

Oct. 26, 1965

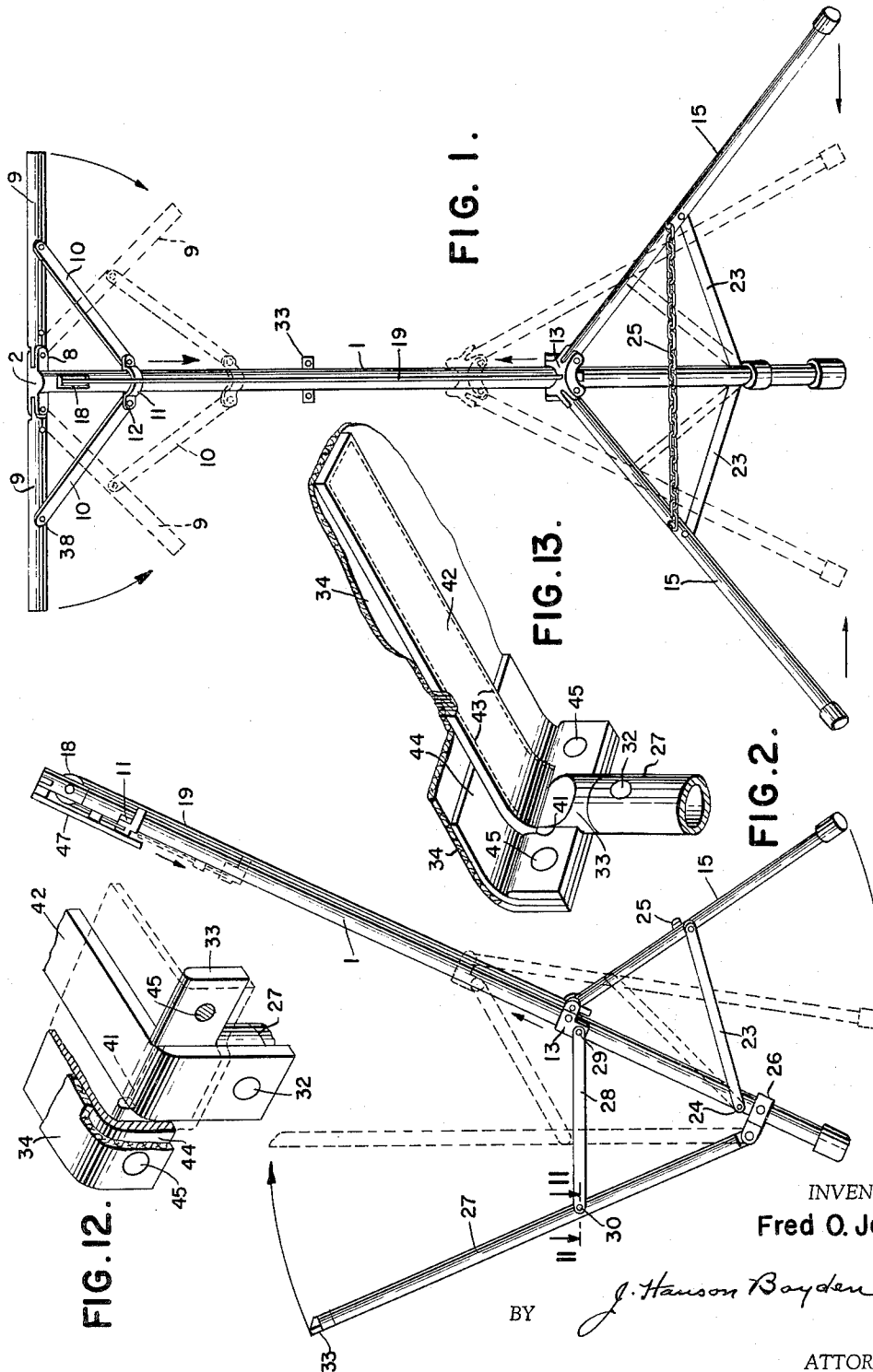
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3,214,217

