No. 897,325. PATENTED SEPT. 1, 1908.

W. E. THOROMAN.

COLLAPSIBLE SHIPPING CRATE.

APPLICATION FILED JAN. 31, 1908.

Fig. 1.

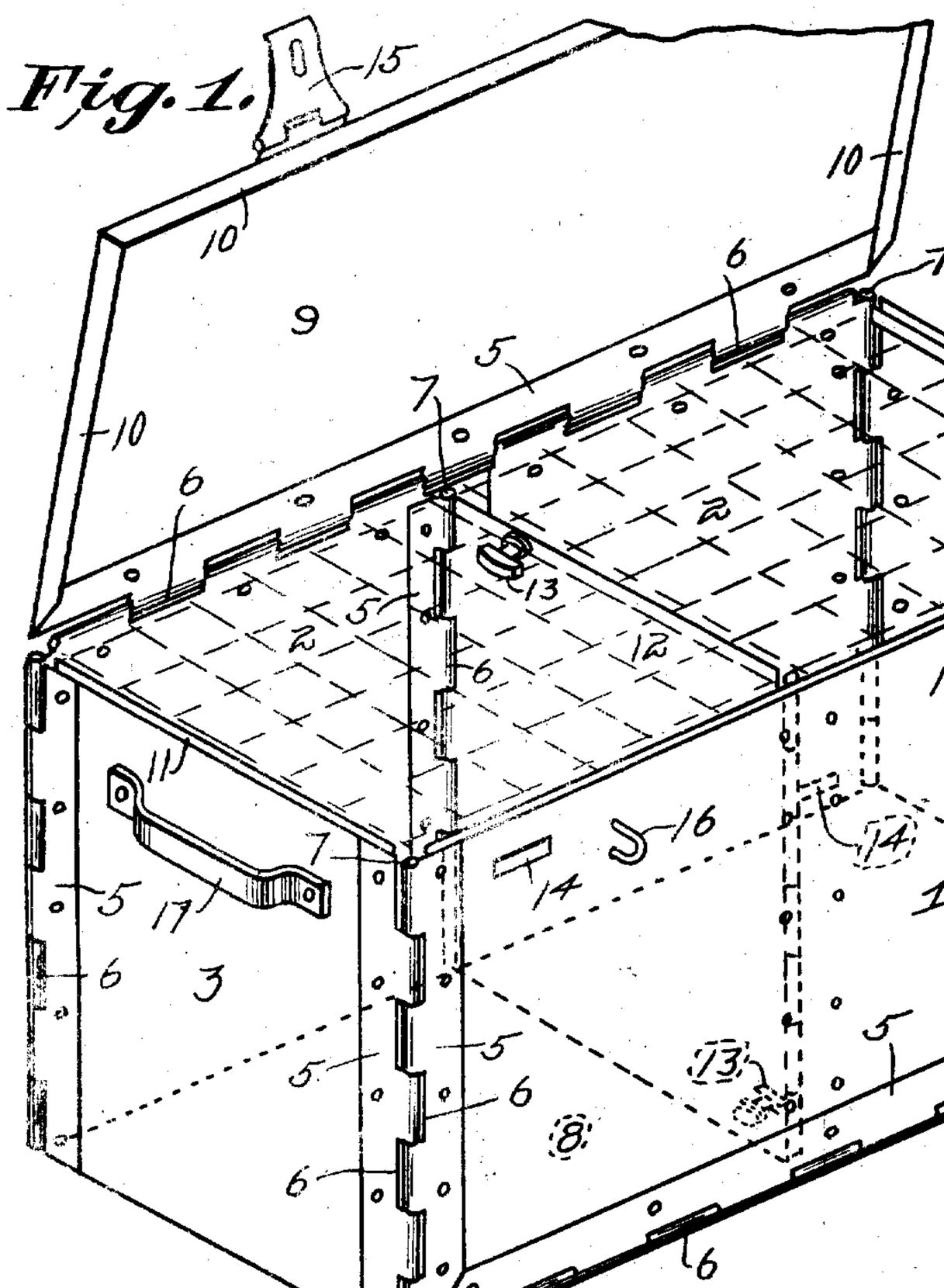
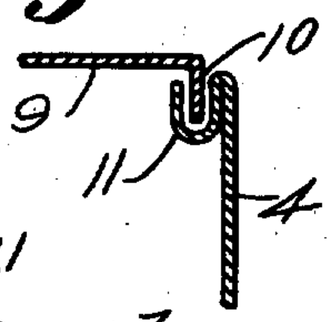


Fig. 3.



