

Feb. 6, 1951

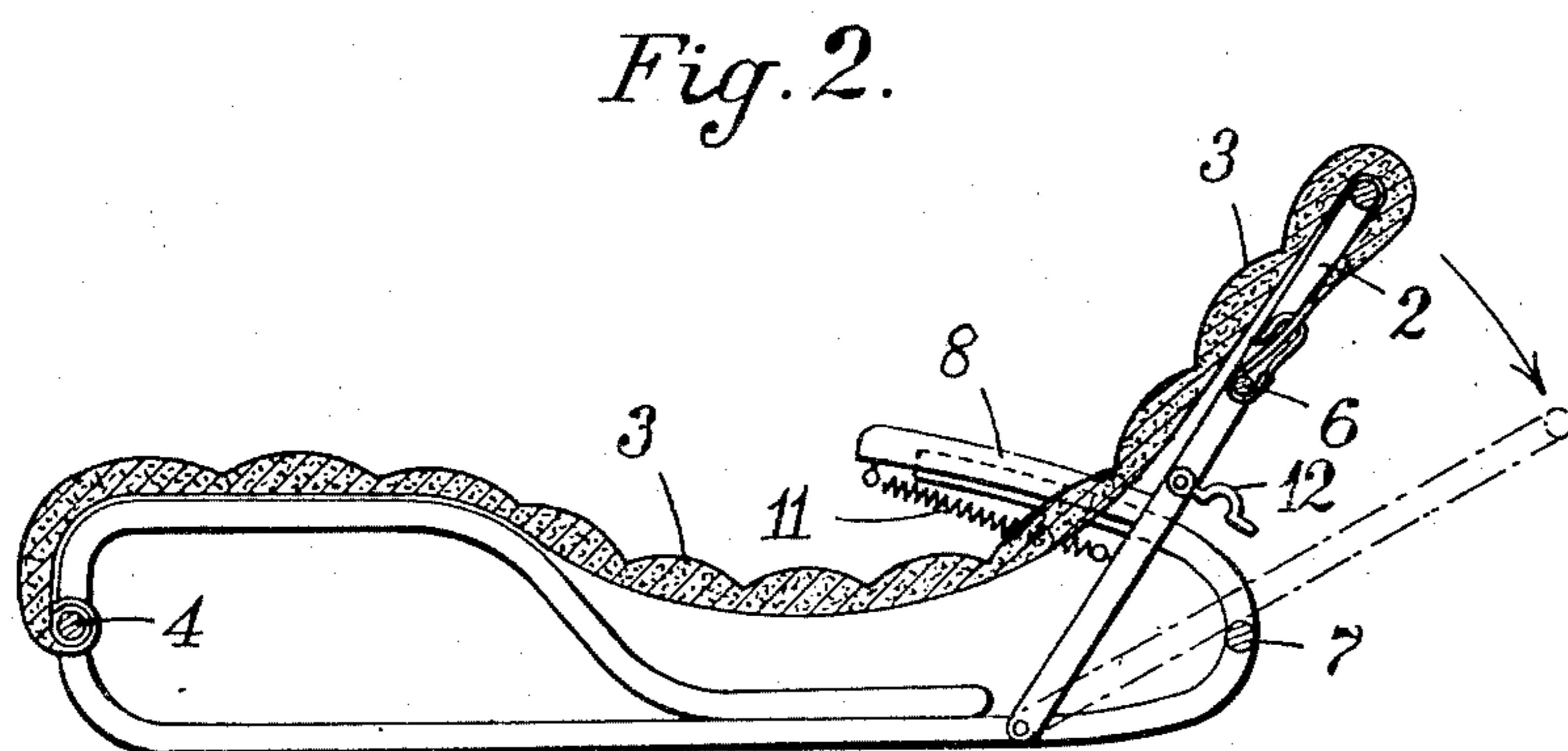
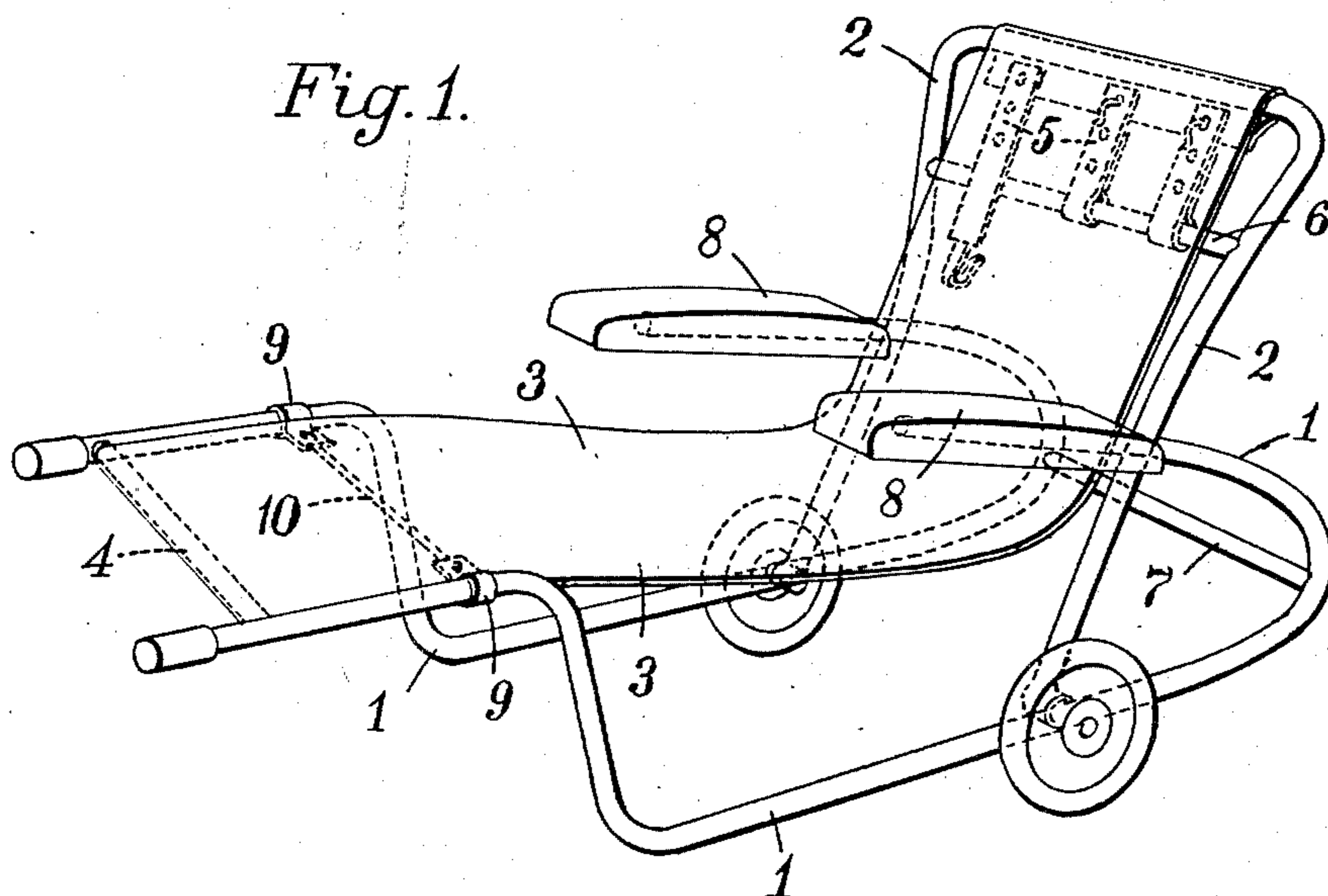
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2,540,823

