

A. O. HUBBARD.
FOLDING CRATE.
APPLICATION FILED OCT. 27, 1911.

1,046,297.

Patented Dec. 3, 1912.

3 SHEETS-SHEET 1.

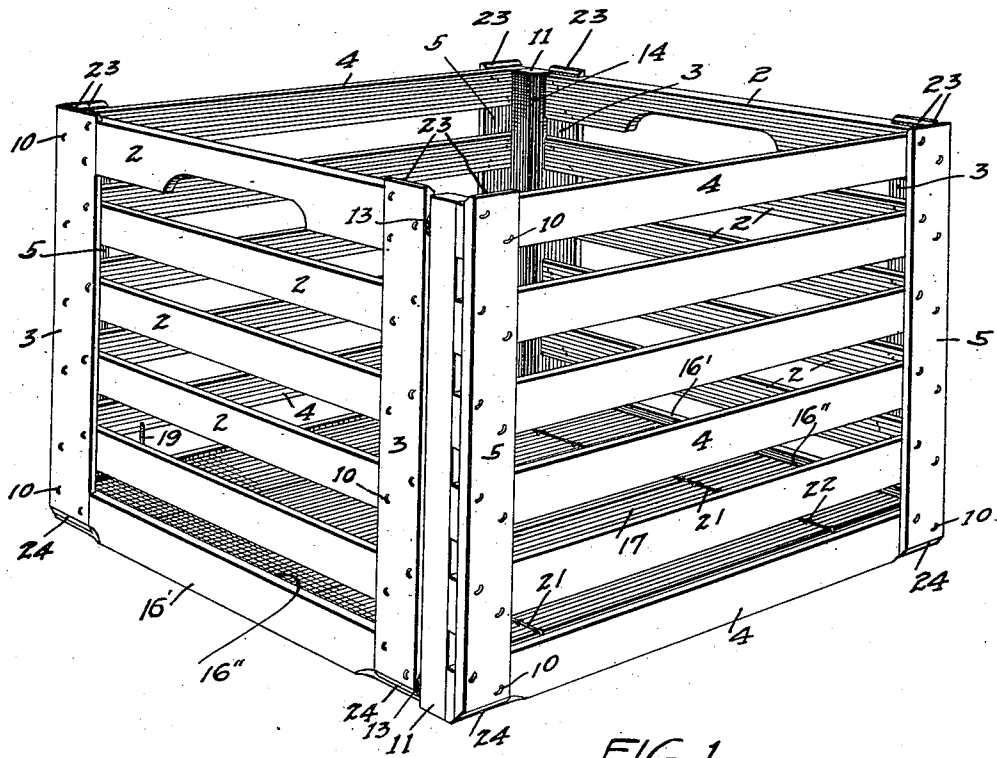


FIG. 1.

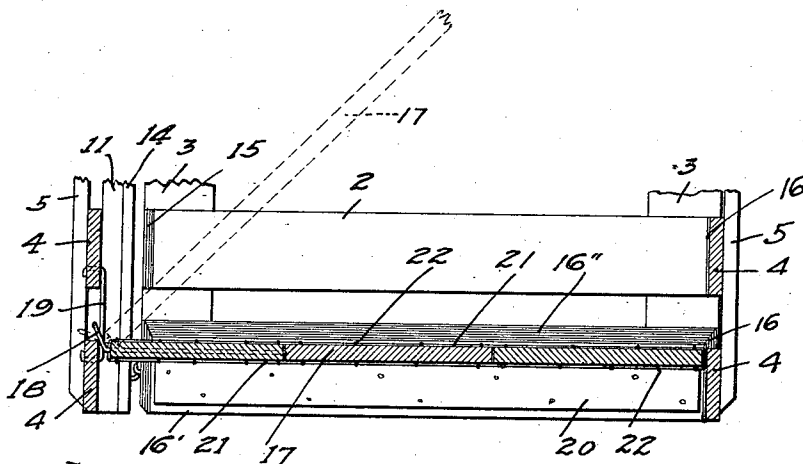


FIG. 5.

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3 SHEETS—SHEET 2.

