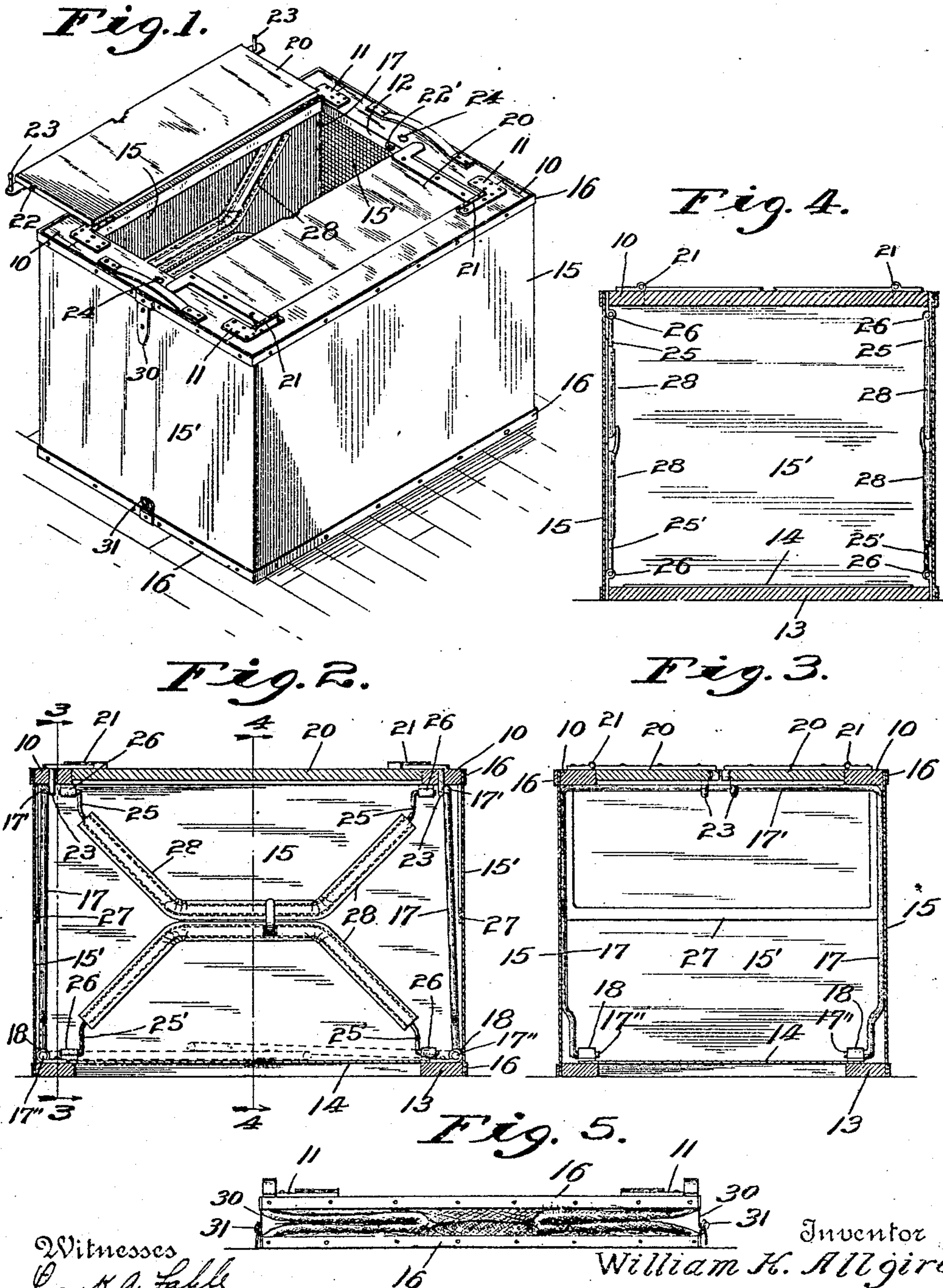


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W. K. ALLGIRE.
FOLDING SHIPPING BOX.
APPLICATION FILED MAY 13, 1907.



Witnesses
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FOLDING SHIPPING-BOX.

No. 880,347.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed May 13, 1907. Serial No. 373,357.

