

April 24, 1934.

E. WATSON

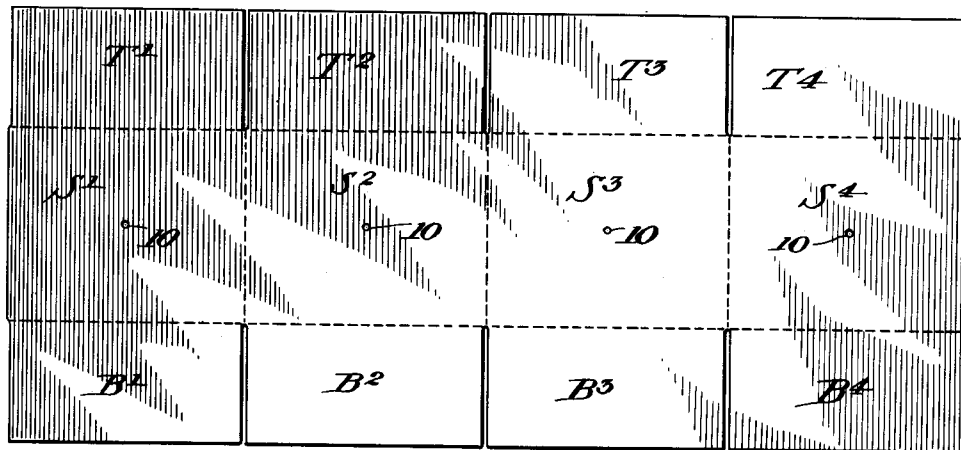
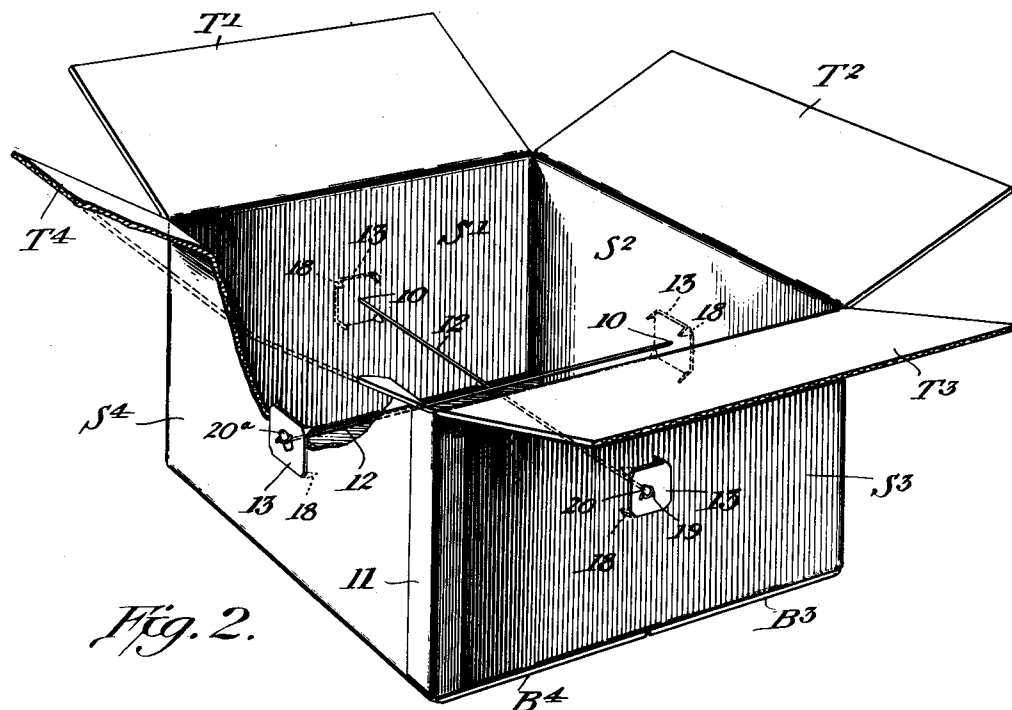
1,956,458

STAYED CONTAINER

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2 Sheets-Sheet 1

Fig. 1.



