S. B. FIED.

FOLDING BOX OR SHIPPING CASE.

APPLICATION FILED JULY 19, 1913.

1,126,967.

Patented Feb. 2, 1915.

2 SHEETS—SHEET 1.

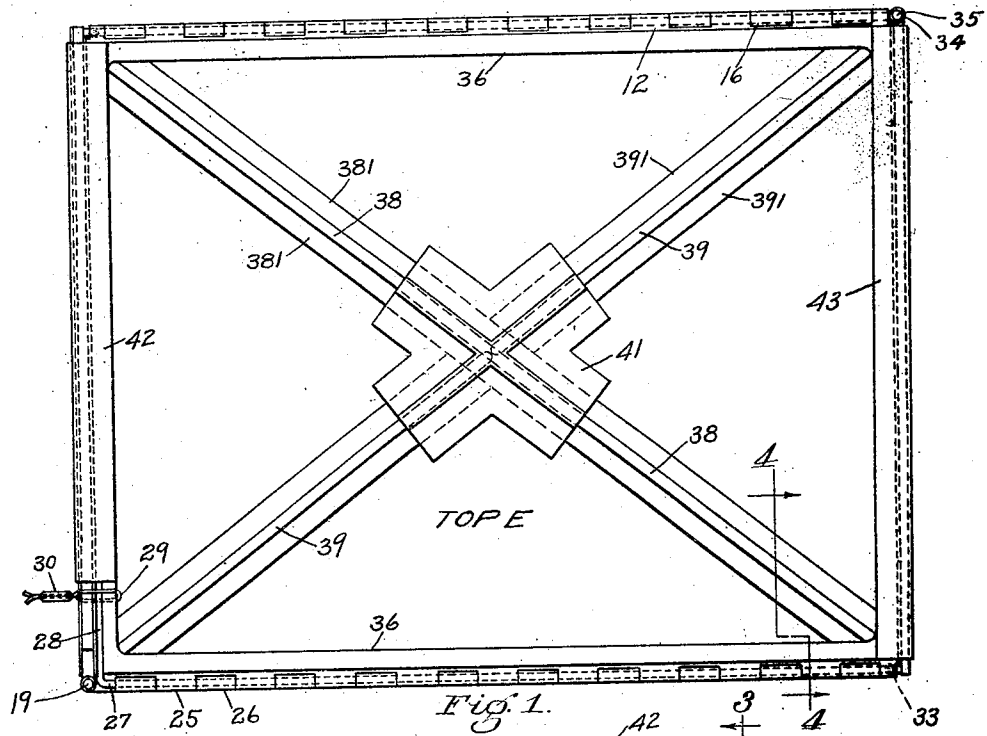


Fig. 1.