PORTABLE FOLDING CHAIR

Filed July 27, 1964

3 Sheets-Sheet 1



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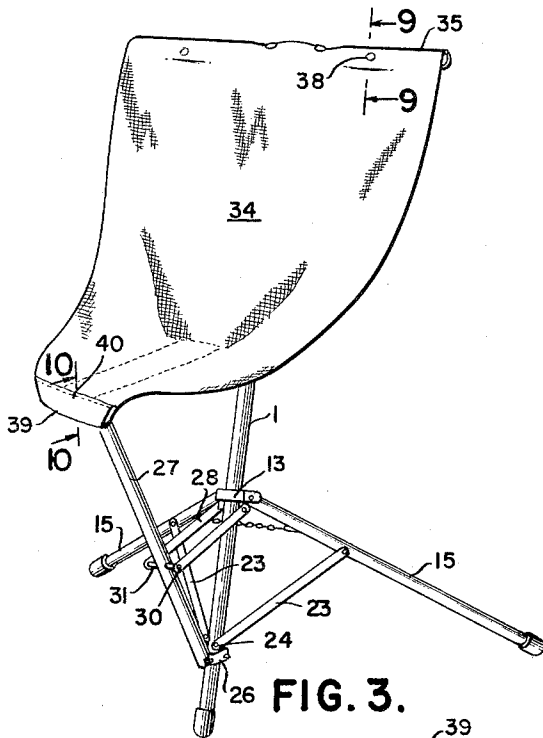


FIG. 3.

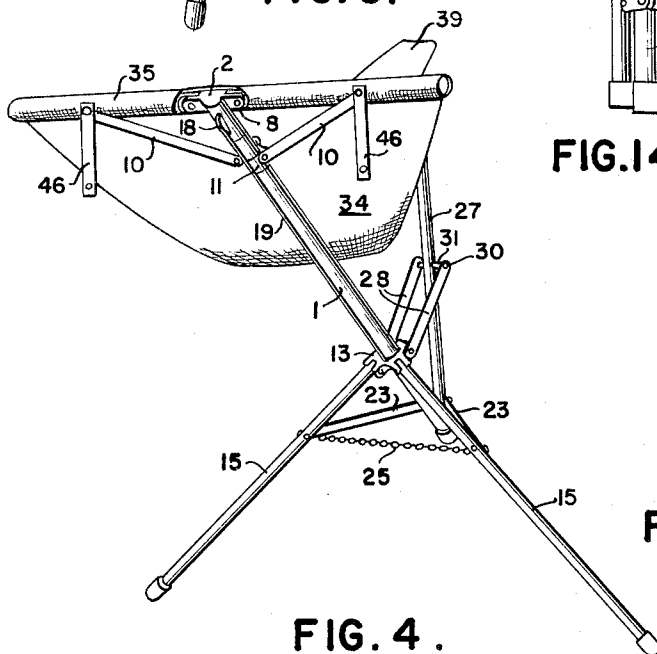


FIG. 4.

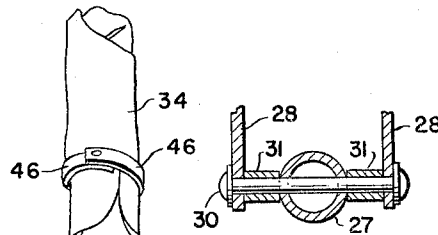


FIG. II.

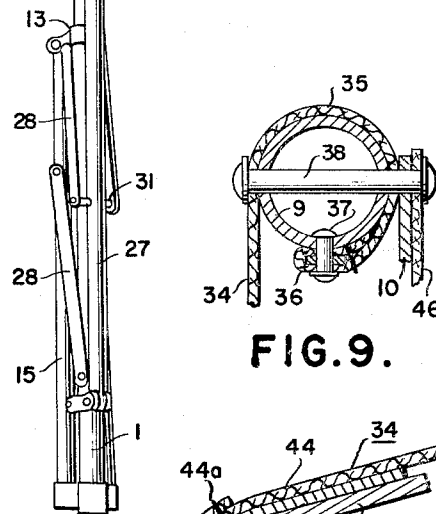


FIG. 9.

FIG. 14.

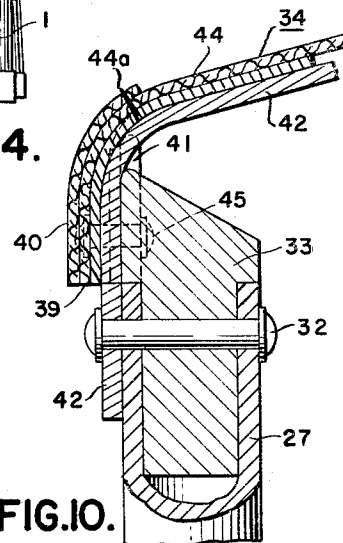


FIG. 10.

