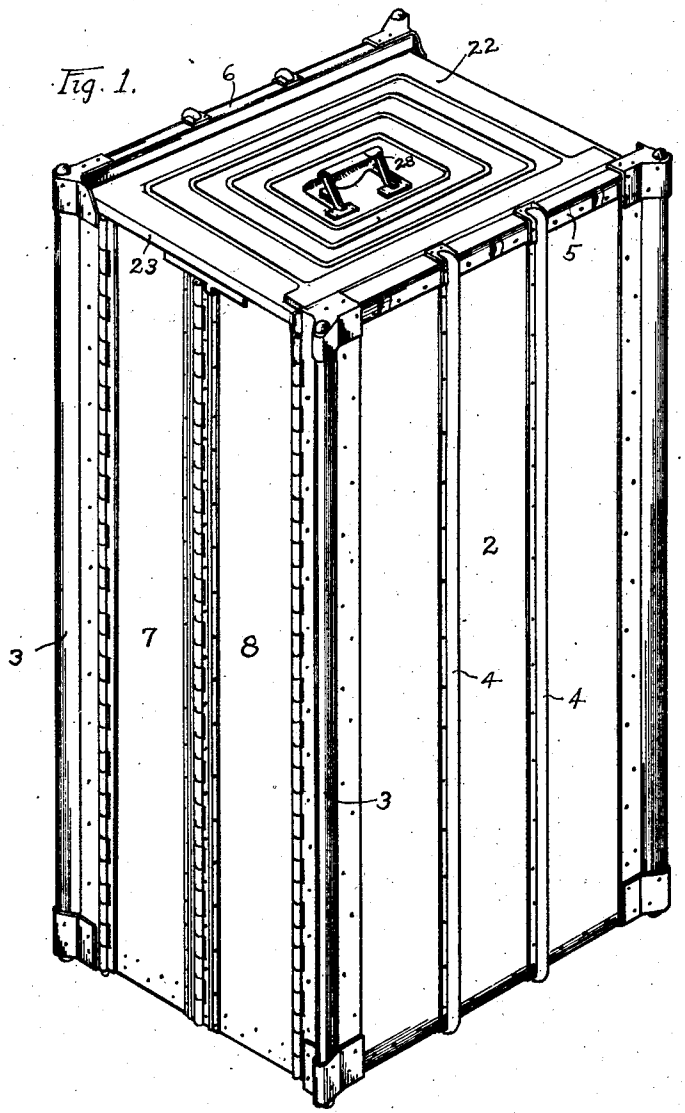
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H. H. YERK ET AL

COLLAPSIBLE BOX

Filed April 26, 1924 3 Sheets-Sheet 1

Fig. 1.



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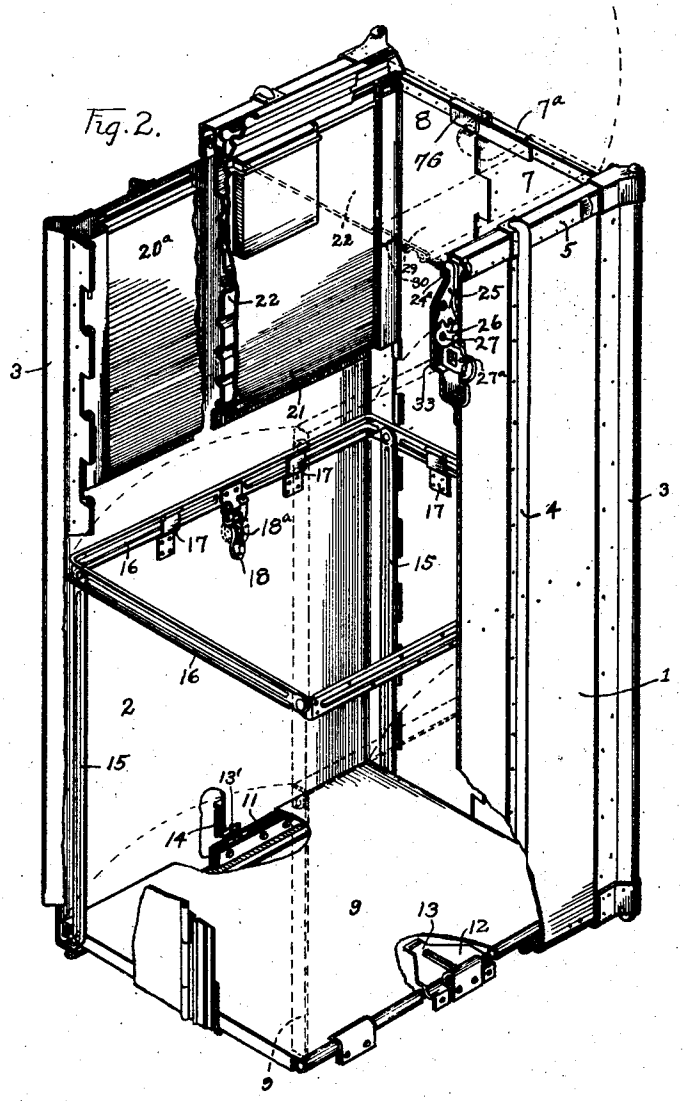
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Fig. 2.



