Jan. 4, 1944. F. B. HARMAN 2,338,511

POSTURE CHAIR

Filed Sept. 15, 1941

Fig. 2

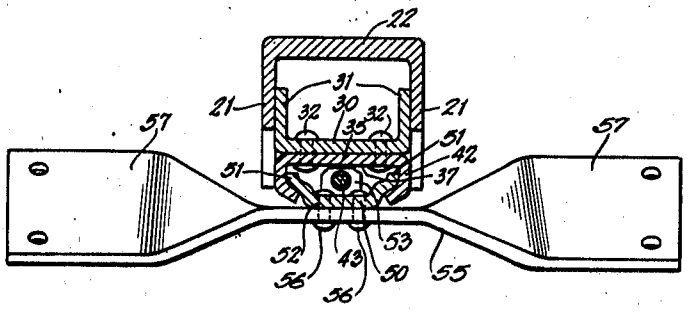


Fig. 3

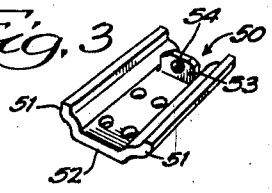


Fig. 1

Fig. 4

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POSTURE CHAIR

Frank B. Harman, Grand Rapids, Mich.

Application September 15, 1941, Serial No. 410,847

1 Claim. (Cl. 155—157)

My invention relates generally to posture chairs and it has particular relation to posture chairs in which the backs and seats are adjustable relative to each other. The present application is a continuation in part of my prior application Ser. No. 280,959, filed June 24, 1939 which has matured into Patent 2,310,366, issued February 9, 1943.

It is the purpose of posture chairs of the type described to provide adequate and proper support for the back and legs of a person seated therein. Such support is only adequate and proper when the seat of a chair is of such a length as to provide support for the entire upper part of the legs, and when the height of the back of the chair is sufficient to support the person in the chair at the proper point along the spine. It is known that a tall person requires a greater back height and a greater seat length than does the short person, for the reason that a tall person generally has a longer body trunk and correspondingly longer upper leg portions. In this connection, I have found that the ratio of the difference of back height required for any two normal people of different heights to the difference in seat length required for the same two people is substantially constant.

The object of my invention, generally stated, is the provision of a posture chair of the type described wherein the back height and the seat length of the chair may both be simultaneously increased or decreased by an improved mechanism whereby the chair back alone is adjusted simultaneously, horizontally and vertically relative to the chair seat.

It is still another object of this invention to provide a posture chair of the type described wherein the back height and seat length of the chair may be simultaneously increased or decreased by a single manual control operable by a person seated in the chair.

Other objects of my invention will, in part, be obvious and in part appear hereinafter.

For a more complete understanding of the nature and scope of my invention reference may be had to the following detailed description thereof taken in connection with the accompanying drawing in which:

Fig. 1 is a side elevational view of a posture chair wherein the back is made simultaneously, horizontally and vertically adjustable relative to the chair seat by one form of adjusting mechanism shown in the figure in vertical section;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a perspective view of a relatively short channel-shaped carriage member forming one element of the back adjusting mechanism of Figs. 1 and 2; and

Fig. 4 is a perspective view of a channel member forming another part of the back adjusting mechanism of Figs. 1 and 2.

In Fig. 1 of the drawing, a posture chair is indicated generally at 10 which comprises a base 11, a seat 12, and a back 13. The seat 12 is carried on a screw 14 so as to be vertically adjustable relative to the base 11, and the chair back 13 is carried by an adjustable support mechanism indicated generally at 15 so as to be simultaneously, vertically and horizontally adjustable relative to the seat 12.

The details of the supporting arrangement for the seat 12 and of the back adjusting mechanism 15 are as follows: A U-shaped member 20 is secured to the top of the screw post 14 which extends centrally through the bottom thereof. The sides 21 of a horizontal support member 22 are secured to the opposite sides of the U-shaped member 20 by rivets 23, as shown. A seat support iron 24 having depending flanges 25 fits over the member 22 and is secured to the side flanges 21 thereof. The chair seat 12 may be secured on the top of the seat support iron 24 by a number of screws 26, as shown.

The channel member 22 may be formed from a flat stamping and has a rear inwardly turned portion 30 at the right hand end thereof which extends at an angle of about 45° with the underside of the seat 12. A pair of opposite ears 31 are carried by the under turned portion 30 and fit within the flanges 21, as shown. The back adjusting mechanism 15 is secured to the underside of the portion 30 by four rivets 32.

The adjustable back support mechanism 15 comprises a channel member 35 (shown in perspective in Fig. 4) attached by the rivets 32 to the underside of the part 30. The rivets 32 pass through four rivet holes 36 (Fig. 4) provided therefor in the web 37 of the channel member 35. Thus, when attached, the channel member 35 extends upwardly at an angle from and to the rear of, the chair seat 12. For proper relative horizontal and vertical movement of the back 13 relative to the seat 12, it has been found that this angle should be about 45°.

