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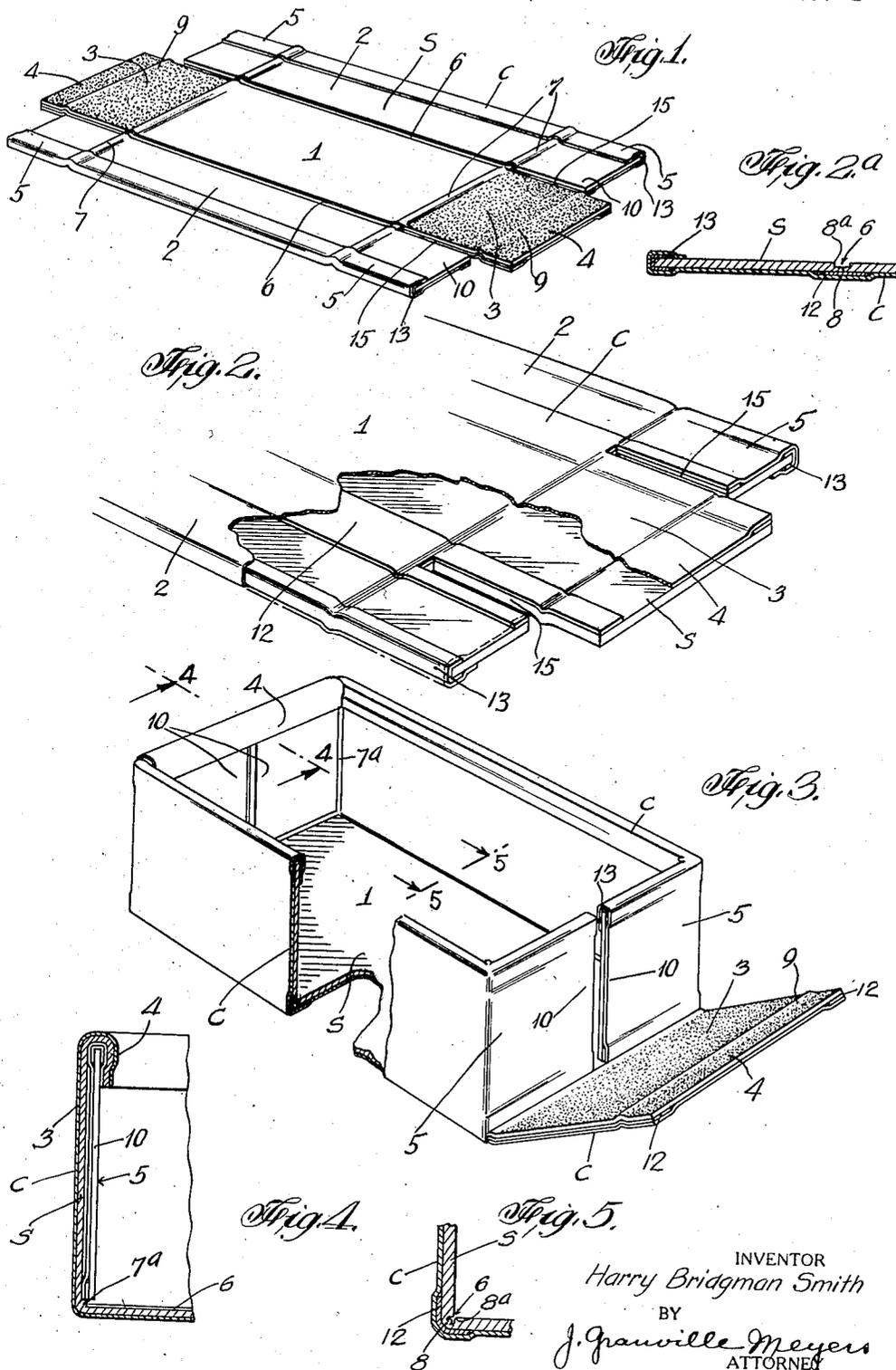
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BOX BLANK AND BOX

