Sept. 14, 1954 H. H. CARLSON 2,688,756

COLLAPSIBLE STRUCTURE

Filed July 14, 1951

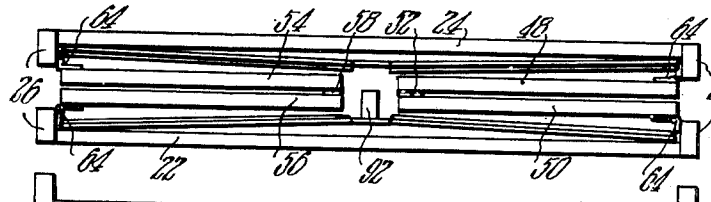


Fig. 3.

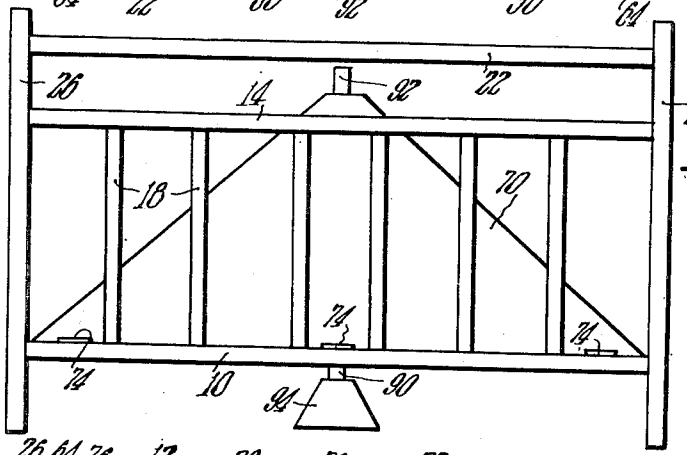


Fig. 1.

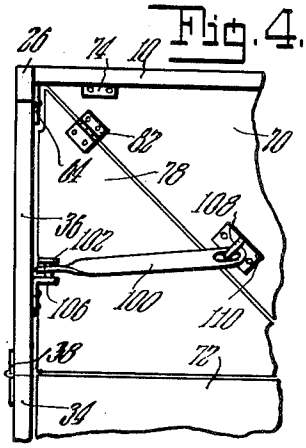


Fig. 4.

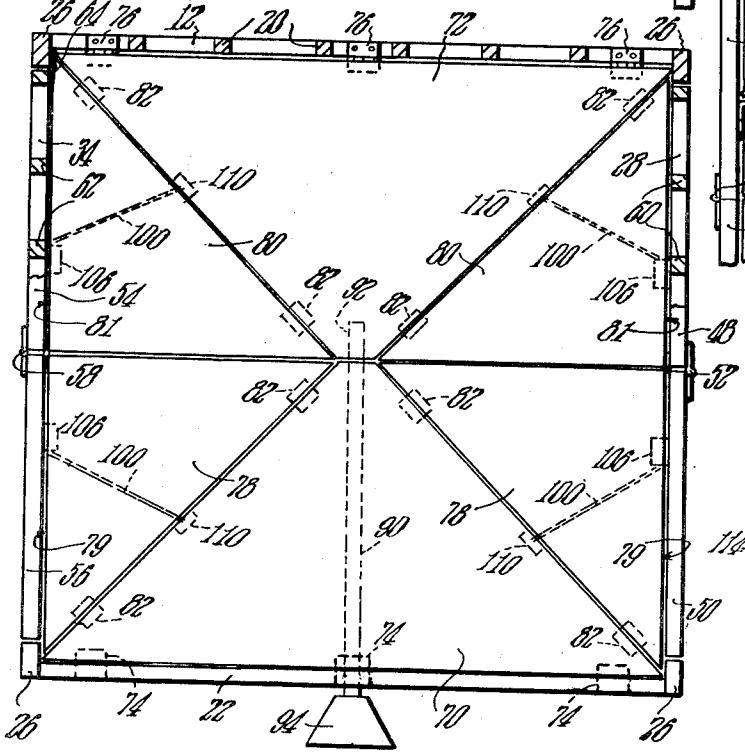


Fig. 2.

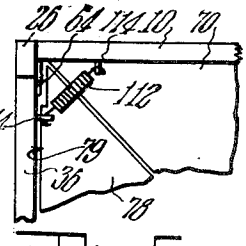


Fig. 5.

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COLLAPSIBLE STRUCTURE

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3 Claims. (Cl. 5—99)

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My invention relates to improvements in a collapsible structure and more specifically it is directed to a means for folding an item of square or rectangular shaped furniture into a more compact unit for ease in carrying and/or storage when same is not in operational use.

While I have shown the device of my invention as applicable to a child's play yard, it is to be clearly understood that the construction is not to be limited thereto, it being equally applicable to a variety of furniture pieces such as cribs, cradles or beds and to a variety of other structures such as animal kennels or coops, exercising or amusement arenas, tables and like furniture pieces, and to the broad class of receptacles including boxes, crates and the like.