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3 Sheets-Sheet 3

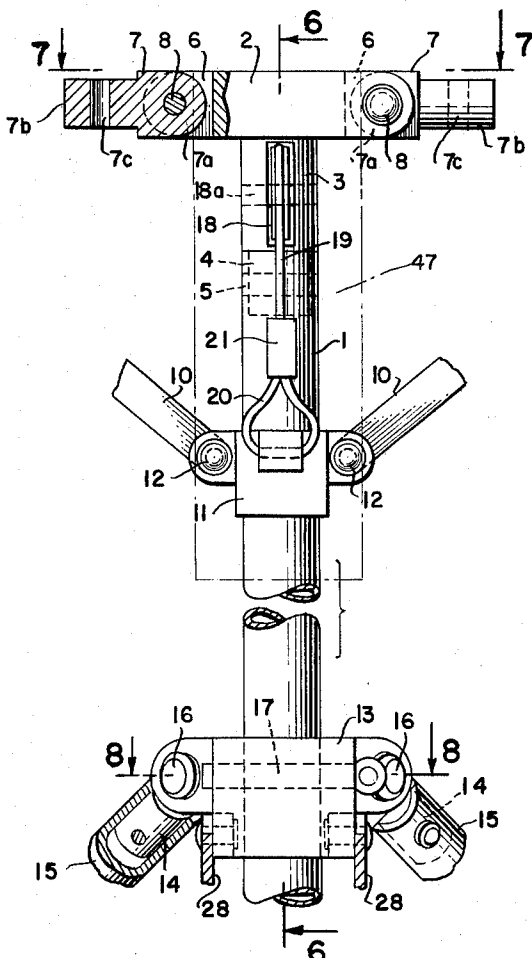


FIG. 5.

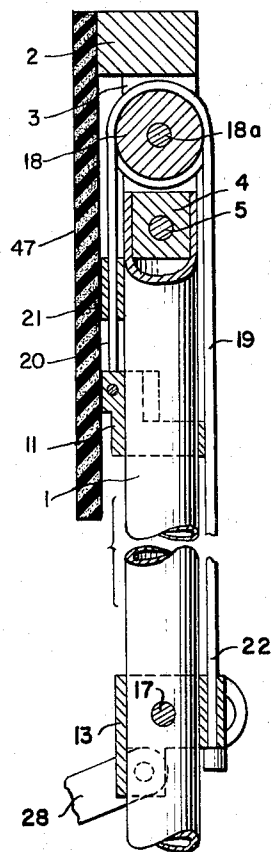


FIG. 6.

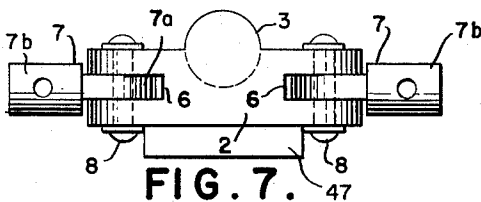


FIG. 7.

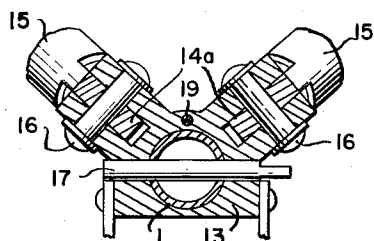


FIG. 8.

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PORTABLE FOLDING CHAIR

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12 Claims. (Cl. 297-45)

This invention relates to folding chairs, and more particularly to portable folding chairs of the type that may be collapsed or folded into a compact package, so that many of them may be stored in a small space.

A general object of the invention is to provide a folding chair of this type that is exceptionally strong and rigid, and at the same time remarkably light in weight, so that it may be effortlessly carried around by hand for use in various outdoor activities.

I preferably construct the frame of my chair from extruded tubing made of a well annealed aluminum-magnesium-silicon alloy. In this way, a sturdy chair, capable of effectively supporting a person of average size, can be made to weigh less than two pounds.

Furthermore, by way of example, but in no way a limitation, the chair is so designed as to make a package, when folded, of not more than two inches in diameter and some thirty inches long.

