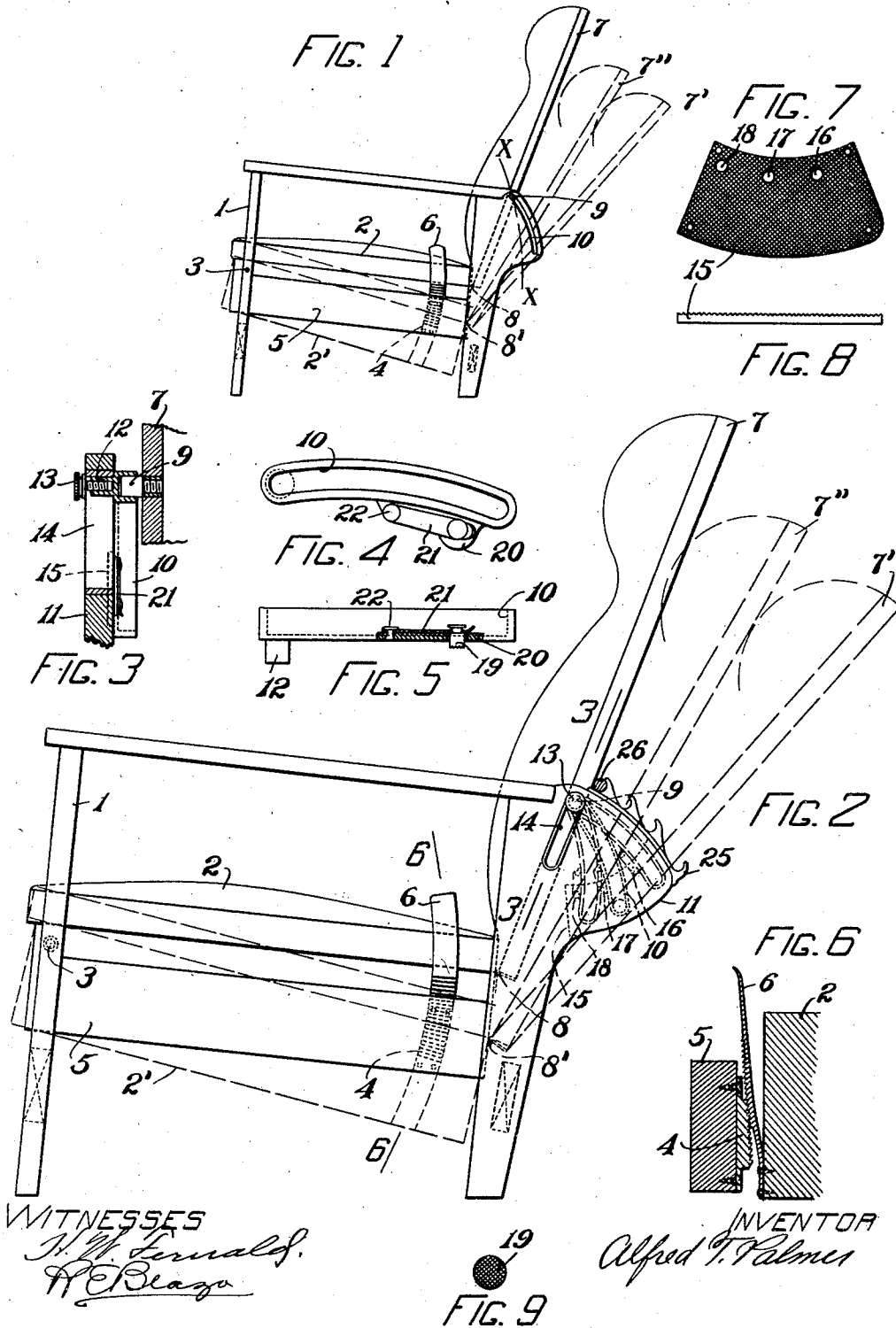


A. T. PALMER.
ADJUSTABLE CHAIR.
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ALFRED T. PALMER, OF BOSTON, MASSACHUSETTS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALFRED T. PALMER, a citizen of the United States, and residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Adjustable Chairs, of which the following is a specification.

This invention relates to adjustable chairs and particularly to that class with hinged seats.

The principal object sought is to provide a back capable of independent movement which is automatically controlled by the swinging seat.

Further refinements of adjustment and control which admit of non-control without dis-engagement, are among the lesser features of the invention.

The desirability of a swinging seat is generally understood, it being designed for the purpose of resisting the tendency of the occupant to slide forward as the body takes a more recumbent position when the chair back is inclined, as in the common rigid-seat Morris chair. It is also desirable that, as the rear of the seat is depressed, the angle between back and seat should be increased, as the comfort of the user then demands a more extended position of the body. To satisfy this latter demand, I have invented and here illustrate a means for causing the seat to automatically control this change of angle, and, by making said means adjustable, have succeeded in varying this control, as will be explained. As a further adjustment, I have so designed this means that it can be rendered inoperative at any time, without dis-engagement, so as to permit separate adjustment of the back.

