

Sept. 29, 1925.

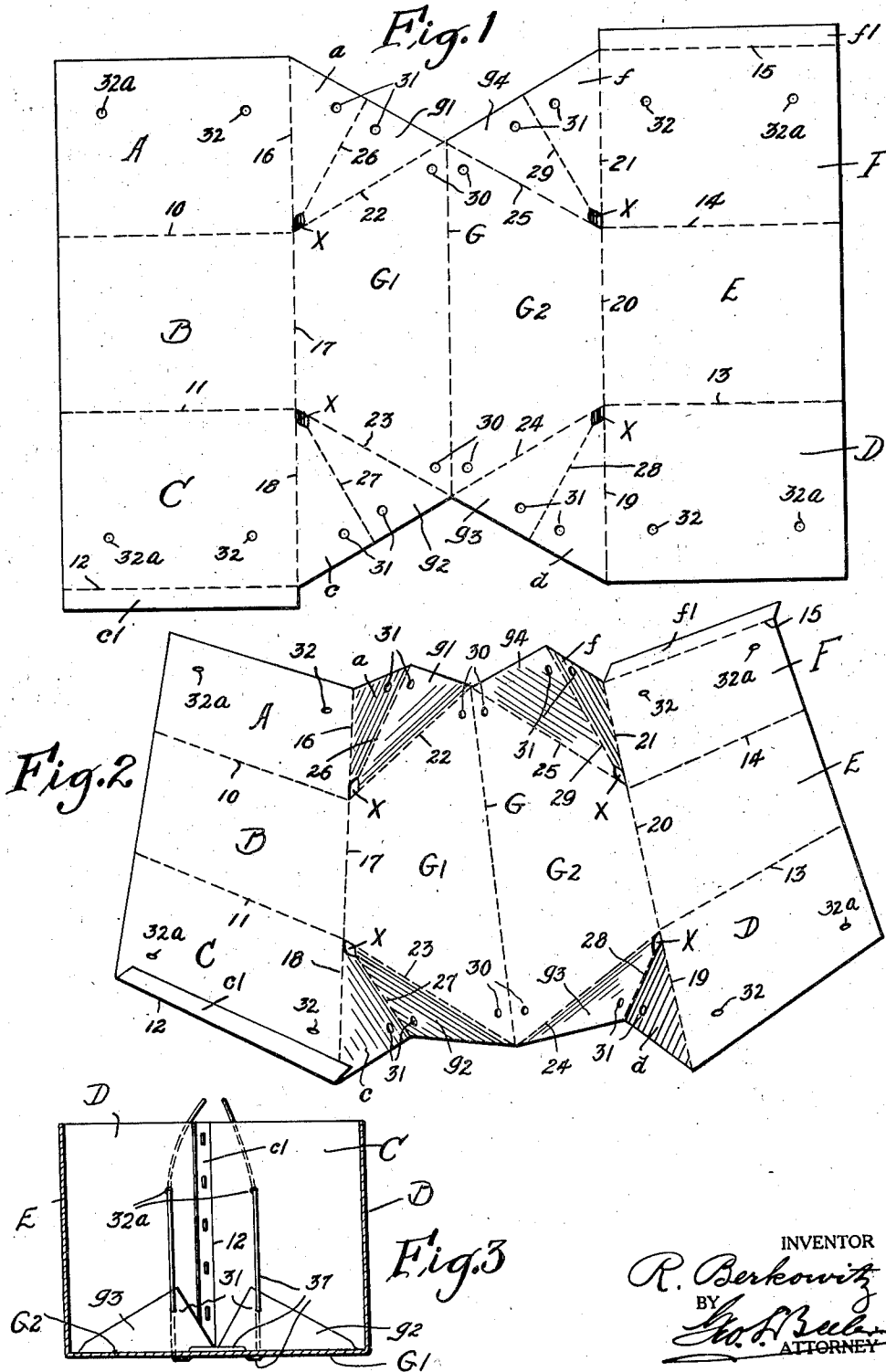
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R. BERKOWITZ

HEXAGONAL FOLDING BOX

Filed Feb. 7, 1925

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4

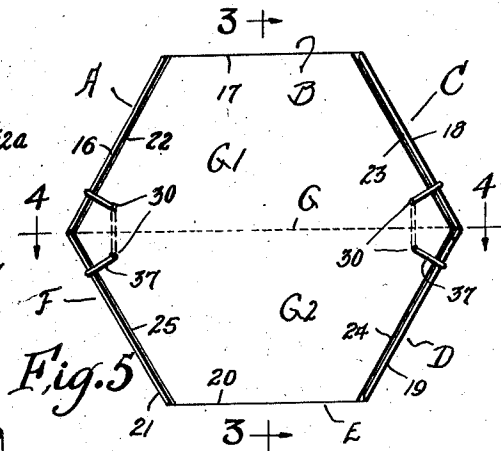
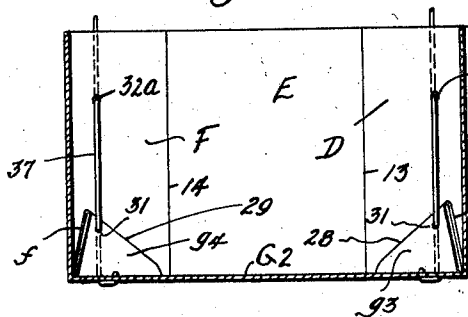


