

Feb. 7, 1939.

E. PULSIFER

2,145,993

BOX

Filed June 23, 1933

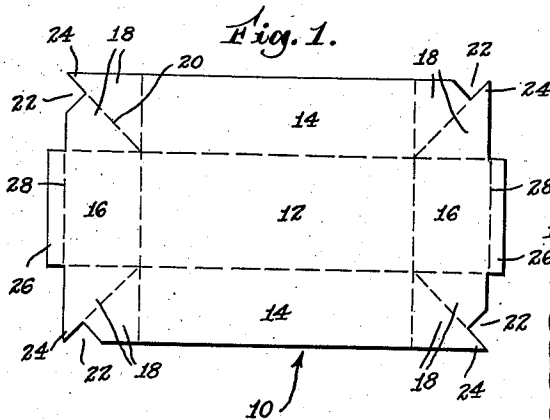
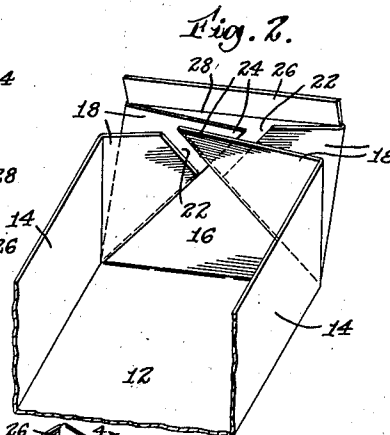


Fig. 3.

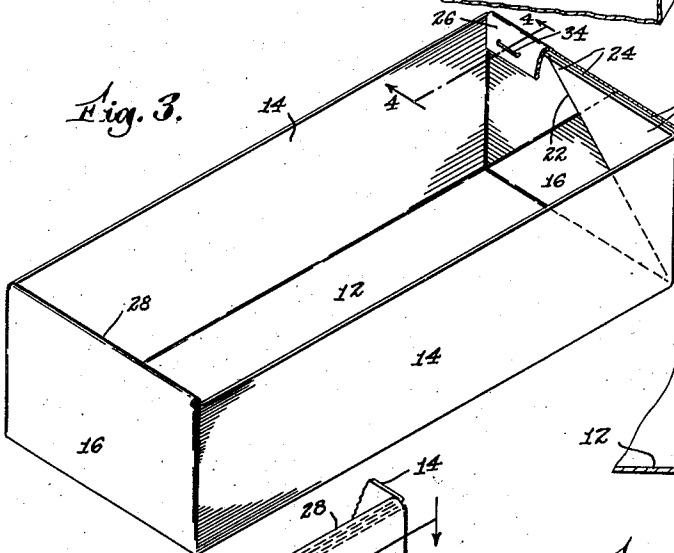


Fig. 4.

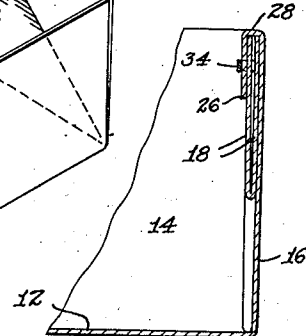


Fig. 5.

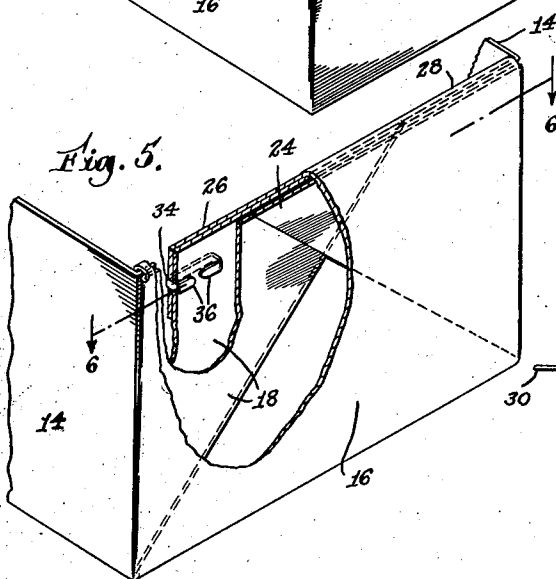
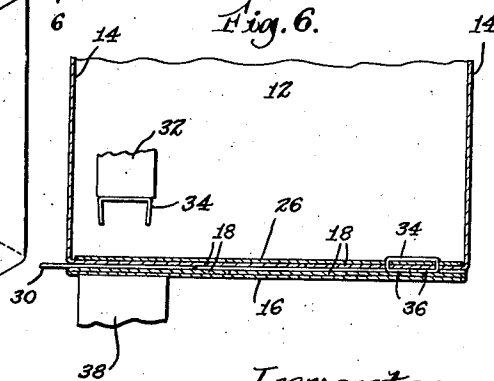


Fig. 6.



