Nov. 10, 1953 G. W. CARLSON 2,658,558

FOLDING CHAIR

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Fig. 1

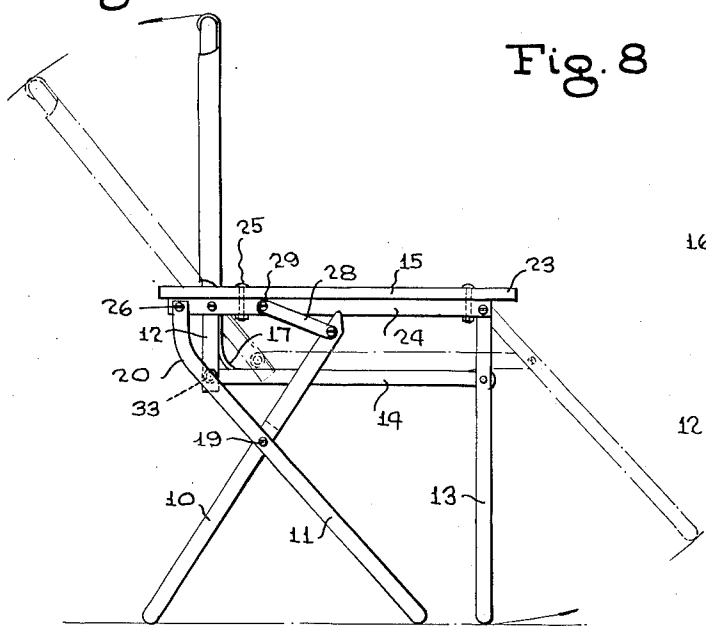


Fig. 8

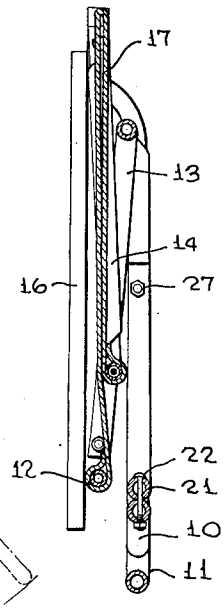
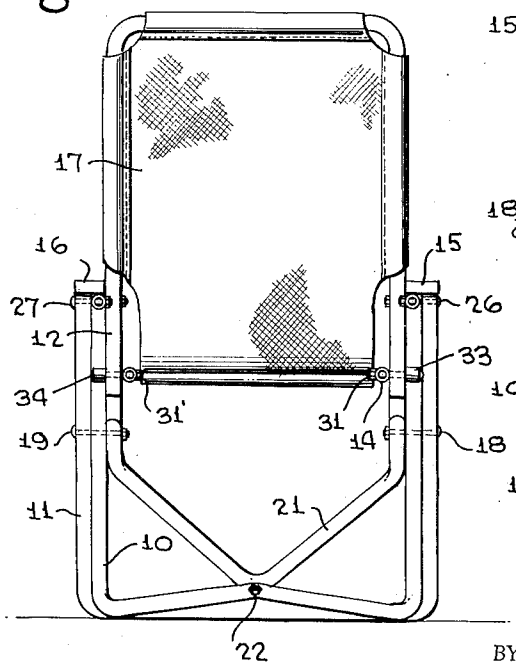
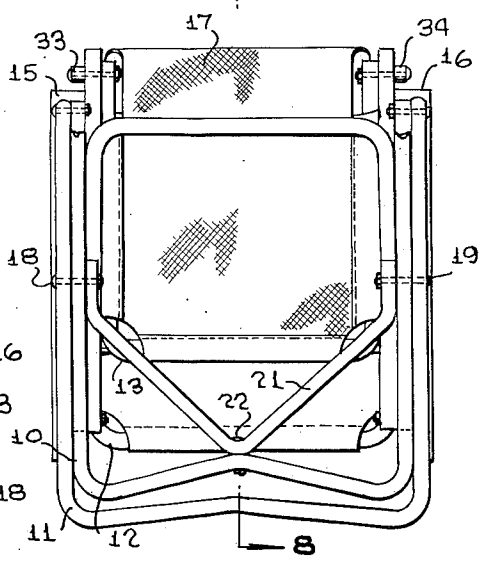


