No. 632,451. Patented Sept. 5, 1899.

D. DRAWBAUGH.

COLLAPSIBLE BOX.

(Application filed Jan. 24, 1899.)

(No Model.)

Fig. 1

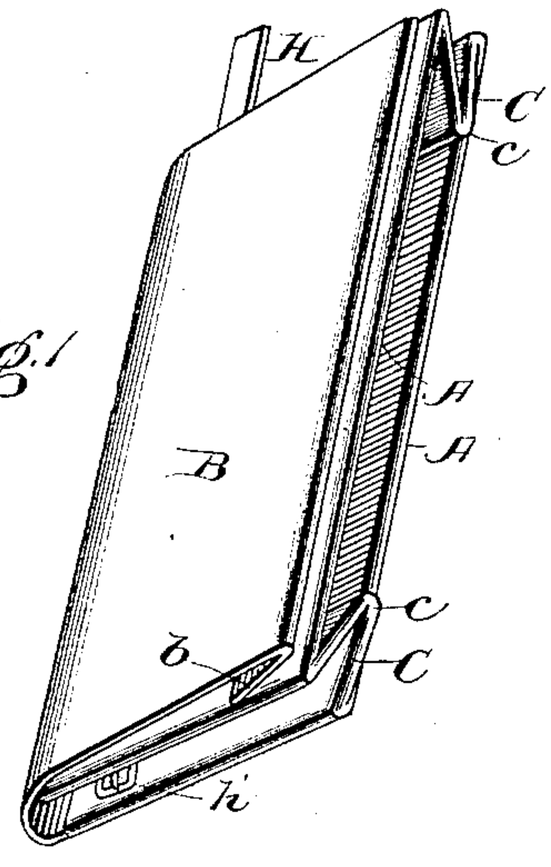


Fig. 2.

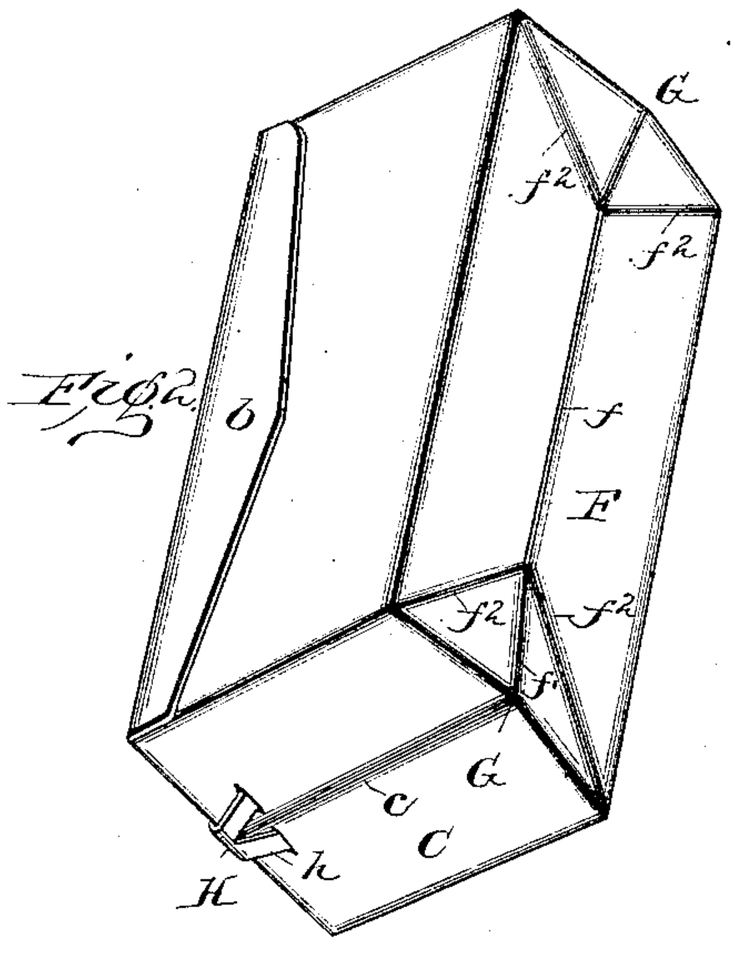


Fig. 3.