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UNITED STATES PATENT OFFICE

2,145,993

BOX

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Application June 23, 1933, Serial No. 677,182

7 Claims. (Cl. 229—31)

This invention relates to boxes and box blanks, and more especially to such as are constructed of a single foldable sheet. Boxes of cardboard and the like are most commonly manufactured by folding a blank into box form and pasting the overlapping faces together. As thus manufactured, it is obvious that the box must be constructed in box form at the factory and shipped to the consumer in this form, such shipments being bulky, inconvenient and expensive. One object of my invention is the production of an improved box blank consisting of a single sheet which can be shipped flat and thereafter quickly and conveniently set up into box form as and where used, thus eliminating much expense and labor heretofore required.

The box blank of my invention is a single sheet creased at the fold lines and adapted quickly to be folded on these lines to provide full and secure side and end walls, and the construction is such that only folded edges and finished exterior surfaces are exposed. The end walls furthermore include folded portions having overlapping ears fitting into formed recesses in a manner producing flat and flush folds within the end walls. The box, and more especially the end walls, are firmly held in the set up condition by a flap on each end panel folded inwardly and downwardly against the end wall and secured to the adjacent fold of said portions. The production of a blank and box of this nature comprises another object of the invention.

A further feature of the invention resides in the production of an improved box adapted to be quickly and conveniently folded up from a flat blank and firmly secured, all by automatic machinery, thus permitting the blanks to be shipped flat to the consumer where they can be rapidly formed into boxes as needed. The blank is of the nature above set forth and wherein said folded portions in the end walls are adapted to receive a relatively thin clinching anvil therebetween. When the box has been folded, staples are driven outwardly through the end wall flaps and these staples are clinched over within the walls by said anvil, thus quickly and firmly securing the parts together without exposing the staples at the exterior of the box. Such an improved box and the method of producing the same comprises a further object of the invention.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which

Fig. 1 illustrates the box blank of my invention;

Fig. 2 is a fragmentary view of one end of the blank partially folded into box form;

Fig. 3 is a perspective view of the finished box;

Fig. 4 is a fragmentary sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is an enlarged end view of the box, partially broken away;

Fig. 6 is a sectional plan view taken on line 6—6 of Fig. 5 and showing the stapling operation.

The blank 10 comprises a single sheet of foldable material creased along the broken lines (Fig. 1) whereby to be folded into box form and provide a bottom panel 12, side panels 14, and end panels 16. Portions 18 connect the side and end panels at the corners and each such portion is creased diagonally as indicated to provide a fold line 20. Each portion is also cut out to provide a recess 22 at one side of the fold line and also to provide an ear 24 at the opposite side thereof. A foldable flap 26, creased at 28, is provided on the extreme outer end of each end panel 16 for the purpose of binding the parts together and holding the blank in folded relation as hereinafter described.

The blank may be easily and quickly folded in the manner illustrated in Fig. 2. The side panels are folded upwardly, the portions 18 folded inwardly and the end panels folded upwardly. When all the panels are brought fully to the upright position, the ears 24 overlap and each ear fits within the recess of the adjacent portion fold and is flush therewith. The flaps 26 are then folded inwardly, on the lines 28, and downwardly over and against the inner face of the fold portions. These flaps may be secured to the adjacent face of the end wall in any manner desired and when thus secured the end and side walls are very substantially supported. As thus folded, it will be noted that each portion 18 provides two adjacent sections lying in inner and outer planes and that the inner and outer sections of the two adjacent portions at each end of the box lie respectively in these inner and outer planes, the two ears 24 overlapping each other and also lying respectively in said planes. It will be readily apparent that such construction provides a perfectly flat end with the parts overlapping in a manner greatly strengthening the box.