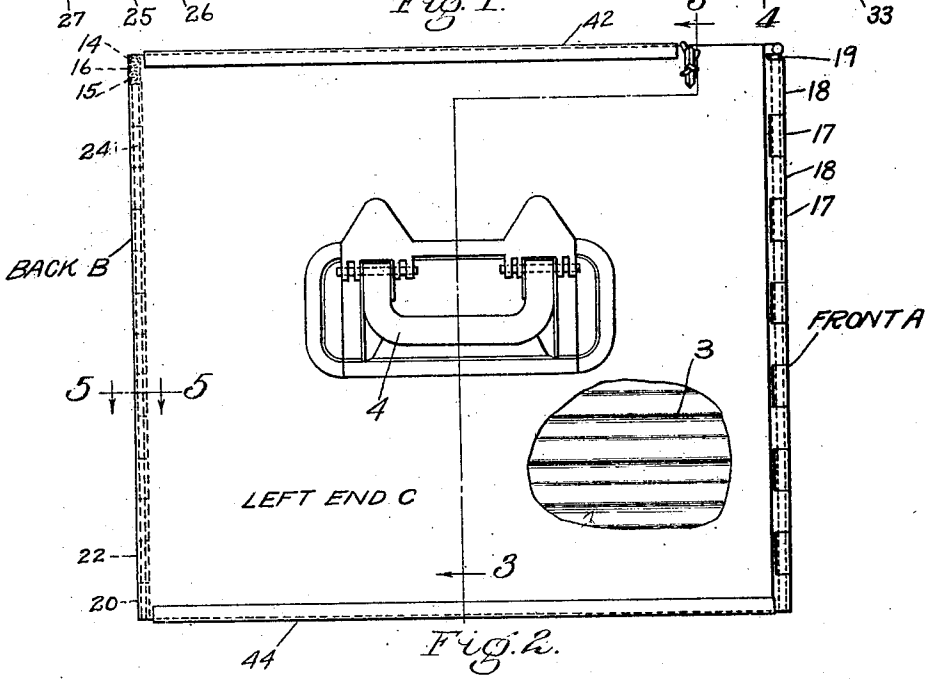


Fig. 2.

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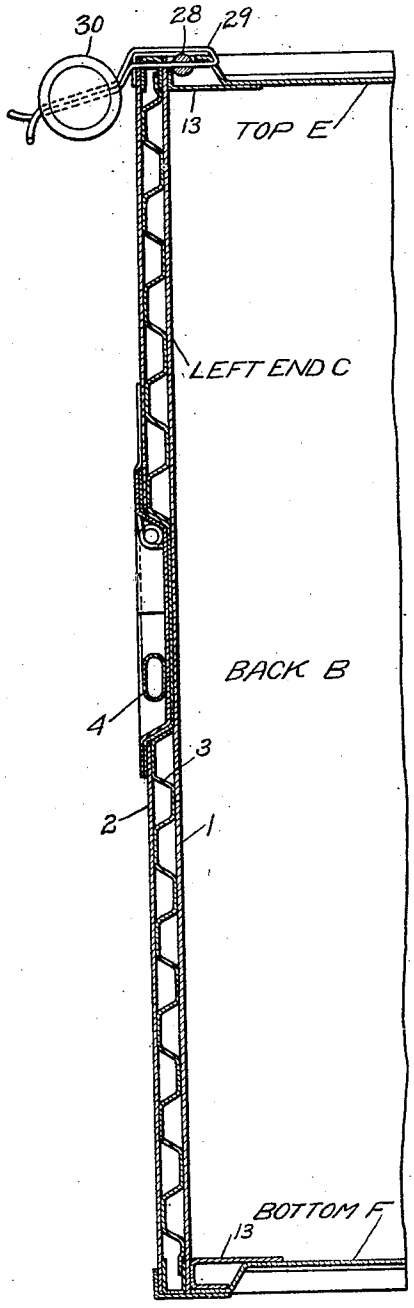


Fig. 3.

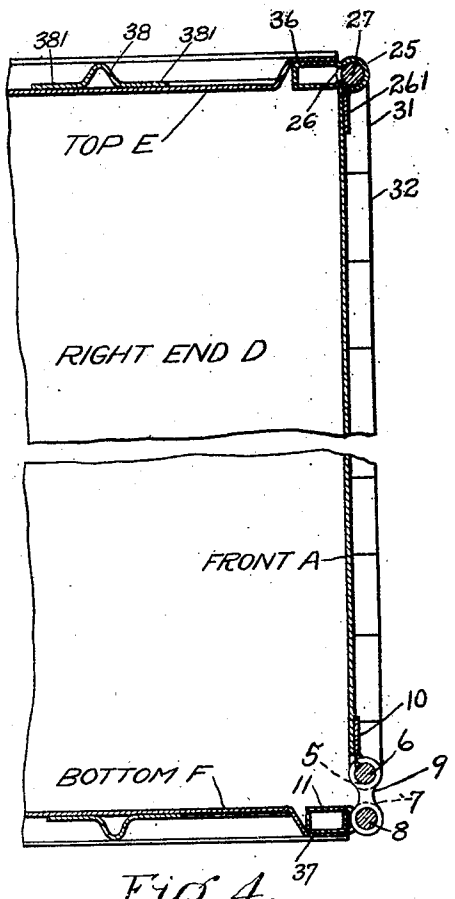


Fig. 4.

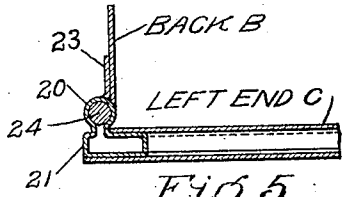


Fig. 5.

