

G. R. TIBBETTS.
COLLAPSIBLE BOX.
APPLICATION FILED MAR. 25, 1910.

980,705.

Patented Jan. 3, 1911.

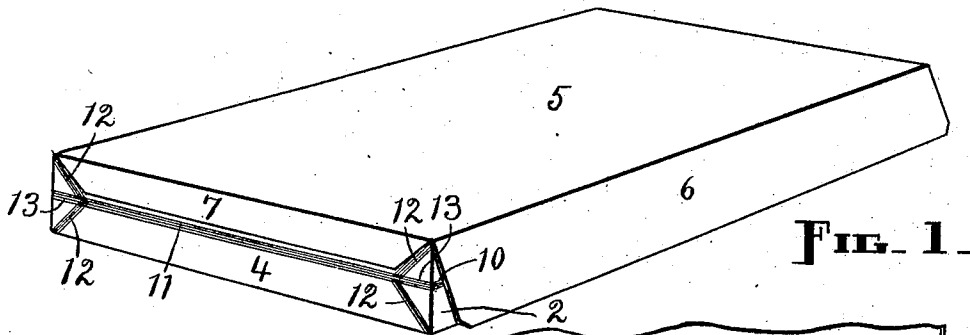


FIG. 1.

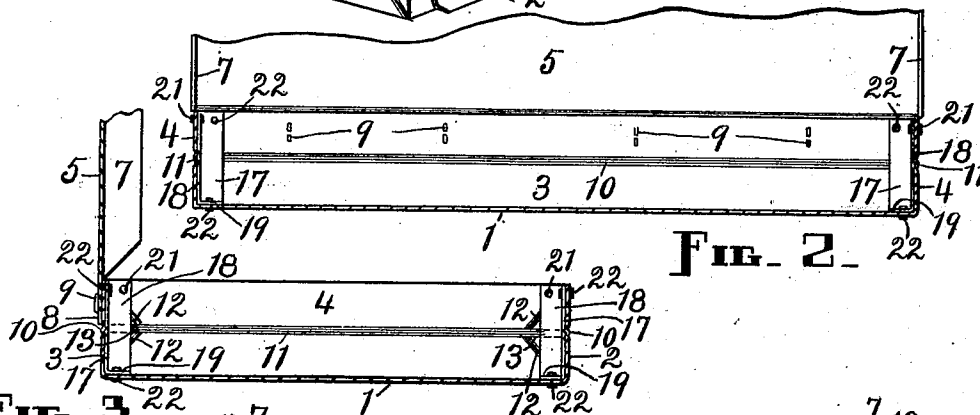


FIG. 2.

FIG. 3.

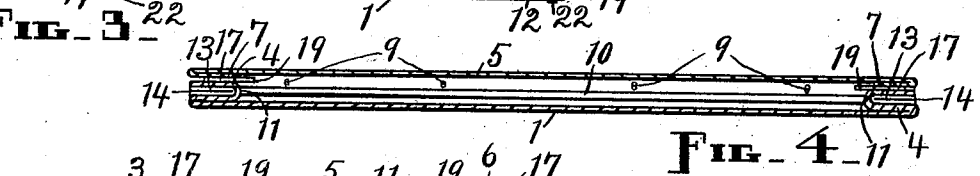


FIG. 4.

FIG. 5.

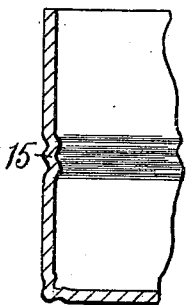
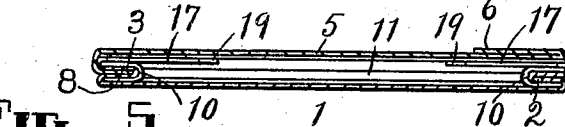


FIG. 6.

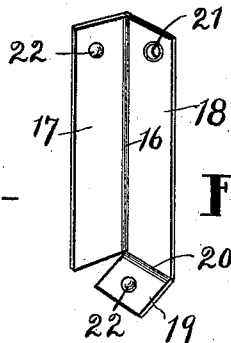


FIG. 7.

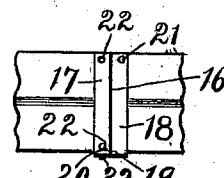


FIG. 8.

WITNESSES:

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COLLAPSIBLE BOX.

980,705.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE R. TIBBETTS, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Collapsible Box, of which the following is a specification.

My invention relates to improvements in heavy paper, cardboard or fiber boxes adapted to fold or collapse flatwise, and consists essentially of a box body scored, creased, or otherwise arranged to fold in the center, longitudinally, of the front and back sides and the ends, together with some means for maintaining said front and back sides and said ends in their upright positions when said body is opened up or expanded vertically, all as hereinafter set forth.