My invention furthermore contemplates a novel and convenient method of securing the flaps 26 in the folded position shown in Figs. 3-6. This method consists of so stapling the flaps that

the exterior surface of the box is left intact. It will be noted that the interior of the two folds of each portion 18 is open at the corners of the box whereby a relatively thin anvil 30 may be slipped thereto. The stapling is performed by means of a hammer 32 driving a staple 34 outwardly through the flap 26 and one fold 18, and clinching the staple over at 36 on the anvil 30, a supplementary anvil or support 38 being provided outside the box. Thus the flaps are quickly secured in place without affecting the exterior surface of the box and it will be readily apparent that the stapling operation is particularly applicable to machine operations and entirely eliminates the use of paste and its attending objections.

The blank 10 may be covered with lining (inside) and wrap (outside) papers and, when folded into box form, these papers will assume their respective positions on the inside and outside of the box. It will also be noted that all outside edges of the box are folds, no raw or cut edges being visible or exposed. There is substantially no waste in forming the blank and a single simple blank will make a finished box or cover. The overlapping and joining of the ears 24 adds substantially in providing a rugged end wall which gives firm support to the side walls 14.

It will be understood that much of the value of the invention lies in its adaptation to the shipping of the boxes in blank form and setting the same up by relatively simple machinery at the time and where they are to be used. Comparatively small, simple and light machines will serve the purpose of setting up the box, thus permitting this operation to be conveniently and rapidly performed. Furthermore such a machine using staples can operate speedily and without the danger or troubles attending the use of paste and the like.

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

1. A box constructed of a single sheet and comprising a bottom panel, side and end panels connected thereto, portions between and connecting the side and end panels at the corners of the box, each of said portions being folded onto itself at the inner face of its end panel and forming two adjacent sections lying in inner and outer adjacent planes, the inner and outer sections of each two adjacent portions lying respectively in the said inner and outer planes and each portion having an ear overlapping the other portion, said two ears being respectively in said two planes, and a flap at the free end of each end panel folded inwardly and downwardly over and against said portions and attached thereto.

2. A box constructed of a single sheet and comprising a bottom panel, side and end panels connected thereto, portions between and connecting the side and end panels at the corners of the

box, each of said portions being folded onto itself along a line diagonally thereof and being cut away at one side of said line in a manner leaving an ear at the opposite side of the line, each ear overlapping the ear of the adjacent portion, fitting into the recess formed by the cut-away therein and being flush with the fold of the said adjacent portion not carrying the ear, and a flap at the free end of each end panel folded inwardly and downwardly over and against said portions and attached thereto.

3. The box defined in claim 2 in which the said recesses are substantially triangular and in which the said ears fitting thereto are substantially of a size and shape corresponding to the recesses.

4. A box constructed of a single sheet and comprising a bottom panel, side and end panels connected thereto, portions between and connecting the side and end panels at the corners of the box, each of said portions being folded onto itself at the inner face of its end panel and forming inner and outer sections, a flap at the free end of each end panel folded inwardly and downwardly over and against said portions, and metallic fasteners extending outwardly through the flaps and the inner sections but not through the outer sections and end panels.

5. A box constructed of a single sheet and comprising a bottom panel, side and end panels connected thereto, portions between and connecting the side and end panels at the corners of the box, each of said portions being folded onto itself along a line diagonally thereof and being cut away at one side of said line in a manner leaving an ear at the opposite side of the line, each ear overlapping the ear of the adjacent portion, fitting into the recess formed by the cut-away therein and being flush with the fold of the said adjacent portion not carrying the ear, a flap at the free end of each panel folded inwardly and downwardly over and against said portions, and fasteners extending outwardly through the flaps and the inner fold of said portions but not through the outer fold and the adjacent end panel, the fasteners being clinched over between said folds.

6. A box blank comprising a single flat sheet creased to form bottom, side and end panels, and four portions between and connecting the side and end panels at the corners, each of said four portions being creased diagonally to form a fold line and recessed at one side of said line adjacent to the outer end thereof in a manner leaving an outwardly projecting ear at the opposite side of the line, said four recesses being formed within and removing a portion of the four edges of the blank respectively.

7. The blank defined in claim 6 in which each said recess on one side of a fold line is of a size and shape substantially corresponding to the ear at the opposite side of the line.

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