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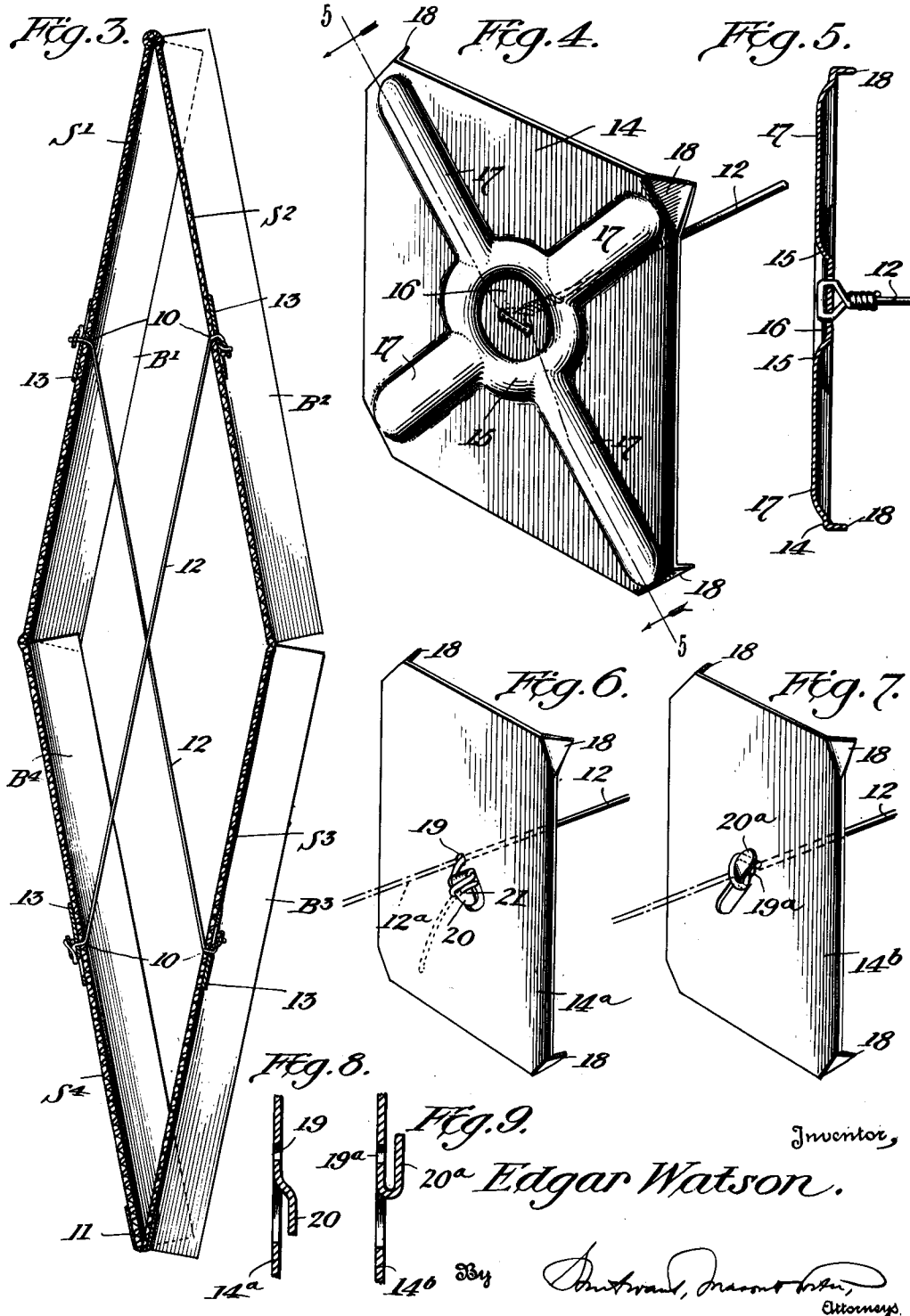
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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STAYED CONTAINER

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11 Claims. (Cl. 229—6)

This invention relates to improvements in con-
tainers and more particularly concerns the stay-
ing or bracing of opposite walls of the container
whereby to support these walls against bulging.

5 One of the features of the present invention is
the provision of a stay in a container, which op-
erates to hold the opposite walls against bulging,
and yet is so constructed and arranged that it does
not hinder or prevent the ready folding of the
10 container into flat condition for easy shipment.

Another feature of the present invention is the
provision of a stay for preventing the bulging of
opposite walls of the container, in combination
with means for distributing the stresses in the
15 stay to the said walls.