Fig. 2



8 Fig. 7



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Fig. 3

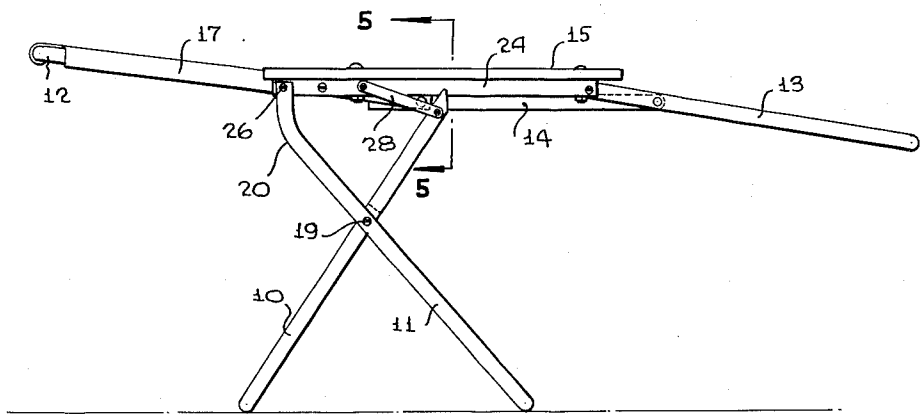


Fig. 4

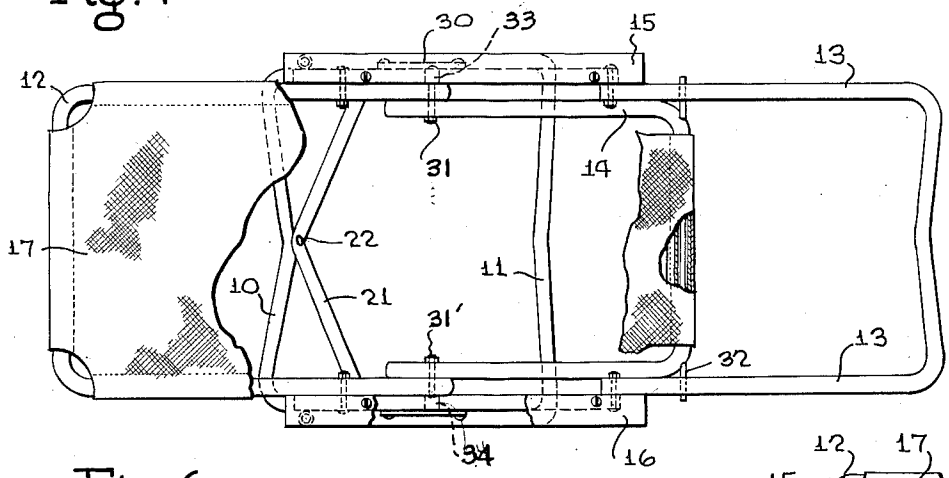


Fig. 6

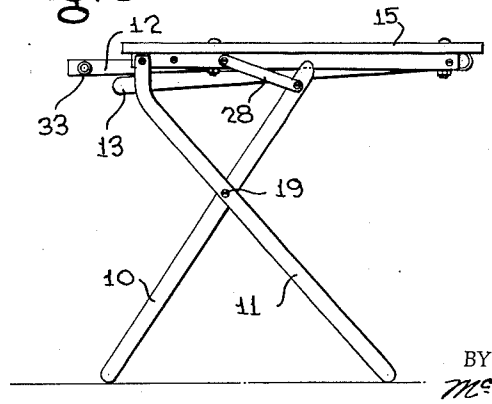
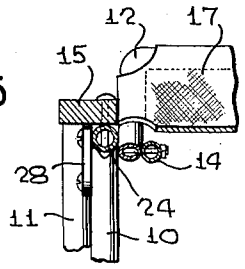


Fig. 5



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FOLDING CHAIR

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Application September 7, 1951, Serial No. 245,545

4 Claims. (Cl. 155—106)

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This invention relates to an improved folding chair which can be unfolded from a compact folded condition to a chair-forming condition and changed from the chair-forming condition to a condition in which it provides a cot or table.