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3 Sheets-Sheet 3

Fig. 3.

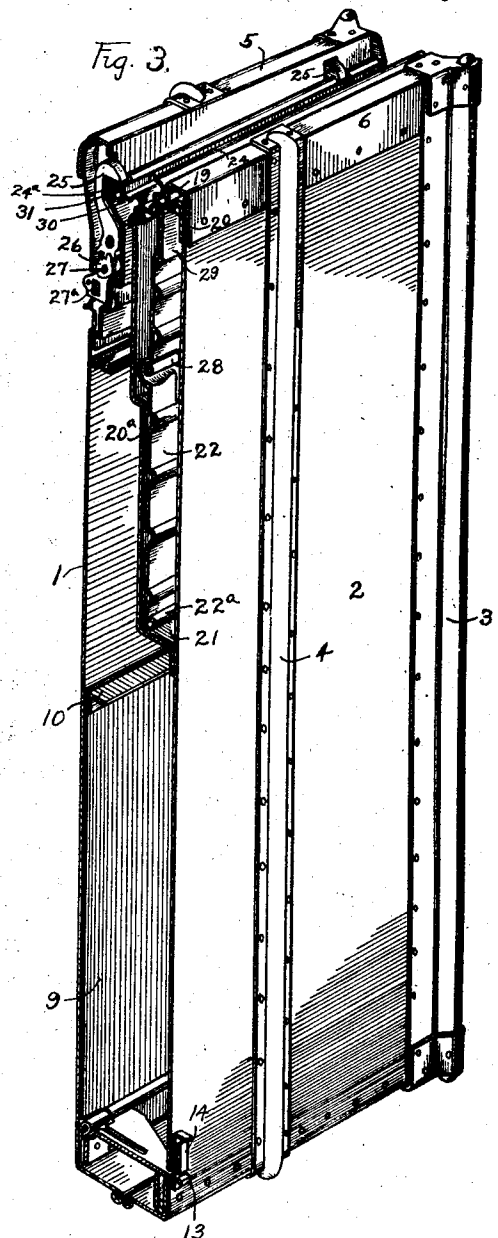
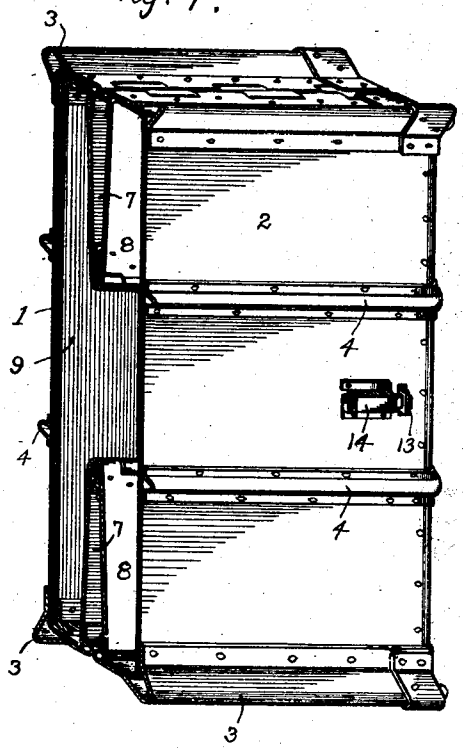


Fig. 4.