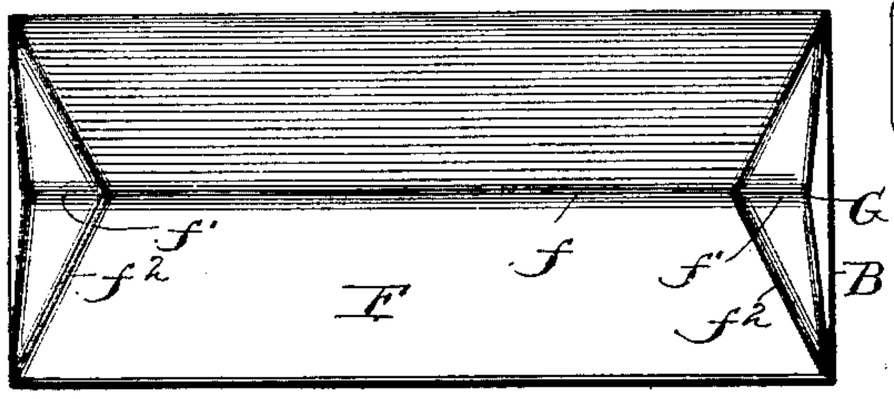


Fig. 4.

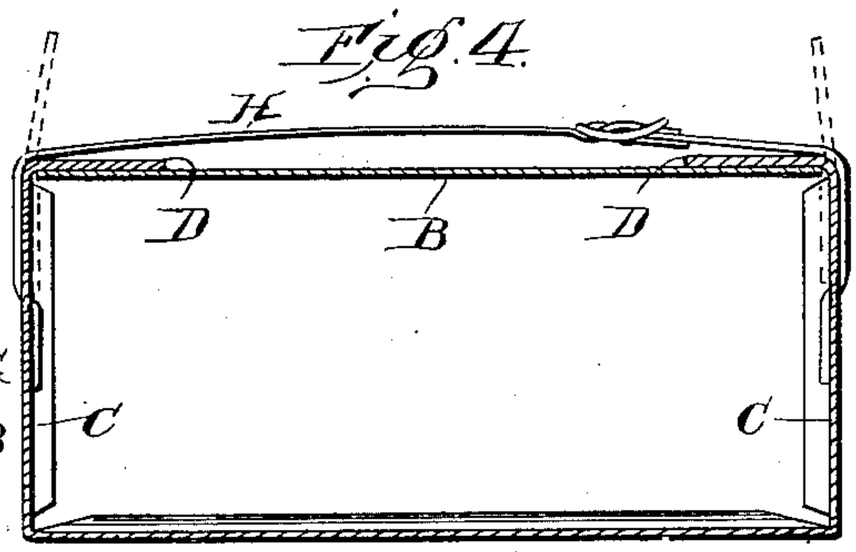
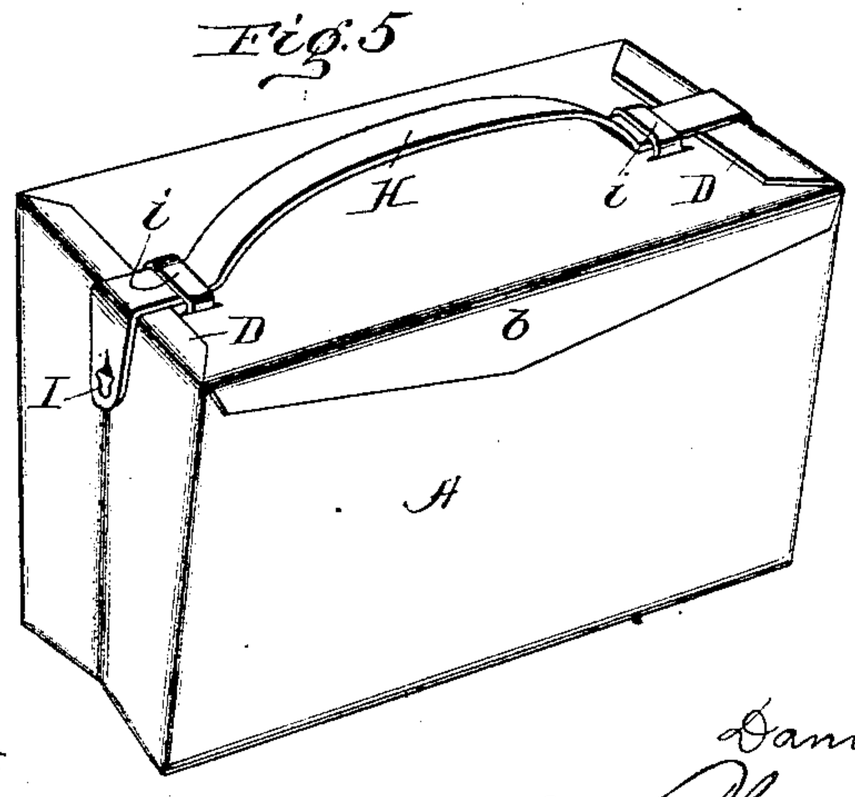


