

Dec. 13, 1938.

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2,139,673

FOLDING CHAIR

Original Filed Feb. 6, 1935

3 Sheets-Sheet 1

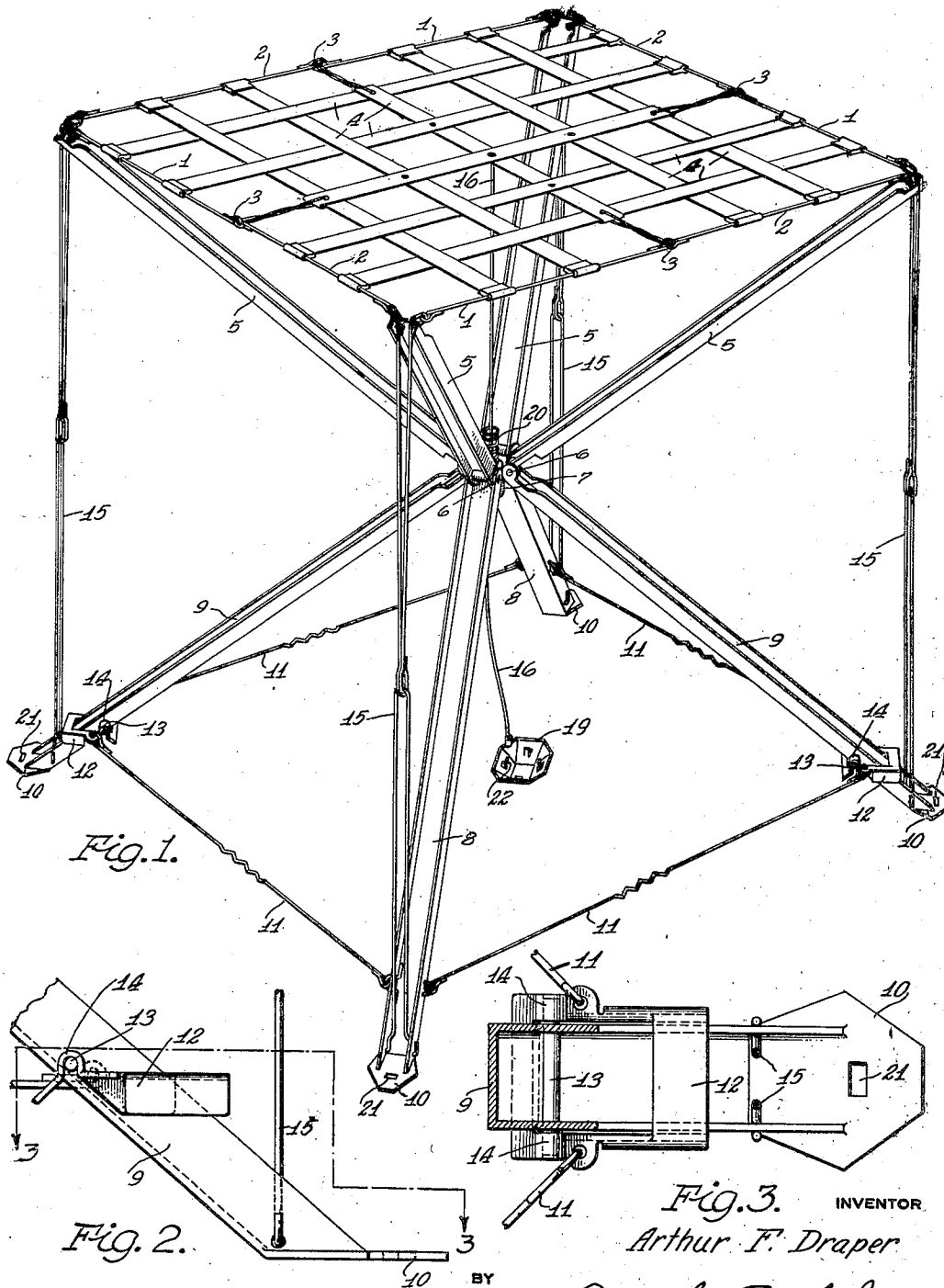


Fig. 1.

Fig. 2.

Fig. 3.

