Dec. 31, 1929. E. F. LAU 1,741,241

CRATING

Filed Oct. 7, 1926

Fig. 1.

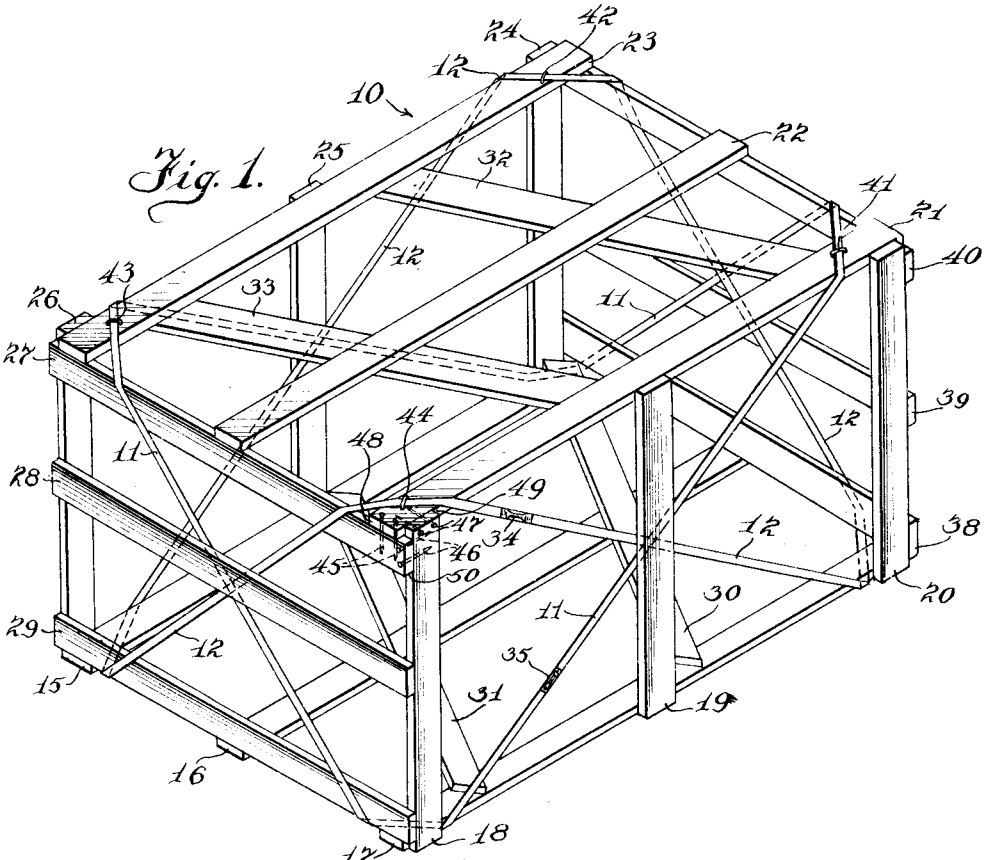
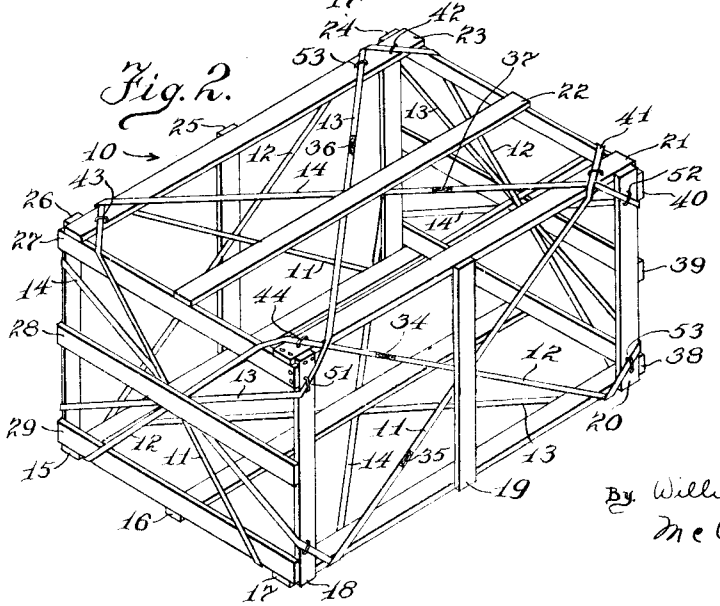


Fig. 2.



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UNITED STATES PATENT OFFICE

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CRATING

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My invention relates to improvements in crating of objects of all kinds for shipment, and is of particular importance in the provision of bracing means having novel cooperation with said crating, and I employ the term "crating" herein as designating not only open shipping frames but closed and open boxes and containers of all kinds adapted to be so braced.

Heretofore it has been customary to brace standard crating members with a plurality of diagonal boards, cleats, or other members, such members often being mitre cut to fit within the corners of the crate to withstand compressional stresses, and often occupying substantial space within the crate, interfering with the disposal of the crated article, require a larger crate, more material and considerable time and labor in fitting and mitre cutting said braces.