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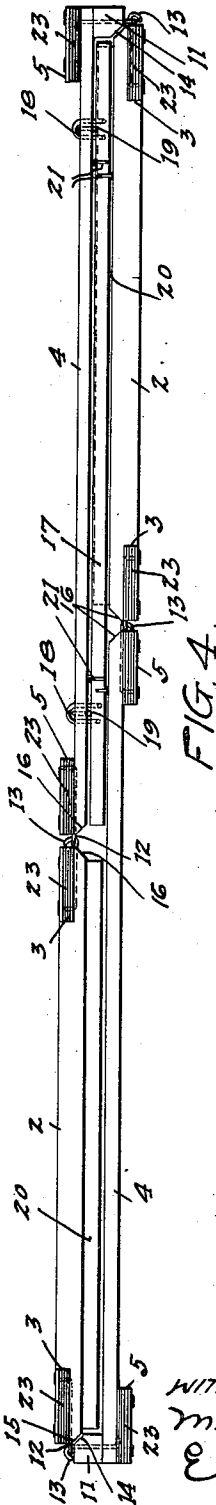


FIG. 4.

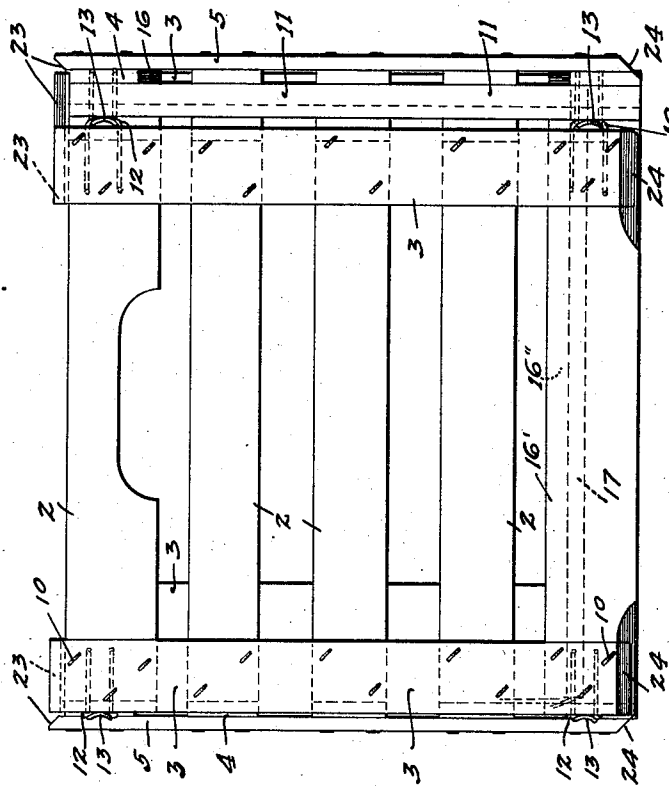


FIG. 2.

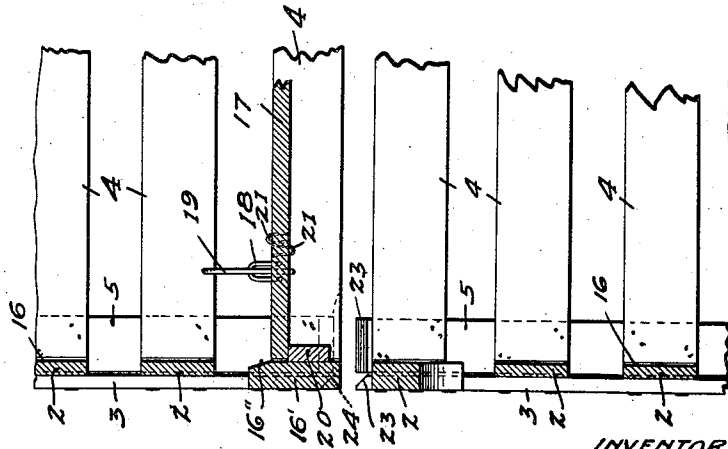


FIG. 3.