Another object is to devise a folding chair of this kind which shall be extremely comfortable to use. To this end I provide a hammock type, flexible, suspended seat, relatively wide at the upper rear end and relatively narrow at the lower or front end, together with an upwardly extending, seat supporting member separate from the legs.

With the above and other objects in view, and to improve generally on the details of such a chair, the invention consists in the construction, combination and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, forming part of this specification, and in which:

FIG. 1 is a rear view of the frame of my improved chair, the operative position of the parts being shown in full lines, and an intermediate position in dotted lines;

FIG. 2 is a side view of such frame, showing the upright seat-supporting member;

FIG. 3 is a front perspective view of the complete chair, in operative position;

FIG. 4 is a rear perspective view of the same;

FIG. 5 is a fragmentary view, on an enlarged scale, partly in elevation and partly in section, showing the front side of the upper portion of the control post and associated elements;

FIG. 6 is a central, vertical section substantially on the line 6-6 of FIG. 5, looking in the direction of the arrows;

FIG. 7 is a plan view of the top of the central post and associated parts, viewed along the line 7-7 of FIG. 5, looking in the direction of the arrows;

FIG. 8 is a transverse section substantially along the line 8-8 of FIG. 5, looking in the direction of the arrows;

FIG. 9 is a fragmentary transverse section, on an enlarged scale, substantially on the line 9-9 of FIG. 3, looking in the direction of the arrows;

FIG. 10 is a fragmentary transverse section, on an enlarged scale, substantially on the line 10-10 of FIG. 3, looking in the direction of the arrows;

FIG. 11 is a fragmentary transverse section on an enlarged scale, substantially on the line 11-11 of FIG. 2;

FIG. 12 is a fragmentary perspective view, on an enlarged scale, showing the front end of the seat and the associated seat supporting member, parts being broken away and parts shown in section;

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FIG. 13 is a similar fragmentary perspective view but looking up at the underside of the parts shown in FIG. 12; and

FIG. 14 is a side elevation, on substantially the same scale as FIGS. 3 and 4, showing my improved chair as it appears when collapsed or folded for transportation or storage.

Referring to the drawings in detail, my improved folding chair comprises a central tubular post 1, of suitable length.

Mounted at the upper end of this post is a T-shaped member, having a horizontally extending portion 2 and a downwardly extending portion 3. This, in turn, is provided at its lower end with a cylindrical portion 4 of a diameter to fit snugly within the tubular post 1, being secured to said post by means of a rivet 5, as best shown in FIGS. 5 and 6.

Each end of the horizontally extending member 2 is slotted as shown at 6 in FIGS. 5 and 7, and fitting in each of these slots is the flattened, circular end 7a of a joint or connector 7, the other end of each of these joints or connectors being cylindrical as at 7b, and having a diameter adapted to fit snugly in the end of a tubular arm 9. The flat, circular end of each connector is pivotally mounted in one of the slots 6 of the head 2, by means of a rivet 8, and the cylindrical portion is secured in one of the arms 9 by means of a rivet passing through the arm and a hole 7c in the connector. Thus, when assembled, the two arms 9 extend in opposite directions, and when in operative position, as shown in full lines in FIG. 1, are in alignment with each other, and lie at right angles to the post. The arms 9 are pivotally connected with a pair of braces 10, which are, in turn, connected by pivots 12 with a sleeve 11, freely slidable on said post.

It will be noted, by reference to FIGS. 6 and 7, that the horizontally extending member 2 is offset somewhat from the downwardly extending portion 3 so that it projects forwardly therefrom. This serves to position the arms 9 forward as far as possible from the post 1, so that the user's back will be slightly spaced from this post.

A second sleeve 13, also freely slidable on said post, is provided, and to this sleeve are pivotally connected the upper ends of a pair of legs 15. The method of pivotal attachment is preferably the same as above described in connection with the arms 9, that is to say, joints or connectors are employed, each having a cylindrical portion 14 fitting in the end of the tubular leg, and a flat, circular portion 14a working in slots formed in the sleeve, and pivotally secured by means of rivets 16 (see FIGS. 5 and 8).

