Nov. 17, 1964 E. F. HAMILTON 3,157,430

INFANT'S CHAIR

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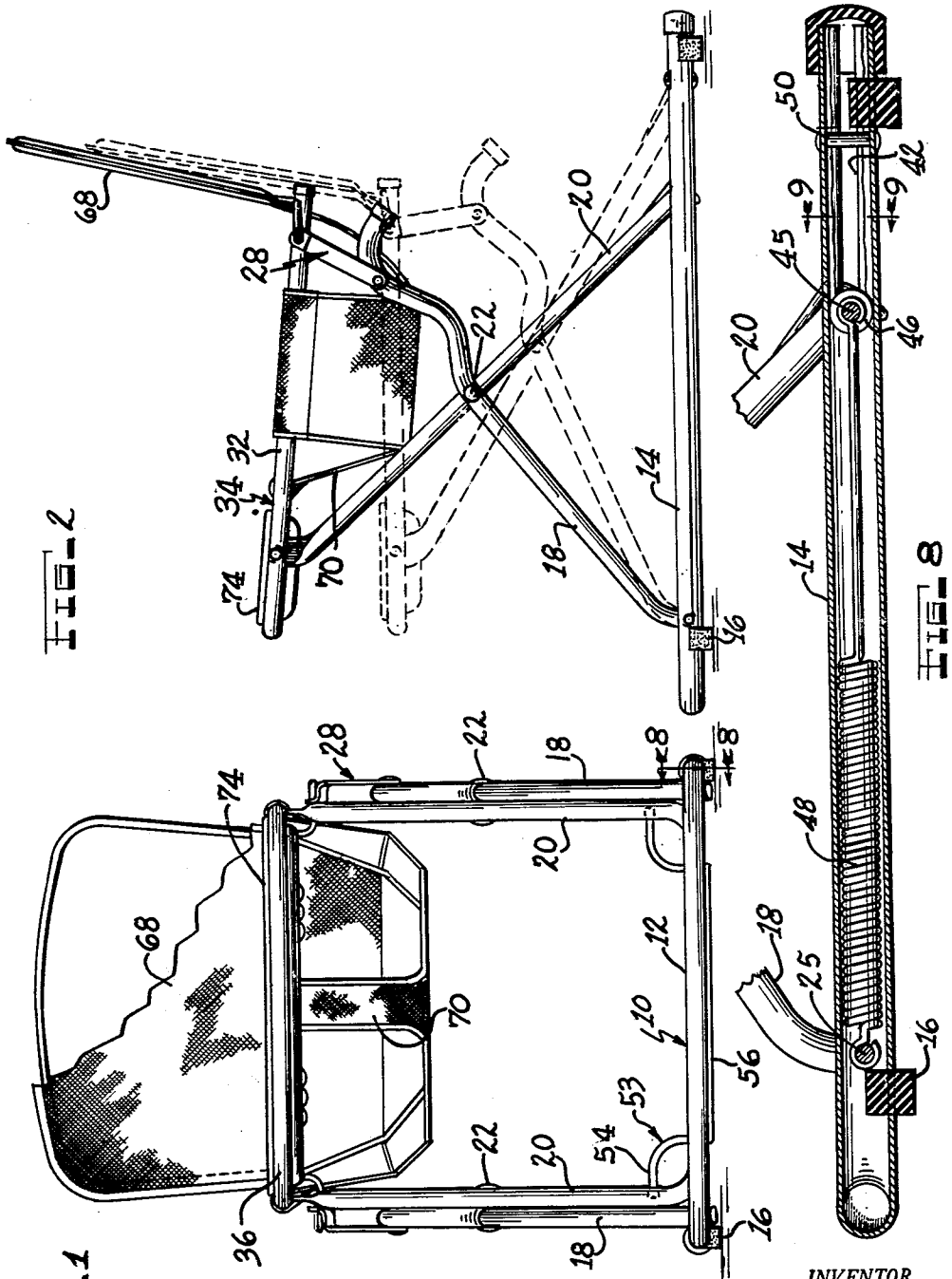