It is among the objects of the invention to provide an improved folding chair which can be easily unfolded from a completely folded, compact condition to a chair-forming condition and can then be changed to a cot or table forming condition and is gravity sustained in its chair-forming and cot-forming conditions; which has stop means precluding movement beyond its cot-forming condition; which has no cross bars or rods intermediate the outer ends of the back and seat forming portions thereof; which is especially constructed to rest solidly on uneven ground; and which is simple and durable in construction, of light weight and economical to manufacture, easy to use, 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 side elevational view of a folding chair illustrative of the invention shown in chair-forming condition;

Figure 2 is a rear elevational view of the chair as illustrated in Figure 1;

Figure 3 is a side elevational view of the chair when in cot or table-forming condition;

Figure 4 is a top plan view of the chair as illustrated in Figure 3 with portions broken away and shown in cross section to better illustrate the construction thereof;

Figure 5 is a fragmentary cross sectional view on the line 5—5 of Figure 3;

Figure 6 is a side elevational view of the chair when in partly folded condition;

Figure 7 is a plan view of the chair when in completely folded condition; and

Figure 8 is a cross sectional view on the line 8—8 of Figure 7.

With continued reference to the drawings, the chair comprises a plurality of U-shaped frames formed of light weight metal tubing, such as one-inch diameter steel tubing, and includes inner and outer leg forming frames 10 and 11, a back frame 12, a front ground engaging frame 13, and a seat forming frame 14. The chair also includes a pair of arms 15 and 16, preferably formed of wood or some material which does not become uncomfortably hot when exposed to the sun in the summertime, and a seat

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and back web 17 formed of a suitable heavy fabric, such as a medium or heavy weight canvas.

The leg frames 10 and 11 are pivotally interconnected intermediate the length of their legs, by suitable pivot bolts or rivets 18 and 19, these bolts being disposed somewhat nearer the open than the closed ends of the frames. The outer leg frame 11 is somewhat longer than the inner leg frame 10 and has its legs longitudinally curved, as indicated at 20 in Figure 1, near the open end of the frame. The inner leg forming frame 10 has a V-shaped brace 21 therein, the apex of which is connected to the closed end of this frame substantially at the midlength location of the latter by suitable means, such as the rivet 22, and the ends of which are connected to the legs of the frame by the pivot bolts 18 and 19. This brace 21 maintains the legs of the leg forming frames 10 and 11 spaced apart a predetermined distance and substantially parallel to each other at the respectively opposite sides of the frames.

Each of the arms 15 and 16 comprises a flat top plate 23, of rectangular shape, and a rail 24 extending along the under side of the top plate medially of the width of the latter and secured to the top plate by suitable means, such as the bolts 25.

The arm 15 is pivotally connected at its rear end to the upper or free end of one of the legs of the leg forming frame 11 by a pivot bolt or rivet 26. The arm 16 is pivotally connected at its rear end to the upper or free end of the other leg of the outer frame 11 by a pivot bolt or rivet 27.

A forwardly declining link 28 is pivotally connected at one its depressed or forward end to one leg of the inner leg forming frame 10 at the upper or free end thereof and is pivotally connected at its elevated or rear end to the rail of the arm 15 at a location spaced forwardly along the arm from the pivot bolt or rivet 26 by a bolt or rivet 29, the bolt or rivet being located substantially midway between the upper ends of the legs of the frames 10 and 11 in the unfolded condition of the chair. A similar and complementary link 30 is pivotally connected at one end to the other leg of the frame 10 at the open end of this frame and is pivotally connected at its other end to the arm 16 by a pivot pin or bolt spaced the same distance from the pivot bolt 27 as the pin or bolt 29 is spaced from the bolt or rivet 26.

The closed ends or bight portions of the leg frames 10 and 11 are bent or curved symmetrically

of the frames so that these bight portions have convex outer surfaces or edges to firmly support the chair in upright position on uneven ground, and these leg forming frames, when in chair supporting position, support the arms 15 and 16 in spaced apart and substantially parallel relationship to each other and in a substantially horizontal position, the rails of the arms resting at their bottom edges on the upper or free ends of the legs of the frame 10, as clearly illustrated in Figure 1, to provide this support.

The legs of the back forming frame 12 are pivotally connected to the arms 15 and 16 at points spaced from the free ends of the legs of the back frame 12 and spaced forwardly on the arms a short distance from the pivot bolts 26 and 27.

The legs of the U-shaped front frame 13 are pivotally connected at their free ends to the forward ends of the arms 15 and 16. The rear or free ends of the legs of the U-shaped seat forming frame 14 are pivotally connected to the lower or free ends of the legs of the back frame 12. At its forward closed end the seat forming frame 14 is pivotally connected to the legs of the front frame 13 at a location spaced below the pivotal connections between the legs of the front frame and the arms 15 and 16 equal to the distance between the pivotal connection between the legs of the back frame 12 and the arms 15 and 16 and the location at which the legs of the seat frame 14 are secured to the legs of the back frame 12 so that the legs of the seat frame 14 are disposed one adjacent each of the arms 15 and 16 and are maintained substantially parallel to the corresponding arms in all positions of the back, seat and front frames relative to the arms.