A further feature of the invention is the pro-
vision of a container having stay means for oppo-
site walls thereof, in conjunction with stay sup-
porting elements which maintain the connection
20 of the stay with the walls at a predetermined
point, whereby the container may be folded flat
without movement of the stays from the desired
position upon later unfolding of the container.

Still another feature of the present invention
25 relates to improvements in stays and stay plates
for containers, whereby the stays may be quickly
and accurately positioned in assembling the con-
tainer.

With these and other objects in view as will ap-
pear in the course of the following specification
and claims, an illustrative form of container, and
illustrative forms of stay plates and joints be-
tween stay plates and stays, are set out on the
accompanying drawings, in which:

35 Fig. 1 is a view, on a small scale, showing a con-
tainer blank adapted for the present invention.

Fig. 2 is a perspective view, on a larger scale,
showing an assembled container with the stays
therein, parts being broken away.

40 Fig. 3 is a sectional view of a container blank, in
semi-folded condition.

Fig. 4 is a perspective view of one type of stay
plate.

Fig. 5 is a cross section of the same substantially
45 one line 5—5 of Fig. 4.

Figs. 6 and 7 are perspective views of other
forms of stay plates.

Figures 8 and 9 are cross-sectional views, on a
larger scale, and corresponding respectively to the
plate and lug arrangement of Figures 6 and 7.

50 It has heretofore been proposed to employ con-
tainers of the fiber type, in which the blank is
made of solid or corrugated fiber material, for the
shipment of various types of loads. Where the
55 load is at least in part self-supporting, as with

canned goods and other articles having a substan-
tially fixed volume, the usual type of container
is satisfactory under many conditions. When,
however, it is sought to employ such a container
for the shipment of bulk materials in which the
60 container is loaded loosely with articles which may
settle and shift, the load of the article in settling
causes the weight to come against the side walls
and to bulge these walls outwardly. If a number
of such containers are stacked one above another,
65 the distortion by bulging of the vertical walls, out
of plane, ultimately leads to crushing of the lower
containers since the non-plane walls have little
or no strength against superimposed loads. Fur-
thermore, this bulging is highly disadvantageous
70 as it leads to a weakening of the package at the
edges and ultimately to a tearing at the corners.
Furthermore, the package becomes irregular in
shape and is far more subject to bruising and
scratching.

75 It has heretofore been proposed to strengthen
the container in several ways. For example, a
current proposal is to employ extra heavy liners to
absorb the stress at the edges, to prevent tearing.
This however does not correct for the funda-
80 mental difficulty of the bulging itself. As a test,
three boxes of the same shape and size with loads
of fifty pounds of the removable seals employed
for soft drink bottles was shipped for several thou-
sand miles, and it was found that the boxes bulged
85 so that the three boxes required five inches more
space after shipment than when delivered to the
shipping company: by comparison, three identi-
cal boxes with identical loads, and shipped at the
same time and in the same way, but with the pres-
90 ent stays had no noticeable bulges after ship-
ment.

On the accompanying drawings, the blank
shown in Fig. 1 comprises the four walls S₁, S₂, S₃,
S₄ which are joined by parallel fold lines to one
95 another, each of them being provided with a pair
of flaps comprising the top flaps T₁, T₂, T₃, T₄,
and the bottom flaps B₁, B₂, B₃, B₄. It will be
noted that this is substantially a standard blank:
and that in operating according to the present
100 invention, any desired relative shape and size may
be given to the several parts in the usual way.
Each of the sides S₁, S₂, S₃, S₄ is shown as pro-
vided with an aperture 10, which is located remote
from all edges of the corresponding wall, and in
105 the illustrated form is located at the mid-height
and mid-width thereof.

This blank can be folded into the form shown
in Fig. 2 in the usual way, and the free vertical
edges joined, for example, by a tape 11 as usual. 110

The bottom flaps are folded together, and connected to provide the bottom of the container.

According to the present invention, a stay is provided between opposite parallel walls, which is joined to each of these walls and extends parallel to the other pair of walls. In Fig. 2, two such stays are indicated for connecting the two pairs of parallel walls. Each stay 12 may be formed of any desired material having the requisite tensile strength. It has been found that wire, flat strap material, or a fabric such as shoe lacing or the like (preferably saturated with a rubber solution or other water-proofing and strengthening material) may be employed. Such stay should be resistant against tensile stress and should be capable of yielding flexibly adjacent the walls to which it is attached. These stays are passed through the apertures 10.

