J. W. WEISS.

REINFORCED COLLAPSIBLE BOX.

APPLICATION FILED JUNE 3, 1913.

1,108,289.

Patented Aug. 25, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

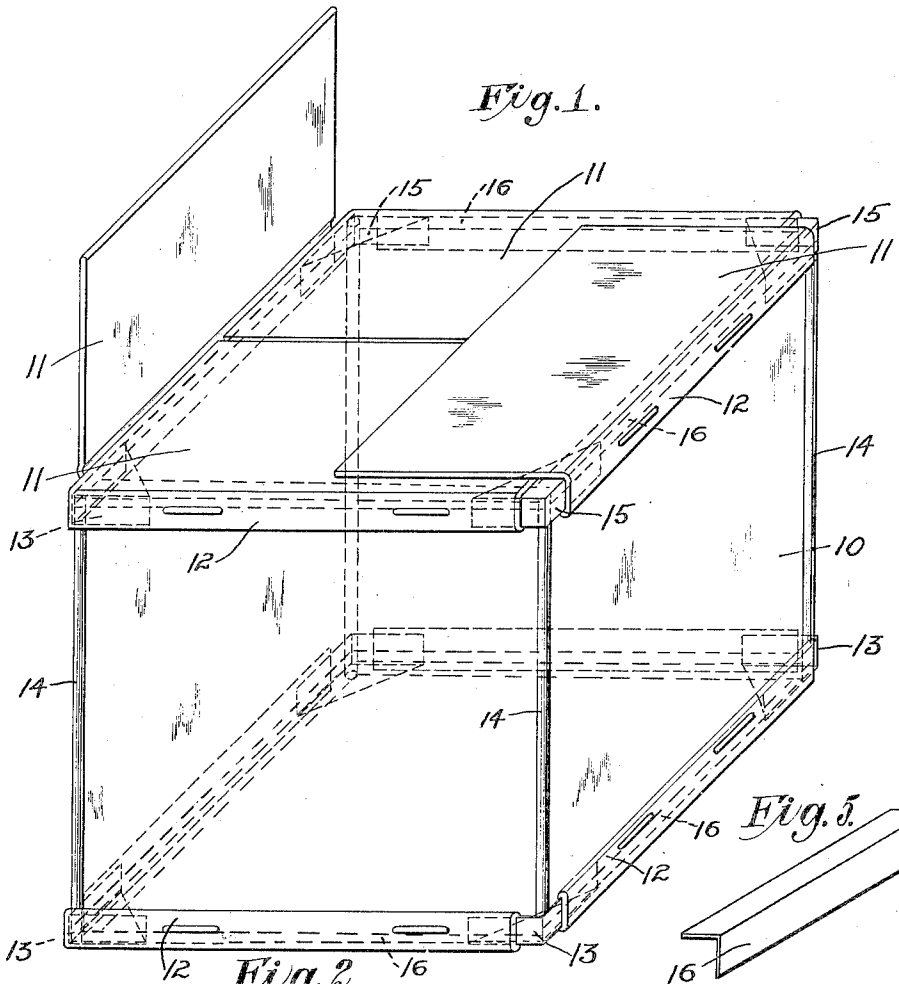


Fig. 5.

Fig. 2.

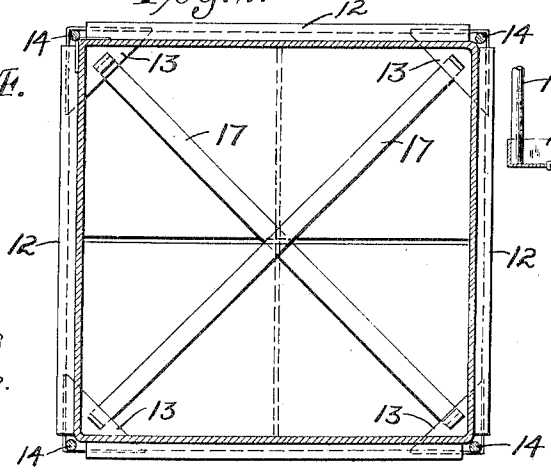


Fig. 3

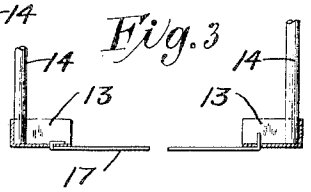
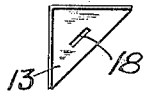


Fig. 4.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 6.