AUTOMATICALLY ADJUSTABLE CHAIR OR THE LIKE

Filed April 25, 1947

2 Sheets-Sheet 1



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Fig. 3.

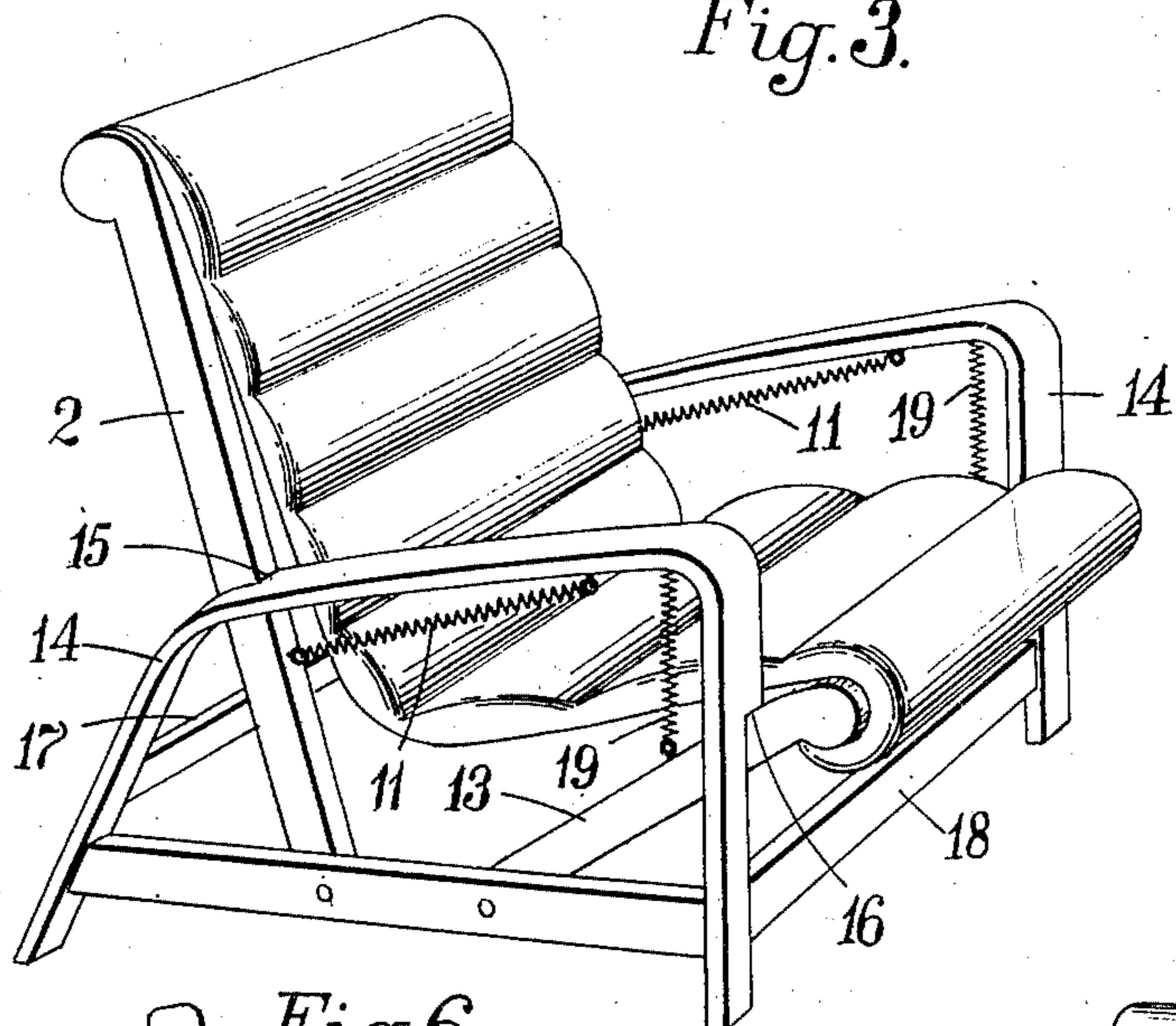


Fig. 6.

