No. 687,807. Patented Dec. 3, 1901.

A. WINTER.

COLLAPSIBLE BOX.

(Application filed Apr. 25, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

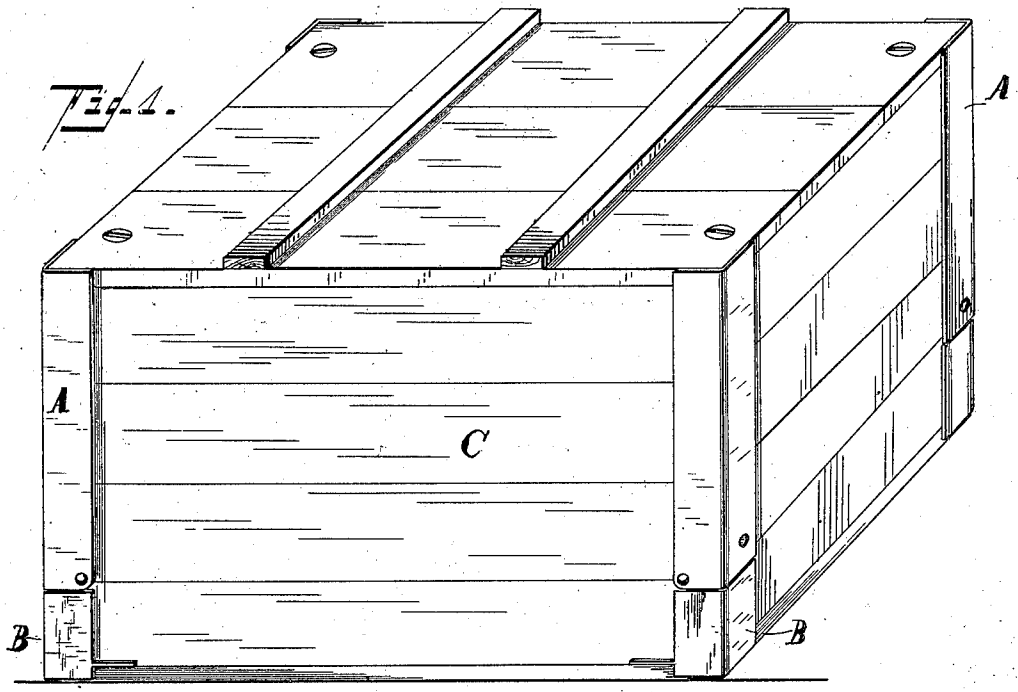
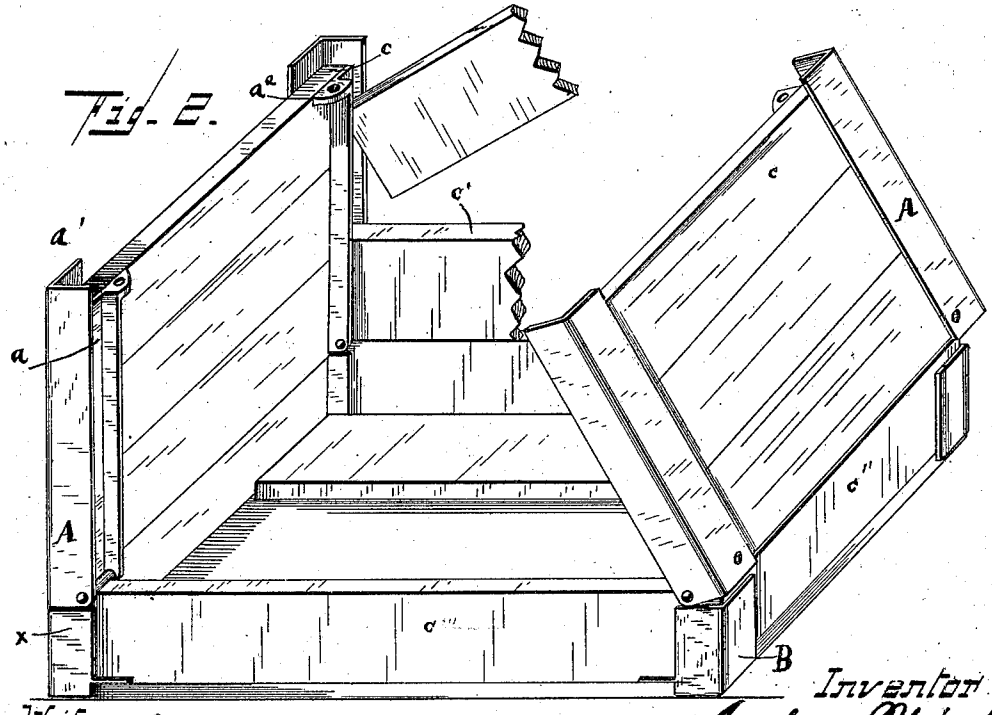


Fig. 2.



