Jan. 10, 1961 J. O. BURMAN, JR 2,967,638

HINGED BOX

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Fig. 1.

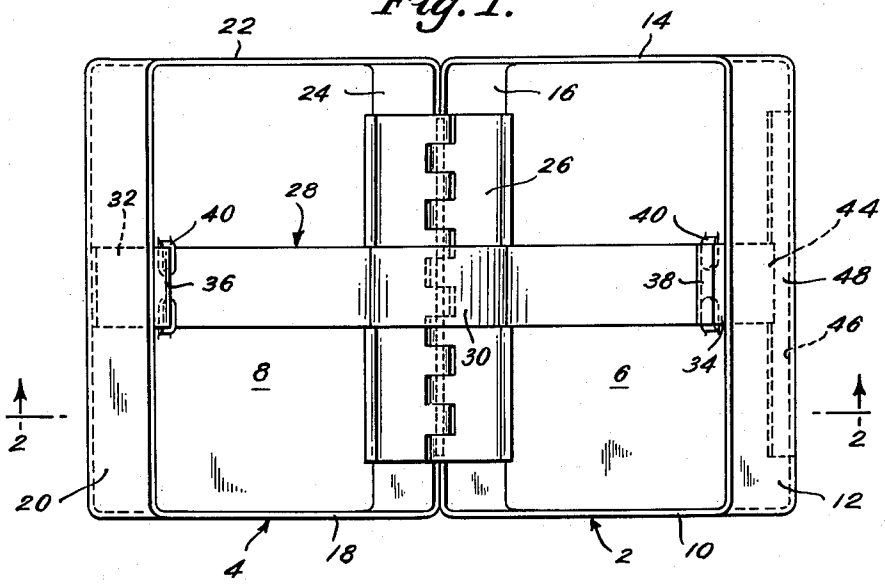
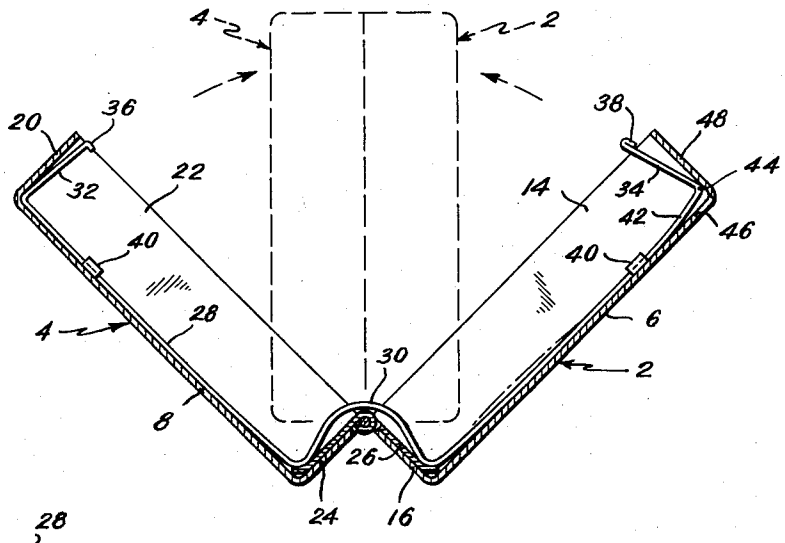


Fig. 2.



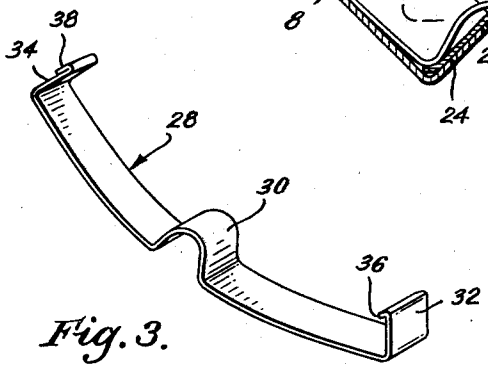


Fig. 3.

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Fig. 4.

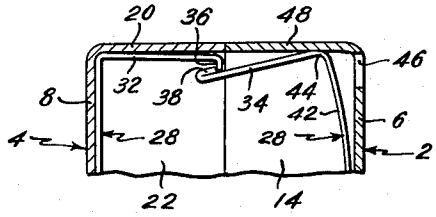


Fig. 5.

