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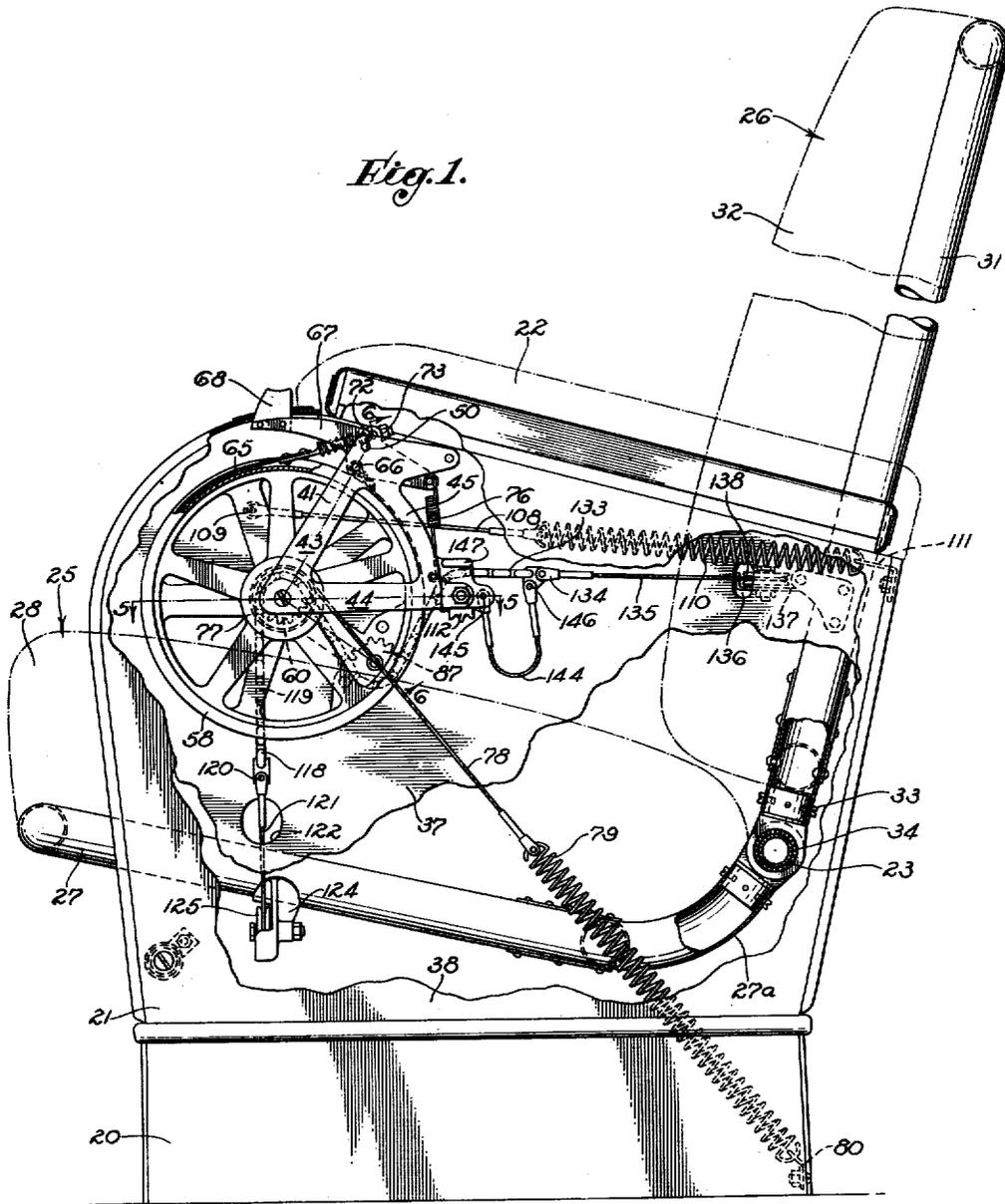
O. F. OPPERMAN

