Aug. 14, 1962 G. A. CARLSON 3,049,375

RECLINING CHAIRS

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FIG. 2

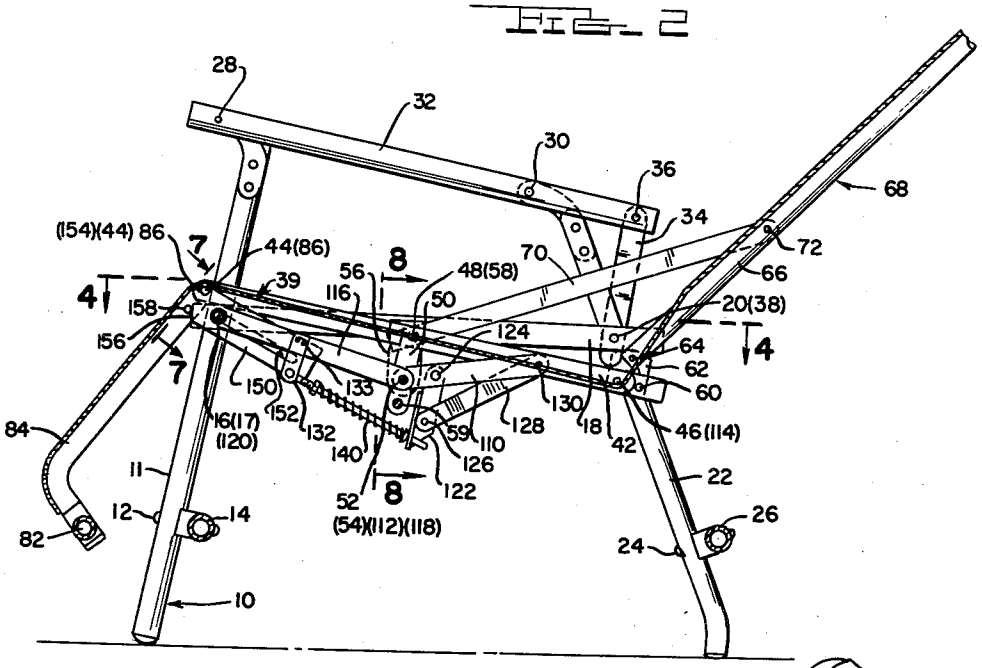
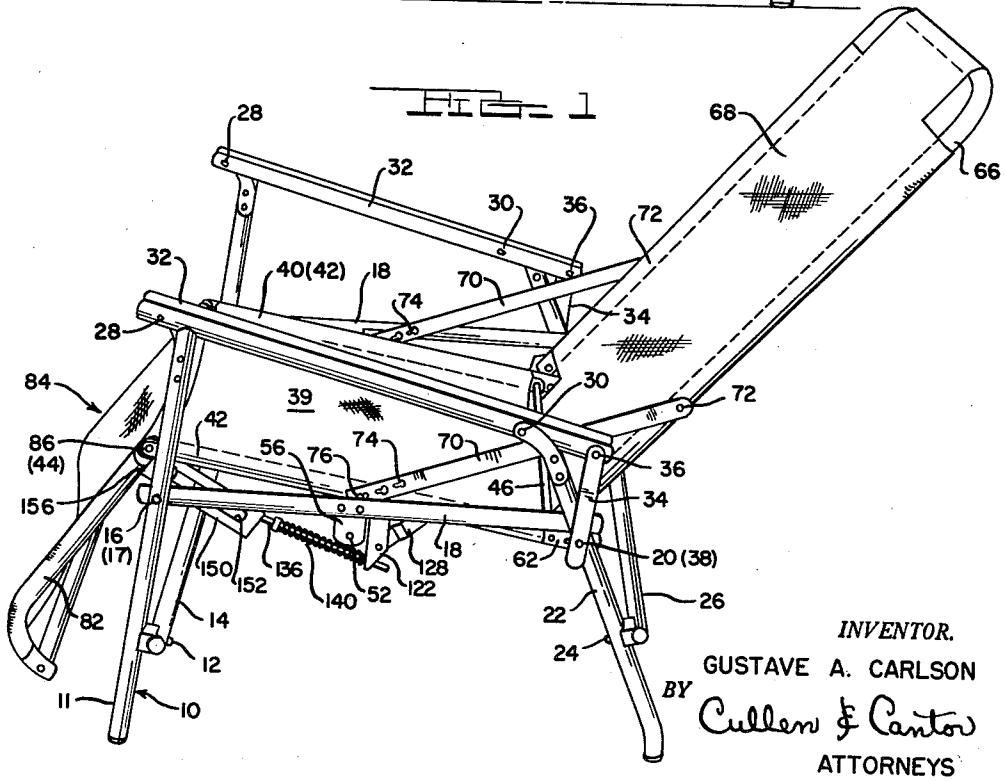