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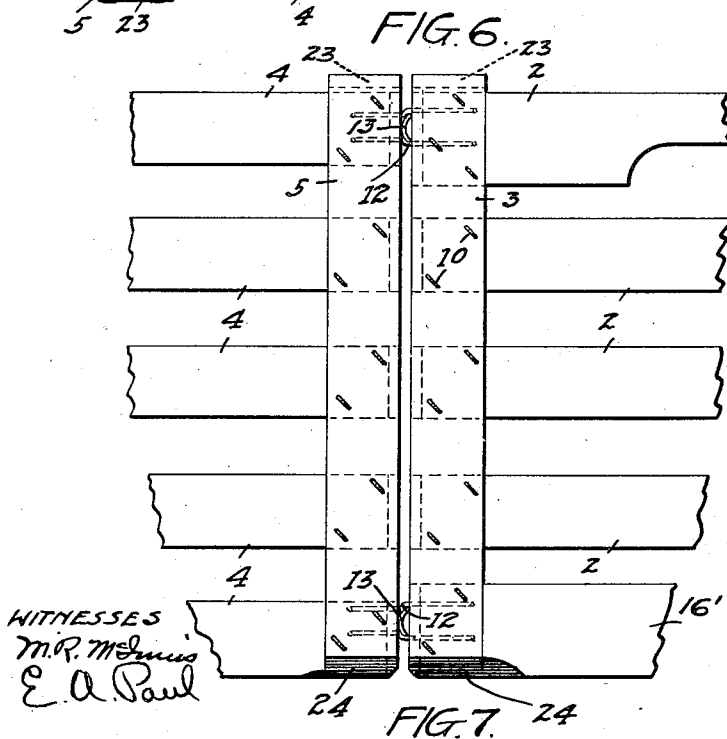
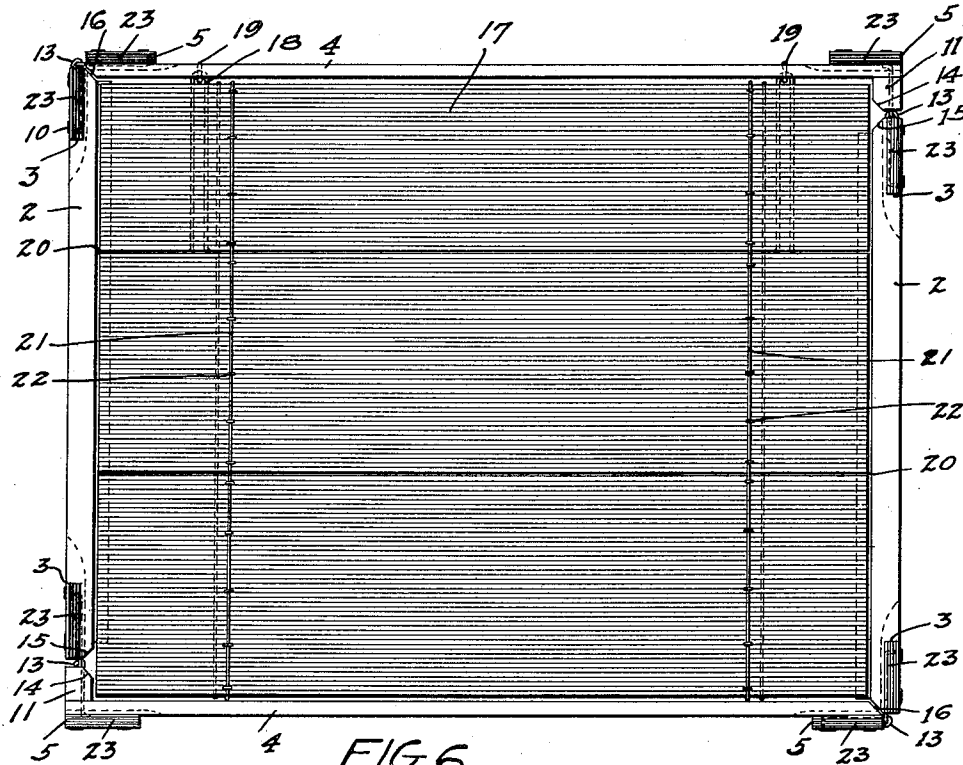
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3 SHEETS—SHEET 3.



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FOLDING CRATE.

1,046,297.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed October 27, 1911. Serial No. 657,097.

To all whom it may concern:

Be it known that I, ARTHUR O. HUBBARD, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Folding Crates, of which the following is a specification.

The object of my invention is to provide a crate designed particularly for transporting vegetables or fruit to market, and the object of the invention is to provide a construction which will allow one crate to be piled upon another without the use of dowel pins or similar devices.

A further object is to provide an improved means for hinging the bottom of the crate to the end that it cannot bind or become twisted or bent in opening or closing the crate.