Filed Jan. 22, 1927

2 Sheets-Sheet 1



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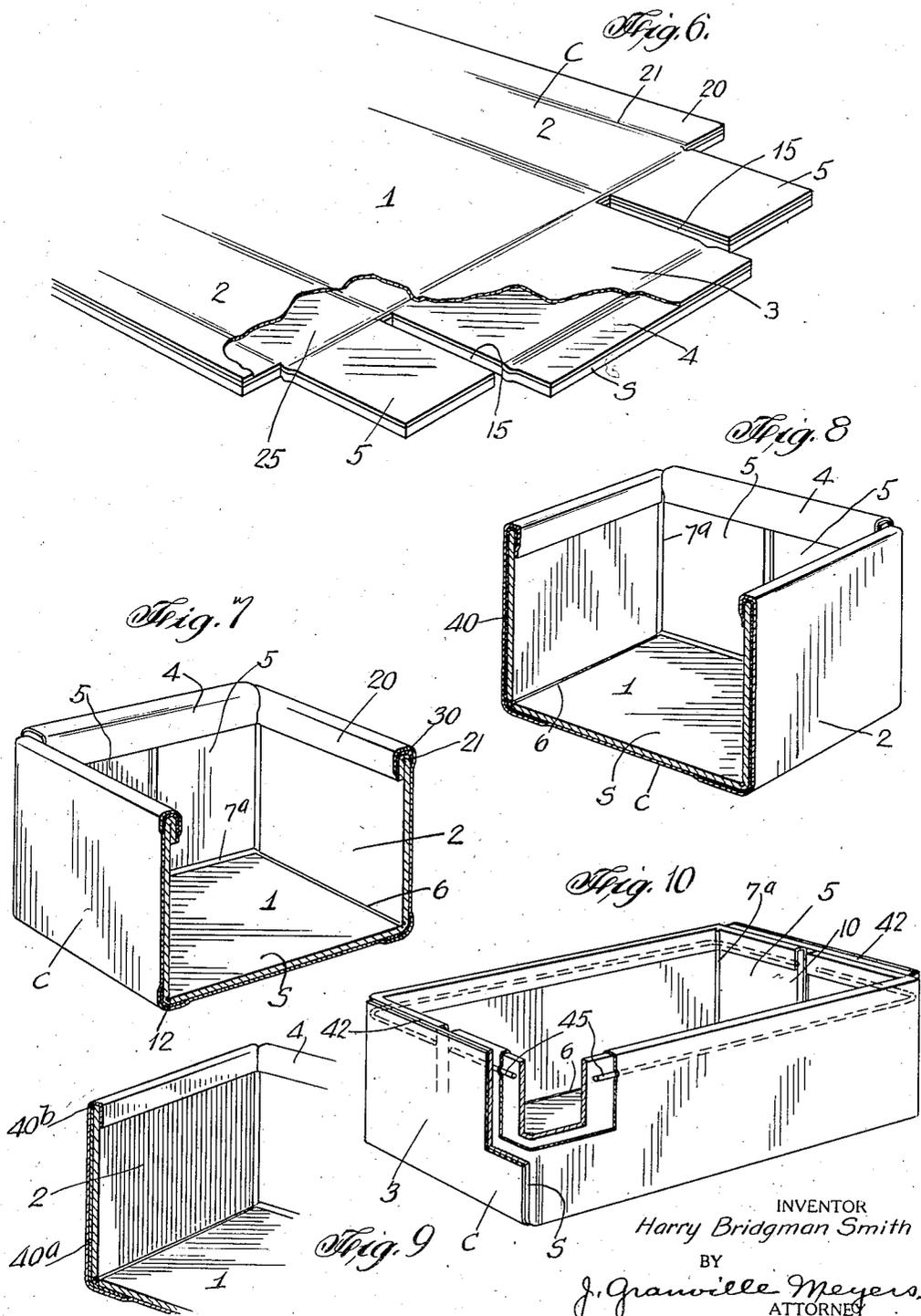
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BOX BLANK AND BOX

Application filed January 22, 1927. Serial No. 162,737.

This application is a continuation in part of my prior applications, Serial Numbers 612,168 and 612,169, filed January 12, 1923.