The principal object of the invention is directed to the provision of a folding structure whose parts are so arranged relative to each other that the folding of certain parts automatically initiates a folding action on the part of other related parts.

It is to be appreciated that the direction of effort in this invention has been to provide an automatically folding or collapsing structure which is smooth in its functioning, the folding action once initiated being such that all components readily contributing to the action simultaneously with each other.

All of the above objects I accomplish by means of such structure and relative arrangements of parts thereof, as will fully appear by a perusal of the description below and by various specific features which will be hereinafter set forth.

To the above cited and other ends and with the foregoing and various other novel features and advantages and other objects of my invention as will become more readily apparent as the description proceeds, my invention consists in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more particularly pointed out in the claims hereunto annexed and more fully described and referred to in connection with the accompanying drawings wherein:

Fig. 1 is a side elevational view of a play yard in folded or closed position showing certain features of my construction;

Fig. 2 is a top plan view of the play yard shown in the open or operating position with certain parts broken away for the sake of clarity;

Fig. 3 is a top plan view of the play yard in the folded position shown in Fig. 1;

Fig. 4 is a partial bottom plan view of the play yard in open position as shown in Fig. 2

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showing certain features of my construction; and

Fig. 5 is a partial bottom plan view similar to Fig. 4 showing certain other features of my construction.

In the various figures of the drawing, I have shown a play yard although it will be understood that the device of my invention could be a bed or crib or receptacle or similar article adapted for folding or collapsing functions.

Referring now to the drawings more in detail, the invention will be fully described.

The play yard as shown includes a pair of lower side rails 10 and 12 spaced opposite from and parallel to each other.

An upper side rail 14 is disposed above the lower side rail 10. Similarly an upper side rail (not shown) may be disposed above the side rail 12.

A plurality of vertically extending connecting bars 18 and 20 connect the upper and lower side rails on each side of the structure. It will be understood, however, that these rails may, if desired, be connected by other types of construction so as to provide for example solid side walls.

An upper and lower side rail and the connecting member or members therebetween comprise what will be referred to in this specification as a side member.

I have also shown additional rails 22 and 24 disposed above the respective upper side rails in spaced relation therewith but it will be understood that these are for decorative purposes in the case of the play yard in question and contribute nothing per se to the structure of my invention.

A vertically extending corner post 26 is provided at each end of each of the sides and in each instance same connects the respective lower side rail with the upper side rail or rails as shown in Fig. 1.

A pair of opposite and spaced lower end rail members, each comprising two sections are provided on the opposite ends of the structure.

One of the sections 28 of one of the lower end rail members and one of the sections 34 of the other of the lower end rail members will be observed in the partially broken view of Fig. 2.

In Fig. 4, the section 34 and its related section 36 will be observed, same being hingedly connected by a hinge member 38 whereby the sections 34 and 36 are foldable inwardly relative to each other. Similarly the two sections of the opposite lower end rail member are hinged and are foldable inwardly.

In a similar manner, a pair of opposite and spaced upper end rail members are provided

each of which comprises two sections. One of the members consists of sections 48 and 50 which are connected by hinge 52. The other of the members consists of sections 54 and 56 which sections are held in pivotal relation by hinge 58.

The upper end rail members are disposed directly over lower end rail members in spaced relation therewith. A plurality of vertically extending connecting bars 60 and 62 connect the respective sections. Again it will be understood that, if desired, solid wall members may be substituted for the connecting bars between the respective sections so as to provide a pair of solid walls on each end of the structure.

The sections of the upper and lower end rail members and the connecting members therebetween comprise what will be referred to in this specification as an end member. The sections are each foldable inwardly as shown in Fig. 3 whereby the sections of each of the upper and lower end rail members are brought into adjacency with each other and the structure assumes the collapsed or folded position so that the opposite aforementioned sides are drawn toward each other.

The side rail members (upper and lower) are connected at their outer ends to the adjacent corner posts 26 by corner hinges 64 as will be observed in Figs. 2, 3, 4 and 5.

A floor or base (the construction being a floor in the case of a play yard, crib or cradle and being a base in the case of a receptacle) comprises a pair of floor members 70 and 72. These members are pivoted by means of hinges 74 and 76 to their respective lower side rails 10 and 12 as shown in Fig. 2.

Members 70 and 72 are generally triangular in form and have their apices pointing toward each other. Members 70 and 72 are in no way mechanically connected with each other, all for purposes as will presently be observed.

Members 70 and 72 are each provided with a pair of wing members 78 and 80 respectively. The wing members are generally triangular in shape and are of such dimension that the members 70 and 72 and the wing members 78 and 78 and 80 and 80 when placed in a plane side by side in the position shown in Fig. 2 generally cover the area defined within the opposed side and end rails of the structure.

The wing member 78 and the opposed wing member 80, one at each end of the structure, are in no way connected with each other.

The wings 78 and 80 are hinged to the member 70 and 72 at their adjacent edges by hinges 82.

