No. 653,321. Patented July 10, 1900.

T. J. SHACKELFORD & C. A. L. KIRKPATRICK.

ADJUSTABLE SURGICAL CHAIR.

(No Model.) (Application filed July 26, 1898.)

2 Sheets—Sheet 1.

Fig. 1.

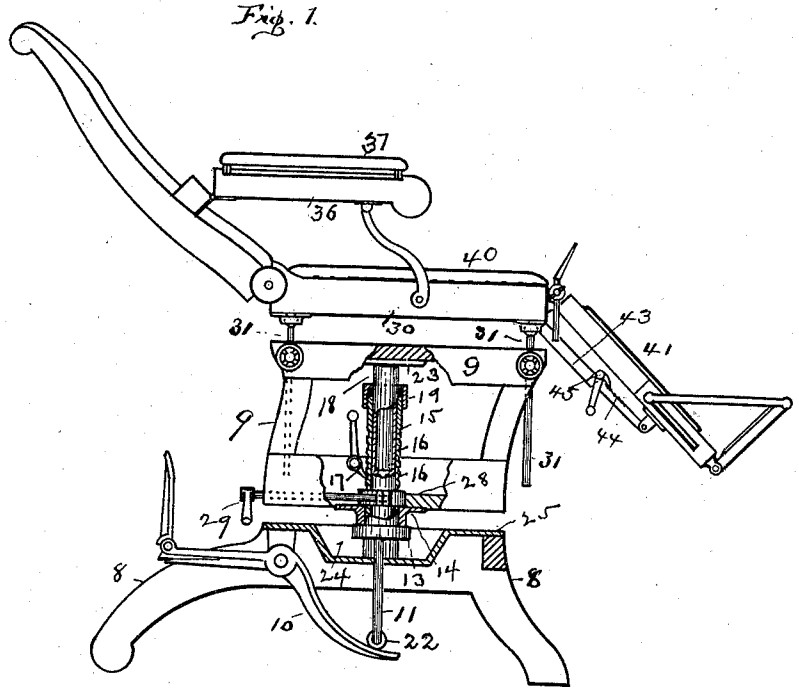


Fig. 2.

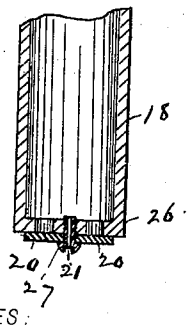
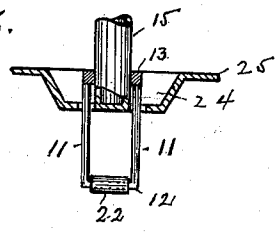


Fig. 3.



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Fig. 4.

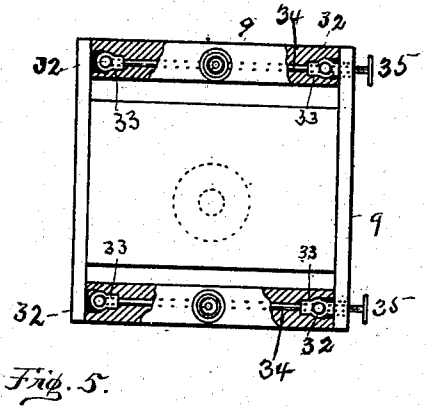


Fig. 5.

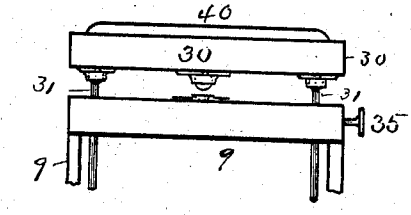


Fig. 6.

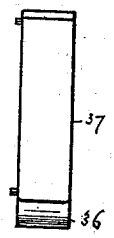
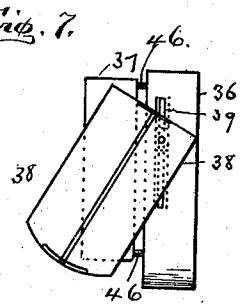


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ADJUSTABLE SURGICAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 653,321, dated July 10, 1900.

Application filed July 26, 1898. Serial No. 686,908. (No model.)