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UNITED STATES PATENT OFFICE.

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COLLAPSIBLE BOX.

Application filed April 26, 1924. Serial No. 709,095.

This invention relates to folding boxes or crates particularly useful for shipping articles which may be packed therein, and is designed to be folded into compact form for return shipment.

An object of the invention is to provide a box which is of rigid and durable construction which can be readily collapsed into a compact form in which the parts of the box are all nested together and enclosed within rigid parts of the box so that they are effectively protected against injury by rough handling during return shipment.

A further object is to provide a box which has an outwardly opening lid which is adapted to be nested within the box when the box is folded.

A further object is to provide a rigid brace for the interior of the box which engages the inner sides of the walls when the box is extended and folds between the walls when the box is collapsed.

A further object is to provide a locking device adapted to cooperate with the cover to lock the box against collapse or to lock the box in collapsed condition.

With the above and other objects in view, the invention may be said to comprise the structure illustrated in the accompanying drawings, hereinafter described and particularly set forth in the appended claims, together with such variations and modifications thereof as will be apparent to those skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification, in which

Figure 1 is a perspective view of the box with the cover closed.

Fig. 2 is a fragmentary view similar to Fig. 1 with the cover nested within the box and a portion of the walls broken away to show the interior construction.

Fig. 3 is a sectional, perspective view of the box in collapsed position, the section being taken longitudinally of the box.

Fig. 4 is a sectional, perspective view of the box collapsed, the section being taken transversely of the box.

Referring to the accompanying drawings, the box consists of rigid front and rear walls connected by inwardly folding side walls and having its ends closed by a hinged bottom and outwardly swinging cover. The front wall 1 and the rear wall 2 are each formed of a single piece of sheet metal which is flanged inwardly at the bottom and along the sides. The front and rear walls are reinforced by V-shaped corner bars 3 extending from top to bottom and secured along the corners to the inwardly extending, side flanges and to the face of the wall, and by longitudinally extending, ribbed, sheet metal bars 4 which are bent over and secured to the bottom flanges and to reinforcing bars 5 and 6 secured along the top edges of the front and rear walls 1 and 2. The flanges of the corner V bars 3 project beyond the side flanges of the front and rear walls and pivoted to the edges of these flanges to swing inwardly are the sections 7 and 8 of the side walls, which are joined together along their inner edges by pivots which permit the sections to fold inwardly so that the box may be collapsed to bring the inwardly projecting flanges substantially into contact.

The bottom wall 9 is hinged along one edge to the front wall 1 immediately above the inturned bottom flange thereof and is adapted to be swung upwardly between the inturned side flanges of the front wall when the box is folded. Along its free edge the bottom 9 is provided with a downturned flange 10 which is adapted to fit in a channel bar 11 fixed to the rear wall immediately above the inturned flange at the lower edge thereof. A latch plate 12 projects rearwardly from the front wall 1 immediately beneath the bottom 9 and this latch plate is provided with a slotted end portion 13 which, when the box is collapsed, extends through a slot 13′ in the rear wall 2 and is engaged by a latch 14 on the rear wall to lock the box at its lower end in collapsed position.

Adjacent its free end the bottom 9 has arms 15 pivoted to the sides thereof which extend upwardly along the side walls and are pivotally connected at their upper ends to a rectangular bracing frame 16 which engages the inner faces of the front, rear and side walls, being held in place within brackets 17 secured to the side and rear walls and by a releasable latch 18 pivotally suspended from the frame and engaging a lug 18ª on the inner side of the rear wall. When the bottom wall is swung upwardly to folded position, as indicated in dotted lines in Fig. 2, the brace is lifted out of the supporting

brackets and folded between the side flanges of the front wall, the bottom wall and bracing frame being retained in folded position by the side walls when folded inwardly to the position shown in Fig. 4.

