Aug. 1, 1950 V. E. LITTLE ET AL 2,517,004

FOLDABLE HIGH CHAIR

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FIG. 1.

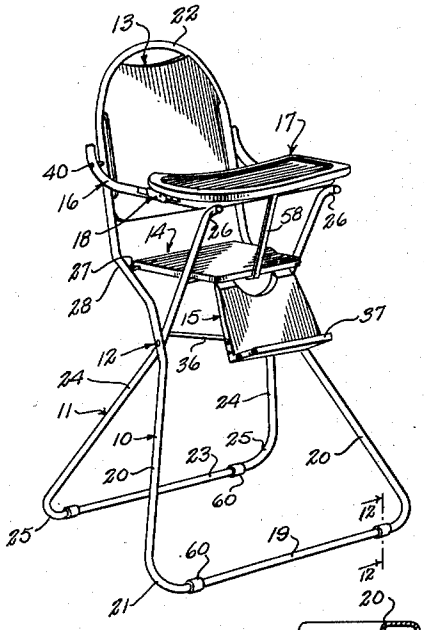


FIG. 2.

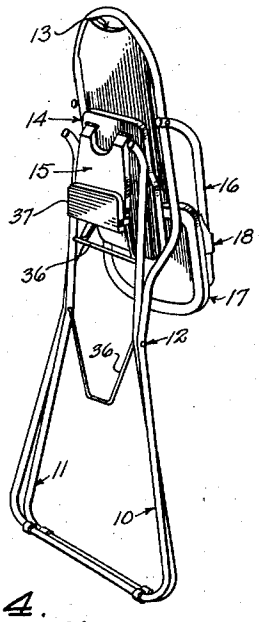


FIG. 4.

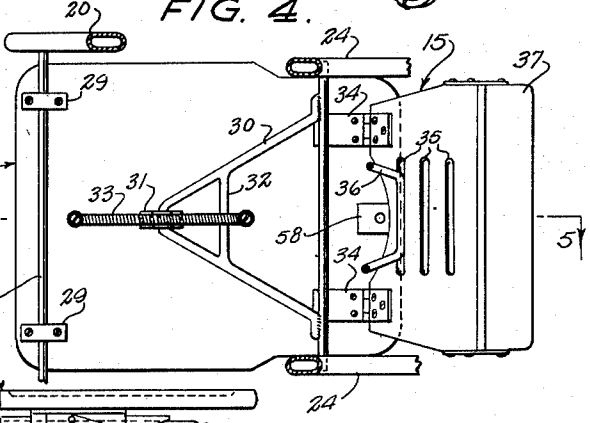
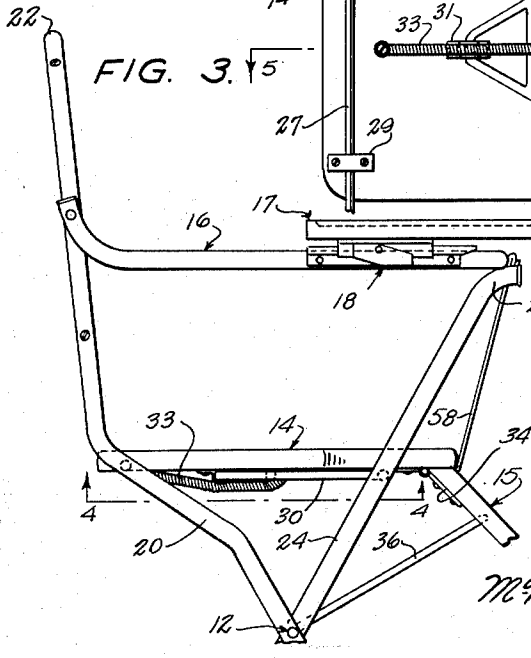


FIG. 3.



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FIG. 5.