2,133,471

ADJUSTABLE CHAIR

Filed June 30, 1936

5 Sheets-Sheet 1



INVENTOR  
OTTO FRED OPPERMAN  
BY  
*Fred A. Opperman*  
ATTORNEY

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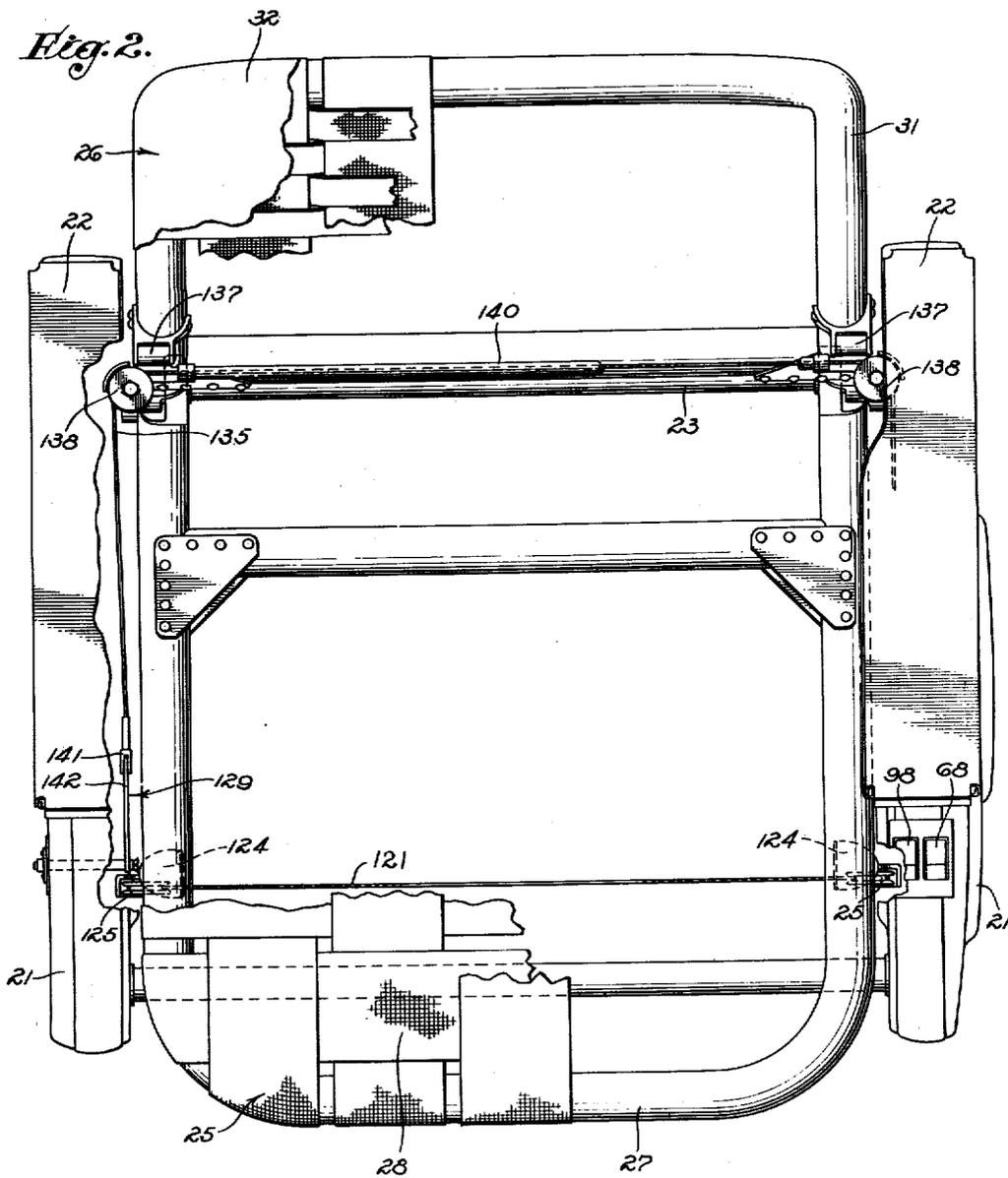
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5 Sheets-Sheet 2



INVENTOR  
OTTO FRED OPPERMAN  
BY  
*Fred Opperman*  
ATTORNEY.

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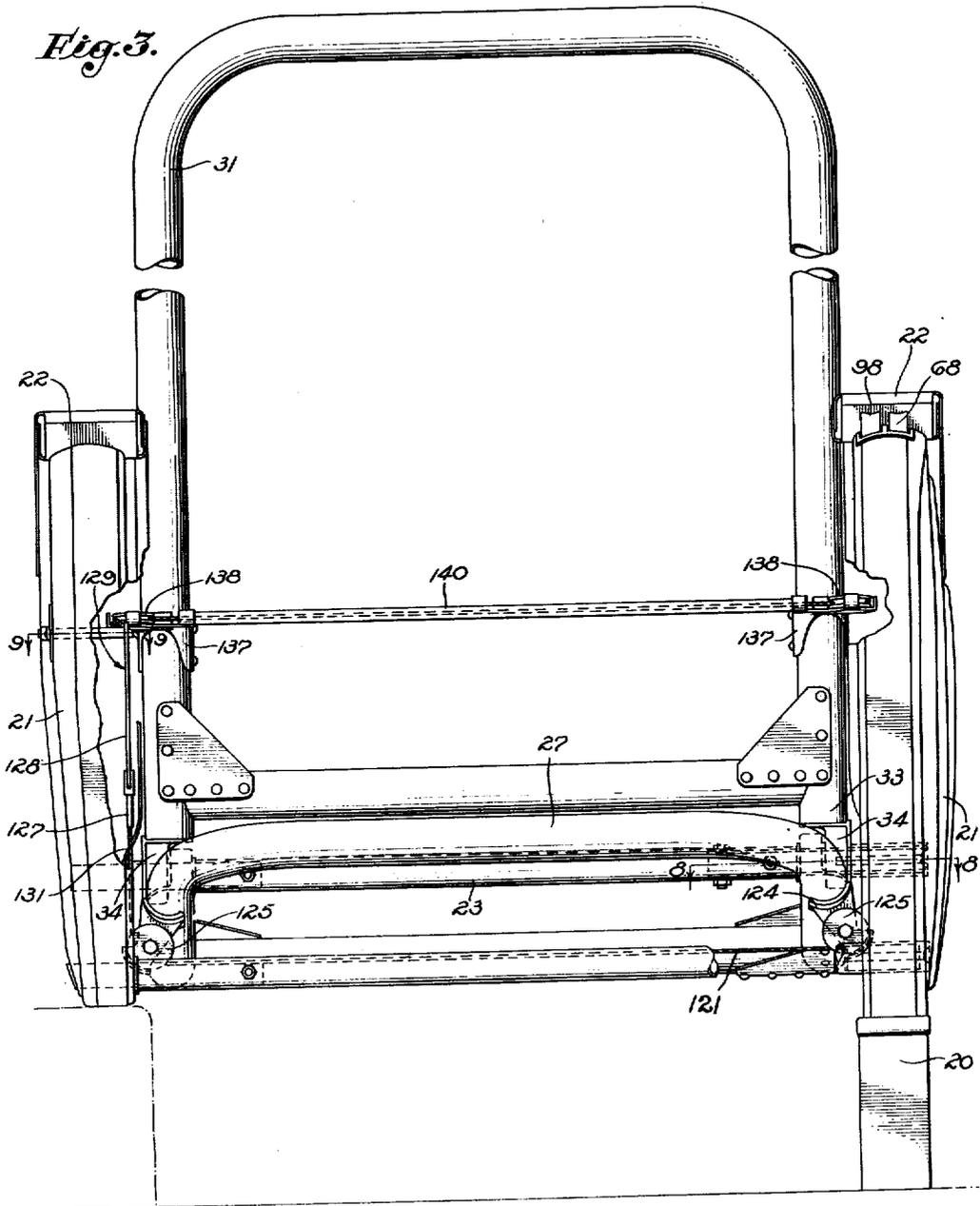
O. F. OPPERMAN

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ADJUSTABLE CHAIR

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5 Sheets-Sheet 3



INVENTOR  
OTTO FRED OPPERMAN  
By *Fred A. Harris*  
ATTORNEY.