The invention relates to box blanks and boxes of the class usually referred to as paper sheet material of substantial thickness and stiffness, such as cardboard, strawboard and the like, with or without a sheet of "cover" material, usually paper substantially thinner than the shell material and of a grade suitable to the desired quality of "finish" of the box.

The principal objects of the invention are: To provide a blank or box having novel and improved fold formations, either in the form of bead creases or routed fold channels, either or both of these fold formations being included in a single blank or box.

To provide blanks and boxes having side wing extensions or end wing extensions or both, these extensions being turned in and secured to inner wall faces in the completed box.

To provide reinforcements in the form of strips, sheets or cords, these reinforcements being designed to reinforce fold lines or wall margins or other or larger areas of the box, as later fully explained.

To provide in connection with any or all of the preceding features a covered blank or box in which the shell and cover materials are properly arranged or associated in connection with or relation to the other structural features, such as the improved fold formations, wing extensions and reinforcements.

A general and important object of the invention in addition to or in connection with the preceding objects, is to provide blank and box structures which are especially economical, both with regard to structure and methods of production admitted by the structures, and which are at the same time very strong and durable, and have an attractive appearance or finish with the due regard to the grade of materials employed.

Features embodying all of the above stated objects or advantages are not necessarily employed in a single box or blank, but some of

them may be omitted, while realizing the advantages of others, as sufficiently explained hereafter.

The drawings show representative embodiments of the invention and after considering these skilled persons will understand that many variations may be made, and I contemplate the employment of any structures that are properly within the scope of the appended claims.

Fig. 1 is a perspective view of a blank embodying the invention in one form, showing the reverse or inward face of the blank.

Fig. 2 is a perspective view of one end of the same blank, enlarged, showing the obverse or outside face of the blank, with some parts broken away and sectioned.

Fig. 2A is a fragmentary transverse section, enlarged, showing mainly one of the longitudinal fold formations.

Fig. 3 is a perspective view of a box produced from the blank of Figs. 1 and 2, showing one end completed and the other end partly folded or completed, and showing a central side wall and bottom portion broken away for explanatory purposes.

Fig. 4 is a section at 4-4, Fig. 3.

Fig. 5 is a section at 5-5, Fig. 3.

Fig. 6 is a perspective view of the obverse or outer face of one end of a modified blank.

Fig. 7 is a transverse section of a box produced from the blank of Fig. 6.

Fig. 8 is a similar section of a modified form of box.

Fig. 9 is a sectional view of another modification.

Fig. 10 is a perspective view of a complete box representing another modification including especially cord reinforcements.

These blanks and boxes are well adapted for production by the continuous methods fully explained in the above identified applications. In such continuous methods the various materials, such as the shell, cover and reinforcing materials, may be advanced in the form of continuous webs or strips, associated to form a continuous assembly, operated upon before or after assembly contact to produce blank formations, such as fold formations and slits or cuts to provide for

wing separation, and the continuous assembly may then be severed transversely to produce the individual blanks. Such methods provide substantial economy in production costs in addition to economy and other advantages provided by the blank and box structures themselves. The blanks and boxes here shown are not, however, limited to production by such continuous methods, but may be produced otherwise, for example, by the use of separate blanks, pieces or sheets, associated and formed by hand or machine operations in any suitable way.

