Aug. 28, 1934. G. T. OLIVER 1,971,533

CRADLING FOR PANELS

Filed Nov. 17, 1933

Fig.1.

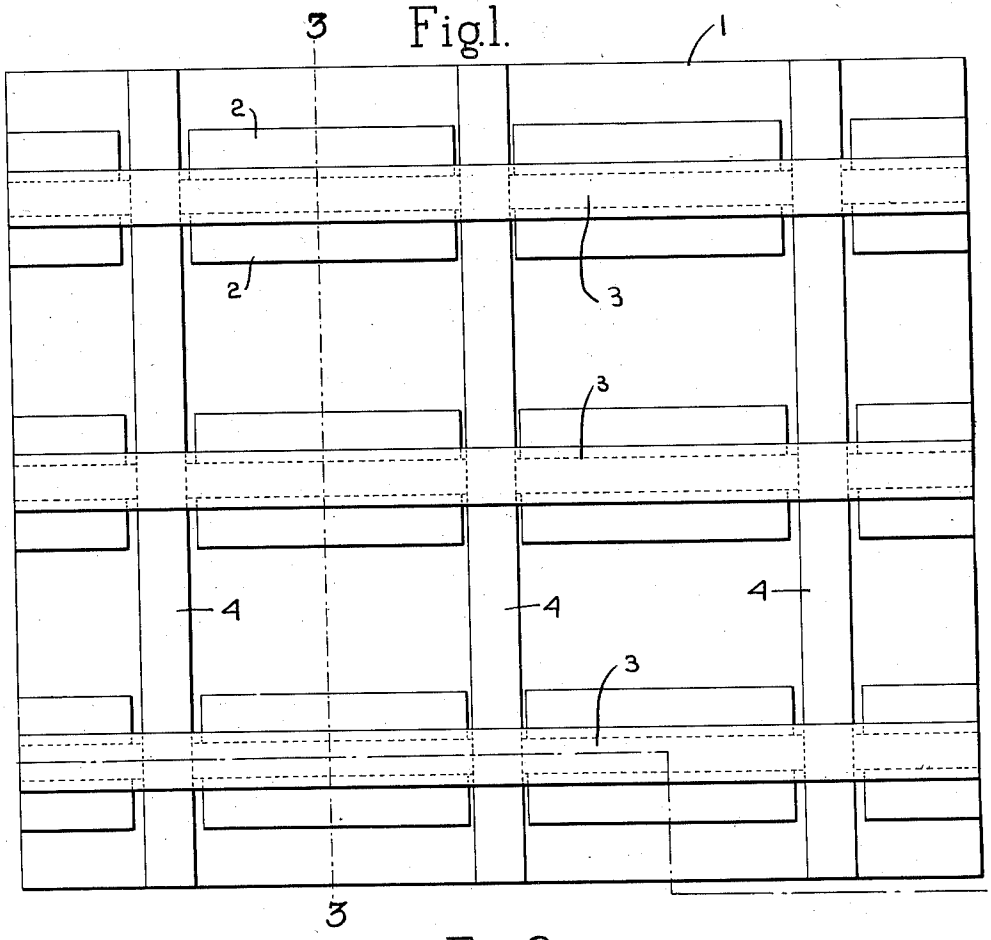


Fig.2.

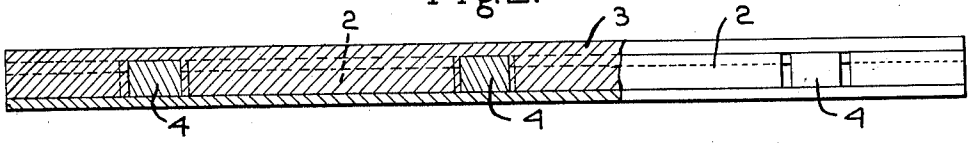
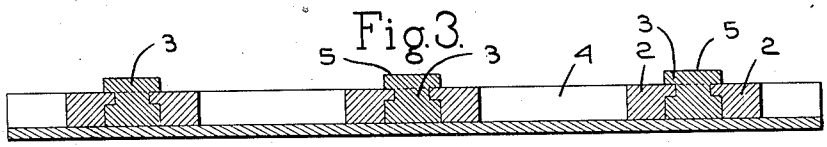


Fig.3.