FIG. 1



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RECLINING CHAIRS

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FIG. 3

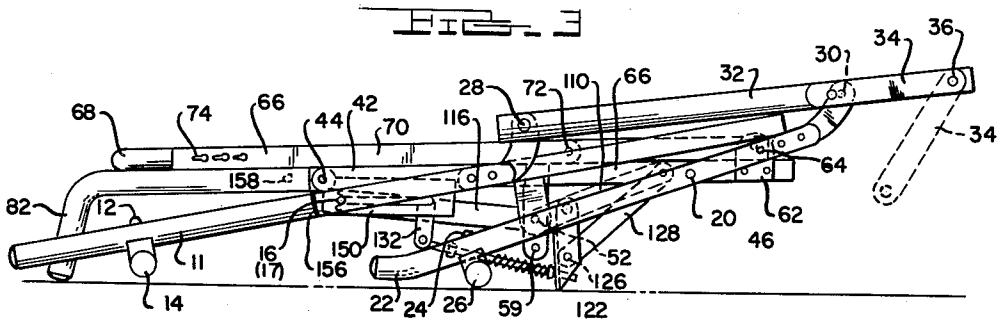


FIG. 4

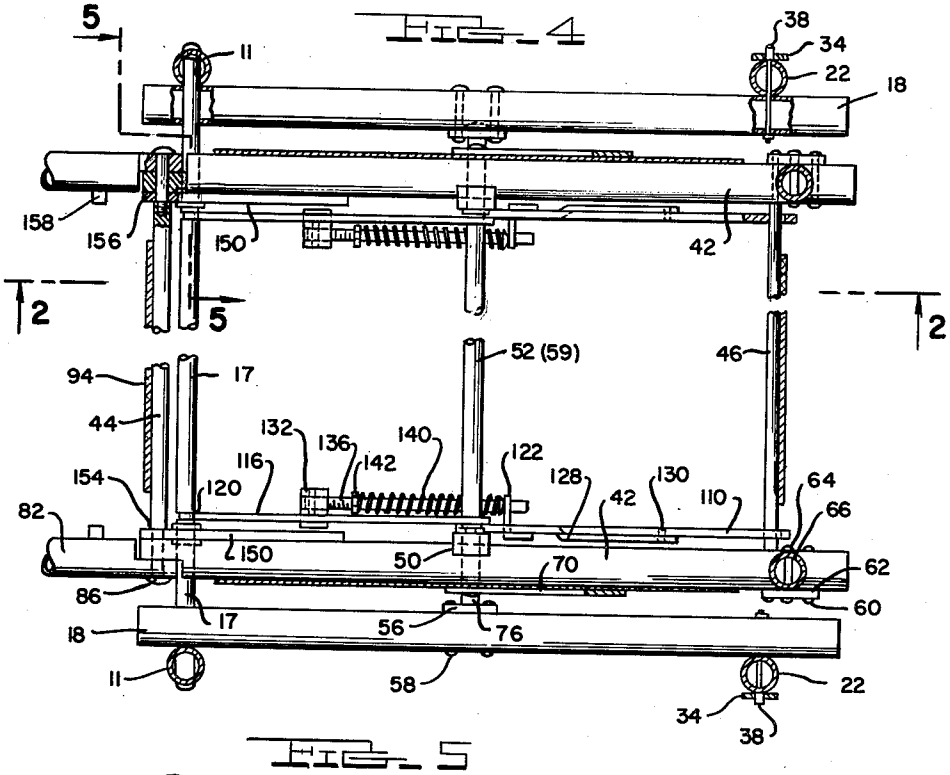
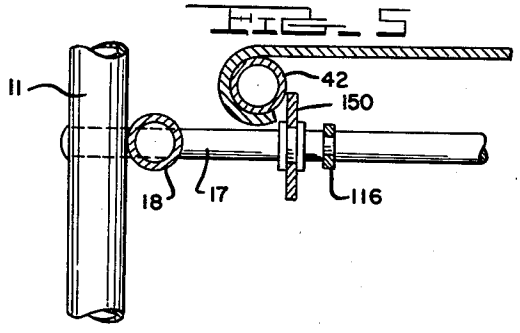