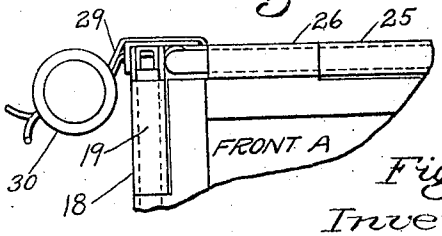


Fig. 6.

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UNITED STATES PATENT OFFICE.

SAMUEL B. FIELD, OF HOLBROOK, MASSACHUSETTS, ASSIGNOR TO PNEUMATIC SCALE CORPORATION, LIMITED, OF QUINCY, MASSACHUSETTS, A CORPORATION OF MAINE.

FOLDING BOX OR SHIPPING-CASE.

1,126,967. Specification of Letters Patent. Patented Feb. 2, 1915.

Application filed July 19, 1913. Serial No. 779,945.

To all whom it may concern:

Be it known that I, SAMUEL B. FIELD, citizen of the United States, residing at Holbrook, county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Folding Boxes or Shipping-Cases, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to an improvement in folding or knock down metallic boxes to serve as shipping cases in which the goods may be packed for shipping and which can be folded into small compass to be returned to the shipper to be again used.

The present invention is an improvement upon the invention of Patent No. 941,013 to Doble and Wheaton, dated November 23, 1909 and also an improvement upon the invention shown and described in the application of William H. Doble and Samuel B. Field, filed March 7, 1913, No. 752,593. The box is of rectangular form having six panels comprising a bottom, two sides, two ends, and a top or cover which are adapted to be hinged together, part of the panels being hinged together by fixed or stationary hinge pins and part of them being held together by removable locking pins, so that by removing the locking pins the panels may be folded together. In the device shown in the said Patent No. 941,013 and said application of Doble and Field above referred to, the panels are each formed with an inner and an outer wall spaced apart from each other and having corrugated strengthening plates in the space between the walls. It is found that for many purposes a box or shipping case capable of being folded in substantially the same manner as the boxes of the said patent and application above referred to may be made of sufficient strength even if a portion or all of the panels have only one thickness, provided it is properly reinforced instead of having the two walls. By this new form of construction the shipping case is lighter in weight and less expensive of construction. In the preferred form of construction, however, it is better to have at least two of the panels formed with the inner and outer plates spaced apart from each other, as for instance the two ends, as the doubling of the end walls adds largely to the stiffening of the box, but I prefer to make the parts in such a manner that said end panels may be of either form, that is, of either the double wall or of the single wall and interchangeable, so that in assembling the parts either the single or the double panels may be used, as desired.

For purpose of illustration the box shown in the drawings and described in the specification is one in which the two end panels have double walls and the remaining panels have single walls.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features thereof will be fully described in the claims at the close of the specification.

In the drawings,—Figure 1 is a top plan of a box embodying the invention. Fig. 2 is an elevation of the left-hand end of the box shown in Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 2 partly broken away. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is a section on line 5—5 of Fig. 2. Fig. 6 is an enlarged elevation of a portion of the left-hand upper portion of the box shown in Fig. 1 looking from the front.

For convenience of designation the six sides or panels of the box will be referred to respectively as the front, the back, the two ends, the cover and the bottom.

Referring now to the drawings,—the six panels referred to are the front A, the back B, the left and right hand ends C and D respectively, the cover E, and the bottom F. The front A is hinged to the bottom F and to the ends C and D, and the top E is hinged to the back B. The front A has a separable connection with the top E, and the back B has a separable connection with the bottom F.

By removing the locking pin between the top or cover E and the front A the cover can be turned back so as to open the box, and by also pulling out the locking pin between the lower edge of the back and the rear edge of the bottom and folding the top or cover over against the outer face of the back and folding the bottom up against the

outer face of the front the entire box may then be collapsed into flattened form.