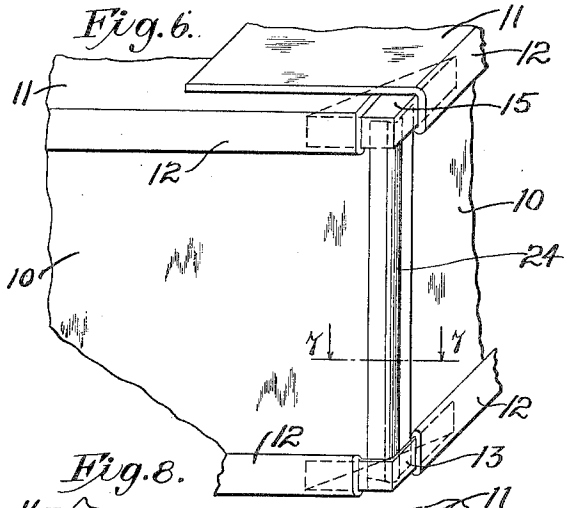


Fig. 7.

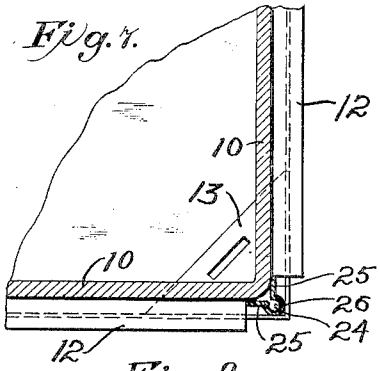


Fig. 8.

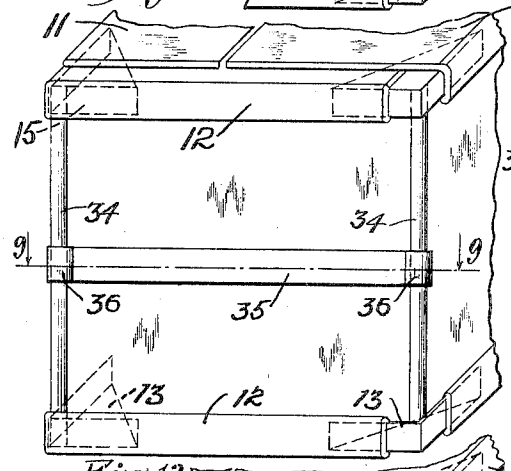


Fig. 9.

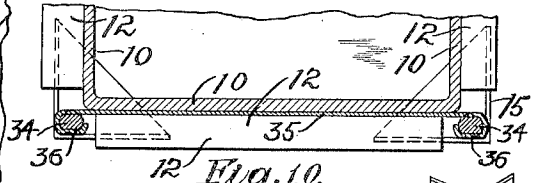


Fig. 10.

Fig. 11.

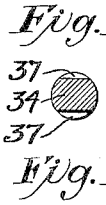


Fig. 14.

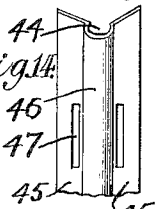


Fig. 15.

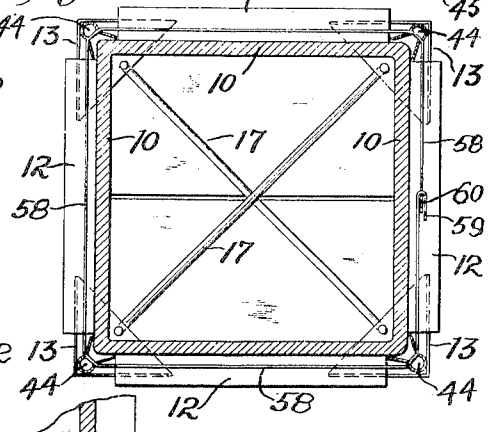


Fig. 12.