FIG. 5



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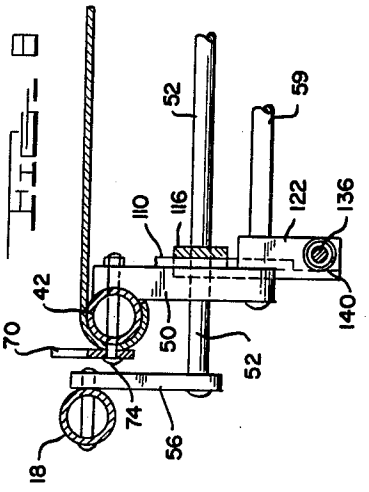
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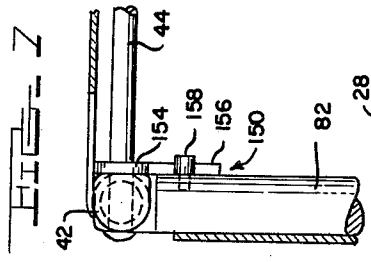
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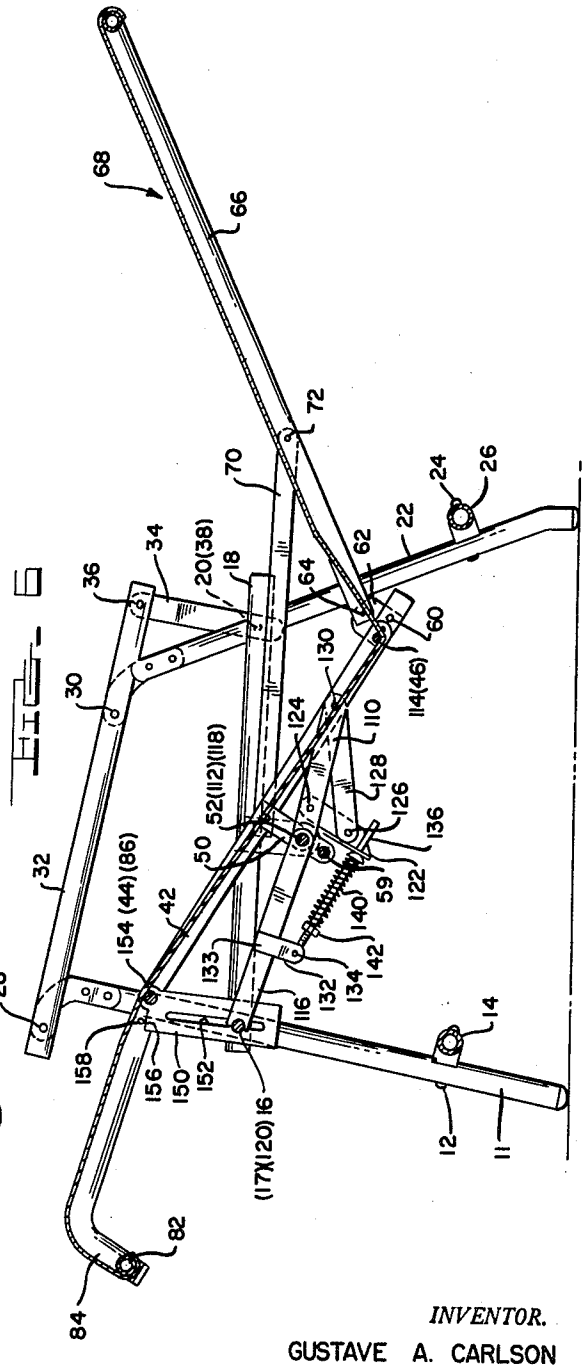
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RECLINING CHAIRS

