May 20, 1958 L. F. STONE 2,835,431

FIBREBOARD SHIPPING BOX

Filed Feb. 21, 1956

Fig. 1.

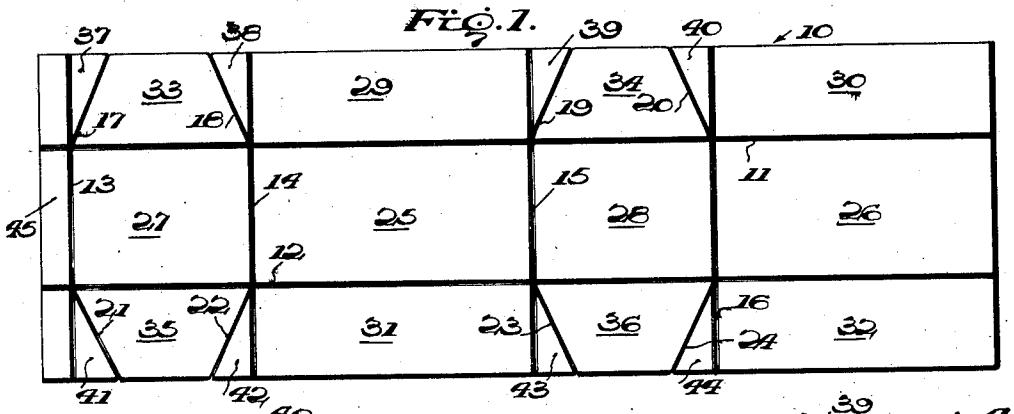


Fig. 3

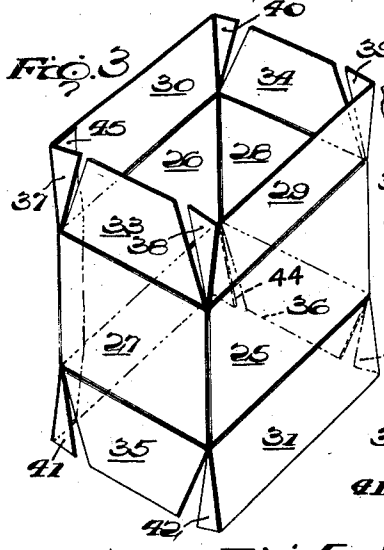


Fig. 2.

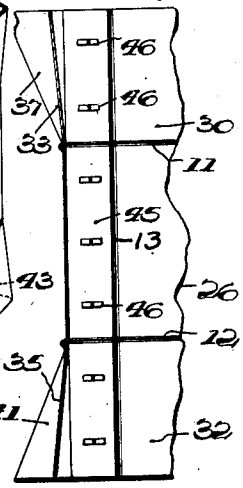


Fig. 4.

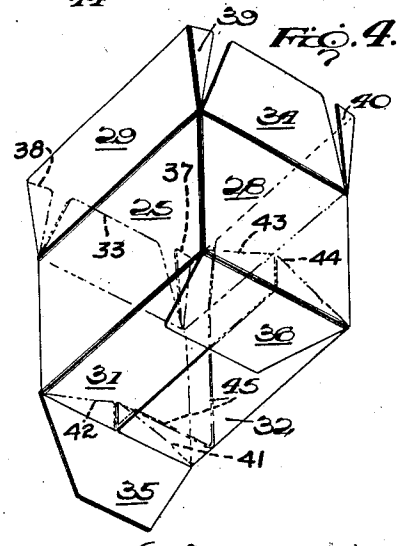


Fig. 5.

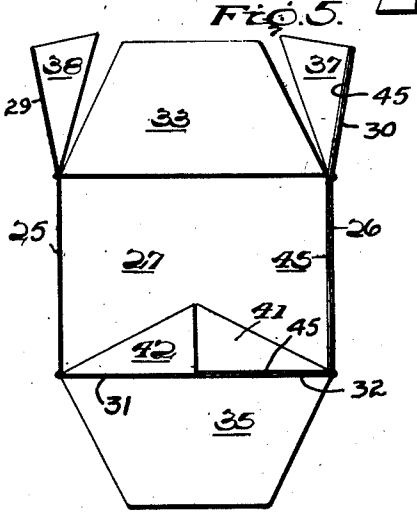
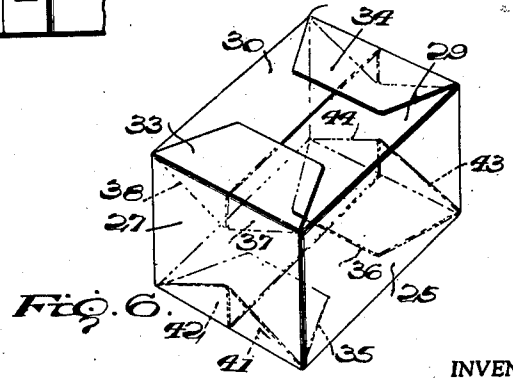


Fig. 6.



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2,835,431

FIBREBOARD SHIPPING BOX

Leslie Frank Stone, Chicago, Ill., assignor to the United States of America as represented by the Secretary of the Army

Application February 21, 1956, Serial No. 567,039

1 Claim. (Cl. 229—38)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to shipping boxes or containers, and among other objects, aims to provide a shipping box which is easily set-up, which is made from a single piece of fibreboard, and which is internally and externally braced against blows and compressive stresses. In general, the invention represents an attempt to provide a box of maximum strength from a minimum of material. A further object is to provide a box cut and scored from a sheet of commercial fibreboard and so designed that there is no waste or scrapped fibreboard. Other objects will be apparent from the following description of a preferred embodiment of the invention shown in the accompanying drawings forming a part of this specification.

