This invention relates to containers of the nature of jewelry and cosmetic boxes and more particularly to line boxes containing trays.

It is an object of this invention to provide a box containing a tray which is automatically displaced by the opening and closing of the box lid.

It is a further object of this invention to provide a box containing a tray which, upon the opening of the box, is displaced away from the center of the box by an attachment of the tray to the lid of the box.

It is another object of this invention to provide a box having trays which are automatically displaced from the center of the box upon raising the box lid in which the trays are automatically returned toward the center of the box upon lowering of the box lid.

These and other objects of this invention will become more apparent upon consideration of the following description taken together with the accompanying drawings in which:

Fig. 1 is a front perspective view of a box according to this invention in open position; Fig. 2 is a transverse section of a portion of the box of Fig. 1 in closed position; Fig. 3 is a section of the box taken on line 3-3 of Fig. 2 in the direction of the arrows; Fig. 4 is a perspective view of a strap attaching the lid of the box to a tray of this invention; Fig. 5 is a front perspective view of the box of Fig. 1 in an intermediate open position; Fig. 6 is a section of the box taken on line 5-5 of Fig. 1 in the direction of the arrows with the lid partly broken away; Fig. 7 is a top plan view of the box of Fig. 1 in open position taken on line 6-6 of Fig. 5 in the direction of the arrows with the position of the tray in closed position shown in dotted lines; Fig. 8 is a top plan view of the box of Fig. 1 in an intermediate open position with a section through the box lid and the position of the tray and lid in an intermediate closed position shown in dotted lines.

Referring to the invention as shown in the drawings, Fig. 1 shows a box 10 which has a box lid 11 attached thereto by a pair of hinges 12. The box 10 is made up conventionally of a front wall 13, rear wall 14 and two identical side walls 15. The box lid 11 in turn has a front wall 16, a rear wall 17 and two side walls 18. A pair of trays 19 are provided to fit within the box lid 11 when the lid is in closed position and resting on the box 10. Each tray is made up of a bottom 20 and four short vertical walls. Of these tray walls, a wall 21 in each tray 19 is shown extending transversely to the box 10 when the lid 11 is in open position. This wall 21 in each tray 19 is the tray wall extending from the center of the box to the box lid.