The top reinforcing bar 6 which is secured to the top edge of the rear wall is formed of sheet metal bent to bring the edge portions into engagement with the outer and inner faces of the rear wall and to provide an inwardly projecting, hollow bead 19 which has a downwardly projecting, inner edge portion 20. Beneath the inwardly projecting bead 19 the rear wall has an inner plate 20[a] secured thereto which is spaced from the rear wall and extends between the side flanges thereof to form a pocket 21 into which the cover 22 of the box is adapted to be slid when the box is folded. The cover 22 is formed of sheet metal and has a beaded rear edge 22[a] which is adapted to be engaged between the upper edge of the plate 20 and the downwardly projecting edge 20 of the bar 6. The cover 22 is provided with downturned flanges 23 along its sides adapted to engage the outer sides of the side walls 7 and 8 along their upper edges. The cover 22 is also provided with a downturned flange 24 along its forward free edge which engages in a channel 24[a] formed along the inner edge of the reinforcing bar 5, said bar being secured along the upper edge of the front wall. Along the inner side of the front wall and adjacent its upper edge is a housing 33 in which are a series of latches 25 with hooked upper ends adapted to be engaged over the outer edge of the cover to lock the same in closed position, the latches 25 having gear segments at their lower ends which engage with gear segments 26 carried by a rock shaft 27 which extends lengthwise of the housing 33. When the shaft 27 is turned by any suitable means, such as the handle 27[a], the latches are shifted to and from locking position. When the cover 22 is released, it may be swung upwardly to substantially vertical position and slipped down into the pocket 21 carried by the rear wall, as shown in full lines in Fig. 2. The cover is stamped from sheet metal and has suitable reinforcing ribs surrounding a depressed, central portion, in which is secured a suitable handle 28 by means of which the cover may be raised. The depression in the cover brings the top of the handle substantially flush with the edge portions of the cover so that the handle does not interfere with the nesting of the cover within the pocket on the rear wall.

Along the free edge thereof, the cover 22 is provided on its under side with a channel 29 in which there is positioned an extension member 30 which is pivoted along the outer side of the channel 29. When the cover is in use, the extension member 30 is folded against the under face thereof, as shown in dotted lines in Fig. 2, but when the cover is nested in the pocket on the rear wall, the extension is swung outwardly, as shown in full lines in Fig. 2 and in Fig. 3. The extension member 30 is provided with a flange 31 along its free edge which, when the box is folded as shown in Fig. 2, is adapted to engage in the channel at the inner edge of the reinforcing bar 5 and to be engaged by the latches 25 to lock the upper end of the box in folded position.

As shown in Figs. 3 and 4, when the box is folded, the front and rear walls are locked against separation at the bottom by the latch 13 and at the top by the latches 25, all parts of the box being nested between the front and rear walls. The V-shaped corner reinforcing bars project outwardly from the corners of the walls and provide rigid supports for the box when folded.

To extend the box for use the latches 13 and 25 are released, the front and rear walls are pulled apart to extend the side walls, and the bottom wall is swung down to position against the bottom flanges of the front and rear walls, carrying with it the bracing frame 16 which swings down into engagement with the supporting brackets 17 and is retained by the latch 18. The cover 22 may then be lifted out of its pocket and swung down to cover the open top of the box, with the extension member swung underneath the channel 29

Upon the upper edges of each of the side sections 7 are mounted bridge members 7[a] which conform to the roll top edges of these sections and are adapted to be slid along them to engage the sections 8, 8 when they are aligned respectively with sections 7, 7, that is, when the box is in open position. The members 7[a], therefore, serve to hold the upper parts of the sections 7, 8 rigidly together against swinging movement inwardly. In order to limit the sliding movement of the member 7[a] along the top of section 7, lug 7[b] is provided to project downwardly and engage the hinge. Of course when it is desired to collapse the box the members 7[a] are moved so that they are positioned entirely on sections 7 and do not engage sections 8.

