

April 17, 1945.

J. H. SCHERER

2,373,977

FOLDABLE BOX

Filed Sept. 18, 1943

2 Sheets-Sheet 1

Fig. 1.

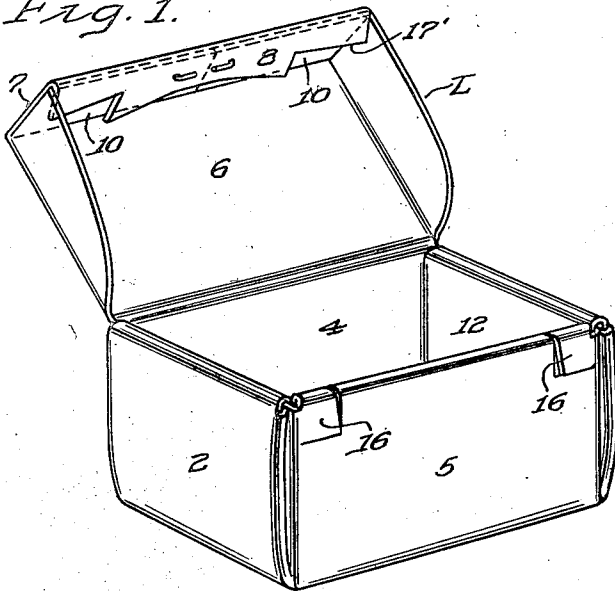


Fig. 5.

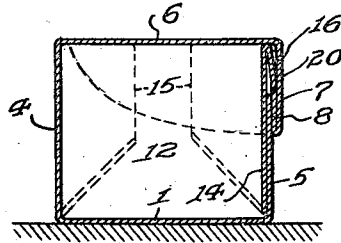


Fig. 3.

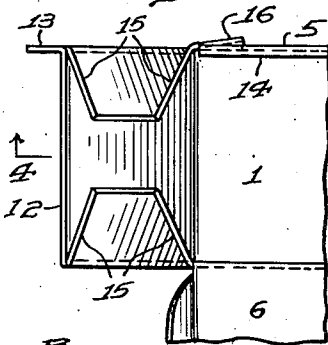


Fig. 2.

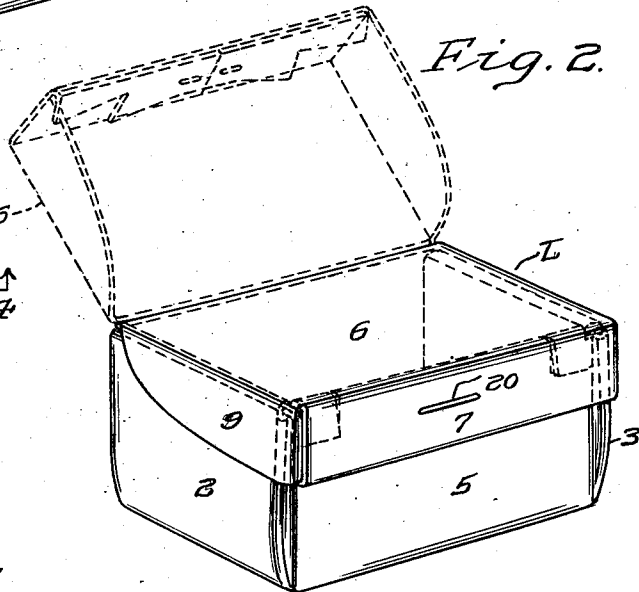
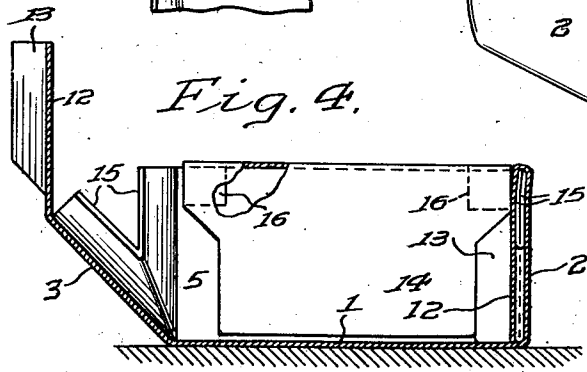


Fig. 4.