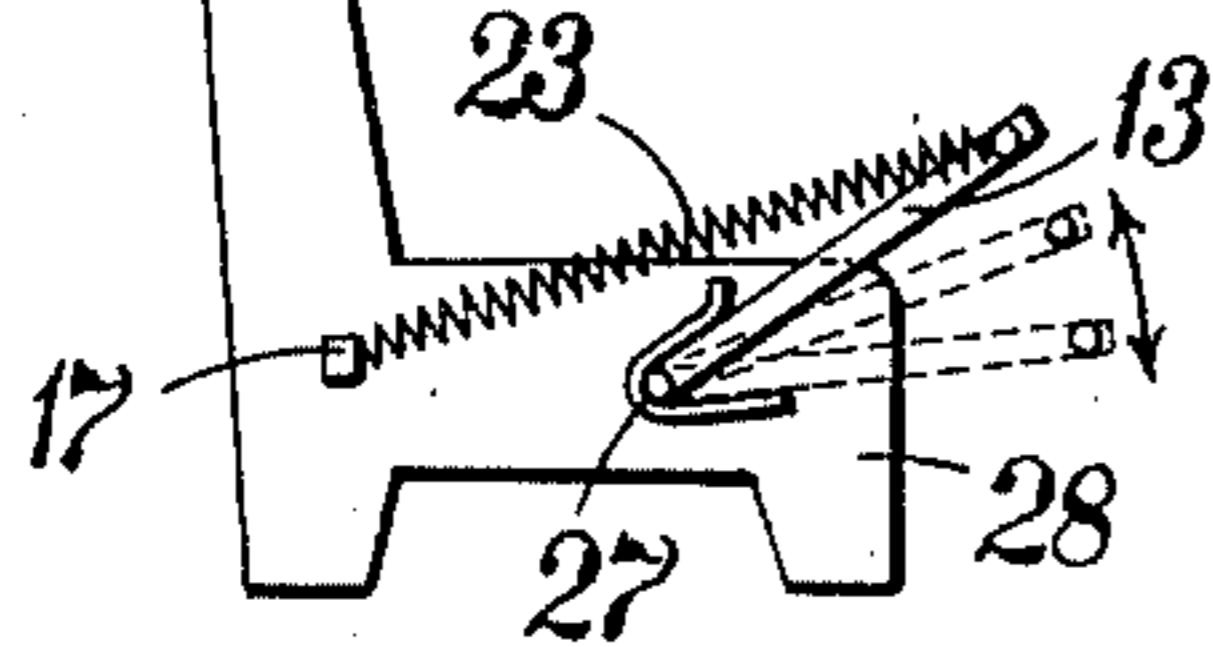


Fig. 4.

