

No. 795,504.

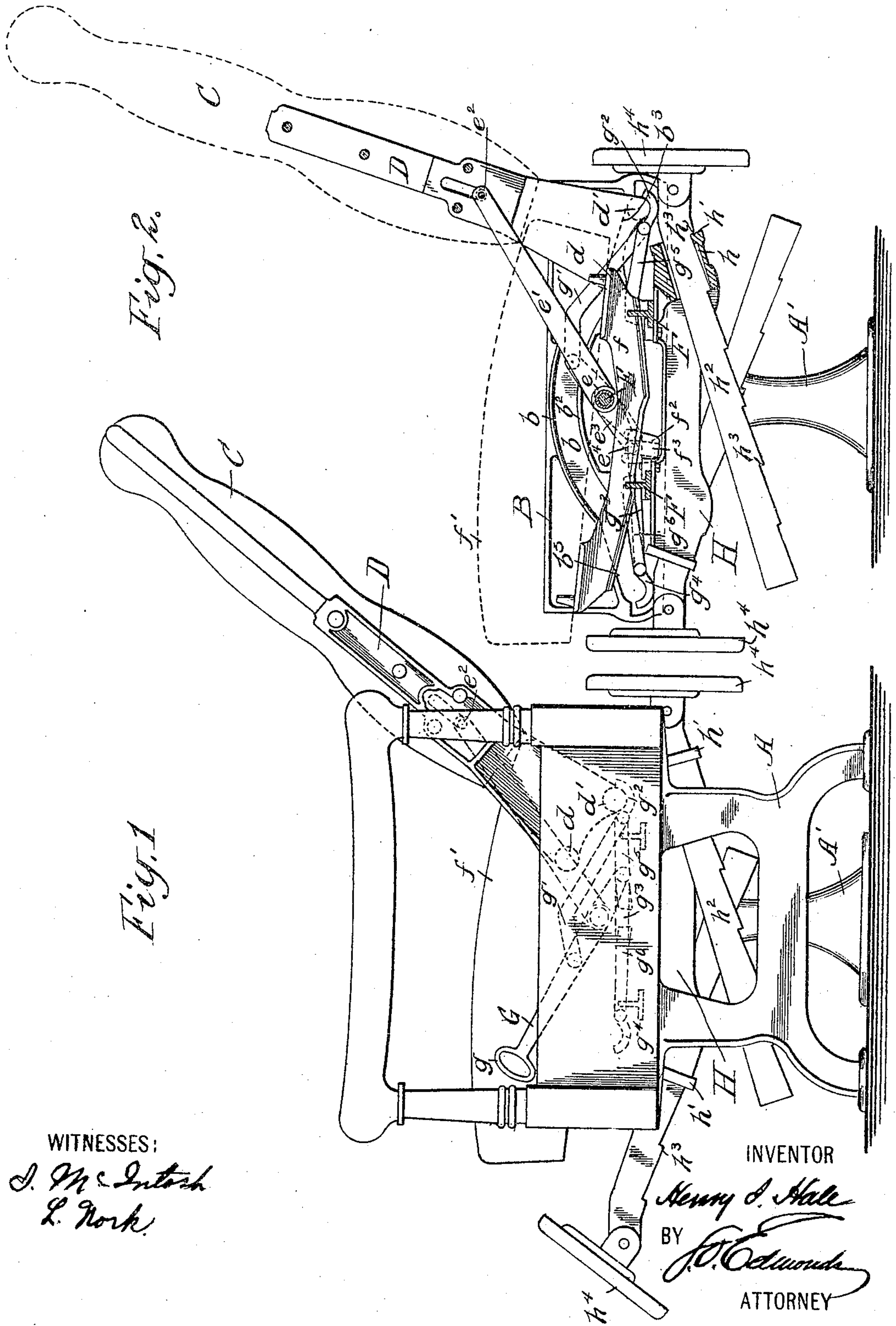
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H. S. HALE.

SEAT.

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2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

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SEAT.

No. 795,504

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY S. HALE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Seats, of which the following is a description.

The object of the present invention is to provide a seat in which the inclination of the back may be readily and easily governed by the occupant of the seat, such inclination being changed at will without requiring the occupant to rise.

A further object is to provide a seat which in one embodiment shall be not only adjustable as to the inclination of the back, but shall also be reversible in order that the seat and back may face in either direction.

A further object is to provide a seat of the character last referred to in which the reversal of the back shall be accompanied by a corresponding reversal of the seat-cushion.

