A. D. LUEDDERS.

ADJUSTABLE CHAIR.

APPLICATION FILED MAR. 31, 1909.

978,386.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

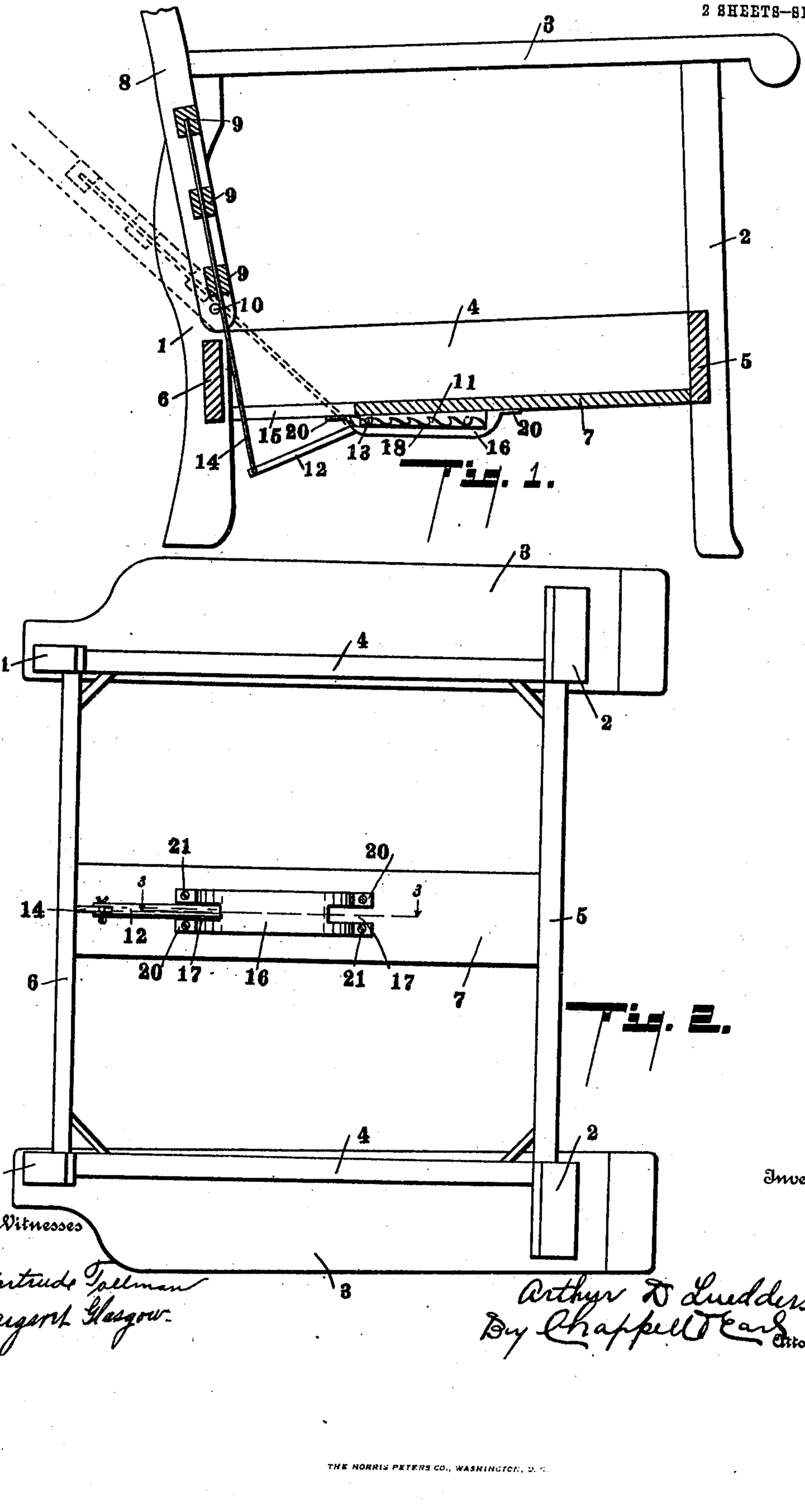

Fig. 1.

Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

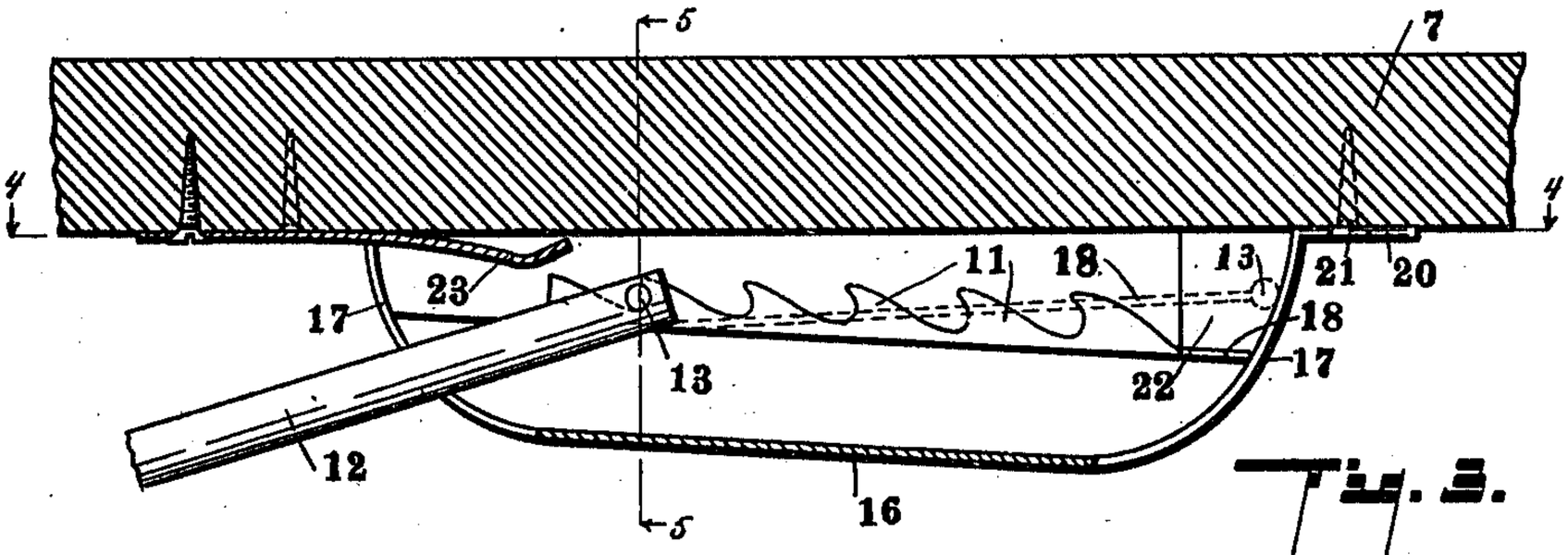

Fig. 3.

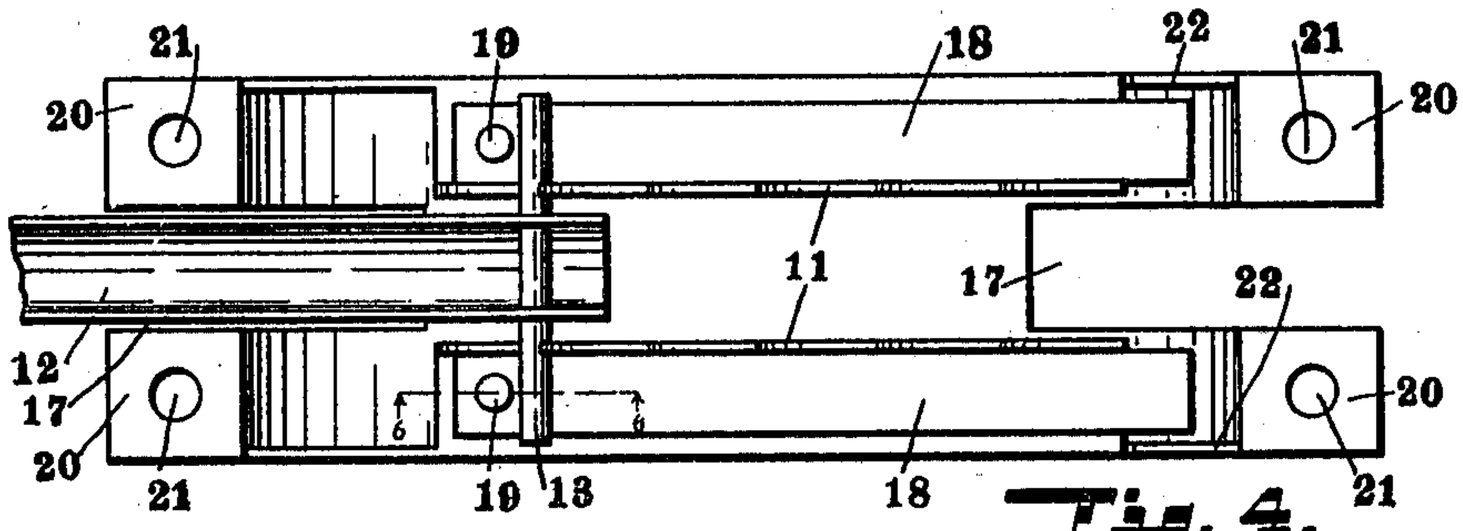

Fig. 4.