A further object is to provide means in connection with the hinged bottom of the crate for centering the bottom when the crate is unloaded, and squaring the walls of the crate.

A still further object is to provide a hinging means which will not be affected by climatic conditions.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a perspective view of a folding crate embodying my invention, Fig. 2 is an end view of the same, Fig. 3 is a detail sectional view, showing the manner of placing one crate upon another, Fig. 4 is a detail view showing the crate folded, Fig. 5 is a detail sectional view showing the manner of hinging the bottom of the crate to one of the side walls, Fig. 6 is a top view, showing the construction of the crate which permits the placing of one crate upon another, Fig. 7 is a detail view showing the manner of hinging the walls of the crate together.

In the drawing, the end walls are shown as composed of a series of horizontal bars 2, spaced apart a suitable distance and secured together by upright bars 3. The side walls are composed of horizontal bars 4 and upright bars 5, the horizontal and upright bars being secured together by suitable means, as staples 10. At the diagonally opposite corners upright posts 11 are provided, secured to the ends of the side walls and pivotally connected to the end walls by hinges, con-

sisting of staples 12, preferably of wire, having eyes to receive hooks 13 and forming hinges on which the walls may be swung back and forth with respect to one another. The staples or loops comprising the hinges are so formed that the smaller loops secured to one wall enter the wider loops secured to the abutting wall, the ends of the smaller loops being bent at right angles before insertion and are then turned backwardly upon themselves to complete the hinge and hold the walls together. Some of the loops have their free ends sharpened and turned outwardly at right angles to enter the upright corner bases 3 and 5 at the corners of the box. These loops or sections of the hinges are inserted during the process of stapling or nailing the slats together. At two of the diagonally opposite corners where the upright posts 11 are provided, the wider loops have straight pointed ends which are driven through the posts and clenched in the horizontal slats when the upright corner slats are put in place. A hinge of this kind, composed of wide and narrower staples with interlocking looped ends, is simple in construction, easily connected and very durable. Furthermore, there is sufficient freedom of movement to allow for the swelling of the slats and posts without causing the walls of the crate to bind or preventing them from being easily folded or unfolded at any time.

The posts have their corners beveled at 14 to receive the correspondingly beveled ends 15 of the end walls when the crate is folded, and the abutting ends of the side and end walls at the opposite diagonal corners have beveled surfaces, as at 16, to allow them to be hinged close together and form a neat, finished joint when the crate is set up. The bottom 17 has loops 18 on one side, inserted into the edge of the bottom and upwardly turned, and slidable on rods 19 which are mounted, preferably, in the adjoining horizontal bars of one of the side walls. This loose, hinged connection of the bottom allows it to slide vertically in the crate for a limited distance and accommodate itself to the different positions of the side and end walls without binding or cramping. Ordinarily, in crates of this kind, the hinged bottom can swing on its pivot pins but has no sliding movement thereon and consequently, any cramping or twisting of the walls of the crate will often result in breaking a hinge.

Then, too, it is often difficult to fold or open the crate without cramping the bottom in some way or damaging the hinge. With the construction I have shown herein the bottom has such freedom of movement up and down, back and forth, on its hinges, that it is practically impossible to cramp it or to get it in such a position in folding or opening the crate where there would be much danger of breaking or damaging a hinge. Cleats 20 are provided on the lower walls of the crate to support the bottom and hold it in a horizontal position when the crate is in use. The bottom is preferably composed of a series of boards connected together by wires 21 and staples 22.

At the bottom of the crate I prefer to provide bars 16' which are thicker than the other corresponding bars and have beveled upper edges 16''. These beveled upper edges guide the swinging bottom to its seat on the cleats 20, and the increased thickness of the bars 16' causes the swinging bottom to square the walls of the crate with one another and hold them against any racking or twisting movement.

As a crate of this kind is bulky and its contents take up considerable room without being particularly heavy, it is desirable that a construction be employed which will permit one crate to be placed upon another without danger of sliding off, and without throwing the load on the upper crate, but evenly distributing the load on the uprights of the lower crate in such a manner that no damage can possibly result therefrom. With this end in view I provide beveled surfaces 23 at the upper ends of the upright bars, which are adapted to receive correspondingly beveled surfaces 24 at the lower ends of the bars of the superimposed crate, the posts 11 having squared upper and lower ends so that when one crate is placed upon another the lower ends of the posts of one crate will rest squarely upon the upper ends of the posts of the crate beneath, and the load will, in reality, be carried by these posts, the bars 3 and 5 with their meeting faces serving to prevent lateral movement of the crates and holding them in vertical alinement with one another. The crates may therefore be piled one upon another to the desired height without danger of toppling over or the lower crates being crushed by the weight of those above.