Witnesses
Wm Winter.
E. J. Dempster.

Inventor
Andrew Winter
By James N. Ramsey
His Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 687,807. Patented Dec. 3, 1901.

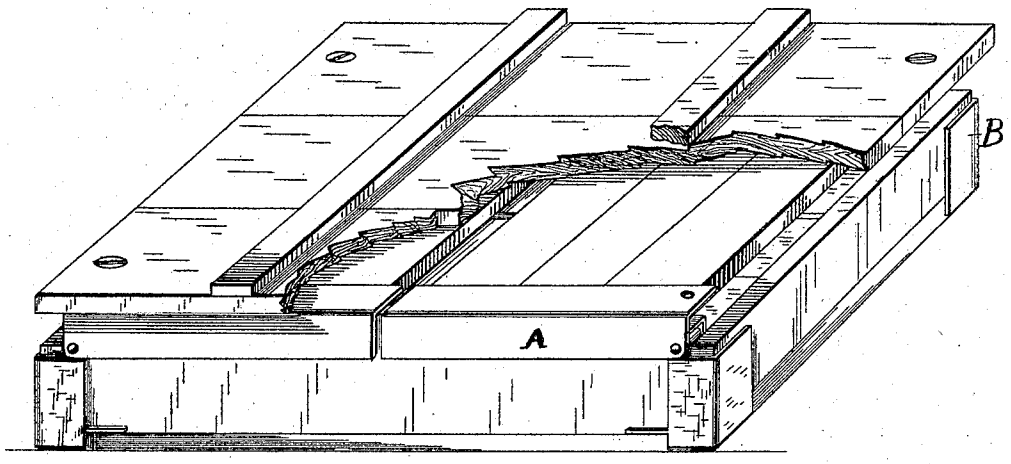
A. WINTER.

COLLAPSIBLE BOX.

(Application filed Apr. 25, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 3.



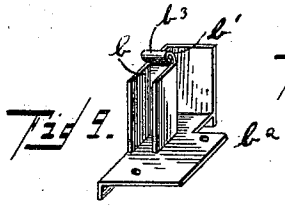


Fig. 9.

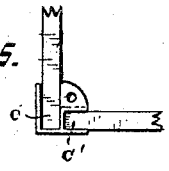


Fig. 6.

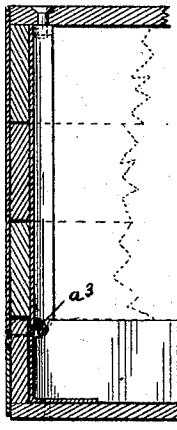


Fig. 4.

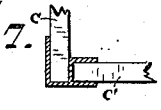


Fig. 7.

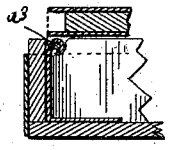


Fig. 5.

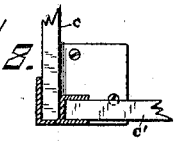


Fig. 8.



Fig. 11.

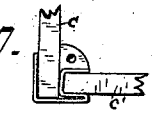


Fig. 10.

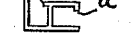


Fig. 12.

Witnesses
Wm. Winter.
E. J. Dempster

Inventor
Andrew Winter
by James A. Ramsey
his Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ANDREW WINTER, OF WEST COVINGTON, KENTUCKY.

COLLAPSIBLE BOX.

SPECIFICATION forming part of Letters Patent No. 687,807, dated December 3, 1901.

Application filed April 25, 1901. Serial No. 57,368. (No model.)

To all whom it may concern:

Be it known that I, ANDREW WINTER, a citizen of the United States, residing at West Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Collapsible Boxes, of which the following is a specification.