The sleeve 13 is provided with a pair of transverse, aligned openings through which extends a removable pin 17, this pin being adapted to also pass through a similar opening in the post 1, when the openings are brought into registry for the purpose of locking the sleeve rigidly to the post when the chair is in open, operative position, as will be further explained.

Mounted in a slot in the downwardly extending portion 3 of the T-head 2, and journaled on a pin 18a is a pulley 18. A rope or cable 19, preferably of wire, runs freely over this pulley. One end of this cable is anchored, as by means of a loop 20 and clamp 21, to the sleeve 11, and the other end 22 is secured to the sleeve 13. Thus when one sleeve is moved downwardly the other moves upwardly, or vice versa. In other words, the pulley and cable constitute means for moving the sleeves simultaneously in opposite directions.

The legs 15 which are pivoted at their upper ends to the sleeve 13, are controlled by braces 23, each being pivoted at one end to the post 1, as at 24 (see FIG. 2), and pivoted at the other end to one of said legs, at a point inter-

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mediate its ends. A chain 25 is also connected between the legs to limit their outward movement.

Near the bottom of the post 1 is fixed, as by riveting, a stationary sleeve 26, and pivotally mounted on this sleeve is the lower end of an upwardly extending seat-supporting member 27. Each of a pair of parallel braces 28 is pivoted at one end to the sleeve 13, as at 29, and at the other end to the supporting member 27, at a pivot preferably somewhat below its middle, as indicated at 30. Because the width of the sleeve 13 is considerably greater than the diameter of the member 27, it is desirable to interpose spacing bushings 31 between each of the braces 28 and the member 27, the rivet 30 passing through such bushings, as clearly shown in FIG. 11.

Set into the upper end of the supporting member 27 is a T-shaped head 33, secured by rivet 32, as shown in FIGS. 10, 12 and 13.

A seat of flexible material such as canvas, designated in its entirety by the reference numeral 34, is suspended like a hammock between the arms 9 at the top of the post 1 and the T-head 33 at the top of the supporting member 27. As shown in FIG. 9, the upper edge 35 of the seat fabric is given a turn around the arms 9, and fastened at their lower side by means of rivets 37. A metal strip 36, extending longitudinally of each arm, is enclosed in a loop at the extreme edge of the seat fabric as a reinforcement, and the rivets 37 pass through these strips. A rivet 38 also passes through each arm 9 and surrounding seat material, and serves as a pivot for the brace 10.

As will be seen by reference to FIGS. 3 and 4, the rear or upper end 35 of the seat 34, which is attached to the arms 9, is relatively wide, while the front or lower end 39 is relatively narrow. The wide upper end, which is in close proximity to the post 1, and is supported on the rigid arms 9, serves as a back- and shoulder-rest. The variation in the width of the seat is achieved by suitably pleating and trimming the fabric.

Referring again to FIGS. 10, 12 and 13, the upper edge of the T-head 33 is formed with a notch 41, and a stout strap 42 of hemp or the like is secured at one end by the rivet 32, and passes upwardly through the notch 41, and thence along the under side of the seat fabric 34, to which it is fastened by stitching 43. This strap is used to strengthen the front end of the seat and distribute the load on the same, and does not need to extend back entirely to the post 1.

To further reinforce the front end of the seat, I preferably employ a small piece of leather 44, interposed between the seat fabric and the strip 42. The size of this piece of leather is indicated in dotted lines in FIG. 12, and it is secured by rivets 45 to the arms of the T-head 33. An additional strip of seat fabric may be secured to the front edge of the seat, as indicated at 40 in FIG. 10. The seat fabric 34, as well as the strip 40, are fastened to the piece of leather 44 by stitching 44a.

To protect the user's back from contact with the upper portion of the post 1, and associated parts, I preferably attach to the T-head 2 a piece of foam rubber padding 47. This extends down a substantial distance so as to cover the sleeve 11 and front end of cable 19, as best shown in FIGS. 5 and 6.

To close the chair, the transverse pin 17 is first removed, and then the back rest arms 9 are folded downwardly, as shown in dotted lines in FIG. 1. Braces 10 push the sleeve 11 downwardly, while cable 19 pulls the sleeve 13 upwardly. Finally, the seat fabric is folded vertically by hand.

When folded, the parts are held in compact form by two ribbons 46, as shown in FIG. 14, these ribbons being preferably attached to the arms 9.