Oct. 18, 1938.

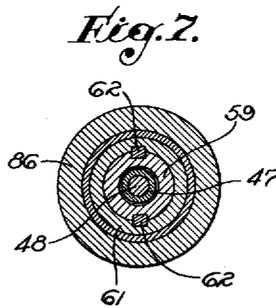
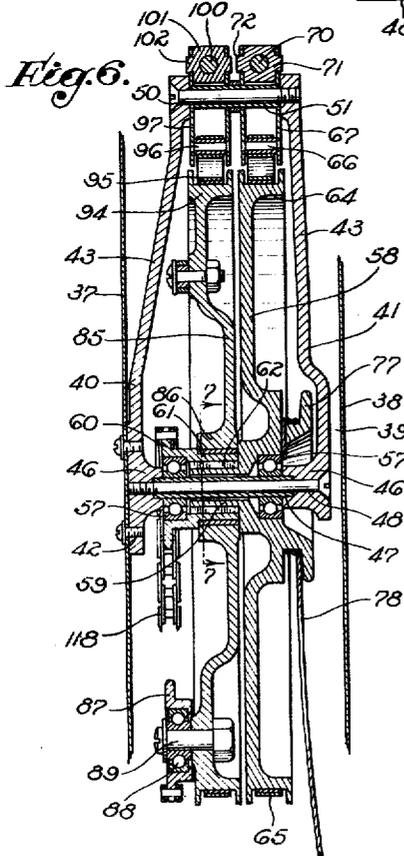
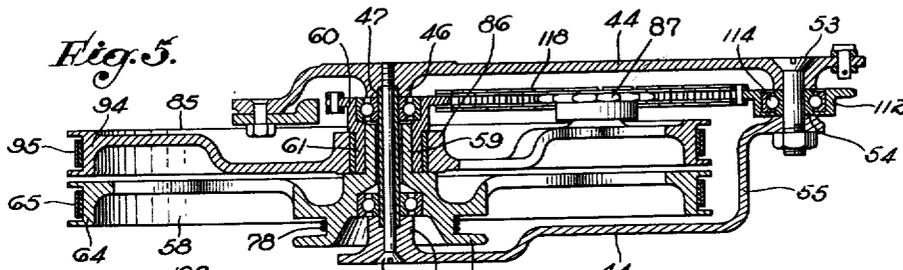
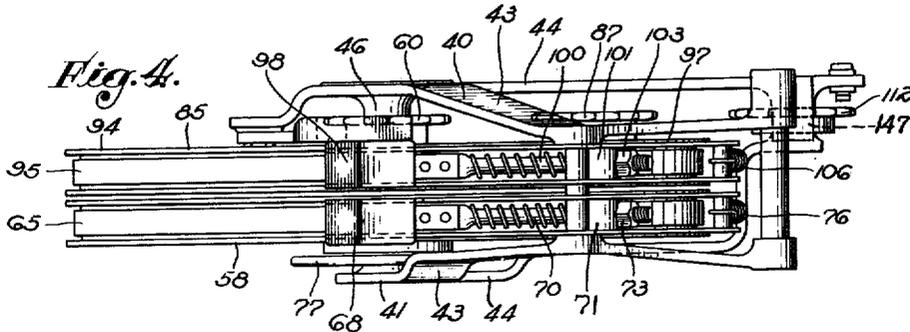
O. F. OPPERMAN

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ADJUSTABLE CHAIR

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5 Sheets-Sheet 4



INVENTOR  
OTTO FRED OPPERMAN

By

*Fred W. Harris*

ATTORNEY.

Oct. 18, 1938.

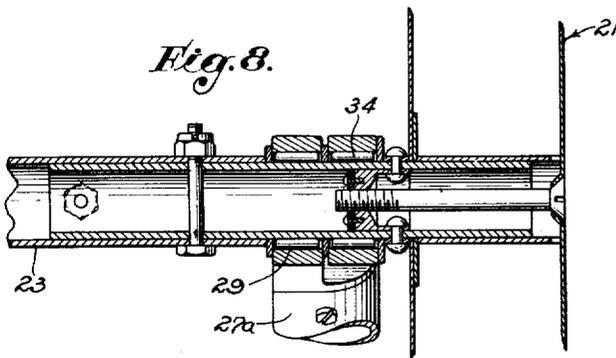
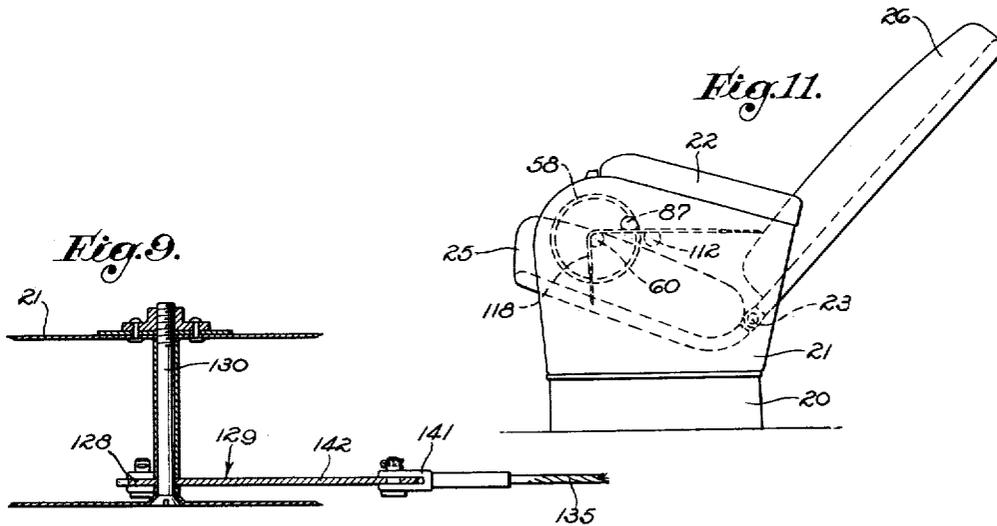
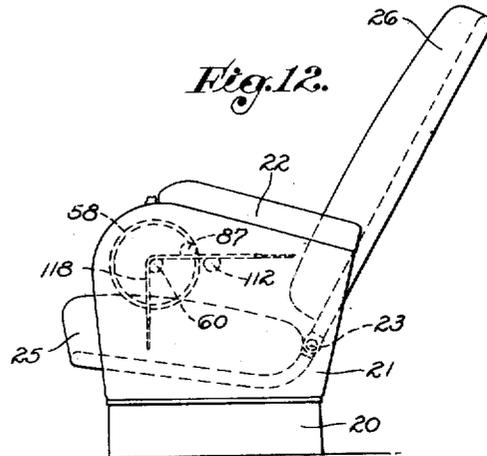
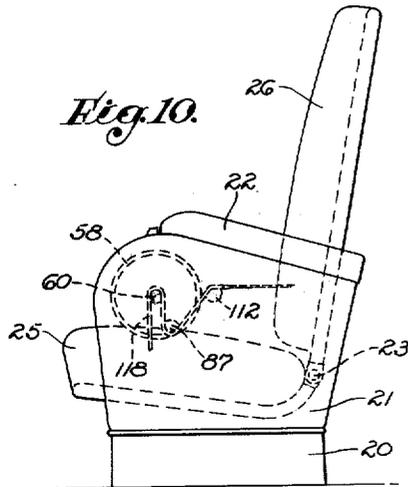
O. F. OPPERMAN