The front A, the back B, the top E and the bottom F are shown made with a single wall thickness, that is, without the use of double walls with air space between them. The two ends C, D are made respectively with the inner and outer walls 1, 2 spaced apart from each other and having corrugated plates 3 between the walls to stiffen and strengthen the same. The outer wall plate 2 of each end C and D may be made with a depression to receive a drop handle 4 properly hinged and secured to the end of the box, so that the drop handle may when not in use lie within the depressed portion of the panel. The lower edge of the front is provided with a series of knuckles 5 to receive a hinge pin 6 and the front edge of the bottom is provided with a series of knuckles 7 to receive a hinge pin 8.

The knuckles 5 and 7 should be of equal length and the spaces between the knuckles 5 and the spaces between the knuckles 7 should be of equal length. The hinge pins 6 and 8 are connected together at the spaces between the knuckles by links 9 which are in the form of a double barrel sleeve, the two barrels of the sleeve being connected together by a neck portion, one barrel of the sleeve being adapted for the passage of the pin 6 and the other barrel of the sleeve being adapted to receive the pin 8. The hinge pins pass loosely through these sleeves so that the links may be turned on either one of the pins 6, 8. The knuckles 5 are formed integral with the panel A which has portions cut out of one edge, thereby forming spacings between the knuckles to receive the links 9 and leaving projecting portions alternating with said spaces which are curled to form the knuckles 5 and have flat end portions 10 which are turned up flat against the outer face of the panel A and are welded or otherwise properly secured to the outer face of the front A, as shown in Fig. 4.

The knuckles 7 connected with the bottom F are integral with a plate 11 whose front edge has cut out spaces also corresponding with the spaces between the knuckles, the projecting portions of the front edge being curled to form the knuckles 7, while the body or shank portion of the plate 11 is preferably bent around into box shape, as shown in Fig. 4 and welded or otherwise properly secured to the inner face of the front offset portion of the bottom F, as shown in Fig. 4.

The bottom F and also the top E are offset near their outer edges, as shown in the drawings and the purpose of the box form of the shank portion 11 of the knuckles 7 is to allow for the off-set and make the shank of a thickness equal to the offset.

The top or cover E has a hinge connection with the back B in a similar way to the hinge connection which is described of the front A with the bottom F, the top E being provided with knuckles 12 secured thereto by shank portions, as already described, and the back B being provided with knuckles (not shown) formed integral therewith similar to the manner in which the knuckles 5 are formed on the lower edge of the front panel A, said knuckle portions 12 receiving the pin 14, and said knuckle portions (not shown) on the upper edge of the back receiving the pin 15, said pins 14 and 15 being connected intermediate the knuckle portions by the links 16. The front A has a hinge connection with the left-hand end C by a series of knuckle portions 17 formed integral with the front A in a similar manner to that in which the knuckles 5 are formed integral with the panel, and a series of knuckle portions 18 secured to the end C, the knuckle portions 17 alternating with the knuckle portions 18 and said knuckle portions being secured together by a hinge pin 19 which passes through both sets of knuckles. The shank portions of the knuckles 18 extend into the space between the inner and outer walls of the panel C. The front A has a hinge connection with the right-hand end panels D, the end D being provided with knuckles 31 and the front A being provided with knuckles 32 which interengage with the knuckles 31, the two sets of knuckles being connected by a hinge pin 33 which is made fast to one set of knuckles and is loose with relation to the other set of knuckles, and the knuckles which are secured to the front A are formed with an off-set shank so that the end D may be folded around against the back side of the front 3 when the box is to be folded.

The left-hand edge of the back B is connected with the rear edge of the left-hand end panel C in a similar manner and by a similar form of hinge construction to that by which the front A is connected with the end D, that is, the end C has a series of knuckle portions 20 spaced apart from each other but all having an integral off-set box shank portion 21 which is secured within the space between the inner and outer walls of the end panels C, and the back B has a series of knuckles 22 alternating with the knuckles 20, said knuckles 22 being integral with the back panel B and having a flat end portion 23, similar to the knuckles 5 and flat portion 10. A hinge pin 24 passes through the two sets of knuckles.