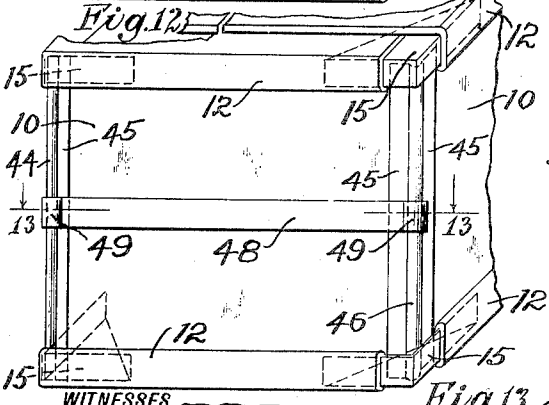
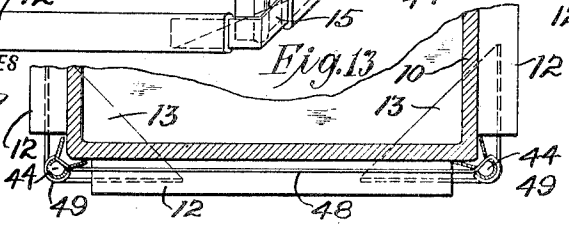


Fig. 13.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH W. WEISS, OF BALTIMORE, MARYLAND.

REINFORCED COLLAPSIBLE BOX.

1,108,289. Specification of Letters Patent. Patented Aug. 25, 1914.

Application filed June 3, 1913. Serial No. 771,380.

To all whom it may concern:

Be it known that I, JOSEPH W. WEISS, a citizen of the United States, and a resident of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Reinforced Collapsible Boxes, of which the following is a specification.

This invention relates to collapsible boxes, and has for its primary object to provide a collapsible box which is reinforced to resist shocks and strains from any direction.

A further object is to combine with the corner pieces, such as used in my Patent No. 1,063,845, struts, or struts and braces, which will so stiffen a collapsible box made of fibrous material as to adapt it for rough handling such as only strong boxes of more solid material could endure.

Still further objects and advantages will appear more fully from the detailed description, and the features of novelty will be particularly pointed out in the claims.

In the drawings illustrating this invention Figure 1 is a perspective view of a collapsible box having struts and angles in connection with the corner pieces. Fig. 2 is a sectional plan view illustrating the diagonal braces which may be used in connection with the corner pieces. Fig. 3 is a fragmental detail view illustrating a method of attaching the braces. Fig. 4 is a plan view of a corner piece showing the slot therein. Fig. 5 is a perspective view of one of the angles. Fig. 6 is a fragmental perspective view illustrating the box with a modified form of strut applied thereto. Fig. 7 is a section taken about line 7—7 of Fig. 6, the thickness of parts being exaggerated for the sake of clearness. Fig. 8 is a fragmental perspective view illustrating an intermediate tie strip between the struts. Fig. 9 is a section taken along line 9—9 of Fig. 8. Fig. 10 is a fragmental detail view of a form of strut used in the construction of Figs. 8 and 9 to which the tie band may be applied. Fig. 11 is a section taken along line 11—11 of Fig. 10. Fig. 12 is a fragmental perspective view illustrating the tie band used in connection with a sheet metal strut such as illustrated in Figs. 6 and 7. Fig. 13 is a section taken along line 13—13 of Fig. 12. Fig. 14 is a detail perspective view of the strut used in Figs. 12 and 13 showing the slots formed therein. Fig. 15 is a sectional plan view of a unitary tie band passing through all the struts.

The thickness of the various parts shown in section has, similarly to Fig. 7, been exaggerated for the sake of clearness.

In my Patent No. 1,063,845, I have disclosed and claimed a collapsible box having sides, end flaps, a fold between the sides and flaps, and a reinforcing corner piece retained in the fold. To further strengthen the box against endwise shock and strain, I provide struts which may be readily placed in position between the corner pieces when the box is set up, and is retained thereby in place. If desired, angle pieces may be added under the corner pieces and located within the folds. Also, diagonal braces may unite the corner pieces, and intermediate tie bands may unite the struts. In this way a construction is obtained which is very similar to a box within a crate, thereby securing for the usual comparatively weak collapsible box a maximum of strength and rigidity.

