United States Patent

Lee

[15] **3,654,645**

[45] **Apr. 11, 1972**

[54] FOLDABLE CRIB

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[22] Filed: **Nov. 2, 1970**

[21] Appl. No.: **86,083**

[52] **U.S. Cl.** **5/99,** 5/93, 190/2

[51] **Int. Cl.** **A47c 31/00**

[58] **Field of Search** ..... 5/93, 99 B, 99 C; 190/2

[56] **References Cited**

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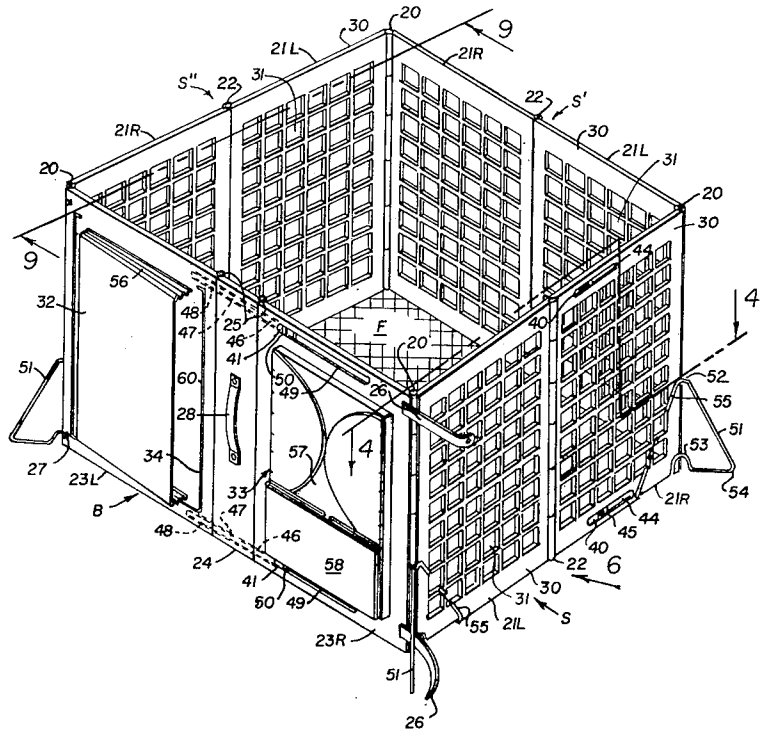
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Primary Examiner—Bobby R. Gay
Assistant Examiner—Garry Moore
Attorney—Van Valkenburgh and Lowe

[57] **ABSTRACT**

A foldable crib for a child having hinged wall sections and hinged corner sections adapted to accordian-fold into a compact unit with a backwall section embracing the other wall sections and into a package having the general shape of an ordinary suitcase. A handle at one edge of this folded unit permits it to be easily carried. A cloth-type floor in the crib, with the weave arranged on a bias, stabilizes the same when opened, and when folded, the floor section is merely pulled upwardly between the wall sections. The auxiliary features may be incorporated in this crib, on the opposing sides of the backwall section, such as a mattress and a foldable baby seat, the same enhancing its usefulness and versatility.

