(No Model.)

W. B. HOWE & F. B. DAVIDSON.

PAPER BOX.

No. 564,377. Patented July 21, 1896.

Fig. 1.

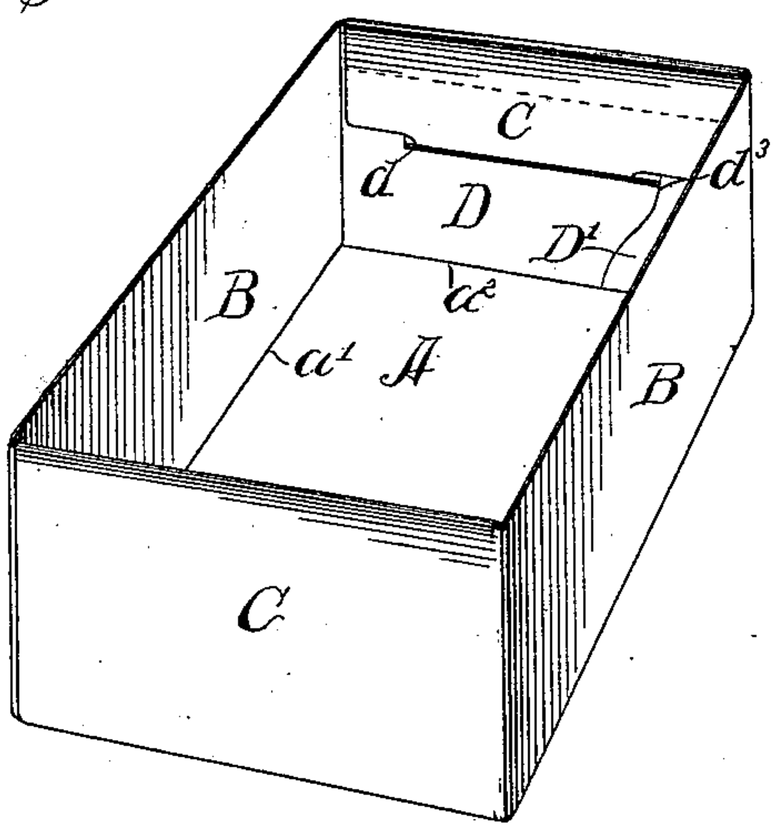


Fig 2.