The primary object of my invention is to produce a simple and inexpensive box, of the class above described, which according to its size is suitable for a great variety of purposes, and which when not in use can be easily and quickly collapsed so as to lie quite flat and thus take up little space in depth. The box can be extended or expanded for use as easily and quickly as it can be collapsed.

A further object is to provide such a box with adequate supports for the same when expanded, such supports preferably consisting of suitable braces at the corners.

Further objects will appear in the course of the following description.

This box may be made of such size as to render it available for use in place of a dress-suit case or for holding garments which it is desired to pack flat, and by changing the size can be utilized for other packing purposes.

I attain the objects and secure the advantages above pointed out by the means illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a box which embodies my invention in a practical form, such box being shown expanded and with the cover closed, although the exposed end flap and the front flap of said cover are not brought down against the corresponding walls of the box as they would be in practice with the box strapped or corded; Fig. 2, a longitudinal, vertical section through said box, looking toward the rear wall thereof; Fig. 3, a transverse, vertical section

through said box, looking toward the right-hand end wall; Fig. 4, a longitudinal, vertical section through the box in its collapsed condition, looking in the same direction as in Fig. 2; Fig. 5, a transverse, vertical section through the collapsed box looking in the same direction as in Fig. 3; Fig. 6, an enlarged and exaggerated, fragmentary section of a corner of the box, showing a manner in which the walls may be creased to produce an efficient joint; Fig. 7, an enlarged, perspective view of one of the corner braces, and, Fig. 8, a fragmentary view showing a corner of the box with the brace applied to the outside. Portions of the cover of the box, raised, appear in Figs. 2 and 3.

Similar figures refer to similar parts throughout the several views.

Referring to the drawings, it will be seen that I have therein illustrated a box which comprises a bottom 1, front and back walls 2 and 3, respectively, end walls 4—4, and a cover 5 provided with a front flap 6 and end flaps 7—7. Two sheets of fiber stock are used in making this box, but the box may be made out of more or less than that number of sheets. One of the aforesaid sheets is fashioned into the box body or box proper, and the other into the cover 5 provided with a rear flap 8, in addition to the flaps already mentioned. The flap 8 is attached to the back wall 3, on the outside, by means of staples 9, or in any other suitable manner. The construction and arrangement of the parts may be such that the loose cover flaps close over the outside of the box body, as shown, or such that either the front flap 6 or the end flaps 7 or all three pass down inside of the corresponding wall or walls of the box when the cover is shut. Up to this point the parts are old and well-known and subject to a great variety of changes which come within the prior art.

Each of the side walls, 2 and 3, of the box has a central longitudinal joint 10 extending from end to end thereof; and each of the end walls, 4, has a central longitudinal joint 11 which branches at each end and extends to the adjacent corners, as shown at 12, in Figs. 1 and 3, and has an extension 13 between each pair of such branches, such extension being in line with the main joint and leading from the crotch formed by said branches to the adjacent end of the wall in

which said main joint and its branches and extensions are located. The joints 10 and the joints 11 with their oblique branches 12 are all arranged to fold inwardly and the extensions 13 to fold outwardly when the box is collapsed.

By locating the single joints in the back and front walls, the corner projections which the collapsed box must necessarily produce are at the ends of the box, as shown at 14—14, in Fig. 4, there being two such projections at each end of said box. But by interchanging the joints, so as to have the single joints in the end walls and the branched and extended joints in the front and back walls, the projections 14 will be at the front and rear instead of at the ends.

When the box shown in the drawings is collapsed each wall at the front and back folds together throughout its entire length upon or at its joint 10, and each end wall folds at its joint 11, including the connected branches 12 and the extensions 13, on the projections 14, said joint 11 like said joint 10 bending inwardly, and said branches also bending inwardly and with said extensions, which latter are bent the other way and are also readjusted so that they lie at right-angles to their former positions, taking position within the adjacent folded side or wall at the ends.

In Fig. 6 is shown at 15 a triple-crease joint which I prefer to employ in the construction of my box, although some other might be substituted therefor. This joint is made by doubly creasing the material on one side and singly creasing it on the other side at a point intermediate of the positions of the twin creases or of the ribs produced by said twin creases. This kind of a joint should be used for the collapsible walls and may also be used to advantage for all of the joints in the box and even in the braces described below, since such joint is very durable as well as flexible and forms a rounded corner which enhances the appearance of the box.