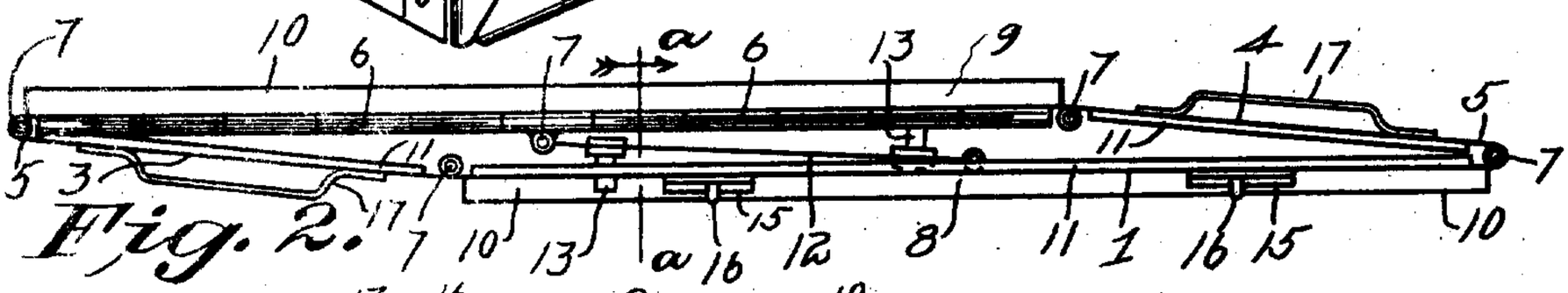


Fig. 2.

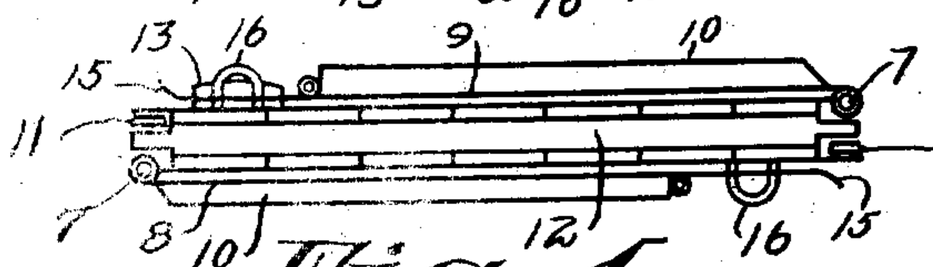


Fig. 4.

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COLLAPSIBLE SHIPPING-CRATE.

No. 897,325. Specification of Letters Patent. Patented Sept. 1, 1908.

Application filed January 31, 1908. Serial No. 413,589.

To all whom it may concern:

Be it known that I, WILLIAM E. THOROMAN, citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Collapsible Shipping-Crates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in shipping crates of the type known as knock-down or collapsible shipping crates.

The shipping crate is especially designed for the shipment of eggs, but is equally useful as a shipping crate generally.

The object of the invention is to provide a practically indestructible knock-down shipping crate, made of sheet metal and so united that it may be reduced within the smallest possible space for returning when emptied. In providing a sheet metal shipping crate of this character, it is essential that the hinged portions of the crate shall be strong, and that the said hinged portions shall fold in a manner which enables the crate to be brought within the smallest possible compass when collapsed. It is also desirable to have means for holding the collapsed crate and preventing it from opening or spreading after being so collapsed and during the return shipment.

With these ends in view, the invention comprises the structural features and peculiarities hereinafter described in connection with the accompanying drawings, of which—

Figure 1, is a perspective view of the shipping crate with the lid or cover thrown back. Fig. 2, is a front edge view of the crate in a collapsed condition. Fig. 3, is a cross-sectional view of the outer edge of the lid and the upper edge of the front or end panels of the crate when the lid is closed. Fig. 4, is a detail sectional view on the line *a a* of Fig. 2, looking in the direction of the arrow.

In a detail description of the invention, similar reference characters indicate corresponding parts.

As previously stated, the shipping crate is constructed of sheet metal, the front and rear sides and the two ends of which are hinged together so that the crate may be folded lengthwise with the top and bottom inclosing said front and rear sides and ends.

As shown in the drawings, the front and rear panels 1 and 2 and the end panels 3 and 4 are connected by means of hinges 5 which are riveted to the respective ends of said front, rear and end panels. These hinges extend the entire height of said panels and thus reinforce the corners of the crate to a very great extent, and thereby preserve the crate indefinitely. The said hinges are provided with alternate apertured beads 6 through which the hinged pivot in the form of a rod 7 extends, so that the entire corners from bottom to top of the crate are made to withstand the strain. The bottom 8 and the top or lid 9 are provided with similar longitudinal hinges 5 by means of which said bottom and top are hinged throughout their lengths to the bottom of the front panel 1 and the top of the rear panel 2. These longitudinal hinges which connect the top and bottom of the crate to the front and rear panels, are also provided with apertured beads 6 throughout their lengths through which the pivot rod 7 passes to form the hinges. When the top and bottom of the crate are so connected, the top may fold down against the outer side of the rear panel, and the bottom may fold up against the outer side of the front panel as shown in the collapsed form—Fig. 2, and the end panels 3 and 4 lie between the front and rear panels and substantially parallel thereto.

