Dec. 10, 1946. J. G. HUYE 2,412,402

AUTOMATICALLY LOCKED FIBERBOARD SHIPPING BOX

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Fig. 1.

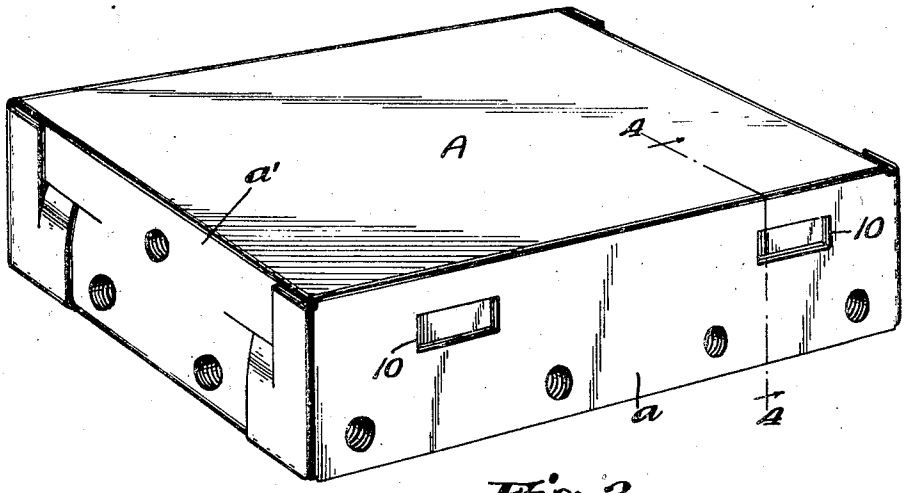


Fig. 2.

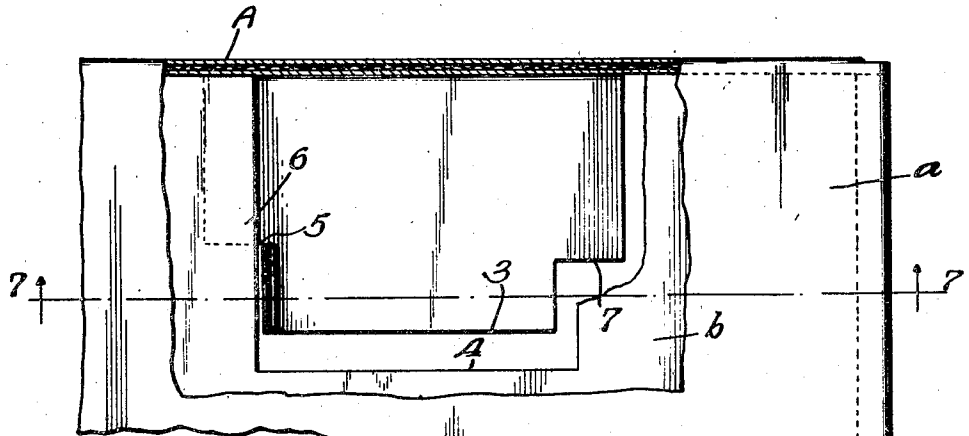
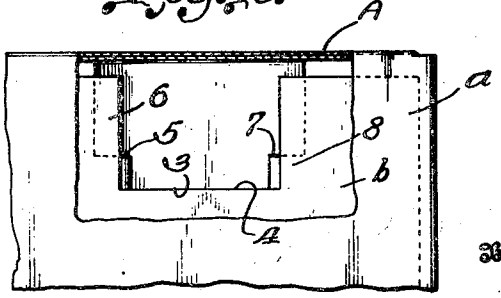


Fig. 10.



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Fig. 3.

