

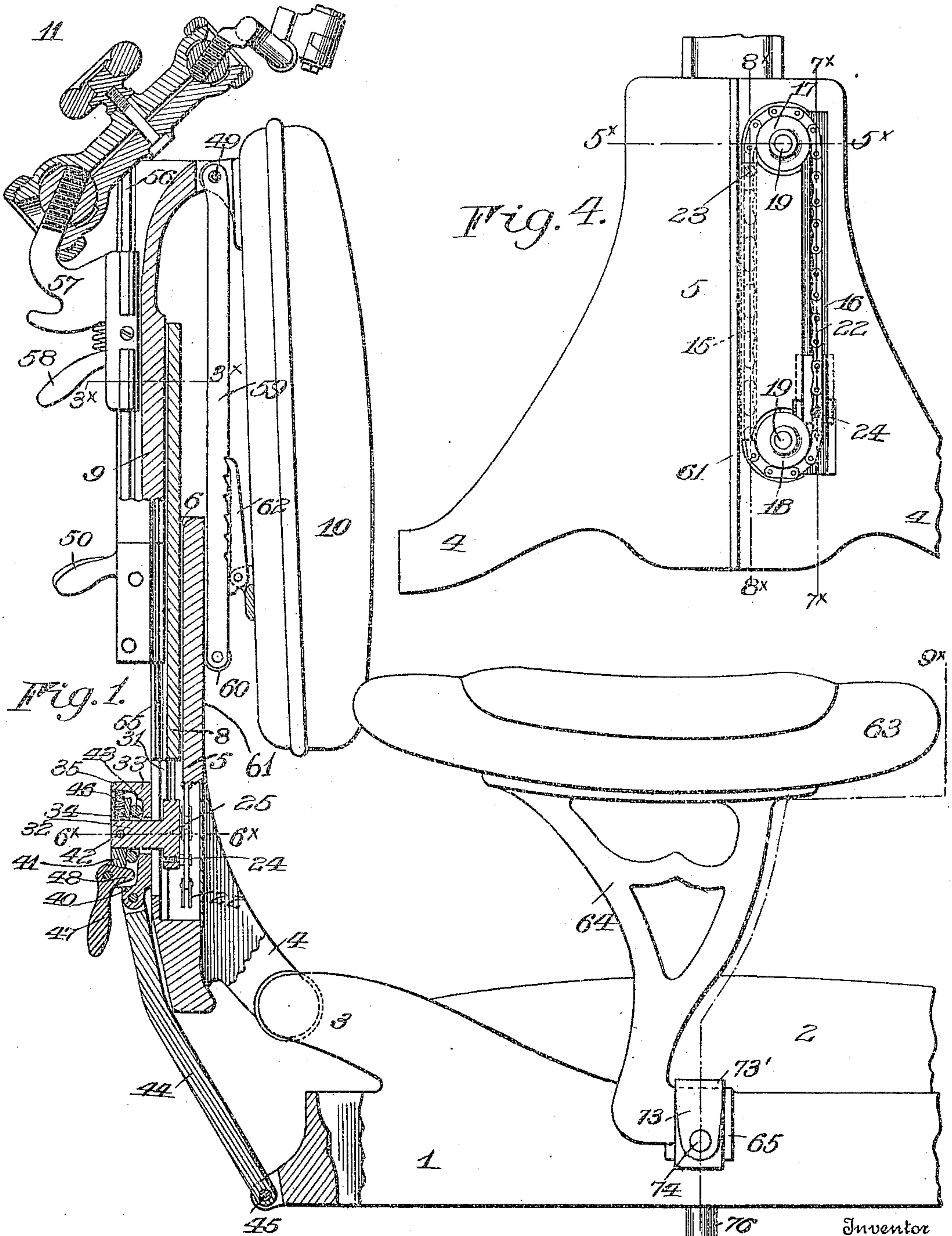
F. RITTER.  
DENTAL CHAIR.

APPLICATION FILED MAY 5, 1904.

Patented May 31, 1910.

3 SHEETS—SHEET 1.

959,608.



Witnesses

Walter B. Payne  
G. Willard Rich.

