Nov. 12, 1940. W. J. BEASLEY ET AL 2,221,504

BOX AND THE LIKE

Filed June 8, 1938 2 Sheets-Sheet 1

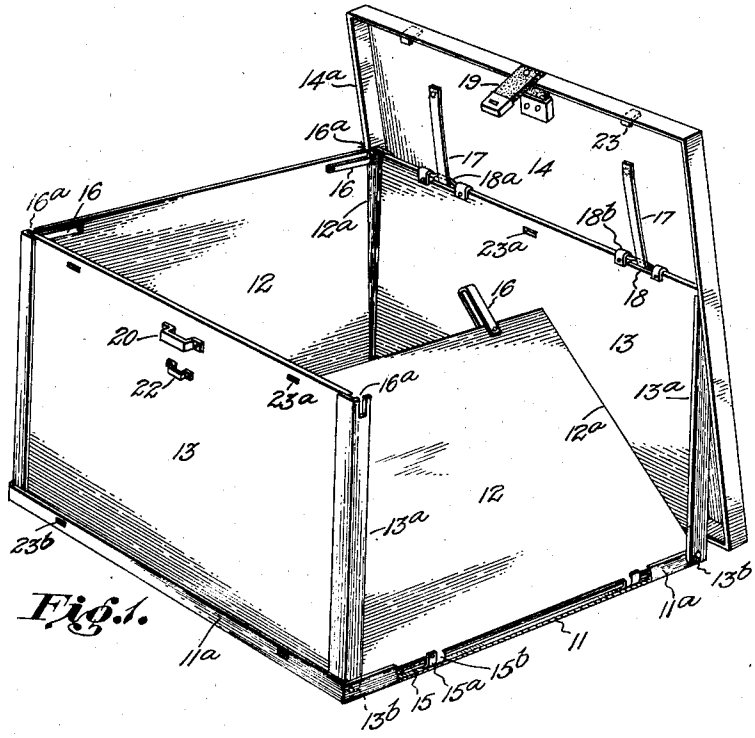


Fig. 1.

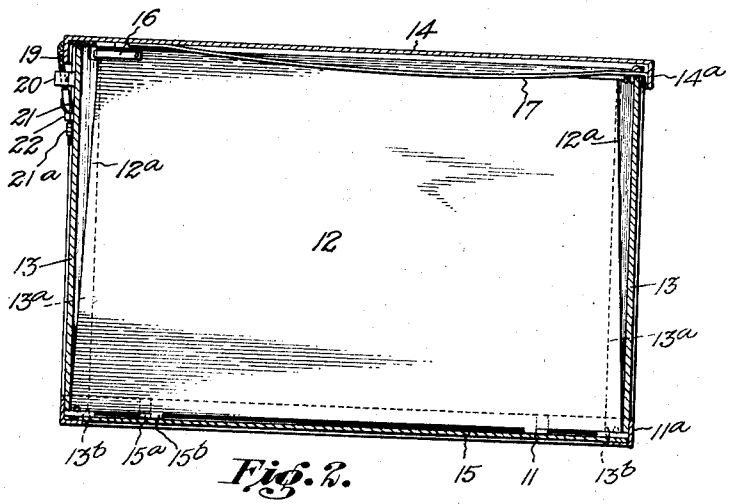


Fig. 2.

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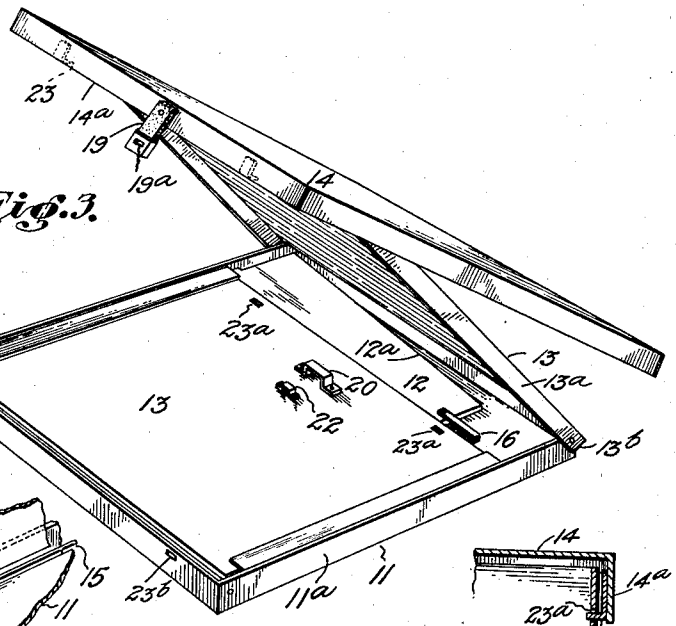


Fig. 3.