Fig. 5



Witnesses:
J. M. Fowler Jr.
Alexander J. Stewart

Inventor:
Daniel Drawbaugh,
by Church & Church
his Attorneys.

UNITED STATES PATENT OFFICE.

DANIEL DRAWBAUGH, OF EBERLY'S MILL, PENNSYLVANIA.

COLLAPSIBLE BOX.

SPECIFICATION forming part of Letters Patent No. 632,451, dated September 5, 1899.

Application filed January 24, 1899. Serial No. 703,295. (No model.)

To all whom it may concern:

Be it known that I, DANIEL DRAWBAUGH, a citizen of the United States, residing at Eberly's Mill, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Collapsible Boxes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in collapsible or folding boxes such as are usually made of press-board and employed for carrying lunch or small packages, although it will be understood that the particular material of which the box is made or the particular use to which it may be put is immaterial, and hence I do not wish to be limited in this particular.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of a box embodying my present improvements in collapsed position, the view being taken to show the bottom folds. Fig. 2 is a perspective view with the box open, the two views being taken from about the same point. Fig. 3 is a bottom plan view. Fig. 4 is a longitudinal section showing the end flaps in normal position in full lines and in folded and open positions in dotted lines. Fig. 5 is a perspective view illustrating a slight modification.

Like letters of reference in the several figures indicate the same parts.

The body of the box is made of relatively stiff material, as before indicated, and it consists of flat sides A A, forming the front and rear of the box, and a flat top B, hinged to the rear side and having a short front flap *b* adapted to fit down over the front side, this small flap being given an initial set inward, so as to hug the front when the box is distended. These sections thus far described are preferably flat and relatively stiff, or, in other words, are not intended in the collapsing of the box to be folded except at the hinged joints between the front flap and top and between the top and rear side. The end sections and bottom section are the sections in which the folding or collapsing takes place, and it is one of the objects of the invention to provide a box which will stay either in its collapsed position or in its distended position without requiring the employment of spreaders and other devices heretofore used to accomplish these results. With this object in view the folds in the bottom or between the bottom and ends are made on curved or arched lines, so to speak, whereby there will be a strain set up in the material during the time when the box is being distended or collapsed and less of a strain both when the box is collapsed and when distended, and thus there is a tendency created for the parts to stay in one position or the other, and in addition I preferably provide a carrying-strap or handle, which, drawing over the relatively rigid top, will hold the end sections outwardly. In addition to this also in the preferred construction I employ end flaps for the ends of the boxes, which end flaps will overlie the ends of the top when the box is distended and so further maintain its shape and prevent it from being collapsed unintentionally.