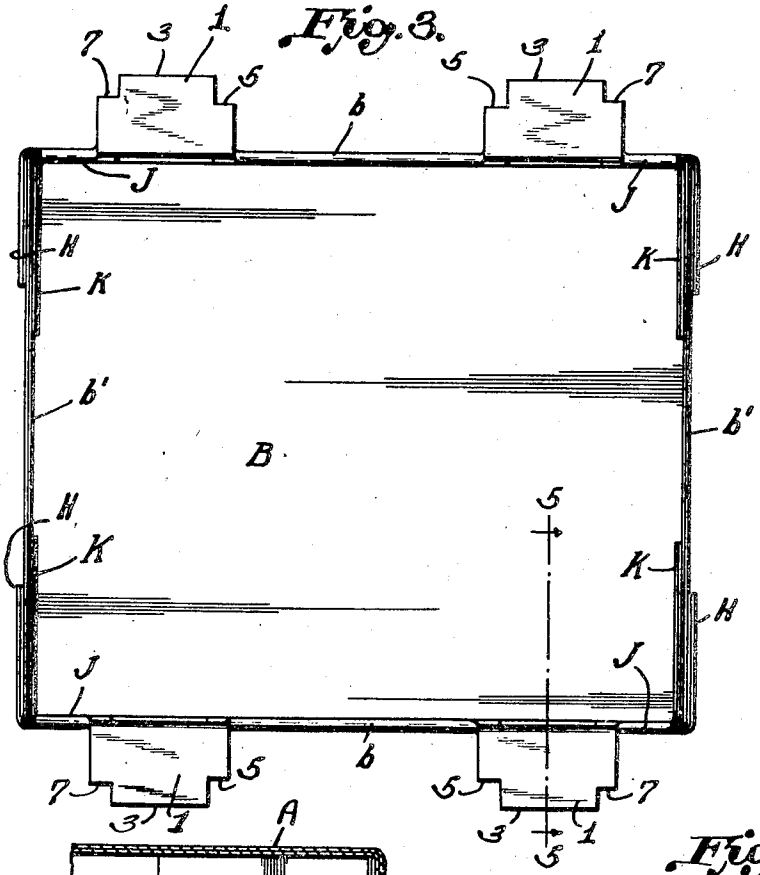


Fig. 4.

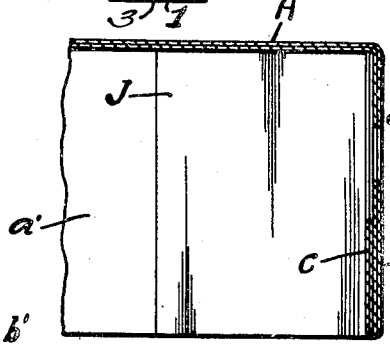


Fig. 5.

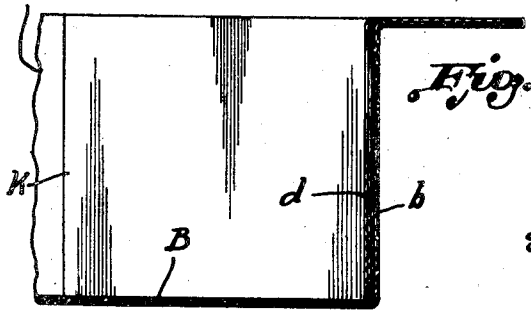
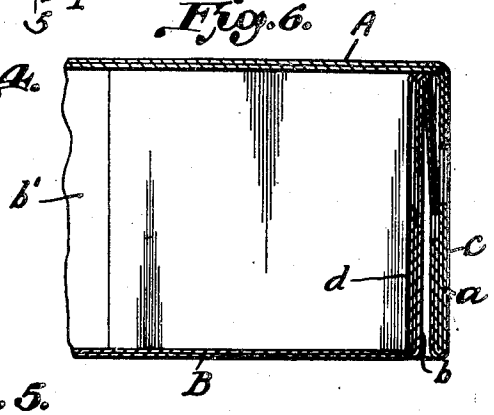


Fig. 6.



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Fig. 7.