FIG-2

FIG-3

FIG-1

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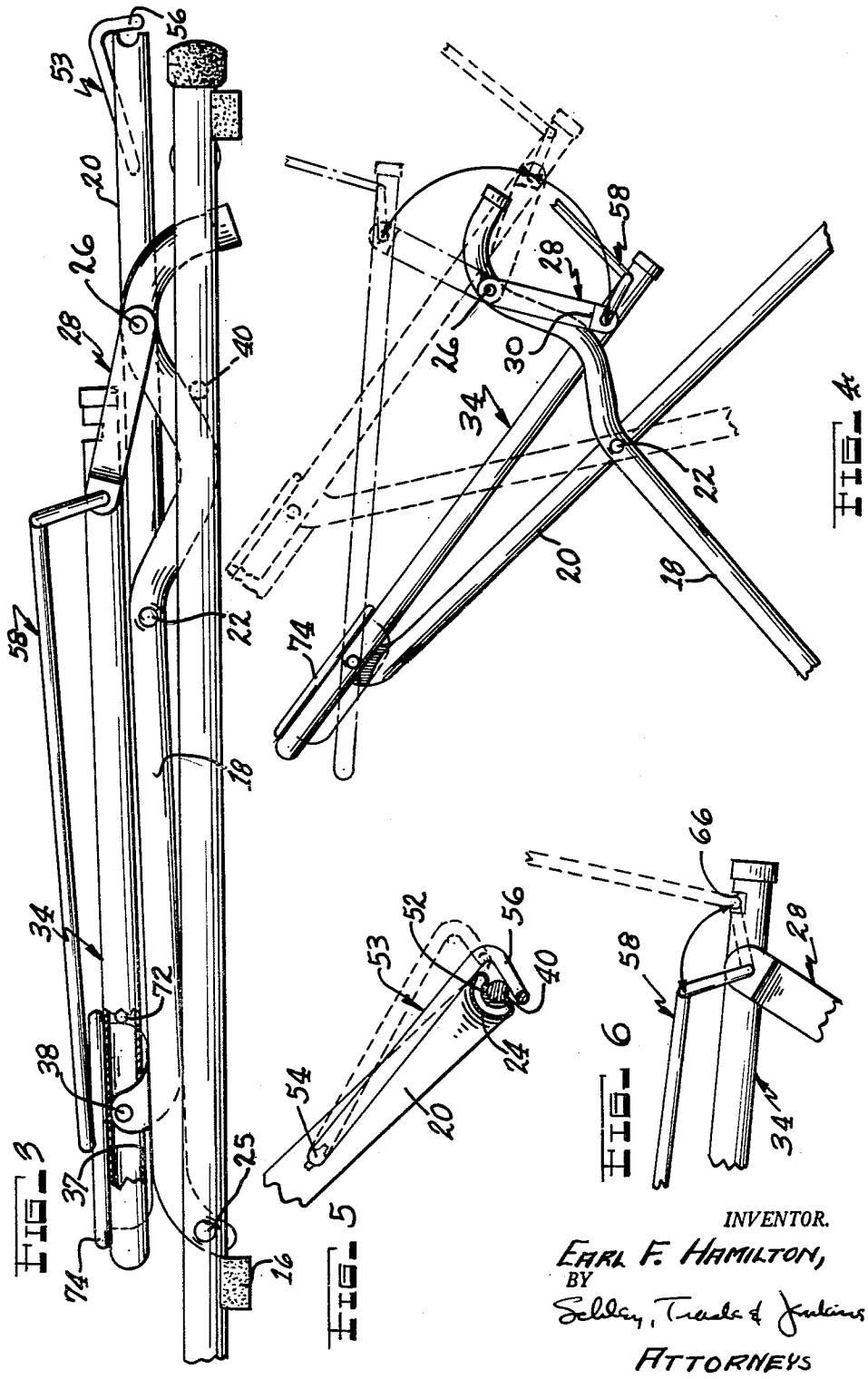