In order to distribute the stress existing in the stay wire, and to absorb the strain produced by the lading upon each wall, stay plates are provided at these walls. In Fig. 2, each end of each stay is provided with a plate 13 which is located externally of the corresponding container wall, and is connected fixedly to the stay itself.

When the container is assembled and the stays positioned, but with the top and bottom flaps still in plane with their corresponding sides, the assembled blank can be crushed or folded as shown in Fig. 3. Since the pairs of opposite parallel walls are of the same length from edge to edge, they continue to form a parallelogram, regardless of the folding, and since each stay is joined to its pair of walls, and extends parallel to the other pair of walls, the folding does not cause either looseness or excessive tightening of the stays. It is therefore obvious that the assembled container can be shipped flat at no substantially greater cost than ordinary containers: and that it may be immediately prepared for use by opening, and folding in and sealing the bottom flaps. It is then ready for the reception of its lading material, and can be handled and closed in any standard automatic sealing equipment.

In shipment, when loads of bulk material are placed therein, any settling cannot cause bulging of the sides, as the sides are supported by these stays. In the form illustrated in Fig. 2, each pair of opposite walls is supported at its center point, i. e. the point at which a maximum bulging may occur in the normal container: and since this support is parallel to the direction of movement of the wall in bulging, a relatively light stay is sufficient to resist a considerable load.

Since the walls S_1 , S_2 , S_3 , S_4 are held in plane, the container retains its original size and shape, and a number of them can be stacked without difficulties by reason of crushing. For example, it has been found in practice that eight containers each holding fifty pounds of a bulk material such as the crown seals mentioned above, with a total load of 400 pounds, may be stacked, and are then not crushed in shipment.

The stay plates may have many different forms. In Fig. 4 the stay plate is shown as comprising flat portions 14 surrounding a central raised annular rib 15 with a central depression 16. Radial ribs 17 extend between the flat portions 14 for stiffening the plate against warping. The central depression 16 is apertured to permit the passage of the stay, and in this form of construction, the stay 12 is illustrated as being a wire having its end passed through an aperture in the central depression 16 and then back through a second

aperture, the free end of the wire being bent around the length of the stay 12.

It is preferred to provide the stay plates with prongs 18 which are illustrated as being at the four corners of the stay plate, and which serve to engage into the material of the container, and prevent displacement of this plate upon the container wall.

In the form of construction shown in Fig. 6, the stay plate 14a is provided with prongs 18, and has a single aperture 19 adjacent its center to receive the stay 12, which is again illustrated as being of wire or similar flexible material. A lug 20 is struck from the stay plate 14a in a relative outward direction, and bent back into parallelism with the main portion of the plate to provide a hook around which the projecting end 12a of the stay may be bent and secured. Any excess length of wire, for example, may be cut off at the point 21, without danger of the unwrapping of the end of the stay. If desired, the lug 20 may be clinched down to assist further in holding the turns in position.

In Fig. 7, the stay plate 14b has an aperture 19a for the stay wire, and a lug 20a which however is shown folded backward over the aperture 19a. The wire or similar stay 12 is passed through the aperture 19a and wrapped around the lug 20a while it extends for example away from the plate 14b. The lug 20a is then bent downward to grip the turns and hold them against separation.

With these several illustrated forms of construction, the container is set up or assembled as a unit in the usual way. One of the stay plates may be fixed at the end of the stay wire, for example, and then this wire is threaded through the opposite apertures 10 of a pair of walls. A second stay plate is threaded onto the projecting end of the stay, and the spurs 18 are engaged in the material of the walls. The projecting end of the stay may then be secured to the stay plate, as for example in one of the ways described above. In this operation, it is desirable to maintain the opposite walls both plane and parallel.

It is, however, equally possible to assemble the stays and plates in the container without assembling it so far as shown in Fig. 2, as the length of the stay remains the same whether the walls S_1 , S_2 , S_3 , S_4 are at right angles to one another, or are at acute and obtuse angles as shown in Fig. 3.

By this arrangement, it is possible to assemble a container at a container factory and ship it to a manufacturer who completes the assembly, loads and seals the container, and delivers it for shipment.