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Patented Aug. 28, 1934

1,971,533

UNITED STATES PATENT OFFICE

1,971,533

CRADLING FOR PANELS

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Application November 17, 1933, Serial No. 698,409

4 Claims. (Cl. 20—15)

This invention relates to a cradling for panels or a structure for preventing the warping or buckling of relatively thin panels and for maintaining them flat under varying conditions of temperature and humidity to which they may be subjected. While the invention is particularly applicable to panels employed for art or decorative purposes, the invention is of wider application and in its broader aspect is applicable to any longitudinally and laterally expansible and contractible panel subject to transverse distortion under varying conditions of temperature and humidity.

The object of the invention is therefore to provide a structure which shall act to prevent transverse distortion of such panels under such conditions.

The nature and objects of the invention will appear more fully from the accompanying description and drawing and will be particularly pointed out in the claims.

The drawing illustrates one simple and preferred form of construction embodying the invention.

Fig. 1 is a rear plan view of the construction illustrated.

Fig. 2 is a view partially in side elevation and partially in cross section taken on the line 2—2 of Fig. 1 of the construction shown in Fig. 1.

Fig. 3 is a cross section taken on the line 3—3 of Fig. 1.

The term "panel" as herein employed includes any sheet of relatively stiff expansible and contractible material of wood, metal, or other composition, such, for example, as cardboard, wall-board, building board, laminated material, wood substitutes, etc., which is inherently subject to warping and buckling or other transverse distortion under varying conditions of temperature and humidity.

Such panels of wood or of artificial composition are extensively used for decorative purposes, for having directly painted thereon pictures and designs, or for having mounted thereon paintings or designs on canvas or other material. Such panels may be of any desired size but it is essential that they shall be maintained flat and prevented from warping or buckling transversely under varying conditions. Such panels are also subject to expansion and contraction both longitudinally and laterally and to a greater or lesser degree depending upon their size and the material of which they are composed.

The terms "transversely" and "transverse", as herein employed, refer to direction normal to the plane of the panel, while the terms "longitudinally" and "laterally" refer to directions substantially at right angles to each other and parallel to the plane of the panel.

The invention essentially provides a plurality of longitudinally and laterally spaced supports rigidly secured to the rear of the panel throughout the surface thereof. These supports may be of any desired character and of any suitable material and secured to the panel by any suitable means.

The invention essentially further provides two sets of transversely rigid braces, that is, braces which are rigid in a direction normal or transversely to the plane of the panel. One set of these braces extends longitudinally of the panel and the other set laterally and both sets are held directly or indirectly by the supports against transverse movement while movement of both sets in a lengthwise direction thereof relatively with respect to the panel is permitted. These braces thus act to prevent transverse distortion of the panel, notwithstanding any expansion and contraction of the panel which may take place. The braces may also be made of any suitable material and movably held by the supports by any suitable form of connection.

It will thus be seen that under the principles of the invention a wide variety of shape and material both of the braces and of the supports may be employed in carrying out the invention in its broader aspects.

In the particular construction illustrated as a simple and preferred form of the invention and as adapted to wooden panels, wall-board panels, or composition panels such as employed for receiving or having mounted thereon paintings, the supports are suitably grooved wooden blocks adhesively secured to the rear face of the panel in the required positions, while the braces are shown as relatively heavy and therefore rigid wooden bars fitted to slide endwise with respect to the panel and held by the supports against movement transversely of the panel. Thus the required results are secured in a simple and efficient manner. While it is not essential that the braces or bars shall contact throughout with the rear surface of the panel, such a construction is shown in the form illustrated.