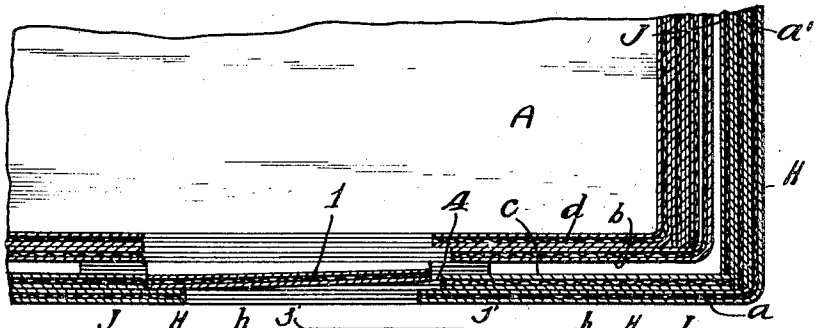
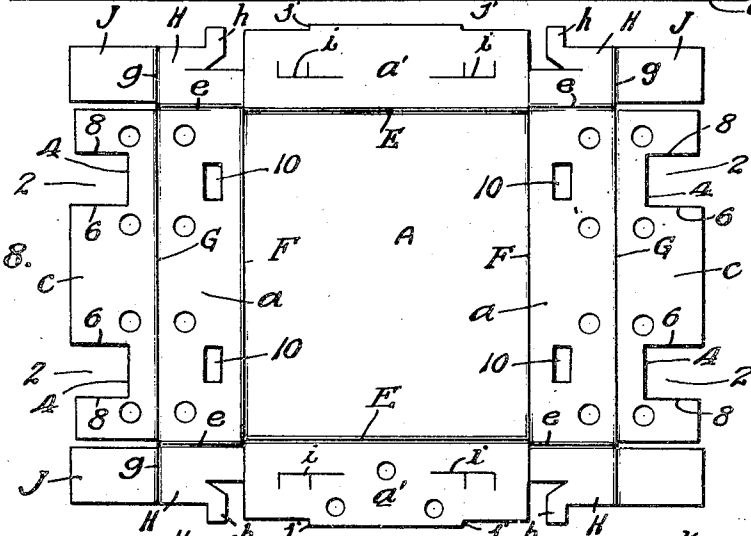


Fig. 8.



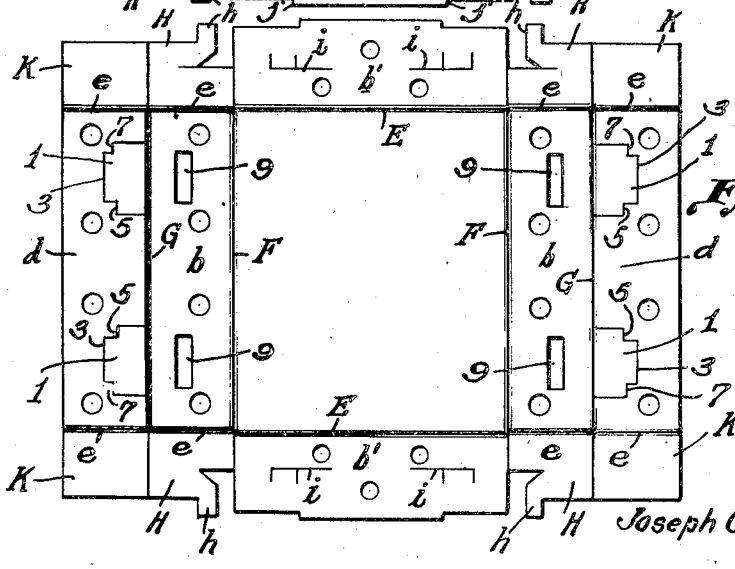


Fig. 9.

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AUTOMATICALLY LOCKED FIBERBOARD SHIPPING BOX

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Application October 30, 1944, Serial No. 561,086

4 Claims. (Cl. 229—45)

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This invention relates to automatically locked boxes such as are used for shipping merchandise.

The primary objects of this invention are to provide in a shipping box simple automatically locking means which will function to lock the cover on the box body or tray by the simple act of placing said cover on such body or tray; to provide a simple locking means which, while automatically locking the box parts together, may be released quickly and without damage to permit the cover to be removed for inspection or other purposes and again applied and automatically locked to the body or tray, and this may be repeated a number of times so that the box may be used over and over again in the shipping of merchandise; to provide an edge abutting construction of locking means and to so form and associate the parts that one of the abutting edges will extend slantingly lengthwise of the other to thus extend across the other to positively prevent such slanting abutting edge from overshooting and slipping past the other; to provide bracing means presented edgewise of the height of the box to aid in supporting the load of similar shipping boxes piled on top of a particular box in a stack of such filled boxes; and to provide an automatically locking shipping box of such construction that it may be easily and quickly sealed against tampering and pilfering.

In the accompanying drawings:

Figure 1 represents a perspective view of a shipping box embodying my invention:

Figure 2, a detail fragmentary view partly in section and partly broken away and in side elevation, showing on an enlarged scale one of the locks;

Figure 3, a top plan view of the box body section or tray;

Figure 4, a sectional view through the top or cover A on the line 4—4 of Figure 1, looking in the direction of the arrows;

Figure 5, a sectional view on the line 5—5 of Fig. 3, looking in the direction of the arrows;

Figure 6, a sectional view on the line 4—4 of Fig. 1, looking in the direction of the arrows;

Figure 7, a sectional view on the line 7—7 of Fig. 2, looking in the direction of the arrows;

Figure 8, a plan view of the top A in flat or blank form;

Figure 9, a similar view of body or tray B; and

Figure 10, a reduced scale view similar to Figure 2, only showing the parts in extreme bulge pack relation immediately after packing and prior to any contraction or shrinkage of the contents.