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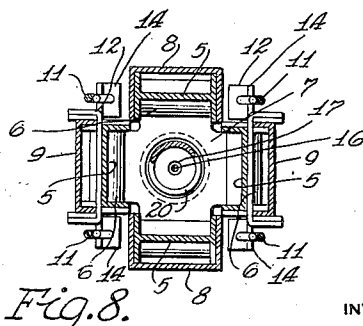
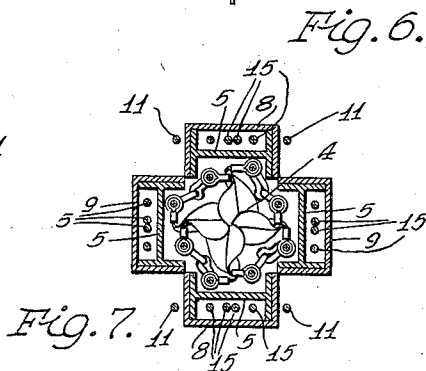
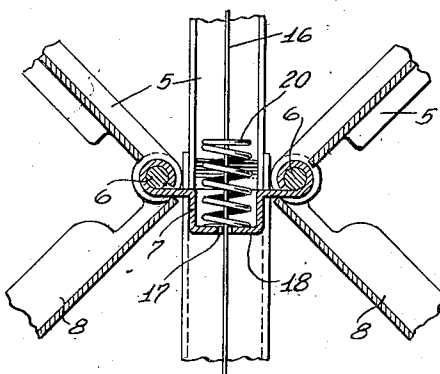
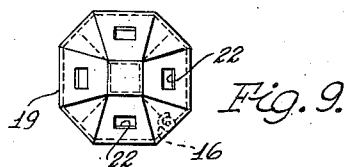
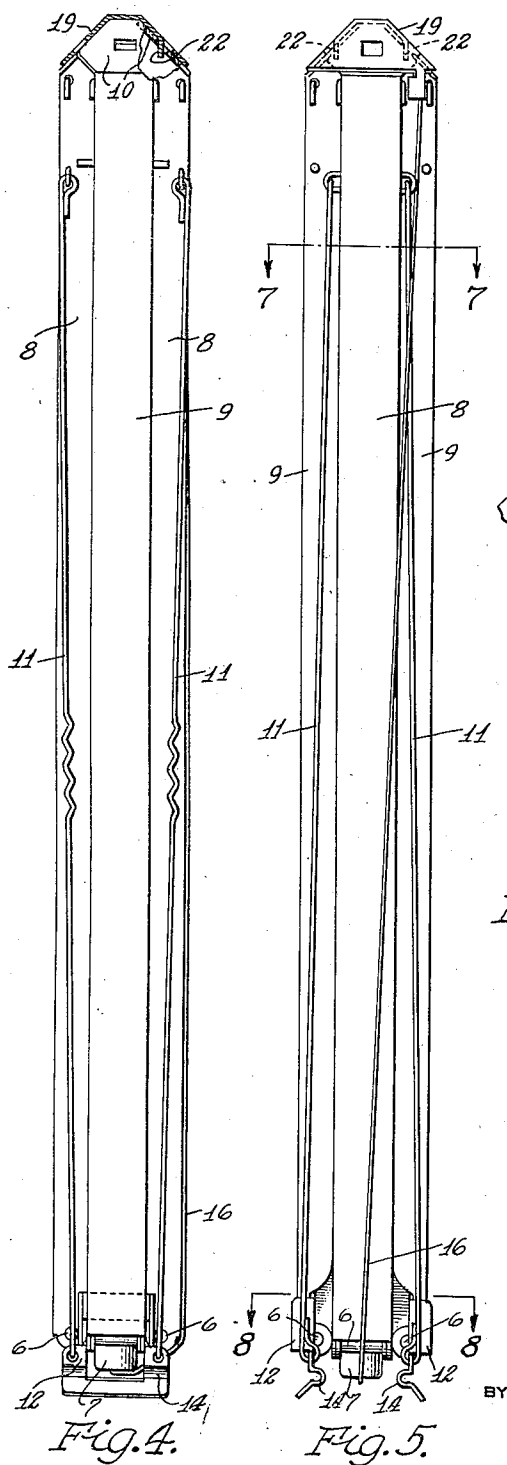
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Original Filed Feb. 6, 1935 3 Sheets-Sheet 2