A continuous back and seat forming web 17 is secured at its ends to the bight portions of the back frame 12 and the seat frame 14 and is secured along its side edges to the legs of the back and seat frames at locations spaced from the pivotal connections between these frames.

The means connecting the legs of the back frame 12 and the seat frame 14 together comprise pivot bolts or rivets 31 and 31' which do not extend between the frame legs transversely of the frames but terminate adjacent to the inner sides of the legs of the seat frame which are disposed against the inner sides of the corresponding legs of the back frame, while the means pivotally connecting the seat frame at its closed end to the legs of the front frame 13 comprises a rod 32 which extends through the tubular end closing portion of the seat frame and through apertures in the legs of the front frame 13, as is particularly illustrated in Figure 4.

Stops in the form of knobs 33 and 34 are secured on the pivot bolts 30 and 31 respectively at the outer sides of the legs of the back frame 12 for engaging the under sides of the corresponding arms 15 and 16 to prevent further movement of the back frame 12 and seat frame 14 relative to the arms once these frames have been moved to the cot or table forming positions illustrated in Figures 3 and 4.

Assuming that the chair is in the chair forming condition illustrated in Figure 1 and it is desired to change it to the cot or table forming condition illustrated in Figures 3 and 4, the upper closed end of the back frame 12 is merely pulled downwardly and rearwardly until the stops 33 and 34 contact the under sides of the corresponding arms 15 and 16 limiting further rearward and downward movement of the back frame. This will swing the seat frame 14 and the front frame

13 upwardly and forwardly from the horizontal position of the seat frame and the substantially vertical position of the front frame illustrated in Figure 1 to a substantially horizontal position of the seat frame and a substantially horizontal position of the front frame, as illustrated in Figure 3, the frames 12, 13 and 14 all then being disposed in substantially end to end relationship and substantially horizontal to form a cot or table. By reason of the leverage between the legs of the back frame, the arms and the seat and front frames, the weight of the body of a person reposing on the back of the chair when the latter is in horizontal position, will maintain the seat and front frames substantially horizontal.

If it is now desired to reduce the chair to a compact condition for storage or transportation, the closed end of the back frame is raised to its substantially vertical position and then is swung downwardly and forwardly until this frame is disposed between the arms 15 and 16. This will move the seat frame 14 upwardly between the arms and will swing the front frame 13 upwardly to a horizontal position against the seat frame 14, the ends of the arms to which the front frame is attached being raised sufficiently to bring the leg forming frames 10 and 11 out of the way of the closed end of the front frame as the latter is folded against the seat frame 14. After the back, seat and front frames have been folded to a position in which they are superposed one on the other and are substantially parallel to the arms 15 and 16, the outer leg forming frame 14 is moved downwardly and rearwardly relative to the arms until the links 28 and 30 swing around their pivotal connections with the arms bringing the closed end of the inner leg forming frame 10 between the legs of the outer leg forming frame 11 near the open end of the latter frame. With the frame 10 then disposed within the frame 11 with its legs substantially parallel to the legs of the frame 11, the frame 11 is swung forwardly and upwardly until the two leg forming frames are disposed against the adjacent sides of the front frame 13, giving the compact condition of the chair, as illustrated in Figures 7 and 8.

From this compact condition the chair can be returned to its chair forming condition by first swinging the leg forming frames out of the way of the front frame, swinging this frame downwardly and forwardly with a consequent upward and rearward swinging of the back frame 12 and then swinging the leg forming frames to the crossed over condition illustrated in Figure 1.

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. In a folding chair, an inner leg frame and an outer leg frame, said leg frames being U-shaped and involving bight portions and legs having free upper ends, said leg frames being crossed and legs thereof pivoted together, horizontal arms having rear ends pivoted to the upper ends of legs of said outer leg frame and forward ends, a U-shaped ground-engaging front frame involving a bight portion and legs having free

upper ends pivoted to the forward ends of said arms, a horizontal U-shaped seat frame involving a bight portion and legs having free rear ends and forward ends, the forward ends of the legs of the seat frame being pivoted to the legs of said front frame at points spaced below said arms, and a vertical U-shaped back frame involving a bight portion and legs having free lower ends, the lower ends of the legs of the back frame being pivoted to the legs of the seat frame at points adjacent to the rear ends of the legs of the seat frame, means pivoting the legs of said back frame to said arms at points on said arms spaced forwardly from the pivotal connections of the rear ends of the arms with the upper ends of the legs of the outer leg frame and spaced upwardly from the pivotal connection of the lower ends of the back frame legs with the rear ends of the legs of the seat frame, and means pivotally connecting the upper ends of the legs of the inner leg frame to said arms.