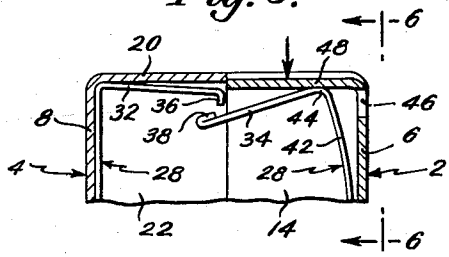


Fig. 6.

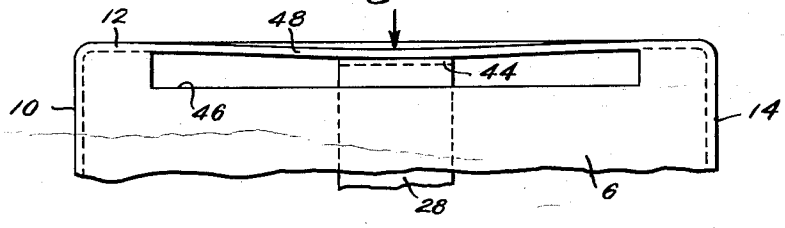


Fig. 7.

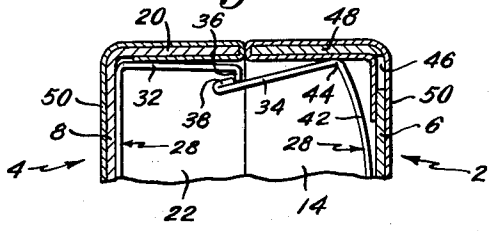
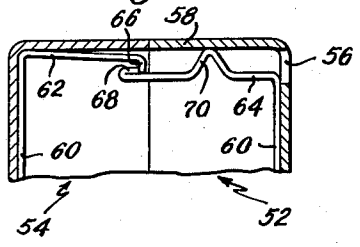


Fig. 8.



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HINGED BOX

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7 Claims. (Cl. 220—35)

This invention relates to boxes having hinged lids which are spring biased to fly open when a catch is released.

Among the several objects of the invention may be noted the provision of a box having a hinged lid with spring means for automatically opening the lid when a catch or detent is released; the provision of a box of the above type in which the spring, catch and detent are of one-piece construction; the provision of a box of the general class in which the release mechanism is an integral part of the box construction itself; the provision of a box of the last named class which may be completely covered with an ornamental covering material, thus covering the release mechanism but still leaving the latter actuable from the exterior of the box; and the provision of boxes of the above types which are simple and economic to make because of utilization of only a few parts, and which are long-lasting. Other objects and advantages will be in part obvious, and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts, which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which two of several possible embodiments of the invention are illustrated:

Fig. 1 is a plan view of a box of this invention, the box being shown open;

Fig. 2 is a sectional end view of the Fig. 1 box, taken in the direction of sight lines 2—2 on Fig. 1, with the closed position being indicated by dotted lines;

Fig. 3 is a perspective view of a spring element of this invention;

Fig. 4 is a sectional view of a portion of the Fig. 1 box showing the latch mechanism in engaged position;

Fig. 5 is a view similar to Fig. 4 but showing the latch in opened or disengaged position;

Fig. 6 is a bottom view of a portion of one of the box sections of the Fig. 1 embodiment showing certain constructional details;

Fig. 7 is a view similar to Fig. 4, but showing the box sections as covered with decorative material; and

Fig. 8 is a sectional view of a portion of another embodiment of the invention, similar to Fig. 4 but showing a different construction as to certain details.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now to Figs. 1 and 2 there are shown a plan and end view of a box of this invention, comprising the two opposed box sections 2 and 4, each box section having the bottoms 6 and 8, and the upstanding walls 10, 12, 14, 16 and 18, 20, 22, and 24, respectively. The opposed box sections are hinged to each other by hinge 26 along one edge of a wall of each in conventional manner, the hinged walls in this instance being walls 16 and 24. In Fig. 1, the box is shown in open position, and in Fig. 2 the dotted lines show the box in closed position.