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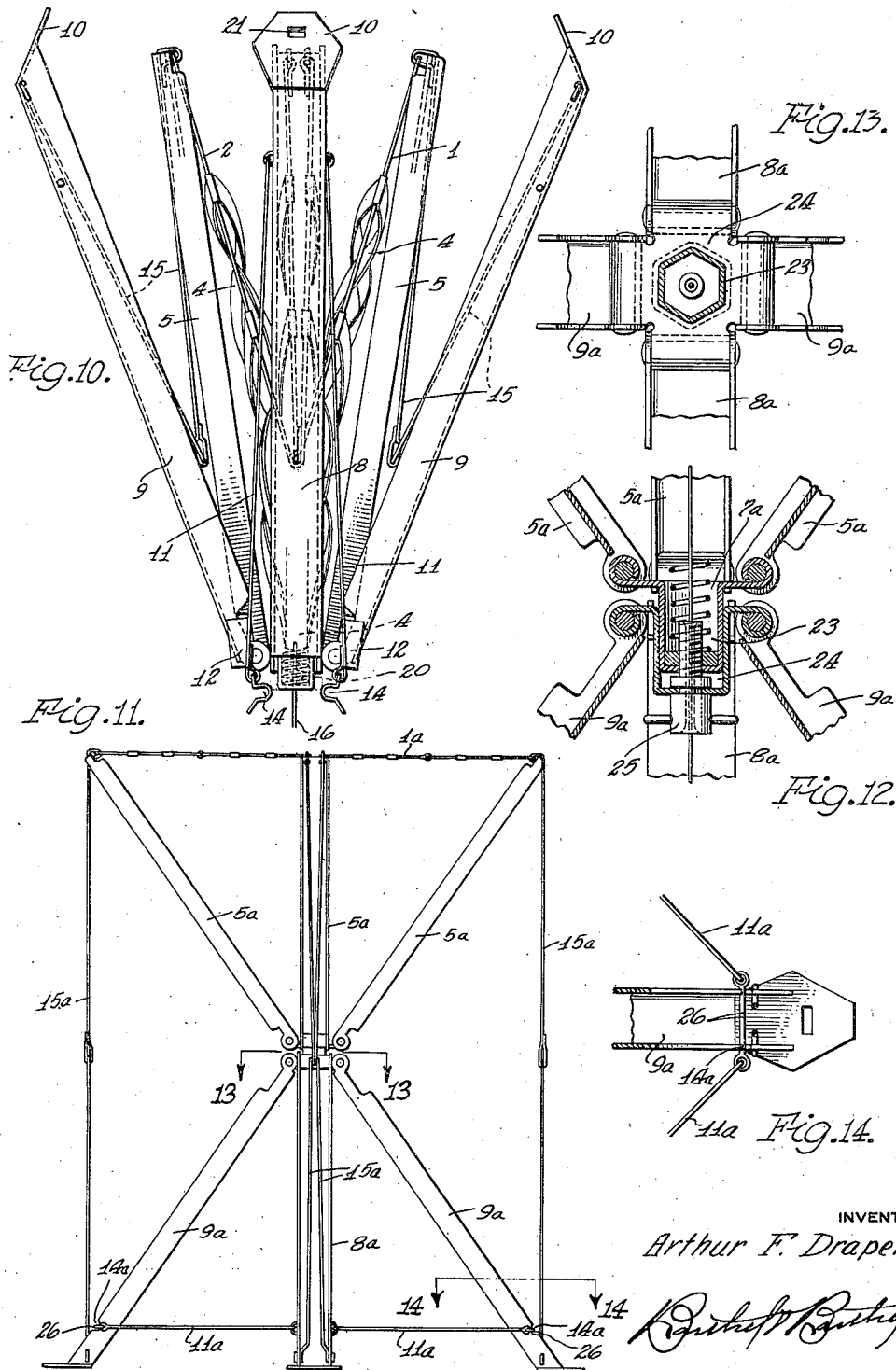
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Original Filed Feb. 6, 1935

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,139,673

FOLDING CHAIR

Arthur F. Draper, Ferndale, Mich.