In each of the ends C there is made a central fold inwardly at *c*, and when this fold is made the end flap D is preferably turned in in the position indicated by the dotted lines, whereby it is given an initial set to bend in one direction, which initial set, however, when the flap is turned out in line with the end section will be in a direction opposite to that in which the end section itself folds. Thus these two parts taken by themselves if turned down against each other may be folded inwardly; but if the end flap is turned out each will resist the folding of the other, and so the end will be held distended.

The bottom section F is provided with a central fold *f* for folding upwardly an end fold *f'*, folding outwardly, and from the point where the folds *ff'* meet diagonal folds f^2 extend to each corner, these folds being inwardly. Thus the ends of the box fold into the bottom, as shown clearly in the drawings. The fold between the bottom and end, it will be noted,

does not form a straight line from one corner to the other, but is arched, or the two portions of the fold at G G on each side of the center form a slightly-obtuse angle, and the effect of this formation is to throw a strain in the material during the transition period from open to closed and from closed to open position, and a consequent tendency of the box to remain in either of the said positions.

From the foregoing it will be seen at once that when the box is to be folded or collapsed the end flaps D turn in and pressure is applied to the front and rear sides. As these sides are forced toward each other the strain in the material will be gradually overcome until at a certain point it will of itself spring inwardly and tend to assume its collapsed position. On the other hand, when the box is to be distended the two sides are drawn away from each other or the bottom pushed down from the inside until the box is distended. Then the end flaps D are turned out, and when the contents have been placed within the box the cover is brought down with the front flap over the front side, which it will hug closely, and the end flaps D are turned down over the top. They will tend to automatically hug down closely upon the top, and in addition, if desired, the carrying-strap or handle may hold them. If no end flaps D are employed, the holding-strap may be relied upon to prevent the upper portions of the ends from moving inwardly, although there will be but a slight tendency in this direction. In the preferred construction the holding-strap or handle H is bifurcated at the ends, as shown at *h*, and each of the two branches is secured to one of the end panels on each side of the central fold *c*, and also in this preferred construction the strap or handle is divided and the two sections united by a buckle or like device *h'*, which will permit it to be adjusted as desired; but it will be understood that the particular construction of this handle is immaterial, and, if desired, it might be, for instance, as shown in the last figure of the drawings, where a hook I is provided on one of the end panels, over which the end of the strap may be caught, and the two loops or guides *i* may be provided on the top near each end and beneath which the strap may be slipped to maintain its shape and position over the ends of the box. This last-mentioned figure of the drawings also shows a form of box wider at the top than at the bottom, but which, however, except for its appearance, does not differ in mechanical construction from that heretofore described.

Obviously the several panels of the box may be made from stiff material united by flexible hinges or joints or the material may be of such character that it may be creased to form the hinges or joints and the vertical corners may be united by paste, glue, or any other suitable fastening means.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A collapsible box comprising the front, rear and top sections, the end sections having the central inwardly-turning folds and the bottom section having the inwardly-turning folds substantially as described, the folds between the bottom and end sections, being arched to create a tendency to hold the box in either its distended or collapsed position; substantially as described.

2. A collapsible box such as described, comprising front, rear and top sections, of relatively stiff material, end sections having central inwardly-turning folds and a bottom section having central and diagonal folds, as described, forming triangular end panels in said bottom section, the folds between said triangular panels and end panels being arched to throw a tension in the material during the transition from open to closed and from closed to open position; substantially as described.

3. In a collapsible box, the combination with the front rear and top sections, the bottom section and end sections having central folds for permitting the front and rear sides to approach each other, and end flaps on the end sections, having central folds corresponding, when the flaps are turned in, to the central folds in the end sections whereby said flaps are adapted to be folded with the ends when turned in but will resist folding when turned out, substantially as described.

4. In a collapsible box, the combination with the front, rear and top sections, the bottom section having inwardly-turning folds and the end sections having central inwardly-turning folds, of a strap or handle having its end bifurcated, the said bifurcated end being attached respectively to the two panels of the end section on opposite sides of the center fold; substantially as described.

DANIEL DRAWBAUGH.

Witnesses:
J. C. MOSSER,
IOLA E. OYSTER.