This wall 22 is the transverse-in-closed-position wall. In open position the wall 22 of each tray 19 extends across the depth of the box 10. A flexible link between each tray and its respective lid side wall 18 is provided by a strap 23. This strap 23 as shown in Fig. 4 is made up of a stiff central body 24 adjoined on each side by flexible areas 25 which serve as hinge connections between the central body 24 and the side wall 18 of the box 26 on its one side and a foot 27 on its other side. Each strap 23 is attached to its respective tray wall 21 and lid wall 18. A suitable screw or bolt 28 attaches the foot 26 to the side wall 18 while a suitable screw or bolt 29 attaches the foot 27 to the wall 21 as shown in Figs. 2 and 5. Each tray 19 is pivoted on a post 30 which is mounted on a block 31 in the box 10. As shown in the drawings, the block 31 is contiguous and parallel to the box rear wall 14. The pivot post 30 for each tray is mounted in the block 31 at a point which is removed from its closest box side wall 15 by a short portion of the box 10. A portion of the block 31 indicated by the bracket marked "A" in Fig. 5. The tray 19, in turn, is mounted on its pivot post 30 in its wall 22 at a point in the wall 22 which is removed from its adjacent wall 21 by a short portion of the wall 22 indicated by the bracket marked "B" in Fig. 5. The foot 27 is attached to the wall 21 of the tray 19 on the inner surface of the wall 21 at a point removed from its contiguous wall 22 by a short portion of wall 21 indicated by the bracket marked "C" in Fig. 5. The strap 23 is shown in Figs. 2 and 3 folded up in the closed position of the lid 11 on the box 10. In this position the stiff central body 24 lies across the upper edge of the wall 21 and the flexible areas 25 fit the strap 23 into the folded up position. The strap 23 is shown in Figs. 2 and 3 folded up in the closed position of the lid 11 on the box 10. The motion of the tray 19 which is the object of this invention is provided by the structural relationship between the point of fastening the strap 23 to the lid 11 and the tray 19 and the point of pivoting the tray on the post 30. In Fig. 2, the box 10 and the lid 11 are viewed across transverse or side to side dimension. In Fig. 3, the box 10 and the lid 11 are viewed along the depth dimension from the front to the back of the box 10. In Fig. 2, it is seen that the screw 28 fastens the foot 26 of the strap 23 to the wall 18 of the lid 11. The screw 29 fastens the foot 27 at the other end of the strap 23 to the wall 21 of the tray 19. The screws 28 and 29 lie in substantially the same transverse plane when the lid 11 is in the closed position. The screws 28 and 29, however, are spaced apart in this transverse plane. In Fig. 3 the screw is shown in solid lines and the screw 26 is shown in dotted lines lying behind the screw 27 in the same transverse plane. The Figs. 3, however, being taken on the depth dimension shows the relation of these two screws 28 and 29 to the post 30 upon which the tray 19 pivots. The post 30 is spaced from the screws 28 and 29 in the depth dimension by "C". As seen in Fig. 2, the post 30 is also spaced from the screws 28 and 29 in the transverse dimension. The screw 29 is spaced from the post 30 in the transverse dimension by the distance of portion "B" of wall 22. As a result, as can be seen in Fig. 5, the portions "B" and "C" of the walls 21 and 22 that lie between the screw 29 and the post 30 form a lever arm. This arm is balanced by the transverse space "A" between the post 30 and the plane in which the screw 28 is moved with the lid 11.

On opening the lid 11, the screw 25 holding one end of the strap 23 is moved through an upward and backward arc. This motion pulls on the strap 23. As shown in Figs. 4 and 5, the strap 23 is of such construction as to be unfolded and drawn taut by the upward and backward movement of the lid 11. When so drawn out, the strap 23 then pulls on its foot 27 which
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is fastened to the tray 19. The tray 19 is pivoted on post 30 by this pull. Portions "B" and "C" of the walls 21 and 22 between the screw 29 and the post 30 act as a lever arm to turn the tray 19 on the post 30. The tray 19 is rotated in a clockwise direction with the tray bottom 20 passing over the side wall 15. Thus, when the lid 11 is in fully raised position, as shown in Figs. 6 and 7, the tray 19 will be pivoted to the point where the wall 21 is transverse to the box 10. In this position, the wall 22 lies in the direction of the depth of the box 10. In the open position, the tray 19 is pivoted so as to be almost entirely outside of the area described by the walls of the box 10. In the outer position as shown in Fig. 7, the tray bottom 20 overlies the wall box 15.

The central body 24 of the strap 23 has a helical configuration. This shape of the body 24 together with the flexible areas 25 permits the strap 23 to assume the position between the open lid 11 and the tray 19 shown in Figs. 6 and 7. In this position, the foot 26 lies along a front to back plane while the foot 27 attached to the wall 21 lies in a transverse plane. The section of the strap 23 lying between the feet 26 and 27 describes an upward right angle bend which is permitted by the flexible areas and the shape of the body 24.

