Feb. 3, 1925. 1,525,360

H. BLANDFORD

UNIT BOX STRUCTURE

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Fig. 8.

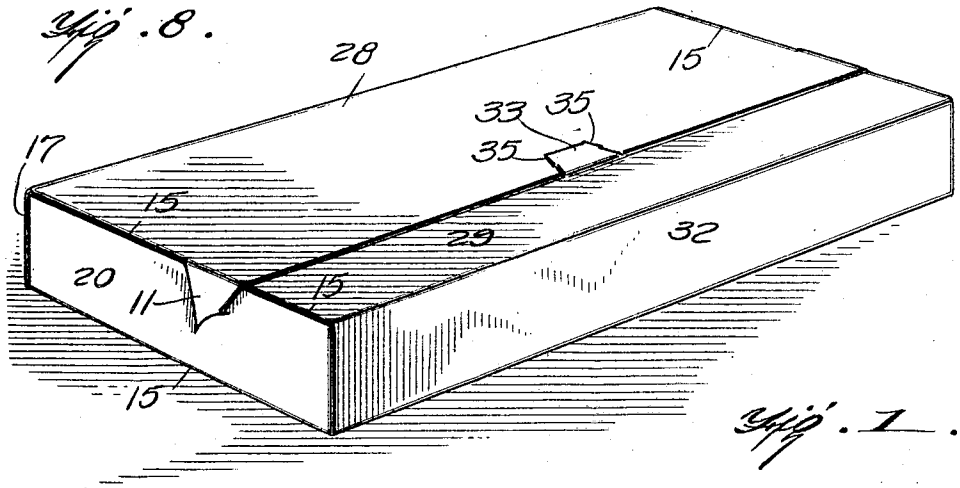
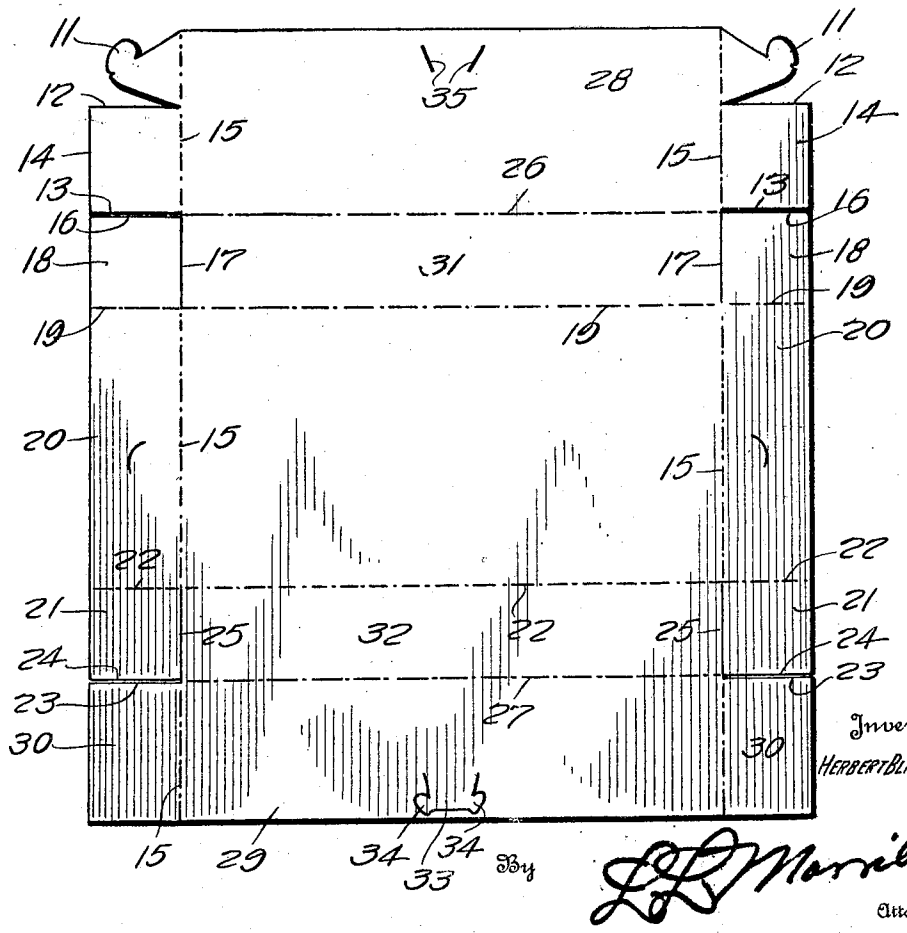


Fig. 1.