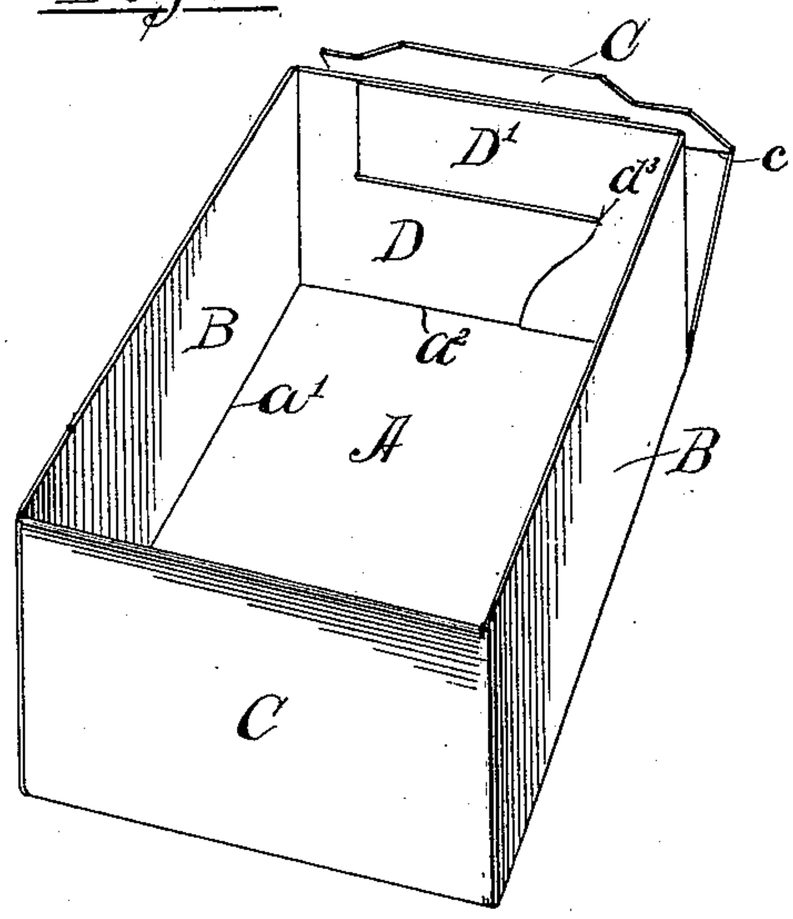


Fig 5

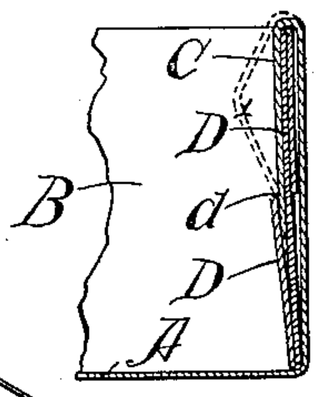


Fig. 3.

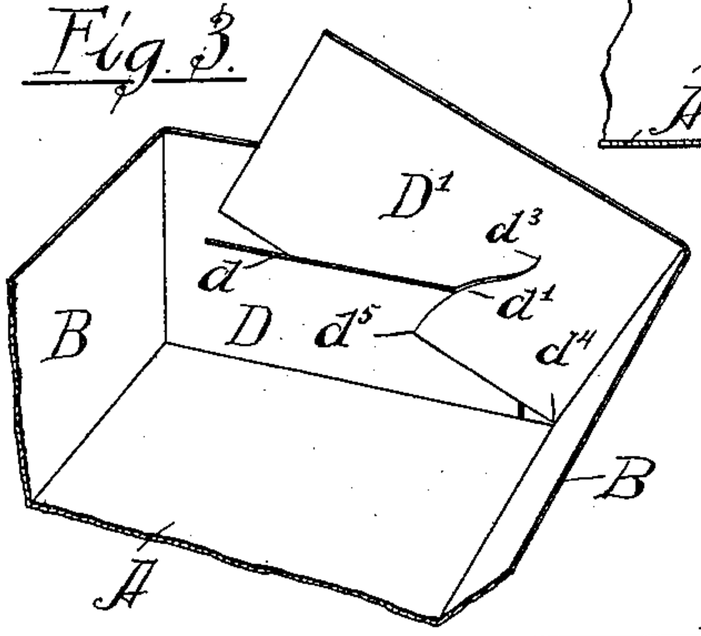


Fig. 4.