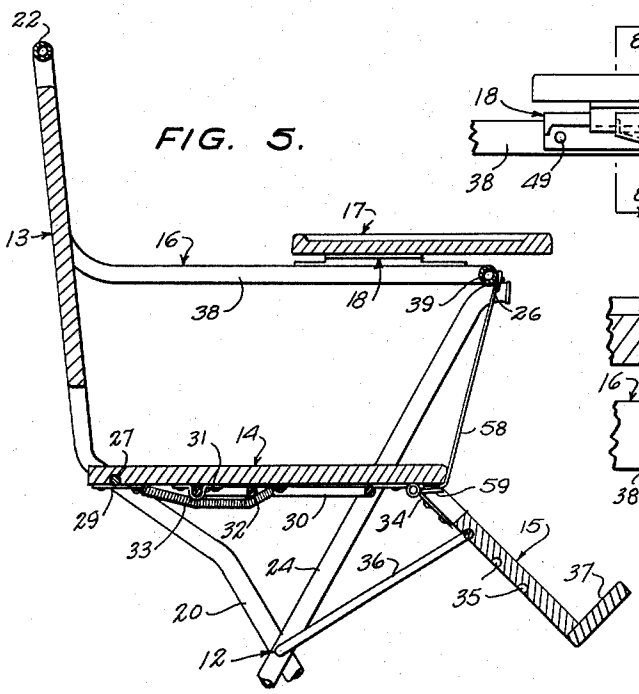


FIG. 7.

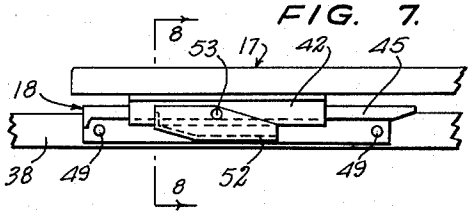


FIG. 8.

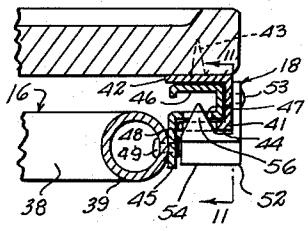


FIG. 9.

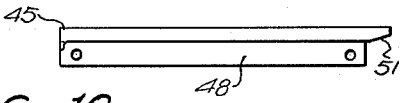


FIG. 10.

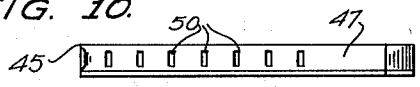


FIG. 6.

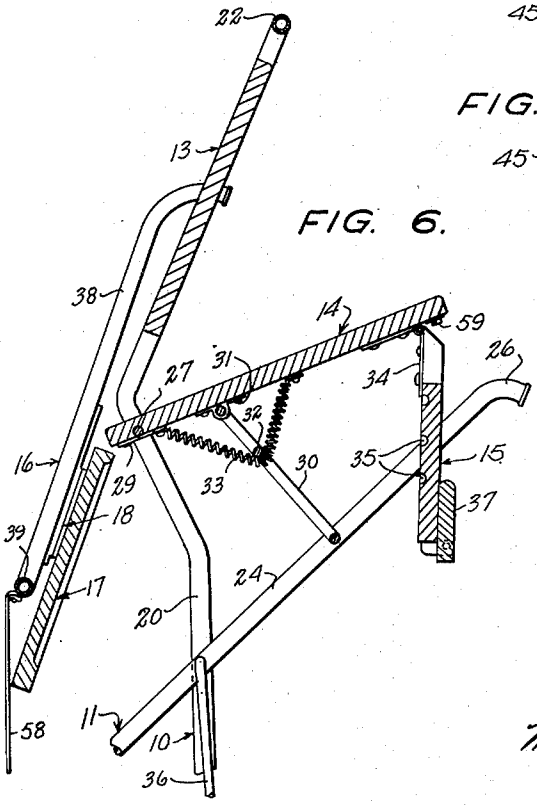


FIG. 11.

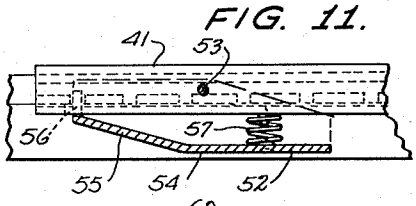
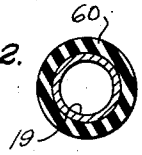


FIG. 12.



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FOLDABLE HIGH CHAIR

Virgil E. Little and Ray B. Norris,
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Application November 23, 1948, Serial No. 61,706

3 Claims. (Cl. 155—143)

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This invention relates to foldable high chairs for infants and small children, and more particularly to a foldable high chair of the character disclosed in patent application of V. Emery Little and Ray B. Norris, Serial No. 790,682, filed December 9, 1947, for Folding High Chair.