To set up the chair in operative position, the user first has to unsnap these ribbons. Holding the folded chair in upright position, he then swings the arms 9 upwardly to a horizontal position. The sleeve 11 is thus moved upwardly, thereby slackening the rope and causing the sleeve

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13 to move downwardly, urged by the weight of the legs carried thereby. Braces 23 cause legs 15 to swing to their open, divergent position, and at the same time, braces 28 push the seat-supporting member 27 to its open or operative position, as shown in full lines in FIG. 2. It will be understood that the braces 10, 23 and 28 serve not only as actuating means for the parts to which they are respectively pivoted but also as connecting and supporting means to hold such parts rigidly in operative position.

It will be particularly noted that, as sleeve 13 moves downwardly to spread the legs, the sleeve 11 moves upwardly to lift the arms 9, while, at the same time, the seat-supporting member 27 has swung to operative position. When the sleeve 13 reaches its lower limit of travel, the legs are fully extended, the arms 9 have moved into a position in alignment with each other, and the seat-supporting member 27 has swung to operative position. The pin 17 is then inserted through registering holes in the sleeve 13 and post 1, as shown in FIGS. 5 and 8, thus locking the parts in position, and transforming the folding frame into an absolutely rigid structure. When the sleeve 13 is locked to the post by the pin 17, the cable 19 serves to hold the arms 9 in their extended, operative position. The pin 17 is preferably attached loosely to the post 1 by means of a piece of string (not shown).

By way of example, but in no sense as a limitation, the following dimensions which I have successfully used may be given. The center post, which constitutes one of the legs of any 3-legged chair, may, when the chair is set up, be tilted at an angle of about 25° to the vertical. The seat may be 15 inches wide at its rear or upper end. The hole in the post 1 to receive the locking pin 17 can be about 10 inches from the lower end of the post. The two legs may be disposed at an angle of about 96° to each other. Each leg may be about 15.7 inches long, and is disposed at an angle of 69° with the center post, when fully extended. In the open position of the chair, the seat supporting member 27 forms an angle of about 48° with the center post, and its upper end is about 13 inches in front of the center post. The distance travelled by the two slidable sleeves on the post may be about 5.5 inches.

It will thus be seen that I have provided a portable, folding chair of exceptionally light weight, but at the same time strong, rigid and stable, as well as comfortable, and it is thought that the many advantages of the invention will be readily appreciated by those skilled in such matters.

What I claim is:

1. A foldable chair comprising a central post and legs, a pair of arms pivotally secured to the top of said post, a sleeve slidably mounted on said post, a brace pivotally connecting each arm which said sleeve, whereby when said sleeve is moved upwardly, said arms are caused to assume an operative position in substantial alignment with each other and substantially at right angles to said post, a seat member of flexible material supported at one end on said arms, and means on said central post for operatively supporting the other end of said seat member.

2. A foldable chair comprising a central post, a pair of arms pivotally secured to the top of said post and extending in opposite directions, a seat of flexible material secured to said arms, a first sleeve slidable on said post, a brace pivotally connecting each arm with said sleeve, a second sleeve slidable on said post, a pair of legs pivotally secured to said second sleeve, a pair of braces, each pivoted at one end to said post, and at the other end to one of said legs at a point intermediate its ends, a pulley mounted in said post adjacent the upper end thereof, and a cable passing over said pulley and having its ends connected with said respective sleeves, whereby said sleeves are caused to move simultaneously along said post in opposite directions.

3. A foldable chair comprising a central post, a pair of arms pivotally secured to the top of said post and extend-

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ing in opposite directions, a seat of flexible material secured to said arms, a first sleeve slidable on said post, a brace pivotally connecting each arm with said sleeve, a second sleeve slidable on said post, a pair of legs pivotally secured to said second sleeve, a pair of braces, each pivoted at one end to said post, and at the other end to one of said legs at a point intermediate its ends, and means connecting said sleeves in such manner that when one is moved along said post in one direction, the other is caused to simultaneously move in the opposite direction.

4. A foldable 3-legged chair comprising a central post, the lower part of which constitutes one leg, a pair of arms pivotally secured to the top of said post and extending in opposite directions, a seat of flexible material secured at its upper end to said arms, means on said central post for supporting the other end of said seat, a pair of legs pivotally supported on said post so that they may be extended to constitute with said post a triangular base, and means whereby, when said legs are so extended to the limit, said arms are caused to assume a position in substantial alignment with each other, so as to operatively support the upper end of said seat.