Upon closing the lid 11 down on the box 10, the distance between the screws 28 and 29 is reduced and the tension on the strap 23 is removed. The downward movement further compresses the strap 23 causing the foot 26 to bear against the stiff central body 24 which in turn pushes on the foot 27 and through the foot 27 pulls on the wall 21. Referring to Figs. 6 and 7, this motion of the body 24 is at first in a forward direction moving the wall 21 forward with respect to its pivot post 30 and causing the tray 19 to turn counter-clockwise on the pivot 30 as seen in Fig. 7. In Fig. 8, the lid 11 is shown in two partially closed positions. In solid lines, the lid 11 and tray 19 are shown approximately in the half-closed position. At this point, the downward motion of the lid 11 and the counter-clockwise motion of the tray 19 has untwisted the strap 23 to the point where the central body 24 pushed by the foot 26 is moving in an inward or transverse direction than in a forward direction. In this position, it continues to move the tray inward. In dotted lines the lid 11 and tray 19 are shown in the three-quarters closed position. At this point of closure, the body 24 of the strap 23 is moving almost completely in a transverse direction and the tray 19 is moving inward in a continued counter-clockwise motion. Fig. 7 shows the tray 19 in dotted lines in its final inner position when the lid is completely closed on the box 10. The position of the strap 23 in this closed condition is shown in Figs. 2 and 3.

The embodiment described above in connection with Figs. 1 through 8 may be modified by replacing the strap 23 with a more flexible strap which having all the other properties of strap 23 will not be capable of applying a rotational force to the tray 19 upon closing the lid 11. Such a strap when compressed by the lid 11 would merely fold over the tray 19. An automatic closing is obtained through the camming action of the lid 11 on the tray 19.

As described above, the pivot post 30 is offset from its most adjacent box side wall 15 by a portion "A" of the box rear wall 14. Consequently, as seen in Fig. 7, when the tray 19 is in its outermost position the wall 21 extends transversely of the box 10 and the wall 22 of the tray 19 extends along the depth dimension of the box 10. In this position, the lid 11 mounted on the rear wall 14 by the hinges 12 is set back from the transverse plane through the post 30 by a distance equal to the portion "B" of the wall 22. Similarly, the side wall 18 which is adjacent the tray 19 is offset from the post 30. As a result of this transverse and depth displacement between the post 30 and the side wall 18 and the tray wall 21 upon lowering of the lid 11. This camming action is obtained by the bearing of the side wall 18 against the tray wall 21. It turns the tray 19 on the pivot post 30 and urges the tray 19 in a counter-clockwise direction as seen in Figs. 7 and 8. In the final closed position of lid 11, the tray 19 is moved completely within the lid 11 and lies over the box 10.

Among other advantages of this invention are simplicity of construction and operation. The opening and closing of the box lid cooperates with the leverage provided by the attachment of the parts to bring about the desired movement. Shallow trays are highly desirable in jewel boxes but heretofore have also been troublesome and cumbersome. This invention has provided a device in which the trays are carried within the box. Yet, when the box is open for use, the trays are positioned conveniently but out of the way.

Various modifications of the above-described embodiments of this invention are readily apparent without departure from the spirit of the invention. Therefore, it is not intended to limit the invention other than by the scope of the appended claims.

We claim:

1. A box comprising: a receptacle having a base and side wall members; a lid hingedly connected to one of said side wall members and shiftable between closed position covering said receptacle and an open position exposing the interior of said receptacle; a tray pivotally connected to said receptacle and shiftable in a substantially horizontal plane between a closed position within the confines of the vertical planes of the side wall members and an open position projecting outwardly beyond the confines of the vertical planes of said wall members; and a flexible strap connected between the tray and the lid and cooperating to cause said tray to shift to open position projecting outwardly beyond the confines of the vertical planes of the side wall members when said lid is shifted to open position, said tray being disposed in the path of movement of said lid when in its open position, whereby the lid engages said tray and shifts it to closed position within the confines of the vertical planes of the side walls of the receptacle when said lid is shifted from open to closed position.

2. A box as set forth in claim 1 in which said strap has relatively stiff portions adjacent the points of connection to the lid and tray respectively and a relatively more flexible portion connecting said stiff portions together to facilitate the folding of said strap upon itself.

3. A box as set forth in claim 1 in which said tray is pivotally connected to the lid, said side walls adjacent one end of the lid and another similar tray is similarly pivotally connected to the receptacle adjacent the opposite end of the lid.

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