E. LENKE.

COLLAPSIBLE BOX.

APPLICATION FILED MAY 14, 1918.

1,317,140.

Patented Sept. 23, 1919.

2 SHEETS—SHEET 1.

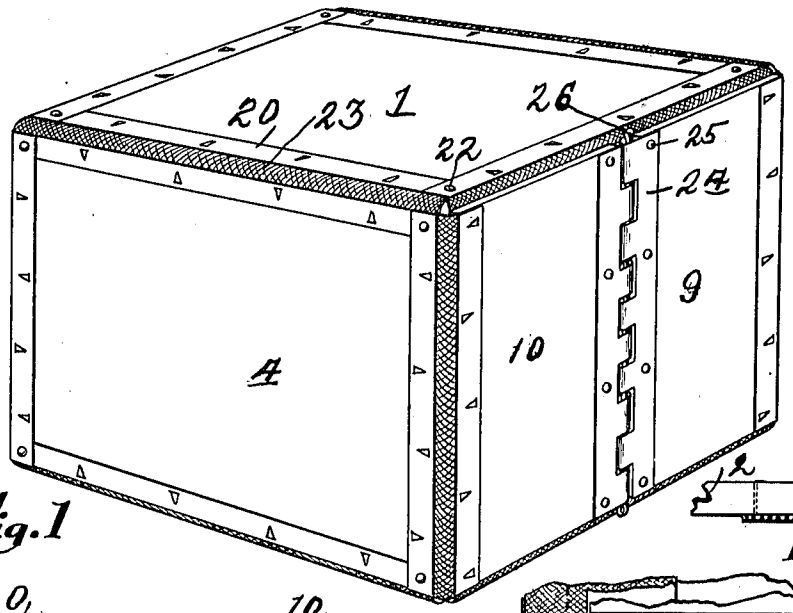


Fig. 1

Fig. 4

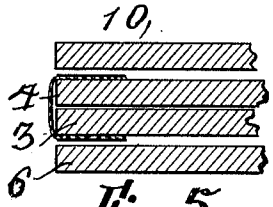


Fig. 5

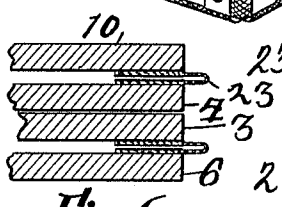


Fig. 6

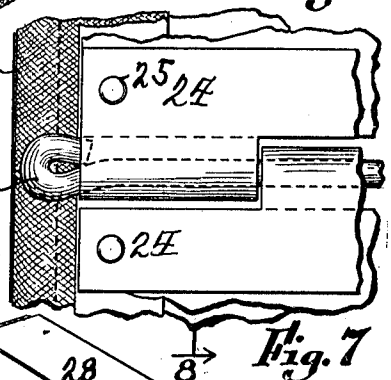


Fig. 7