Referring now in detail to the drawings, A designates the cover or top box section and B the tray or body box section, these two sections being telescoped together as illustrated in Figure 1 and locked in such relation as shown in Figures 2, 6, 7 and 10.

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The cover A is preferably cut or stamped from a single piece of material, preferably relatively stiff inherently resilient mediumly heavy corrugated paste-board and comprises a top panel, which may be quadrangular in form, as shown, with side flanges *a*, end flanges *a'*, and upwardly folded side lock panels *c*, there being impressed into the material lengthwise fold or score lines F between the respective side flanges *a* and the top panel, G between the respective side flanges *a* and the respective lock flanges or panels *c* and transverse fold or score lines E respectively between the respective ends of the top panel and the respective end flanges *a'* and extending across the respective end portions of the respective side flanges *a* to facilitate the proper folding of the end tabs H respectively integral with the respective end portions of the respective side flanges *c*. The end tabs H respectively are formed with tongues *h* to be received in the respective cooperating compound slots *i* in the respective end portions of the respective end flanges *a'* in the set-up condition of the cover or top section to interlock the corner portions of the respective side flanges *a* and end flanges *a'*, the construction and operation of this corner interlock feature being substantially as illustrated and described in Patent No. 2,193,925 for a Box granted to me on March 19, 1940.

To erect the cover or top section A from the flat sheet condition illustrated in Figure 8 to the condition shown in Figures 1, 2, 4, 6, 7 and 10, the flanges *a* and *a'* are folded downward on the fo'd lines F and E respectively to extend at right angles to the large central top panel, the lock flanges *c* are then folded inward to lie substantially flat against the inner faces of the flanges *a* respectively with their then upper edges adjacent to or abutting or substantially abutting the lower face of the main panel; the end tabs H are then folded on their score lines *e* and the tongues *h* are inserted in the slots *i* and the end bracing stays are folded on their score lines *g* across the lower notched end portions of the edges of the end flanges *a'* with their inner edges adjacent to or in abutment with the shoulders *j* and with their upper end edges adjacent to or abutting or substantially abutting the lower face of the main panel and with their outer faces in or substantialy in engagement with the inner faces of the respective end portions of the respective end flanges *a'*.

The body section or tray B is stamped out in the same manner and is of substantially the same construction, with the exception that instead of the material being cut through transversely in line with the fold lines E to form the stays J the material is cut through lengthwise in line with the score or fold lines G from the respective ends of the respective side flanges *b* to the edges of the

blank to form stays K foldable along fold or score lines *e* to extend at right angles to the respective male lock flanges *d* with which they are integral and lie in contact or substantially in contact with the opposed inner faces of the respective end portions of the respective end flanges *b'* and with their lower edges in abutment, or substantially in abutment, with the upper face of the bottom or main panel of the tray B and with their upper edges flush with the highest portions of the upper edges of the respective end flanges *b'*.

The manner of erecting the tray B is similar to that described with relation to the top section or cover A, and its corners are interlocked in the same manner.

The stays J and K, and in particular the stays K provide added strength to resist and support the load in the form of a number of similar loaded or filled boxes that may be stacked upon or above a given particular box, thus permitting a large number of such boxes with their contents to be loaded into a freight car or truck in high stacked relation without fear of crushing the lower boxes and so running the risk of ruining such boxes with their contents.

The female locking flanges *c* are deeply notched out as at 2 adjacent each end to respectively provide an upwardly presented locking edge 4 preferably extending substantially parallel to the main panel of top or cover A and each such notch has side edge walls 6 and 8 preferably respectively extending upward from the edge 4 and preferably substantially at right angles thereto and the respective side flanges *a* of the cover or top A are preferably formed with release openings 10 preferably of oblong shape and which respectively register transversely with the medial portions of their respective corresponding notches 2.