In Figs. 1 and 2, the blank consists of a sheet S of suitable shell material such as cardboard, strawboard or the like, with a sheet C of cover material, usually paper of a suitable grade for the class of box in view, applied and adhesively secured to one face thereof. The blank includes the following parts, each of which is composed of a portion of the shell and of the cover sheet: A central or body portion 1; side wings 2, end wings 3, end wing extensions 4 (which may be omitted in some cases), and corner laps 5 projecting from ends of the side wings (although otherwise they might be connected to longitudinal edges of the end wings). The shell sheet or blank is preferably in a single integral piece and so also is the cover sheet. Longitudinal margins C of the cover sheet are folded about the outer edges of the shell side wings and adhesively secured to inward marginal faces thereof and of the connected corner laps 5. Longitudinal fold formations 6 define the adjacent boundaries of the central or body section 1 and side wings 2, and transverse fold formations 7 define the adjacent boundaries or connections of the ends of the body 1 and the end wings 3 and ends of the side wings 2 and the corner laps 5. In a broader aspect of the invention these fold formations may be of any suitable type such as simple scores or creases. Special fold formations are, however, preferably employed; thus the longitudinal fold formations 6 are desirably in the form of channels produced by routing or skiving operations upon the inner face of the shell. In one preferred form, as best shown in the detail section 2^a, these channels are rectangular sections leaving webs 8 of reduced thickness in contact with the cover sheet. The transverse fold formations 7 are desirably in the form of bead creases produced in the combined materials, the convex portions of the beads being on the inner face of the blank (shown in Fig. 1). The end wing extensions 4 are defined by similar bead creases 9 or if these extensions are omitted the end wings may be cut off on a suitable transverse line, the location of this line depending on the depth of the box part to be formed. The length of the corner laps 5 also is dependent upon the width of the box part, since the ends 10 of these laps are

usually brought to approximately abutting relation when the blank is folded (see Fig. 3).

Reinforcements may be provided, consisting of cords or strips of other suitable material, such as cloth or paper, or sheets or webs of paper covering the entire shell surface areas, or such reinforcements may be omitted, in accordance with the box strength necessary for different classes of service. Figs. 1 to 4 show certain types or arrangements of such reinforcements and certain variations will be explained with reference to other figures. In Figs. 1 and 2 strips of suitable sheet reinforcing material, such as cloth or paper 12, are applied and adhesively secured between the outer surface of the shell and the inner surface of the cover, these strips being preferably wide enough to overlap the longitudinal fold formations 6. Other reinforcing strips 13 are applied to the opposite outer margins of overlapping longitudinal edges of the side wings and connected corner laps, these marginal and edge reinforcements being located under the cover sheet and its overturned longitudinal margins c. Separation of longitudinal edges of the corner laps and end wings is provided by longitudinal cuts, or preferably, as shown, by slots 15 in the combined materials extending from the transverse creases 7 to the ends of the blank, and these slots are in line with the longitudinal fold channels 6 and may be of the same width.

The blank is folded to box form, in the manner sufficiently explained in Fig. 3. Before the parts are brought to the positions there shown the side wings 2 with the connected corner laps are bent up at right angles to the main or body section 1. The corner laps are then turned in at right angles to the side wings, as shown at the right in Fig. 3, with their ends 10 in nearly abutting relation. Adhesive is applied either to the outer faces of the corner laps or to inner faces of the end wings, as sufficiently indicated by stippling, in Figs. 1 and 3. The end wings are then brought into contact with the outer faces of the corner laps and pressed to insure adhesion, and if end wing extensions 4 are provided, as shown, they are folded about the upper edges of the corner laps and then down and their adhesive faces are pressed down in contact with inner marginal faces of the corner laps, as shown in the left in Fig. 3. The left hand portion of this figure, and the section of the side wall and bottom fully explain the completed form of the box part produced from the blank of Figs. 1 and 2. When the side wings are folded up, the fold webs 8 of reduced thickness readily bend without strain or cracking of the superposed cover paper or crumpling of the reinforcement strips 12 and in this bending the edges 8^a of the channels are brought substantially together. The folding of the corner laps and of the end

wings is easily accomplished by reason of the deep bead creases, the convex portions of which are forced somewhat inward, as at 7^a, Fig. 4 and this inward displacement of the shell material avoids undue strain upon the cover material and permits the cover sheet to bend smoothly and evenly along the longitudinal corners of the box, without danger of breaking or cracking.

When the covered end wing extensions, such as 4, are provided, as shown, an attractive interior appearance or finish of the box is provided by reason of the fact that the entire inner marginal periphery of the shell is covered and concealed by inturned cover margins. In some classes of boxes this complete inner wall finish may be dispensed with, and in such cases the end wings may be cut off in alignment with the upper edges of the corner laps. In such cases raw shell edges will appear at the edges of the end wings, but this is unobjectionable for certain purposes.