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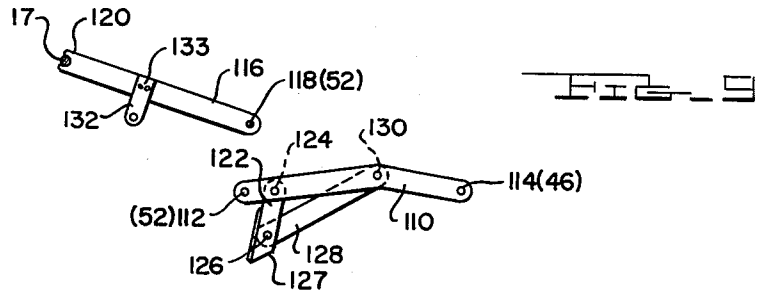


FIG. 9

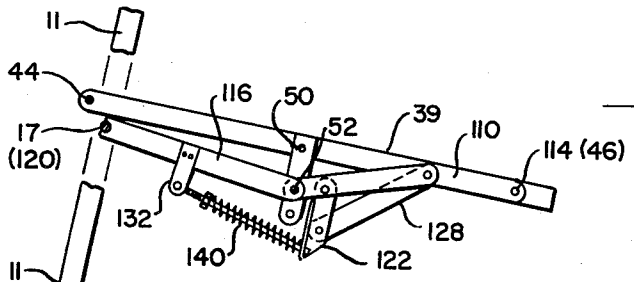


FIG. 10

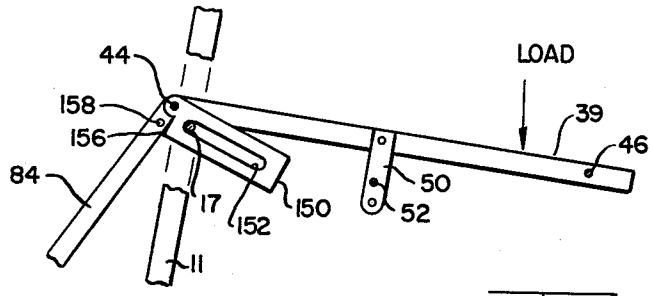


FIG. 11

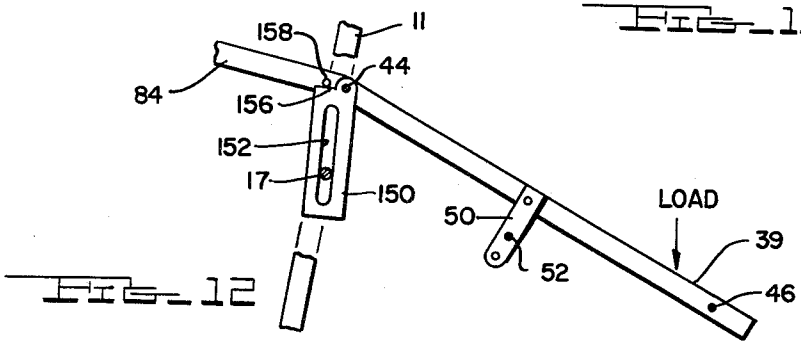


FIG. 12

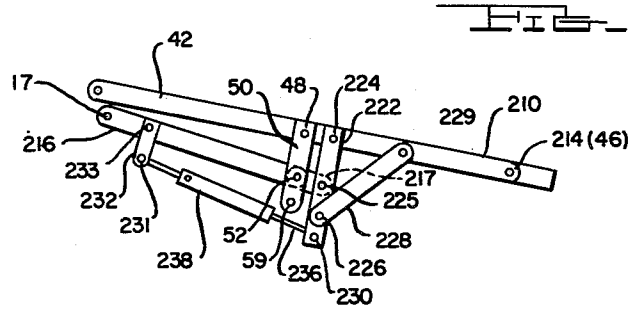
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RECLINING CHAIRS