It is among the objects of the present invention to provide an improved foldable high chair having a pair of crossed-over, pivotally connected frames, a backboard, a pivotally-mounted seat board, a slidable and pivotally-mounted tray board and a pivotally-mounted footboard, wherein the frames are relatively movable to a side-by-side relationship, the seat board is simultaneously upwardly movable at its front edge to a position substantially parallel to the backboard, the tray board is movable downwardly to a position overlying and substantially parallel to the seat board, and the footboard overhangs and is nearly parallel to the tray board, so that all of said boards are stacked in contiguous, face-to-face relationship when said chair is folded, which chair includes spring-biased, pivoted means connecting the seat board to the frames so that the frames are automatically brought to folded position when the front edge of the seat board is raised, and whereby the seat board is resiliently held in operative position when the chair is unfolded, and which chair is simple, strong and durable in construction, extremely stable when in unfolded condition, easy to fold and unfold, of light weight, and of compact size when folded for easy and convenient transportation, and neat and attractive in appearance.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of a high chair illustrative of the invention, showing the chair in unfolded or operative condition;

Figure 2 is a perspective view of the chair in folded condition;

Figure 3 is a side elevation of a fragmentary upper portion of the chair;

Figure 4 is a transverse, cross-section taken substantially on the line 4—4 of Figure 3, looking upwardly in the direction of the arrows;

Figure 5 is a transverse, medial, cross-section of the upper portion of the chair taken substantially on the line 5—5 of Figure 4;

Figure 6 is a cross-section similar to Figure 5, but showing the movable parts of the chair in a partially folded condition;

Figure 7 is a side elevation on a somewhat enlarged scale of a slidable connection between the tray board and the board-supporting rail of the chair;

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Figure 8 is a cross-section of a fragmentary portion of the tray board, supporting rail and slidable connection taken substantially on the line 8—8 of Figure 7;

Figure 9 is a side elevation of that portion of the tray-slide assembly secured to the tray-supporting rail;

Figure 10 is a bottom plan view of the element illustrated in Figure 9;

Figure 11 is a longitudinal, cross-section taken substantially on the line 11—11 of Figure 8; and

Figure 12 is a transverse cross-section taken substantially on the line 12—12 of Figure 1.

With continued reference to the drawings, the improved chair comprises, in general, a front frame 10, a rear frame 11, means 12 pivotally inter-connecting contiguous legs of the two frames intermediate the ends of such legs, a backboard 13 rigidly secured between the legs of the front frame above the pivotal connections 12, a seat board 14 pivotally connected to the legs of both the front and rear frames at a location below the bottom edge of the backboard 13, a footboard 15, hinged at its upper edge to the under surface of the seat board near the front edge of the latter and depending from the seat board, a tray-supporting, U-shaped rail 16 pivotally connected at its ends to respective legs of the front frame between the top and bottom edges of the backboard, a tray board 17 and slide assemblies 18, slidably connecting the tray board at its opposite ends to respective legs of the U-shaped rail 16.

The front frame 10 is a length of metal tubing bent to provide a frame in the form of a continuous open figure or loop. This front frame includes a straight bottom 19 and two legs 20 extending respectively from opposite ends of the bottom 19 and connected to the latter by arcuately-curved portions 21 of the tube. The portions of the legs immediately above the bottom 19 are straight and converge slightly toward each other. At a location spaced above the bottom 19 the two legs 20 are bent rearwardly relative to the assembled chair, as illustrated in Figure 1, and above the location of the rearward bend, are bent forwardly again to provide straight, substantially-parallel portions disposed one at each side edge of the seat board 13. The upper ends of the legs 20 are connected by an arcuately-curved tube portion 22, so that the front frame comprises a continuous tubular structure.

The rear frame 11 is also provided by bending a metal tube to provide a stright bottom 23, and a pair of spaced-apart legs 24 extending respectively from the opposite ends of the bottom 23. These legs 24 are connected to the respective ends of the bottom 23 by arcuately-curved tube portions 25, and the leg portions immediately above the curved portions 25 are substantially stright and convergent relative to each other. At the upper ends of these convergent portions the two legs 24 are bent rearwardly relative to the assembled chair, as illustrated in Figure 1, and the upper ends of the legs 24 are separate and curved forwardly on a small radius to provide supports 26 for the forward, intermediate portion of the U-shaped tray-supporting rail 16.