Referring now to Fig. 3 there is shown a spring member 28 which is mounted within the box and serves to bias the box sections toward the open position of Fig. 1. Spring 26 is an elongated one-piece strip of flat spring metal and having approximately at its center the loop 30. The purpose of loop 30 is to provide clearance for the spring around the hinge 26 when the box sections are spread apart by the spring, as shown in Fig. 2. The end portions 32 and 34 of the spring are bent at a substantial angle to the body of the spring to form an integral latch mechanism which will now be described.

End portion 32 is bent at approximately right angles to the body of the spring, and is further bent at its extremity to provide the hook 36. The angle at which end portion 32 is bent is not critical and can vary several degrees from the aforesaid right angle. The angle will be determined by the configuration and angle of the walls of the box sections, and by the fit or engagement of the latch and detent together when the box sections are closed one on the other.

The other end portion 34 is similarly bent and in the same direction as end portion 32, and is further bent or folded on itself at its extremity to form the detent or shoulder 38.

Spring 28 is mounted in the box sections 2 and 4 as shown in Figs. 1 and 2, and is held therein preferably by the bent-over tabs 40 which may be struck up from the material comprising the bottoms of the box sections. As formed and mounted, it will be observed that in this embodiment, the spring body is given a slight curvature (as shown by numeral 42) to raise the corner 44 of the spring above the level of the box section level, and bring said corner in proximity to the side-wall 12.

A slit or slot 46 is provided in bottom 6 extending along the edge of the bottom where it joins wall 12. By this means, a portion 48 of wall 12 is freed along its bottom edge, thus rendering said portion free to be flexed inwardly by force applied externally. The aforesaid corner 44 rests against the inside surface of portion 48. (It will be noted, of course, that the slit 46 may be placed entirely in the side-wall 12, or partially in the side-wall and partially in the bottom, and still be within the scope of this invention.)

Referring now to Figs. 4, 5, and 6, there are shown views illustrating (slightly enlarged for clarity) the operation of the latch and release mechanism. In Fig. 4, the box sections 6 and 8 are shown closed. In this position the spring halves have been forcible folded toward each other, the bending taking place primarily at the center portion of the spring where loop 30 is situated, and against the normal tendency of the spring to remain in its unstressed shape shown in Fig. 3. In this closed (Fig. 4) position, hook 36 engages detent or

shoulder 38, and locks the ends of the spring together, thus holding the box sections closed.

In Fig. 5, force has been applied to the freed portion 48 of wall 12, moving it inwardly. In so moving inwardly, the portion 48 engages the corner 44 of spring 28 and moves the end portion 34 inwardly, thus freeing the hook 36 from the detent 38. With these parts thus unlatched or disengaged, the spring 28 will bias or move the box sections to the Figs. 1 and 2 position.

It will be noted that the inward motion of end portion 34 is the combined result of a slight further bending of the spring body at 42, and a slight sliding motion of the spring body itself backward along the bottom 6.

Illustrated in Fig. 7 is one of the advantages of this invention. In many boxes, particularly those in which jewelry is sold, it is the practice to cover the box with an ornamental covering, such as a fabric, or leather. In such cases, it is often desired that no metal parts show outside the box, and desideratum therefore precludes the use of metal push-buttons or catches. Also, it is often desired that the box have a smooth exterior, which desired feature similarly precludes externally protubing buttons or catches. As shown in Fig. 7, an ornamental covering 50 may be glued or otherwise fastened to the box exterior, completely covering all portions of the box. This covering can extend, if desired and as shown, over the walls of the box sections and down into the interior. Such a covering does not interfere with the movability of freed portion 48 and the movement of the end portion 34 of the spring 28. Thus, to all appearances, the box of the present invention, thus covered, shows no external evidence of a latch mechanism or a release mechanism therefore.

There is shown in Fig. 8 a second embodiment of the invention which differs from the Figs. 1–6 embodiment in the construction of an end portion of the spring member. In this embodiment, the box sections 52 and 54 are provided exactly as before, with the same upstanding walls. A slot 56 is provided, just as before, to provide a freed portion 58 of a wall. The spring 60 is the same as described above, and has the bent end portions 62 and 64, the one providing the hook 66 and the other the detent or shoulder 68.

However, in this embodiment, end portion 64 is provided with a U-shaped (or equivalent) outward bend 70 as shown. This bend 70 faces in the same direction as detent 68 and engages the inside surface of freed portion 58. Therefore, when portion 58 is moved inwardly, it pushes on bend 70 thus bending the end portion 64 inwardly to free the latching mechanism.