Inventor

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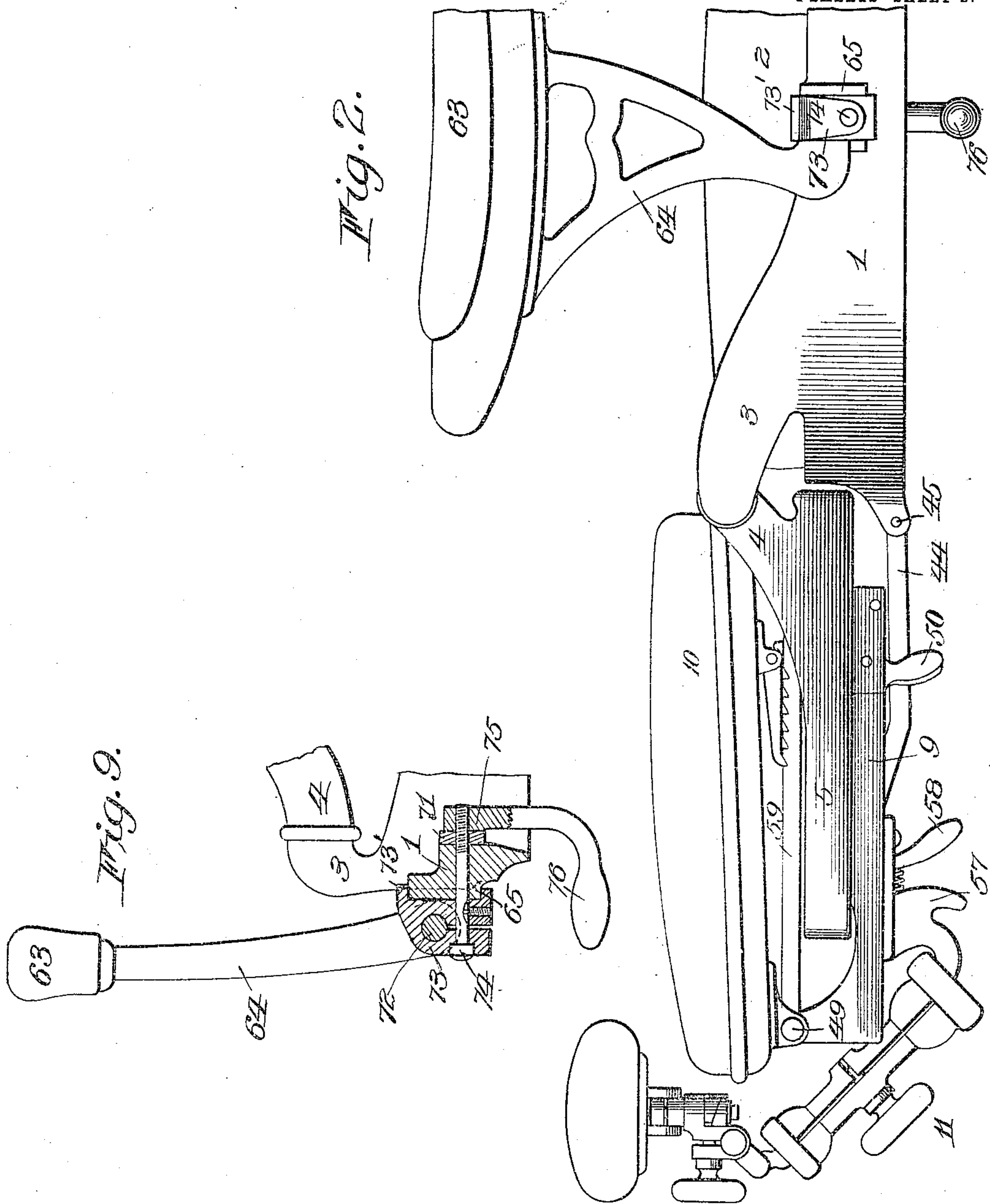
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Witnesses.