FIG. 3

FIG. 4

FIG. 5

FIG. 6

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FIG. 7

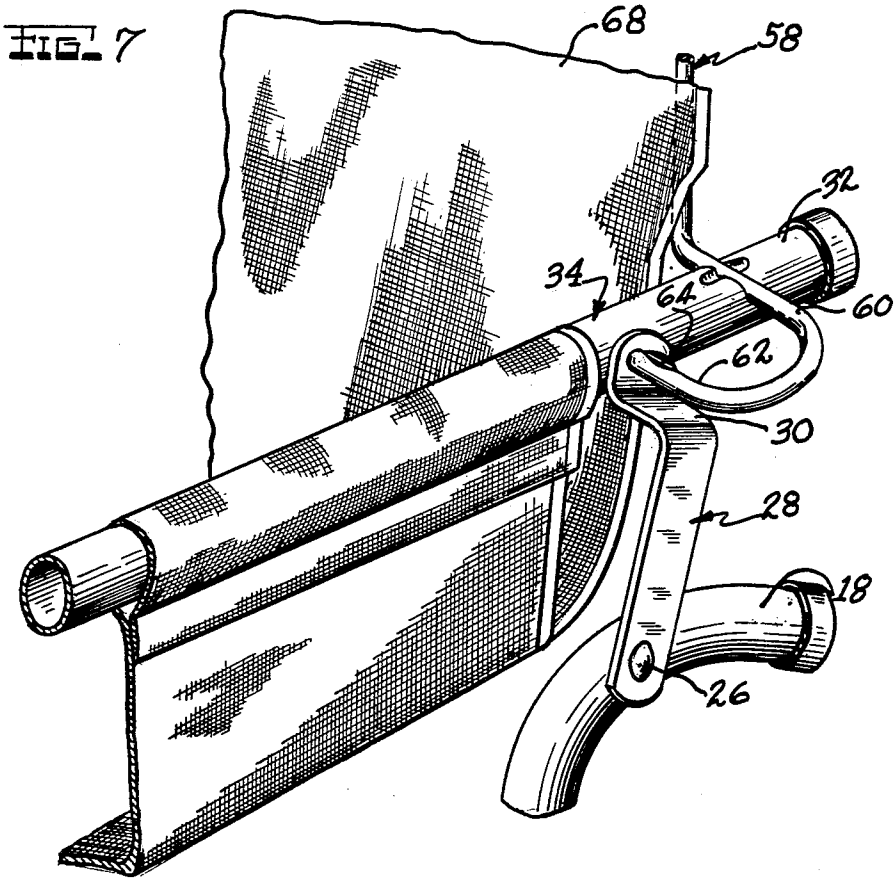
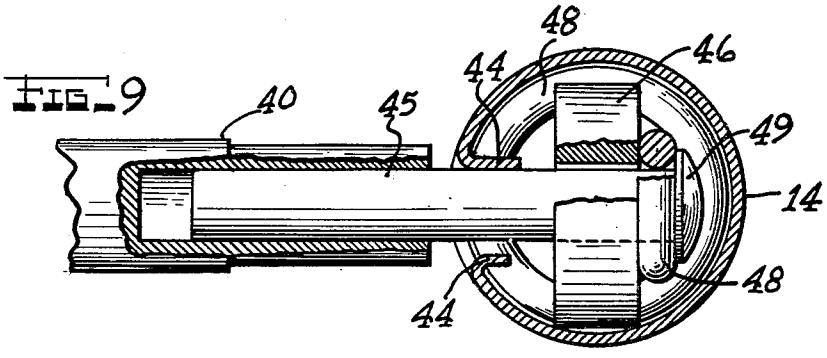


FIG. 9



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INFANT'S CHAIR

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9 Claims. (Cl. 297—19)

This invention relates to an infant's chair construction, and has for its objects the provision of a chair construction of attractive appearance which can be inexpensively manufactured from metal-tubing; which can be adjusted into positions to provide a baby jumper having the desired characteristics of springiness and sturdiness; which can be moved into an adjusted position to provide a stationary tilted infant's seat; and which can be folded into a collapsed storage position.