The right-hand end D has a hinge connection with the back B similar to the connection of the front A with the left-hand end C, that is, the rear edge of the end D is formed or provided with a series of

knuckle portions 34 alternating with a series of knuckle portions (not shown) projecting from the right-hand edge of the back B, said knuckle portions being connected by a hinge pin 35 which is made fast to one set of knuckles and passes loosely through the other set of knuckles, so that when the box is folded the end D may be swung around into straight alinement with the back B.

The bottom F has a separable connection (not shown) with the back B by means of a locking rod passing through knuckles secured to the bottom and knuckles formed on the back in a similar manner to that which will be more specifically described in connection with the description of the locking connection between the top E and the front A.

The top E has a locking connection with the front A as follows,—The top E is provided with a series of knuckles 25 spaced apart from each other, alternating and interengaging with spaces between a series of knuckles 26 projecting from the top edge of the front A. A locking rod 27 is adapted to be passed through the knuckles 25 and 26 and at one end it is formed with an arm 28 bent at right angles with the body of the rod and extending alongside in a groove or recess in the off-set portion of one end of the cover or top E. Said locking rod is secured from withdrawal by means of a wire 29 which is passed through a hole transversely through the arm 28 and the wire is doubled over to form a loop and its ends are secured by a seal 30 so that the locking rod 27 cannot be withdrawn from its locking position until the seal is broken. The knuckles 26 are preferably formed integral with the front panel A in a similar manner to that in which the knuckles 5 were formed on the lower edge and terminate in the flat portions 261 lying against the outer face of the panel and secured thereto.

On account of the offset marginal portion of the top and bottom panels there is a recess formed in the inner face of both the top and bottom panels extending from front to rear along both the left and right hand ends. In order to fill up these recesses I provide channel plates 13 suitably bent to fill these spaces and welded to the faces of the panels. These channel plates not only serve to fill the recesses as described but also they stiffen the corners.

As already stated, the top C and bottom F are each formed with an angular off-set portion along each of the four edges, thus forming a central in-set, or depression in the cover and inward bulge in the bottom, as shown in Figs. 3 and 4, the top E thus being bordered by an off-set portion 36, and the bottom F being bordered by the off-set portion 37. Within this sunken portion of the panel or top E there are placed diagonal braces or ribs 38 and 39 extending diagonally across from one corner to the other and intersecting each other in the middle. These diagonal braces are formed preferably of sheet metal having a central, hollow rib portion and flat side flanges 381 and 391 which are secured by welding or otherwise to the top E, the mid rib portion rising above the flange portions. In order to allow for the cross over where the brace 39 intersects the brace 38 the brace 39 is preferably made in two sections, the inner ends of the flanges of the braces 39 extending up to the sides of the flanges of the brace 38, as shown by dotted lines in Fig. 1, while the mid rib portion of each section of the brace 39 projects forward until the two mid rib sections of the brace 39 meet each other, as shown by the dotted lines in Fig. 1. As an additional reinforcement, and to protect the joint at the cross over of the two braces 38, 39, a central plate 41 is provided having on its under side cross over grooves adapted to fit over the mid rib portions of the braces 38, 39 and the flange portions of said braces and having flat extensions at the outer sides to lie down flat upon the upper surface of the top E alongside of the braces, the whole being welded or otherwise secured together. The bottom F is constructed and braced in a similar manner to the top E, as shown in Fig. 1 just described.

As the upper edges of the end panels C, D are unconnected with the top panel E and the lower edges of the end panels C, D are unconnected with the bottom panel F, I provide means to protect said end panels against distortion or crushing such as might occur if the box, especially when full, falls upon the edge. For this purpose I provide angle plates 42, 43 having a right angle bend lengthwise thereof, one flange of each of which is secured by welding or other suitable means to the upper face of the top panel E near the ends of the panel and which respectively project over the top edge of the end panels C, D, the other flange of said angle plates extending down for a short distance outside of the outer faces of said end panels C, D, thus not only covering the lines between the top and the end panels where they come together, but also serving as a buffer to receive the impact if the box falls on its edge. A similar set of angle plates 44, is secured to the under side of the bottom F near opposite ends and has flanges which extend up outside of the lower edge of the end panels C, D. These projecting flanges of the angle bars are unattached to the end panels and therefore do not interfere with the folding of the panels to collapse the box.