8 Claims, 16 Drawing Figures



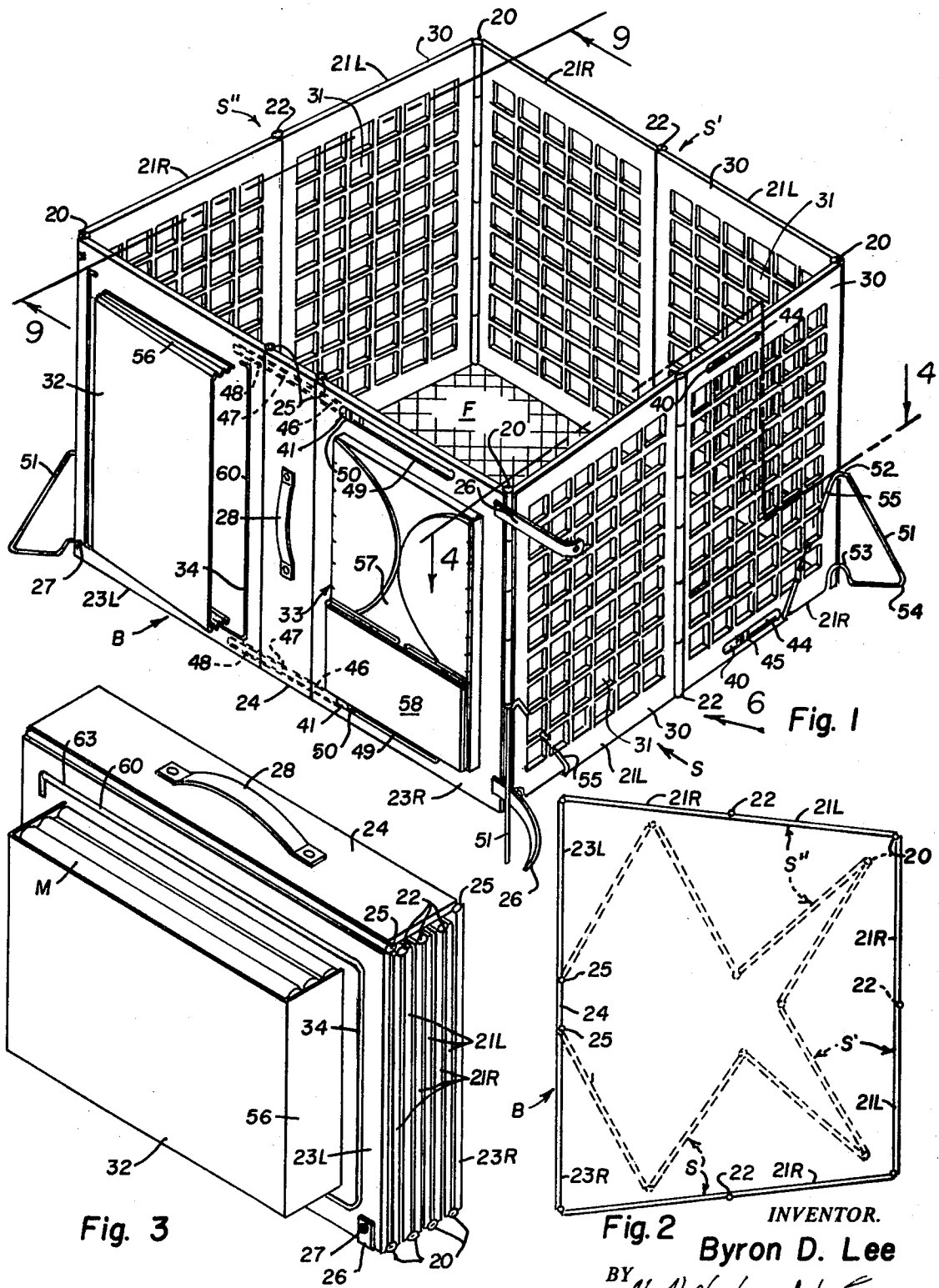


Fig. 1

Fig. 3

Fig. 2

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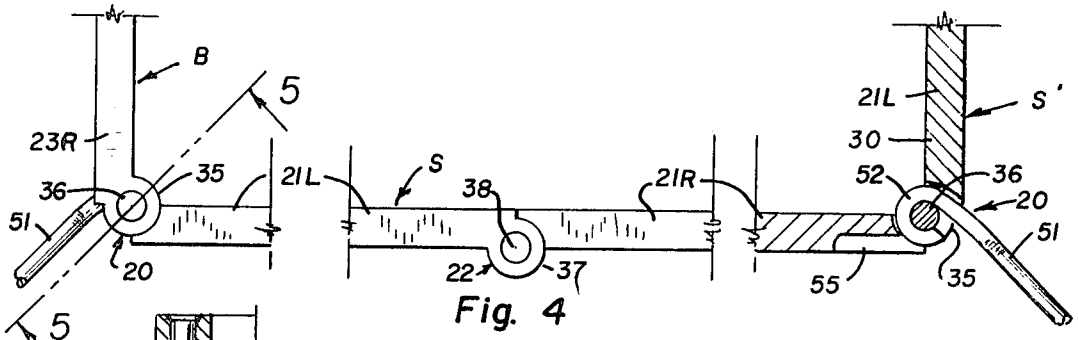