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Fig. 13



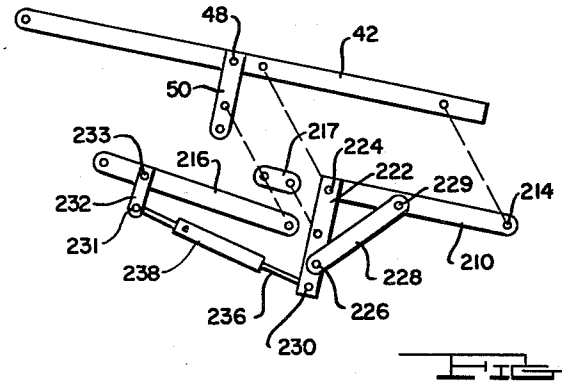


Fig. 14

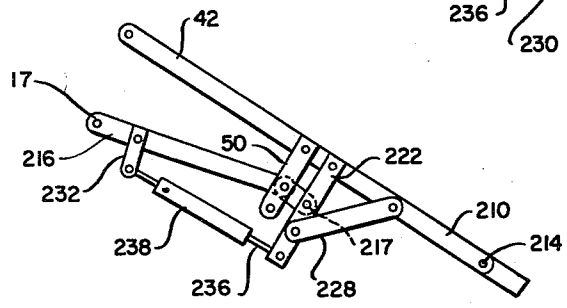


Fig. 15

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United States Patent Office

3,049,375
Patented Aug. 14, 1962

3,049,375

RECLINING CHAIRS

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Filed Mar. 17, 1961, Ser. No. 96,515
4 Claims. (Cl. 297—303)

This application relates to reclining chairs and more particularly to chairs of the type having a support frame preferably of tubular construction, in which is pivotally mounted a tiltable unit comprising a seat, a back, and a foot rest, with such unit being movable forward and back to serve the desires of a person for sitting up, or reclining, as desired.

Such chairs in general are known. The improvements hereof relate specifically to certain aspects of such chairs which now will briefly be outlined.

A first aspect of the chair hereof is in the formation of the support frame, as well as the reclining unit frame, of tubular members, preferably aluminum tubing, light in weight and yet sturdy in construction.

A second aspect of the present invention is a novel spring balance means incorporated in the chair to give a desirable coaction to the reclining unit.

A third aspect of the present invention is a novel foot rest arrangement so constructed that the foot rest is automatically lifted when a person sits properly in the reclining unit and then moves his weight back for reclining.

These and other aspects of the present invention will best be understood upon reference to the appended drawings which show a preferred embodiment for purposes of illustration and not by way of limitation.

In these drawings:

FIG. 1 is a perspective view of a chair of the invention.

FIG. 2 is a side section view taken on line 2—2 of FIG. 4.

FIG. 3 is a side view of a chair with the parts collapsed for portability.

FIG. 4 is a plan section view taken on line 4—4 of FIG. 2.

FIG. 5 is an enlarged fragmentary section view as if on line 5—5 of FIG. 4.

FIG. 6 is a side view like FIG. 2 but showing the parts in a reclined seat position.

FIG. 7 is an enlarged fragmentary section view taken on line 7—7 of FIG. 2.

FIG. 8 is a fragmentary section as if on line 8—8 of FIG. 2.

FIG. 9 is a composite view of certain links and other parts of the spring balance means.

FIG. 10 is a diagram of the spring balance action.

FIG. 11 is a diagram of the foot rest lifting action showing the seat without load thereon and with the foot rest lowered.

FIG. 12 is a view like FIG. 11 but showing the seat under load in reclined position and the foot rest lifted.