In the drawings, which accompany and form part of this application, Figure 1 is a side view of a chair embodying my invention in its simplest form. Fig. 2 is a similar view of my preferred form. Fig. 3 is a sectional detail on line 3—3 of Fig. 2. Figs. 4 and 5 are details of the guiding groove. Fig. 6 is a sectional detail on line 6—6 of Fig. 2. Figs. 7 and 8 are detail views of the lock-plate. Fig. 9 is an end view of the lock-pin.

The frame 1 carries a seat 2, pivoted at 3, and maintained in its various positions by ratchet plates 4 secured to side-bars 5 of the frame, said ratchet-plates co-acting with spring pawls 6, secured to seat 2.

The back 7, pivoted at 8 to seat 2, carries

projecting pins or guides 9 adapted to engage guiding grooves 10 mounted or formed in frame 1. These grooves are preferably curved and, in Fig. 1, the essential feature governing their position is that pins or guides 9, as they descend in said grooves, shall fall without the arc X—X, which arc is formed with radius 3—9.

Upon inspection of Fig. 1, it will be noticed that when the seat is depressed to position 2', the back is compelled to take the position 7'. Had the grooves 10 followed the arc X—X, the back would have taken the position 7'', and the angle between seat and back would have remained unchanged. Reference to this feature will again be made in the discussion of the other figures.

In the preferred form, the guiding grooves 10 are formed in separate castings, one to be pivotally mounted on the inner face of each of the side-arms 11. These grooves are each formed with a projecting, threaded socket 12 at one end, which socket is adapted to receive the threaded end of a locking thumb-nut 13 which passes through an aperture 14 in side-arm 11 for the purpose of securing this pivoted point of groove 10 in proper position.

For a purpose presently to be described, groove 10 is formed on an arc whose radius is 8—9 and, in Fig. 2, it is adapted to be secured in three positions by means of a lock-plate 15 secured to side-arm 11, said lock-plate being provided with three recesses 16, 17 and 18, each adapted to receive a lock-pin 19 which is free to play in a recess in lug 20 on the groove casting. Lock-pin 19 is fastened to spring 21 which, in turn, is secured to lug 20 by rivet 22. The free end of spring 21 is slightly upturned to facilitate the withdrawal of lock-pin 19 from either of the recesses 16, 17 or 18.

For a purpose which will later appear, I prefer to knurl or otherwise roughen the projecting end of lock-pin 19 and also the exposed surface of lock-plate 15, as is illustrated in Figs. 5, 7, 8 and 9.

Recess 17 is designed to secure groove 10 in position so as to automatically compel an increase of angle between seat and back as former is depressed; but, as the comfort of some users might make it necessary to maintain this angle unchanged, I provide recess 18 for securing groove 10 for that purpose. The extremes of groove 10 in this position are on the arc X—X, before referred to,

hence it will be seen that, theoretically, the precise angle is not maintained in the middle positions of seat 2, due to the difference between radii 8—9 and 3—9; but this difference is so small as to be negligible, particularly as the slight error is in favor of an increase in the angle, so the phrase "maintaining the angle" is to be taken in view of this fact. Thus, in the two positions 17 and 18, grooves 10 enable seat 2 to automatically control this angle. As a further adjustment, I provide recess 16 for use when the seat is in its highest position and it is desired to release the back of the chair from control by the seat. This will permit free and independent adjustment of back 7, the same being controlled by racks 25 and a rod 26, as in ordinary Morris-chairs, without necessitating dis-engagement of pins 9 with grooves 10. As it might also be desirable to similarly release back 7 in the inclined positions of seat 2, I have provided an elongation of aperture 14 to permit the shifting of the socket 12 until groove 10 occupies the same radial relation to the inclined hinge 8' as recess 16 compels it to assume with hinge 8 in Fig. 2. Before shifting socket 12, lock-pin 19 must be withdrawn from lock-plate 15 and the free end of groove 10 need not be locked, as it is no longer a controlling agency, for rack 25 and rod 26 are again employed to control back 7.

It will be noticed as an added function of the elongated aperture 14, that a partial dropping of socket 12, not to the position noted above, permits a considerable increase in the angle between seat and back above that permitted before such drop, but does not surrender the control, as the nurling on lock-plate 15 and lock-pin 19 insure a sufficient lock for the free end of groove 10.

In summing up, the drawings illustrate the groove 10 in two positions of automatic control, although more could be provided, if necessary, and one position of non-control, while the method of securing universal control or non-control has been described. It is thus seen that my improved chair can be so adjusted as to either automatically maintain or automatically increase the angle between seat and back, as the former descends, or it can be freed entirely from automatic control without dis-engagement of the controlling means.

But one side of a chair is shown in the drawings but it will be understood that the mechanism is to be provided in pairs, each side-arm 11 being similarly equipped.

I do not limit myself to the precise construction shown.

What I claim is:—

1. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various posi-

tions and a back pivotally mounted on said seat, in combination with guiding means adapted to automatically increase the angle between seat and back as the former is lowered.

2. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with adjustable guiding means adapted to automatically increase the angle between seat and back as the former is lowered.

3. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with guide-controls mounted on said frame, and guides mounted upon said back and adapted to so engage said guide-controls as to automatically increase the distance from the seat pivot to said guides as the seat is lowered.

4. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with adjustable guiding means whereby said seat automatically controls the angle between itself and back.

5. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with adjustable guide-controls mounted on said frame, and guides mounted on said back and adapted to cooperate with said guide-controls to insure automatic control by said seat of the angle between seat and back.

6. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with guides mounted on said back, and guiding-grooves which are bodily adjustable on said frame and are adapted to engage and control the movement of said guides so as to permit said seat to automatically control the angle between seat and back.

7. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with guides mounted on said back, and guiding-grooves which are pivotally adjustable on said frame and are adapted to engage and control the movement of said guides so as to permit said seat to automatically control the angle between seat and back.

8. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for

maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with guide-controls mounted on said frame, and guides mounted on said back and adapted to engage with said guide-controls to permit automatic control by said seat of the angle between itself and said back, and means whereby said guide-controls may be so positioned as to release such control without dis-engagement with said guides.

9. In an adjustable chair, a frame, a seat pivotally connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guide-controls pivotally mounted on said frame, and guides mounted on said back and adapted to cooperate with said guide-controls, and means whereby said guide-controls may be so secured on said frame as to insure automatic control, by said seat, of the angle between seat and back.

10. In an adjustable chair, a frame, a seat adjustably connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guide-controls pivotally mounted on said frame and guides rigidly mounted on said back and adapted to engage with said guide-controls, and means whereby said guide-controls may be alternately positioned to insure or release control by said seat, of the angle between seat and back without disengaging said guides.

11. In an adjustable chair, a frame, a seat adjustably connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat in combination with guideways pivotally mounted on said frame and guides mounted on said back and adapted to so engage said guideways as to permit control by said seat of the angle between seat and back, and means for securing said guideways in alternate positions about their pivots so as to insure or release such control, as desired.

12. In an adjustable chair, a frame, a seat adjustably connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat in combination with guideways adjustably mounted on said frame and guides mounted on said back and adapted to so engage said guideways as to permit control by the seat, of the angle between seat and back, means whereby the guideways may be variously positioned with respect to said frame, and means for securing said guideways in their various positions.

13. In an adjustable chair, a frame, a seat adjustably connected with said frame,

means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guideways pivotally mounted on said frame and guides mounted on said back and adapted to so engage said guideways as to permit control, by said seat, of the angle between seat and back, means whereby the guideway pivots may be variously positioned with respect to the frame, means adapted to secure the guideway pivots in their various positions and means for securing the free ends of the guideways in their various positions.

14. In an adjustable chair, a frame, a seat adjustably connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guideways pivotally mounted on said frame and guides mounted on said back and adapted to so engage said guideways as to permit control, by said seat, of the angle between seat and back, means whereby the guideway pivots may be moved with respect to the frame and means whereby said guideway pivots may be so secured to said frame as to release all control of said angle, without dis-engagement of said guides.

15. In an adjustable chair, a frame, a seat pivotally connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guiding grooves pivotally mounted on said frame and guide-pins fast on said back and adapted to engage said grooves so as to permit control, by said seat, of the angle between seat and back, and adjustable locking means whereby the free ends of said grooves may be alternately positioned so as to insure or release such control without dis-engagement of said guide-pins.

16. In an adjustable chair, a frame, a seat pivotally connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guideways pivotally mounted in grooved apertures on said frame, said grooved apertures adapted to permit adjustment of the guideway pivots with respect to said frame and guides mounted on said back and adapted to so engage said guideways as to permit automatic control, by said seat, of the angle between seat and back, and adjustable locking means for securing the free ends of said guideways in any desired position.

17. In an adjustable chair, a frame, a seat pivotally connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guideways pivotally mounted on said frame, and guides mounted on said back and adapted to

so engage said guideways as to permit control, by said seat, of the angle between seat and back, a locking-plate secured to said frame and a spring-controlled pawl secured to said guideways and adapted to engage said locking-plate in any position of said guideways to form a lock for said guideways.

18. In an adjustable chair, a frame, a seat pivotally connected with said frame, means for maintaining said seat in its various positions and a back pivotally connected with said seat, in combination with guideways having a threaded pivot at or near one end, and a locking-bolt adapted to engage said pivot for the purpose of securing the guideways pivotally on said frame, guides mounted on said back and adapted to engage said guideways so as to permit automatic control, by the seat, of the angle between seat and back, and locking means

adapted to secure the free ends of said guideways in any desired position with respect to said frame.

19. In an adjustable chair, a frame, a seat pivotally mounted on said frame, means for maintaining said seat in its various positions and a back pivotally mounted on said seat, in combination with guiding grooves mounted on said frame, the descending path of which gradually recedes from the pivot-point uniting said seat and frame, and guides mounted on said back and adapted to so engage said grooves as to automatically increase the angle between seat and back, as the former is depressed.

In testimony whereof I have affixed my signature, in presence of two witnesses.

ALFRED T. PALMER.

Witnesses:

B. E. BLAZO,
C. A. WYATT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."