In carrying out my invention in its preferred form, there is provided a base having a pair of elongated parallel stretches upon which pairs of intersecting front and rear legs are mounted. The lower ends of said rear legs are releasably connected to a spring-tensioned cross rod carried on the base and movable in a fore-and-aft direction with respect to said base. The upper ends of said rear legs are pivotally connected to a U-shaped seat frame. The front legs are pivotally connected to said base stretches on fixed pivotal axes, and extend upwardly therefrom with their upper ends pivotally connected to the seat frame by a pair of toggle links, said toggle links being movable into a first position of adjustment whereby said rear legs are movable with respect to the seat frame to permit reciprocating vertical movements of said seat frame, and to a second position of adjustment in which said links engage and support the front legs to thus hold the seat frame in a stationary tilted position.

A back frame is swingably mounted on the seat frame for movement between a collapsed position generally parallel with the seat frame and an operative position generally normal to said seat position. The back and seat frames support a flexible fabric type sling forming the back and seat-supporting surfaces for an infant.

Other objects and features of my invention will become apparent from the more detailed description which follows and from the accompanying drawings in which:

FIG. 1 is a front elevation of an infant's chair embodying my invention;

FIG. 2 is a side elevation of the chair shown in FIG. 1, and showing in dotted lines the vertical reciprocating movements of the chair when it is adjusted for use as a baby jumper;

FIG. 3 is an enlarged side elevation of the chair shown in FIG. 1, but with the infant-supporting sling removed therefrom and showing said chair in its fully collapsed position;

FIG. 4 is an enlarged fragmentary side elevation of the chair shown in FIG. 1, but showing said chair in its stationary tilted position of adjustment;

FIG. 5 is an enlarged fragmentary vertical section showing the releasable interconnection between the chair rear legs and the chair base;

FIG. 6 is a fragmentary enlarged side elevation showing the interconnection between the chair seat and back frames;

FIG. 7 is an enlarged fragmentary isometric view of the interconnection of the back frame and one of the rear legs to the seat frame;

FIG. 8 is a fragmentary vertical section taken on the line 5—5 of FIG. 1; and

FIG. 9 is an enlarged vertical section taken on the line 9—9 of FIG. 8.

As illustrated in the drawings, my infant's chair is supported on a base 10, conveniently formed from a length of metal-tubing bent into a generally U-shape to provide

a transversely extending forwardly disposed bight 12 and a pair of rearwardly extending elongated stretches 14. A plurality of snubber feet 16 are mounted on the lower faces of the stretches 14 to thus support the base 16 in a slightly elevated position above the floor.

The chair is supported on the base on pairs of intersecting front and rear legs 18 and 20 pivotally joined together at their joints of intersection 22. Conveniently, the rear legs 20 constitute the parallel stretches of a U-shaped length of metal-tubing and are interconnected at their lower ends by a transversely extending member 24.

As shown, the lower ends of the front legs 18 are pivotally joined to the base members 14 by pivot pins 25, and the upper ends of said legs are pivotally connected, as at 26, to a pair of toggle links 28. Said toggle links are provided with inwardly directed offsets 30 and are pivotally joined to a pair of lateral stretches 32 of a seat frame 34 which is also conveniently formed from a length of U-shaped metal-tubing, the stretches 32 being interconnected by a transversely extending bight 36. In this manner, the toggle links 28 pivotally interconnect the seat frame and front legs to permit relative pivotal and longitudinal movement therebetween when the chair is in the position illustrated in FIG. 2.

The upper ends of the rear legs 20 are flattened and pivotally mounted in slots 37 formed in the lower faces of the seat frame stretches 32 by pivot pins 38. The member 24 interconnecting the rear legs 20 is adapted to be releasably locked on a transversely extending rod 40 having axles 45 projecting outwardly from its ends to form lateral extensions thereof and slidably carried in a pair of longitudinally extending slots 42 formed in the opposed inner faces of the base members 14 for thus operatively connecting said rear legs to the base. Conveniently, as shown in FIG. 9, the slots 42 are formed by slitting the members 14 and then bending the edges of said slits inwardly to form pairs of elongated shoulders 44 which support the rod axles 45. The ends of the axles 45 projecting into the slots 42 are provided with wheels 46 carried within the tubing forming said base members to thus facilitate the longitudinal movements of the rod 40 with respect to the base.