5. A foldable 3-legged chair comprising a central post the lower end of which constitutes one of the legs, and a pair of legs pivotally connected with said post and lying in a common plane, a transversely disposed supporting structure comprising a pair of arms pivotally secured to the upper end of said post, a single upwardly extending supporting member secured to the lower part of said post and disposed at an angle to the plane of said legs, and a seat of flexible material having a relatively narrow front end secured to the top of said single upwardly extending member and a relatively wide rear end secured to said supporting structure, said seat being suspended between said supporting structure and said upwardly extending member and tapering downwardly from said relatively wide rear end to said relatively narrow front end.

6. A foldable chair in accordance with claim 5 in which the rear, wide upper portion of the seat lies adjacent said post, and in which a pad of soft material is interposed between said seat and post, the pad and post thus serving as a back rest.

7. A foldable chair comprising a central post constituting one leg, a sleeve slidably mounted on said post, a pair of legs pivotally secured to said sleeve, a brace pivotally connecting each leg with said post, an upwardly extending supporting member pivotally secured to the lower part of said post, a pair of braces pivotally connecting said upwardly extending supporting member with said sleeve, a transversely disposed supporting structure secured to the upper end of said post, and a seat of flexible material having one end secured to said transversely disposed supporting structure and the other end secured to said upwardly extending member.

8. A foldable 3-legged chair comprising a central post, the lower part of which constitutes one leg, a pair of arms pivotally secured to the top of said post and extending in opposite directions, a seat of flexible material secured at its upper end to said arms, means on said central post for supporting the other end of said seat, a pair of legs pivotally supported on said post so that they may be extended to constitute with said post a triangular base, means whereby, when said legs are so extended to the limit, said arms are caused to assume a position in substantial alignment with each other, so as to operatively support the upper end of said seat, and means for locking said legs in such extended position.

9. A foldable chair comprising a central post, constituting one leg, a sleeve slidably mounted on said post, a pair of legs pivotally secured to said sleeve, a pair of braces, each pivoted at one end to said post, and at the

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other end to one of said legs at a point intermediate its ends, an upwardly extending supporting member pivotally secured to the lower part of said post, a pair of arms pivotally mounted at the upper end of said post and extending in opposite directions, means interconnecting said sleeve with said arms and with said upwardly extending member in such manner that when said sleeve is moved downwardly to extend said legs to the limit, said arms are caused to assume a position in substantial alignment with each other transversely of said post, and said upwardly extending supporting member is rigidly held in operative position, and a seat of flexible material having its upper end secured to said arms, and its lower end secured to the top of said upwardly extending supporting member.

10. A foldable chair comprising a central post, a pair of arms pivotally secured to the top of said post and extending in opposite directions, a seat of flexible material secured to said arms, a first sleeve slidable on said post, a brace pivotally connecting each arm with said sleeve, a second sleeve slidable on said post, a pair of legs pivotally secured to said second sleeve, a brace pivotally connecting each leg with said post, and means connecting said sleeves in such manner that when one is moved along said post in one direction, the other is caused to simultaneously move in the opposite direction.

11. A foldable chair comprising a central post, a pair of arms pivotally secured to the top of said post and extending in opposite directions, a seat of flexible material secured to said arms, a first sleeve slidable on said post, a brace pivotally connecting each arm with said sleeve, a second sleeve slidable on said post, a pair of legs pivotally secured to said second sleeve, a brace pivotally connecting each leg with said post, a chain interconnecting said legs to limit the pivotal movement thereof, and means connecting said sleeves in such manner that when one is moved along said post in one direction, the other is caused to simultaneously move in the opposite direction.

12. A foldable chair comprising a central post and legs, a pair of arms pivotally secured to the top of said post, a sleeve slidably mounted on said post, a brace pivotally connecting each arm with said sleeve, whereby when said sleeve is moved upwardly, said arms are caused to assume an operative position in substantial alignment with each other and substantially at right angles to said post, a seat member of flexible material supported at one end on said arms, means on said central post for operatively supporting the other end of said seat member, and a piece of foam rubber padding interposed between said flexible material and the upper part of said post.

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FRANK B. SHERRY, *Primary Examiner*.