Fig. 4

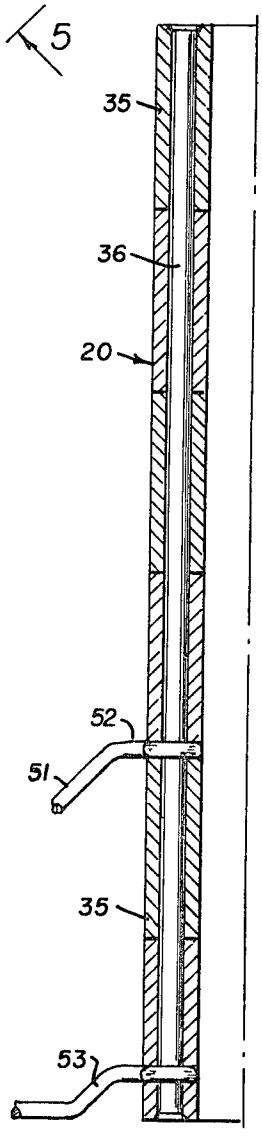


Fig. 5

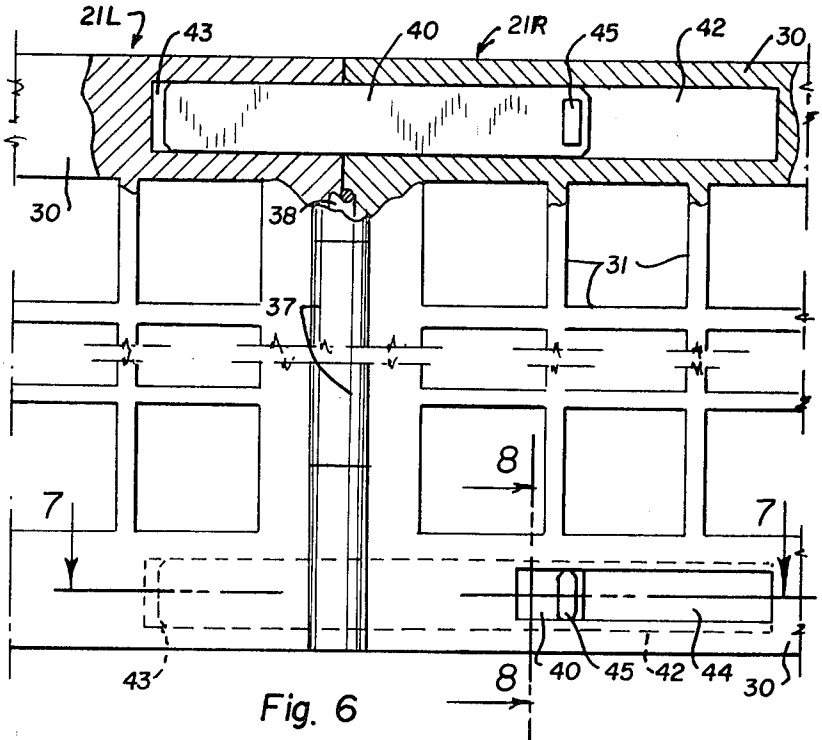


Fig. 6

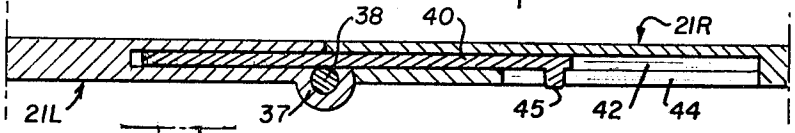


Fig. 7

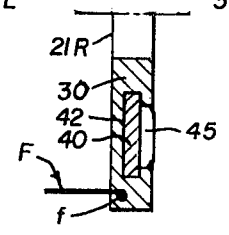


Fig. 8

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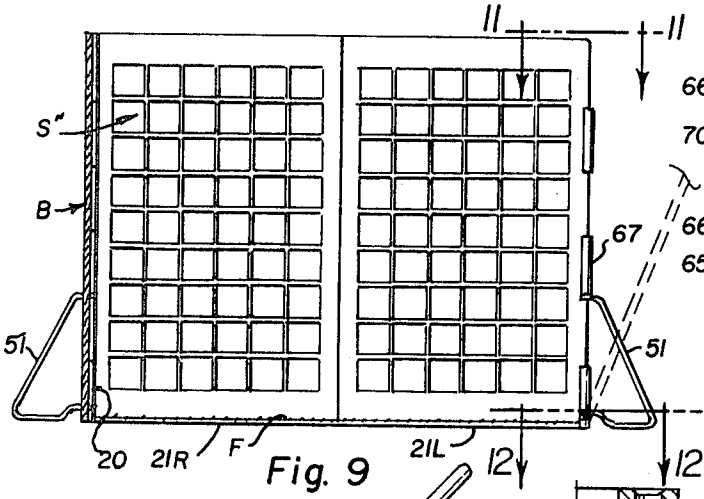