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ADJUSTABLE CHAIR

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5 Sheets-Sheet 5



INVENTOR  
OTTO FRED OPPERMAN  
By  
*Fred W. Harris*  
ATTORNEY.

# UNITED STATES PATENT OFFICE

2,133,471

## ADJUSTABLE CHAIR

Otto Fred Opperman, Santa Monica, Calif., assignor to Douglas Aircraft Company, Inc., Santa Monica, Calif., a corporation of Delaware

Application June 30, 1936, Serial No. 88,137

9 Claims. (Cl. 155—118)

My invention consists of a unique and improved chair construction which is particularly designed for use in transport airplanes. It may, however, be used wherever a chair of the character of my invention is desired. My invention in its preferred embodiment includes many important features and advantages which are provided by the unique combination as a whole, unique subcombinations, and unique elements, some of which are capable of independent use. I believe my invention to be patentably new not only in its entirety, but also in its several subcombinations and elements.

In order to illustrate my invention, I will hereafter describe in detail a preferred form of my invention which has been particularly designed for use in transport airplanes.

It is an object of my invention to provide a chair in which the seat or seat structure, and back or back structure, are adjustable into various positions to suit the personal comforts or requirements of the occupant.

This is particularly desirable where the chair is used in airplanes or trains where passengers must remain seated for long periods and therefore desire the most comfortable sitting position.

A further object of my invention is to provide a chair in which the adjustments referred to may be easily and conveniently made by the occupant himself and while he is seated in the chair.

This will enable the occupant to initially adjust the chair to suit his fancy, and at any time thereafter to readjust the chair when he becomes tired of his sitting position. This feature is particularly attractive to train travelers, since the usual Pullman seat is either nonadjustable or must be adjusted by the porter.

Another object of my invention is to provide a chair in which the seat structure and back structure are both independently adjustable between extreme positions.

The seat and back structures of my invention are thus provided with a wide range of positions and will satisfy the requirements of any height or weight of occupant.

A further object of my invention is to provide an adjustable chair in which the seat and back are spring actuated, and when the control means is suitably actuated they conform to the sitting posture of the occupant.

Another object of my invention is to provide an adjustable chair having an adjustable seat structure and an adjustable back structure in which one of the structures is operable to deter-

mine the position of the other structure, and is also independently adjustable.

I find that such an arrangement enables the occupant of the chair to conveniently and comfortably adjust the chair in a manner which is more or less natural, since it employs the instinctive weight shifting or weight balancing tendencies which the occupant would naturally follow in adjusting the chair. As illustrative of this, in the preferred form of my invention an occupant seated in the chair may, upon proper operation of certain control or release means, raise the seat structure by shifting his weight backwardly against the back structure which is naturally done by placing the feet on the floor and by pressure thus applied tilting backwardly. This reduces the weight applied to the seat structure and increases the force applied to the back structure; and when this occurs the back structure is moved backward and automatically raises the seat. Having adjusted the seat structure, the back structure may then be adjusted relative to the seat structure as desired by the occupant. The seat structure may be lowered by a reverse of the procedure outlined above.

A still further object of my invention is to provide a chair having the many features and advantages which I incorporate in the preferred embodiment of my invention, in which the chair is relatively light in weight, and which is of simple, sturdy, and dependable design.

The benefits of this object are especially valuable in airplane use of the invention since weight, simplicity, sturdiness, and dependability are determining factors, and in my invention I have uniquely combined many new features and advantages without sacrificing these determining factors.

An additional object of my invention is to provide manually operable control means conveniently positioned for actuation by the occupant of the chair, which control means is simple and almost effortless to operate.

In the preferred form of my invention the control means is located at the forward part of one of the arm rests where the occupant may operate the same with his hand while the arm rests on the arm rest.

In the developing and designing of my invention various unique structural details have been created which are of importance. These, as well as other objects and advantages of my invention not specifically stated in the preceding paragraphs, will be embodied in the following detailed

description where the particular structure in which they inhere is described.

Referring to the accompanying drawings:

Fig. 1 is a side elevational view, partly in section, of a chair incorporating the features of my invention.

Fig. 2 is a plan view of Fig. 1, the cushions and certain other parts being broken away to show structural details.

Fig. 3 is a front elevational view of Fig. 1.