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2 Sheets-Sheet 2

Fig. 6.

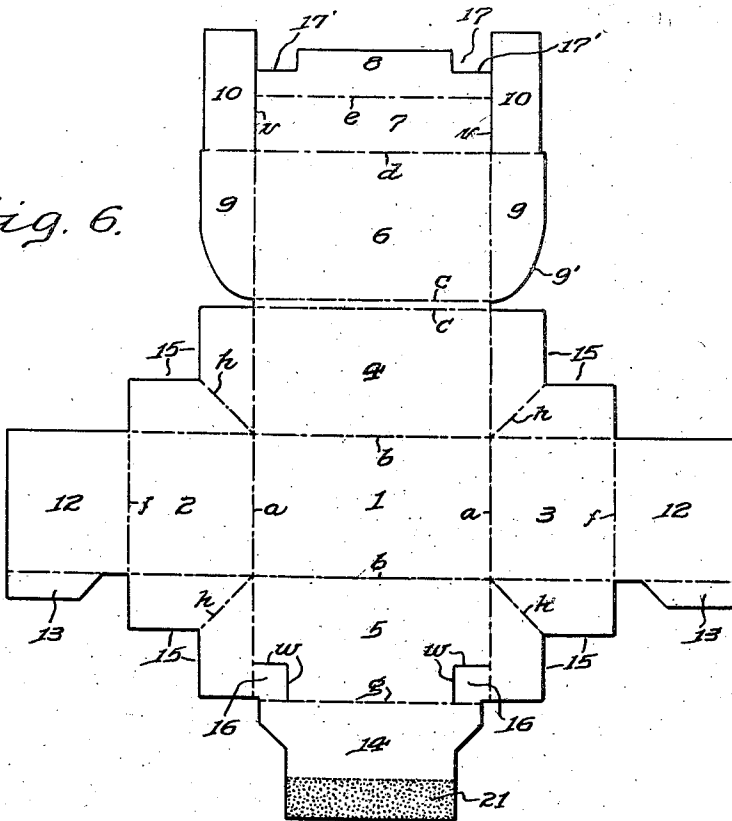
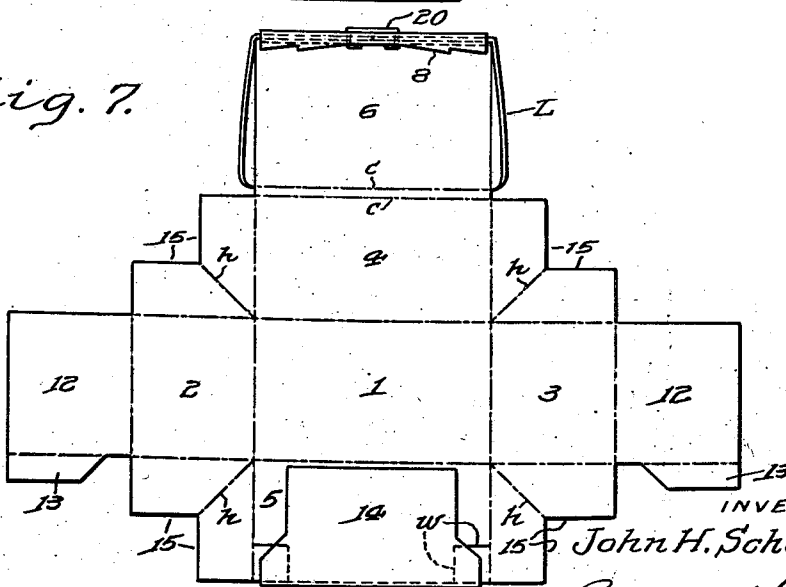


Fig. 7.



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UNITED STATES PATENT OFFICE

2,373,977

FOLDABLE BOX

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Application September 18, 1943, Serial No. 502,892

4 Claims. (Cl. 229—31)

The principal object of the invention is the provision in a foldable box having a hinged lid of novel locking means effective to automatically lock the lid in closed position when it is moved thereto as after the contents have been introduced into the box.