To all whom it may concern:

Be it known that I, WILLIAM K. ALLGIRE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Folding Shipping-Boxes, of which the following is a specification.

The object of my invention is to produce a light yet rigid collapsible shipping box or crate of such character that it may be readily collapsed and distended and also of such character that the collapsible sides thereof shall be substantially continuous and free from points or projections and substantially unbreakable.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view of a box in distended condition; Fig. 2 a longitudinal section thereof; Fig. 3 a transverse section on line 3—3 of Fig. 2; Fig. 4 a similar section on line 4—4 of Fig. 2, and Fig. 5 a side elevation of my box in collapsed condition.

In the drawings, 10 indicates a top frame conveniently formed of comparatively narrow strips of wood connected together by suitable connecting plates 11, said frame forming a central opening 12. The bottom frame 13 is similar to frame 10 and the central opening therein is conveniently closed by a light metal plate 14. The sides 15 and ends 15' are formed of flexible material, such, for instance, as heavy duck, being conveniently formed of a single strip passing around the outer edges of the top and bottom frames and secured thereto by nailing or otherwise, suitable strengthening bands 16 being used if desired.

In order to hold the structure distended I mount in each end thereof a swinging strut each of which is conveniently formed from a single piece of rod bent into a substantially U-shape so as to form legs 17 and a connecting cross-bar 17'. Each leg 17 is provided at its lower end with an inturned portion 17'' which is journaled in a suitable bearing 18 fastened to the inner face of the bottom 13, the arrangement being such that this strut may be swung from the position shown in full lines in Fig. 2 to the position shown in dotted lines in said figure. It will be readily understood that the struts may be fastened to the top frame instead of the bottom frame, as shown, or one strut may be fas-

tened to each frame, but I consider the arrangement shown to be the most practical.

Any suitable means may be used to hold the struts in distending position, but I find a convenient means to be one carried by the swinging doors 20 which I prefer to use for closing the opening 12 in the top 10. These swinging doors 20 are hinged, at their outer edges, by hinges 21, to the frame 10 and may be normally held in closed position by ordinary cupboard catches 22 of a well known form, said catches coöperating with suitable sockets 22' arranged in the frame 10. Each swinging door carries, at each end of its free edge, a pin 23 adapted to be projected through an opening 24 formed through frame 10 and said pins and openings are so arranged that, when the doors are closed, as shown in Fig. 2, the pins 23 will project in front of the cross-bar 17' of the adjacent strut and thus hold said struts against displacement.

In view of the fact that the side walls of the receptacle are flexible it is desirable that means be provided to facilitate the proper folding of said walls along predetermined lines, when the receptacle is collapsed, as otherwise the folded structure would present an unsightly appearance and the folded walls might project beyond the edges of the top and bottom and thus be liable to be torn in shipping. For this reason I provide the sides 15 with suitable means for defining the crease or fold lines. In the drawings I have shown such means as consisting of a pair of swinging members 25 and 25' which are identical and are conveniently formed of wire bent into substantially the shape shown with their ends formed to enter suitable bearing brackets 26 secured in pairs to the top and bottom frames, the arrangement being such that the members 25 and 25' are free to swing. I also deem it advisable to stiffen one vertical half of the end walls 15' and this is conveniently done by a U-shaped stiffening member 27 secured to the inner face of each wall. The members 25 as well as member 27 may be secured to the inner faces of the flexible walls of the box and by suitable means, the means shown in the drawings consisting of pockets 28 which are formed of a strip of canvas stitched to the inner face of walls 15.

In order to hold the parts together in folded position I find it convenient to provide a strap 30 and coöperating buckle 31 at

each end of the structure, said parts being secured to the top and bottom frames.

In operation, practically the entire volume of the box is available for reception of articles to be shipped, as, for instance, bread and other bakery products. When the contents have been removed, the doors 20 being opened, the operator has merely to pull the rods 17' of the struts toward each other, thus causing the struts to drop to the position shown in dotted lines in Fig. 2. Thereupon a slight inward pressure on the walls 15 and 15' causes said walls to fold inwardly, members 25 swinging in their brackets 26 and thus defining the lines of fold. Doors 20 may be then closed and the parts secured together by the strap and buckle 30—31. In reverse operation, the top frame 10 is first lifted and the struts 17—17' are swung to the positions shown in full lines in Fig. 2. The box is then loaded and doors 20 swung down to closing position where pins 23 pass through openings 24 in position to retain the struts in holding position. Said pins 23 also serve to stiffen the top frame 10 so that an extremely rigid structure is produced. The side walls, while easily foldable, are still continuous and do not present any projecting points or edges.