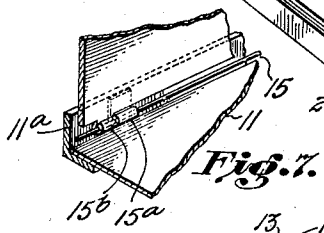


Fig. 7.

Fig. 8.

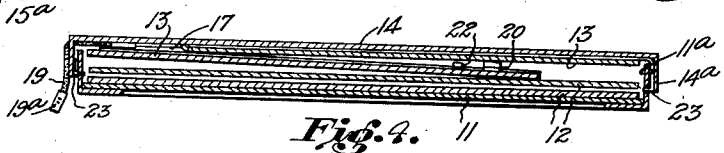


Fig. 4.

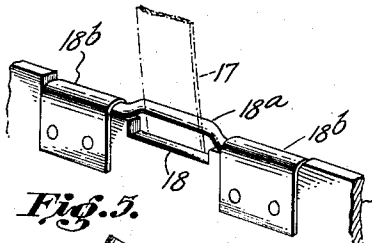


Fig. 5.

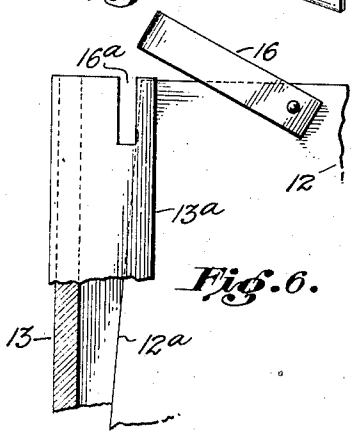


Fig. 6.

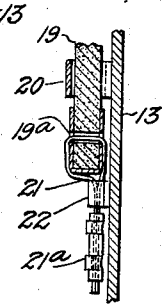


Fig. 10.

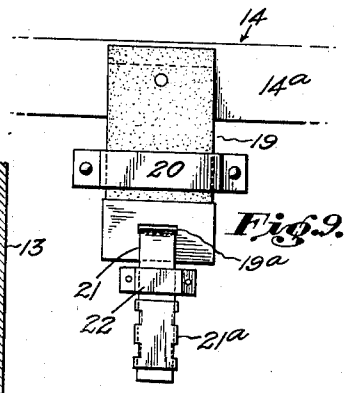


Fig. 9.

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UNITED STATES PATENT OFFICE

2,221,504

BOX AND THE LIKE

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Application June 8, 1938, Serial No. 212,434
In Australia November 17, 1937

3 Claims. (Cl. 220—6)

This invention relates to boxes, cases, crates trunks and like containers (all herein called boxes), of the type in which the lid is slidable relatively to the body in such manner that it may be arranged to cover the interior or be moved longitudinally and swung pivotally into an upright position outwardly of one end.

The primary object of this invention is to provide means for connecting the lid to an end in a box of the type referred to, in such manner that during the sliding movement of the lid, desirable flexibility and freedom from jamming is ensured and so that when the lid is arranged to cover the box interior it rests flatly on the upper edges of the sides and ends, without loss of space.

Another object of this invention is to provide improved means for fastening the said slidable lid when it is arranged to cover the box interior.

A further object of this invention is to provide a box of the type referred to which is collapsible and in which the slidable lid is arranged to engage other parts of the box, in both the erected and collapsed positions.

A still further object of this invention is to provide a collapsible box of the type referred to which is stronger, more durable, and generally more suitable for commercial use than known boxes of similar type, in which, when the box is erected, there are no parts which project into the box interior to obstruct the packing of the box or reduce its capacity and in which the sides and ends are readily foldable to the collapsed position.