Fig. 6

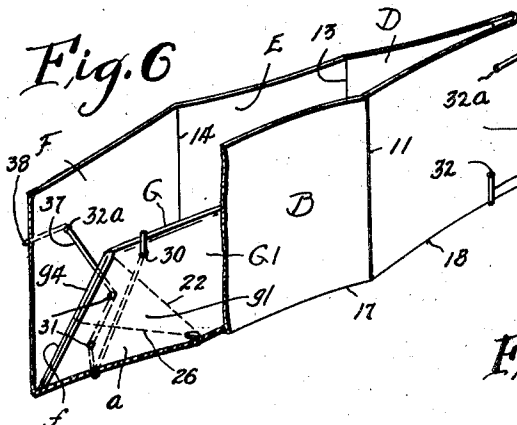


Fig. 7

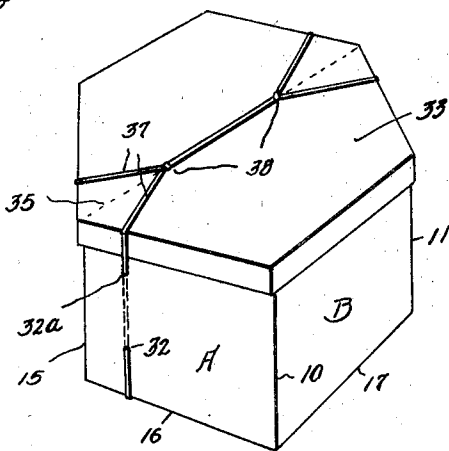
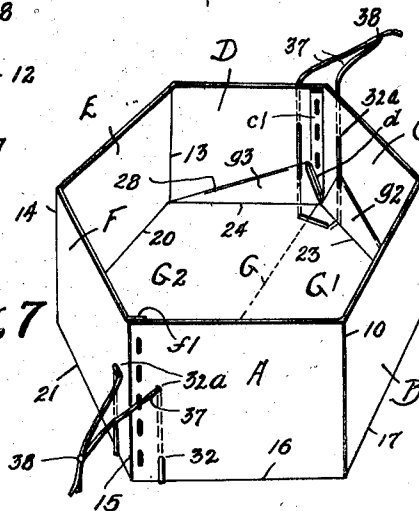


Fig. 8

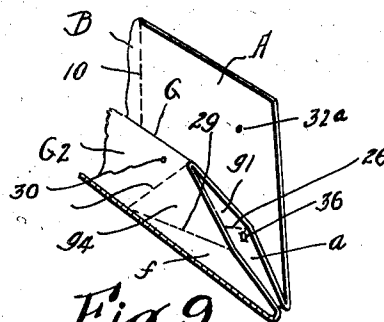


Fig. 9

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HEXAGONAL FOLDING BOX.

Application filed February 7, 1925. Serial No. 7,460.

To all whom it may concern:

Be it known that I, REBECCA BERKOWITZ, a citizen of the United States, residing at New York city, borough of the Bronx, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Hexagonal Folding Boxes, of which the following is a specification.

This invention relates to storage, packing, or shipping receptacles and has particular reference to boxes adapted for the shipping of merchandise, such as hats or other commodities, and adapted for close flat folded or nested form as well as for set up open form in the strongest possible construction, depending upon the quality of the material.

Among the objects of the invention is to simplify and cheapen the manufacture of boxes of this general character and to provide for maximum strength and rigidity in the set up position and for the utmost facility for transforming the box from flat to open form and vice versa.

Another object of the invention is to construct a folding box complete except the top from a single piece of material such piece being of substantially regular form and otherwise so designed as to eliminate waste of material.

A further object of the invention is to provide a folding box having a one-piece bottom made integral with all the side walls and so designed as to be self supporting in erect position without interlocking means, and whereby the box may be repeatedly collapsed or set up for use any number of times.

A still further object of the invention is to provide a collapsible box having self-contained tie means for securing the cover, the tie means being peculiarly designed and arranged to assist in holding the box erect in carrying or holding position coincidentally with the retaining of the cover in place.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings in which

like reference characters designate the same parts in the several views, and in which—

Figure 1 is a plan view of a blank constituting the complete box having a hexagonal bottom and six equal sides.