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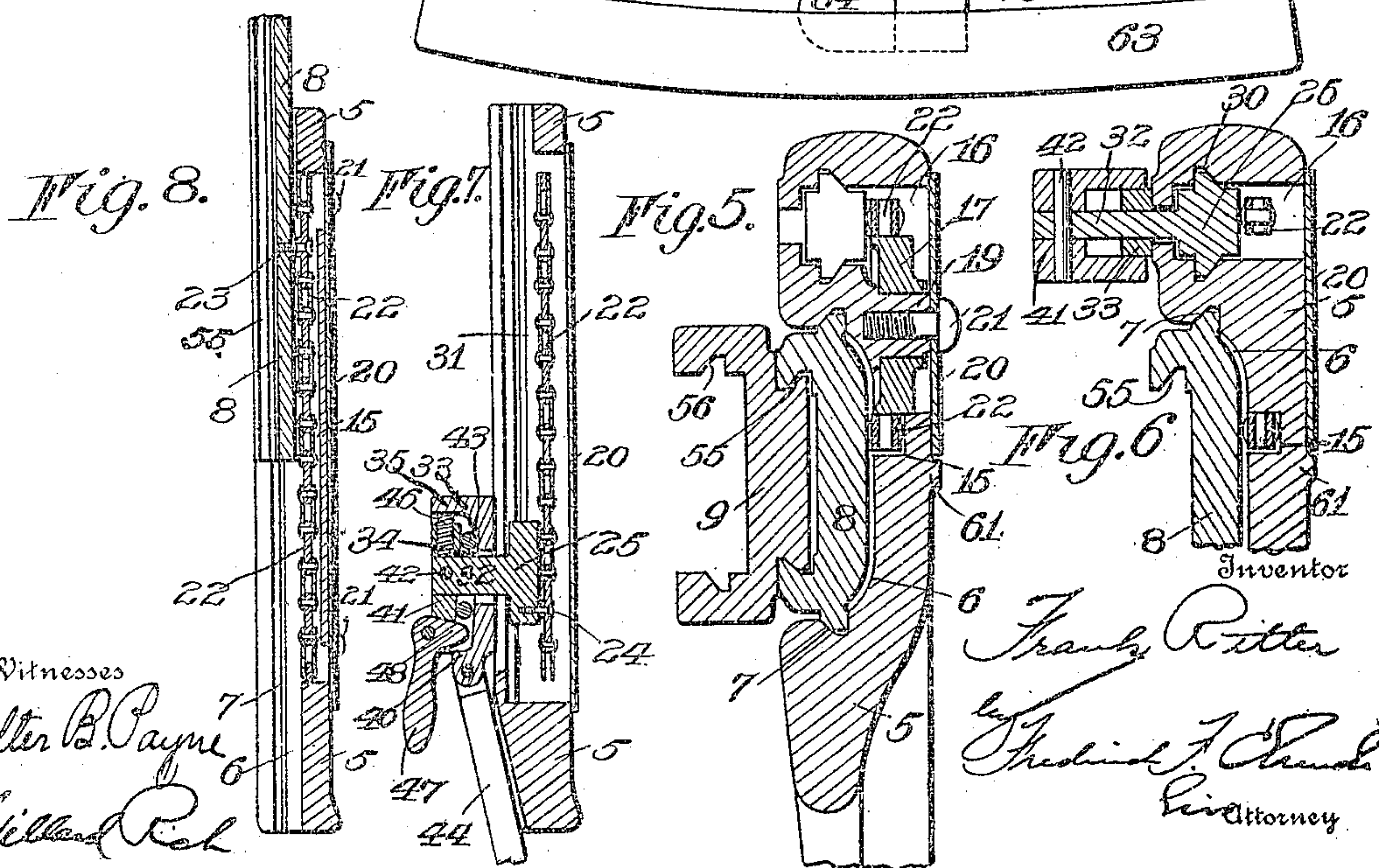
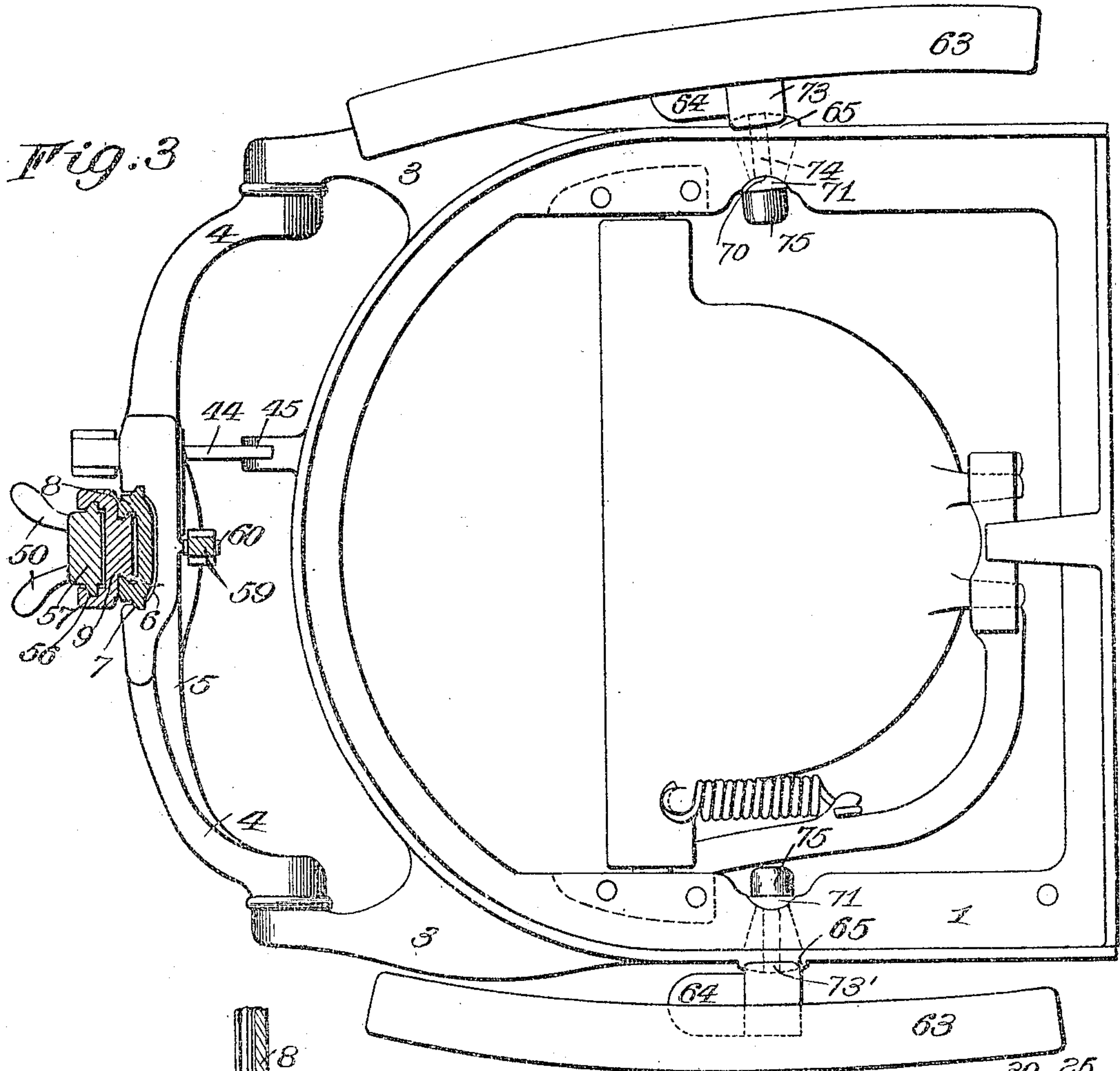
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# UNITED STATES PATENT OFFICE.