Reinforcing strips 12 greatly strengthen the side and end corners of the box and also facilitate folding of the side wings without danger of breaking or cracking the cover paper. The edge reinforcements 13 very greatly strengthen the entire open wall edge of the box and especially resist strains which are often placed upon boxes of this class in handling; for example, in shoe and other boxes which are placed in stacks on shelves, the box or its cover part (which may be substantially identical with the structure shown but dimensioned to telescope outside it) is often grasped by the hand or a suitable implement inserted under one of the free end edges, and the edge reinforcing materially aids in resisting breaking or tearing under such strains.

Fig. 6 shows a modified blank which is similar to the blank of Figs. 1 and 2, except that the side wings 2 are provided with side wing extensions 20 consisting of combined shell and cover material. Also, the reinforcement in this example is a sheet 25 of suitable fabric or paper coextensive with the entire surface area of the shell and cover sheet, and interposed between them and secured by adhesive. The side wing extensions are defined by longitudinal fold formations 21 which are desirably in the form of bead creases similar to those already described. When this blank is folded to box form, the operations are as already described, with the exception that the side wing extensions are folded in and secured in a manner similar to the folding and securing of the end wing extensions previously explained. When side or end wing extensions are provided, they aid materially in strengthening the peripheral margin of the side walls in resisting handling strains of the character referred to in connection with the edge reinforcing strips.

Fig. 7 illustrates a modification in which longitudinal reinforcing strips 12 are provided at the longitudinal box corners previously described, and edge reinforcing strips 30 are provided, which, in the flat blank, overlie the longitudinal fold formations 21 and adjacent margins of the shell side wings, and also overlie the faces of the side wing extensions 20 being placed between the shell and cover material, as previously explained. The provision of these edge reinforcements in connection with side wing extensions provides an exceptionally strong wall edge structure.

Fig. 8 illustrates a modification in which side wing extensions are omitted and reinforcing strips 40 are provided overlying the entire areas of the side wings, and folded about the free edges and secured to inner margins of the side wings, and these strips are also of such width that they pass about the longitudinal box corners and overlie adjacent longitudinal margins of the body section 1, being located, as in previous examples, between the shell and cover materials. This style of reinforcing provides additional strength for the entire side wall and corner structures.

Fig. 9 illustrates another modification in which the reinforcing strips 40^a do not pass about the free wall edges but terminate at 40^b along the lines of the free side wall edges.

Fig. 10 illustrates another modification in which end wing extensions, such as 4, of Fig. 1, are omitted, leaving raw shell edges 42 parallel to the free edges of the corner laps 5. This type of box also incorporates a modified edge reinforcement consisting of cords 45 applied between the shell and cover material and adhesively secured near the upper edges of the side walls and connected corner laps. These cords, even if of small diameter so that they do not create objectionable bulge in the cover paper, may be of sufficiently high grade to provide great strength and thus powerfully resist outward or bursting strains imposed upon the box walls or especially upon the open edges thereof.

I claim:—

1. A composite box blank comprising a body section with integral side and end wings and corner laps, each of said blank portions including shell material and superposed adhesively secured cover material, the blank having side wing fold lines consisting of strips of the shell material of reduced thickness and having end wing fold lines in the form of deep creases on the outer face of the material forming beads on the inner face.

2. A box blank assembly comprising a central or body section with integral side wings, corner laps extending from the ends of the side wings and end wings between the corner laps and separated therefrom, each of said blank portions including shell material and

superposed adhesively secured cover material and having side wing fold lines) consisting of strips of the shell material of reduced thickness and having end wing and corner lap fold lines in the form of deep creases on the outer face of the material forming beads on the inner face.

3. A box part of paper or similar material including a central or body section, side walls and end wings arranged at right angles to the body section, corner laps hingedly connected to ends of the side walls and located inwardly of the end wing, said box portions each comprising shell material and superposed cover material with marginal portions of the cover material turned in and adhesively secured along inner marginal lines of the box, the structure being strengthened by reinforcing material extending along the outer surfaces of the shell side walls and corner laps and under the cover paper, the outer edges of said material being adjacent the outer edges of the said walls and corner laps.