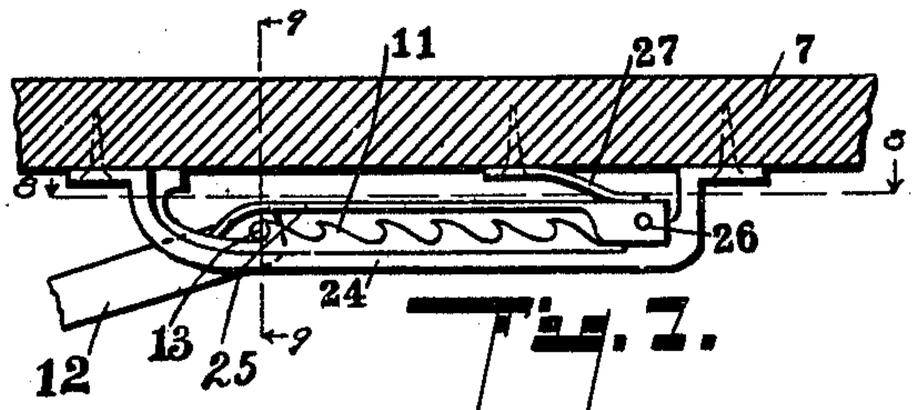

Fig. 7.

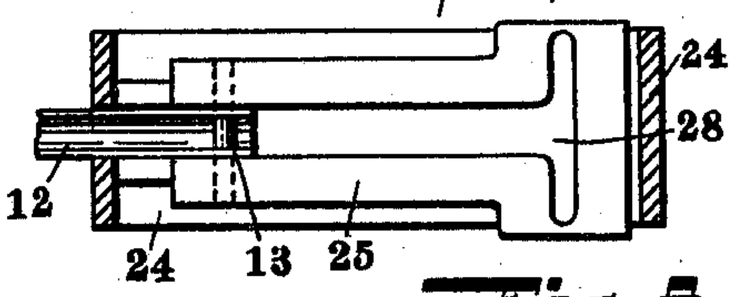

Fig. 8.

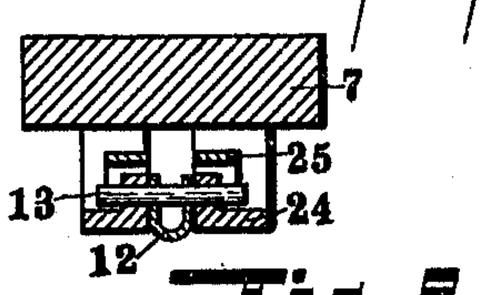

Fig. 9.

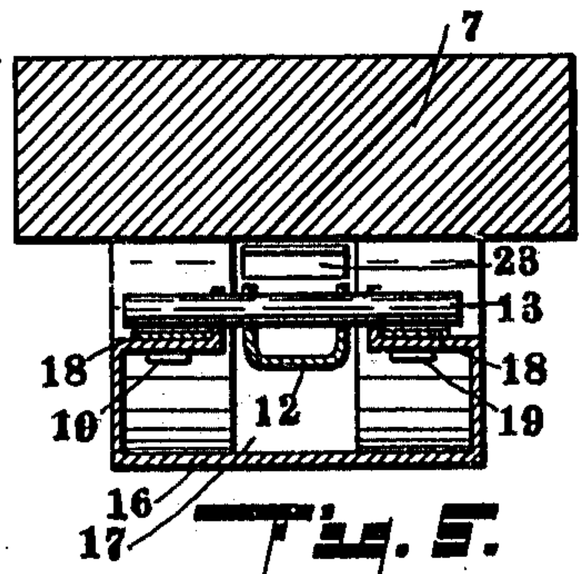

Fig. 5.