A further object is to construct a seat having an adjustable back and in addition an extension foot-rest, which shall also be adjustable to various positions to support the limbs or feet of the occupant of the seat.

The invention may be embodied in any one of several forms, each designed for its own particular use. Thus it may be utilized to advantage in the construction of a house-chair, in which case the back while being adjustable as to inclination need not necessarily be reversible. Again, it may be utilized to advantage in a car-seat, in which case the back in addition to being adjustable as to inclination will also preferably be reversible, although if the structure be mounted upon a pivot—as, for instance, in the manner observed in parlor-car-chair construction—the back need be adjustable only as to inclination, but not reversible. Again, if desired, the invention may be utilized in the construction of twin reclining-chairs for railway-cars, in which case two chairs or seats will be mounted side by side upon suitable supports, each chair preferably being operable independently of the other.

In carrying out the invention in the form last referred to, for example, I provide a suitable frame in which the back-supporting arm or bracket is movably mounted—as, for instance, by studs or sheaves carried by the lat-

ter and coacting with a guide-groove carried by the side plates of such frame. Mounted upon sills extending between the side plates of the frame are cushion-supporting rockers, and between the same and the back arms or brackets are levers, which when the back is reversed transmit movement to the seat-cushion to correspondingly shift and cant the same. In either facing direction of the seat mechanism the back is adapted to occupy what I may term the “normal position,” this having the inclination or substantially the inclination of the back of an ordinary reversible “walkover” seat. By means, however, of a hand-lever in position to be operated by the hand of the occupant of the seat and connections between the same and the arms or brackets which support the back the inclination of such back may be readily varied to permit the occupant of the seat to recline in a comfortable position. Below the mechanism just referred to I provide extension foot-rests, which may be drawn out to the proper position, whereupon they will automatically lock themselves, so as to retain this position until again restored manually to their original (inoperative) position.

In the drawings, in which the invention has been illustrated in one of the several forms above referred to, (*i. e.*, twin reversible reclining-chairs for railway-vehicles,) Figure 1 is an end view illustrating a single seat in elevation. Fig. 2 is a central vertical section of the seat illustrated in Fig. 1, one of the foot-rests, however, occupying a different position; and Fig. 3 is a front view of a twin-chair structure, one of the chairs being shown in elevation and the other in central section.

Referring to these drawings, in which similar letters denote corresponding parts, I premise with the statement that whether the chairs be arranged in pairs or not each chair is complete in itself and preferably independent of another chair. Where the chairs are employed in pairs, as shown in Fig. 3, the structure as a whole will preferably be supported by means of the frame-leg A at the aisle end, the intermediate leg A', and the wall-end leg A², which may, however, be omitted, the frame-plate carried thereby being secured direct to the wall of the car. Carried by the supporting-legs are side plates B, each provided on its inner surface with

a guide-groove b , defined by inwardly-projecting ribs b' b'' . Each of these guide-grooves is centrally arched, as clearly shown in Fig. 2, both ends, however, being substantially straight and inclined, as shown at b^3 , the incline being such as to determine the normal position of the back supported in said guide-grooves, as hereinafter described.

The back-cushion C is mounted, either detachably or rigidly, upon supporting arms or brackets D, the lower end of each of which is provided with sheaves or studs d d' , coacting with and of such size as to snugly fit in one of the guide-grooves b .

E designates a rock-shaft extending through and journaled in the side plates of the seat-frame, and pivoted loosely upon such rock-shaft by means of sleeve e are two levers e' , the upper ends whereof are provided with studs e^2 , coacting with slots which may be formed in the back-supporting arms or brackets D. The sleeve e is provided with arms e^3 , having inwardly-projecting pins e^4 for actuating the rockers, as will presently be explained.

F F designate sills secured to and extending between the side plates B of the frame. Near each end these are recessed, as shown in Fig. 3, to receive cushion-supporting rockers f , carrying the cushion f' , and each of which rockers is provided with a depending ear f^2 , having a substantially vertical slot or recess f^3 , with which coacts the pin e^4 on the corresponding extension e^3 of one of the levers e' . It will thus be seen that the movement of the back C is transmitted through the supporting-arms D and levers e' to the cushion-supporting rockers, so that the movement of such back correspondingly shifts and cants the cushion.