To all whom it may concern:

Be it known that we, TIFFIN J. SHACKELFORD, residing at Warsaw, in the county of Kosciusko, and CHARLES A. L. KIRKPATRICK, residing at Fort Wayne, in the county of Allen, State of Indiana, citizens of the United States, have invented certain new and useful Improvements in Adjustable Surgical Chairs, of which the following is a full, clear, and exact description, that will enable others to use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of our invention is to provide means for more prompt, easy, and efficient adjustment and control, so that the chair can be quickly and conveniently converted into any of the changeable positions or combination of positions or angles while the patient is in the chair and required by the particular nature of the operation, and to construct such chair so that the same will be more economically constructed, easier of operation, more securely held in its different positions, and more easily adjustable. The different positions required in such a chair are not illustrated, but the mechanism employed to effect such change is fully shown; and the invention consists in the construction and novel combination and arrangement of parts hereinafter described, pointed out in the appended claim, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a chair structure embodying our improved features. Fig. 2 is a cross-section of the bottom part of the hollow sliding post. Fig. 3 is a section of the lower part of the pivot-post, its supporting-plate, the lifting-rods, cross-bars, and roller. Fig. 4 is a plan view of the method of securing the supporting-rods. Fig. 5 is an end view of the same. Fig. 6 is a top view of the adjustable arm-rest. Fig. 7 is a top view showing the same folded and covered.

Similar numerals of reference refer to similar parts throughout the several views.

The chair-seat frame 30 is supported by four supporting-rods 31, securely fastened by ball-and-socket joints to the corners of the bottom part of the seat-frame 30, so that the rods may have any angles desired to the plane of the seat proper. These rods 31 pass through orifices 32 in the intermediate frame 9 or a supporting-frame beneath and also through loops 33 in the slightly-endwise-moving clamping-bars 34, placed and secured just below the seat, the ends of which project beyond the frame and are provided with hand-screws 35, whereby the bars 34 are moved and the supporting-rods 31 thereby firmly clamped in the loops 33. When the supporting-rods are released, they move freely up and down with the movement of the chair, and the plane of the seat is then adjusted to any angle in one or both directions, as desired. There are three movements of the seat provided for. The first is the means to adjust the plane of the seat to any angle required. This is done by means of the supporting-rods 31, held vertically in orifices in the upper beam of the frame 9, upon which rods the seat rests. These rods are clamped in place by the clamping-rods 34, which have a slight endwise movement. When the rods 34 are moved outward by the thumb screws or wheels 35, their openings or loops 33 are drawn forcibly against the vertical rods 31, thereby forcing them against the sides of the orifices 32, and thus clamping them in place. As shown in Fig. 1, the seat of the chair is raised but little, if any, above the angular frame 9, and it is only when the angle of the seat is to be changed that the rods 31 are raised or lowered in pairs at either the front or back, according to the inclination of the seat desired. When the front or back pair of rods 31 are raised or lowered, the front or back of the seat is raised to the desired angle without raising the whole of the seat. As above stated, the rods 31 are only used for the purpose of changing the inclination of the seat and not for raising the seat itself. As shown in Fig. 4, the clamping-rods 34 have but a very slight endwise movement, and hence the frictional contact upon the vertical rods 31 is never entirely done away with. After the angle of the seat has been adjusted it will remain in that position, owing to the frictional contact of the rods 34, unless a weight should be placed upon it. By operating the screws 35 the seat will be locked in position, so that any weight can be placed upon the seat without depressing it. When

in position, the rods are clamped in place, holding the seat firmly in position. The chair is so well balanced upon these four points of support that it is an easy matter to adjust it into these positions while the patient is seated or reclining in it. The advantage of this construction is that the chair is held firmly on four separate points of support, as well as being easily adjustable, and is therefore as firm as if it had four legs. We have shown this construction attached to an intermediate frame 9 because we also wished to illustrate with it our improved means of vertical adjustment; but it is also adapted to chairs not provided with means for vertical adjustment, as will be readily seen from the description and views. We also provide an adjustable arm-rest, Fig. 7, attached to the arm 36 of the chair and provided with a cover 37, the top of which is upholstered and forms the ordinary arm of the chair when closed. It is secured to the arm 36 of the chair by knuckle-joints 46, so that when open it affords additional support to the adjustable arm-rest. The adjustable arm-rest consists of two boards 38 38, of suitable size and shape, hinged to each other and secured to the arm 36 by a pivot operating in a slot 39, the pivot-head (not shown) holding it in a manner readily understood from the view Fig. 7. By this construction a much larger surface is afforded for the arm or hand to rest upon. Fig. 6 shows the boards folded and the cover 37 closed. The arm-rest can be moved backward and forward and inward and outward into any desired position and form an operating-table for the arm or hand.