Fig. 2 is a perspective view of the same blank indicating more particularly the direction of folding of the several parts.

Figs. 3 and 4 are vertical central transverse sections on the corresponding lines of Fig. 5.

Fig. 5 is a bottom plan view of the box in the form shown in Figs. 3 and 4.

Fig. 6 is a perspective view, partly broken away, showing the box in approximately flat form, three of the sides being close against the other sides but with the folded bottom between the two sets of sides.

Fig. 7 is a perspective view of the box without the cover, showing more particularly the relation of the tie means to the box structure.

Fig. 8 is an outside perspective view showing the manner of co-operation between the tie means and the box complete with the cover.

Fig. 9 is a detail view indicating a slight modification.

Referring now more specifically to the drawings and with respect to Fig. 1, the box is indicated as of a regular hexagonal form, although it is to be understood that some of the sides of the bottom might be longer than others and still not depart from the principle of the design shown herein. This figure shows a layout, and for the purpose of clear understanding of the design and manner of assemblage the reader will understand that he is looking at the inner surface of the blank which comprises six vertical side walls A, B, C, D, E, and F, and a one-piece bottom foldable along a central diagonal G parallel to the side walls forming the two equal halves G¹ and G². Formed integral with four of the side walls are triangular webs a, c, d, and f, so lettered as to show the relationship with the side walls to which they are attached, and lying between these triangular webs and the bottom are similarly shaped webs g¹, g², g³, and g⁴ integral with the first mentioned triangular webs respectively.

Adjacent side walls A, B, and C are connected integrally along vertical hinge

lines 10 and 11, and at 12 is another hinge line connecting the binding flange c^1 with the side wall C. Between adjacent side walls D, E, and F are vertical bending lines 13 and 14, while the wall F is connected to its binding flange f^1 along a bending line 15. The bending lines along the bottom edges of the respective side walls are indicated at 16, 17, 18, 19, 20, and 21. The bending lines between the other sides of the bottom and the adjacent triangular webs are indicated at 22, 23, 24, and 25, respectively, and between the several respective pairs of triangular webs are bending lines 26, 27, 28, and 29. These bending or hinge lines just enumerated are shown dotted in Fig. 1.

Each pair of triangular webs are provided with a pair of holes 31 so spaced on opposite sides of the central line of connection between them as to register when the two webs fold upward together, and when so folded these two holes register with a hole 32 formed in the adjacent side wall. Also adjacent to each end of the bottom crease G are a pair of holes 30.

It will be understood that in the formation of the blank the several bending lines will be so stamped as to crease readily but not break. From the flat form and as suggested in part by Fig. 2 the direction of bending or folding will be understood as follows: The bending or crease lines 26, 27, 28, 29, and G may be understood as being lifted or elevated from the original flat position, while all the others may be regarded as being left down or depressed. Otherwise stated, the hinge line 26 being elevated, the bottom or outer surface of the two webs a and g^1 will come directly together and the side wall A will swing around the hinge line 10 toward the bottom side 22 and so that the end edge of the wall A will make connection with flange f^1 . This description of the two webs just referred to is applicable to all the other three pairs. The bottom surface of the bottom parts G^1 and G^2 when the box is folded come together with the bending line G elevated between the two sets of side walls. To facilitate the bending and folding of the parts a bit of the material is cut out at X at the end or apex of each pair of webs, but when the box is set up the parts so mate together that no appreciable opening is observable.

While this specification deals particularly with the body and bottom structure of the box, it will be understood of course that a lid or cover 33 having a marginal flange 34 will be provided, but the construction of the lid may follow any conventional lines. For convenience, however, the lid may be made so as to fold along a central diagonal 35 and nest within the other portions of the box in flat form. Of course the cover

will be designed to fit upon the otherwise open end or top of the box and so hold the box in perfect shape when set up.

When the box is properly folded following the description of Figs. 1 and 2, the web members at each end of the bottom diagonal G are disposed flat against each other, each pair of webs being unfolded or flat against the other pair, see Fig. 6, while the bottom bending line G is elevated. The webs a , g^1 , c , and g^2 , and the bottom half G^1 all lie in the same plane, and the same is true of the other symmetrically arranged portions.

From the flat folded position of Fig. 6 in order to set up or open the box to the form of Figs. 5 and 7, all that is necessary for the operator to do is to strike sharply against the two ends of the structure, with the result that the two end hinge lines 12 and 15 are caused to approach each other, the two side walls B and E spread apart, each pair of end walls A F and C D, flare apart into or toward proper position, the bottom bending line G goes downward and the bottom flattens out, the ends of the bottom carrying down with them the triangular webs directly integral therewith, while the outer webs respectively remain flat against their respective side walls A, C, D, and F. Thus each pair of triangular webs constitute a powerful reinforcement and attachment means for that side of the bottom which would otherwise be unattached to the adjacent side wall.