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UNIT BOX STRUCTURE

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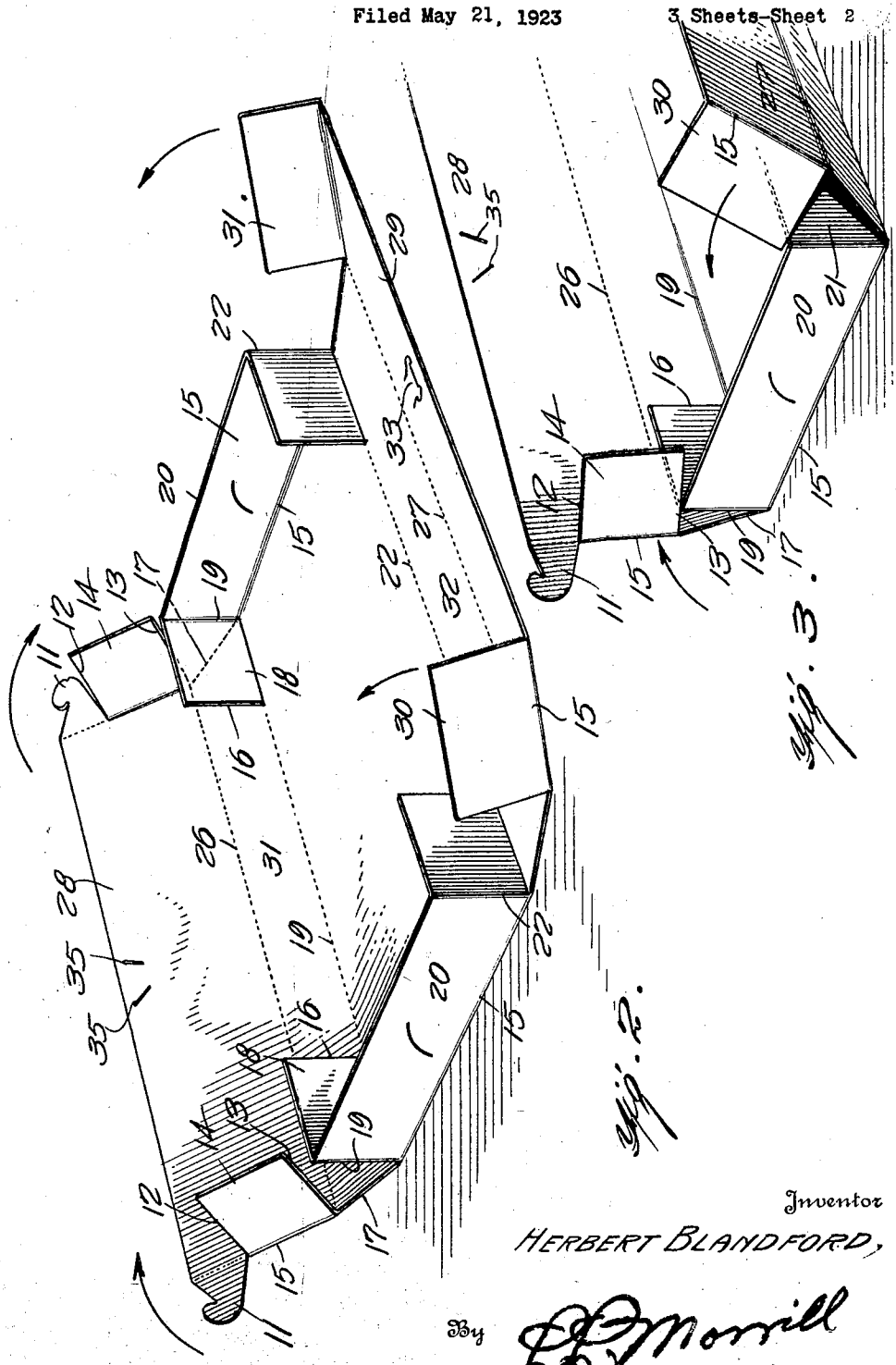


Fig. 3.