My invention relates to improvements in collapsible or knockdown boxes and the like.

The object of my invention is to construct a box in such a manner that it may, when empty, be easily and quickly reduced to compact form, so as to occupy as little space as possible for storage or shipping, and when desired for use can be conveniently built up without injury to the parts composing it.

My invention consists in providing a box or other similar structure with corner-sockets, each having grooves or channels adapted to receive and hold the ends and sides of the box, and also suitable hinge-joints, whereby movable parts of each side of the box may be placed within the lower part thereof and a part of each end folded down over the same and over the stationary portions of the sides.

My invention also consists in certain novel features of the construction, combination, and arrangement of the several parts, whereby important advantages are attained and the box is rendered stronger, more durable, and convenient for use, storage, or shipping and the interior thereof more accessible for packing or unpacking, especially where my invention is applied to very large boxes, all as will be hereinafter fully set forth. The novel features of my invention will be defined in the claims.

In the drawings which serve to illustrate my invention, Figure 1 is a perspective view of the box having my invention applied thereto. Fig. 2 is a perspective view showing the box in partial knockdown position. Fig. 3 is a perspective view of the box in knockdown position having the cover screwed thereto and partially broken away to show the position of the parts when folded together. Fig. 4 is a partial section of the box, taken through one of the corner-sockets. Fig. 5 is a similar view of these parts, showing the position of the parts when the box is folded. Fig. 6 is a top view of one of the metal corners. Fig. 7 is a cross-section of Fig. 6, below the top of the same. Fig. 8 is a horizontal section near the base of the corner-piece. Fig. 9 is a perspective view of the lower corner-socket. Fig. 10 is a view similar to Fig. 6, showing a modified construction of the corner-socket. Fig. 11 is a modified form of one of my corner-sockets. Fig. 12 is another modification of one of the corner-sockets.

I preferably construct the corner-sockets A and B of metal and apply them to the box C or other structure, substantially as shown in the drawings. The corner-sockets A are preferably formed of double angles having U-shaped grooves or channels a and a', as shown in Fig. 2, to engage the movable end pieces c and movable side pieces c' of the box. I provide an ear or lug a^3 at the top of each inner wall, as shown in Fig. 2, to receive a screw or bolt for fastening the lid of the box thereto, as shown in Fig. 1.

The corner-sockets B are preferably formed with double angles having U-shaped grooves or channels b and b' to engage stationary end pieces c'' and side pieces c''' of the box and are provided with plates b^2, formed integral therewith, to strengthen and brace the lower corners of the box, said construction being clearly illustrated by Fig. 9. If desired, however, this plate may be omitted and the construction otherwise modified and simplified, as shown by Fig. 11. When this latter construction is used, the end pieces are secured to the rear wall thereof, and the walls of the channels are adapted to engage the ends of the sides of the box. When the modified construction shown in Fig. 12 is used, it is necessary to form vertical grooves or channels near the end of each board engaging therewith, in which the ribs a^4 are adapted to fit, so as to prevent endwise movement of the board and spreading of the box without the use of nails, and thereby maintaining the detachability of the end and side pieces. When this form of structure is used, the end and side pieces cannot be removed in the manner shown in Fig. 2, but must be lifted out vertically.

The corner-sockets A and B are hinged together in any suitable way, but preferably by means of a pivot-pin a^3 in the lower end

of the corner-socket A taking through an eye or loop b^3 in the upper end of the corner-socket B.

When my corner-sockets are applied to a box, I prefer to have the ends extended so that they will come flush with the surface of the lid and bottom of the box, as shown in Figs. 1 and 2. This requires a less number of screws and nails for holding the parts together, protects the corners of the lid and bottom, and otherwise materially strengthens the construction of the box.