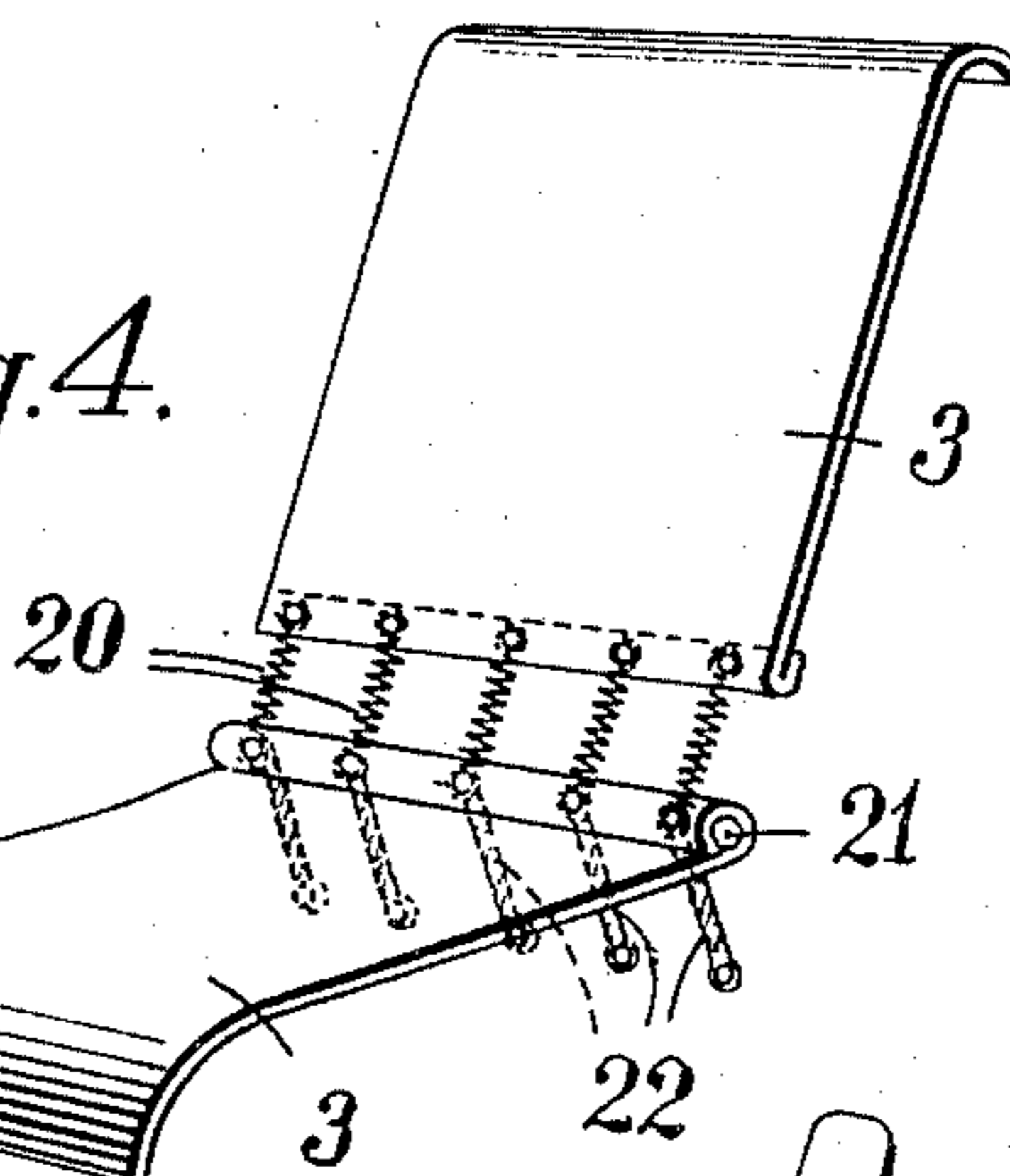


Fig. 5.