Fig. 2.

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UNIT BOX STRUCTURE

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Fig. 4.

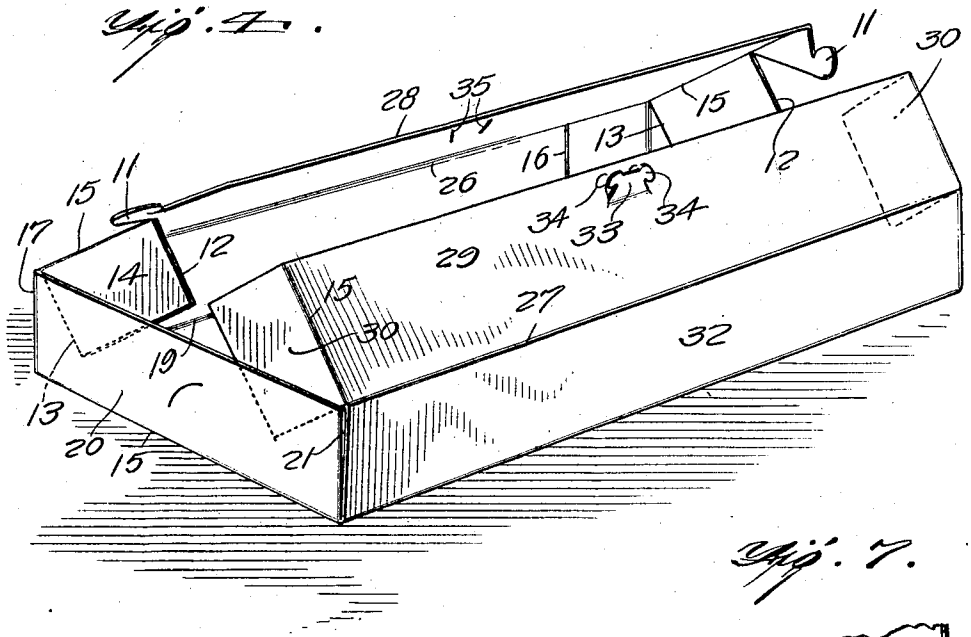


Fig. 7.

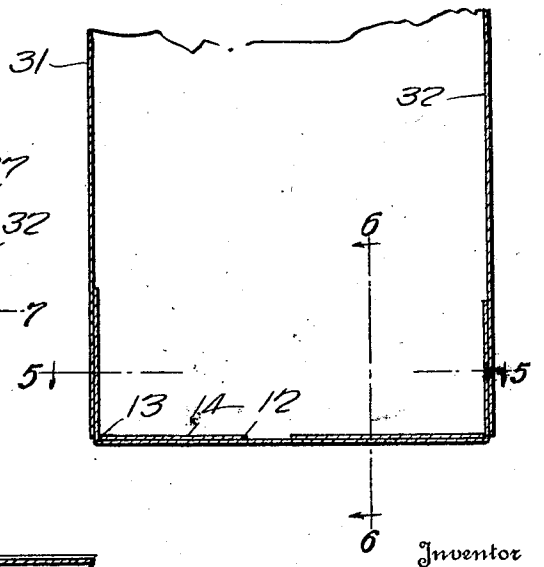


Fig. 5.