A further object is the provision of a box of the character aforesaid which is formed from a single blank of cardboard or other suitable stock and preferably partially erected before shipment to the user to condition it for final erection by the latter preparatory to filling the box with its contents and then closing the lid to thereby bring into play the means for automatically locking it.

Other objects, advantages and novel features of design, construction and arrangement comprehended by the invention are hereinafter more particularly pointed out or will be apparent from the following disclosure.

While the invention may be embodied in boxes intended for various purposes or for containing different classes of goods, I shall herein describe it more particularly with reference to a box adapted to contain pistol cartridges, blasting caps or other generally similar articles which when disposed in the box substantially fill its body in both directions and thus tend to support its walls against inward collapse. It is to be understood, however, that use of the invention is not in any way restricted to boxes designed for articles of this general class although, as will hereinafter appear, when the contents are of such character as to adequately resist inward movement of the front wall it is substantially impossible to open the box lid after it is once closed without materially mutilating portions of the box.

In the accompanying drawings illustrating the box which I have selected as exemplifying the invention and now to be described,

Fig. 1 is a perspective view of the erected box with the lid raised and thus ready to receive its contents,

Fig. 2 is a similar view with the lid closed as after the contents have been introduced, the prior position of the lid being indicated by the dotted lines,

Fig. 3 is a fragmentary top plan view of one end of the box body and lid during the process of erecting the box,

Fig. 4 is a longitudinal section through the box on the plane of line 4—4 in Fig. 3 looking in the direction of the arrows,

Fig. 5 is a transverse section through the box with the lid closed,

Fig. 6 is a plan view of the cut and scored blank from which the box is formed, and

Fig. 7 is a plan view of the same blank after it has been partially erected as by the manufacturer and thus conditioned for final erection as by the user.

The same characters of reference are used throughout the drawings to designate the same parts.

More particularly, the blank shown in Fig. 6 is preferably formed from relatively heavy cardboard or other suitable stock from which it is cut or stamped out to shape and also during the same operation or by others scored and cut to define areas which subsequently form various parts of the box when erected and will be correspondingly designated herein. Thus pairs of suitably spaced parallel scores *a—a* and *b—b* extending at right angles to each other define a rectangular bottom 1, end walls 2 and 3, back wall 4, and front wall 5. The scores *a—a* are prolonged beyond the back wall to define the ends of the body 6 of the lid which is separated from the back wall by a pair of closely adjacent scores *c—c* parallel to scores *b—b*, the opposite edge of the lid body terminating at a score *d* also parallel thereto. Beyond the score *d* in prolongation of the body are panels 7 and 8 separated by the score *e*, these two panels forming part of the front flange or lip of the lid as hereinafter described, while at the sides of the lid body 6 are flaps which form its side lips, the edges of these flaps being preferably curved from the ends of the proximate score *c* as at 9'. Score *d* is extended to define the ends of flaps 9 from other flaps 10 lying proximate the ends of panels 7 and 8 and defined therefrom by cuts *x—x* in prolongation of scores *a—a*, the side edges of flaps 10 being preferably slightly inwardly offset from the corresponding edges of flaps 9.

Inner side wall flaps 12 respectively extend beyond the side walls 2 and 3 and approximate the latter in size being defined therefrom by scores *f—f* paralleling scores *a—a*, and on that edge of each of these flaps proximate the front wall 5 is a tab 13 having its inner end beveled off as shown, the tabs being defined from their adjacent flaps by scores in prolongation of the score *b* between the bottom 1 and front wall 5.

Beyond the outer edge of the latter and defined therefrom by a score *g* paralleling scores *b—b* is an inner front wall flap 14 this flap being slightly narrower than wall 5 adjacent thereto and having its lateral edges respectively cut to conform with the tabs 13 so that in the erected

box the said tabs will fit snugly against these edges.