Fig. 9

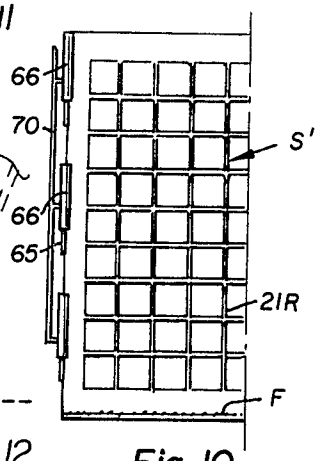


Fig. 10

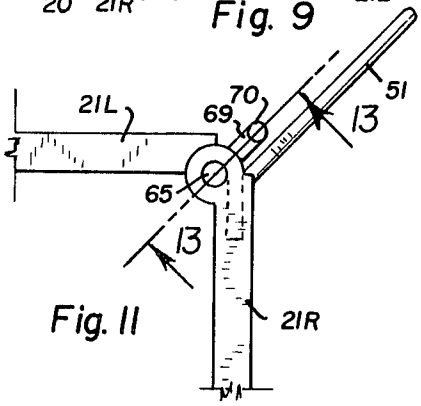


Fig. 11

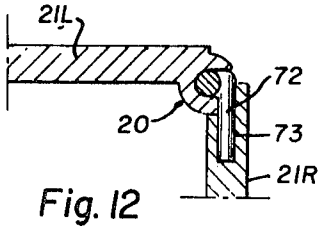


Fig. 12

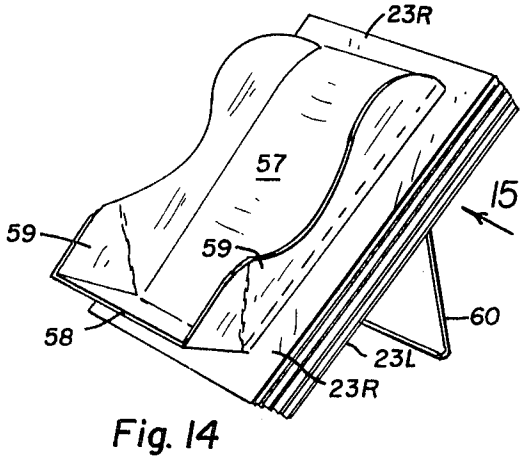


Fig. 14

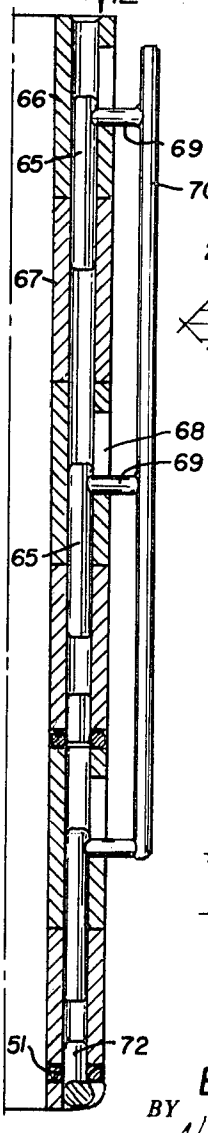


Fig. 13

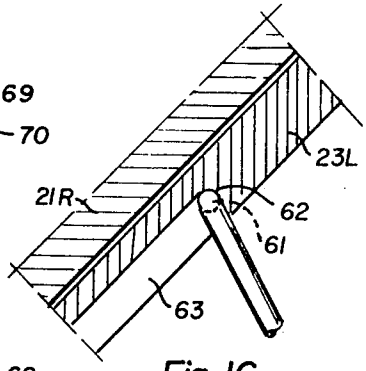


Fig. 16

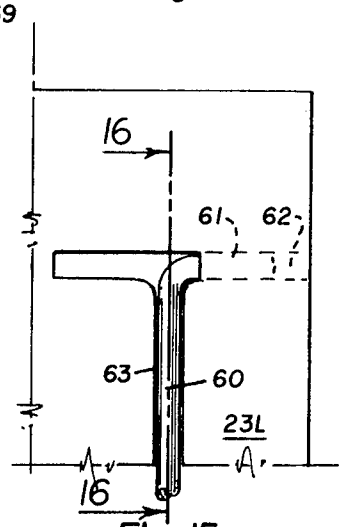


Fig. 15

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FOLDABLE CRIB

This invention relates to playpens for small children, and more particularly to a playpen or crib which can be folded into a neat, compact unit. As such, the invention will be hereinafter called a "Foldable Crib."

An object of the invention is to provide a novel and improved foldable crib which, when open, can be provided with a mattress to hold a small child during nap times and is also large enough to serve as a playpen for the child.

Another object of the invention is to provide a novel and improved foldable crib having wall sections arranged to permit it to be quickly folded into a compact package similar in form to an ordinary suitcase so that it may be easily carried and transported and thus permit the parents of a child more latitude in making trips by taking both the child and the child's crib.

Another object of the invention is to provide a novel and improved foldable crib which incorporates structural features in its arrangement to permit it to be more easily folded into a compact package, which are rendered practical by the formation of crib components with selected plastic materials.

Another object of the invention is to provide, in an improved foldable crib, simple arrangements of wall sections and hinge connections between the wall sections which permit the incorporation of accessory features and alternate arrangements in the crib to enhance its usefulness.

