E. ABERLE.

FOLDING BOX.

APPLICATION FILED MAR. 30, 1920.

1,394,134.

Patented Oct. 18, 1921.

2 SHEETS—SHEET 1.

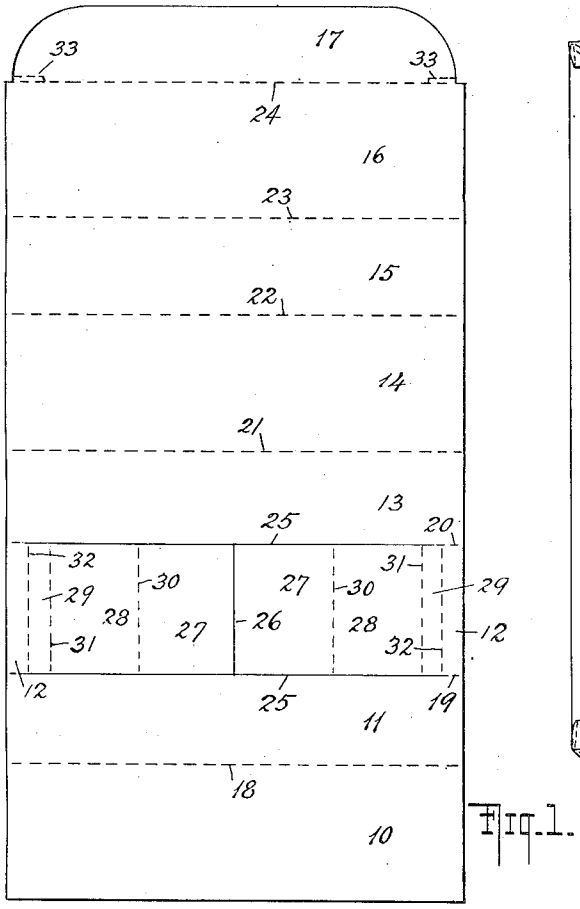


Fig. 1.

Fig. 2.

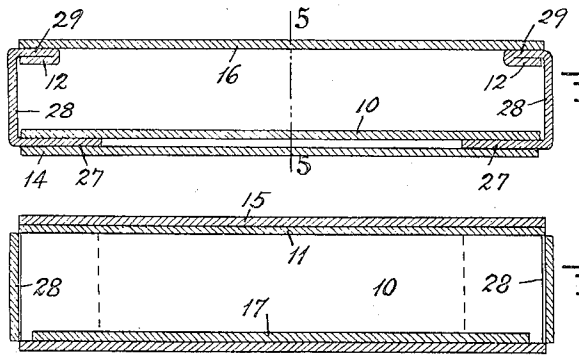


Fig. 3.

Fig. 4.

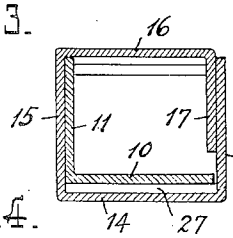


Fig. 5.

WITNESS:

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2 SHEETS—SHEET 2.

Fig. 6.

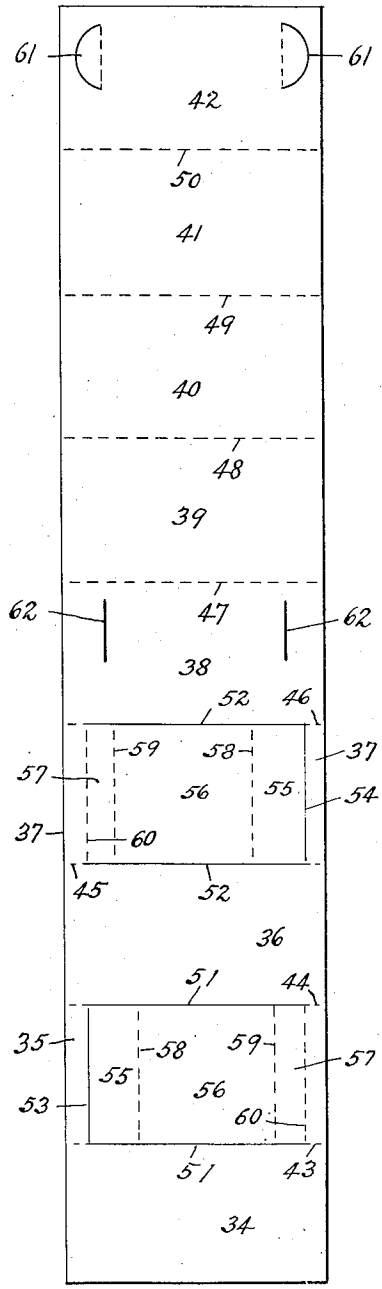


Fig. 7.