As shown in FIGS. 8 and 9, the rod 40 and thus the lower ends of the legs 20 are urged forwardly to urge the seat frame into its full line position of FIG. 2 by coil springs 48 mounted within the base members 14. As shown, the forward ends of the springs 48 are mounted within said base members by the pivot pins 25 for the front legs 18, and the rearward ends of said springs are received over the axles 45 and retained thereon by the wheels 46 and expanded heads 49 on the ends of said axles. Thus, the rod 40 and the lower ends of the rear legs 30 are urged forwardly under the action of the springs 48 to force the seat frame upwardly, said forward movement being limited by the axles 45 abutting the forward ends of the slots 42. When a downward force is applied to the seat frame, the rod 40 will be forced rearwardly placing the springs 48 in tension, said rearward movement being limited by the stops 50 mounted in the base members 14 in the path of travel of the wheels 46.

In order to move the chair into its various positions of adjustment, it is of course necessary to be able to disconnect the member 24 from the longitudinally movable rod 40. To this end, the member 24 has a concave downwardly presented face 52 adapted to embrace the upper face of the rod 40. The concave face 52 on the member 24 also forms a bearing surface for the pivotal movements of the rear legs when the chair is used as a baby jumper. The member 24 is releasably locked on said rod by a generally U-shaped locking finger 53 hav-

ing its ends turned outwardly, as at 54, for pivotal reception in a pair of aligned openings in the inner faces of the legs 20. The intermediate stretch of the finger 53 is bent forwardly, as at 56, and is movable into the full line position of FIG. 6 in which it extends around the face of the rod 40 opposite the convex face 52 on the member 24 to releasably lock said member on the rod. To move the locking finger 53 into its illustrated locked position, said finger is stressed downwardly and forwardly under the rod 40 and is releasably retained thereunder by its inherent resiliency.

As shown in FIG. 7, the back of the chair comprises a back frame 58, conveniently a metal rod bent into a general U-shape. Each end of said frame is bent into a hooked configuration to provide an outwardly extending rearwardly disposed stretch 60 and an inwardly extending forwardly disposed stretch 62. As shown, the inwardly extending stretches 62 extend through openings in the links 28 and are swingably received in aligned openings in the outer faces of the seat frame stretches 32 to thus swingably mount both the back frame and the links 28 on the seat frame. Conveniently, the links are swingably retained on the back frame stretches 62 between the seat frame and noses 64 swaged in said stretches.

As shown in FIG. 6 the back frame 58 is swingable about the axes of the stretches 62 between a collapsed position generally parallel with the seat frame 34 to an operative position generally normal to said seat frame. To releasably lock the back frame in its operative position, a pair of aligned recessed seats 66 are formed in the upper faces of the seat frame stretches 32 for reception of the back frame stretches 60. Desirably the seats 66 are located sufficiently rearwardly of the pivotal interconnections between the seat and back frames that said back frame must be stressed slightly rearwardly to be received in said seats.

As shown in FIGS. 1 and 2, the back frame 58 and the seat frame 34 support a flexible fabric-type sling 68 which forms the seat and back-supporting surfaces of the chair. The forward end of the sling 68 is provided with a crotch strap 70 which is connected to a transversely extending rod 72 mounted on the seat frame stretches 32 adjacent their forward ends. Interposed between the rod 72 and the bight 36 of the seat frame is a dished pan 74 conveniently formed of sheet-metal, plastic, or the like, press-fit into the seat frame.

Thus, from the structure just described it will be apparent that my infant's chair can be easily adjusted for use as a baby jumper as shown in FIG. 1, and a stationary tilted chair as shown in FIG. 4, and may also be folded into a collapsed position for storage as shown in FIG. 3.

When it is in its position of adjustment shown in FIG. 2, the member 24 interconnecting the rear legs 20 is releasably locked on the rod 40, and the toggle links 28 are swung into the position shown in FIG. 2 in which they are swingable above the front legs 18. As the infant in the chair jumps up and down, it is moved between its full and dotted line positions shown in FIG. 2, with the front and rear legs pivoting with respect to each other and with respect to the seat frame 34 and base 10. The links 28 and the rod 40 also permit relative pivotal and longitudinal movement between the front legs 18 and the seat frame 34 and the rear legs 20 and base 10, respectively, so that the seat frame is retained in a generally horizontal position during its vertical movements.