4. A box part of paper or similar material including a central or body section, side walls and end wings arranged at right angles to the body section, corner laps hingedly connected to ends of the side walls and located inwardly of the end wings, said box portions each comprising shell material and superposed cover material with marginal portions of the cover material turned in and adhesively secured along inner marginal lines of the box, the structure being reinforced by reinforcing material extending along the outer surfaces of the shell side walls and corner laps and under the cover paper, the outer edges of said material being adjacent the outer edges of the said walls and corner laps.

5. A box part of paper or similar material including a central or body section, side walls and end wings arranged at right angles to the body section, corner laps hingedly connected to ends of the side walls and located inwardly of the end wings, said box portions each comprising shell material and superposed cover material with marginal portions of the cover material turned in and adhesively secured along inner marginal lines of the box, the structure being reinforced by strips of reinforcing material extending along the outer surfaces of the shell side walls and corner laps and under the cover paper and having their outer edges near the free edges of said walls.

6. A box blank assembly comprising a body section with integral side wings, end wings, and corner laps, and creased on folding lines, and having reinforcing strips along the folding lines on the outer face of the blank, and having other reinforcing strips at the edges of the laps and the wings with which they are connected which will be at the top of the box part when it is folded.

7. A box blank assembly including con-

nected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with corner laps and extending onto the corner laps.

8. A box blank assembly including connected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with corner laps, and extending the full length of said wings and corner laps.

9. A box blank assembly including connected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps, and extending onto the corner laps.

10. A box blank assembly including connected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps, and extending the full length of the said wings and connected corner laps.

11. A box blank assembly including connected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps and extending onto the corner laps, and between the body section and the wings provided with corner laps and extending onto the other wings and upon the corner laps.

12. A box blank assembly including con-

5 nected shell and cover materials, and comprising a body section, with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps and reinforcing strips located between the cover and shell material at the juncture of the body section and side wings.

10 13. A box blank assembly including connected shell and cover materials, and comprising a body section with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, and reinforcing strips between the materials positioned to lap over the free edges of the alternate wings and corner laps and to lie upon the fold lines between said wings and the body.

15 14. A box blank assembly including connected shell and cover materials, and comprising a body section with integral side and end wings, and corner laps extending from the ends of the alternate wings of an aggregate length substantially that of the other or intermediate wings whereby to substantially abut when lapped upon said other wings, said other wings having extensions to be folded inwardly upon the corner laps, and reinforcing strips between the materials positioned to lap over the free edges of the alternate wings and corner laps and to lie upon the fold lines between said wings and the body, and substantially coextensive with the said wings.

20 15. A box blank assembly including connected shell and cover material, and comprising a body section with integral side and end wings, and corner laps extending from the ends of the alternate wings, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps, and lapping over the free edges of said wings onto the inner faces thereof.

25 16. A box blank assembly including connected shell and cover material, and comprising a body section with integral side and end wings, and corner laps extending from the ends of the alternate wings, and reinforcing strips located between the cover and shell materials along the outer edges of the wings provided with the corner laps, and along the corner laps, and lapping over the free edges of the wings and lapping onto the inner faces thereof.

30 17. A box part of paper or the like, including a body section, side and end walls at right angles to the body section, corner laps hingedly connected to ends of similar opposite walls and located inwardly of the other walls, said box portions each comprising shell material and superposed cover material, the structure being strengthened by reinforcing material extending along outer wall surfaces of the shell and under the cover paper and along the outer edges of the wings provided with the corner laps.

35 18. A box part of paper or the like, including a body section, side and end walls at right angles to the body section, corner laps hingedly connected to ends of similar opposite walls and located inwardly of the other walls, said box portions each comprising shell material and superposed cover material, the structure being strengthened by reinforcing material extending along outer wall surfaces of the shell and under the cover paper and along the outer edges of the wings provided with the corner laps, and lapping over the free edges of said walls onto the inner faces thereof.

Signed at New York city, in the county of New York and State of New York, this 19th day of January, A. D. 1927.

HARRY BRIDGMAN SMITH.

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