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2,318,608

BOX AND HINGE STRUCTURE

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Fig. 1

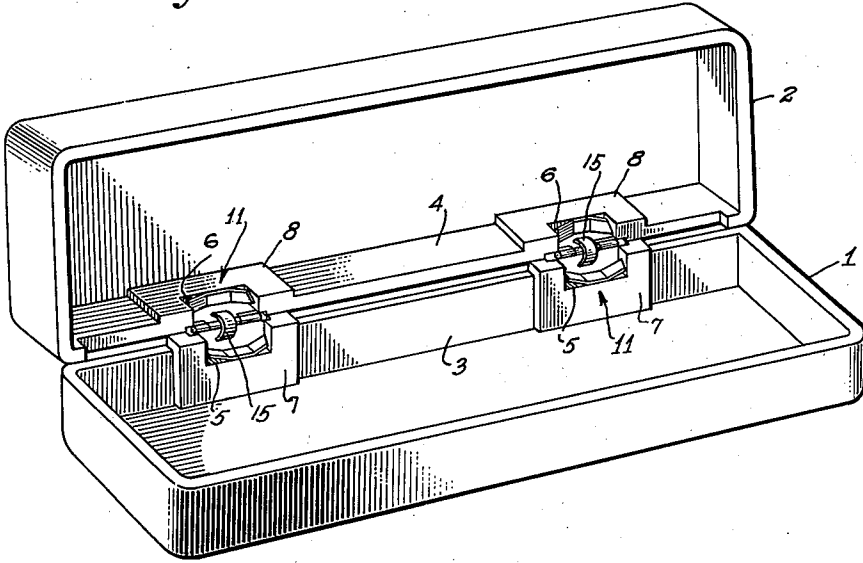


Fig. 2

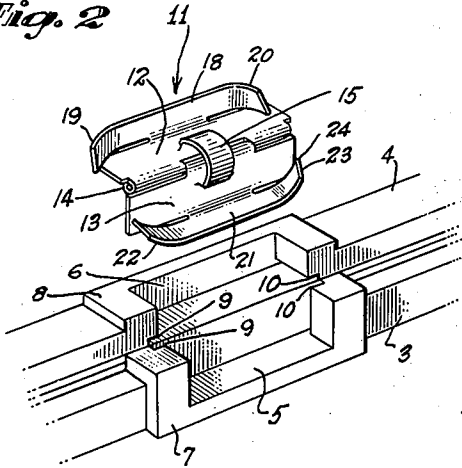
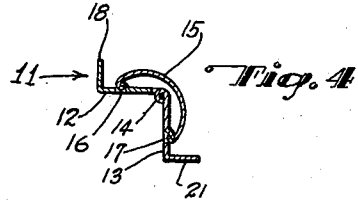


Fig. 5

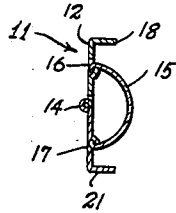
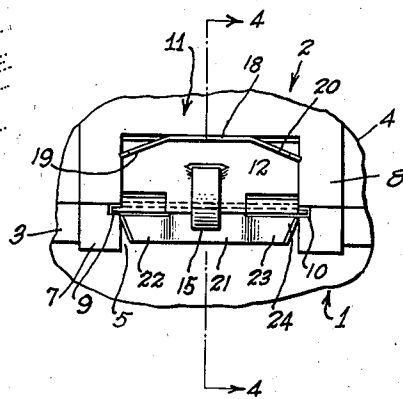


Fig. 3

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BOX AND HINGE STRUCTURE

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4 Claims. (Cl. 217—56)

The present invention relates to hinges, and boxes and containers intended to have covers hinged thereto, and particularly involves the type of hinge in which two hinge leaves are not only connected by the usual hinge pin but also have special facilities for attaching the same to the box and its cover.

The main object of my invention is to produce a box and cover with one or more hinges which can be very quickly and easily fixed in place without rivets, pins, screws or cement of any kind.

Another object is to have such a box and cover with a hinge which despite the ease with which it is applied, is rigidly secured in place when applied properly, so as to be proof against accidental removal.

A further object is to introduce hinge and box structure which is simple, effective, practical and compact as well as easy and cheap to manufacture.

It is a particular object to utilize in the box and hinge structure a group of wedge members which are capable of cooperating so as to permanently fix the hinge leaves in special recesses in the rear walls of the box and cover.