In the corners formed between the scores $a-a$ defining the ends of front and rear walls 4 and 5 and the scores $b-b$ defining the side panels 2 and 3 are disposed parts 15 which I shall term gussets, each of which is of L-shape with a score or partial cut h extending across it from its inner corner at an angle of 45° to scores $a-a$ and $b-b$. Preferably these scores h are of a character to materially weaken the stock; thus, as will be readily understood by those familiar with the art, they may extend entirely through the stock at space points leaving it whole at intervals therebetween or they may partially sever the stock throughout the length of each score, the object being to permit the two parts of each gusset to fold snugly against each other during erection of the box, which cannot be readily accomplished when a relatively heavy board is used by merely folding it on ordinary score lines such as preferably employed for the other scores to which reference has been made.

Adjacent each of the outer corners of the front wall 5 cuts w are made entirely through the stock at right angles to each other to thereby define with the scores $a-a$ and score g approximately square locking tabs 16. The outer corners of the inner lip panel 8 are also notched as at 17, these notches preferably approximating half the width of the panel in depth and being slightly wider than the locking tabs.

The blank having been prepared substantially as just described, is now conditioned for final erection in the following way: the flaps 9-9 and 10-10 are turned up on the scores $a-a$ until they are substantially normal to the lid body 6 and flaps 10-10 are then turned inwardly toward each other by bending on the extremities of score d . The panel 7 is next similarly turned up on that score exteriorly of the flaps and the panel 8 bent down over the latter on score e so that the flaps then extend between the two panels which latter, together with the flaps are then secured firmly together proximate center of the panels by a staple 20 or other suitable means. In this manner a marginal flange or lip is formed along the front and sides of the lid body to complete the lid L is as whole.

The inner front wall flap 14 is also turned over on the score g against the inner face of the front wall 5 and permanently secured thereto in any suitable way as by adhesive 21 previously applied to the flap although staples or other suitable fastening means may be used if preferred. The blank as thus conditioned, customarily by the box manufacturer, now appears as in Fig. 7 and is thus ready for final erection by the user preparatory to filling the box with its contents.

This final erection may be readily and quickly effected in the following way: The rear wall 4 and front wall 5 are turned oppositely inward about scores $b-b$ to a position substantially normal to the bottom 1, and one of the end walls, for example 2, is then similarly turned about the score a to an approximately like position, the adjacent gussets 15 collapsing oppositely inward upon themselves about their scores h during the movement of the end wall so that at its completion both parts of each gusset lie proximate and substantially parallel to its inner face. The flap 12 attached to the end wall is then bent downwardly along the score f over the inwardly projecting gussets until it is substantially parallel with the end wall and at the same time its tab 13

is bent inwardly and snapped into the notch in the side of the inner front wall flap 14 with which it is designed to cooperate, thus locking the flap 12 in place and preventing it from subsequently springing upward away from the adjacent end wall. In a similar way the other end wall is then turned up, its flap 12 bent down over the adjacent gussets and its tab snapped into place in the notch on the proximate side of the inner front wall flap, thus completing erection of the box.

These several operations, particularly the inward collapsing of the gussets adjacent the front wall, are effective to cause the locking tabs 16 to spring out of the plane of the front wall 5 so that after the box is erected the free corner of each tab projects for a relatively considerable distance, generally approximating the thickness of the stock, beyond the outer face of that wall and its free edges extend from the corner at an angle to the face of the wall until they respectively merge into its side and upper edges.

It may be observed at this point and as will be apparent from inspection of Fig. 1 that due principally to the inherent resiliency of the stock and the fact that the panels 7 and 8 are fastened together only adjacent their centers, the outer extremities of the inner panel also tend to spring away from the outer one with the result that the longitudinal edges 17' of the notches 17 are normally slightly spaced from the latter.

The finally erected box, ready to receive its contents, appears substantially as in Fig. 1 and when the lid is turned forwardly to closed position after it is filled (Fig. 2) the edges 17' of the notches 17 in the inner lip panel 8 ride downwardly over the locking tabs 16 and force them back towards the plane of the front wall 5 until said edges clear the lower edges of the tabs. Due to the resiliency of the stock the tabs then immediately spring back into their normal outwardly projecting position and thus, as best shown in Fig. 5, engage the edges 17' of the lip panel and automatically lock the lid in place.