FIG. 13 shows diagrammatically a modified form of spring balance means.

FIG. 14 shows the parts of FIG. 13, but disassembled.

FIG. 15 is similar to FIG. 13, but in reclined position.

Now we refer to the drawings and particularly to the reference numerals thereon.

Supporting Frame

The support is in the form of a frame **10** which has two sides, left and right, generally similar but differing in detail because they are left and right sides. The frame support comprises forward legs **11**, FIG. 4, to which are secured by screws **12** a front stretcher bar **14**. To the upper ends of legs **11**, at pivot points **16**, are connected the ends of a front cross bar **17** which connects these forward legs and also connects the ends of main frame or

side members **18** at whose rear ends are headed pivot pins **20** connecting the side members **18** to rear legs **22**. These in turn are connected at **24** by a rear stretcher bar **26**. At the upper ends of legs **11** and **22** are pivot pins **28—30** connecting these legs to arm rails **32** of double tube form.

Pivots **16—20—28—30** enable the frame to be collapsed as shown in FIG. 3. To inhibit collapse of the frame when not desired, there are provided locking straps **34** pivotally connected to the arm rails **32** at pivots **36** and having holes **38** for releasably receiving the heads of pins **20** and thus locking straps **34** to rear legs **22** and maintaining the support rigid.

All of the frame members including forward legs **11**, front stretcher bar **14**, side member **18**, rear legs **22**, rear stretcher **26** and arm rails **32** are of tubing, light in weight yet sturdy of construction. Rails **32** as shown are of double tubular form. Straps **34** are of strap form.

Reclining Seat

The reclining seat **39** basically comprises a seat frame **40** of two side tubes **42** and two cross rods **44** and **46**, forward and rear. Firmly anchored at **48**, midway between the ends of side tubes **42** are seat support blocks or brackets **50** preferably of casting form, mounting and connected by a support cross rod **52** whose ends are connected by screws **54** to support brackets **56** firmly anchored by screws **58** to the main frame members **18** whereby these members **18** support the seat frame and fulcrum it on the main frame fulcrum rod **52**, between the front and rear ends of the seat frame. Blocks **50** are connected for reinforcing purposes by a reinforcing cross rod **59** below the fulcrum cross rod **52**.

Back

At the rear ends of the seat side members **42** and at the rear cross rod **46** of the seat, are firmly anchored, by screws **60**, brackets **62** to which, by screws **64**, are pivotally connected the lower ends of an inverted U-shaped piece of tubing **66** which forms the frame of the back **68**.

For releasably locking back **68** to seat **39** at a desired angular adjustment and when desired, there are provided back locking and adjusting straps **70** pivotally connected at **72** to the back frame **68** and having keyhole slots **74**, selected ones of which may be engaged over heads of pins **76** mounted on the seat frame tubes **42** near brackets **56** and in the side spaces between brackets **56** and blocks **50**, that is, in the side spaces between the side tubes **42** of the seat and the side frame members **18** of the support.

Foot Rest

A U-shaped piece of tubing comprises a frame **82** for a foot rest **84**, with the ends of the frame **82** connected by screws **86** and by the front cross rod **44** to the seat frame **40**.

Webbing

Seat frame **40**, back frame **66** and foot rest frame **82** are filled in by a webbing sheet which may be formed of individual woven cross straps and longitudinal straps. The webbing extends from the forward bight end of the foot rest frame **82** to the rear bight end of the back frame **66**.

Spring Balance

As has been mentioned, a principal aspect of the present invention, now to be described in detail, is the spring balance construction that produces a novel coation of the parts and gives a special value to the chair shown. It will be understood that when a person sits down in the chair, his weight will be concentrated largely in the rear part of the seat **39**, in back of fulcrum rod **52**, with his back

thrusting against back **68** of the reclining chair unit. For desirably balancing a person so seated, there is provided a spring balance construction now to be described.

Straps **110** (FIG. 6) have holes **112—114** through which pass center and rear cross rods **52** and **46** for pivotally anchoring these straps **110** to seat frame side tubes **42**.