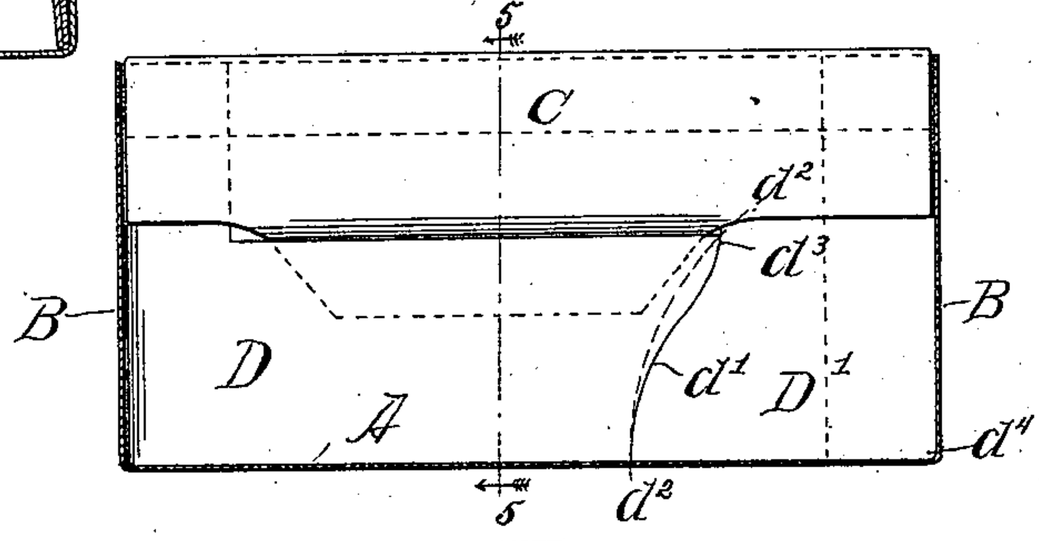
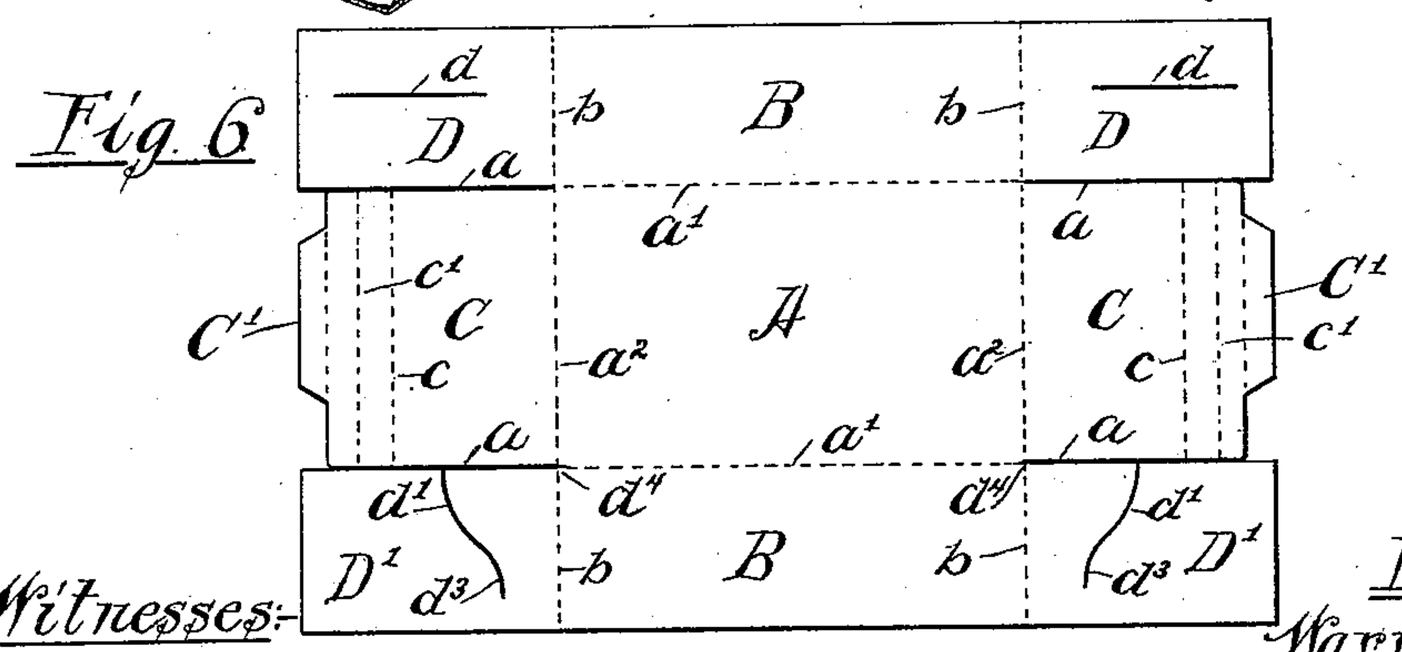


Fig. 6



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UNITED STATES PATENT OFFICE.

WARREN B. HOWE AND FRANK B. DAVIDSON, OF CHICAGO, ILLINOIS.

PAPER BOX.

SPECIFICATION forming part of Letters Patent No. 564,377, dated July 21, 1896.

Application filed January 7, 1895. Serial No. 534,069. (No model.)

To all whom it may concern:

Be it known that we, WARREN B. HOWE and FRANK B. DAVIDSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper Boxes; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved folding paper box of that kind consisting of a bottom and four connected sides, and which is open at its top, the same being intended for use with a separate cover, which may be constructed in the same manner or otherwise.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating our invention, Figure 1 is a view in perspective of a box embodying our invention in readiness for use. Fig. 2 is a similar view of the box with one end partially unfolded to illustrate the construction thereof. Fig. 3 is a perspective view of one end of the box, illustrating the process of folding. Fig. 4 is a cross-section of the box, showing the inner surface of one end in elevation. Fig. 5 is a sectional view taken on line 5 5 of Fig. 4. Fig. 6 is a view of the unfolded blank from which the box is made.

As the construction of the box can be best understood from the form of the blank, this, as seen unfolded in Fig. 6, is made as follows: A indicates the central part or back of the blank, which forms the intermediate wall or bottom of the box, and B B side parts, which form the side walls of the box. At each end of the blank are formed three flaps, namely, a center flap C, equal in width to the body A, and two side flaps D D′, each equal in width to the body portions B B of the blank. The flaps C D D′ are separated from each other by slits *a a*, which extend inwardly to the body A and terminate at the lines or creases *a′ a′*, at which the blank is folded to form the lower horizontal end corners of the box, and which are in alinement with the lines or creases a^2 a^2 at the junction of the body A and side portions B B of the blank. At the bases of the flaps D D′, or where the same join the side portions B B, are lines or creases *b b*, which are located in alinement with the lines or creases a^2 a^2, and on which the flaps D D′ are folded to form the upright corners of the box.