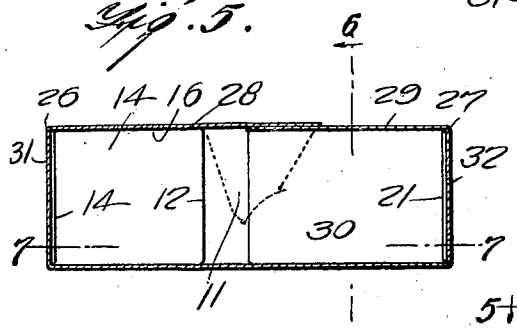
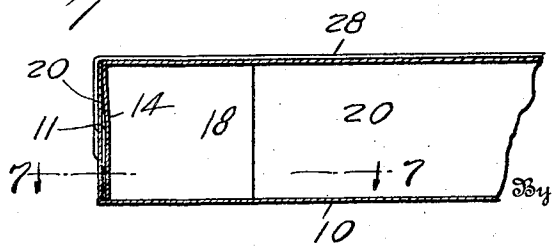


Fig. 6.



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Patented Feb. 3, 1925. 1,525,360

UNITED STATES PATENT OFFICE.

HERBERT BLANDFORD, OF LOCKPORT, NEW YORK.

UNIT BOX STRUCTURE.

Application filed May 21, 1923. Serial No. 640,594.

To all whom it may concern:

Be it known that I, HERBERT BLANDFORD, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Unit Box Structures, of which the following is a specification.

This invention relates to unitary or folding boxes and has for an object to provide a box constructed of the minimum material and presenting the maximum rigidity when folded.

A further object of the invention is to provide a box constructed of a rectangular piece of material, practically the entire area of said rectangle being employed in the making and stiffening of the box structure.

A further object of the invention is to provide a unitary or folding paper box having inturned integral flaps bearing against other parts of the box structure providing for stiffening and adding rigidity to the box at each of its corners and in all directions.

With these and other objects in view the invention comprises certain novel parts, combinations, arrangements and functions as disclosed in the drawings, together with equivalents thereof, as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a plan view of the blank showing in full lines the cut edges and margins and in dotted lines the scoring;

Figure 2 is a perspective view of the first steps in the folding of the box from the blanks shown at Figure 1;

Figure 3 is a perspective fragmentary view showing a further step in the folding of the box.

Figure 4 is a perspective view of the last step in the folding of the box preceding its entire closing;

Figure 5 is a transverse sectional view showing section lines of Figures 6 and 7;

Figure 6 is a longitudinal sectional view taken on line 6—6 of Figure 5 and showing line 5—5, the plane of Figure 5;

Figure 7 is a horizontal sectional view taken on line 7—7 of Figure 5 and showing section lines 5—5 and 6—6 of said figures respectively;

Figure 8 is a perspective view of the completely folded and locked box.

Like characters of reference indicate corresponding parts throughout the several views.

It is well known that in the construction and production of paper boxes one of the very desirable features in the conservation of material, another being rigidity and strength. The question of strength depends largely upon the stock, while the conservation and rigidity depend largely upon the construction, including the cutting and folding.

The present box embodies the maximum of conservation, in that it is cut from a single substantially rectangular sheet of paper or like material, indicated at 10 in Figure 1, the only waste being the slight amount removed from about the tabs 11 which serve as locks. The locks, represented by the tabs 11, however, form the subject matter of a separate application filed coincidentally herewith, and are not claimed per se in the present application.

The rectangle 10 is cut upon the lines 12 and 13 to produce a flap 14 connected with the blank by the score line 15 which extends entirely across the blank, spaced equally distant from the edge. The cut line 13 is also separated by a small space from the cut line 16, which, together with a second cut 17 provides a flap 18 foldable upon the score line 19, which extends entirely across the blank, as shown.

It will be understood that these flaps and their manners of connection and attachment are duplicate on opposite ends of the box. The folding of the flaps 18 on the score line 19 provides end sections 20 which, when turned upon the score line 15, as previously described, stand substantially perpendicular to the plane of the blank, turning the flaps 18 inwardly to the position shown at Figure 2 to rest upon the bottom of the box defined as the blank 10, the said end section 20 and flaps 18 defining the height of the box.