The pivotal connections 12 are pivot pins extending through registering apertures in the tubular legs 20 and 24 of the front and rear frame members at the upper ends of the straight, convergent lower portions of the frame legs, and pivotally connect together the contiguous legs at the opposite sides of the two frames.

The backboard 13 is a flat board of any suitable material, such as wood, and is fitted into the upper portion of the front frame 10 and secured to the frame tube by suitable means, such as screws extending through apertures in the tube and into the edges of the board.

A straight bar 27 extends transversely between the two legs 20 of the front frame 10 and is secured at its opposite ends to the respective front frame legs adjacent the upper, forward bends 28 of these legs, and at a location between the bottom edge of the backboard 13 and the pivotal connections 12. The seat board 14 is transversely grooved to receive the straight bar 27 and the bar is held in the groove in the seat board by suitable clips 29 secured to the under surface of the seat board and spanning the groove with the bar 27 therein.

A U-shaped bail 30 is pivotally secured at its ends to the respective legs 24 of the rear frame 11 at a location substantially the same distance above the pivotal connections 12 as the bar 27. Adjacent its mid-length location, the bail 30 is pivotally secured to the under surface of the seat board 14 between the front and rear edges of the latter by a U-shaped clip 31 spanning the mid-length portion of the bail and secured at its ends to the seat board.

With this arrangement, when the front edge of the seat board is raised, the portion of the bail 30 pivotally connected to the seat board will also be raised, and the pivotal movement of the seat board about the mid-length portion of the bail and the bar 27 will pull the portions of the two frames above the pivotal connections 12 together to swing the frames to a contiguous, substantially parallel folded condition, as illustrated in Figure 2.

A strut 32 extends transversely across the bail 30 spaced from the mid-length portion of the bail received in the clip 31, and an elastic element, such as the elongated coiled, tension spring 33, is secured at its ends to the under side of the seat board 14 at opposite sides of the clip 31, and passes under the strut 32 to resiliently hold the seat board down on the bail 30 when the chair is in its unfolded condition, as illustrated in Figures 1 and 5, to secure the chair against accidental folding while in use.

The footboard 15 is secured at its upper edge to the under surface of the seat board 14 near the forward edge of the latter by a pair of spaced-apart hinges 34, and is provided in its rearward or under surface portion with spaced-apart, transversely-extending grooves 35.

A lower, U-shaped bail 36 is pivotally secured at its ends to respective pivot pins of the pivotal connections 12, and is receivable at its mid-length location in any selected one of the spaced-apart grooves 35 to adjustably hold the footboard 15 in operative position, as illustrated in Figure 5. If desired, the bail 36 may be bent outwardly adjacent its opposite ends, and these outwardly-bent portions utilized as the pivot pins for the pivotal connections.

A narrow shelf 37 is pivotally connected at its rearward edge to the footboard near the bottom edge of the latter, and is movable between the operative position, illustrated in Figure 5, in which it extends outwardly or forwardly substantially perpendicular to the footboard, and its folded position, as illustrated in Figure 6, in which it lies against the front surface of the footboard.

The U-shaped rail 16 is of generally rectangular, open-ended construction, and has its legs 38 bent upwardly near their ends opposite the intermediate portion 39 of the rail, such legs being provided near their ends with apertures receiving respective pivot pins 40, which are received in apertures provided in the legs 20 of the front frame 10 between the top and bottom edges of the backboard 13 to pivotally connect the rail to the front frame. As explained above, the rail is so dimensioned so that its intermediate portion 39 rests upon the supports 26 at the upper ends of the legs 24 of the rear frame when the chair is unfolded, and the rail in its lowered position, as illustrated in Figure 5.

The tray board 17 is an elongated, somewhat rectangular board having rounded corners and a concavely-curved inner or rearward edge, and is provided with a concave recess in its upper surface. This board is connected near each end thereof to a corresponding leg 38 of the tray-supporting rail 16 by a respective slide assembly 18, as illustrated in detail in Figures 7, 8, 9, 10 and 11.