Another object of the invention is to provide a novel and improved foldable crib which is a neat appearing, light-weight, sturdy, economical unit.

With the foregoing and other objects in view, my present invention comprises certain constructions, combinations and arrangements of parts and elements as hereinafter described, defined in the appended claims, and illustrated in preferred embodiment by the accompanying drawing in which:

FIG. 1 is an isometric view of the improved crib, open and ready for use.

FIG. 2 is a plan view of the crib shown at FIG. 1, but on a reduced scale and with broken lines indicating, in a somewhat diagrammatic manner, the walls of the crib being partially folded.

FIG. 3 is an isometric view of the crib when it is folded into a package for transportation.

FIG. 4 is a fragmentary plan and sectional view of one side of the crib to better show the hinge arrangements thereof, the view being taken from the indicated line 4—4 at FIG. 1, but on an enlarged scale and with portions between the hinges being broken away to conserve space.

FIG. 5 is a fragmentary sectional detail as taken from the indicated line 5—5 at FIG. 4.

FIG. 6 is a fragmentary elevational view of the central portion of a wall section, as taken from the indicated arrow 6 at FIG. 1, but on an enlarged scale, with the central portion of the wall broken away to conserve space and with broken lines and removed surfaces showing parts otherwise hidden from view.

FIG. 7 is a sectional detail as taken from the indicated line 7—7 at FIG. 6.

FIG. 8 is a fragmentary sectional detail as taken from the indicated line 8—8 at FIG. 6.

FIG. 9 is a sectional view through the crib, as taken from the indicated line 9—9 at FIG. 1, but on a reduced scale and indicating an alternate embodiment wherein a corner of a wall section may be disconnected to tilt the same, a portion of the tilted wall being shown in broken lines.

FIG. 10 is an elevation view of a portion of the wall section which may be disconnected and tilted about a hinge at the bottom of the wall.

FIG. 11 is a fragmentary detail as taken from the indicated line 11—11 at FIG. 9, but on an enlarged scale and with the wall section shown at FIG. 10 being connected to the section shown at FIG. 9.

FIG. 12 is a section as taken from the indicated line 12—12 at FIG. 9, but on an enlarged scale and showing specifically the hinge construction which permits the wall section shown at FIG. 10 to be tipped.

FIG. 13 is a fragmentary sectional detail as taken from the indicated line 13—13 at FIG. 11.

FIG. 14 is an isometric view of the folded crib set at an inclination to use the same for a baby seat.

FIG. 15 is a fragmentary detail view as taken from the indicated arrow 14 at FIG. 14.

FIG. 16 is a fragmentary sectional detail as taken from the indicated line 16—16 at FIG. 15.

The present invention was conceived and developed to better meet the need for a crib for small children, and to also function as a playpen. The crib can be folded into a compact package which may be easily carried and transported. In this way, a mother can take her child and the crib on trips and when away from home, she can bed the child in his own crib and not expose him to strange surroundings.

The invention contemplates a simple pen which is approximately square in plan but with one wall, hereinafter referred to as a "backwall" which is wider than the other three walls, hereinafter referred to as "sidewalls." The backwall and the sidewalls are hinged together at the corners and each of the walls is also formed by sections hinged together in a manner which will permit the sidewalls to be folded in an accordian fold and embraced by sections of the backwall. The crib may thus be folded into a package having the general appearance of an ordinary suitcase. Other features of the crib include a floor sheet, lock slides on the wall sections to prevent the walls from folding together when the crib is open, suitable straps to secure the folded unit together and corner support braces, all as will be described.

The exposed faces of the backwall sections of the folded crib provide ideal surfaces for mounting accessories to the crib and in the embodiment described herein, a pocket is provided on one face, a child's seat is provided at the other, opposite face, and a brace to support the seat at various positions is provided at the first mentioned face. A further embodiment of the crib will include a feature where a wall section may be disconnected at the hinge and tipped to the floor to enlarge the same to use as a child's bed as hereinafter described.

Referring more particularly to the drawing, the crib as illustrated at FIG. 1 is formed by four walls, a backwall B and three sidewalls S, S′ and S″, the sidewall S′ being opposite the backwall. A floor F, of a cloth or sheet material, is secured to the bottom edges of the walls by locking it into a slot *f* as illustrated at FIG. 8. Also, this floor sheet may be secured in any other suitable manner as by using an adhesive. If cloth is used, it is preferably arranged on a bias with respect to the crib to prevent racking.