Keyed or otherwise secured upon the rock-shaft E are rocking levers G G', one of which is here shown as provided with a handpiece g . Obviously the movement of one or both of said rocking levers forward or rearward of the seat will cause the rotation or partial rotation of the rock-shaft E, and such rock-shaft is provided at either side of the seat with connections (including said rocking levers) for governing the inclination of the back. Since these connections are preferably the same at both ends of the rock-shaft, save that one of said levers is provided with said handpiece g , those at one end only need be described in detail. Pivoted to the rocking lever G, above the point at which such lever is mounted upon the rock-shaft E, is an arm g' , the distant end whereof is curved to form a stirrup g^2 , coacting with one corner of the back-supporting arm or bracket D in the position in which such arm or bracket is shown in Figs. 1 and 2. Also pivotally connected with said rocking lever G, but at a point below that at which said lever is mounted upon the rock-shaft E, is another arm g^3 , the distant end whereof is curved to form a stirrup

g^4 , coacting with the other corner of the back-supporting arm or bracket D when the back is in reverse position—i. e., the position opposite to that shown in Figs. 1 and 2.

In the position in which the parts are shown in Fig. 2 the back, being in normal position, is supported wholly in the straight inclined portions b^3 of the guide-grooves b , the slight inclination of the back being determined by the inclination of such portions b^3 independently of the rocking lever G and its connections just described. If, now, the occupant of the seat wishes to further incline the back—as, for example, to move it to the position shown in Fig. 1—the rocking lever G (lying in position to be readily grasped by the hand) may be moved forward, thereby, through the arm g' and stirrup g^2 , moving the lower ends of the back-supporting arms D, so that the forward studs or sheaves d will move a short distance within the arched portions b^2 of the guide-grooves b , the studs or sheaves d' remaining, however, in the straight inclined portions b^3 of such guide-grooves. This movement of the lower ends of the back-supporting arms D results in further tilting or inclining the back C, as shown in Fig. 1, and almost any degree of movement may be provided for in the manner described. That degree illustrated in said figure will, however, under ordinary conditions be quite sufficient.

In practice I prefer to omit the lower ribs b^2 of the guide-grooves b in constructing the straight inclined portions b^3 of such grooves, in which case the outer corners of the back-supporting arms or brackets D will coact with the stirrups g^2 and g^4 for support. Also I provide the arms g' and g^3 with pivoted stop-arms g^5 and g^6 . Should the sheaves or studs d move rearwardly so far as to pass beyond the lower ribs b^2 of the arched portions of the guideway, they would coact with said stop-arms for support, said arms constituting, in effect, movable lower boundary-ribs for the straight inclined portions of said guideways.

Turning now to the foot-rest mechanism, this is best shown in Fig. 2. Secured to the under side of the T-iron sills F is a casting H, provided at each end with a socket h , having stop-shoulder h' . Operating in each of said sockets is a foot-rest bar h^2 , the under side whereof is here shown as toothed or serrated at h^3 , and the upper end of each of said bars having movably secured to it a foot-rest h^4 . Any desired form of hinged joint between the foot-rest h^4 and bar h^2 may be employed, and, if desired, an ordinary set-screw or thumb-nut may be utilized to lock the rest in any desired position relatively to the bar. In order to move one of the foot-rests from the inoperative position (illustrated in Fig. 2) to an operative position—as, for instance, that illustrated in Fig. 1—it is only necessary to draw the rest and bar outwardly, whereupon the same will be held in this position

by the engagement of the teeth or serrations on the under side of the bar with their coacting stop-shoulder *h'*.

As hereinabove indicated, I have attempted to do no more in the foregoing explanation than to describe one of the several forms in which the invention may be embodied. In other forms but a portion of the mechanism illustrated and described need be employed. Thus in constructing an adjustable-back house-chair no provision need be made for reversal, and in such case the guide-groove may be curtailed in length, the same being but half or less than half the extent illustrated and described herein. Again, unless desired no provision need be made in such a chair for the reversal of the seat-cushion; nor, in fact, need such provision be made where the invention is embodied in a revolving chair of the general type used in parlor-cars. In the construction herein described in detail, as well as in the other forms referred to, the arrangement of the parts for supporting and adjusting the back is such as to at all times hold the back rigidly in any position to which it may be moved, this being due primarily to the positive mechanical coaction between the sheaves or studs carried by the back-supporting arms and the side walls of the guide-grooves or other supports in which such sheaves or studs operate, and, secondarily, to the coaction between the rocking lever and such back-supporting arms, this coaction being assured in any (operative) position to which the back may be moved.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In a seat, the combination with a supporting-frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions extending outwardly from said arched portions, and back-supporting arms carrying a back, the lower ends of said arms being provided with studs or sheaves coacting with said guide-grooves, substantially as set forth.