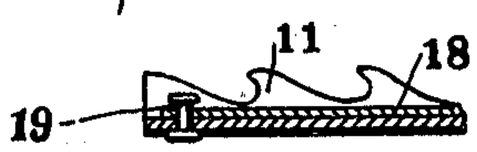

Fig. 6.

Witnesses

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UNITED STATES PATENT OFFICE.

ARTHUR D. LUEDDERS, OF STURGIS, MICHIGAN, ASSIGNOR TO JERROLD F. WALTON, OF STURGIS, MICHIGAN.

ADJUSTABLE CHAIR.

978,386. Specification of Letters Patent. **Patented Dec. 13, 1910.**

Application filed March 31, 1909. Serial No. 486,965.

To all whom it may concern:

Be it known that I, ARTHUR D. LUEDDERS, a citizen of the United States, residing at the city of Sturgis, county of St. Joseph, State of Michigan, have invented certain new and useful Improvements in Adjustable Chairs, of which the following is a specification.

This invention relates to improvements in adjustable chairs.

The main objects of this invention are: First, to provide an improved adjustable chair in which the back can be easily adjusted by the occupant on the chair, the adjustment being effected entirely through the manipulation of the back. Second, to provide an improved chair having an adjustable back in which the adjustable mechanism is automatic,—that is, no hand manipulated disengaging or releasing means are required.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail vertical section of a structure embodying the features of my invention. Fig. 2 is an inverted plan view thereof. Fig. 3 is an enlarged detail vertical section, taken on a line corresponding to line 3—3 of Fig. 2, the link 12 being shown in full lines. Fig. 4 is a detail view, taken on a line corresponding to line 4—4 of Fig. 3. Fig. 5 is a detail section, taken on a line corresponding to line 5—5 of Fig. 3. Fig. 6 is an enlarged detail taken on a line corresponding to line 6—6 of Fig. 4. Fig. 7 is a detail view of a modified construction of the supporting rack. Fig. 8 is a horizontal section, taken on a line corresponding to line 8—8 of Fig. 7. Fig. 9 is a vertical section, taken on a line corresponding to line 9—9 of Fig. 7.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the chair frame preferably consists of the rear posts 1 and the front posts 2, which are extended to form the legs of the chair. On the upper ends of the posts are the arms 3. The posts are connected by suitable side pieces 4 and the front and rear cross pieces 5 and 6, respectively. The frame is also preferably provided with a horizontally-arranged frame piece 7 by which the adjusting mechanism is supported—see Fig. 2. The back is preferably made up of the side bars 8 and the cross bars 9. The back is hinged at its lower end on suitable pivots, as 10. The details of the hinge connections are not here illustrated, as they form no part of this present invention. On the under side of the frame piece 7 is a rack having rearwardly-facing teeth 11. This rack is preferably made up of two rack members, as is illustrated in Figs. 1 to 6, inclusive.

The link 12 is provided with laterally-projecting rack-engaging members 13 at its forward end, its rear end being pivotally connected to the downwardly-projecting arm 14 which is secured to the back preferably being arranged through the cross pieces 9 thereof, as is illustrated in Fig. 1, the lower end of the arm being arranged within the frame and through a slot 15 provided therefor in the frame piece 7. The rack-engaging members 13, engage the teeth of the rack, to support the back in its adjusted position. To make the adjustment practically automatic, I provide a return way 16 for the link. This receives the link when it passes from the rear end of the rack and guides its return to the forward end of the rack. The way 16 is curved upwardly at 17 at the forward end of the rack to raise the end of the link as it is pushed forwardly.

The guide pieces 18 are arranged to coact with this upturned portion of the way for guiding the rack-engaging members of the link to the forward end of the rack. These preferably consist of the metal strips pivotally or loosely mounted on the rivets 19, so that, as the link is guided upwardly by the part 17 of the return way, these guide pieces are raised, as indicated by dotted lines in Fig. 3, and drop under the rack-engaging members 13 so that, on the rearward movement of the link, the rack engaging members are guided to the teeth. The return way and the rack are preferably formed of a single

piece of sheet metal, as is illustrated in Figs. 1 to 6, inclusive, the edges being bent upwardly and thence inwardly and thence upwardly, the teeth being formed on the edge of this upturned portion, as clearly appears from the drawing.

The rivets 19 for the guide members are arranged through the horizontal portions on the racks. The portion below the rack forms the guide 16. The ends are arranged horizontally to form the attaching members 20, which have apertures 21 therein to receive the attaching screws, as indicated in the drawing.