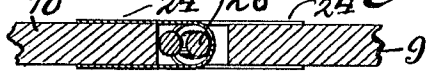


Fig. 8

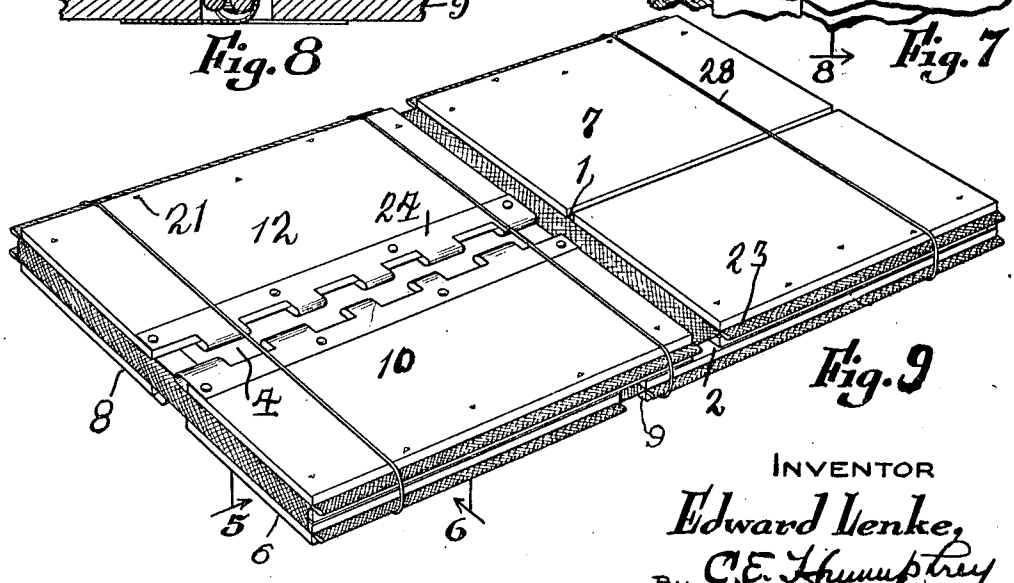


Fig. 9

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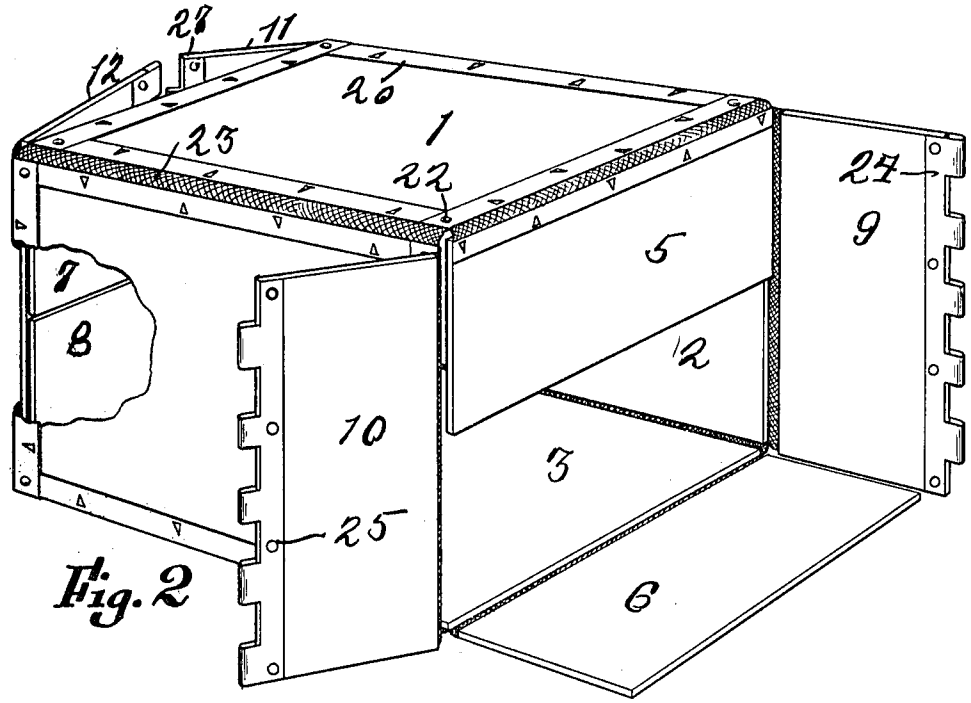


Fig. 2

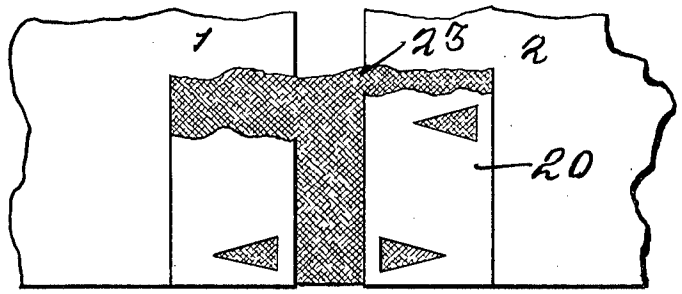


Fig. 3

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COLLAPSIBLE BOX.