Fig. 4 is a plan view of the control means of my invention.

Fig. 5 is a section taken on the line 5—5 of Fig. 1, and showing the control means in section.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is a fragmentary sectional view taken on the line 8—8 of Fig. 3.

Fig. 9 is a fragmentary sectional view taken on the line 9—9 of Fig. 3.

Figs. 10, 11, and 12 are schematic views illustrating different positions of the seat structure and back structure of the chair of my invention.

I will now refer to the drawings in detail and describe the details of construction and operation of the preferred form of my invention which I have chosen for the purpose of illustrating my invention.

As shown in Figs. 1, 2, and 3, the chair construction includes a suitable supporting structure having a base 20 which rests on the floor or other surface. Extending upwardly from opposite sides of the base 20 are hollow side walls 21 which at their upper edges support suitable arm rests 22. Extending horizontally across the rearward part of the side walls 21 is a pivot support or pivot shaft 23 which serves as a pivot supporting means for the seat structure and back structure of my invention.

The chair of my invention includes a seat structure 25 and a back structure 26. The seat structure 25 includes a frame 27 and a suitable seat 28 which is shown by dotted lines in Fig. 1 and is in many of the other views completely eliminated in order that important structural details will not be concealed. The frame 27 is preferably made from tubular parts and is substantially rectangular in plan, and has rear upwardly curved arms 27a which, as shown clearly in Fig. 8, include bearings 29 which surround the pivot shaft 23. The seat structure 25 is therefore adjustably mounted on the supporting structure and may be swung around the pivot shaft 23 so that the seat or seat structure may be raised or lowered.

The back or back structure 26 includes a frame 31 which supports a cushion 32, this cushion 32 being shown in dotted lines in Fig. 1, being broken away in Fig. 2, and being eliminated from many other views to clearly show structural details. The frame 31 is preferably made from tubular material and is substantially an inverted U in shape. The frame 31 has depending arms 33 which support bearings 34 which, as shown in Figs. 1 and 8, surround the pivot shaft 23. The back or back structure 26 may be moved forward, advanced, or moved backward or retracted on the pivot shaft 23.

Mounted in one of the side walls 21 is the construction whereby the seat and back of my invention may be moved into various positions, or, in other words, the construction which enables the seat and back to be adjusted either together or independently into desired positions. Referring

particularly to Figs. 1 and 4 to 7 inclusive, the left side wall 21 includes a pair of vertically spaced wall members 37 and 38, thus defining a chamber 39 in which the mechanism now to be described is situated. The control means includes a frame consisting of parts 40 and 41, the part 40 being secured by suitable securing means 42 to the wall members 37. Both of these parts are of substantially the same elevational shape as shown in Fig. 1, having upwardly inclining arms 43, horizontally extending arms 44, and peripheral connecting portions 45. The parts 40 and 41 have hubs 46 which are secured against the ends of a central sleeve or shaft 47 by means of a bolt 48. In this manner the hub portions of the parts 40 and 41 are connected together. The upper ends of the arms 43 are secured together by a bolt 50 which clamps the same against a spacing sleeve 51. The outer ends of the arms 44 are secured together by a bolt 53 which clamps the same against a spacer member 54 and also acts as a part of a bearing, as will be described later. The arm 44 of the part 41 is offset, as indicated at 55, while the arm 44 of the part 40 is straight.

Mounted on the ends of the sleeve 47 are bearings 57, the right one of which supports a rotatable member or wheel 58 having a hub 59 which surrounds the sleeve 47. The hub 59 has connected to it a rotatable member or sprocket 60 which has a cylindrical portion 61 secured to the hub 59 by keys 62. This rotatable member or sprocket 60 surrounds the left bearing 57 as shown so that the parts 58 to 62 are rotatably supported concentric to the bearing sleeve 47.

For the purpose of locking the rotatable member 58 from rotation, but at will allowing the same to rotate, I provide a locking means which includes a brake drum 64 formed on the periphery of the rotatable member 58. Adapted to engage this drum 64 is a brake band 65. One end of the brake band 65 is connected by a connecting pin 66 to a releasing lever 67 mounted within the chamber 39 but having an engagement projection 68 extending to the exterior thereof immediately forward of the adjacent arm rest 22. The opposite end of the brake band 65 is connected to a rod 70 which extends through an opening in a block 71 which is pivoted at 72 to the releasing lever 67. A nut 73 is threaded on the extending end of the rod 70 so that the brake band may be adjusted relative to the brake drum 64. It will be noted that the releasing lever 67 is pivotally mounted on the sleeve 51 and that the connections of the ends of the brake band 65 are on opposite sides of the pivot. When the releasing lever is moved in an anti-clockwise direction by depressing the engagement projection 68, it will be seen that the band 65 is released from the drum 64 and the drum is free to rotate. A spring 76 is connected to the right end of the releasing lever 67 which tends to rotate it in a clockwise direction or, in other words, in such a direction as to apply the brake 65. The parts just described and including parts numbers 58 to 76 inclusive constitute a holding means of my invention which is employed for holding an adjusting means of my invention to be described later. The control means also includes a spool or sheave 77 which is preferably formed integral with the rotatable member 58. Connected to this spool 77 and wrapped around it in a clockwise direction is a cable 78 which, as shown in Fig. 1, has the extending end connected to a tension spring 79, which tension spring is preferably secured to the base 20 such as shown at 80. The purpose of

the parts just described, and which may constitute a counterbalancing or loading means, is to produce a force tending to rotate the rotatable member 58 in a clockwise direction.