A detachable bearing plate 38 is fastened to the upper end of the channel member 35 as shown in Fig. 1. The bearing plate 38 is in the form of an angle member one leg of which is

secured to the top side of the channel member 35 by a pair of screws 40 and the other leg 41 of which extends across the upper end of the channel member 35 in between the side flanges 42 thereof. The leg 41 of the bearing plate 38 has an aperture provided therein in which a screw 43 is journaled for rotation. The screw 43 extends lengthwise in between the flanges 42 of the channel member 35 and may be supported at its lower end in an apertured turned up portion 44 (Fig. 4). A hand wheel 45 is keyed to the upper end of the screw 43 which projects above the bearing plate 38 so as to provide for manual rotation of the screw. A collar 46 secured to the screw 43 adjacent the leg 41 together with the hand wheel 45 fitting against the upper side of the leg 41, serve to prevent longitudinal movement of the screw 43 relative to the bearing plate 38.

The shiftable element of the adjustable back supporting mechanism 15 is in the form of a relatively short channel-shaped carriage member 50, shown in perspective in Fig. 3. The carriage member 50 has a pair of side flanges 51 which are longitudinally slidable in interlock relationship within the turned over flanges 42 of the channel member 35 as shown in Fig. 2 of the drawing. Thus, the flanges 42 serve as guides for the carriage 50. The web portion 52 of the carriage member 50 is spaced opposite from the web portion 37 of the channel member 35 with the screw 43 disposed therebetween. In assembling the mechanism 15 the carriage member 50 is inserted in the channel member 35 before the bearing plate 38 is attached to the upper end thereof.

A portion 53 (Fig. 3) of the web of the carriage 50 is turned up vertically in between the side flanges 51 and is provided with a threaded aperture 54, as shown. When the carriage member 50 is in place in the mechanism 15, as shown in Fig. 1, the threaded aperture 54 is threadedly engaged by the screw 43 so that the carriage member 50 may be worked along the screw 43 in opposite directions depending upon the direction of rotation thereof.

A back support member 55 is attached to the web portion 52 of the carriage 50 by four rivets 56 passing therethrough. The end portions 57 of the back support member 55 are vertical while the center portion 58 attached to the carraige 50 is twisted at an angle of about 45° therewith. The two parallel sides 60 of the chair back 13 are secured at their lower ends to the end portions 57 of the chair support member 55.

In operation, when the screw 43 is turned clockwise by turning the hand wheel 45, the carriage 50 will be worked upwardly therealong, guided by the flanges 42, and carrying with it the back support member 55 to which the chair back 13 is attached. In this manner, the chair back 13 is moved or shifted horizontally away from the back edge of the seat 12 the same distance that it is vertically raised above the seat 12. Thus, the seat length and the back height of the chair 10 are simultaneously increased in the same ratio. Conversely, when the screw 43 is rotated counterclockwise by turning the hand wheel 45, the carriage 50 will be worked downwardly therealong so as to carry with it the back support member 55 and the back 13. Thus, the back 13 will be horizontally shifted toward the back edge of the chair seat 12 the same amount that it is vertically lowered thereabove. Since only the weight of the chair back 13 is involved, this adjustment may be conveniently and easily made by a person seated in the chair 10.

Since changes may be made in the described construction and different embodiments of the invention made without departing from the scope thereof, it is intended that all matter shown in the accompanying drawing or described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

I claim:

A posture chair of the type described, comprising a seat, a back, and means adjustably supporting said back relative to said seat whereby, when said back is raised vertically, it is simultaneously shifted horizontally away from said seat so as to increase the seat length of the chair when the back height thereof is increased and whereby, when said back is lowered vertically, it is simultaneously shifted horizontally toward said seat so as to decrease the seat length of the chair when the back height thereof is decreased, said adjustable back supporting means comprising, in combination, a channel member with the edges of the flanges thereof turned in towards each other, means for rigidly mounting said channel member adjacent to the back edge of said seat with the web portion thereof uppermost so that the member extends upwardly at an angle from, and to the rear of, said seat, a detachable bearing plate fastened across the upper end of said channel member with an aperture therein between the flanges of said channel member, a screw journaled for rotation in the aperture of said bearing plate and extending lengthwise in between the flanges of said channel member, means for preventing longitudinal movement of said screw relative to said bearing plate, a hand wheel secured to the end of said screw which projects above said bearing plate so as to provide for manual rotation thereof, a relatively short channel-shaped carriage member having flanges which are longitudinally slidable in interlock relationship within said turned-over flanges of said channel member, the web portion of said carriage member being spaced opposite to that of said channel member with said screw disposed therebetween, a portion of the web of said carriage member being turned inwardly at right angles thereto and having a threaded aperture provided therein which is threadedly engaged by said screw which extends therethrough, and a back support member for said chair back fastened to the web of said carriage member so as to be movable therewith, said carriage member being worked in opposite directions along said screw depending upon the direction of rotation thereof.

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