The corners of the crib at the adjacent walls are hinged with vertical hinges 20 which are arranged to hold the walls together and to fold the corners outwardly. Each sidewall S, S′ and S″ is formed as two sections: a section 21L and 21R at the left and right sides of each wall, respectively, as when viewed from outside the crib. The sections 21L and 21R are interconnected by vertical hinges 22 arranged to fold inwardly. The backwall is formed as three sections: a left side section 23L, a right side section 23R and a comparatively narrow, center section 24. The sections 23L and 23R join sidewall sections 21R and 21L, respectively, at the corners by hinges 20 and the sections 23L and 23R are joined to the respective adjacent edges of the center section 24 by vertical hinges 25, arranged to fold outwardly.

The actual proportions of this crib may be varied as desired. The height of the crib should be sufficient to prevent a child from climbing out of it and a height of from 20 to 24 inches was found to be suitable for this purpose. The width of the sides of the crib should be sufficient to permit it to function both as a comfortable crib and as a playpen for a small child. A width of from 30 to 36 inches was found to be suitable for this purpose.

As heretofore stated, the width of the backwall B is greater than the width of the sidewalls S, S′ and S″, to permit the backwall to overlie the other wall sections when they are folded together as illustrated at FIG. 3. The outward-inward folding arrangement of hinges 20 and 22, as hereinabove

described, permits the sections 21L and 21R of the sidewalls S to be folded together in an accordian-like fold pattern. To complete the folding of the unit, the backwall side sections 23L and 23R will fold against these folded sections 21L and 21R to overlie and embrace them. At the same time, the center section 24 of the backwall will abut against an end of the folded sidewall sections. Accordingly, the width of the backwall side sections 23L and 23R will be sufficient to overlie the sidewall sections 21L and 21R and at the same time provide adequate clearance between the end of the sections, where hinges 22 are located, and the center section 24 of the backwall B. The width of the center section 24 of the backwall will be the same as or slightly greater than the aggregate thickness of the six folded sections 21L and 21R to permit a complete folding action of the unit.

The folding of this unit is a simple matter. A lock slide, hereinafter described, will normally prevent the sidewall section hinges 22 and the backwall section hinges 25 from swinging inwardly, and these lock slides must be first released. Then, the wall sections may be collapsed with the infolding sidewall sections coming together as illustrated in broken lines at FIG. 2 and move towards the backwall section 24. The fully collapsed unit is in a box-like pattern as shown at FIG. 3. Once folded, the unit may be secured together. For example, straps 26 may be attached to the top and bottom of the backwall side section 23R, near the corner edge thereof. These straps may be then wrapped about the folded unit and each connected to a snap 27 on the section 23L, each snap being properly located at the top and bottom and near the corner edge of that section to effect the connection. A handle 28 is mounted upon the face of the center section 24 of the backwall B to carry this folded package, and thus, when the package is folded and secured by the straps 26, it has the appearance of a suitcase.

The floor F is a sheet of pliable, easily folded cloth or plastic material, glued or otherwise secured to the bottom edges of the several sidewalls S, S′ and S″ and the backwall B. When folding the crib into a compact package, the center of this floor sheet may be pulled upwardly to be placed between the folds of the several wall sections and it is contemplated that the clearances between the wall sections will permit this, and thus the floor F will be out of the way when the crib is folded.

The several wall sections of this crib may be made of various types of sheet material by providing hinges thereon. However, a preferred mode of manufacture resides in making the sections as unitary members from selected synthetic resin plastics such as high impact polystyrene or polycarbonate, and by using injection molds to form the units. The sections 21L and 21R of the sidewalls S, S′ and S″ may be identical to each other in many respects. Each may be the same size and preferably each is formed as a simple panel, each having peripheral edge portions 30 with a thickness of ⅜ to ¾ inch surrounding a reticulated grillwork 31, in its central portion. The panels 23L, 23R and 24 are likewise formed as unitary members but without any grillwork in the wall surfaces so that these surfaces may be used for the mounting of accessory items. Such items, as shown in the drawing, may include a mattress pocket 32 affixed to the outer face of the backwall section 23L and a foldable child's seat 33 affixed to the outer face of the backwall section 23R. Also, a hinged U-shaped wire strut 34 is located in a slot in the face of the backwall side section 23L which functions to hold the assembly upright when the seat is used.

Various details of construction are illustrated in FIGS. 4 through 8 of the drawing. Typical portions of a sidewall are illustrated in plan and in section at FIG. 4. An outward hinge 20 connects the backwall side section 23R with a sidewall section 21L, an inward corner hinge 22 connects the sidewall sections 21L and 21R and an outward corner hinge 20 connects the sidewall section 21R of wall S and the sidewall section 21L of the wall S′. Each hinge 20 is a piano-type hinge having segments 35 alternating from one wall section to the other with a pintle 36 extending through the common passageway of these segments, connecting the same in a conventional manner. However, in order to fold the wall sections together with the hinge 20 moving outwardly, the axis of each pintle 36 of the hinges 20 is located at, or preferably a short distance outwardly from, the plane of the inner surface of the two wall sections forming the hinge. Each sidewall section hinge 22, connecting the sidewall sections 21L and 21R, at sidewalls S, S′ and S″, is constructed the same as hinge 20, being a piano-type hinge having alternating segments 37 on the two wall sections held together by a pintle 38. To permit these adjacent wall segments 21L and 21R to fold together when the hinge 22 moves inwardly, the axis of the pintle of the hinge 22 is at, or preferably a short distance outwardly from, the plane of the outer wall of each segment.