If the contents of the box are of such character as to adequately resist inward pressure on the center of the front wall it is thereafter substantially impossible to open the lid without material mutilation of the box, but if the box be empty or the contents readily compressible it is sometimes feasible to press the center of the front wall inwardly for a sufficient amount to clear the locking tabs from inner lip panel 8 and thus permit the lid to be reopened. Generally, however, it is necessary to tear off the lid in whole or in part to obtain access to the contents.

While I have herein described one form of the invention with considerable particularity I do not desire or intend to thereby restrict or confine myself specifically thereto, as the principles of the invention may be embodied in boxes of types other than that to which I have referred and the details of construction, arrangement and assembly modified in many particulars, if desired, without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention I claim and desire to protect by Letters Patent of the United States:

1. A foldable box of the character described, comprising a bottom, front, rear and side walls and a lid hinged to the rear wall, said lid having a lip at its front edge adapted to overlies the upper part of the front wall when the lid is closed and including inner and outer panels secured together

adjacent their centers with the extremities of the inner panel notched inwardly from its longitudinal edge, and a locking tab formed from and proximate each upper corner of the front wall and partially severed therefrom, said tab normally yieldingly projecting outwardly of the plane thereof, said tabs as the lid is closed being adapted to move inwardly toward the plane of the front wall until the notches are aligned with the tabs and to then automatically return to substantially normal position within the notches and thereby lock the lid in closed position.

2. A foldable box formed from a single unitary blank and comprising a bottom, front, side and rear walls, a lid hinged to the rear wall and infolded gussets respectively connecting the front and rear walls with the side walls, the front wall being cut through on intersecting lines adjacent each of its upper corners to define two sides of a locking tab proximate each gusset and biased by the infolding of the latter to a position in which its free corner normally extends outwardly of the plane of the front wall, and said lid comprising a lip at its front edge adapted to overlie the locking tabs when the lid is closed and including inner and outer panels secured together proximate their centers, the extremities of the inner panel adjacent its ends being notched inwardly from its longitudinal edge for reception of the locking tabs when the lid is closed.

3. A foldable box formed from a single unitary blank and comprising a bottom, a front wall, a rear wall, side walls and a lid hinged to the rear wall, an inner front wall flap secured to the inner face of the front wall and notched on its lateral edges, and a flap extending from the upper edge of each side wall in approximate parallelism thereto having a tab engaging in the notch in the adjacent edge of the inner front wall flap, infolded gussets respectively connected to the lateral edges of the front and rear walls and to the edges of the side walls and lying between the latter and said flaps, a locking tab adjacent

each upper corner of the front wall defined by intersecting cuts therein and biased by the infolding of the proximate gusset to cause its free corner to normally project outwardly of the plane of the wall, and a lip extending along the front edge of the lid and including inner and outer panels secured together proximate their centers, the free corners of the extremities of the inner panel being cut out to provide notches for reception of the locking tabs when the lid is moved to closed position, said tabs during such movement being pressed back by the inner panel of the lip substantially into the plane of the front wall and then automatically returning to normal position with respect thereto and engaging in the notches when the latter align with the tabs as the lid attains fully closed position, thereby through engagement with the inner lip panel locking the lid in such position.

4. In a foldable box comprising a body including front, rear and side walls, and infolded gussets interconnecting the front and side walls, and a lid hinged to the rear wall, locking tabs respectively located adjacent the upper corners of the front wall formed by intersecting cuts therein and biased by the infolded gussets so that the free corners of the tabs normally project outside the plane of the front wall, a lip extending about the sides and free edge of the lid, that part of the lip along said edge including inner and outer panels and the side parts of the lip having oppositely intumed flaps extending between said panels and means securing said panels and flaps together proximate the centers of the panels, whereby the outer extremities of the inner panel are operative as the lid is closed to ride over the locking tabs and press them inwardly, against the bias exerted by the gussets, toward the plane of the front wall and said tabs are operative when the lid attains fully closed position to automatically return to their normal position and engage beneath the edge of the inner lip panel to thereby lock the lid in said position.

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