By providing a suitable fastener such as a staple or its equivalent as shown at 36 in Fig. 9 which passes directly through a side wall and that triangular web that lies against it, it follows that each of these reinforcement connections becomes fixed substantially in such position as to maintain the bottom in positively flat position and strong rigid condition. The folded reinforcement pair of end triangular webs, moreover, occupies practically no space on the interior of the box, it being merely the double thickness of the material. The bottom being flat and held from movement along its perimeter in either direction by the means just described and having in view the fact that along the lines 17 and 20 it is integral with the side walls, the box is exceedingly strong and stiff, and yet it may be folded and used repeatedly if desired.

For the best service I prefer to employ tie means either instead of or in addition to the locking means described at 36. For reasons soon to appear the best arrangement of tie means now known to me consists of two similarly formed loops of tape or the equivalent indicated at 37, and a specific description of the threading and action of either of these loops will be understood as applicable to the other. Beginning on the inside of the box the two ends of the tape are threaded down-

ward through the pair of holes 30, thence the ends are brought directly around beneath the bottom hinge lines 16 and 21 or 18 and 19, and thence threaded inward through the holes 32 and the adjacent holes 31, thence outward through the other holes 31, thence the tapes are carried upward and threaded outward through the holes 32^a at any convenient point just below the lid, and thence the two ends are brought together and knotted at 38. The tapes are preferably of such a length that the parts will lie in flat form as described in Fig. 6, while the knots 38 lie against the adjacent edges of the structure. According to the dimensions of the box the tapes may be extended somewhat for the convenience of fastening them together across the cover 33. Thus as will be observed from Fig. 8, when the box is set up or opened out and the knotted portions of the tapes drawn directly outward, bringing the looped portions of the tape taut, the exposed portions of the tapes being then drawn across the top of the cover and suitably attached to each other, it will be assured that with all the portions of the tapes taut, the web portions and the end portions of the bottom that lie in the plane of and adjacent to the bottom bending lines 22, 23, 24, and 25 will all be positively interlocked, and therefore every portion of the bottom will be anchored to the adjacent side walls and so held stiff and in flat form. Moreover, the tapes so brought together and tied over the cover serve to hold the cover in place as well as reinforcing the upper portions of the side walls. Those portions of the tape, moreover, which extend upward along the inside of the box between the holes 31 and 32^a serve to bind the looped portions of the pairs of webs neatly and securely against their respective side walls.

I claim:

1. A foldable shipping box comprising a polygonal bottom and a series of side walls integral each to each with the corresponding sides of the bottom, the bottom being creased along a diameter for collapsing upward between the opposite side walls, while the side walls are all uncreased and folded flat against the opposite sides of the folded bottom, creased web connections being provided having individual connection between certain of said sides and the adjacent sides of the bottom, said web connections being folded when the box is in open position.

2. A box as set forth in claim 1 in which the bottom is hexagonal and having two of its opposite side walls hinged directly to the adjacent sides of the bottom, while each of

the other four sides is individually connected to its adjacent side of the bottom by means of a web as aforesaid foldable into a double thickness when the box is open.

3. The herein described foldable box of one piece of material so cut and creased as to constitute a hexagonal bottom, six side walls corresponding to the sides of the bottom, two of the side walls being hinged directly and integrally with the adjacent sides of the bottom, foldable substantially equilateral web connections between the other four side walls and the remaining sides of the bottom as an integral construction, one side of each web being free to facilitate the folding of the web upon itself, and means to attach one series of three side walls to the other series of side walls.

4. A box as set forth in claim 3 including tie means to bind the foldable web portions individually against the adjacent side walls making a rigid connection between them and the adjacent sides of the bottom.

5. A box as set forth in claim 3 wherein a plurality of tie cords are provided passing individually through a pair of webs and their adjacent side walls.

6. A box as set forth in claim 3 wherein the bottom is creased longitudinally for folding between the sides when the box is collapsed, and a cord is provided passing through a pair of adjacent webs, their respective side walls, and the bottom upon opposite sides of said crease line whereby the box is retained in open position.

7. The herein described foldable one-piece shipping box comprising a bottom of polygonal form, a series of side walls corresponding to the sides of the bottom, two of said side walls being joined directly and integrally with the bottom, and foldable means located individually between the remaining walls and the remaining sides of the bottom for hinging said remaining side walls to the bottom so as to fold or stand in set up position, each of said foldable means being weakened substantially centrally whereby it can be doubled up to form a strong reinforcement for the adjacent side of the box when the same is open.

8. A box as set forth in claim 7 including a cover and flexible tie means passing through the bottom, the foldable means, and the side walls adjacent thereto for binding such parts in fixed relation to one another when the box is set up and the cover is tied in place.

In testimony whereof I affix my signature.
REBECCA BERKOWITZ.