Each side flap D is provided with an internal slit or slot *d*, preferably straight, and arranged longitudinally or extending lengthwise of the flap or in a direction from the base toward the free end thereof, and preferably parallel with the outer side edge of the blank. The flap D′ is provided with a transverse slit *d′*, which extends from its inner toward its outer margin in an indirect line and terminates in a part which is parallel with the base or inner edge of the flap. The drawings show a form of the said slit having special advantages, the same, as herein illustrated, being made on a reversed or ogee curve, the slit starting at the inner edge of the flap, practically at right angles thereto, and then curving toward the base of the flap, and then again outwardly away from the same, and terminating at right angles with the side edges of the flap. Such curved slit *d′* follows generally the direction of a circular arc of which the inner corner of the flap is the center, curving inwardly from the arc and then outwardly, so as to terminate near the arc, as clearly shown in Fig. 4, in which d^2 d^2 is a line drawn on a circular curve with the inner flap as its center, to show the course taken by the slit *d′*. This particular formation of the slit *d′* produces certain results in practice that will hereinafter fully appear.

The middle flap C is provided at its outer end with a tongue C′, preferably of about the same width as the length of the slit *d* in the flap D, but in all cases narrower than said slit, so that it will freely enter the same.

When the blank is set up or folded to form the box, the side parts B B are bent at right angles to the body to form the side walls of the box, the side flaps D D′ bent inwardly at right angles with the sides, so as to overlap, and are interlocked to hold the sides from spreading apart, and the middle flaps C C are bent at right angles, so as to extend outside of said flaps D D′, and bent over the edges of the same, so as to bring inside of the box the tongues C C′, which are tucked into the slits

d d. In folding together the flaps D and D′ the flaps D′, containing the indirect slits d', are folded inside of the flaps D, so that when the end portions of the flaps D′ are inserted through the slits d they will leave the slits open at the inside of the flaps in such manner that the tongues C′ can be inserted therein, as clearly shown in Figs. 4 and 5. To facilitate the folding of the end flap over the upper edges of the side flaps, the said end flap is creased or scored at the line of the fold, as shown at c c, Figs. 1, 2, and 5, and to enable the tongues C′ to be inserted more readily into the slits d d said end flaps are creased or scored on the line c', thereby enabling the end portion of the flap, after it is folded over the edges of the flaps D D′, to be bent outwardly in angular form to permit the end of the tongue to be entered in the slit d, and then straightened or flattened down against the inner faces of the said flaps D D′ until the tongue has been fully entered into the said slit. This is fully illustrated in Fig. 5 and in the sectional view of the end of the box, Fig. 6, wherein the end part of the middle flap is shown in full lines as fully folded and in dotted lines as bent at an angle on the scored line c' in readiness for entering the end of the tongue in the slit d.