One object of my invention is the provision of a method of crating without the necessity of using mitre cut bracing members.

Another object is the provision of a crating composed of transverse compression members and braced by diagonal tension members.

Another object is the provision of such a method of crating which is economical of time, space and material better adapted to withstand the shocks of transportation.

Another object is the provision of a crating in which the frame members cannot be torn apart at nailed joints by shocks of transportation.

Further objects and advantages of my invention will appear more fully from the following description and the accompanying drawings in which similar characters of reference indicate similar parts throughout the several views.

Figure 1 is a view in perspective of a crating embodying my invention, and

Figure 2 is a view in perspective of a modification.

The embodiment which I have chosen to illustrate my invention consists in general in a crating which is indicated in its entirety at 10 and a plurality of endless tension members 11, 12, 13 and 14, and other details further to be described.

The crating 10 is preferably constructed of a plurality of relatively stiff frame or compression members, and for ordinary purposes inch board or less of oak or other relatively strong woods are sufficient.

Referring to Figure 1, it will be seen that the base of the crate may consist of a plurality of base frame members 15, 16 and 17 which are fixed at their ends to the edges of transverse end frame members 29 and 38 by nails or any convenient fastening means. The side frame members 18, 19 and 20 as well as 24, 25 and 26 may likewise be constructed of boards extending vertically from the base frame members and the said side frame members are fixed to the base frame members 15 and 17 at their outward edges by nails or any convenient fastening means.

The end frame members 27, 28 and 29 as well as 38, 39 and 40 may consist of a plurality of boards extending between the side frame members 18 and 26, and 20 and 24 respectively, the said end frame members being fixed to the edges of said frame members in a similar manner to that previously described.

The top frame members 21, 22 and 23 may consist of a plurality of boards extending between the upper edges of the end frame members 27 and 40 and fixed thereto by nailing or any other convenient fastening means, and the exterior parts of said top frame members 21 and 23 are also nailed or otherwise fixed to the ends of the side frame members 18, 19 and 20 as well as 24, 25 and 26 respectively.

The distinguishing characteristics of a crate constructed by the foregoing method are that all the respective frame members wherever located, extend the full length, width, or height of the crate, that nowhere in the crate as so far constructed is more than one thickness of wood interposed between the inside of the crate and the outside, and that the corners of the said crate consist of three frame members each nailed upon the other in order to form the standard interlocked corner.

For instance, in Figure 1, the side frame member 18 lies against the edge of the top frame member 21 and is secured thereto by a plurality of nails 47. Likewise the end frame member 27 lies against the side frame member

18 and is secured therto by a plurality of nails 46 and in a similar manner the top frame member 21 lies against the end frame member 27, being secured thereto by a plurality of nails 45, the said nails in every case being driven edgewise into the boards opposing the frame member. Another characteristic of the corner structure thus provided lies in the fact that at the internal edges of the respective frame members and the frame members to whose edges they are nailed, there is an inside corner such as the corner 48 between the internal edge of the top frame member 21 and the end frame member 27, or the corner 50 formed between the end frame member 27 and the edge of the side frame member 18 or the corner 49 formed between the side frame member 18 and the top frame member 21. The corners thus formed are utilized in my invention to perform a novel cooperation with diagonal tension members further to be described.

In order to brace the crating structure thus provided without the necessity of further compression members, unless such are desired, and to provide for this operation with the utmost economy of time, space and labor, I provide my invention with a plurality of endless tension members 11, 12, 13 and 14. The said tension members are extended diagonally across successive faces of the said crating, being caught on or near the corners of adjacent faces and then passed diagonally across other faces until the ends of said tension members meet. For instance, the tension member 12 may start at the top frame member 21 passing from the corner 49 across the top frame member 21 through the corner 48 across the end frame member 27 diagonally across the end of the crate under the frame member 28 and exterior to the frame member 29 adjacent the corner formed by frame members 29, 15 and 26. The tension member 12 is then continued diagonally across the corner portion of the lower face of the crate, about the ends of the frame members 15 and 29, diagonally across the rear side of the crate, being passed over the interior side of the frame member 25 for a purpose further to be described. Continuing the tension member 12 across the ends of the frame members 23 and 40, and diagonally across the end of the crate, but within the frame member 39, the tension member passes about the right ends of the frame members 38 and 17 back to the front side of the crating, across which it passes diagonally to meet the other end of the tension member. It will thus be observed that my tension members pass diagonally across a plurality of successive faces of the crating being caught and held at or near the corners of the crating by the projections or inside corners provided between the adjacent frame members at their junction.