It is obvious that the invention is not limited to the forms of construction shown, but that it may be employed in many ways within the scope of the appended claims.

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

1. A stay plate for a container comprising a wall-engaging portion having a stay-receiving aperture, and a lug bent out of the plane of said wall for engaging and holding the end of a stay.

2. A container comprising two pairs of opposite parallel walls of fiber board, and a stay joined to each wall of one said pair at a point thereof spaced from all its edges whereby to stiffen the same against bulging, said stay extending parallel to the other pair of walls, said walls being connected so that the container may be folded about the connections of said walls, said stay 150

and the walls parallel thereto remaining parallel throughout the folding operation.

3. A container comprising two pairs of opposite parallel walls of flexible material, a stay plate on the exterior of each wall at a point removed from the edges thereof, and a pair of stays located substantially at a right angle to one another and each having bent portions immediately outside two of said plates and extending through apertures of one pair of said walls and across the container in a direction parallel to the other pair of walls whereby to stiffen the walls against bulging outwardly.

4. A container comprising two pairs of opposite parallel walls of flexible material, a stay plate on the exterior of each wall at a point removed from the edges thereof, and a pair of stays each fixed to two of said plates and extending through apertures of one pair of said walls and across the container in a direction parallel to the other pair of walls whereby to stiffen the walls against bulging outwardly, and permanent corner hinge joints between said walls whereby they may be folded flat together, said stays and walls maintaining parallelism during the folding operation.

5. A foldable container comprising two pairs of opposed parallel walls, a stay plate on the exterior of each wall of one pair, and a stay fixed to said plates and extending through apertures of the walls of said one pair and across the container in a direction parallel to the other pair of walls, and permanent corner hinge joints between said walls whereby they may be folded while maintaining the parallelism of said stay and said other pair of walls, each said stay plate having means for fixing it in position upon its wall so that said stay is maintained in said parallelism.

6. A foldable container of flexible fiber board comprising two pairs of oppositely parallel walls, said walls having extensions hinged thereto for providing the top and bottom of the container, external stay plates including spurs engaged in said walls, and stays for joining the stay plates of pairs of walls, each stay being flexible adjacent its stay plates, permanent corner hinge joints between said walls and about which they may be folded when the top and bottom projections of said walls are in plane with the walls to which attached, said stays being maintained by said plates in parallelism with said walls during folding.

7. A container comprising two pairs of opposite parallel walls of fiber board hingedly connected along their vertical edges, stay plates lo-

cated at the outsides of one pair of said walls at points remote from the edges thereof and secured against movement parallel to said one pair of walls, and a stay attached to said plates and extending across the container parallel to the other pair of said walls for preventing outward bulging of the walls of said one pair, whereby the walls and stay may be folded flat upon one another and opened while the said other pair of walls and the stay maintain their parallelism.

8. A container comprising two pairs of opposite parallel walls of fiber board hingedly connected along their vertical edges, stay plates located at the outsides of one pair of said walls at the mid-height and mid-width of each of the same and secured against movement in the planes thereof, and a stay attached to said plates and extending across the container parallel to the other pair of said walls for preventing outward bulging of the walls of said one pair, whereby the walls and stay may be folded flat upon one another and opened while the said other pair of walls and the stay maintain their parallelism.

9. A stay plate for a container comprising a wall engaging portion having stiffening ribs extending at an angle to one another, and a stay-receiving aperture therethrough at the junction of said ribs and wall-engageable spurs located at outer edges of the wall-engaging portion.

10. A stay plate for a container comprising a wall engaging portion of substantially square shape and having diagonally extending reinforcing ribs and a stay-receiving aperture substantially at the center thereof, and spurs bent out of the general plane of the plate and located at the corners for engaging in the material of a container wall to prevent displacement of said stay plate in the direction of its surface.

11. A foldable container including pairs of opposite walls of flexible material subject to bulging under the action of the contents of the container and joined at the edges for folding, and stay means including a portion extending across the container space between the walls of one said pair at points of said walls remote from the edges thereof, said stay means also including members fixedly secured to said portion and located externally of the walls at said points for distributing the stresses of said stay portions to large areas of the walls, said stay portion being parallel to another pair of said walls and folding with the container while remaining parallel to said other pair of walls.

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