When extended or straightened, the walls of the box must be supported in that position or condition in some way, as hereinbefore noted, and as a simple and convenient means for this purpose I may employ a folding brace in each corner of said box. Each brace is of a length which is equal to the height of the walls on the inside when extended, has a longitudinal central joint 16 which divides it into two leaves 17 and 18, is provided at one end, the bottom end when said brace is in operative or supporting position, with a rectangular foot-piece 19 which is jointed at 20 to the leaf 18, and is pivoted at 21 through said leaf 18 at the end opposite said foot-piece to one of the end walls 4 near the top of the latter and the proper distance from the adjacent corner of the box

to lock said joint 16 in such corner when the brace is in the aforesaid supporting position. The length of the leaf 18 and the thickness of the foot-piece 19 combined equal the length of the leaf 17. The office of the foot-piece is to hold the two leaves of the brace apart and at right-angular relation to each other at the bottom, when said brace stands upright.

For the sake of additional security at the corners, suitable fasteners for each brace, besides the pivots 21, may be provided, such fasteners being preferably of the snap variety like ordinary glove-fasteners. For each inside brace two such fasteners are provided, one for the leaf 17 at the same end of the brace as the pivot 21, and the other for the foot-piece 19. For the outside brace, that shown in the last view, three such fasteners are provided, one at each end of the leaf 17, and one for the foot-piece. These fasteners are represented at 22. One part of each fastener 22 is attached to the brace and the other part to the box, as is customary with devices of this kind, and the part which is attached to the box is, of course, so placed that it can be engaged by its companion part when the brace is in locking position; in other words, there are parts of said fasteners attached to the front and rear walls 2 and 3, adjacent to the pivots 21 in the ends 4, and to the bottom 1 near the corners, all inside of said box, for the inside brace, and to said front and rear walls, above and below the joints 10, and to said bottom, all outside of said box, for the outside brace.

In practice, assuming the box to be equipped with the inside braces and in a collapsed condition, it is made ready for use by raising the upper portion of said box to straighten the walls thereof, and then turning down said braces on their pivots 21, until said braces fit snugly into the corners of the box, and connecting the fasteners 22 by snapping associated parts into engagement with each other in the usual manner. Each brace is now securely held by its pivot and fasteners in a corner of the box, with the leaves 17 and 18 arranged at right-angles to each other and the foot-piece 19 attached by its fastener to the bottom in such a way as to hold said leaf 17 in place at the base, and in turn the walls of the box at and adjacent to such corner are supported by said brace. Thus expanded and supported the box is in condition for use like a box of ordinary construction.

When the box is no longer needed, it is collapsed or compactly pressed together, after first disconnecting the fasteners 22, and swinging the braces up against the ends 4 of the box. In the collapsed box the braces should by preference lie flat on the upper folds of the ends 4, as shown in Figs. 4 and

5, since said braces thus opened out at the joints 16 and 20 take up less room and permit the box to be collapsed still more, thus enabling it to be stored in a shallower space than would otherwise be the case. In the act of collapsing all of the jointed members fold in and turn in so that the box is not lengthened by that operation. The outside braces fit over the corners of the box, with the foot-pieces 19 underneath the bottom 1, as shown in Fig. 8, instead of fitting the corners on the inside with the foot-piece above said bottom, as explained, and each of said outside braces has the additional fastener previously mentioned, but the expanding and collapsing operations, which include the manipulation of the braces to lock and unlock the walls, is substantially the same with the outside braces as with the inside braces. The outside braces serve to protect the corners of the box from wear and injury, which is something of an additional advantage perhaps, but their efficiency as locking mediums is no better if as good as that of the inside braces. For some purposes the box need not be provided with supports of any kind, the contents of the box being depended upon to retain it in its expanded condition.

Some departures may be made from the construction herein shown and described, in addition to those to which attention has already been called, such as in the matter of locking and releasing means for the collapsi-

ble walls, without violating the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a collapsible box, with the bottom, and the front, back and end walls of the box, such walls being longitudinally jointed intermediate of their top and bottom edges, of braces for such walls when extended, such braces being pivotally attached at suitable points to the walls and adapted to lie flat when the box is collapsed and to fold to an angular cross-section when the box is expanded.

2. The combination, in a collapsible box, with the bottom, and the front, back and end walls of the box, such walls being longitudinally jointed intermediate of their top and bottom edges, of corner braces to support said walls when extended, such braces being pivotally attached at suitable points to the walls and adapted to lie flat when the box is collapsed and to fold to an angular cross-section when the box is expanded, and fasteners adapted to further secure said braces to the walls and to secure them to said box bottom when said braces are in operative position.

GEORGE R. TIBBETTS.

Witnesses:

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A. C. FAIRBANKS.