The marginal edges 10 of the top and bottom of the crate are bent at right angles to their bodies, and these bent margins are adapted to enter grooves 11 formed on the inner sides of the front and rear sides and the ends of the crate. These grooves 11 in the front and rear sides of the crate are formed on the edges opposite the hinged edges, while the similar grooves on the ends of the crate are formed in the top and bottom edges thereof. In Fig. 3, the grooves 11 and the tongue 10 are shown in somewhat larger dimensions than they actually are, but it will be understood that owing to the thinness of the sheet metal these features will be much thinner when shown in cross section and will fit closer than they are shown in said figure of the drawings.

The interior of the crate is divided by a partition 12 which is hinged at its vertical edges to the front and rear panels of the crate. The hinges 5 are similar to the hinges

which connect the other portions of the crate and extend throughout the depth of said partition 12. When the crate is collapsed, this middle partition 12 folds in a direction with the end panels of the crate. The dotted cross lines shown in Fig. 1, indicate the position of the egg fillers which are constructed of card board, and provide the multiplicity of cells in which the eggs are individually placed.

13 designates two catches placed upon the upper and lower edges of the middle partition 12. The object and purpose of these catches or turn buttons are to secure the crate in its collapsed condition and to thus prevent it from opening or spreading in return shipment. This locking of the crate in its collapsed form is accomplished by the elongated portions of the turn buttons 13 extending through elongated slots 14 in the front and rear panels of the crate, and after being so passed through said slots 14, the elongated portions of said catches or turn buttons 13 are turned at right angles to the planes of the slots 14 and thus the collapsed crate is securely held in its collapsed form.

The top and bottom of the crate are provided with hinged hasps 15 which receive staples 16 on the front and rear panels of the crate and the top and bottom are thus held in position while the crate is in a serviceable condition. The ends of the crate are provided with handles 17 by means of which it may be conveniently moved. The hinged hasps 15 and the staples 16 are also utilized to prevent the top and bottom of the crate from opening when the crate is in a collapsed condition; when so utilized, the hasps 15 on the top or lid of the crate receive the staples 16 on the rear panel, while the hasps 15 on the bottom of the crate receive the staples 16 on the front panel of the crate, and by inserting a pin or other member (not shown) through said staples and in front of the hasps, the said top and bottom portions of the crate will be maintained in positions parallel with the front and rear panels of the crate when the crate is collapsed.

It will be understood that the catches or turn buttons 13 on the central partition 12 are instrumental in preventing the collapsed crate from opening on its vertical hinges, which are the hinges which join the ends and central partition to the front and rear panels of the crate. It will thus be seen that the hasps and staples, together with the turn buttons provide efficient means for maintaining the crate in its collapsed condition. In Fig. 4, the hasps and staples are shown in their relative positions while serving to hold the top and bottom of the crate in parallel positions when the crate is collapsed.

I claim:

1. A collapsible sheet metal shipping crate, the same consisting of front and rear sides and bottom and top portions united by horizontal hinges extending the lengths of said front and rear and top and bottom portions, and end and central partition portions united to the front and rear portions of the crate by vertical hinges extending the entire depth of said end and central partition portions, the top and bottom portions having hasps, and the front and rear portions having staples which coöperate to maintain the top and bottom in position when the crate is in a serviceable form, or to maintain the top and bottom parallel with the rear and front portions when the crate is collapsed, and means on the central partition coöperating with means on the front and rear portions of the crate to prevent the crate from opening on the vertical hinges when in a collapsed condition.

2. In a collapsible sheet metal shipping crate, front and rear panels hinged to top and bottom portions, and end panels hinged at their opposite edges to the vertical edges of the front and rear panels, the front and rear panels having grooves in their opposite longitudinal edges and the end panels having similar grooves in their top and bottom edges, the top and bottom of the crate having marginal edges adapted to enter said grooves when the top and bottom of the crate are closed, hasps on the top and bottom of said crate, and staples on the front and rear sides thereof which coöperate with said hasps in maintaining the crate in a serviceable condition or in a collapsed condition, a central partition, and means thereon engaging the front and rear panels of the crate to hold the crate in a collapsed condition, substantially as specified.

3. A sheet metal collapsible shipping crate, the front and rear panels of which are hinged at their vertical edges to the end panels, top and bottom panels hinged to the upper and lower edges respectively, of the front and rear panels, the front and rear panels being provided each with one or more staples and a longitudinal slot, the top and bottom panels being provided each with one or more hasps which coöperate with the staples on the front and rear panels in maintaining the top and bottom of the crate in a serviceable position or in position when the crate is collapsed, a central partition in said crate hinged at its vertical edges to the front and rear panels of the crate, and means thereon which coöperate with the slots in the front and rear panels to prevent the crate when in a collapsed condition, from opening on the hinges which connect the end panels and the central partition to the front and rear panels of the crate.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM E. THOROMAN.

Witnesses:
R. J. McCARTY,
CLAIR GIBBS.