2. In a seat, the combination with a supporting-frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions at each end of said arched portions and extending outwardly therefrom, and back-supporting arms carrying a back, the lower ends of said arms being provided with studs or sheaves coacting with said guide-grooves, substantially as set forth.

3. In a seat, the combination with a supporting-frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions extending outwardly from said arched portions, back-supporting arms provided with studs or sheaves coacting with

said guide-grooves, cushion-carrying rockers supported by said frame, and connections between the same and said back-supporting arms, substantially as set forth.

4. In a seat, the combination with a supporting-frame including side plates, of back-carrying arms and means for movably supporting the same within guide-grooves in said side plates, and manually-actuated mechanism supported by said frames and coacting with said back-carrying arms to move the lower ends thereof in said guide-grooves relatively to the upper ends thereof and correspondingly incline said arms, substantially as set forth.

5. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and having arched portions and connected straight inclined portions extending outwardly therefrom, back-carrying arms having sheaves or studs coacting with said guide-grooves, a seat-cushion, and mechanism adjacent thereto and coacting with the lower ends of said back-carrying arms for moving the sheaves or studs carried thereby within said guide-grooves, substantially as set forth.

6. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and having arched portions and connected straight inclined portions extending outwardly therefrom, back-carrying arms having sheaves or studs coacting with said guide-grooves, a seat-cushion, a lever, and connections between the same and the lower ends of said back-carrying arms for moving the sheaves or studs carried thereby within said guide-grooves, substantially as set forth.

7. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and having arched portions and connected straight inclined portions extending outwardly therefrom, back-carrying arms having sheaves or studs coacting with said guide-grooves, a seat-cushion, a rock-shaft extending between the side plates of said frame, a lever carried thereby, and a connection between the same and the lower ends of said back-carrying arms for moving the sheaves or studs carried thereby within said guide-grooves, substantially as set forth.

8. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions extending outwardly therefrom, back-carrying arms having studs or sheaves coacting with said guide-grooves, a rock-shaft extending between said side plates, an actuating-lever connected therewith, and arms connected with said lever and coacting with the lower ends of said back-carrying arms, substantially as set forth.

9. In a seat, the combination with a frame

including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions, back-carrying arms having studs or sheaves coacting with said guide-grooves, a rock-shaft extending between said side plates, an actuating-lever secured thereto, an arm secured to said lever above said rock-shaft, and another arm secured to said lever below said rock-shaft, the ends of said arms being adapted to coact with the lower ends of said back-carrying arms, substantially as set forth.

10. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions, back-carrying arms having studs or sheaves coacting with said guide-grooves, a rock-shaft extending between said side plates, an actuating-lever secured thereto, an arm secured to said lever above said rock-shaft, and another arm secured to said lever below said rock-shaft, the ends of said arms having curved portions or stirrups coacting with the lower ends of said back-carrying arms, substantially as set forth.

11. In a seat, the combination with a frame including side plates, of guide-grooves formed in said side plates and including arched portions and connected straight inclined portions, back-carrying arms having studs or sheaves coacting with said guide-grooves, a rock-shaft extending between said side plates, an actuating-lever secured thereto, an arm secured to said lever above said rock-shaft, another arm

secured to said lever below said rock-shaft, the ends of said arms being adapted to coact with the lower ends of said back-carrying arms, and stop-arms carried by the arms secured to said lever, substantially as set forth.

12. In a seat, the combination with a supporting-frame, including side plates having guide-grooves, of back-carrying arms supported in said guide-grooves, a rock-shaft extending from one side to the other of said seat, rocking levers secured thereto and connections between said rocking levers and the lower ends of said back-carrying arms and operable to effect the inclination of said arms by moving the lower portions thereof in said guide-grooves relatively to the upper portions of said arms, substantially as set forth.

13. In a seat, the combination with a supporting-frame including side plates, of a back, arms depending therefrom and supported and guided in guide-grooves in said plates, a cushion carried by said frame, and a hand-lever in proximity to said cushion, said hand-lever having connections extending between the same and said back-supporting arms, for effecting the adjustment of said arms and back by moving the lower portions thereof relatively to the upper portions thereof, substantially as set forth.

This specification signed and witnessed this 26th day of September, 1904.

HENRY S. HALE.

Witnesses:

GEO. H. RAPSON,
JAMES A. MARTIN.