It will be seen by reference to Fig. 3 that the left hand end of the top panel E including the panel piece 13 which forms a part of the top panel being soldered thereto abuts squarely against the inner face of the left-hand end panel C. The horizontal portion of the angle plate 42 which is attached to the top panel E covers the joint between the top panel E and the end panel C and the downwardly turned flange of said angle plate extends down some distance on the outer face of the end panel C. The lower angle plate 44 which is secured to the bottom F covers the joint between the said bottom panel F and the end panel C and the upwardly extending flange extends part way up on the outer face of the panel C. Thus there is formed a groove between the end of the top panel E and the downwardly turned flange of the angle plate 42 which receives the upper end of the left-hand end panel C and a similar groove formed by the bottom F and the upturned flange of the angle plate 44 which receives the lower edge of the end panel C when the box is set up so that the said end panel is protected against the crushing strain both in and out. The same construction consists with reference to the right-hand end panel at the top and bottom, but on account of the vertical flanges of the angle plates 42 and 44 being unattached to the end panels the top and bottom panels may be turned back on their hinges releasing the end panels from the grooves.

What I claim is:

1. A knock down, metallic, six sided box in which the front and back are each hinged to the two ends, the front is hinged to the bottom and the top is hinged to the back, the front having a separable connection with the top, the back having a separable connection with the bottom, angle plates secured to the top near the two opposite ends thereof and each having a right angled flange which projects over the joint between the upper edge of the end of the box and down outside of the outer face of said end, and angle plates secured to the outside face of the bottom near opposite ends thereof, each extending under the lower edges of said end portions and upward over the joint between the bottom and the end panel and outside of the outer faces of said end portions, said angle plates being unattached to said end portions.

2. A knock down box having six panels hinged together, the top having a hinge connection with the back and a detachable connection with the front, the bottom having a hinge connection with the front panel and a detachable connection with the rear panel, the two end edges of said top and bottom panels being free from attachment to any other panel, two opposite end panels each having a hinge connection with the adjacent ends of the front and rear panels, the inner faces of said end panels both at top and bottom overlapping the end edges of said top and bottom panels, and angle plates secured to the outer faces of said top and bottom panels at both ends thereof, each angle plate having a flange which extends over outside of the outer face of the adjacent end panel but free from attachment thereto.

3. A box having a cover hinged at the rear edge to the rear wall of the box, the front edge having secured thereto a series of knuckle bearings spaced apart from each other, the adjacent edge of the front panel of the box having a series of knuckle bearings which engage with the spaces between the bearings on the said cover, the bearings of the cover and said front wall being in alinement with each other, a locking rod which is slidable into engagement with the bearings of both the cover and said front, said locking rod having an arm bent at right angles thereto which extends along the edge of one of the end panels of the box, and means for locking said angle arm to said end panel.

4. A folding metallic box comprising a plurality of panels hinged together, one or more of said panels having one edge folded back upon itself and cut to form a series of eyes spaced apart from each other at the fold, and terminating in a flat portion which lies against the outer face of the panel both behind the eye and continuing along behind the space between the eyes.

5. A knock down six sided metallic box in which the front and back are hinged to the two ends, the front is hinged to the bottom and the top is hinged to the back, the front having a separable, connection with the top, and the back having a separable connection with the bottom, the two ends of the top and bottom panels abutting the two end panels at their top and bottom, but being unattached thereto, the top and the bottom having each an off-set marginal portion entirely around the same and forming thereby a sunken portion bordered by said off-set margin, right angle plates each having one leaf secured to the outer face of one of the two marginal off-set portions which form the ends of the top and bottom panel and the other leaf extending at right angles with the first leaf over the joint between the end panel and the top or bottom as the case may be and alongside of the outer face of said top or bottom but being free from attachment thereto.

6. A panel for a folding metallic box, said panel having one edge curled back upon itself in cylindrical form and terminating in

a flat flange, the inner face of said flange being secured to the face of the flat portion of the panel, said cylindrical portion having portions cut out at intervals, thereby forming a series of eyes with intervals between them.

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

SAMUEL B. FIELD.

Witnesses:

WILLIAM A. COPELAND,

ALICE H. MORRISON.