The manner of using my corner-sockets is as follows: Take two pieces of board of any desired width and length and insert each end thereof in one of my corner-sockets, as shown at X in Fig. 2, each end engaging the walls of the channel b and fitting beneath and being held from vertical movement by the loop b^3 of the hinge-joint. Place these parts so connected upon the bottom part of the box or similar structure and secure the same thereto by suitable fastenings taking through the plate b^2. Then place a piece of the same width as the sides at each end, the same engaging with the walls of the channels b' and being held by contact with the same. These end and side pieces should all be of width sufficient to form a space within the lower or stationary part of the box large enough to receive the movable side pieces of the box and permit the ends thereof to be folded down over the same, as shown in Fig. 3. The parts of the box as thus far constructed are secured together practically in a permanent manner, although the end pieces may with very little difficulty be held without fastenings and removed and inserted easily. Next take the four parts A and insert the ends of the boards in the grooves a' to form the movable end pieces, as shown in Fig. 2. This forms a structure ready for packing the contents therein. As the box is being filled up place additional pieces in the sides to engage the walls of the channels a until the sides are entirely built up, as shown in Fig. 1. Then place the lid thereon and fasten in the manner shown or in any other desired way. To remove the contents, reverse the operation, and when the box is empty place the movable side pieces within the bottom of the box, as indicated in Fig. 2, by one of the boards being placed in the bottom of the structure. After all of the side pieces have been so packed within the permanent portion of the box the movable end pieces are folded down over the same to the position shown in Fig. 3. The lid of the box is then placed over the end pieces and may be held thereon and the end pieces held in place thereby by securing the parts together, as shown in Fig. 3. This reduces a large box, as shown in Fig. 1, to a very compact and small-sized box (represented by Fig. 3) and enables the same to be stored in small space, handled with ease and facility, and shipped at much less expense, as well as injury to the box, than otherwise.

Referring to the modified construction shown in Fig. 11, the parts A' and B' may be applied so as to engage with the ends of the side pieces and have the end pieces secured to the outer walls thereof by screws or otherwise instead of in the manner previously described. This construction permits of the collapsibility of the box, but requires that the end pieces be permanently secured to the corners. When the modified construction shown in Fig. 12 is used, it is necessary that the end and side pieces be grooved near each end to correspond with the ribs a^4 and permit the ribs to take and fit therein. This construction enables the movable pieces to be inserted and removed without the use of screws or nails, thus rendering the movable parts detachable, and prevents the boards from moving endwise or the box from spreading.

These corner-sockets may be made of cast metal, as shown in Fig. 8, or may be stamped out of sheet metal, as shown in Fig. 10, or of any other suitable material desired.

The plate b^2 may be used in connection with the structure shown in Figs. 9 and 11 or may be omitted from either; but I prefer to use it, as it serves as a means to fasten the parts together and to strengthen the box.

My corner-sockets not only serve to render the box collapsible, but serve to protect the corners and otherwise greatly strengthen the box and make it more durable. This construction is also of great advantage, especially when packing or unpacking very large boxes, as it enables the user to remove one or both sides, and thereby obtain easy access to the interior. The side pieces of the box may be put in as the box is being filled and taken out as it is being emptied, in either case making it very easy to handle the goods.

While my corner-sockets are especially adapted, as shown in the drawings, for rendering boxes collapsible, they may also be used in various other ways, and I do not, therefore, wish to be understood as limiting myself to the use herein shown or to the precise form set forth.

I claim—

1. An angle-iron corner-socket for collapsible boxes comprising a stationary channel portion, a hinged portion secured thereto, the hinged channel portion being adapted to embrace the stationary side of the box when folded down.

2. A corner-socket for collapsible boxes comprising two stationary channel portions at right angles to each other adapted to hold the ends and sides of the box in place, and, hinged thereto, movable channel portions at right angles to each other adapted to hold the movable ends and sides of the box together, substantially as set forth.

3. In a collapsible box, a corner-socket comprising a movable part adapted to engage with removable parts of the ends and sides of a box and also, when folded, to engage with

the stationary sides of a box, and a stationary part hinged to the movable part and adapted to engage the ends and sides of the stationary part of the box, substantially as set forth.

4. In a collapsible box, a corner-socket having a channel portion adapted to engage and hold a part of the box, in combination with a similar corner-socket secured to the movable end of the box, said socket being adapted to fold over the stationary side of the box whereby the walls of the channel will engage therewith, substantially as set forth.

5. A corner-socket having a channel portion adapted to embrace the ends of the movable side pieces and also adapted to engage the edge of the stationary side pieces when the ends of the box are folded inwardly, in combination with stationary corner-sockets having channel portions adapted to engage the end of the stationary side piece, substantially as set forth.

ANDREW WINTER.

Witnesses:
ALBERT JOHNSON,
WILLIAM WINTER.