According to this invention a box of the type referred to includes any suitable number of strips which extend along the inside of the box lid for a distance that is not less than the height of a box end, and means to slidably retain each said strip relatively to a box end, the said means comprising a member the medial part of which is offset relatively to each of its ends and bearings to pivotally support each end of the said member relatively to a box end, the arrangement being such that the lid may be slid longitudinally of the box and be swung into an upright position or be arranged to lie flatly on the upper edges of the ends and sides to close the box.

Means to hold and seal the said slidable lid in its closed position include a flexible strap that is connected to that end of the box lid which is not retained by the means to engage the beforementioned strips, a loop on the adjacent end of the box through which said strap may be passed, an aperture in the part of the said strap which projects beyond the said loop, a doubled metal strip that is threaded through the said aperture, and another loop to receive the limbs of the said strip in such manner that the projecting ends may be united by a seal.

The box lid is flanged and the flanges at the opposite ends of the lid each carry one or more inwardly extending projections that are of sufficient length to engage complementary apertures in the box ends. When the box is collapsible the said projections also engage apertures in a flange on the box base when the parts are in collapsed position.

When the box is collapsible, each foldable end has a flange at each side that overlaps a side of the box when the parts are erected and the lower end of each said flange is pivotally connected to a flange on the box base in such manner that when the ends are folded, the flanges on the end to which the lid is connected are outside the sides of the base flange, and the flanges on the other end are inside the sides of the said base flange.

But in order that this invention may be more readily understood a practical embodiment will now be described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a collapsible box in erected position except that a foldable side is set obliquely and the slidable lid is in an upright position.

Fig. 2 is a longitudinal vertical section of the box shown in Fig. 1, with the parts fully erected and with the lid closed and sealed.

Fig. 3 is a perspective view showing the box illustrated in Figs. 1 and 2, with the parts almost collapsed.

Fig. 4 is a longitudinal vertical section showing the box illustrated in Figs. 1 to 3, completely collapsed.

Fig. 5 is a detail perspective view of part of an end of the box showing guide means for a strip that is fixed to the slidable lid.

Fig. 6 is a detail side elevation showing means for connecting a side of the box to an end thereof, when the parts are erected.

Fig. 7 is a detail perspective view showing the hinge for connecting a foldable side of the box to the base thereof.

Fig. 8 is a detail sectional view showing means for holding the slidable lid of the box relatively to an end thereof, when erected, or relatively to the base, when collapsed.

Fig. 9 is a detail front elevation showing means for fastening the slidable lid of the box.

Fig. 10 is a vertical central section of the lower part of Fig. 9.

11 is the box base, 12 are foldable sides, 13 are foldable ends, and 14 is a slidable lid. The base 11 has an upstanding peripheral flange 11a, each end 13 has a flange 13a at each side and the top 14 has a peripheral flange 14a. The lower end of each flange 13a is extended to form an

ear 13b which is pivotally connected to the base flange 11a. Each flange 13 extends over the adjacent part of a side 12 when the sides 12 and the ends 13 are erected. To facilitate folding, especially in boxes in which the depth of an end 13 is greater than half the length of a side 12, the ears 13b of the end that is connected to the lid as hereinafter described, are outside the sides of the base flange 11a, while the ears 13b of the other end are inside the sides of the said base flange.

Each side 12 is hinged at its lower edge so that it is foldable over the base 11 within the flange 11a. The preferred hinge comprises a pin 15 that is embraced by eyes 15a which are fixed to the base flange 11a and by eyes 15b that project from the lower part of the side 12. The position of each pin 15 relatively to the base 11, is such that the hinge does not project into the box and when the sides 12 are folded first and the ends 13 are folded over the sides in succession, the superposed sides and ends lie flatly, or approximately so. Each end 12a of each side 12 is cut obliquely to prevent the sides fouling the ends during movement to the collapsed or erected position.

Means to hold each side 12 relatively to the ends 13 when the parts are in erected position, include a loop 16 that is pivotally supported near each corner of each side and a co-acting slot 16a in the upper end of each flange 13a.