Furthermore, it is to be understood that the particular forms of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from our invention as defined in the appended claims.

What we claim is:

1. A collapsible box having a cover mounted for swinging movement on one of the walls thereof, and a housing upon the inner side of said wall adapted to receive the cover.

2. A box having front and rear and side walls, a cover mounted for swinging movement on the rear wall, said cover having side flanges adapted to overlie the upper edges of the side walls, and a housing on the inner side of the rear wall adapted to receive the cover.

3. A box having front, rear and side walls, the front and rear walls projecting above the side walls, a cover hinged to the rear wall upon the inner side thereof, said cover having side edge portions adapted to overlie the upper edges of the side walls, a front edge portion which, when the cover is in closed position, lies within the upper edge of the front wall, a lock carried by the front wall and engageable with the cover to secure the same in closed position, and a housing carried by the rear wall on the inner side thereof adapted to receive said cover when the latter is in open position.

4. A folding box comprising front and rear walls, side walls formed of hinged sections adapted to be collapsed between the front and rear walls, a swinging cover forming a closure for one end of the box, said cover being collapsible between the front and rear walls, and an auxiliary closure member carried by the cover for closing the end of the box when the same is folded.

5. The invention specified in claim 4 in which means are provided to engage said auxiliary closure to lock it in closing position.

6. A folding box comprising front and rear walls, side walls formed of hinged sections adapted to be collapsed between the front and rear walls, a bodily movable cover forming a closure for one end of the box, means on the inside of the rear wall to receive said cover when the box is in collapsed position, an auxiliary closure member carried by the cover to close the end of the box when the same is collapsed, and releasable means carried by the front wall to lock said auxiliary cover in closed position.

7. A folding box comprising front and rear walls, side walls formed of hinged sections adapted to be collapsed between the front and rear walls, a cover adapted to be collapsed between the front and rear walls, and a lock adapted to cooperate with the cover when the box is extended to secure the cover in closed position and hold the box against collapse and when the box is collapsed to hold the box against opening movement.

8. A folding box comprising front and rear walls, side walls formed of hinged sections adapted to be folded inwardly between the front and rear walls, a bottom wall adapted to be folded between the front and rear walls, and a rectangular bracing frame within the box adapted to engage the inner faces of the walls intermediate the ends of the box, said frame being foldable with the bottom wall between the front and rear walls.

9. A folding box having rigid front and rear walls, side walls adapted to be collapsed between the front and rear walls, a bottom wall hinged to a rigid wall and adapted to be folded to substantially vertical position on the inner side thereof, a rectangular frame adapted to fit within the box, retaining members upon the inner sides of the walls and adapted to engage said frame, and means connecting said frame and bottom wall to cause said frame to be swung against a side wall when the bottom wall is folded inwardly.

10. A folding box having front and rear walls, side walls, a bottom, a top closure member and an interior bracing frame, said side walls, bottom bracing frame and closure member being collapsible between the front and rear walls.

11. A folding box having a rear wall with inwardly extending side flanges, a housing between the side flanges of said rear wall, a front wall, collapsible side walls connecting the front and rear walls, a cover adapted to be positioned within said housing or to extend across the upper end of the box, and an auxiliary closure member hinged to the outer edge portion of the cover and adapted to close the end of the box when the box is folded.

12. A folding box having rigid front and rear walls having inturned flanges along the side and end edges thereof, collapsible side walls hinged to the side flanges of the front and rear walls, an inwardly folding bottom wall within the bottom flanges of the front and rear walls, an outwardly swinging cover engageable with the top edges of the side walls and the top flange of the front wall, said cover being collapsible to a position alongside the inner face of the rear wall.

In testimony whereof, we hereunto affix our signatures.

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WILLIAM J. BAUMBERGER.