The male locking flange *d* of the body or tray B has stamped or cut therefrom the locking tongues 1 which are integrally hingedly connected along the score or fold lines G respectively with the respective end portions of the respective side flanges *b* and so located lengthwise thereof that the reduced length free end portions respectively thereof will register transversely with, and will be received in, the respective notches 2 of the respective female locking flanges *c*, and their free end edges 3 will lie in the path of, or abut, the locking edges 4 of the respective slots 2 when the cover A and body or tray B are telescoped together.

The sides of the lower or free end portion of each of said locking tongues 1 are cut away to form the reduced length free end portion of the tongue 1 to snap into its corresponding notch 2 and to form positioning shoulders 5 and 7 at different levels to engage and cooperate with the side edges 6 and 8 of the corresponding notch 2 to slightly twist the tongue 1 so that its locking edge 3 of its free end portion extends slantwise across the width of the cooperating locking or abutting edge 4 of the slot or notch 2 lengthwise of said edge 4 to positively guard against the respective tongues 1 snapping outward beyond the path or plane of the edge 4 so that the edge 3 overshoots the edge 4 and slips down beyond it.

The corrugated paste board material has considerable inherent resiliency which results in the locking tongues 1 being presented laterally outward substantially at right angles to the side flanges *b* prior to the application of the cover A to the tray B, the flanges or sides of the cover

A in the telescoped relation of the two sections bending the locking tongues downward on their hinge or fold lines G to lie close to the flanges *b*, while the natural resiliency of their material tends to swing them upward back toward horizontal position, so that in locking relation said tongues 1 diverge progressively downwardly and outwardly from their side flanges *b* and toward and into the notches 2 respectively, with their respective shoulders 5 and 7 pressed against the respective side edges or walls 6 and 8 of the respective notches 2 and since the respective shoulders 5 are at a higher level than the respective shoulders 7 the end portions adjacent the shoulders 5 of the respective tongues 1 will swing outward to a greater extent than the end portions adjacent the respective shoulders 7 of the respective tongues 1, with the result that the respective tongues will be slightly twisted lengthwise and will present the free end of the reduced free end portion of the respective locking tongues 1 slantingly so as to extend across or intersect the locking edge 4 of the corresponding notch 2, this construction preventing the locking edge 3 of the tongue 1 from either overshooting or undershooting the locking edge 4 of the notch 2.

The flanges *b* are preferably formed with oblong openings 9, which constitute receiving openings, so positioned as to receive the free end or reduced end portions of the respective locking tongues 1 when a user inserts the tips of his fingers through the respective release openings 10 in the cover A and presses upon the respective tongues 1 and swings them about their hinge connections and bends them within themselves to such degree that their free ends are moved out of the notches 2 and into the respective receiving openings 9 to thus free the top or cover A for removal for inspection or other purposes.

If it be desired to seal the package against tampering or pilfering this may be done by securing a tightly drawn sheet of paper or other suitable sheet material by a suitable adhesive over the release openings 10 so as to completely close them and over or across the corner interlock construction to prevent release of the locking tongues 1 or of the interlock corner construction without leaving visual evidence the box has been tampered with.

Where the box or container is to be used for shipping fruits or vegetables or other articles or materials which for various reasons shrink or lose bulk after being packed and thus are most usually packed in tightly so that the container top or cover is bulged up, the notches 2 are cut from one fourth to one half an inch or more lower than where contraction or shrinkage does not require to be considered, the exact depth of the notches depending on the particular fruit, vegetable or other articles to be boxed. This construction permits the cover A to be locked on a body or tray B wherein the fruit or other contents extend above the upper edges of the side flanges *b* and end flanges *b'*, as illustrated in Figure 10, wherein the edges 3 and 4 are actually abutting in locking cooperation, with the assurance that as the contents contract or shrink the locking relationship of these pairs of abutting edges 3 and 4 will be maintained even though the abutment edge 4 moves downward with the cover A and away from the abutment edge 3 progressively as the contraction or shrinkage progresses until finally the extreme point of telescoping movement of the cover A on the body or

tray B is reached with the lower face of the main panel of the cover A in engagement with the upper edges of the side flanges b and end flanges b' of the body or tray B, as illustrated in Fig. 2, wherein the abutment edges or faces 3 and 4 are shown in their extreme spaced relationship.