Each slide assembly 18 includes an elongated, straight rail 41 of channel or U-shaped cross-section, one leg or flange 42 of which is provided with spaced-apart screw holes and secured to the under surface of the tray board 17 to extend transversely of the latter at the corresponding end edge of the board by suitable fasteners, such as the wood screws 43. The opposite or lower flange 44 of the rail 41 is provided with a transversely-elongated, rectangular aperture for a purpose which will presently appear.

The slide assembly further includes an inner rail 45 having a portion of channel or U-shaped cross-section slidably receivable in the channel-shaped outer rail 41, and including an upper flange or leg 46 slidable along the under surface of the upper flange 42 of the outer rail, and a lower flange or leg 47 slidable on the upper surface of the lower flange 44 of the outer rail. This rail 45 has along the edge of its lower flange at the open side of the rail a depending leg or flange 48 secured by suitable means, such as rivets 49 to the outer side of the corresponding leg 38 of the support 16 near the intermediate portion 39 of the support.

The rail 45 is particularly illustrated in Figures 9 and 10, and the lower leg or flange 47 is provided with a series of rectangular apertures 50 spaced apart longitudinally of the rail. At its

end adjacent the intermediate portion 39 of the support, the channel-shaped portion of the inner rail 45 is extended somewhat beyond the corresponding end of the depending leg 48, and the bottom edge of this extension is inclined upwardly away from the adjacent end of the leg 48, as indicated at 51 in Figure 9.

A latch 52 of angle or L-shaped cross-section is pivotally secured to the web of the outer rail 41 by suitable means, such as the rivet 53 extending through an aperture in the leg of the latch overlying the web of the outer rail, and has its other leg 54 disposed below and extending along the bottom flange 44 of the outer rail.

Near its rearward end of the bottom leg 54 of the latch is inclined upwardly, as is clearly indicated at 55 in Figure 11, and a pointed tongue or dog 56 extends upwardly from the rearward end of this lower leg of the latch to project through the aperture in the bottom flange 44 of the outer rail 41, and into a selected aperture 50 in the bottom flange 47 of the inner rail 45.

A compression spring 57 is disposed between the bottom leg 54 of the latch and the bottom flange 44 of the outer rail 41 at a location spaced forwardly of the pivot pin or rivet 53 to resiliently urge the tongue 56 into an aperture 50 of the inner rail.

The tray board 17 may be adjustably moved longitudinally of the legs 38 of the supporting rail 16 by first depressing the forward ends of the two latch members 52, disposed one at each end of the tray board, and then moving the tray forwardly or backwardly to the desired position and releasing the latches. If the latches do not immediately engage in apertures 50 in the corresponding inner rails, the board may be moved forwardly or backwardly a slight amount to bring one of the apertures 50 into alignment with the tongue 56 of each latch, so that the board will be firmly held in adjusted position.

A flexible strap 58 is secured at its upper end to the intermediate portion 39 of the tray-support rail, substantially at the mid-length location of such intermediate portion of the rail, and is detachably secured at its lower end to the under side of the seat board 14 near the forward edge of the latter by a suitable means, such as the snap fastener 59.

When the lower end of the strap 58 is secured to the seat board, the tray cannot be raised, nor can an infant or small child slide out of the chair between the seat board and the tray.

Cylindrical cushions or bushings 60 are mounted on the bottom portions 19 and 23 of the two frames 10 and 11, and are disposed, one bushing near each end of each frame bottom portion to provide four resilient supports for the chair, disposed substantially at corresponding corners of the rectangular base area of the chair. These bushings are preferably formed of rubber and may be provided by cutting suitable rubber tubing to the proper length and sliding the tube sections onto the frame tubes.