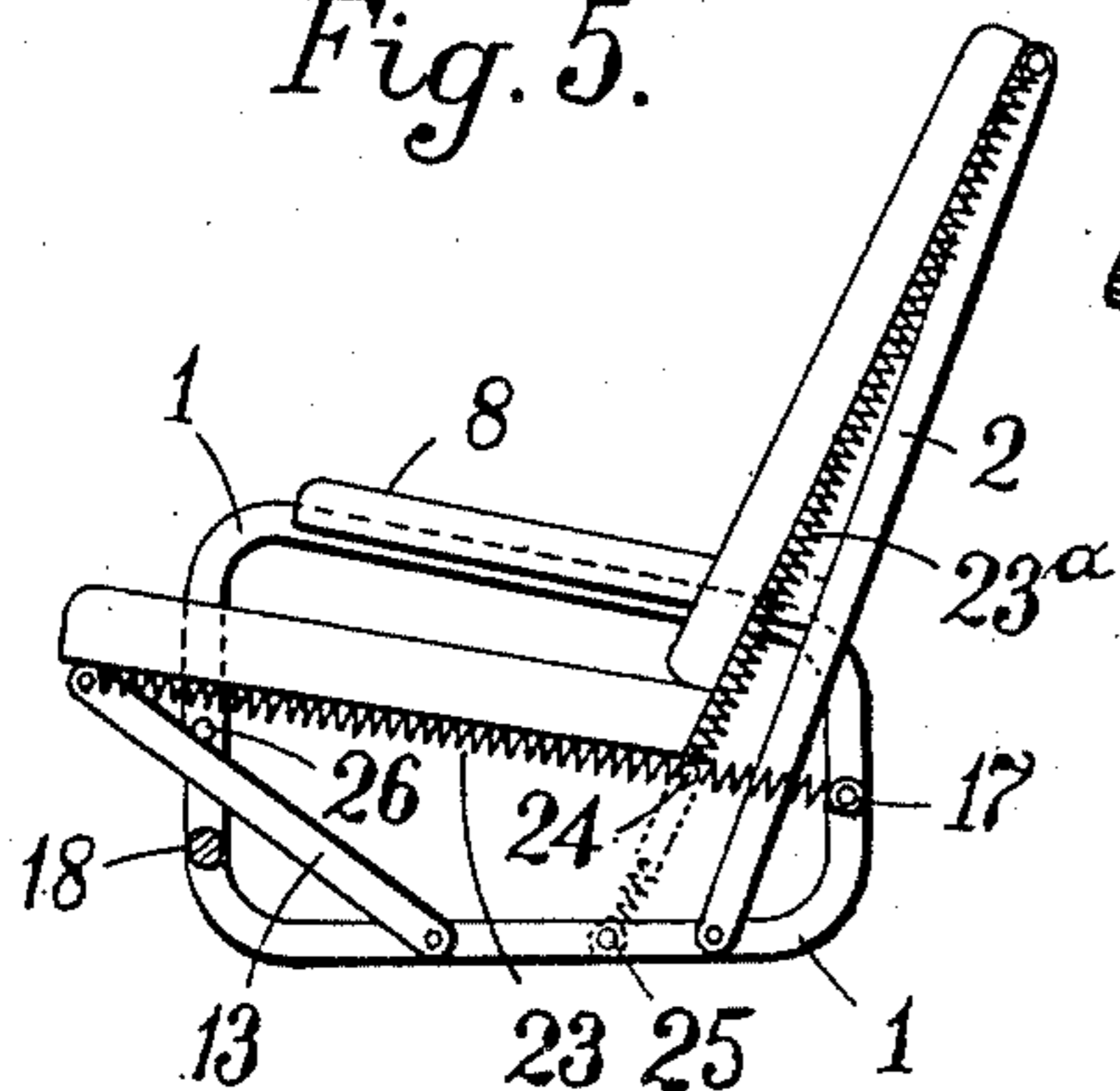