Straps **116** are firmly anchored to the seat frame tubes **42** and to the main frame by cross rods **52** and **17**, center cross rod **52** passing through holes **118** in the rear ends of these straps **116**, and forward cross rod **17** passing through open end slots **120** at the forward ends of these straps **116**. Behind the cross rod **52** are brackets **122** whose upper ends are connected at **124** to straps **110** and whose lower ends are connected by rivets **126** to the lower ends of straps **128**, these having their upper ends connected by rivets **130** to straps **110**, whereby straps **128** reinforce and brace the brackets **122**. Forward of the cross rod **52** are brackets **132** fastened to straps **116** and **133** and mounting at **134** the forward ends of links **136** whose rear ends pass freely through holes in brackets **122**. Links **136** mount coiled compression springs **140** whose rear ends abut brackets **122** and whose spring reaction may be adjusted by nuts **142** on threads of links **136**.

Load on the rear part of seat **39** is accordingly balanced by springs **140** reacting against the seat through brackets **122** and reacting against the main frame or support frame through front cross rod **17**.

Modified Spring Balance (FIG. 13)

This figure shows the seat side members **42** to which are secured at **48** support blocks **50** connected to center cross rod **52**.

Connected to front cross rod **17** and to center cross rod **52** are straps **216** whose rear ends are extended and connected at **225** to bracket **222** whose upper ends are connected at **224** to straps **210** connected at their rear ends **214** to rear cross rod **46**. Brackets **222** are also connected at **226** to reinforcing straps **228** connected at **229** to straps **210**. Brackets **222** are also connected at **230** to spring links **236**.

The latter have their forward ends connected at **231** to brackets **232** secured at **233** to straps **216**. On links **236** are coiled springs and adjusting nuts, not shown, and hand grip sleeves **238** secured to the nuts for manual adjustment of spring action.

Load on the rear part of seat **39** is balanced by the spring links **236** reacting against the seat through brackets **222** and straps **210** and reacting against the main frame or support frame through front cross rod **17**.

Foot Rest

As has been mentioned, a second aspect of the invention relates to means for automatically lifting the foot rest **84** when a person seats himself in seat **39** properly and leans back against back **68**, and this aspect of the invention will now be described in detail. There are provided lifter levers of strap form **150** (FIG. 6) and these are journalled on front cross rods **17**, the latter passing through slits **152** of levers **150**. Forward holes **154** of levers **150** receive front cross rod **44** of foot rest **84** and seat frame **40**. Forward edges **156** of levers **150** engage behind and under pins **158** on foot rest frame tubing **82**.

Load on the rear part of seat **39**, behind fulcrum **52**, moves cross rods **44** upwardly to rock levers **150** clockwise, as shown, so that edges **156** engage pins **158** and lift foot rest **84** up and forward.

Now having described the chair construction herein shown, reference should be had to the claims which follow.

I now claim:

1. In a chair having a support comprising forward legs, rear legs, side members connecting the forward and rear legs, and a front cross bar connecting the forward legs; said chair also having a seat between the side members of the support; pivoting means for said seat comprising a fulcrum cross rod between the forward and rear ends of the seat supported at its ends by the side members of the support; said seat being connected to said fulcrum rod for fulcruming thereon; and spring balance means for the seat comprising rear brackets mounted on the seat behind the fulcrum rod, front links connecting the fulcrum rod and the front cross bar, and compression springs reacting against the rear brackets and said front links, said chair including rear links connecting the fulcrum rod and the rear of the seat, said rear links mounting said rear brackets.

2. A construction according to claim 1 including front brackets mounted on said front links with said springs reacting against said front brackets.

3. A construction according to claim 1 wherein the fulcrum cross rod is below the seat, being connected to it and to the side members of the support by vertical brackets depending from the side members and the seat.

4. A construction according to claim 1 wherein the fulcrum cross rod is below the seat, being connected to it and to the side members of the support by vertical brackets, depending from the side members and the seat; and including front brackets mounted on said front links with said springs reacting against said front brackets.

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