When the crib is open and in use, it is essential that the sidewall sections S″ do not come together by folding at the hinges 22 and that the backwall sections do not come together by folding at the hinges 25. Accordingly, the walls must be locked in a straight position by a suitable means and in the present invention, a lock slide 40 is provided at the top and bottom of each sidewall S, S′ and S″ and a lock slide 41 is provided at the top and bottom of the backwall B. Each pair of lock slides is carried in a socket in one of the sidewall sections and moves in a registering socket in the other. In the arrangement illustrated in the drawing, the lock slides are carried in a socket 42 in the right hand sidewall section 21R. Each lock slide is formed as a horizontally disposed bar, rectangular in cross section, and slidably mounted in the socket 42. Each socket is a rectangular passageway in the respective top and bottom peripheral edgings 30 of the sidewall section 21R. The length of each lock slide 40 is such that when extended, approximately half of it will project from the edge of the sidewall section and into a corresponding registering socket 43 in the sidewall section 21L. Accordingly, when a lock slide is so extended and projected into the slot 43, the two sections 21L and 21R are interconnected in such a manner as to prevent the swinging of the sections about the hinge 22. Each socket 42 in the sidewall section 21R is of sufficient depth as to permit its lock slide 40 to be retracted completely into it and thus be removed from the opposing socket 43 of the adjacent sidewall section 21R. When thus retracted, the sections 21L and 21R may then fold together. A slot 44 is formed in the outer face of the wall of the section 21R to expose the bottom of the socket and the base of the lock slide 40 therein. A finger tab 45 on the base of each lock slide 40 projects into the slot 44 to permit the lock slide to be gripped and shifted to and from extended and retracted positions.

Each lock slide 41, at the top and at the bottom of the backwall B, is mounted in a socket 46 in the backwall side section 23R as shown in broken lines at FIG 1. This socket registers with a socket 47 in the backwall center section 24 and the socket 47 extends completely through the backwall center section 24 to register, in turn, with a socket 48 in the backwall side section 23L. The length of each lock slide 41 is such that when extended from the side section 23R, it extends through the socket 47 in the center section 24R and into the socket 48 in the side section 23L. The length of each socket 46, which carries the lock slide, is such that the lock slide 41 may be completely retracted into this side section 23R. A slot 49 is formed in the outer face of the wall of the section 21R at each socket 46 to expose the bottom of the socket and the base of the slide lock 41. A finger tab 50 is provided on the base of each lock slide to project into the slot 49 to permit the lock slide to be gripped to facilitate extending and retracting it the same as heretofore described.

The crib is a lightweight unit and to stabilize it and prevent a child within it from tipping the crib over, each corner may include a stabilizing leg 51. Each leg is formed as an upright, angular wire member having its upper end 52 and lower end 53 formed as eyes which are fitted into the corner hinge 20 to swing upon the pintle 36 as illustrated at FIGS. 4 and 5. This angular stabilizing leg includes an outstanding corner 54 which extends outwardly and downwardly to the floor when the crib is opened. The stabilizing legs 51 are adapted to be

swung to various positions about their pintles **36** and also into slot-like recesses **55** in the faces of the sidewall sections S and S'' when the crib is to be folded into a compact package.

The mattress pocket **32** is an auxiliary feature which may be mounted upon the face of a backwall section, as **23L**. This pocket is preferably a simple envelope open at one end and having sides **56** which fold in an accordian-like manner to permit the envelope to expand to hold a mattress M as shown at FIG. **3**.

The child's seat **33** is another auxiliary feature and is affixed to the backwall side section **23R**. It is preferably a simple folding seat having a back **57** of a soft, resilient padding. A seat **58** is hinged to a bottom edge of this back and side panels **59** are hinged to each side of the back. The seat may thus be folded into a flat unit when not in use, as illustrated at FIG. **1**, or opened for use as illustrated at FIG. **13**. When in use, it is contemplated that the crib will be collapsed, folded and set upon an end, preferably at a tilt. Accordingly, a U-shaped support rod **60** is provided at the opposite backwall side section **23L** to swing outwardly from this section and support the collapsed crib at the desired tilt. Each end of this support rod **60** is turned to provide a short shaft **61** which fits into a socket **62** in the face of the backwall side section **23L** as shown at FIGS. **14** and **15**. The U-shaped rod also preferably fits into a slot-like recess **63** extending about the face of the side section **23L** to be completely out of the way when it is not needed.