In said drawings,

Fig. 1 is a plan view of the box blank as it appears after being cut and scored;

Fig. 2 is a fragmentary sectional elevation showing the setting-up flap stapled to the box on the inside;

Fig. 3 is a perspective view of the box partly set-up;

Fig. 4 is a perspective view of the box, viewed from another angle, and showing a further step in setting-up the box;

Fig. 5 is a vertical cross section through the box of Fig. 4; and

Fig. 6 is a perspective view of the box completely set-up and closed, ready for sealing, stapling or other final steps.

Referring particularly to the drawings, the box blank **10** shown in Fig. 1 is a practically perfect rectangle, as clearly shown. Such a blank can be cut and scored in one operation by automatic machinery, without any waste of the fibreboard. The blank **10** has two longitudinal, parallel score lines **11**, **12** and four transverse, parallel score lines **13**, **14**, **15**, **16**, also eight slits or cuts **17–24** inclusive. These score lines and slits define side walls **25** and **26**, end walls **27** and **28**, top flaps **29** and **30** attached to and adapted to be bent inwardly from the side walls, bottom flaps **31** and **32** attached to and adapted to be bent inwardly from the side walls, trapezoidal flaps **33**, **34**, **35** and **36** attached to and adapted to be bent inwardly from the end walls, right triangular flaps **37–44** inclusive, and a setting-up or securing flap **45** adapted to be stapled, glued or otherwise secured to the opposite end of the box blank when the latter has been brought into adjacency in the setting-up operation. Staples **46**, Fig. 2, show how the securing may be effected.

The side and end walls may be of any convenient dimensions and proportioned in such a manner as to insure a maximum efficiency in use of the box. The top flaps **29** and **30** are rectangular and have lengths equal to the lengths of the side walls while their widths are equal to one-half the width of the box measured on the inside, so that when the top flaps are closed (Fig. 6) their free edges will meet or be in substantial contact, thus

substantially closing the top of the box. The bottom flaps **31** and **32** are exactly like the top flaps, and they substantially close the bottom of the box as shown in Fig. 4. Further to close the box at the top and the bottom, also to support loads better and resist blows, the trapezoidal flaps **33—36** are bent inwardly to lie outside the top flaps **29**, **30** and outside the bottom flaps **31**, **32**, as shown in Fig. 6. This arrangement of end-wall-attached flaps is one of the features of the invention.

The box is further strengthened and braced at its ends and corners by the right-triangular flaps **37–44** inclusive, all but two of which are attached to the top and bottom flaps **29**, **30** and **31**, **32** by score lines, hence are bendable at right angles, as will be clear from Figs. 3 and 4. Right-triangular flaps **37** and **41** are directly attached to the setting-up flap **45**, which itself is bendable into three portions because of score lines **11**, **12**. When the box is set-up, end wall **27** is braced at the top by flaps **37** and **38** and at the bottom by flaps **41** and **42**. Flaps **37** and **41**, being integral with the setting-up flap **45** (and the latter being stapled to bottom flap **32**, side wall **26** and top flap **30**) provide especially firm support. As the two triangular flaps at the top and also at the bottom of each end wall are in contact along their short sides or edges (Fig. 6) and as the goods inside the box normally will hold the triangular flaps in such contact, the box corners are strengthened. Generally speaking, the box of the invention has far more strength at its ends, especially the corners and joints, than along its sides. Thus the box is particularly useful for shipping goods, since it will resist blows, rubbing, compression and other stresses at its ends. The top and bottom are also strong, permitting stacking of filled boxes one on the other without crushing at the joints.

It will be observed that the box of the invention does not waste one square inch of material, all of the blank **10** being used, and no scrap being formed when cutting the blank. The provision of the trapezoidal flaps **33**, **34**, **35**, **36** makes possible the forming of eight right triangular flaps, the hypotenuses of the right triangles being formed by the same cuts or slits **17–24** inclusive which form the non-parallel sides of the trapezoids.

As the described box has least thickness and strength in the central portions of the side and end walls and centrally of the top and bottom, it may be strengthened by layers of fibreboard on the inside, and this may be particularly advantageous if some heat insulation is desirable. The triangular flaps may be secured by adhesive to the end walls and the trapezoidal flaps may likewise be secured, or they may be stapled or taped to the top and bottom.

The described box is believed to be unique in providing maximum strength from a minimum of material.

What I claim is:

A box for shipping goods, formed from a single blank of fibreboard without waste of material, comprising, in combination, two identical side walls, two identical end walls integrally connected along three spaced parallel fold lines, one of said identical side walls terminating in a free edge, one of said end walls terminating in an elongated bendable setting-up flap, a top consisting of two identical flaps integral with the side walls and two identical flaps integral with the end walls, a bottom consisting of two identical flaps integral with the side walls and two identical flaps integral with the end walls, all four flaps which are integral with the end walls being trapezoidal and outside the other flaps at both the top and bottom to protect the top and bottom of the box against compressive stresses, all four of the flaps which are integral with the side walls each having identical right-angled triangular flaps integral therewith at the ends thereof adjacent said fold lines and said elongated bendable setting-up flap

having two like identical integral right angle triangular flaps, the said setting-up flap being stapled to the said free end of said identical side wall, the adjacent pairs of right angle triangular flaps being bent and fitting inside the two identical end walls at both the top and bottom of the box with their adjacent base portions in abutting relationship and lying directly in contact with the end walls whereby to reinforce the ends of the box at the top and bottom thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 23,204	Zinn	Mar. 7, 1950
1,587,038	Sandor	June 1, 1926
1,987,647	Wellman	Jan. 15, 1935
2,652,970	George	Sept. 22, 1953