5 My invention also provides a back control means or operating means which includes a rotatable member 85 having a hub 86 which is journalled on the cylindrical portion 61 which cooperates with the hub 59 and forms a part of  
10 the rotatable member 58. Near the periphery of the rotatable member 85 is a bodily movable member in the form of a sprocket 87, and which constitutes a means for shortening the effective length of the adjustment member to be described.  
15 This sprocket 87 is in alignment with the sprocket 60 as shown and is rotatably mounted on a bearing 88 which is secured to the rotatable member 85 by a bolt 89. The rotatable member 85 is rotatable relative to the rotatable member 58. It  
20 is, however, provided with a locking means which ordinarily locks the same from rotation but which is manually operable to permit the rotatable member 85 to rotate. At the peripheral portion of the rotatable member 85 is a brake drum 94  
25 adapted to be engaged by a brake band 95, one end of which is connected at 96 to a releasing lever 97 which has an engagement projection 98 which extends to the exterior of the chamber 39 for manual operation. The other end of the  
30 brake band 95 is connected to a rod 100 which extends through a block 101 which is pivoted at 102 to the releasing lever 97. Threaded on the end of the rod 100 is a nut 103 whereby the brake band 95 may be adjusted. This releasing lever  
35 97 is positioned on the sleeve 51 adjacent the releasing lever 67 and the ends of the brake band 95 are connected at points above and below the pivot so that upon movement of the releasing lever 97 in an anti-clockwise direction this brake  
40 is released and frees the rotatable member 85 for rotation. A spring 106 is provided for exerting a force tending to rotate the releasing lever 97 in a clockwise direction, thus tending to hold the brake band 95 applied at all times.

45 The braking construction for the rotatable members 58 and 85 may be identical in construction and are operated in precisely the same manner. The engageable projections 68 and 98 are positioned closely adjacent each other at the forward end of the arm rest 22 and therefore can  
50 be readily operated by the occupant of the chair who may depress either one of the engageable projections in order to enable the chair to be adjusted, as will be described after all of the details of construction have been described.

55 The back control means or operating means also includes a back returning means or loading means which is in the form of a flexible cable 108 which is connected to the rotatable member 85 at 109, and which is also connected to a tension  
60 spring 110, the tension spring 110 being connected within the side wall 21 as indicated at 111. This construction exerts a force on the rotatable member 85 tending to rotate it in a clockwise direction.  
65

Supported on the spacer 54, as shown in Fig. 5, is an idler means or idler sprocket 112, there being suitable anti-friction bearings 114. This idler sprocket 112 is in alignment with the sprockets 60 and 87.  
70

For the purpose of enabling controlled adjustment of the seat structure and back structure by means of the operation of the control means which has just been described, my invention provides an adjustment means or a connecting means  
75

which is operatively associated not only with the control means but also with the seat structure and back structure.

This portion of my invention includes a chain 118 having links adapted for coengagement or  
5 meshing with the teeth of the sprockets 60, 87, and 112. As shown best in Fig. 1, the chain extends over the sprocket 60, under the sprocket 87, and over the sprocket 112. The chain 118 includes a downwardly extended portion 119, the  
10 lower end of which is secured by a connection member 120 to a flexible cable 121 which extends outwardly from the chamber 39 through an opening 122. As shown in Figs. 1, 2, and 3, the frame 27 of the seat 25 is provided with brackets  
15 124 on opposite sides thereof and in vertical alignment with the downwardly extending portion 119 of the chain 118. Supported by the brackets 124 are sheaves 125 around which the flexible cable 121 extends. This flexible cable  
20 extends downwardly from the portion 119 of the chain 118 underneath the adjacent sheave 125, and extends horizontally below the frame 27 of the seat 25 and extends around the other of the sheaves 125, and then extends upwardly where  
25 it is secured by a connection member 127 to a downwardly extending arm 128, which arm 128 forms a part of a bell crank shaped connection member 129 secured in the right side wall 21 by means of a bolt 130. The flexible member enters  
30 the right side wall 21 through an opening 131. It will be seen by this arrangement that the forward part of the seat structure 25 is supported in a cradle provided by the flexible cable 121 and the means to which the ends thereof are at-  
35 tached. In this way the seat structure is supported at opposite edges and when adjusted will move up and down without any unequal supporting or twisting of the structure. During this movement of the seat it swings or adjusts  
40 freely around the pivot shaft 23.

The other end of the chain 118 is in the form of a rearwardly extending portion 133 which is connected by a connection means 134 to a flexible  
45 cable 135 which extends from the chamber 39 through an opening 136. Secured to the opposite sides of the frame 31 of the back structure 26 are brackets 137 which support sheaves 138 around which the flexible cable 135 is extended. It will be seen that these sheaves 138 are positioned at the extreme edges of the frame 31  
50 projecting outwardly therefrom so that the cable may freely extend from and into the side walls 21. It will furthermore be noted that the sheaves 138 are supported to the front of the frame 31, and that portion of the cable extending across  
55 the back structure is enclosed in a tube 140. A suitable recess is provided in the cushion 32 for receiving the tube 140. After extending around the sheave 138, the cable 135 extends forwardly  
60 in the right side wall 21 and is connected by means of a connection member 141 to an arm 142 of the connection member 129. In this manner the back is supported by a cradle formed by the cable 135 from swinging backward or being  
65 retracted unless the cable 135 is adjusted. It is equally supported at the opposite edges at all times and the movement of the back will therefore be without any twisting or binding action.

For the purpose of limiting the movement of  
70 the adjusting means or connecting means my invention provides a tie means in the form of a tie cable 144, one end of which is connected at 145 to the frame parts 40 and 41 as shown in Fig. 1, and the other end of which is connected  
75

at 146 to the connection means 134 which connects the end 133 of the chain 118 to the flexible cable 135. The movement of the chain 118 and flexible cables 121 and 135 is limited in a rightward direction by the length of the tie cable 144 and is limited in a leftward direction by the connection means 134 engaging abutment wall 147 provided by the arms 44 of the frame parts 40 and 41.

10 Having described the construction of the preferred form of my invention, I will now describe its operation and the manner in which an occupant may adjust the seat and back to a desired position.

15 In Figs. 10, 11, and 12 I have diagrammatically illustrated extreme positions of the seat and back structures. In Fig. 10 the seat structure 25 is in fully lowered position and the back structure 26 is in an extreme forward position.