During downward movement of the chair, the transversely extending member 24 interconnecting the rear legs 20 will force the rod 40 rearwardly against the biasing action of the springs 48 carried in the base members 14 with the stops 50 limiting said rearward movement. As the infant jumps up, the chair will be forced upwardly under the action of the springs 48 forcing the rod 40, and thus the lower ends of the legs 20, forwardly

until the chair is in its full line position shown in FIG. 2.

To convert the chair from a baby jumper into a stationary tilted chair, as shown in full lines in FIG. 4, the member 24 is disengaged from the rod 40 by releasing the locking finger 53. This permits the seat frame 34 to be swung on the toggle links 28 from the chain link line positions of FIG. 4 through the dotted line position into the full line position of said FIG. 4. In such full line position the links 28 are swung over their centers and their offsets 30 engage and support the rearwardly disposed faces of the front legs 18. The member 24 is then again mounted on the rod 40 as by placing its concave face 52 against said rod and then spring-stressing the locking finger 53 around said rod. In this position of adjustment, the legs 20 and 18 are prevented from pivoting with respect to each other by the link offsets 30 bearing against the rear legs 18, and the chair will thus be maintained in a stationary tilted position.

The chair is movable into its collapsed position illustrated in FIG. 3 from its tilted position illustrated in FIG. 4 by disengaging the interconnecting rear leg member 24 from the rod 40, and then pivoting the chair seat frame 34 rearwardly and upwardly to cause the toggle links 38 to swing about their connections 26 to the rear legs until they lie in a forwardly extending position. During this movement of the toggle links, the front and rear legs will pivot about their interconnections 22 until they are disposed in their collapsed position. The rear legs 20 are disposed within the lateral extent of the front legs 18 and are thus free to move into a fully collapsed position coplanar with said front legs. As shown, the front legs abut the rod 40 during collapse and are thus prevented from swinging through the plane of the base 10. The back frame 42 is collapsed by spring-stressing its stretches 60 out of engagement with their seats 66 and then swinging said back frame forwardly about its interconnections 62 to the seat frame.

I claim as my invention:

1. An infant's chair, comprising a base having a pair of laterally spaced elongated members, pairs of intersecting front and rear legs pivotally joined together at their points of intersection, said pair of rear legs being pivotally connected at their upper ends to the lateral stretches of a seat frame and pivotally interconnected at their lower ends to said elongated base members for pivotal and longitudinal movement with respect to said base members, each of said front legs being pivotally connected at its lower end to one of said base members and pivotally connected at its upper end to a toggle link pivotally connected to the seat frame, said toggle links being swingable in a first position of adjustment above the front legs for effecting freedom of relative pivotal movement between said front legs and seat frame upon said movement of the rear legs with respect to the base members for vertical reciprocation of said seat frame toward and away from said base and movable into a second position of adjustment in which said links bear against the front legs below their connections thereto to support said seat frame on the front legs in a stationary tilted position, a back frame mounted on said seat frame, an infant-supporting sling mounted on said seat and back frames, and resilient means urging said seat frame upwardly when said toggle links are in said first position of adjustment.

2. An infant's chair as set forth in claim 1 in which said back frame is swingably mounted on said seat frame for movement between an extended position generally normal to said seat frame and a collapsed position parallel to said seat frame, and said rear legs are releasably interconnected to the base members for movement of the front and rear legs and the seat frame into collapsed positions parallel to the base.

3. An infant's chair, comprising a base having a pair of laterally spaced elongated members, pairs of intersecting front and rear legs pivotally joined together at their

points of intersection, said pair of rear legs being pivotally connected at their upper ends to the lateral stretches of a seat frame and pivotally interconnected at their lower ends to said elongated base members for pivotal and longitudinal movement with respect to said base members, said seat frame lying within the lateral extent of said rear legs, each of said front legs being pivotally connected at its lower end to one of said base members and pivotally connected at its upper end to a toggle link pivotally connected to the seat frame, said toggle links being swingable in a first position of adjustment above the front legs for effecting freedom of relative pivotal movement between said front legs and seat frame upon said movement of the rear legs with respect to the base members for vertical reciprocation of said seat frame toward and away from said base and movable into a second position of adjustment in which said links bear against the front legs below their connections thereto to support said seat frame on the front legs in a stationary tilted position, a back frame mounted on said seat frame, an infant-supporting sling mounted on said seat and back frames, and resilient means urging said seat frame upwardly when said toggle links are in said first position of adjustment, said toggle links having inwardly directed offsets adjacent their ends connected to the seat frame which engage the rear faces of the front legs when the toggle links are in said second position of adjustment.