Application February 6, 1935, Serial No. 5,232

Renewed March 7, 1938

6 Claims. (Cl. 155—136)

The present invention pertains to chairs, and more particularly to chairs of the collapsible type adapted to be folded to occupy a minimum amount of space when they are not in use.

5 The primary object of the present invention is to provide a folding chair which will occupy an exceptionally small amount of space when folded, the chair being comprised of parts providing for stability and mechanical strength and being arranged and assembled whereby they may be
10 readily moved from their extended position to their folded position or the reverse. In combination with a chair of this type it is another aim of the invention to provide a simple and efficient
15 means for holding the parts in their folded position so that the chair may be quite easily carried about.

It is another object of the present invention to provide, in combination with a folding chair,
20 means which automatically functions, as a result of movement of the collapsible parts from their folded position to their extended position, to hold the parts in their extended position, the holding means being designed to prevent the acci-
25 dental release thereof and yet to require but a simple manual operation in order to release the same to permit folding of the chair.

Still another object of the present invention is to provide means whereby the parts of the folding chair may be adjusted to compensate for wear
30 resulting from use in order that the looseness resulting from such wear may not reduce the stability of the chair.

With the above and other ends in view the invention is more fully disclosed with reference to the accompanying drawings, in which

Figure 1 is a perspective view of the chair in its extended position;

40 Fig. 2 is a side elevation of a detail;

Fig. 3 is a cross section taken on the line 3—3 of Fig. 2;

Fig. 4 is a side elevation of the chair in its folded position;

45 Fig. 5 is a side elevation taken at right angles to Fig. 4;

Fig. 6 is a cross section of a detail;

Figs. 7 and 8 are cross sections taken on lines 7—7 and 8—8 respectively of Fig. 5;

50 Fig. 9 is a plan of a detail;

Fig. 10 is an elevation of the chair partially collapsed;

Fig. 11 is a side elevation of a modification;

55 Fig. 12 is a cross section of a part of the chair shown in Fig. 11, and

Figs. 13 and 14 are cross sections taken respectively on line 13—13 and 14—14 of Fig. 11.

Like characters of reference are employed throughout to designate corresponding parts.

The seat part of the present chair comprises a marginal frame formed of wire or rods. Each side of the marginal frame is formed of two parts 1 and 2 which are looped together intermediate their ends as designated at 3. Straps 4 extend from side to side of the seat frame and are interwoven as illustrated in Fig. 1 to complete the seat. At the four corners of the seat the free ends of the wire members 1 and 2 are each pivotally united with the upper end of an arm 5, the chair structure thus having four arms 5 attached to the seat with one of such arms disposed at each corner of the seat frame. The lower end of each arm 5 is pivotally attached, by means of a pin 6 to a bracket 7 which is common to all of the arms.

Four legs are provided, the legs being designated in pairs by numerals 8 and 9, and each leg having a ground engaging flat foot 10. The upper ends of each of the legs 8 and 9 are mounted on one of the pins 6 which are employed to pivotally attach the arms 5 to the bracket 7, and the legs 8 and 9 are thus pivotally secured to the bracket 7 with one adjacent to each arm. The arms 5 are preferably formed of I-beam cross section and the legs 8 and 9 are formed of channel irons proportioned so that the arms may move into and out of the channels, as will hereinafter appear. On each leg 8 is connected a pair of wire elements 11 with each extending toward one of the legs 9. The adjacent free ends of the wires 11, extending from opposite legs 8, are connected to a latch element 12 having a retainer part 14 adapted to receive the ends of a pin 13 in its respective leg 9. When the pin 13 extends into the part 14 the latch element 12 is retained against sliding movement relative to the leg 9 and the legs 8 and 9 are thus tied together. The latch element 12 may be rocked by manual pressure to move the retainer part 14 out of engagement with the pin 13 so as to permit sliding movement of the latch element relative to the leg 9, at which time the legs 8 and 9 may be relatively pivoted.

The upper end of each arm 5 is connected to the leg 8 or 9 which is pivoted on the same pin 6 by an articulated tie member 15, the connection of each tie member to its respective leg and arm being in each case pivotal. When the latch elements 12 have their retainers 13 disposed in the notches 14 they cooperate with the wire elements 11 in holding the legs 8 and 9 in the extended position shown in Fig. 1 by tying the four legs to-

gether so as to prevent further spreading movement thereof. The tie members 15 serve to tie the seat frame, arms and legs together to prevent pivotal movement of the legs in a direction opposite to that prevented by the wires 11 and latch elements 12. With the legs and arms held in the position described they hold the seat frame members 1 and 2 in an extended position and the chair is in condition for use.