This embodiment may also be covered with an ornamental covering, just as in the case of the Figs. 1–7 embodiment, with the same desirable external appearance.

It is to be noted that in the several views, the end portion that is shown as being moved to free the latch is the one having at its extremity the detent or shoulder. It is within the skill of a mechanic, obviously, to reverse the parts so that it is the hooked end portion that is so moved. Also, the detent or shoulder 38 is illustrated as being a folded back portion. Quite obviously, a hook similar to hook 36 could be formed which would work in the same way. The folded construction is preferred because it provides a rounded top past which the hook 36 can slide easily just prior to latching.

It is to be especially noted that in the constructions presented herein, the spring and latch mechanism are integral (that is, one-piece) in construction, thus leading to economy of manufacture. The release mechanism (the freed portion of the box section wall) is integral with the wall, a feature again leading to economy of manufacture.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A box comprising opposed box sections hinged to each other along one edge of each to open and close, spring means lying within said box and attached to said sections to bias said sections apart, said spring means lying along the bottoms of said sections and incorporating as an integral part thereof and at each end thereof latch means for holding said sections closed, and release means formed as an integral part of a wall of one of said box sections opposite a hinged wall for disengaging said latch means.

2. The box of claim 1 in which said spring means and latch comprise an elongated strip of flat spring metal having end portions thereof bent at a substantial angle to the plans of the adjoining portions of the spring, each of said end portions being bent at its outermost extremity to form a hook on one end portion and a detent or shoulder on the other portion, said spring having a length thereof fastened to one box section and the remaining length portion thereof fastened to the other box portion; said end portions lying adjacent walls of said box sections opposite the hinged edges, said length portions of the spring being bent toward each other when said box sections are in closed position, and said hook engaging said detent.

3. The box of claim 1 in which said spring means and latch comprise an elongated strip of flat spring metal having bent end portions thereof adapted to meet each other when said box sections are closed, one of said bent end portions having a hook at its extremity and the other of said bent end portions having a detent or shoulder at its extremity, said hook catching on said shoulder when said box sections are closed, and in which said release means comprises a flexible portion of a wall of one of said box portions opposite the hinged edge, said flexible portion being adapted to be bent inwardly against its own bias by manually applied force to press against one of said bent end portions and to bend the latter inwardly to disengage said hook and detent.

4. The box of claim 1 in which said release means comprises a flexible portion of a wall of one of said box portions opposite the hinged edge, said flexible portion being attached to the rest of the wall integrally at its ends, but being free of the box section along its sides.

5. A box comprising opposed box sections each of which comprises a bottom and a plurality of walls upstanding from said bottom, said box sections being hinged together along one edge of a wall of each to open and close elongated two-legged spring means extending around the interior of said box sections to bias said sections apart, the legs of said spring means lying against and being attached to the box bottoms and incorporating at their free ends as integral parts thereof a latch and detent for holding said box sections closed, and one of said bottoms being provided with slit extending along the length of the wall for a portion of the length thereof adjacent the corner formed between that wall and the bottom of the box section, thereby to free a portion of said wall for bending inwardly, the freed portion being adapted to be pushed inwardly to disengage said latch and detent.

6. The box of claim 5 in which said latch and detent comprise, respectively, end portions of the legs of said spring member which are bent at approximately right angles to said member on the same side thereof, one of said end portions being further bent at its extremity to form a hook, and the other of said end portions being folded at its extremity to form a detent or shoulder, said hook and detent engaging each other when said box sections are closed, and one of said bent portions lying adjacent that portion of said wall that has been freed, thereby to be pushed inwardly to disengage said

hook and detent when said portion of the wall is pushed inwardly.

7. The box of claim 5 in which said latch and detent comprise, respectively, end portions of the legs of said spring member which are bent at approximately right angles to said member on the same side thereof, one of said end portions being further bent at its extremity to form a hook, and the other of said end portions being folded at its extremity to form a detent or shoulder, said detent and hook being engaged when said box is closed, and one of said end portions being provided with an off-set U-shaped loop extending beyond

the plane of the end portion, said U-shaped loop being positioned adjacent that portion of said wall that has been freed, thereby to be engaged and pushed inwardly to disengage said hook and detent when said portion of the wall is pushed inwardly.

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