The lifting and lowering apparatus consists in separating the supporting part of the chair into a base structure 8, which is provided with a downward depression 24 to provide space for a part of the mechanism hereinafter described to pass into, so that the intermediate frame 9 may be lowered upon the base structure 8 when desired. There is provided also for supporting the mechanism a metallic plate 25, which extends across the bearing-surface of the base 8 and conforms to the depression 24. Upon the center of this plate 25 is affixed a tubular pivot-post 15, the bottom of which is hermetically closed, the upper portion being free and open and the upper portion also provided with corrugations 16 to form interdental spaces for a pawl 17, secured to the frame 9 and adapted to operate therein. An annular collar 13, moving freely up and down upon the lower part of the pivot-post 15, is attached on its lower side to two lifting-rods 11, which are provided with a cross-bar 12, securing their lower ends, and upon this cross-bar 12 a roller 22 is placed. Upon the upper part of this collar 13 an annular bracket-plate 14 is secured, which plate is also attached to the under side of the frame 9. A lifting foot-lever 10 is secured to the base 8 and adapted to operate against the roller 22 and the lifting-rods 11, whereby the intermediate frame 8, with its attachments, is elevated and may be lowered; but this is not the construction we depend upon for lowering the chair. Such construction consists in attaching a hollow sliding post 18, having an upper plate 23, closing the same and forming means of securing it to the upper part of the frame 9, and provided near the top with an air-vent. This posts fits snugly within the tubular pivot-post 15. The upper part of the post 15 is provided with a stuffing-box 19 to prevent the escape of liquid. The lower end of this sliding post 18 is provided with openings 26, to which outlet-valves 20 are secured in any suitable way, preferably by a screw 27. Through the center of this screw a very small orifice extends, forming a communication with the interior of the sliding post 18. When the parts are placed together, the interior spaces in the pivot-post 15 and the sliding post 18 are filled with a suitable liquid, preferably oil. A clamp 28, secured to the frame 8, extends around the pivot-post 15 and is operated by a rod and handle 29 to clamp the post to prevent the revolution of the frame around the pivot-post and hold it firmly in position.

The operation is as follows: The frame 9 and the base-frame 8 are made separable, so that the frame 9 may be raised above the frame 8 any desired distance. The raising is done by the foot-lever 10, operating a stirrup 11, the upper ends of which are attached to a flanged collar 13, which flange is secured to the under part of the frame 9, whereby it is raised with the seat. To hold the frame 9 at any desired point of elevation, the corrugations 16 and pawl 17 are operated as described. For lowering the frame and seat two tubular posts are used. One is the pivot-post 15, the lower end of which is securely attached to the metallic plate 25, and thereby held to the base-frame 8. The other is the hollow sliding post 18, having its upper end attached to the supporting-plate 33, which plate is secured to an upper beam of the frame 9, thereby holding the post 18 firmly to the frame 9. The post 18 slides snugly within the post 15, and the stuffing-box 19 prevents leakage. When the frame 9 is elevated, the sliding post 18 is by construction carried upward with it, but the pivot-post 15 does not move, whereby the sliding post 18 is withdrawn out from the pivot-post 15 to that extent. Any vacuum in the space thus caused in the post 15 is avoided by the construction shown in Fig. 2. The post 18 is filled with oil. As it rises out of the post 15 the oil passes down through the valves 20, filling the space in the post 15 below the bottom of the post 18, the air-vent 47 permitting its free flow. On the downward movement of the post 18 the oil forces the valves 20 upward and closes them. The oil is then forced to pass upward into the post 18 through the small orifices 21, which permit its transfer very gradually, the air in the upper part of the post 18 escaping through the air-vent 47. Of course the seat cannot descend any faster than the oil is thus transferred, where-

by the lowering is very gradual and very uniform and without the slightest jar to the patient.

The seat of the chair is suitably upholstered, preferably by a removable cushion 40, the seat itself being provided with a hard smooth surface impervious to moisture or liquid, preferably of glass, for use in some kinds of surgical operations.

The leg-rest 41 is hinged to the chair-seat and is held adjustably extended by an extension brace-rod provided with ratchet-teeth 44, operating in a hollow brace-rod 43 and held at any given point of extension by a pawl 45, engaging the ratchet-teeth. The mode of operation readily appears on inspection of the view Fig. 1. These brace-rods are attached to both sides.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In a surgical chair, a supporting-frame provided with vertical openings, and the seat of the chair, and vertical rods secured thereto and passing down through the openings in the supporting-frame, combined with ball-and-socket joints by means of which the upper ends of the rods are connected to the seat; and endwise-moving rods to clamp the vertical rods in position so as to support the seat of the chair at any desired angle, substantially as described.

TIFFIN J. SHACKELFORD.
CHARLES A. L. KIRKPATRICK.

In presence of—
JOHN D. WILLERMAN,
WM. B. FUNCK.