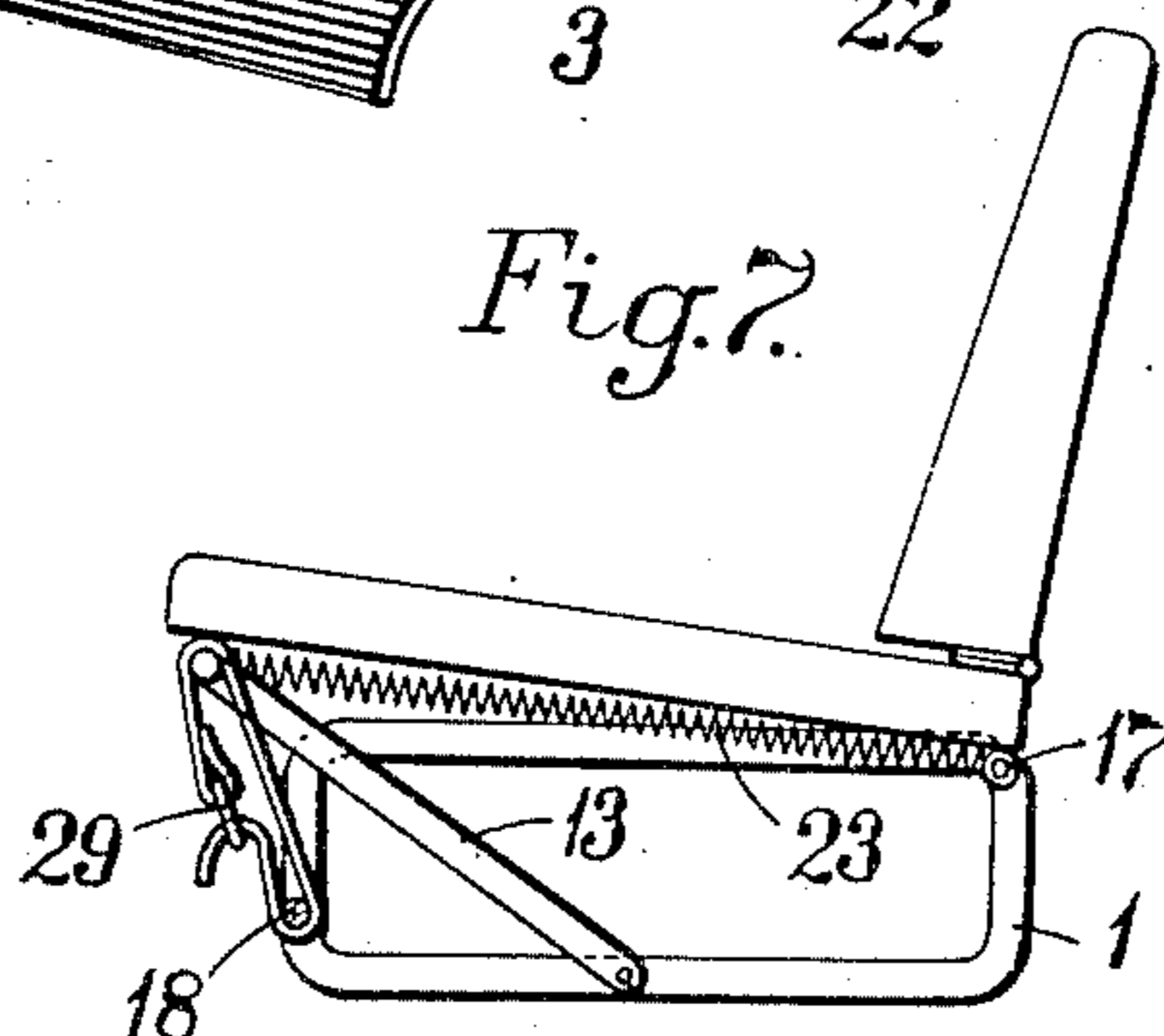


Fig. 7.