Secured to the point where the two central strap members 4 intersect is a flexible cord 16 which extends downwardly and through an aperture 17 in a socket 18 formed in the center of the bracket 7. On the free end of the cord 16 is secured a cap 19 and in the socket 18 is mounted a coiled spring 20.

When it is desired to fold the chair from the position shown in Fig. 1, through the position shown in Fig. 10, to the position illustrated in Figs. 4 and 5 the latch elements 12 are rocked manually to withdraw the retainers 14 from engagement with the pins 13. The legs 8 and 9 are then pointed upwardly, relative to the showing in Fig. 1, and the articulated tie members 15 fold and are received between their respective legs and arms, there being a space provided between the legs and arms due to the fact that the legs are constructed of channel irons and the arms being I shaped in cross section. As illustrated in Fig. 7 each arm 5 is received in the leg, 8 or 9 as the case may be, which is pivoted to the bracket 7 on the same pin 6 as the particular arm and by drawing downwardly on the cord 16 at the same time the legs are swung upwardly the upper ends of the arms 5 will be drawn inwardly and the legs and arms may be swung to assume the position illustrated in Figs. 7 and 8 wherein the strap members 4 are concealed within the same. At this time the several feet 10 will be in contact, one with another, and the cap 19 is slipped over the same. Each foot 10 has an aperture 21 and the cap 19 has a series of spring fingers 22 received in the apertures. In order to permit the cap to be placed as above described the strap members 4 are drawn against the spring 20 by the cord 16 to compress the spring so that resilient pressure is constantly exerted on the cord 16 tending to draw the cap 19 into tight engagement with the feet 10.

To again extend the parts of the chair the cap 19 is removed and the legs 8 and 9 and arms 5 are swung outwardly on the bracket 7. As the legs are pivoted outwardly the latch elements 12 will slide down the legs 9 and the retainers 13 will enter the notches 14 to hold the legs as above described.

It is apparent that the stability of the chair as above described is governed by the wires 11 with their latch elements 12 and by the tie members 15 and that any looseness in these elements would destroy the stability. In order to provide for adjustment to eliminate looseness resulting from wear an adjustable device is provided and is illustrated by way of modification in Figs. 11 to 13 inclusive. In this modification the seat 1a is mounted on the upper end of four arms 5a, the lower end of each arm being pivotally attached to a bracket 7a. The bracket 7a has a projecting pilot 23 slidably received in a bracket 24 and the four supporting legs 8a and 9a have their upper ends pivotally attached to the bracket 24. A set screw 25 is screwthreaded into the pilot 23 so that by rotating the set

screw the brackets 7a and 24 may be moved relative to one another. Wires 11a are attached to the legs 8a and are united in pairs by cross members 26, as shown in Fig. 14, and the cross members 26 are received in notches 14a in the legs 9a. Articulated tie members 15a extend from the upper ends of the arms 5a to the lower ends of the adjacent legs 8a and 9a, the wires 11a and tie members 15a serving to hold the legs and arms against pivotal movement. By rotating the set screw 25 so as to move the brackets 7a and 24 apart the wires 11a and tie members 15a may be placed under tension.

With the exception of the adjustable feature the modified embodiment is the same as the first described form and the folding operation is identical. Therefore reference may be had to the description of the first described form for an understanding of the modified form.

Although a specific embodiment of the present invention has been illustrated and described it will be understood that various changes may be made within the scope of the claims without departing from the spirit of the invention, and such changes are contemplated.

What I claim is:—

1. In a folding chair, a supporting structure composed of a plurality of arms and legs, said arms and legs being pivotally connected in sets with each set having an interfitting cross sectional configuration in opposed relation whereby the arm and leg of each set may be relatively nested by folding one within the other, the plurality of arms and legs being relatively disposed whereby the sets thereof when folded provide a hollow housing, a collapsible seat attached to extremities of said arms, releasable means for holding said arms and legs in unfolded position with said seat extended, feet attached to extremities of said legs, means for drawing said seat within said housing when said arms and legs are folded, a retainer connected to said drawing means and adapted to engage said feet, and yieldable means adapted to be engaged by said seat when folded to pull said drawing means for holding said retainer in engagement with said feet.