In the drawing, the panel 1 is shown of rectangular shape and of a relatively thin material such as adapted to receive on its front face a painting either painted directly thereon or mounted thereon.

The supports are arranged spaced both later-

ally and longitudinally from each other and arranged in parallel rows extending longitudinally of the panel. Each support is shown as comprising two wooden blocks 2 permanently secured by suitable adhesive to the rear face of the panel and dove-tailed on their opposing faces as shown in Fig. 3. In the small panel section illustrated, these supports extend in three spaced rows longitudinally of the panel and with the supports of each row spaced apart so that they are arranged in four rows transversely of the panel. As pointed out, this is but one form of arrangement, the essential thing being that there shall be a sufficient number of supports located throughout the entire rear surface to provide in connection with the two sets of braces the required rigidity of construction.

The braces in the construction illustrated are shown as straight rigid bars of wood or other suitable material. One set of bars 3 extends longitudinally of the panel and each of these bars is shaped as shown in Fig. 3 and telescopes with the dove-tailed construction of the supports. The second set of these bars 4 extends laterally of the panel and is shown as of rectangular cross section and fitting between the lateral rows of supports and firmly beneath bridging portions 5 of the bars 3. The braces or bars illustrated are rigid transversely and, being illustrated as perfectly straight, are arranged with their lower faces directly in contact with the rear surface of the panel.

The supports are spaced longitudinally from each other sufficiently so that the bars 4 extending laterally of the panel may shift longitudinally of the panel with respect thereto under any conditions of expansion and contraction to which the panel may be subjected and when thus arranged the bars 4 may engage, as illustrated, portions 6 of the longitudinally extending bars 3.

It will now be seen with the combination of supports and the two sets of braces or bars that a firm and rigid construction is provided throughout the entire area of the panel which acts to hold the panel against any warping or buckling and maintain it perfectly flat at all times. If the panel expands or contracts longitudinally, the bars 3 slide endwise in the supports and the bars 4 shift with the bars 3, both sets of bars remaining throughout in contact with the rear surface of the panel in the form illustrated or in any form maintaining throughout transverse rigidity and thus preventing any warping or buckling of the panel. If the panel expands or contracts laterally, the bars 3 shift with their supports while the bars 4 and the panel shift laterally relatively to each other, thus again maintaining the required condition.

If expansion or contraction takes place in any direction or in all directions, the same principle of arrangement insures the required shifting of the bars with respect to the panel while maintaining the rigidity of the structure and thus preventing any transverse distortion of the panel such as warping or buckling.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A longitudinally and laterally expansible and contractible panel, a plurality of longitudinally and laterally spaced supports rigidly secured to the rear of the panel throughout the surface thereof and two sets of transversely rigid braces, one set extending longitudinally and the other laterally and both sets movable lengthwise with respect to the panel and held by the supports against movement transversely, the said braces thus acting to prevent transverse distortion of the panel during expansion and contraction.

2. A longitudinally and laterally expansible and contractible panel, a plurality of longitudinally and laterally spaced supports rigidly secured to the rear of the panel throughout the surface thereof and two sets of transversely rigid braces, one set extending longitudinally and the other laterally and one set mounted in the supports for lengthwise movement and held by the supports against transverse movement and the other set mounted in the first set for lengthwise movement and held against transverse movement, the said braces thus acting to prevent transverse distortion of the panel during expansion and contraction.

3. A longitudinally and laterally expansible and contractible panel, a plurality of spaced parallel rows of spaced supports rigidly secured to the rear of the panel, a set of spaced parallel rigid straight bars mounted to slide lengthwise longitudinally in the supports and held thereby against transverse movement, and a second set of spaced parallel rigid straight bars mounted to slide lengthwise laterally in the first set of bars and their supports and held thereby against transverse movement, the said bars thus acting to prevent transverse distortion of the panel during expansion and contraction.

4. A longitudinally and laterally expansible and contractible panel having the construction defined in claim 3, in which the surfaces of both sets of bars contact with and slide upon the rear surface of the panel.

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