At the forward ends of the ways are retainers 22 formed for the guide members 18 by turning up the metal. The return way 16 extends to the rear of the rack, so that, as the teeth-engaging members drop from the teeth of the rack, the link drops onto the way.

To indicate to the manipulator when the end of the rack is reached, I preferably provide a spring 23, which engages the link at the time the rack-engaging members pass from the rack. The slight retarding caused in the adjustment by the spring will indicate to the user that the end of the rack is reached and the back must then be moved to reëngage the link with the rack.

In the modified construction shown in Figs. 7, 8 and 9, the rack 24 is arranged below the return way 25, the way being pivoted at its forward end at 26, its rear end being curved downwardly to guide the rack-engaging members up onto the ways on their forward movement. A spring 27 is preferably arranged above the forward end of the way to cause the rack-engaging members to drop through the slot 28 on the way—see Fig. 8. This modified form of the rack has the advantage of being simple and the parts can be readily formed of castings or sheet metal stamp, as desired.

My improved chair is very simple, and economical in structure and is very convenient in its adjustment.

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

1. In a chair, the combination with the frame, of a hinged back; means for adjustably supporting said back comprising a link pivotally connected to said back below its hinges; a rack member comprising a pair of racks between which the forward end of said link is arranged; laterally-projecting rack-engaging members on said link; the rear end of said rack member being slotted to receive said link whereby the same is guided; a return way for said link, said way being curved upwardly at the forward end of said rack; and a pair of guide pieces arranged to coact with the upwardly-curved end of said way to guide the rack-engaging members of said link to said rack members.

2. In a chair, the combination with the frame comprising a horizontally-arranged piece, of hinged back; a downwardly-projecting arm on said back, said arm being arranged with its lower end within said frame, said horizontally arranged piece being slotted to receive and permit the adjustment of said arm; a rack member having a pair of racks arranged on the under side of said frame piece; a link pivotally connected to the lower end of said arm; a rack-engaging member on said link; said rack member being slotted at its rear end to receive said link, whereby it is guided; and a return way for said link.

3. In a chair, the combination with the frame, of a hinged back; means for adjustably supporting said back comprising a rack; a rack engaging member connected to said back below its hinges; a return way for said member, said way being curved upwardly at the forward end of said rack; a guide piece arranged to coact with the upwardly-curved end of said way to guide the rack-engaging member of said link to said rack; and a spring arranged to engage said link as the rack engaging member passes from the rack.

4. In a chair, the combination with the frame comprising a horizontally-arranged piece, of a hinged back; a downward-projecting arm on said back, said arm being arranged with its lower end within said frame, said horizontally-arranged piece being slotted to receive and permit the adjustment of said arm; a link pivotally connected to the lower end of said arm; a rack comprising a pair of members between which the forward end of said link is arranged, mounted upon the under side of said horizontally-arranged frame piece; laterally-projecting rack-engaging members on said link; a return way for said link, said way being curved upwardly at the forward end of said rack; and a pair of guide pieces arranged to coact with the upwardly-curved end of said way to guide the rack-engaging members of said link to said rack members.

5. In a chair, the combination with the frame, of a hinged back; and means for adjustably supporting said back including a link pivotally connected to said back; a rack comprising a pair of members between which the forward end of said link is arranged; laterally-projecting rack-engaging members on said link; a return way for said link, said way being curved upwardly at the forward end of said rack, the said rack and way being formed integrally of a piece of sheet metal, the edges of which are turned upwardly and thence inwardly and thence upwardly and notched to form the rack

members, the portions below the rack ends forming the way and the ends being arranged to form attaching members; a pair of guide pieces arranged on the horizontal portions of said rack members to project into said way and coacting with the upwardly-curved forward end thereof to guide the rack-engaging members of said link to said rack; and retaining members for the swinging ends of said guide pieces formed integrally with said way and rack.

6. In a chair, the combination with the frame, of a hinged back; and means for adjustably supporting said back including a link pivotally connected to said back; a rack comprising a pair of members between which the forward end of said link is arranged; laterally-projecting rack-engaging members on said link; and a return way for said link, said way being curved upwardly at the forward end of said rack, the said rack and way being formed integrally of a piece of sheet metal, the edges of which are turned upwardly and thence inwardly and thence upwardly and notched to form the rack members, the portions below the rack ends forming the way.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

ARTHUR D. LUEDDERS. [L. S.]

Witnesses:

THOS. J. COLLINS,

H. C. KRAFT.