A further alternate construction is illustrated at FIGS. **9–13** wherein the sidewall S', opposite the backwall B, may be disconnected from its hinges at the sidewalls S and S'' and tipped to the floor. This disconnection is effected by using a segmented pintle **65** at each hinge **20** connecting this section S' to the sections S and S''. The construction of such a pintle is illustrated at FIG. **13** wherein the hinge segments **66** of the sidewall S' mesh with the hinge segment **67** of the sidewall S'', the same as heretofore described as segments **35**. However, the pintle **65** is formed as a plurality of short, rod-like sections which are slidably carried in the socket hinge segments **66** to drop into the sockets of the hinge segments **67** when interengaged. The hinge segments **66** include a slot **68** wherein to a finger **69** extends to connect with the pintle segment **65**. The engagement and release of the pintle to and from the hinge segment **66** and **67** is effected by raising and lowering the finger **69** in the slot **68**. To facilitate the engagement or disengagement of the hinge, the fingers **69** of the several pintle segments may be joined together by a common rod **70** which is best shown at FIG. **13**. In providing the stabilizing leg **51** at this disconnectable hinge, the leg may be connected to the segments **67** on the sidewall S as illustrated and as heretofore described, but held in place by a fixed lock pin **71** at the upper portion and one leg of a compound hinge **72** at the bottom portion, as illustrated at FIG. **13**.

The wall S' is hinged to the bottom edge of the walls S and S'' to swing outwardly therefrom, such hinging effect being possible by using an angled pintle **72** having one portion at the vertical axis of the hinge **20** and another portion extending horizontally into a socket **73** at the base of the section S' as illustrated at FIG. **12**.

I have now described my invention in considerable detail. However, it is obvious that others skilled in the art can build and devise alternate and equivalent constructions which are nevertheless within the spirit and scope of my invention. Hence, I desire that my protection be limited, not by the constructions illustrated and described, but only by the proper scope of the appended claims.

I claim:

1. A foldable crib of a selected height, comprising:

a. a plurality of rectangular wall section panels including a backwall section and three sidewall sections, each of the sidewall sections having substantially the same width and thickness and the backwall sections having a width exceeding the width of the sidewall sections by not less than six times the thickness of the sidewall sections;

b. upright corner hinges at each corner of each section connecting the sections together to form a quadrilateral when the crib is open and outfolding with respect to the wall sections when the crib is being folded;

c. upright center hinges at the center of each sidewall section dividing the section into two portions and infolding with respect to the sidewall sections when the crib is being folded, whereby the three sidewall sections can fold together in an accordian-like fold, into a compact package having a width of one-half the width of a sidewall section and a thickness of not less than six times the thickness of the sidewall sections;

d. two upright hinges at the center portion of the backwall spaced apart a distance not less than the thickness of the aforesaid package of accordion-folded sidewall sections and outfolding with respect to the backwall when the crib is being folded, said hinges dividing the backwall into a center section and side sections, the three backwall sections folding over the aforesaid package of sidewall sections with the side sections of the backwall overlying the sides of the said package and the center section of the backwall overlying one end of the package.

2. In the crib structure defined in claim **1**, including

a locking means at each center hinge of the sidewall sections and at the hinges of the center portion of the backwall section adapted to lock the walls to prevent them from folding whenever the crib is open.

3. In the crib structure defined in claim **2**, wherein the locking means includes:

a slidable bolt in one portion of a crib wall section; and

a socket in the other portion of the crib wall section adapted to receive the bolt.

4. In the crib structure defined in claim **2**, including a brace means at each corner to stabilize the crib when it is open.

5. In the crib structure defined in claim **1**, wherein

said hinges include pivot pintles and the pintles of the corner hinges at the corners of one of the sidewall sections are removable to permit this sidewall section to be disconnected from the adjacent wall sections.

6. In the crib structure defined in claim **1**, including

a floor formed of a cloth-like material having the warp and woof of the threads on a bias with respect to the walls of the crib, whereby to stabilize the crib against racking when the crib is open.

7. In the crib structure defined in claim **1**, wherein

a lock means is provided adjacent to each corner hinge of the backwall, said lock means adapted to be interengaged when the backwall is folded about the sidewall sections to lock the folded crib into a compact package.

8. In the crib structure defined in claim **7**, including

a handle at the center portion of the backwall to permit the folded crib to be carried like a suitcase.

* * * * *