Attached to the end section 20 opposite the flaps 18 are similar flaps 21 which are attached to the end sections 20 at the score line 22, with cut lines 23, 24 and 25 similar in all respects to the cut lines 13, 16 and 17, said flaps being similarly folded.

By reason of the score lines 26 and 27, in addition to the score lines 19 and 22, cover sections 28 and 29 respectively are formed, the former carrying the flaps 14 and the latter provided with similar flaps 30, also

folded upon the score line 15. Connection of the cover sections 17 and 28 with the body portion of the blank 10 by the score lines 19, 22, 26 and 27 provides side sections 31 and 32.

The cover sections 28 and 29 are provided with some form of inter-locking means, here shown as a tongue 33 cut out of the cover section 29 provided with ears 34 to engage in slots 35 cut in the cover section 28, the cover section 28 being inserted between the tongue 33 and the cover section 29, although the specific type of lock is immaterial in the present application, forming the subject matter of a co-pending application.

In folding the blank cut as shown at Figure 1, the flaps 18 and 21 are first folded substantially at right angles to the end sections 20 upon the score lines 19 and 22 and the end sections then folded upon the score lines 15 to the position shown at Figure 2. The next step is folding the blank upon the score lines 19 and 22 to bring the side sections 31 and 32 adjacent to the flaps 16 and 21, as shown more particularly at Figure 3. The flaps 14 and 30 are now folded inwardly upon the score line 15 until they pass over the upper edges of the flaps 16 and 21 and are inserted inside of the end sections 20 as the cover sections 28 and 29 are folded downwardly, such action being indicated by comparison of Figures 3 and 4. The width of the flaps 18, 21, 14 and 30 is substantially the depth of the box, so that the opposite edges of all of these flaps rest not only squarely and firmly upon the bottom of the box, but also extend along the upper limit of the box, indicated in one case by the fold on the score lines 26 and 27 and limited by the cover sections 28 and 29. In view of the fact that these flaps, interlocking as they do and bearing in opposite directions upon both surfaces of the box, the maximum rigidity is provided at the corners. Distorting the box is, therefore, possible only by the bending or crumpling of the inturned flaps. Distorting the box in opposite directions is, of course, resisted by the bottom, so that a box of the maximum rigidity is provided, and by the use of the minimum amount of material. By making the box of material presenting considerable resistance to bending, a box of very great rigidity is provided.

When the cover sections 28 and 29 are completely folded they are locked in such position by the locks represented by the tabs 11 and 33, although it is to be understood that any usual and ordinary or preferred type of locking means may be substituted for the specific types of locking means shown, without departing from the present invention, such locking members forming the subject matter of other patent applications.

What I claim is:

1. A unit box structure adapted to be folded and knocked down composed of a substantially rectangular sheet of material folded upwardly at right angles to the plane of the box and having flaps foldable inwardly from both directions some bearing upon the bottom and top and others extending from the top bearing upon the bottom of the folded box extending both directions from each corner.

2. A unit box structure adapted to be folded and knocked down composed of a sheet of flexible material folded to form a bottom, sides, ends and overlapping top sections, and integral flaps carried by some of the sections folded inwardly to bear upon the top and bottom of the box extending in both directions from each of the corners and others extending from the top and bearing upon the bottom.

3. A unit box structure adapted to be folded and knocked down composed of a single sheet of foldable material having end sections folded substantially at right angles to the bottom and provided with inturned flaps substantially the height of the end sections and the box, side sections having a height equal to the height of the end sections and folded into contact with the inturned flaps, cover sections carried by the side sections and foldable over the top of the box to overlap, and flaps carried by the cover sections insertible within the box area into engagement with the end sections, said flaps extending in opposite directions from each corner, being of substantially the height of the box and bearing firmly against the bottom of the box.

4. A unit box structure adapted to be folded and knocked down composed of a single sheet of foldable material having end and side sections upstanding from the bottom and overlapping folded cover sections, and reinforcing brace members carried integrally by some of said folded parts and extending in both directions from each corner internally of the box from each of the corners and bearing firmly against the bottom of the box.

In testimony whereof I affix my signature.

HERBERT BLANDFORD.