2. In a folding chair, a central bracket composed of relatively movable upper and lower parts, a plurality of arms pivotally attached to said upper part, a plurality of legs pivotally attached to said lower part, said arms and legs being arranged in sets and being adapted to swing on their pivots to a folding position, a collapsible seat attached to the extremities of said arms, releasable means for holding said arms and legs against swinging movement with respect to their pivots including tie members connecting the extremities of the arms and legs of respective sets, and manual means for moving said bracket parts relatively to adjust said arms and legs relatively whereby to cause and regulate the tension on said releasable means.

3. In a folding chair, a central bracket composed of relatively movable upper and lower parts, a plurality of arms pivotally attached to said upper part, a plurality of legs pivotally attached to said lower part, said arms and legs being arranged in sets and being adapted to swing on their pivots to a folding position, a collapsible seat attached to the extremities of said arms, releasable means for holding said arms and legs against swinging movement with respect to their pivots including tie members connecting the extremities of the arms and legs of respective sets, manual means for moving said bracket parts rela-

tively to adjust said arms and legs relatively whereby to regulate the tension on said releasable means, feet on the extremities of said legs, said feet being adapted to provide a formation adapted
 5 for the reception of a retainer when said arms and legs are in their folded position, a retainer adapted to engage said formation, a draw cord having opposite ends connected to said retainer and seat, and resilient means supported by said
 10 bracket and adapted to be engaged by said seat for exerting pressure on said draw cord to maintain said retainer in engagement with said formation.

4. In a folding chair, a central bracket composed of relatively movable upper and lower parts, a plurality of arms pivotally attached to said upper part, a plurality of legs pivotally attached to said lower part, said arms and legs being arranged in sets and being adapted to swing on
 20 their pivots to a folding position, a collapsible seat attached to the extremities of said arms, releasable means for holding said arms and legs against swinging movement with respect to their pivots including tie members connecting the extremities of the arms and legs of respective sets, manual means for moving said bracket parts relatively to adjust said arms and legs relative whereby to regulate the tension on said releasable
 25 means, feet on the extremities of said legs, said feet being adapted to provide a formation adapted for the reception of a retainer when said arms and legs are in their folded position, a retainer adapted to engage said formation, a draw cord connected to said retainer, said draw cord being
 30 connected to said seat, and yieldable means supported by said bracket whereby it is engaged by said seat when folded to pull said draw cord for holding said retainer in engagement with said feet.

5. In a folding chair, a central bracket, a plurality of arms pivotally attached to said bracket, a plurality of legs pivotally attached to said bracket,

et, said arms and legs being adapted to swing on their pivots to a folded position, a collapsible seat attached to the extremities of said arms, releasable means for holding said arms and legs in unfolded position with said seat extended, feet
 5 mounted on the extremities of said legs, a draw cord connected to said seat and extending through said bracket, a retainer connected to said draw cord and adapted to engage said feet to hold said arms in a folded position, and resilient means
 10 on said bracket adapted to be engaged by said seat when folded to pull said draw cord for holding said retainer in engagement with said feet.

6. In a folding chair, a central bracket, a plurality of arms and a plurality of legs pivotally
 15 attached to said bracket in sets, said bracket having movable means for holding the pivots of the arm and leg of each set spaced apart, said arms and legs having interfitting cross sectional configuration in opposed relation whereby the
 20 parts of each set thereof may be relatively nested by relative swinging movement on their pivots, said cross sectional configuration providing a space between the arm and leg of each set when nested and to form a hollow housing when the
 25 plurality of arms and legs are folded, a collapsible seat attached to extremities of said arms, means for drawing said seat into said housing as the plurality of sets of arms and legs are moved to their folded position, releasable means for
 30 holding said arms and legs against relative movement, including articulated tie members connecting the arms and legs of said sets individually, said tie members being adapted to fold into the space between their respective arms and legs
 35 when the latter are nested, and manually movable means for adjusting the spaced relationship between the movable pivot supporting means of said arms and legs to place said holding means under tension.

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