Figs. 2, 3, and 4 illustrate the manner in which the end flaps D and D′ are interlocked, and also the particular utility of the indirect slit d'. In Fig. 2 is shown the side flaps interlocked and the middle flap standing in an inclined position with its end portion bent over along the line of the crease or score c in readiness to be folded over the edges of the side flaps. The interlocking of the side flaps D and D′, by which the sides of the box are held from spreading apart, is secured by engagement of the outer end of the slit d with the inner end of the indirect slit d'. To insure this result, the said inner end of the indirect slit is so located as to be engaged with the end of the slot when the two flaps D and D′ are overlapped and their edges brought opposite each other, and the inner end of said slit d' is made perpendicular to the side edges of the flap D′, as hereinbefore set forth, the end portion of the slit d^2 thus forming a shoulder d^3 at right angles to the slit d, by which the end of the slit is engaged in a manner to avoid possibility of the flaps being separated by outward pressure on the side walls of the box. To enable the tongue which is formed at the outer end of the flap D′ by the slit d' to be entered into the slit d, the open end of the slit d' is located at a distance from the base of the flap D′ equal to or greater than the distance from the inner corner d^4 of the flap D′ to the outer end of the slit d when the flap D is folded inwardly, as seen in Fig. 3. This will be clearly understood by inspection of Fig. 3, from which it will be seen that if the distance from the point d^4 to the outer end of the slit d' at d^5 were less than the distance from the point d^4 to the adjacent end of the slit d the part outside of the slit could not be inserted in the said slit d. By starting the slit d at a sufficient distance from the point d^4 and then directing it toward the base of the flap until it reaches the perpendicular part of the slit by which the shoulder d^3 is formed, the outer part of the flap may be easily entered into the slit d, while at the same time the outer end of the said slit d will closely engage the said shoulder d^3 when the flaps are brought opposite each other, with the result of firmly locking or holding the flaps together. As far as the mere locking together of the parts is concerned, the particular shape of the slit d' is unimportant; but in order to enable the parts to be easily and quickly interlocked we make the slit in the form of an ogee curve, as showing the slit starting at the inner edge of the flap D′ at a distance from the point d^4 equal to the radius of a curved line drawn through the adjacent end of the slit d, with the point d^4 as a center, as indicated at d^2 d^2, Fig. 4, and make the slit in the form of a reversed curve following nearly the line of the said curve, but being deflected inwardly therefrom, and then joining by a reversed curve the perpendicular outer part of the slit, which forms the shoulder d^3, as before described. The inward deflection of the curved slit from the line d^2 d^2 obviously has the effect of slightly stretching or distorting the parts or of pulling some strain thereon in carrying the end of the slit past or over the point of greatest divergence, inasmuch as the slit at such point is nearer the point d^4 than the end of the slit d. As a consequence, a slight degree of force must be applied to the flaps in order to bring the end of the slit d fairly into engagement with the shoulder d^3. The divergence is not made so great, however, as to endanger tearing either of the flaps in connecting them, while at the same time the divergence is sufficient to prevent the parts being easily separated after being interlocked, it being obvious that the same extent of stretching or distortion and a similar use of force is required to disconnect the flaps as to unite them. When joined, therefore, the flaps will be firmly held together and cannot become accidentally separated, while at the same time outward pressure on the side walls will have no tendency to operate the flaps, as would be the case if the slit d were at its inner end inclined, instead of being perpendicular to the sides of the flap. The making of the indirect slit d' with a perpendicular inner end, forming a shoulder to interlock with the slit in the flap D, is therefore of importance as a means of securely locking together the flaps, while the making of the indirect slit in the form of an ogee curve is of practical benefit, because such form of the slit makes the connection of the flaps easy by guiding the end of the slit d easily and smoothly into engagement with said shoulder as the flaps are brought together by the hands of the operator in the process of uniting or interlocking them.

The construction described in the flaps D and D′ is capable of use independently of the other features shown, and is herein claimed as a separate part of our invention.

It is of course obvious that the box made as described may be used with any suitable cover, or its cover may be similarly made. Furthermore, a box-cover adapted for a box-body of different construction may contain the features herein shown, and this may often be the case, since the construction described affords a smooth exterior finish, and it may be advantageously constructed of smoothly-finished and flexible paper or board of medium thickness, such as is commonly used for finer grades of folding boxes or cartons, and a cover equal in depth to the box may well be used as a cover for a box or shell of cheap or rough material, which will be entirely covered and protected by the cover when the latter is in place thereon.

We claim as our invention—

1. A box comprising connected side and intermediate walls having on its side walls two opposite flaps, one provided with an interior slit extending from its base toward its free end and the other with a generally transverse ogee-shaped slit extending inwardly from its inner edge, the part of said slit next to the inner edge being formed on a curve substantially concentric with the adjacent lower corner of the box so as to form a downwardly-projecting tongue and having on its intermediate wall a middle flap longer than the width of the end-wall flaps, said middle flap being provided at its free end with a tongue of greater length than the distance from the interior slit to the top edge of the box and adapted to enter the said interior slit with the said tongue, substantially as described.

2. A box comprising connected side and intermediate walls having on its side walls two opposite flaps, one provided with an interior longitudinal slit and the other with a generally transverse ogee-shaped slit extending inwardly from its inner edge so as to form a downwardly-projecting tongue and having on its intermediate wall a middle flap longer than the width of the end-wall flaps, said middle flap being provided at its free end with a tongue longer than the distance from the interior slit to the top edge of the box, and adapted to enter the said interior slit with said tongue, and being provided also between said tongue and the point at which it is folded over the end wall with a transverse score-line or crease, substantially as described.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

WARREN B. HOWE.
FRANK B. DAVIDSON.

Witnesses:
TAYLOR E. BROWN,
WILLIAM L. HALL.