Other objects of the invention and the various advantages inherent in the same and the features thereof will appear more fully in detail as this specification proceeds.

In order to facilitate ready comprehension of my invention, the same is illustrated in the accompanying drawing forming part hereof, and in which—

Fig. 1 is a perspective view of a box with cover and equipped with hinges, embodying the invention in practical form.

Fig. 2 is an enlarged, exploded, fragmentary view of part of the box and cover with one hinge of Fig. 1.

Fig. 3 is a top plan view of the parts of Fig. 2 in assembled condition.

Fig. 4 is a section of the open hinge alone of Fig. 3 as taken on line 4—4.

Fig. 5 is a similar view showing the hinge in closed condition.

Throughout the views, the same reference numerals indicate the same or like parts.

In the practice of my invention, a box 1 of plastic or other material has a cover 2 of similar material, both having their rear walls 3 and 4 provided with recesses 5, 5', 6, 6', respectively, with reinforcements 7, 7', 8, 8', about said recesses. At the ends of these recesses, the reinforcements are undercut so as virtually to form narrow extensions of the recesses at 9, 10, 9', 10', etc., which are capable of serving a purpose presently to be described.

In order to connect the cover with the box proper a special hinge generally indicated at 11 is so constructed as to cooperate with the rein-

forced recesses just described and consists primarily of two leaves 12, 13 which are connected by the pivoting pin 14 in the usual manner and have an arcuate spring 15 with the ends thereof hooked into a pair of slotted portions 16, 17 in the leaves 12 and 13 respectively. It is obvious from this construction that when the ends of the spring cross the center forming the theoretical axis of pin 14 so as to occupy the positions shown in Figs. 1 through 4, said spring will tend to retain the hinge in open position, while on the other hand, if the hinge is closed by closing the cover so that the spring crosses the central axis of pin 14 with a result that the hinge appears as in Fig. 5, it is equally obvious that the spring will tend to keep the hinge in this closed position and thus tend to keep the cover of the box closed. In Figs. 4 and 5, all other structure except the hinge has purposely been omitted in order to reveal the details and features of the hinge as clearly as possible in both positions, with respect to the operation of the spring.

Upon the upper leaf 12 of the hinge is an anchoring member or lug 18 terminating at both ends in wedging lugs 19 and 20, and in similar fashion, the lower leaf 13 has an anchoring lug 21 terminating at both ends in wedging lugs 22, 23, the wedging lugs in each case being cut free from the leaf to which only the main central portions of the anchoring lugs are attached. These anchoring members are also bent at an angle of approximately 90° more or less with respect to the general plane of the leaves involved. When a hinge such as just described is to be placed in position, it is but necessary to slide the lower leaf 13 down into recess 5 of the back wall 3 of the box with the ends of the leaf preferably extending into the recess extensions, or undercut portion 9 and 10, whereafter, the ends 22 and 23 are forced down until they engage very heavily against the inner ends of the reinforcement 7 of the recess 5, and it will be found that the leaf 13 will be securely held in said recess against accidental removal, as any attempt to pull leaf 13 of the hinge directly up out of said recess will merely wedge ends 22 and 23 more firmly against the ends of said recess. Then, in order to connect the cover, the leaf 12 is slid into recess 6 preferably with the ends of the leaf sliding into the extensions 9 and 10 forming the undercut portions of the recess in reinforcement 8 of said recess 6 until the anchoring member strikes the reinforcement, after which wedging lugs 19 and 20 are forced down so as to wedge very strongly against the inner ends of the reinforcement in said recess. It will then be found that the hinge is effectively assembled and secured in place connecting the cover with the box in proper hinged relation, so that spring 15 will be effective to tend to retain the box open when the cover has been

open and will tend to retain the cover closed after closure of the same by hand. In order to make the wedging effect of the wedging lugs more decided, the ends thereof are cut off diagonally so as to present a point, as for example, at 24 in the case of wedging lug 23 in Figs. 2 and 3. The points thus produced will, of course, tend to enter into the very material of the reinforcements and prevent the ends of the wedging lugs from slipping out of engagement with the ends of the recess reinforcements, while the latter serve thus to reinforce the walls 3 and 4 of the box and cover so that the same will not be weakened or injured in any manner by the expansive wedging pressure of the hinges.