FRANK RITTER, OF ROCHESTER, NEW YORK.

## DENTAL CHAIR.

959,608.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed May 5, 1904. Serial No. 206,460.

*To all whom it may concern:*

Be it known that I, FRANK RITTER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Dental Chairs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to chairs, and particularly to that class known as dental, surgical and barber's chairs, embodying generally a vertically movable seat frame and a back support, which is adjustable at an angle to the seat, and it has for its object to provide a chair in which the back rest and head rest support while being capable of the usual vertical movement to adjust them to the comfort of the occupant of the chair are also capable of an automatic movement toward and from the seat, as the back frame is rotated relatively thereto, whereby the back rest and head support maintain the same relative position to the occupant of the chair, so that a readjustment of the parts is not required when the angular position of the back frame is altered.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:—Figure 1 is a side elevation of a chair constructed in accordance with my invention and shown partially in section, and in the upright or normal position. Fig. 2 is a side elevation of the chair illustrating the back thereof in adjusted position. Fig. 3 is a top plan view, a portion of the chair back being shown in section and taken on the line 3× 3× of Fig. 1. Fig. 4 is a front elevation of the chair back frame. Fig. 5 is a cross sectional view thereof taken on the line 5× 5× of Fig. 4. Fig. 6 is a similar view taken on the line 6× 6× of Fig. 1. Fig. 7 is a vertical sectional view taken on the line 7× 7× of Fig. 4, and Fig. 8 is a similar view on the line 8× 8× of Fig. 4. Fig. 9 is a detail sectional view on the line 9× 9× of Fig. 1, showing the adjustable arm.