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UNITED STATES PATENT OFFICE

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AUTOMATICALLY ADJUSTABLE CHAIR OR THE LIKE

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1 Claim. (Cl. 155—119)

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This invention relates to automatically adjustable articles such as chairs, couches, settees, vehicle seats and beds and the object of this invention is to provide extraordinary comfort by simple means.

According to this invention a hammock-like supporting member is attached to at least one lever frame which is pivotally connected with a main frame the latter being fitted with stops for confining the upward and downward movement of said lever frame. The lever frames in accordance with the present invention are employed to form adjustable seats and backs and are so arranged and planned to ensure a wide scope of angular adjustability which is automatically obtained when an occupant displaces his weight and pressure on the hammock-like supporting member.

Details of various advantageous features of this invention will be apparent from the following description made with reference to the accompanying drawings which illustrate by way of example various embodiments of the invention in which

Fig. 1 is a perspective view of a garden lounge,

Fig. 2 is a side elevation of a modification of Fig. 1,

Fig. 3 is a perspective view of an armchair,

Fig. 4 is a perspective view of an occupant supporting member in accordance with this invention,

Fig. 5 is a sectional view of another armchair,

Fig. 6 is a diagrammatic view of a chair, and

Fig. 7 is a sectional view of a motor-car back seat.

The garden lounge on wheels of Fig. 1 comprises a main frame 1 made of metal, bentwood, plastic compositions or the like said main frame being provided with a rigid lever frame 2 for the back and a hammock-like occupant supporting member 3 the latter consisting of a length of flexible material. The supporting member 3 is shown to be fastened at one end to the front-cross rod 4 of the lounge and extending from there over the top of the lever frame 2 the opposing end of said supporting member 3 being detachably secured to the transverse member 5 by means of straps 5 having hooks and eyes (shown in broken lines).

When this lounge is not in use its back 2 is unfolded and rests on the rear cross rod 7, the supporting member 3 sags however when loaded and thus forces the back lever 2 automatically upward so that the latter abuts against the inside projecting arms 8 which form the upper stops

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for said back lever. By bringing to bear pressure against the back 2 the latter is constrained to rotate rearward thus ensuring automatic variations of the angle of said back within the limiting stops 7 and 8.

To increase the comfort a raised resilient foot and knee support is provided by adapting for example the supporting member 3 with lateral straps or flaps 9 overlapping the side members of frame 1 the opposing ends of said straps 9 being linked together beneath the supporting member by one or more tensioned springs 10 (shown in broken lines).

A favourable feature of this invention is the arrangement of the upper stops well up the height of the lever frame so as to diminish the strain exerted on the latter when abutting under load. A further advantage is obtained by considerably spacing the lower and upper stops thus ensuring a wide scope of adjustability of the lever frame. If desired the supporting member 3 may be detachably arranged at the frame at both ends.

Fig. 2 is a modification of Fig. 1 in which the supporting member 3 is provided with an upholstery. The frontward parts of the arms 8 are connected with the back 2 by springs 11 which serve to hold said back in an upright position when the supporting member is not loaded at the same time said springs 11 increase the resistance when pressure is applied against the back and elastically control the rearward movement of the back 2. To one or both side members of the back 2 may be secured pivotable hooks 12 or the like which when engaging the cross rod 7 releasably fixes the back in its lowest position.

The armchair illustrated in Fig. 3 comprises in addition to the back lever frame 2 a second rigid pivotable lever frame 13 for the seat proper. The side members of the main frame 14 show by way of example recesses 15 and 16 which form the uppermost stops for the back and seat levers 2 and 13 respectively whilst the stops limiting the downward movement of said lever frames are constituted by the cross members 17 and 18. Each of the lever frames 2 and 13 may be provided with springs 11 and 19 respectively for holding said levers in their uppermost position when the chair is not in use. This seat ensures extraordinary comfort because of the automatically adjustable levers both of which may on occupation be operated simultaneously or independently from each other according as pressure is applied.