The wings 78 and 80 have free edges 79 and 81 adjacent the respective sections of the lower end rails. That is to say, the wings 78 and 80 are not joined to the adjacent sections of the lower end rails for reasons as will be presently observed.

A driving member 90 is secured to the underside of one of the floor members 70 as shown in Fig. 2 and has an inner extremity 92 which extends inwardly beyond member 70 so as to underlie a portion of the adjacent floor member 72. The outer extremity of member 90 extends outwardly beyond member 70 and also outwardly beyond the lower side rail 10 and has fixed thereto a pedal member 94.

An elevator member 100 is provided to underlie each of the wing members 78 and 80 and is of such dimension as to have its slotted outer extremity slidably receivable in a pin 102 carried by a bracket 106 fixed to the respective section

of the lower end rail as shown in Fig. 4. The slotted inner extremity of the elevator is receivable in an eye 108 of a bracket 110 secured to the underside of the respective floor member.

Additionally, on the underside of the floor and wing members, a spring member 112 connects a lower side rail and the adjacent section of the lower end rail by means of eyes 114 fixed thereto for ease of operation when the folding action subsequently to be described takes place. Such a feature is shown in Fig. 5 only, it being omitted from Figs. 2 and 4 in order to avoid confusion in the drawings.

The various components of my invention having been described, I shall now describe the operation of my construction.

When the operator presses upon pedal 94, a pivotal action is initiated as the opposite or free end of the driving member 90 is urged upwardly carrying therewith the floor member 70, which pivots upwardly upon hinges 74. Simultaneously a similar pivoting action is initiated in the case of floor member 72 which pivots upwardly upon hinges 76, this action being produced by means of the extremity 92 of the member 90 which urges the floor member 72 upwardly as the floor member 70 is urged upwardly.

As the floor members 70 and 72 are raised about the axes of the respective hinges 74 and 76, the respective pairs of wing members 78 and 80 being hingedly and pivotally connected thereto are simultaneously raised.

As the wing members 78 and 80 are raised upwardly, the sections of the foldable end members are moved inwardly, by the action of the elevators 100.

The elevator members are slotted at their opposite ends so as to permit a freedom of movement of the elevators relative to the respective floor members and sections of the end rail members and to compensate for the dimensional changes as the various parts are moved relative to each other.

It is to be appreciated that all of these actions are simultaneous with each other so that as the floor members are urged upwardly to the substantially vertical positions, the wing members are similarly elevated to substantially vertical positions to the point where the members are folded to the relative positions shown in Fig. 3 whereat the floor members and respective wing members are folded or collapsed inwardly between the opposite sides which are brought toward each other to provide a collapsed structure ready for carrying or storage.

Conversely, when it is desired to open the structure from the collapsed or folded position of Fig. 3, to the open or operating position of Fig. 2, the sides need only be urged away from each other. Such an action urges the floor and wing members downwardly by their own weight as the sections of the end rail members are moved outwardly.

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claims are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

1. A foldable play yard construction comprising in combination, a pair of separate end members, a pair of separate side members each including a pair of sections hinged together at their inner edges and hinged at their outer edges to the adjacent outer end of one of said end members, a pair of floor members each having one edge thereof hinged to one of said end members and provided with opposed transverse free end edges, wing members adjacent the free end edges of said floor members having inner edges hinged thereto, and elevators each having an outer end thereof connected to the section of one of said side members and an inner end connected to the adjacent floor member, all adapted and arranged whereby in movement of the parts from a non-folded to a folded relation and as said end members are moved together said elevators are caused to pull said side members inwardly.

2. A foldable play yard construction comprising in combination, a pair of spaced end members, a pair of spaced side members each including a pair of side sections hinged together at their inner edges and hinged at their outer ends to the outer ends of said end members, a pair of floor members each having one edge thereof hinged to one of said end members and provided with opposed transverse free end edges, wings adjacent each of the free end edges of said floor members having inner edges hinged thereto, and elevators independent of and supporting each of said wings and each having an outer end connected to a side member and an inner end connected

to a free edge portion of the one of said floor members adjacent thereto, all adapted and arranged whereby in movement of parts from non-folded to folded positions the sections of said side members are moved inwardly by said elevators into engagement with said floor members.

3. A foldable play yard construction comprising in combination, a pair of end members having opposite ends, a pair of side members having opposite ends hingedly connected to the opposite ends of the end members and each side member including a pair of sections hingedly interconnected intermediate the opposite ends of said side members whereby the end members may move towards one another and the pairs of sections may swing inwardly therebetween into adjacency, a pair of floor members, outer edges of said floor members hinged to said end members, wings at side ends of said floor members having inner edges hinged to said opposite side ends of the said floor members, operating means for moving said floor members and for simultaneously moving the sections of the side members.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
134,111	Thorson	Dec. 17, 1872
526,081	Mackie	Sept. 18, 1894
1,724,852	Scott	Aug. 13, 1929
2,489,188	Landry	Nov. 22, 1949
2,523,124	Landry	Sept. 19, 1950