Similar reference numerals in the several figures indicate similar parts.

In illustrating my invention I have shown a dental or surgical chair, consisting of the seat frame 1, supported in the usual or any preferred manner upon the chair base, as will be understood, and mounted upon this frame is the upholstered seat 2. Extending upwardly and rearwardly from the side of the seat frame are short arms 3 to the ends of which are pivotally attached, the laterally and forwardly extending arms 4, of the chair back frame 5 which is provided with the longitudinally extending recess 6, as shown in Figs. 1 and 3. The sides of the recess are channeled or grooved to form ways 7, in which is mounted the longitudinally movable section 8, carrying a slide 9 similarly adjustable thereon and supporting the back rest 10. The slide 9 also supports the head rest section 11 which is capable of universal adjustment into any desired angular position.

At the bottom of the recess 6 is a slot or groove 15, and provided in the forward face of the chair back frame is a similar slot or groove 16 which is connected at its ends to the former groove by enlarged recesses in which are arranged pulleys or sprockets 17 and 18 journaled upon studs 19 and secured in position thereon by a plate 20 also extending over the recess or groove 16 and held in position by screws 21. Mounted upon the sprockets 17 and 18 is an endless driving connection in the form of a chain 22, the opposite sides of which lie in the grooves 15 and 16 and are connected by pins or bolts 23 and 24 with the movable section 8 and a clamping block or head 25 respectively, as shown particularly in Figs. 4 to 8. The head 25 is provided with laterally extending shoulders 30 engaging the ways 31 formed at opposite sides of the bottom of the groove 16, and also having the rearwardly extending end 32, carrying devices adapted to automatically lock the back in the desired position of adjustment. Surrounding the end 32 is a clamping member 33 having the outer face resting against the adjacent side of the chair back frame, and the inner face 34 arranged at a slight angle thereto, at the upper and lower ends of which are the outwardly extending ends 35 and 40, respectively. Arranged in opposition to the face



34 is a similarly inclined face on a head 41 secured to the finger 32 by a pin 42 and between the proximate faces of the head and the member 33 are arranged balls or rollers 43. The member 33 is connected at its lower end to an arm 44 pivotally attached, at the point 45 to the rear side of the seat frame 1 whereby the weight of the chair back, or when pressure is applied thereto, will firmly clamp the member 33 to the chair back frame, the parts of the clamping mechanism being normally held in operative position by a spring 46, the tension of which may be relieved and the parts of the mechanism adjusted by means of an operating handle 47, pivoted to the head 41 and provided with a nose 48 adapted to bear against the bottom 40 to move the member 33 relatively out of engagement with the chair back frame. The arrangement of these parts which I have just described may be varied, but they serve to illustrate the practical construction of means for connecting the seat frame or other stationary portion of the chair with the back and head rest portions, whereby as the latter are revolved outwardly to place a patient in a more or less horizontal position, they will be moved relatively to the chair and the back and the head of the occupant will be supported in the original position in which they may have been placed by the operator.

In order to provide means for adjusting the back rest 10, to accommodate persons having different lengths of bodies, it is mounted on the slide 9 which is longitudinally movable on the section 8 and is held by suitable clamping devices 50 in ways 55, formed at the rear side of said section, the latter in turn, being provided with the ways 56, in which the block or head 57 carrying the head rest section is adjustably secured by suitable clamping devices 58, as shown particularly in Fig. 1. The lower end of the back rest 10 may be rotated outwardly to fit the hollow of a patient's back and to permit this adjustment it is pivoted to the slide 9 at 49 and its lower end is normally supported by a frame piece or bar 59 also connected to the slide 9 and having at its lower end a roller 60 resting against a rib or track 61 provided on the forward side of the chair back frame, and when adjusted outwardly the lower end of the back rest is held by a pawl 62 cooperating with notches or teeth formed in the bar 59, as will be understood.