Fig. 4 shows by way of example a hammock-

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like occupant supporting member for a chair or the like composed of two lengths of fabric 3, leather or the like having intermediate their inner ends a number of springs 20 which preferably form the seat corner or are in proximity of the latter in order to provide elastic resistance at or around the portion of the supporting member which has to bear the greater part of the load on occupation. The supporting member 3 may also be provided with transverse rod 21 or the like for deflecting said supporting member by means of elements 22 which link said supporting member to the main frame.

Another embodiment of this invention is illustrated in Fig. 5 in which the supporting member for the seat proper is constituted by a plurality of springs 23 which are mounted in tensioned condition and extend from the top of lever frame 13 to the cross member 17. Each of the individual springs forming the elastic hammock-like supporting member 23 may consist of two component springs joined together at 24 and the latter joints are shown to form also the attachment points for the lower ends of the springs constituting the tensioned supporting member 23^a. Alternatively the lower ends of the springs for the back may be secured to the main frame at 25 as shown in broken lines. Pins 26 or the like together with transverse member 18 provide the stops terminating the automatic upward and downward rotation of the lever 13 and when loaded the latter forms a resilient front edge. The stops confining the movement of the back lever 2 are formed by the arms 8 and the cross member 17. The efficiency of this arrangement is greatly improved by employing more powerful springs for the seat than for the back of the chair. The tensioned springs, preferably arranged at an angle, hold the unloaded lever frames 2 and 13 in their uppermost position. Alternatively the tensioned springs 23 instead of being secured to the cross member 17 may be connected with the back frame 2 thus interconnecting both lever frames and forming a tensioned supporting member for the seat proper which simultaneously spring-controls the front lever 13 and said back lever 2 (not shown). Furthermore the lever frames 2 and 13 may be arranged to intersect each other or said levers may be positioned to have common pivots (not shown).

Fig. 6 shows a chair in which a stop 27 forms the top and bottom limiting points for the front lever 13. The stops 27 are essentially of right angled shape and may consist of rigid projections provided at the lateral side members of frame 28 or said stops may be formed by recessing said side members. The upper part of the stop 27 is arranged to arrest the spring control lid lever 13 at an angle which brings the front of said lever frame approximately in line with the front of the frame 28 thus providing a tipped-up seat effect. On occupation of this chair the outer end of lever 13 describes an increasing arc thus augmenting the tension on the supporting member 23 which is constructed to hold elastically in position a person of medium weight when the lever 13 is at an angle of about 65 degrees. The lower part of said stop 27 is

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arranged to stop said lever 13 at approximately 80 degrees which mark, when surpassed, would result in the collapse of the tensioned supporting member 23. Chairs or the like incorporating features as hereinbefore described may be advantageously employed for cinemas, theatres, and motor-cars.

The motor-car back seat illustrated in Fig. 7 is provided with a hammock-like supporting member 23 and a lever frame 13 the latter being prevented from rising above its predetermined uppermost position by one or more stops 29 formed by ropes, cables, chains, straps or like elements linking the top of lever 13 with a lower part of the main frame for example with cross member 18 which constitutes the lower stop for said lever 13. The length of the elements 29 may be readily adjustable thus insuring variations of the height of the unloaded lever frame 13. The latter feature enables not only the lowering and raising of the height of the front seat at will, but by altering the initial gradient the resilient resistance of the spring surface is also effected since when pressure is applied to the top end of a lever frame positioned at an obtuse angle the resilient resistance will be weaker than, all things being equal, when pressure is exerted upon a lever frame arranged at an acute angle.

I claim:

30 An article of furniture comprising in combination a rigid main frame, two rigid lever frames each consisting of a transverse member interconnecting two substantially parallel limbs and that end of each of said limbs remote from said transverse member being pivotally connected to said main frame, a flexible occupant-supporting member of which one end is secured to the transverse member of one of said lever frames and the other end is secured to the transverse member of the other of said lever frames, abutments on said main frame limiting the pivoting motions of said lever frames, and resilient means extending between a point intermediate the ends of each of said lever frame limbs and said main frame, the arrangement being such that pivoting motions of said lever frames between said abutments occur in accordance with variations of pressure exerted by occupant and said resilient means tend to turn said lever frames oppositely to the motion caused by increasing pressure exerted by an occupant.

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