1,317,140. Specification of Letters Patent. Patented Sept. 23, 1919.

Application filed May 14, 1918. Serial No. 234,472.

To all whom it may concern:

Be it known that I, EDWARD LENKE, a citizen of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented new and useful Improvements in Collapsible Boxes, of which the following is a specification.

This invention relates to improvements in collapsible boxes or shipping packages. The object of the invention is to provide a collapsible box or shipping package having flexible connections between various portions of the box to permit the infolding or collapsing of the same and also to unite all of the parts of the box into a unit when in its collapsed condition.

It is contemplated, although not necessary in the invention to form the box of a vulcanized rubber compound in sheeted form to reduce the cost of the same and to increase the durability thereof.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the matter hereinafter claimed.

In the drawings in which similar reference numerals indicate like parts in the different figures,

Figure 1 is a perspective view of a collapsible box embodying the present invention in its open or expanded position.

Fig. 2 is a view similar to Fig. 1 showing the end members of the box in their open position and with portions of the box broken away to better illustrate the construction of the same.

Fig. 3 is a detail of the means for reinforcing the edges of the various portions of the box.

Fig. 4 is an end elevation of the two members of the box showing the flexible connection between the two.

Fig. 5 is a fragmentary sectional view taken on line 5 of Fig. 9.

Fig. 6 is a view similar to Fig. 5 taken on line 6 of Fig. 9.

Fig. 7 is an enlarged detail of the locking device employed for connecting a portion of the members which form the ends of the box.

Fig. 8 is a fragmentary sectional view taken approximately on line 8 of Fig. 7, and

Fig. 9 is a perspective view of the box in its collapsed condition.

Throughout the specification and claims the word "box" will be used generically to designate not only boxes but shipping packages and containers such as cartons or otherwise. The box which forms the subject matter of the present invention embodies an upper wall 1, side walls 2 and 4 and a lower wall 3, the oppositely-disposed walls being preferably equal in size and outline. It is contemplated that the main or body portion of the various members of the box will be formed of a composite board which is capable of being vulcanized and all of the members of the box are provided with metallic reinforcing marginal strips 20 through which are punched out tongues 21 which are arranged to be driven through the material and clenched on the opposite side of each of the members for holding the marginal strips 20 in position. Furthermore, the marginal strips 20 of all the members are united where they overlap at the corners of each of the members of the box by reinforcing or holding members 22. The marginal strips 20 serve to reinforce the portions of the various box members to which they are applied and also serve as retaining members for flexible hinges or connections 23, between the several members and which consist customarily of sheets of flexible material such as rubberized fabric in order to render the box as nearly waterproof as possible. The upper wall or the member 1 is thereby flexibly connected to the members 2 and 4 and the lower member 3 is connected in a similar manner to the lower portions of the side walls 2 and 4. Secured by a flexible connection of the kind described to opposite ends of the upper wall 1 are end members 5 and 7 and flexibly connected to the lower member or wall 3 are end forming members 6 and 8 all of which are adapted to be infolded for closing the open end of the box. Secured to one end of the side member 4 by a flexible hinge such as has been described is a partial closure member 10 and at the opposite end a partial closure member or gate 12. Secured to the

end of the side wall or member 2 is a partial closure member 9 and at the opposite end a partial closure member 11. All of the members 5, 6, 7, 8, 9, 10, 11 and 12 are arranged to swing gatewise fashion inwardly with the members 9 and 10 overlapping the members 5 and 6 and the members 11 and 12 overlapping the members 7 and 8 to close the ends of the box. The marginal edges of the members 9 and 10 and the edges of the members 11 and 12 are provided with metallic marginal strips 24 which are secured to the members by holding means 25 and are also provided with apertured interdigitating projections or lugs which are adapted to coöperate so that when the members 9 and 10 are in their operative or closed position the apertures in the interdigitating projections or lugs are in alinement to permit the insertion through these apertures of a locking pin 26. The members 11 and 12 are also provided with marginal strips held in place by holding means 27 and these strips are provided with lugs or projections arranged in interdigitating relation and apertured so that a locking pin may be inserted in the registering openings or lugs for locking the members 11 and 12 in a closed position.