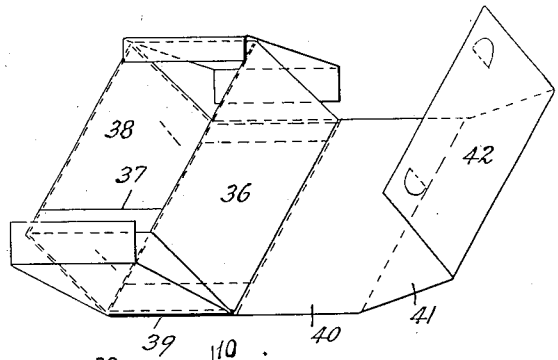


Fig. 8.

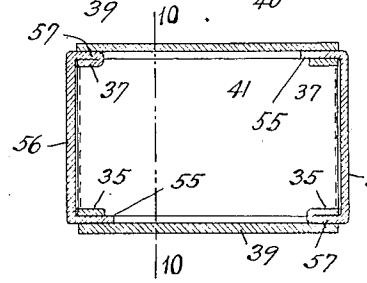


Fig. 9.

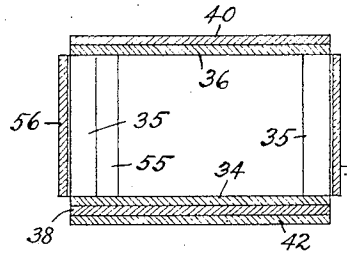
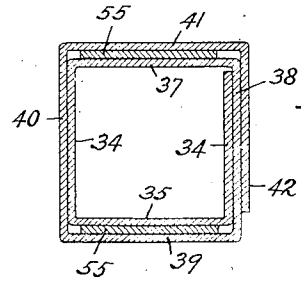


Fig. 10.



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FOLDING BOX.

1,394,134. Specification of Letters Patent. Patented Oct. 18, 1921.

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To all whom it may concern:

Be it known that I, EDWARD ABERLE, a citizen of the United States, and resident of Nutley, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Folding Boxes, of which the following is a specification.

My invention relates to folding or knock-down boxes of the type commonly known as cartons and has for its object to provide a novel construction in which waste of material during manufacture is reduced to a minimum and in which economy of production is developed to a maximum degree. My invention contemplates further a box which may be quickly set up and which has a high degree of efficiency as a container for a large variety of merchandise. My invention will be fully described hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawings which show two examples of my invention without defining its limits, Figure 1 is a face view of the blank used in one of the illustrated forms; Fig. 2 is a diagrammatic perspective of the box in the process of being set up; Fig. 3 is a longitudinal section of the box taken in a vertical plane along the longitudinal center line; Fig. 4 is a similar view taken in a horizontal plane through the box; Fig. 5 is a cross section on the line 5—5 of Fig. 3; Fig. 6 is a face view of the blank used in the other of the illustrated forms; Fig. 7 is a diagrammatic perspective of the box being set up; Figs. 8 and 9 are views similar to Figs. 3 and 4 of this form of box and Fig. 10 is a cross-section on the line 10—10 of Fig. 8.

As shown in Fig. 1 the box in its unfolded or knock-down condition comprises a blank of approximately rectangular form and constructed of material for the intended purposes, such as cardboard, paper, fiber board, celluloid, metal or other suitable material.

The blank, generally speaking, is divided into a plurality of panels 10, 11, 12, 13, 14, 15, 16 and 17 by means of scorings 18, 19, 20, 21, 22, 23 and 24, the panel 12 being cut at 25 along parallel transverse lines and at 26 along a central longitudinal line to form end flaps divided into panels 27, 28 and 29 by scorings 30, 31 and 32 and which remain in connection at one end, with the panel 12 as shown in Fig. 1. The panel 17 is in the nature of a flap and is preferably of somewhat less width than the adjacent panel 16 and has its outer ends rounded as shown and further is provided with cuts 33 extending inwardly in registry with the scorings 24. It will be understood that the scorings need not be actually included in the blank and that said blank may be folded along folding lines which may be either imaginary lines or actually indicated on said blank; the term scoring, as used in this description is therefore synonymous with fold lines.

In setting up the box any sequence may be followed which produces the desired results; for instance as shown diagrammatically in Fig. 2, the panels 10, 11 and 12 may be bent upon the scorings 18 and 19 so as to extend approximately at right angles to each other after which the end flaps may be folded outwardly on the scorings 32 until the panels 29 lie in surface engagement with the panel 12, after which the panels 28 may be folded on the scorings 31 to positions in which they lie across the opposite ends of the box as shown in Fig. 2; the panels 27 may then be bent inwardly on the scorings 30 to positions substantially at right angles to the panels 28 and into surface engagement with the panel 10. The structure resulting from the described folding of the panels 27, 28, 29, 12, 11 and 10 may then be rolled up, as it were, on the remainder of the blank, as clearly indicated in Fig. 2, the scorings 20, 21, 22, 23 and 24 acting successively as hinges about which the folding is accomplished in the desired manner. The same result may be obtained by folding the panel 13 upwardly on the scoring 20, then bending the panel 14 on the scoring 21 into surface engagement with the panel 10, then folding the panel 15 on the scoring 22 into surface engagement with the panel 11, then bending the panel 16 on the scorings 23 to a position to cover the opening originally occupied by the end flaps consisting of panels 27, 28 and 29 and finally folding the panel 17 on the scoring 24 and projecting it into the box in interior surface engagement with the panel 13. In folding the panel 17 into the box as described, its one end is first inserted and the cut 33 at said end passed over the double thickness of material formed by the panels 29 and 12 after which the other end is similarly inserted and the cut 33 at said other end passed over the combined panels 29 and 12 at this end in the same way; the coöperation of the cuts 33 and the panels 29 and 12 prevent the panel 17 from being unintentionally withdrawn from the box.