The foregoing described invention may be embodied in the construction of a folding box as well as in the construction of a crate, if preferred. I do not limit myself, therefore, to the use herein shown and described.

I claim as my invention:—

1. A folding crate comprising side and end walls hinged together, each wall being composed of horizontal bars spaced apart and upright end bars secured to said hori-

zontal bars and holding them in parallel relation with one another, said upright bars extending above said horizontal bars and having beveled ends, upright posts interposed between the side and end walls of said crate and attached thereto and having squared upper and lower ends, and the ends of the posts of one crate contacting with the ends of the posts of the adjoining crate when they are piled one upon another and forming a continuous support from the top to the bottom of the pile, and the beveled ends of the upright bars of one crate cooperating with the beveled ends of the bars of the adjoining crates to hold said crates in vertical alinement.

2. A folding crate comprising side and end walls, a bottom hinged to one of said walls, the hinges of said bottom including staples inserted into the edges of said bottom and vertically arranged rods secured to the wall of said crate and on which rods said staples are loosely and slidably mounted.

3. A folding crate comprising side and end walls, staples inserted into the abutting vertical edges of said walls, the staples of one wall being wider than those of the abutting wall to form eyes, and the narrower staples of the abutting wall entering said eyes and being bent backwardly upon themselves therein to form pivotal connections between said abutting walls.

4. A folding crate comprising side and end walls, a bottom hinged to one of said walls, stops secured to some of said walls and forming a seat for said bottom when the crate is unfolded, and means for centering said bottom between said walls during the unfolding operation.

5. A folding crate comprising side and end walls, a bottom hinged to one of said walls, the bars composing the lower portions of some of said walls being thicker than their upper portions and having beveled upper edges in the path of said hinged bottom, and stops secured to said lower walls and forming seats for said bottom.

6. A folding crate comprising side and end walls composed of horizontal and upright bars secured together, a bottom hinged to one of said walls, the lower slats of some of said walls being thicker than the other slats of the same walls and having beveled upper edges in the path of said hinged bottom, and cleats secured to said thicker slats and forming seats for said hinged bottom.

7. A folding crate comprising horizontal and upright bars provided at the ends of said horizontal bars, staples securing said horizontal and upright bars together, hinges uniting the abutting walls of said crate, said hinges comprising wire staples having outwardly turned, pointed ends inserted between said horizontal bars and said upright

bars, the looped portions of said staples projecting beyond the vertical abutting edges of said upright bars, the staples of one abutting wall being wider than those of the adjoining wall, and the staples of the adjoining wall having their looped portions inserted into said wider staples and backwardly turned upon themselves to loosely and pivotally connect said walls together.

- 10 8. A felding crate comprising side and end walls, upright posts interposed between the side and end walls at two of the diagonally opposite corners of said crate and rigidly secured to one wall and having a
15 pivotal connection with the other and provided with squared upper and lower ends, the ends of the posts of one crate contacting with the ends of the posts of the adjacent crate when they are piled one upon
20 another and forming thereby a continuous support from the top to the bottom of the pile, and suitable hinges connecting said side and end walls at the other two diagonally opposite corners of the crate.

9. A crate comprising side and end walls, 25 upright posts provided at two of the diagonally opposite corners and interposed between the abutting side and end walls at said corners and rigidly secured to one of said walls and having a pivotal connection 30 with the other wall, the ends of the posts of one crate contacting with the ends of the posts of the adjoining crate when they are piled one upon another and forming a continuous support from the top to the bottom 35 of the pile, and bars secured to said walls and having beveled upper and lower ends, the upper ends of the bars of one crate engaging the beveled lower ends of the bars of the superimposed crate and holding them 40 in vertical alinement.

In witness whereof, I have hereunto set my hand this 23d day of October, 1911.

ARTHUR O. HUBBARD.

Witnesses:

GENEVIEVE E. SORENSEN,
EDWARD A. PAUL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."