At opposite sides of the chair seat are arranged the chair arms 63 which are supported upon brackets 64 adjustably connected to the seat frame 1 whereby the arms may be revolved relatively toward or from each other in vertical planes, and also revolved in a horizontal plane relatively to the chair seat. To this end I provide at each side of the chair frame an outwardly

extending boss 65 having its outer surface curved and formed concentrically with a similar surface 70 formed on the inner portion of the frame with which coöperates a segmental clamping plate 71. At the lower end of the bracket 64 is a pin 72 extending through a slit clamping head 73 engaging the curved surface of the boss 65 and which is guided in its movement thereon by lugs or projections 73' extending over the sides of the boss 65 to prevent the head from being twisted thereon. The head is held in engagement with the surface of the boss by a bolt 74 which extends through a sector shape aperture in the frame 1 (as shown in dotted lines in Fig. 3), and has the inner threaded end with which coöperates a locking member or nut 75 bearing against the plate 71, said nut being provided with an operating handle 76 extending downwardly and outwardly beneath the frame 1, as shown in Figs. 2 and 9. This method of clamping the chair arms permits them to be adjusted by shifting the position of the heads 73 on the boss 65, and also permits them to be rotated on their heads to either move them over the chair seat, or adjust them outwardly away from the latter. The clamping nut being located at the inner side of the frame and the operating handle projecting downwardly therefrom beneath the frame, provides a convenient means for tightening or loosening the parts which may be manipulated either by the hand or the foot of the operator.

In operating a chair constructed in accordance with the foregoing description, the parts being in the normal position, as shown in Fig. 1, the operator may adjust the back rest 10 to afford the greatest comfort to the patient, and he may also adjust the head rest section 11 to support the patient's head in any desired position. If it is necessary to give the patient a reclining position, the operator may release the locking mechanism by an outward movement of the handle 47 and then tilt the chair back frame to the desired angle when upon releasing the handle 47, the member 33 will be securely clamped to the chair back frame by means of the balls or rollers operating between the inclined faces of said member and the adjacent head 41. During the outward rotary movement of the chair back frame the head or block 25 moves outwardly thereon and this movement being transmitted to the driving connection or chain 22 will cause a corresponding longitudinal movement of the section 8, and the parts mounted thereon, toward the seat frame, thus obviating the necessity of readjusting the back and head rests, as their movement toward the seat during the relative outward movement of the back rest compensates for the difference between the pivotal center of the body of a



person seated in the chair and that of the chair back frame, thus avoiding the inconvenience commonly experienced of having the back rest slide beneath the patient's back when changing the angular adjustment of the chair back.

While I have shown an automatic locking mechanism employed with the driving connection, between the chair frame and the movable section on the back frame, it will be understood that the driving connection may be attached by any suitable means to a relatively stationary portion of the chair and that the back frame may be locked by other means than those shown.

I claim as my invention:

1. In an adjustable chair, the combination with a seat frame, an adjustable back frame and a locking device for securing the two frames in relative adjusted position, of a movable back rest and connections between it and the locking device for moving it relatively to the seat frame.

2. In an adjustable chair, the combination with a seat frame, an adjustable back frame and a back rest mounted thereon and movable relatively toward and from the seat, of an operating member attached to the seat frame and movably engaging the back frame and connections between said member and the back rest whereby the latter will be moved toward the seat as the back frame is moved outwardly relatively thereto.

3. In an adjustable chair, the combination with a seat frame, an adjustable back frame and a back rest mounted thereon and movable relatively toward and from the seat, of an operating member attached to the seat frame and guided on the back frame, connections between the member and the back rest for causing a movement of the latter in a direction opposite to the movement of the member on the back frame and a locking device for securing the latter and the back rest in adjusted position.

4. In an adjustable chair, the combination with a seat frame, a movable back frame and a back rest movably mounted on the latter, of an arm pivoted to the seat frame having an end guided on the back frame, connections between the arm and back rest for moving the latter toward and away from the seat, operated by the movement of the back frame relatively to the seat frame, and a locking device carried on said arm for retaining the parts in adjusted position.

5. In an adjustable chair, the combination with a seat frame and an adjustable back frame, a back rest movably supported on the latter and a head rest carried on the back rest, of operating connections between the seat frame and back rest for causing their relative movement toward and away

from each other and operated by the movement of the back frame relatively to the seat frame and locking devices between said operating connections and the back frame for securing the parts in adjusted position.

6. In an adjustable chair, the combination with a seat frame and an adjustable back frame having guides thereon, a movable section in the back frame mounted therein and a back rest supported on said section, of an operating member attached to the seat frame, connections between it and the movable section for moving the latter in the guides and means for supporting the back frame in adjusted position.