4. An infant's chair as set forth in claim 1 in which said resilient means comprises a pair of springs mounted on said elongated members, said rear legs being operatively connected to said base members and to said pair of springs by a transversely extending rod connected to said springs and pivotally joined to the lower ends of the rear legs, the ends of said rod being slidably carried in aligned slots formed in said pair of base members, and means for limiting the movement of said rod in said slots for limiting said relative pivotal movement of said front and rear legs and the vertical reciprocation of the seat frame.

5. An infant's chair, comprising a base, pairs of intersecting front and rear legs pivotally joined together at their points of intersection, said pair of rear legs being pivotally connected at their upper ends to seat means and pivotally interconnected at their lower ends to said base for pivotal and longitudinal movement with respect to said base, said pair of front legs being pivotally connected at their lower ends to said base, means pivotally interconnecting the upper ends of said front legs to said seat means, said means being movable in a first position of adjustment for effecting freedom of relative pivotal movement between said front legs and seat means upon said movement of the rear legs with respect to the base for vertical reciprocation of said seat means toward and away from said base and movable into a second position of adjustment in which said means releasably locks said front and rear legs in a fixed position relative to each other to support said seat means in a stationary tilted position, and resilient means urging said seat means upwardly when said means are in said first position of adjustment.

6. A collapsible infant's chair as set forth in claim 5 with the addition that said base is formed from a U-shaped length of tubing, a cross member interconnects the lower ends of said rear legs, a transversely extending rod is connected to said cross member along the length of said cross member, aligned longitudinally extending slots are formed in said base tubing having inturned longitudinal edges upon which the ends of said rod are carried, and a pair of wheels are mounted on the opposed ends of said rod and carried within said tubing forming said base for movably supporting said rod within said base.

7. A collapsible infant's chair as set forth in claim 6 in which said cross member has a concave face to embrace the transversely extending rod in a face-to-face relationship and is releasably locked on said rod by a spring stressed locking finger mounted on said rear legs and engageable with the lower rod face.

8. A collapsible infant's chair as set forth in claim 7 in which said locking finger has a generally U-shape with its ends swingably carried in a pair of aligned openings in said rear legs and its intermediate stretch bent forward to lock under the rod against the rod face opposite the rod face embraced by said cross member.

9. An infant's chair, comprising a base having a pair of elongated members, pairs of intersecting front and rear legs pivotally joined together at their points of intersection, said pair of rear legs being pivotally connected at their upper ends to the lateral stretches of a seat frame and pivotally interconnected at their lower ends to said elongated base members for pivotal and longitudinal movement with respect to said base members, each of said front legs being pivotally connected at its lower end to one of said base members and pivotally connected at its upper end to a toggle link pivotally connected to the seat frame, said toggle links being swingable in a first position of adjustment above the front legs for effecting freedom of relative pivotal movement between said front legs and seat frame upon said movement of the rear legs with respect to the base members for vertical reciprocation of said seat frame toward and away from said base and movable into a second position of adjustment in which said links bear against the front legs below their connections thereto to support said seat frame on the front legs in a stationary tilted position, a generally U-shaped back frame having its lower ends extending inwardly for pivotal reception in aligned openings in said seat frame with said toggle links being carried on said back frame ends, slots formed in the upper faces of said seat frame to receive the stretches of the back frame adjacent its ends for releasably retaining said back frame in a plane generally normal to the plane of the seat frame, an infant-supporting sling mounted on said seat and back frames, and resilient means urging said seat frame upwardly when said toggle links are in said first position of adjustment.

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