I claim:

1. An automatically locked box comprising a body section having a bottom panel and side and end flanges integral with and extending upward from said panel and having their respective end portions firmly secured together to form a rim, and a plurality of locking tongues respectively integrally resiliently hingedly connected to the upper parts of the respective end portions of the respective side flanges and extending laterally therefrom, each said tongue being formed with a free end locking abutment end face and with limiting shoulders at each end of said face and at different distances from said face toward the hinge of said tongue, said tongues being upwardly and outwardly resiliently pressed, in combination with a cover section comprising a top panel, side flanges and end flanges integral with and depending from said top panel and having their respective end portions firmly secured together to form a skirt of such size and form as to snugly receive said rim, said cover side flanges each comprising two layers of material, the upper end portions of the respective inner layers thereof being notched out to a depth substantially in excess of the height of said locking tongues respectively and so positioned as to respectively receive the lower free end portions of said respective tongues and respectively formed with a bottom edge wall and with vertical end walls so positioned as to respectively engage with their inner corners the outer corners of the respective shoulders of the respective tongues at different distances from the hinge connections of the respective tongues to twist the respective tongues and present the respective free end abutment edge faces thereof slantwise across the faces of the respective bottom edge walls and in the same vertical planes to abut the latter, the outer layers of the respective end portions of the respective cover side flanges being formed with release openings respectively smaller than and in transverse registry with the respective notches, and frangible adhesive applied means for covering said openings respectively.

2. An automatically locked box comprising a body section having a bottom panel and an integral continuous vertically upwardly presented rim, and a plurality of locking tongues respectively integrally resiliently hingedly connected at spaced intervals to the upper part of said rim and extending laterally therefrom, each said tongue being formed with a free end locking abutment end face and with limiting shoulders at each end of said abutment face and at different distances from said face toward the hinge of said tongue, said tongues being resiliently upwardly and outwardly pressed, in combination with a cover section comprising a top panel and a continuous skirt integral with and depending from said top panel and of such size and form as to snugly receive said rim, the inner portions of the upper portions of said skirt being notched out at spaced intervals to a depth substantially in excess of the height of said tongues respectively and so positioned as to respectively receive the lower free end portions of said respective tongues and respectively formed with

bottom edge walls and with vertical end walls so positioned as to respectively engage with their inner corners the outer corners of the respective shoulders of the respective tongues at different distances from the hinge connections of the respective tongues to twist the respective tongues and present the respective free end abutment edge faces thereof slantwise across the faces of the respective bottom edge walls and in the same vertical planes to abut the latter, the outer portions of the upper portions of said skirt being formed with release openings at spaced intervals, said release openings respectively being smaller than and in transverse registry and communication with the respective notches.

3. An automatically locked box comprising a body section having a bottom panel and a continuous rim integral therewith and presented vertically upward therefrom, and a plurality of locking tongues respectively integrally resiliently hingedly connected at spaced intervals to the upper part of said rim and extending laterally therefrom, each said tongue being formed with a free end locking abutment face and with limiting shoulders at each end of said abutment face and at different distances from said face toward the hinge of said tongue, said tongues being resiliently upwardly and outwardly pressed, in combination with a cover section comprising a top panel and a continuous skirt integral with and depending from said top panel and of such size and form as to snugly receive said rim, the inner portions of the upper portion of said skirt being notched out at spaced intervals and so positioned as to receive respectively the lower free end portions of said respective tongues and respectively formed with bottom edge walls and with vertical end walls so positioned as to respectively engage with their inner corners the outer corners of the respective shoulders of the respective tongues at different distances from the hinge connections of the respective tongues to twist the respective tongues and present the respective free end abutment faces thereof slantwise across the faces of the respective bottom edge walls and in the same vertical planes to abut the latter.

4. An automatically locked box comprising a body section having a bottom panel and a rim connected therewith and presented upwardly therefrom, and a plurality of locking tongues respectively resiliently hingedly connected at spaced intervals to the upper portion of said rim and extending laterally and downwardly therefrom, each said tongue being formed with a free end locking abutment face and with limiting shoulders at each end of said abutment face and at different distances from said face toward the hinge of said tongue, said tongues being resiliently upwardly and outwardly pressed, in combination with a cover section comprising a top panel and a skirt depending from said top panel and of such size and form as to snugly receive said rim, the inner portions of the upper portions of said skirt being notched out at spaced intervals and so positioned as to receive respectively the lower free end portions of said respective tongues and respectively formed with bottom edge walls and with vertical end walls so positioned as to respectively engage with their inner corners the outer corners of the respective shoulders of the respective tongues at different distances from the hinge connections of the respective tongues to twist the respective tongues.

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