Obviously, the hinge may be made of any material, such as sheet iron, stainless steel, bronze, brass, aluminum, or any alloy or metal whatsoever which will serve for making a good hinge, while the box and cover may also be made of any material desired, although in the present case we prefer to make the box of plastic material such as of cellulose acetate, or other cellulosic derivative, phenol or urea formaldehyde derivative or compound, or ebonite, or of any material whatsoever which can be used for making a box and cover.

From the foregoing description, it is clear that the hinge structure and the corresponding box structure are mutually so suited to cooperate both in assembling and subsequent use that the assembly of the hinge with the box and cover is so quickly and conveniently effected and thereafter so securely held that lasting service is assured and accidental loss of the hinge is practically impossible.

Having now fully described my invention, I claim:

1. In a hinge structure for a box and a cover having the rear portions of the box proper and the cover provided with corresponding recesses or open pocket portions with upright end walls and extending respectively down upon the rear portion of the box toward the bottom thereof and up upon the rear portion of the cover with the recesses fully open throughout the extent of their respective depth or height, the combination, with a pair of pivotally connected flat leaves individually fitted into and retained in said recesses, of an anchoring portion upon the outer edge of each leaf extending integrally at substantially a right angle thereto in general parallelism with the bottom and toward the interior of the box or the top of the cover, as the case may be, and having the ends of each anchoring portion terminating in two oppositely and substantially longitudinally extending wedging lugs for wedging directly against the two opposite upright end walls of the recess involved exteriorly of the leaf proper therein exposed to the interior of the box and cover so as to tend toward being aligned with the remaining portion of the respective anchoring member from which they extend in extreme wedged position of said lugs in order to hold the hinge in assembled relation with the box and cover.

2. In a hinge structure for a box and a cover having the rear portions of the box proper and the cover provided with corresponding recesses or open pocket portions with upright end walls and extending respectively down upon the rear portion of the box toward the bottom thereof and up upon the rear portion of the cover with

the recesses fully open throughout the extent of their respective depth or height, the combination, with a pair of pivotally connected flat leaves individually fitted into and retained in said recesses, of an anchoring portion upon the outer edge of each leaf extending integrally at substantially a right angle thereto in general parallelism with the bottom and toward the interior of the box or the top of the cover, as the case may be, and having the ends of each anchoring portion terminating in two oppositely extending wedging lugs for wedging against the opposite upright end walls of the recess involved so as to tend toward being aligned with the remaining portion of the anchoring member in extreme wedged position of said lugs in order to hold the hinge in assembled relation with the box and cover, the extreme outer ends of the wedging lugs being cut so as to present a point upon each lug directly against the upright end walls of each recess exposed to the interior of said box and cover in order to increase the effectiveness of the initial engagement of each lug with its respective end wall.

3. In a hinge structure for a box and a cover and the rear portions of the box proper and the cover provided with corresponding recesses or open pocket portions with upright end walls and extending respectively down upon the rear portion of the box toward the bottom thereof and up upon the rear portion of the cover with the recesses fully open throughout the extent of their respective depth or height, the combination, with a pair of pivotally connected flat leaves individually fitted into and retained in said recesses, of an anchoring portion upon the outer edge of each leaf extending integrally at substantially a right angle thereto in general parallelism with the bottom and toward the interior of the box or the top of the cover, as the case may be, and having the ends of each anchoring portion terminating in two oppositely extending wedging lugs for wedging against the opposite upright end walls of the recess involved so as to tend toward being aligned with the remaining portion of the anchoring member in extreme wedged position of said lugs in order to hold the hinge in assembled relation with the box and cover, and the anchoring member upon each leaf of said hinge lying upon an open bottom of the respective recess in which it is located in substantial parallelism with the bottom of the box or the top of the cover, as the case may be, and the oppositely extending wedging lugs forming the end terminations of each anchoring member being cut free at their sides from the leaf involved so as to be capable of the mentioned wedging action directly against the upright end walls of their respective recesses independently of said leaf and exposed to the interior of the box and cover.

4. A hinge structure according to claim 1, having the hinge leaf in each recess extending at both ends into correspondingly opposite blind undercut portions of the recess independently of and within the wedging lugs with the two opposite end walls immediately outside of the undercut recess portions retaining said leaf, the ends of each leaf which extend into said recess portions cooperating with the wedging lugs in locating each lug in wedging position and retaining each leaf rigidly in place in its respective recess.

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