20 In Fig. 11 the seat structure is in fully raised position and the back structure is in an extreme rearward or retracted position. In Fig. 12 the seat structure is in a fully lowered position and the back structure is as far rearward as it will move with the seat structure in a lowered position.

Referring now particularly to Figs. 1, 4 to 7 inclusive, and 10 to 12 inclusive, the seat structure and back structure are operated as follows.

30 It is preferable to adjust the seat and back structures when the occupant is sitting in the chair. He may then place his left hand on the left arm rest 22 and with his fingers depress either of the engagement projections 68 or 98, as desired, to adjust positions of the seat and back structures.

To adjust the position of the seat structure 25 it is necessary to release the rotatable member 60 so that it is free to rotate and so that the chain 118 is longitudinally movable. This releasing is done by depressing the engagement projection 68 which, as explained heretofore, releases the brake band 65 from the brake drum 64.

40 The spring 79 tends to rotate the rotatable member 60 in such a direction as to tend to pull upwardly on the downwardly extending portion 119 of the chain 118 which tends to raise the flexible cable 121 and raise the seat structure 25. However, if the occupant has his entire weight on the seat structure 25 or on the forward portion thereof, the tension spring 79 is not strong enough to raise the seat structure and the seat structure will be depressed. Therefore, it will be seen that if the occupant depresses the engagement projection 68 and places his weight on the seat structure 25, that the seat structure will move from the raised position shown in Fig. 11 to the lowered position shown in Fig. 12.

45 When the rotatable member or sprocket 60 is released for rotation and the seat structure moves from a raised position into a lowered position, the chain 118 has a longitudinal traveling movement. The rotatable member 60 rotates, the rotatable member or sprocket 87 rotates about a fixed axis, and the idler member or sprocket 112 rotates, and the chain therefore moves in such a direction that the rearwardly extending end 133 thereof moves in a forward direction. When this movement occurs the flexible cable 135 is pulled forwardly at the end associated with the chain 118,

50 and therefore the back structure 26 is moved forwardly from the extreme rearward or retracted position as shown in Fig. 11 to the extreme forward or advanced position as shown in Fig. 12. In making the adjustment just described, in actual practice it is found to be most conveniently

made by the occupant sitting in the chair with his two feet on the floor depressing the engagement projection 68 and then shifting his weight slightly forward, such as by leaning forward, so that the weight is released from the back 26 and shifted forwardly to the forward portion of the seat structure 25. As the weight is shifted forwardly it is applied to the seat structure and controlled by the occupant who may place all or a part of his weight on the seat structure or may support all or a part of the weight through the legs and feet which are on the floor. In this way it is possible for the occupant to fully lower the seat or to move it into an intermediate position. When the seat has been moved into the position in which the occupant wants it, he then releases the engagement projection 68 which applies the brake band 65 and thus locks the rotatable member 60 from rotation. This locks the seat 25 in the position in which it has been placed.

20 When the occupant desires to raise the seat structure from a lowered position, such as shown in Fig. 12, into a fully raised position as shown in Fig. 11, or a partly raised position, he does this by an opposite shifting of the weight. He places his back against the back structure 26 and shifts his weight against it. He then depresses the engagement projection 68 which releases the rotatable member 60 and allows the chain 118 to travel longitudinally rearwardly. The force applied to the back is transferred through the flexible cable 135, the chain 118, and the flexible cable 121 to the seat structure, and the seat structure is raised.

35 Having adjusted the seat structure to the desired position, the occupant may then adjust the back structure as desired. This is done by depressing the engageable projection 98 which releases the brake 95 and the brake drum 94 and permits the rotatable member 85 to rotate. This allows the bodily movable member or sprocket 87 to move bodily. In the form of my invention illustrated herein the body movement of the sprocket 87 is concentrically around the axis of the supporting sleeve 47 on which the control parts are mounted. The spring 110 tends to rotate the rotatable member 85 in a clockwise direction. In other words, it tends to move the bodily movable member 87 in a downward direction, or if it is in an extreme downward position to retain it in that position. As is clear from a comparison of Figs. 10 and 12, the action which occurs is to shorten the effective length of the chain 118, and since the end 119 is in a fixed position due to the fact that the sprocket 60 is locked, the result is a pulling of the end 133 in a forward direction. In Fig. 12 the back is in a retracted position and the portion of the chain extending rearwardly from the sprocket 60 is straight. When the engageable projection 98 is engaged, to release the brake band 95 the spring 110 is free to move the rotatable member 85 in a clockwise direction and the bodily movable member or sprocket 87 is then moved from the position shown in Fig. 12 into a fully lowered position as shown in Fig. 10. When this occurs a decided shortening of the chain 118 occurs, since the chain must travel downwardly around the sprocket 87 and then upwardly around the idler sprocket 112. This is effective in moving the back structure 26 into an extreme forward position. However, when the occupant is adjusting the back structure he places his weight against the back structure, depresses the engageable projection 98, and then gradually moves

his own back forwardly to the desired position. The tension spring 110, as explained heretofore, pulls the back structure forwardly so that it follows the occupant's back, and when a suitable position has been reached the occupant then releases the engageable projection 98 and the back structure is then locked in the desired position.

By the means and in the manner described the back and seat structure may be moved into any position between the extreme raised and lowered or forward or rearward positions, and by suitably operating the means provided the relative positions may be changed as desired.

In the preferred form of my invention I have provided a spring 79 which I employ as a counterbalance means for the weight of the seat structure and I provide for a raising of the seat by the occupant placing his weight against the back structure. However, by increasing the strength of the spring 79, the spring 79 may be utilized for raising the seat structure independently of any weight being applied to the back structure 26. Likewise, I have shown the parts in such an arrangement that whenever the seat structure is adjusted the back structure is also moved and the back structure is independently adjustable. It is, of course, readily apparent that the seat structure can be made adjustable whenever the back structure is adjusted, with the seat structure independently adjustable. For example, the back member may be associated through the adjustment means with the rotatable member, and the seat member may become associated with the movable member through the adjustment member.