When in its open or expanded position the box is in the form shown in Fig. 1 and the box is collapsed by first removing the locking pins 26 and moving the end members 5, 6, 7, 8, 9, 10, 11 and 12 to their open position and then moving the member 1 so as to lie in contact with the member 2 and with the member 4 in contact with the member 3 after which the members 10 and 12 are folded over on the upper face of the member 4 and the members 5 and 7 folded over on the upper face of the member 1 and the members 6 and 8 folded under the member 3 and the members 9 and 11 folded under the member 2 so that the collapsed box is in the condition and has the appearance shown in Fig. 9. In order to hold it in this position to reship it to its original destination ordinary binding wires or cord 28 or other means are employed.

I claim,

1. A collapsible box including stiff upper, lower and side walls normally arranged in rectangular formation, flexible strips hingedly connecting the adjacent parallel longitudinal edges of said walls in non-contiguous relation, pairs of stiff partial closure members similarly hingedly connected by flexible strips to the end edges of said walls, each arranged to be folded backwardly to flatly rest against the wall connected thereto when the box is collapsed with one side wall flatly resting on the bottom wall and the top wall flatly resting on the other side wall, and detachable connecting means associated with the pairs of partial closure members which are connected to the side walls for maintaining the end of the box closed and for holding the box in its expanded condition.

2. A collapsible box including stiff upper, lower and side walls normally arranged in rectangular formation, flexible strips permanently hingedly connecting the adjacent parallel longitudinal edges of said walls in non-contiguous relation, pairs of stiff partial closure elements similarly hingedly connected by flexible strips to the end edges of said walls, each arranged to be folded backwardly to flatly rest against the wall connected thereto when the box is collapsed with one side wall flatly resting on the bottom wall and the top wall flatly resting on the other side wall, metallic protecting and reinforcing strips secured to the margins of said walls and closure members and securing the flexible strips thereto, and means associated with the pairs of partial closure members which are connected to the side walls for maintaining the ends of the box closed and for holding the box in its expanded condition.

3. A collapsible box including stiff upper, lower and side walls normally arranged in rectangular formation, flexible strips hingedly connecting the adjacent parallel longitudinal edges of said walls in non-contiguous relation, pairs of stiff partial closure members similarly hingedly connected by flexible strips to the end edges of said walls, each arranged to be folded backwardly to flatly rest against the wall connected thereto when the box is collapsed with one side wall flatly resting on the bottom wall and the top wall flatly resting on the other side wall, detachable connecting means associated with the pairs of partial closure members which are connected to the side walls for maintaining the end of the box closed and for holding the box in its expanded condition, said connecting means including metallic strips fastened on the margins of the adjacent free edges of said last named partial closure members and provided with interdigitating lugs having alinable apertures, and locking pins extending through the alined apertures of said lugs.

4. A collapsible box including stiff upper, lower and side walls normally arranged in rectangular formation, flexible strips permanently hingedly connecting the adjacent parallel longitudinal edges of said walls in non-contiguous relation, pairs of stiff partial closure elements similarly hingedly connected by flexible strips to the end edges of said walls, each arranged to be folded backwardly to flatly rest against the wall connected thereto when the box is collapsed with one side wall flatly resting on the bottom wall and the top wall flatly resting on the other side wall, metallic protecting and re-

inforcing strips secured to the margins of said walls and closure members and securing the flexible strips thereto, means associated with the pairs of partial closure members which are connected to the side walls for maintaining the ends of the box closed and for holding the box in its expanded condition, said connecting means including metallic strips fastened on the margins of the adjacent free edges of said last named partial closure members and provided with interdigitating lugs having alinable apertures, and locking pins extending through the alined apertures of said lugs.

In testimony whereof I have hereunto set my hand.

EDWARD LENKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."