With the arrangement shown and described the panels 28 comprise the end walls of the box with the panels 27 projecting inwardly therefrom at substantially right angles between the panels 10 and 14 which constitute the bottom of the box and the space initially occupied by these panels 27 and 28 becomes the top opening of said box. At the same time the panels 11 and 13 comprise the side walls of said box, the bottom of which is a double bottom formed as before stated by the panels 10 and 14. The panel 15 by lying against the panel 11 forms a double side wall along one side of the box while the panel 16 constitutes the cover which is secured in position by the panel 17 which thus constitutes a locking flap. In some cases the panel 10 may be omitted in which case the bottom will consist of a single thickness of material represented by the panel 14.

The box shown in Figs. 6 to 10 inclusive, in its unfolded or knock-down condition, also comprises a blank of approximately rectangular form as illustrated in Fig. 6 and constructed of suitable material such as cardboard and the like.

The blank is also divided into a plurality of panels 34, 35, 36, 37, 38, 39, 40, 41 and 42 by means of transverse scorings 43, 44, 45, 46, 47, 48, 49 and 50, the panels 35 and 37 being cut out respectively at 51 and 52 along parallel transverse lines and longitudinally at 53 and 54 to form end flaps which project in opposite directions and remain in connection at opposite ends respectively with the panels 35 and 37. The end flaps themselves are divided into panels 55, 56 and 57 by scorings 58, 59 and 60. The one end panel 42, as shown in the illustrated form, may be provided with tongues 61 arranged to enter slots 62 in the panel 38 to lock the cover in position when the box is set up.

This form of box may be set up in substantially the same way as the form first described excepting that the end flaps comprising the panels 55, 56 and 57 are folded on the score lines 60 in opposite directions as is clearly shown, diagrammatically, in Fig. 7. The form of box at present under discussion is of advantage in certain dimensions and is of the same efficiency as the form first described.

It will be noted that the blanks include no projecting portions which extend outwardly from the side edges thereof and that all parts of the boxes included in said blanks are located within the rectangles defined by the outer peripheries of said blanks. This arrangement avoids waste of material by making it possible to cut a maximum number of blanks from a given piece of material and at the same time reduces the cutting and scoring of the blanks to the simplest form, thus reducing the cost of production to a minimum. In addition the blanks, because of their simple rectangular form, may be economically stored and shipped and are easily folded or set up into box form when required. The resulting box is rigid and of maximum efficiency and may be made in any desired form or shape to accommodate many different kinds of merchandise.

Instead of opening the box by withdrawing the locking flap 17 or 42 and moving the cover 16 or 41 to its open position, said box may be opened at one or both ends by withdrawing one or both panels 27 or 55 and moving the panels 28 or 56 outwardly on the scoring 31 or 59. The contents of the box, of whatever nature they may be, are thus always easily removed therefrom when desired.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. A folding box comprising a plurality of connected panels arranged to be folded upon themselves to form the sides, top and bottom of the box and end panels comprising portions cut from the connected panels and remaining in hinged connection therewith, said end panels being foldable transversely to the other panels to form the ends of the box and to extend between two folded panels whereby said ends are removably fastened in place.

2. A folding box comprising a plurality of adjacent panels folded upon themselves in rectangular cross-section to form the sides, bottom and cover of the box and end members folded outwardly, then vertically and then inwardly between two contiguous panels to form the ends of the box and to fasten said ends in place, said end members, upon being folded, leaving the space previously occupied by at least one of them, free to form the top opening of the box.

3. A folding box comprising a plurality of connected panels arranged to be folded upon themselves to form an open-ended rectangular tube at least two sides of which are each composed of two contiguous panels lying in surface engagement with each other, end panels comprising portions cut from one of the panels and remaining in hinged connection therewith at a distance from the opposite ends of said panel, said end panels extending in surface contact with the remaining portion of the panel, from which they are cut, then transversely across the open ends of the tube to close the same, and then between two of the contiguous panels to movably fasten said ends in place.

In testimony whereof I have hereunto set my hand.

EDWARD ABERLE.