Where the tension members pass frame members other than those at the edges of the crate, I prefer to pass the tension members underneath these intermediate frame members such as frame members 28, 25, 39 and 19 in order to protect said tension members from abrasion or rupture by the handling of the crating in its transportation. The ends of the tension member 12 may then be placed in a stretching machine in such manner that one end of the strap passes through the machine and extends out of the stretching machine flatly adjacent another tensioned portion on the other end of the strap in such manner that the said tension member may be drawn up tightly about the crating and its ends permanently sealed together, preferably with the well known Signode seal, one form of which is shown and described in Flora Patent No. 1,252,680 issued on January 8, 1918.

In a similar manner the tension member 11 may be applied by passing the said tension member diagonally across the successive faces of the crating in such manner that it is retained upon the corners of the crate as has been previously described, also passing the tension member under intermediate crating members such as side member 25, end member 39, side member 19 and end member 28 until the ends of said tension member meet as at 35, where they may be likewise placed in the stretching machine, tensioned, and permanently sealed.

In order to guard against the release of the tension members across adjacent faces in case the tension member may be broken, I prefer to provide the same with a fastening means located at each corner in such manner that the tension member extends from the said fastening member across a corner and thence across the face of the crate in every case.

A convenient means for accomplishing this result are the staples 41, 42, 43 and 44 shown as applied to the tension members 11 and 12 and it will be observed that in every case the tension members extend from the said staples which secure them firmly to the frame members, about a corner, thence across a face of the crate.

I find that the resistance presented by the turning of the tension member such as standard steel strap which I prefer to use for my invention, about a corner, is sufficient to prevent slipping under the staple and the loosening of the tension member across any of the faces except the one upon which said tension member may have been broken. In a similar manner the parts of the tension members or straps 11 and 12 which extend across the corners of the base of the crate may be likewise secured to the base members 17 and 15 respectively at the four corners.

In order to supply my crating with braces

for preventing deformation of the base and top from standard rectangular shape, I may provide a plurality of boards 30 to 33 extending somewhat diagonally across the base frame members 15, 16 and 17 within the crating and across the top frame members 21, 22 and 23 within the crating and secured to each one of these frame members by nails or any other convenient fastening means, but due to the great rigidity imparted to the crate by my diagonal tension bracing members, I find it is unnecessary to mitre cut the bracing members 30 to 33 and these bracing members may be eliminated entirely by the provision of additional tension bracing members as will be further described.

In the modification shown in Figure 2 I have provided the crating with additional tension bracing members 13 and 14 which extend diagonally across the top and bottom of the crate in both directions and likewise diagonally across the ends of the crate in both directions and these tension members are wrapped about the crating in a manner exactly similar to that described in Figure 1 with the exception that the tension members are begun upon different faces, namely the top and bottom in such manner that both the front and rear sides and the top and bottom are provided with diagonal tension members for bracing and the ends of the crate are both provided with double diagonal bracing members. The tension members of Figure 2 may likewise be passed under immediate frame members such as 25, 39, 19 and 28 in order to protect them at their intermediate portions from rupture by handling during transportation, and the said tension members may likewise be fixed by staples or other means to frame members where said tension members cross the ends of such frame members as at the points 41 to 44, 51, 52, 53 and the similar places upon the rear and base of the crating.

It will thus be observed that I have provided a novel system of crating consisting of a crating member having a plurality of simple compressional members which are braced by a plurality of endless diagonal tension members, and while I have illustrated my invention as applied to a specific type of crating, I desire it to be understood that my endless tension members may be used to brace any form of container or box having a plurality of plane sides arranged in such manner that tension members may be successively passed across the same with their ends meeting.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of many modifications without departing from the spirit of the invention and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

I claim:

1. In a crating, the combination of a polyhedral enclosing frame composed of a plurality of frame members forming a crating or box with a pair of diagonal tension members passing directly over the edges of said frame from face to face on said frame, and extending diagonally and transversely to each other across the faces of said crating and diagonally across corners of said crating, said tension members slidably engaging the faces and corners, whereby the ends of said tension members may be brought together, tensioned and secured to tension the same over the full length of said tension members about said crating under sufficient tension to brace said article.

2. In a crating, the combination of a polyhedral enclosing frame composed of a plurality of frame members forming a crating or box, with a continuously diagonal metal tension bracing member extending directly from face to face of said frame, said tension member alternately extending across a face from one edge to a parallel edge and then across a corner from one edge to an edge transverse to said latter edge, said tension member being tensioned along its full length about said frame, and having its ends joined together.

3. The method of bracing a polyhedral article for shipment comprising passing a metal tension member diagonally across one face of said article from one edge to a parallel edge, thence directly and diagonally across an adjacent transverse face at the corner thereof to an edge transverse to said parallel edge, and thence alternately and diagonally across the faces of said article and between the parallel and transverse edges of said article, until the ends of said tension member meet, tensioning said tension member about said article with a tensioning machine, said tension member slidably engaging said faces to tension the full length thereof, and securing the ends of said tension member together under sufficient tension to brace said article laterally.

In witness whereof, I hereunto subscribe my name this 27th day of September, 1926.

EDWIN F. LAU.