From the foregoing detailed description of the preferred form of my invention and its method of operation, the various features, advantages, and objects of my invention are readily apparent. The construction which I have chosen to illustrate my invention is not the only form in which my invention may be embodied. My invention resides in a new principle of operation and combination of elements which may be embodied either in whole or in part in various other structural elements which, although being of different appearance and detail, still incorporate the features and principle of my invention. Recognizing this to be a fact and further recognizing that it is only necessary to disclose a preferred form of my invention, I have illustrated but a single form of my invention and intend that various modifications and alterations of my invention coming within the principle and scope thereof shall be encompassed by the appended claims which I intend to be broadly construed to cover the principle of my invention in its entirety, its several subcombinations, and several unique elements which are involved therein.

I claim as my invention:

1. In an adjustable chair construction, the combination of: an adjustable seat structure, which may be moved between raised and lowered positions; an adjustable back structure which may be moved between advanced and retracted positions; supporting means for said structures; an adjustment means connected to said structures, which is movable as a whole to effect simultaneous movement of both of said structures; releasable holding means to hold said adjustment means from movement as a whole; and operating means operatively connected with said adjustment means for so operating same as to move one of said structures.

2. In an adjustable chair construction, the combination of: an adjustable seat structure, which may be moved between raised and lowered positions; an adjustable back structure which may be moved between advanced and retracted positions; supporting means for said structures; a linear adjustment means connected to said structures, which is movable as a whole to effect simultaneous movement of both said structures; releasable holding means to hold said adjustment means from movement as a whole; and operating means operatively connected with said adjustment means for shortening the effective length of a portion of said adjustment means so as to move one of said structures.

3. In an adjustable chair construction, the combination of: an adjustable seat structure, which may be moved between raised and lowered positions; an adjustable back structure which may be moved between advanced and retracted positions; supporting means for said structures; an adjustment means connected to said structures, which is movable as a whole to effect simultaneous movement of both of said structures; releasable holding means to hold said adjustment means from movement as a whole; and back structure adjustment means operatively connected with said adjustment means between said holding means and said back structure for so operating same as to move one of said structures.

4. In an adjustable chair, the combination of: an adjustable seat; an adjustable back; adjustment means for said seat and said back; a rotatable member around which said adjustment means extends; a bodily movable member engageable by said adjustment means; means tending to move said bodily movable member in a direction to shorten the effective length of said adjustment means; locking means for locking said rotatable member from rotation, and said bodily movable member from bodily movement; and supporting means for supporting the aforesaid elements in their proper operative relationship.

5. In an adjustable chair, the combination of: an adjustable seat; an adjustable back; adjustment means for said seat and said back; seat control means including a rotatable member engageable with said adjustment means, and releasable locking means whereby said rotatable member is free to rotate to permit movement of both said seat and said back; back control means including a bodily movable member engageable with said adjustment means, and movable in a direction to cause said adjustment means to move said back independently of said seat, and releasable locking means for said bodily movable member; and supporting means for supporting the aforesaid elements in their proper operative relationship.

6. In an adjustable chair, the combination of: an adjustable seat; an adjustable back; adjustment means for said seat and said back; seat control means including a rotatable member engageable with said adjustment means, and releasable locking means whereby said rotatable member is free to rotate to permit movement of both said seat and said back; back control means including a bodily movable member movable around the axis of said rotatable member engageable with said adjustment means, and movable in a direction to cause said adjustment means to move said back independently of said seat, and releasable locking means for said bodily movable member; and supporting means for supporting the afore-

said elements in their proper operative relationship.

7. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back structure; adjustment means for said seat structure and said back structure; control means including a rotatable member engageable with said adjustment means, and releasable locking means whereby said rotatable member is free to rotate to permit movement of both said seat structure and said back structure; control means including a bodily movable member engageable with said adjustment means, and movable in a direction to cause said adjustment means to move one of said structures independently of the other of said structures, and releasable locking means for said bodily movable member; and supporting means for supporting the aforesaid elements in their proper operative relationship.

8. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back

structure; supporting means for said structures; an adjustment means operatively connected to said structures and operable as a whole to enable said structures to be simultaneously adjusted; holding means for holding said adjustment means; and operating means for operating a part of said adjustment means whereby one of said structures may be operated independently of the other of said structures.

9. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back structure; supporting means for said structures; a flexible lined adjustment means operatively connected to said structures and movable as a whole to enable simultaneous adjustment of said structures; holding means for said adjustment means; and operating means for varying a portion of the effective length of said adjustment means whereby the positions of said structures may be changed relative to each other.

OTTO FRED OPPERMAN.

CERTIFICATE OF CORRECTION.

Patent No. 2,133,471.

October 18, 1938.

OTTO FRED OPPERMAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 6, second column, line 13, claim 9, for the word "lined" read lineal; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of December, A. D. 1938.

Henry Van Arsdale

(Seal)

Acting Commissioner of Patents.

said elements in their proper operative relationship.

7. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back structure; adjustment means for said seat structure and said back structure; control means including a rotatable member engageable with said adjustment means, and releasable locking means whereby said rotatable member is free to rotate to permit movement of both said seat structure and said back structure; control means including a bodily movable member engageable with said adjustment means, and movable in a direction to cause said adjustment means to move one of said structures independently of the other of said structures, and releasable locking means for said bodily movable member; and supporting means for supporting the aforesaid elements in their proper operative relationship.

8. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back

structure; supporting means for said structures; an adjustment means operatively connected to said structures and operable as a whole to enable said structures to be simultaneously adjusted; holding means for holding said adjustment means; and operating means for operating a part of said adjustment means whereby one of said structures may be operated independently of the other of said structures.

9. In an adjustable chair, the combination of: an adjustable seat structure; an adjustable back structure; supporting means for said structures; a flexible lined adjustment means operatively connected to said structures and movable as a whole to enable simultaneous adjustment of said structures; holding means for said adjustment means; and operating means for varying a portion of the effective length of said adjustment means whereby the positions of said structures may be changed relative to each other.

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