Any suitable number of flexible strips 17 (two shown) are fixed relatively to the inside of the lid 14 longitudinally thereof. Each said strip is slidably retained in a recess 18 at the upper part of one of the ends 13, by a pivoted guide member 18a. Each guide member 18a is made of wire or like suitable strip material and it is cranked near each end so that its medial part will swing pivotally relatively to its ends each of which is rotatably held by a strap 18b that is fixed to the upper part of the said end at the respective sides of the recess 18. The number of strips and guides will be in accordance with the dimensions of the box.

Each said strip 17 may be formed of metal or fabric and preferably it is sufficiently flexible to permit movement of the lid relatively to the plane in which it is moving, during the sliding movement thereof. Each strip 17 is narrower than the clearance 18 in its guide and this arrangement together with any flexibility of the strip 17 facilitates manipulation and rapid movement of the lid.

Each strip 17 is extended longitudinally of the lid for a sufficient distance to permit the lid to be moved endwise and swung to an upright position. In the arrangement shown in the drawings one end of each strip 17 is connected to the flange 14a and its other end is connected to the body of the lid a suitable distance inwardly of the said flange.

Each guide member 18a turns in its bearing 18b sufficiently to allow the lid to be swung to a horizontal or an upright position and its shape is such that it will move sufficiently to allow the lid to lie flatly on the top of the box sides and ends, without loss of space. The extent to which the medial part of the member 18a is offset relatively to its ends will be varied according to the thickness of the strip 17.

A flexible strap 19 projects from the end of the lid 14 that is not held by the strips 17. The free end of strap 19 may be reinforced and it is arranged to pass through a loop 20 that is fixed to the adjacent end of the box. A metal strip 21 is threaded through a slot 19a in the end of strap 19 and this strip is doubled and its limbs are passed through a smaller loop 22 and engaged by a suitable seal as 21a in such manner that the lid is locked in closed position.

Flange 14a at the opposite ends of the box lid 14 carries any suitable number of projections 23 each of which is arranged to enter an aperture that is in registry with it. There may, for example, be one projection to enter a complementary aperture 23a in the end in which the guides 18 are formed and two spaced apart projections 23 to enter complementary apertures 23a in the other end but the number and disposition of the projections and apertures may be varied according to the size of the box. Other apertures 23b are provided at suitable positions in the base flange 11a. Each projection 23 is longer than the clearance between the flange 14a and the ends 13 when the box is erected or between the flange 14a and the flange 11a when the box is collapsed, so that it will normally force the opposed members apart until it enters a registering aperture.

We claim:

1. In a box of the type in which the lid may be arranged to cover the box or be moved horizontally and swung into an upright position outwardly of one end of the box, means to connect said lid to said end of the box, said means comprising a plurality of flexible strips each extending along said lid for a distance not less than the height of said end of the box and each being secured with its ends to the inside of the lid so as to lie flatly between the contents of the box and the lid when the latter is closed, and guide means for said strips pivotally mounted at the upper part of said end of the box to swing outwardly and inwardly as the lid is swung to its open and closed position, respectively.

2. In a box of the type in which the lid may be arranged to cover the box or be moved horizontally and swung into an upright position outwardly of one end of the box, means to connect said lid to said end of the box, said means comprising a plurality of flexible strips each extending along said lid for a distance not less than the height of said end of the box and each being secured with its ends to the inside of the lid so as to lie flatly between the contents of the box and the lid when the latter is closed, and a guide for each flexible strip, each guide comprising a recess in the upper edge of said end of the box and a member that closes said recess, said member being offset medially and being pivotally movable relatively to said recess.

3. In a box of the type in which the lid may be arranged to cover the box or may be moved horizontally and swung into an upright position outwardly of one end of the box, means to connect said lid to said end of the box, said means comprising a plurality of flexible strips each extending in spaced apart positions along said lid for a distance not less than the height of said end of the box and each being secured with its ends to the inside of the lid so as to lie flatly between the contents of the box and the lid when the latter is closed, each strip passing through a guide clearance provided in the upper part of said end of the box, and means to retain each strip in its clearance, each said retaining means being cranked and pivotally movable relatively to said end.

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