This improved chair is easily foldable by a single movement of the person folding the chair, as it is necessary only to raise the forward edge of the seat board in order to fold the chair from its expanded or operative condition to its fully folded condition. In order to release the footboard 15 to swing downwardly along the under side of the seat board when the seat board is in folded position, it is necessary only to raise the bottom edge of the seat board a slight amount to allow the bail 36 to drop out of the groove 35 in which it is engaged, and when the frame, the seat board and the footboard have been brought to folded condition, the support rail 16 may be allowed to depend at the front side of the chair, or may be swung over to depend at the rear side opposite the lower or rear portion of the seat board in the folded chair. Thus, when the chair is completely folded, the backboard 13, the seat board 14, the footboard 15, and the tray board 17 are all juxtaposed or stacked in contiguous, substantially parallel relationship, and occupy a space not materially greater than the combined thickness of the four boards. The frame is also brought to a condition in which the pivotally-connected pairs of legs of the two frame members are substantially parallel and contiguous to each other. The chair thus, when folded, is in an extremely compact condition for easy transportation and, as the chair is of extremely light weight, it may be easily moved or stored when folded, and may be conveniently placed in a vehicle, such as an automobile, if desired.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. A foldable high chair comprising a front and a rear frame each having a pair of spaced-apart legs, means pivotally inter-connecting contiguous legs of said two frames intermediate the length of said legs whereby the portions of one frame at opposite sides of said pivotal connections are movable toward and away from the corresponding portions of the other frame, a backboard rigidly secured between the legs of said forward frame above said pivotal connections, a bar extending transversely between the legs of said forward frame between the bottom edge of said backboard and said pivotal connections, a seat board pivotally mounted near its rear edge on said transverse bar, a U-shaped bail pivotally connected at its ends to respective legs of said rear frame above said pivotal connections, means pivotally connecting said bail substantially at its mid-length location to the under side of said seat board between the rear and front edges of the latter whereby raising the front edge of said seat board will pull the portions of said frames above said pivotal connections toward each other, a strut extending transversely across said bail at a location spaced from the mid-length portion of the latter, an elastic member secured at its ends to the under side of said seat board in tensioned condition and passing under said strut to resiliently urge said seat board to its lowered position in which it rests upon said transverse bar and said bail, a footboard hinged at its upper edge to said seat board adjacent the front edge of the latter, a lower bail pivotally connected at its ends respectively to said pivotal connections and releasably engageable at its mid-length location with the rear side of said footboard to hold the latter in operative position, a U-shaped support pivotally connected at its opposite ends to respective front frame legs between the top and bottom edges of said backboard with its intermediate portion resting upon the upper ends of the rear frame legs when said chair is unfolded,

and a tray board slidably mounted on said support with its front edge adjacent the intermediate portion of the support.

2. In a foldable high chair including a front and a rear frame each having a pair of spaced-apart legs, means pivotally connecting each leg of one frame to a respective leg of the other frame at locations intermediate the lengths of said frame legs whereby the portions of one frame at opposite sides of the axis of said pivotal connections are movable toward and away from the corresponding portions of the other frame, a backboard secured between the legs of said front frame above said pivotal connections, a U-shaped support rail pivotally secured at its opposite ends respectively to said front frame legs between the top and bottom edge locations of said backboard, a seat board supported by said frames below said backboard, and a footboard hinged at its upper edge to said footboard near the front edge of the latter and depending therefrom, means pivotally mounting said seat board on said frames so that upward movement of the front edge of said seat board will pull the portions of said frames at respectively opposite sides of the axis of said pivotal connections together comprising, means pivotally connecting said seat board near its rear edge to the legs of said front frame between said pivotal connections and the bottom edge of said backboard, a U-shaped bail pivotally connected at its opposite ends respectively to the legs of said rear frame member and pivotally connected at its mid-length location to said seat board between the rear and front edges of the latter, a strut extending transversely across said bail at a location spaced from the mid-length location of the latter, and a tension spring secured at its ends to said seat board and extending under said strut.

3. In a foldable high chair including a front and a rear frame each having a pair of spaced

apart legs, means pivotally connecting each leg of one frame to a corresponding leg of the other frame at a location intermediate the lengths of said frame legs whereby the portions of one frame at opposite sides of the common axis of said pivotal connections are movable toward and away from the corresponding portions of the other frame, a seat supported by said frames above said pivotal connections, and means pivotally mounting said seat board on said frames so that upward movement of the front edge of said seat board will pull the portions of said frames at respectively opposite sides of the common axis of said pivotal connections together comprising, means pivotally connecting said seat board near its rear edge to the legs of said front frame above said pivotal connections, a U-shaped bail pivotally connected at its opposite ends to the legs of said rear frame member and pivotally connected at its mid-length location to said seat board between the rear and front edges of the latter, a strut extending transversely across said bail at a location spaced from the mid-length location of the latter, and a tension spring secured at its ends to said seat board at the under side of the latter and extending under said strut.

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