Referring in detail to Figs. 1 to 5 of the drawings, the box is formed with the side walls 10, the end flaps 11 forming closures for the ends of the box, and reinforcing folds 12 located intermediate the sides and flaps and forming strengthening ridges about the ends of the box. When the latter is set up the bottom corner pieces 13 are placed in position within the folds, the bottom flaps are turned over, then strengthening struts 14 are inserted in the exteriorly projecting corners of the corner pieces, and then the top corner pieces 15 are inserted into the folds and over the struts 14, retaining the latter in place, and finally the top end flaps 11 are turned over to complete the closing of the box. Any shock or strain borne by the ends of the box are taken up by the struts 14, and as these contact the comparatively strong corner pieces, no mutilation of the material of the box can take place. If it is desired to further strengthen the box, angle plates 16 may be inserted within the folds previous to the insertion of the corner pieces. Also, cross braces 17 may be attached within the slots 18 in the corner pieces, thus securing a still more rigid construction which is very similar in its action to a crated box.

In Figs. 6 and 7 I have illustrated a modi-

fied form of strut 24 formed of sheet metal and preferably having two angularly disposed sides 25 united by a curved portion 26. This formation increases the strength of the part to resist compression, and also tends to reduce the weight of the same.

In the form illustrated in Figs. 8 to 10, the struts 34 are further braced by a tie band 35 fastened thereto at an intermediate point in the length of the struts, as by having overturned ends 36 engaging within notches 37 formed in the struts.

Referring to the form illustrated in Figs. 12 to 14, the struts 44, similar to the struts used in Figs. 6 and 7, have the sides 45 arranged angularly to each other and united by the curved portion 46. Slots 47 are formed at intermediate points in the length of the strut, and a tie band 48 passes through these slots and is fastened thereto by the overturned ends 49.

In the further modification illustrated in Fig. 15, the tie band 58 is of unitary construction and passes through all of the struts 44 and is fastened by the engagement of the ends 59 and 60 thereof.

From the various embodiments of my invention above described it will be noted that I have provided a collapsible box which is so reinforced when set up as to be capable of withstanding considerable shock and impact at any point and has substantially the strength of a box and crate combined. The various reinforcing parts may be made very cheaply and may be assembled with very little care or skill.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A collapsible box having sides, ends, removable corner pieces disposed between the sides and ends and retained in place thereby, and freely removable reinforcing struts between the opposing corner pieces, the latter retaining the struts in place.

2. A collapsible box having sides, end flaps forming closures for the box, removable corner pieces at the junction of the sides and flaps, and retained in place by the latter, and freely removable struts between the opposing corner pieces, the latter retaining the struts in place.

3. A reinforced collapsible box, comprising sides, end flaps, a fold between the flaps and sides, removable corner pieces disposed within the folds, and struts between the opposing corner pieces and retained thereby.

4. A reinforced collapsible box, comprising sides, end flaps, a fold between the flaps and sides, removable corner pieces disposed within the folds, compression members located within the folds, and struts between the opposing corner pieces, the latter retaining the struts in place.

5. A reinforced collapsible box, comprising sides, end flaps, a fold between the flaps and sides, removable corner pieces disposed within the folds, angle pieces located within the folds, and struts between the opposing corner pieces, the latter retaining the struts in place.

6. A reinforced collapsible box having sides and end flaps, folds disposed at the junction of the sides and end flaps, removable corner pieces disposed within the said folds, removable reinforcing struts located between the opposing corner pieces and retained thereby, each strut having a reduced portion intermediate its ends, and a tie strip uniting the adjacent struts at their reduced portions.

7. A reinforced collapsible box, comprising sides end flaps, folds between the sides and end flaps, removable reinforcing corner pieces disposed within the folds, removable struts located between the opposing corner pieces and retained thereby, said struts having sides and a bent portion uniting the sides, and having also slots formed therein, and a tie band passing through said slots and connecting said struts.

Signed at Baltimore in the county of Baltimore and State of Maryland this 2nd day of June A. D. 1913.

JOSEPH W. WEISS.

Witnesses:

GILBERT ROSENAUR,

J. OWINGS DAY.