7. In an adjustable chair, the combination with a seat frame, an adjustable back frame having guides thereon, a movable section supported in the guides and a back rest supported on said section, of a head guided on the back frame, means operated by the relative movement of the back and seat frames for moving said head, connections between the head and the movable section for operating the latter relatively toward or away from the seat.

8. In an adjustable chair, the combination with a seat frame, an adjustable back frame having guides thereon, a movable section supported in the guides and a back rest supported on said section, of a head guided on the back frame, an arm connecting it with the seat frame and connections between the head and the movable section for operating the latter in a direction opposite to the movement of the former.

9. In an adjustable chair, the combination with a seat frame, an adjustable back frame having guides thereon, a movable section mounted in the guides and a back rest supported on said frame, of a head guided on the back frame, an arm connecting it with the seat frame, connections between the head and movable section for operating the latter in a direction opposite to the movement of the head and means for clamping the latter to the back frame.

10. In an adjustable chair, the combination with a seat frame, a movable back frame, and a back rest guided thereon, of a movable head guided on the back frame, means actuated by the movement of the back frame for operating said head, wheels journaled on the back frame, and a flexible connection supported on said wheels and attached to the head and the back rest.

11. In an adjustable chair, the combination with a seat frame, a movable back frame and a back rest guided thereon, of a movable head mounted on the back frame, wheels journaled on said frame, an endless connection supported on said wheels and attached to the head and the back rest for operating said parts in opposite directions.

12. In an adjustable chair, the combina-



tion with a seat frame, an adjustable back frame and a back rest movably mounted thereon, of a locking device cooperating with the back frame and connected to the seat frame and operating devices actuated by the locking device and connected to the back rest for moving it in a direction opposite to the movement of said locking device.

13. In an adjustable chair, the combination with a frame supporting a chair seat and an adjustable back frame and a locking device cooperating with the back frame comprising relatively stationary members, located at opposite sides of the back frame, and a block arranged between one of said members and the frame, of an arm connecting the chair frame and the block, means for operating the block into engagement with the back frame actuated by the movement of the locking device in one direction on the back frame.

14. In an adjustable chair, the combination with a frame, a seat thereon and an adjustable back frame having a slot therein, of a locking member extending through the slot and having an inner head and an outer head provided with an inclined surface, a movable clamping block arranged between the outer head and the back frame, and connected to the chair frame, means for moving said block relatively to the locking member into engagement with the frame, and a device for releasing said block.

15. In an adjustable chair, the combination with a frame supporting a chair seat and an adjustable back frame having a slot therein, of a locking member extending through the slot and having an inner head and an outer head provided with an inclined surface, a clamping block arranged between the outer head and the back frame and provided with an inclined surface and rollers arranged between said surfaces, an arm connecting said block to the chair frame and operating it in one direction to lock the back frame and a releasing device cooperating with the block to move it in the opposite direction.

16. In a chair, the combination with a seat frame, a movable back frame and a movable

section arranged on the rear side of the back frame, of a back rest supported on the movable section, a frame piece carried on said section and extending between the back frame and the back rest and means cooperating with the frame piece for adjusting the back rest at an angle to the back frame.

17. In a chair, the combination with a seat frame, a movable back frame and a movable section arranged in rear of the back frame, of a frame piece carried on said section and resting against the forward side of the back frame, a back rest pivoted at the upper end of the frame piece and a pawl engaging therewith for supporting the lower end of the back rest.

18. In a chair, the combination with a seat frame having a seat thereon, a movable back frame having a recess therein and slots leading from the recess and opening at the rear side of the back frame and wheels journaled in the recess, of a driving connection supported on the wheels, a movable section supported on the back frame and attached to the driving connection through one of the slots and an arm attached to the chair frame and to the driving connection through the other slot, a back rest mounted on the movable section and means for locking the back frame in adjusted position.

19. In a chair, the combination with a frame having a seat thereon, a movable back frame having slots in its rear side and provided with recesses connecting the ends of said slots and wheels journaled in the recesses, of a driving connection supported on the wheels, a movable section supported on the rear side of the back frame and connected to the driving connection through one of the slots and an arm attached to the chair frame and connected to the driving connection through the other slot, a back rest mounted on the movable section and means for locking the back frame in adjusted position.

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