2. In a folding chair, an inner leg frame and an outer leg frame, said leg frames being U-shaped and involving bight portions and legs having free upper ends, said leg frames being crossed and legs thereof pivoted together, horizontal arms having rear ends pivoted to the upper ends of the legs of said outer leg frame and forward ends, a U-shaped ground-engaging front frame involving a bight portion and legs having free upper ends pivoted to the forward ends of said arms, a horizontal U-shaped seat frame involving a bight portion and legs having free rear ends and forward ends, the forward ends of the legs of the seat frame being pivoted to the legs of said front frame at points spaced below said arms, and a vertical U-shaped back frame involving a bight portion and legs having free lower ends, the lower ends of the legs of the back frame being pivoted to the legs of the seat frame at points adjacent to the rear ends of the legs of the seat frame, means pivoting the legs of said back frame to said arms at points on said arms spaced forwardly from the pivotal connections of the rear ends of the arms with the upper ends of the legs of the outer leg frame and spaced upwardly from the pivotal connection of the lower ends of the back frame legs with the rear ends of the legs of the seat frame, and forwardly declining links having front and rear ends, the front ends of the links being pivoted to the upper ends of the legs of the inner leg frame and the rear ends of the links being pivoted to said arms.

3. In a folding chair, an inner leg frame and an outer leg frame, said leg frames being U-shaped and involving bight portions and legs having free upper ends, said leg frames being crossed and legs thereof pivoted together, horizontal arms having rear ends pivoted to the upper ends of legs of said outer leg frame and forward ends, a U-shaped ground-engaging front frame involving a bight portion and legs having free upper ends pivoted to the forward ends of said arms, a horizontal U-shaped seat frame involving a bight portion and legs having free rear ends and forward ends, the forward ends of the legs of the seat frame being pivoted to the legs of said front frame at points spaced below said arms, and a vertical U-shaped back frame involving a bight portion and legs having free lower ends, the lower ends of the legs of the back frame being pivoted to the legs of the seat frame at points adjacent to the rear ends of the legs of the seat frame, means pivoting the legs of said back frame to said arms at points on said arms spaced forwardly from the pivotal connections of the rear ends of the arms with the upper ends of the legs of the outer leg frame and spaced upwardly from the pivotal connection of the lower ends of the back frame legs with the rear ends of the legs of the seat frame, and forwardly declining links having front and rear ends, the front ends of the links being pivoted to the upper ends of the legs of the inner leg frame and the rear ends of the links being pivoted to said arms, said links normally extending rearwardly from the inner leg frame legs with the rear ends of the links pivoted to the arms at points forwardly of the pivotal connections of the back frame legs with said arms.

4. In a folding chair, an inner leg frame and an outer leg frame, said leg frames being U-shaped and involving bight portions and legs having free upper ends, said leg frames being crossed and legs thereof pivoted together, horizontal arms having rear ends pivoted to the upper ends of legs of said outer leg frame and forward ends, a U-shaped ground-engaging front frame involving a bight portion and legs having free upper ends pivoted to the forward ends of said arms, a horizontal U-shaped seat frame involving a bight portion and legs having free rear ends and forward ends, the forward ends of the legs of the seat frame being pivoted to the legs of said front frame at points spaced below said arms, and a vertical U-shaped back frame involving a bight portion and legs having free lower ends, the lower ends of the legs of the back frame being pivoted to the legs of the seat frame at points adjacent to the rear ends of the legs of the seat frame, means pivoting the legs of said back frame to said arms at points on said arms spaced forwardly from the pivotal connections of the rear ends of the arms with the upper ends of the legs of the outer leg frame and spaced upwardly from the pivotal connection of the lower ends of the back frame legs with the rear ends of the legs of the seat frame, means pivotally connecting the upper ends of the legs of the inner leg frame to said arms, said back frame being tiltable rearwardly from a normally vertical position to a substantial horizontal position, and stops projecting laterally outwardly from the back frame legs at the lower ends of the back frame legs for engaging the undersides of said arms so as to prevent rearward tilting of said back frame beyond the horizontal position.

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