communication between one of the end ducts and the atmosphere. A variety of means may be employed to permit the exit of the air when the water enters the ducts. In the present instance, grooves 21 are scratched by an emery wheel or file in the ribs separating each pair of ducts, and a groove 22 may be similarly formed in the uppermost right-hand portion of the panel to connect the duct nearest the right-hand side of the panel to the atmosphere. A minute duct or passageway will be formed between each groove and the end closure 14. The duct 22 may be closed in any suitable manner, as by a stopper or valve, but in the present instance, I have illustrated schematically a float valve 23, which, after the parallel ducts have been filled with water and a certain amount thereof has gone into the float valve, the latter will close the duct 22.

In Fig. 2, the dotted lines *a*, *b*, represent the projections of the corners similarly lettered at the ends of the longer of the two axes of the rounded-corner parallelogram, and the lines *c*, *d*, represent the projections of the corners *c*, *d*, respectively. It is to be understood, however, that the ducts may have any shape whatsoever provided that they are partially overlapping, in order to prevent the passage of light through the panel without going through one or more of the ducts 11, 11', 11'', that is, through portions of the panel which would otherwise be normally transparent. The common wall of each proximate pair of ducts, e. g., 11 and 11', and 11' and 11'' form ribs, which being integral with

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the panel, gives the latter great strength and rigidity.

Having thus described an illustrative embodiment of my invention without, however, limiting myself thereto, what I claim and desire to secure by Letters Patent is:

A light transmitting structure that may be made transparent or translucent at will, comprising in combination, an integral panel having formed therein a plurality of parallel ducts extending throughout one dimension thereof, said ducts being partially overlapping in the direction of the light impinging upon said panel to prevent the passage of all but a small part of such light through said panel without passing through one or more of said ducts and the common wall of each proximate pair of ducts being an integral part of said panel, the walls of said ducts having such configuration as to make said panel normally translucent, means affording a supply duct in communication with one end of each of said parallel ducts, means sealing the other ends of said parallel ducts, and means for supplying to or withdrawing from said supply duct at will a liquid having the same index of refraction as said panel, whereby when

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said parallel ducts are filled with said liquid, said panel will be transparent and when said liquid is withdrawn therefrom said panel will be translucent.

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