If desired, a finger 25'' may be attached to member 25 in position to engage the mating member 25' and limit the opening movement thereof so that they will stand bowed slightly inward and thus be in position to automatically swing inward as soon as the struts 17—17' are thrown down.

I claim as my invention:

1. A collapsible receptacle comprising a pair of frames, connecting walls composed of flexible material, and movable struts each mounted upon one of said frames and adapted to be moved into and out of engagement with the other of said frames.

2. A collapsible receptacle comprising a pair of mating frames, connecting walls composed of flexible material, and movable struts each mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames.

3. A collapsible receptacle comprising a pair of mating frames, one of which is provided with a central opening, a door forming a closure for said opening, movable struts mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames, and means carried by said door for retaining the struts in supporting position.

4. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, and a pair of swinging struts each pivotally mounted upon one of said frames at opposite sides thereof and

adapted to be swung into and out of position to hold the frames separated.

5. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, a pair of swinging struts each pivotally mounted upon one of said frames at opposite sides thereof and adapted to be swung into and out of position to hold the frames separated, a closure for an opening through one of said frames, and means carried by said closure for engaging the swinging struts to hold them in supporting position.

6. A collapsible receptacle comprising a pair of frames, connecting walls composed of flexible material, movable struts each mounted upon one of said frames and adapted to be moved into and out of engagement with the other of said frames, and fold-defining members connected to the flexible walls.

7. A collapsible receptacle comprising a pair of mating frames, movable struts each mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames, and fold-defining members connected to the flexible walls.

8. A collapsible receptacle comprising a pair of mating frames, one of which is provided with a central opening, a door forming a closure for said opening, movable struts each mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames, means carried by said door for retaining the struts in supporting position, and fold-defining members connected to the flexible walls.

9. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, a pair of swinging struts each pivotally mounted upon one of said frames at opposite sides thereof and adapted to be swung into and out of position to hold the frames separated, and fold-defining members connected to the flexible walls.

10. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, a pair of swinging struts each pivotally mounted upon one of said frames at opposite sides thereof and adapted to be swung into and out of position to hold the frames separated, a closure for an opening through one of said frames, means carried by said closure for engaging the swinging struts to hold them in supporting position, and fold-defining members connected to the flexible walls.

11. A collapsible receptacle comprising a pair of frames, connecting walls composed of flexible material, movable struts each mounted upon one of said frames and adapted to be moved into and out of engagement with the other of said frames, and fold-defining members connected to the flexible walls,

each of said members being pivotally connected to one of the frames.

12. A collapsible receptacle comprising a pair of mating frames, movable struts each mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames, and fold-defining members connected to the flexible walls, each of said members being pivotally connected to one of the frames.

13. A collapsible receptacle comprising a pair of mating frames, one of which is provided with a central opening, a door forming a closure for said opening, movable struts each mounted within the receptacle on one of said frames and adapted to be moved into and out of supporting engagement with the other of said frames, means carried by said door for retaining the struts in supporting position, and fold - defining members connected to the flexible walls, each of said members being pivotally connected to one of the frames.

14. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, a pair of swinging struts each pivotally mounted upon one of said frames at

opposite sides thereof, and adapted to be swung into and out of position to hold the frames separated, and fold-defining members connected to the flexible walls, each of said members being pivotally connected to one of the frames.

15. A collapsible receptacle comprising a pair of mating frames, flexible walls connecting the same, a pair of swinging struts each pivotally mounted upon one of said frames at opposite sides thereof and adapted to be swung into and out of position to hold the frames separated, a closure for an opening through one of said frames, means carried by said closure for engaging the swinging struts to hold them in supporting position, and fold-defining members connected to the flexible walls, each of said members being pivotally connected to one of the frames.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 11th day of May, A. D. one thousand nine hundred and seven.

WILLIAM K. ALLGIRE. [L. s.]

Witnesses:

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