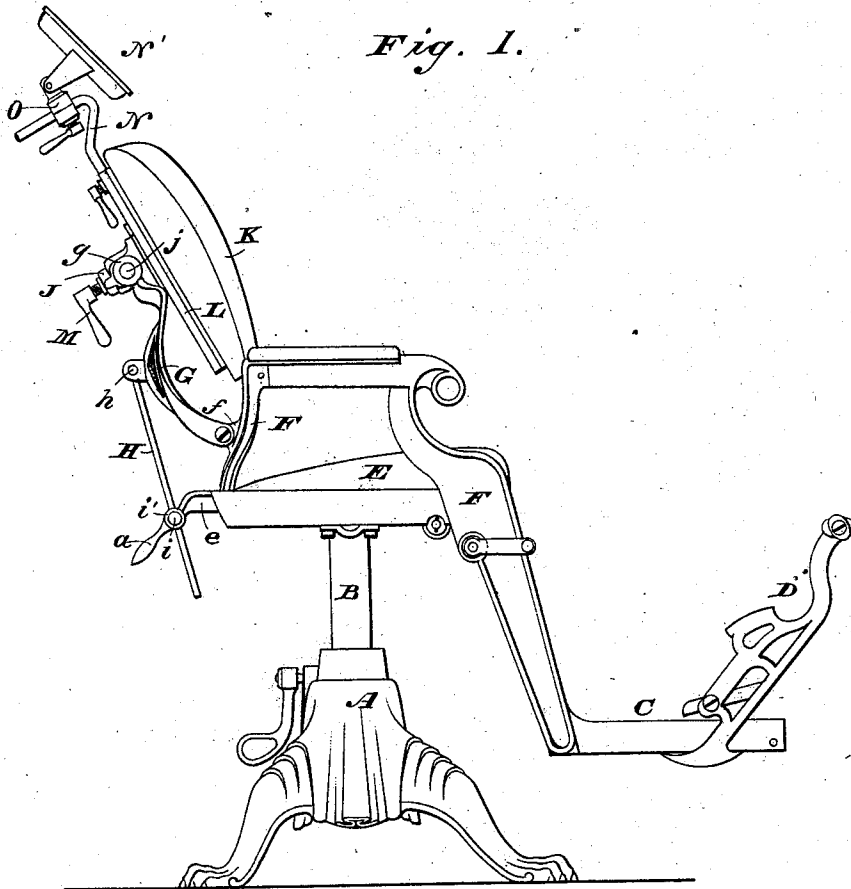
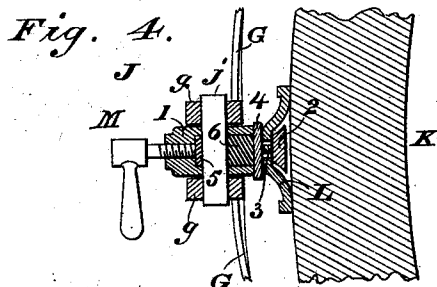


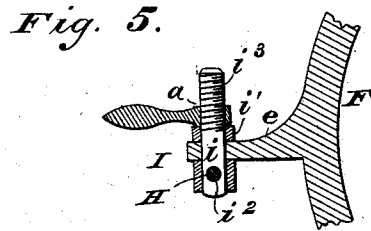
E. T. STARR.
Chair.

No. 224,489.

Patented Feb. 10, 1880.



WITNESSES



INVENTOR

Wm A Skinkle.
Robertson Buchanan.

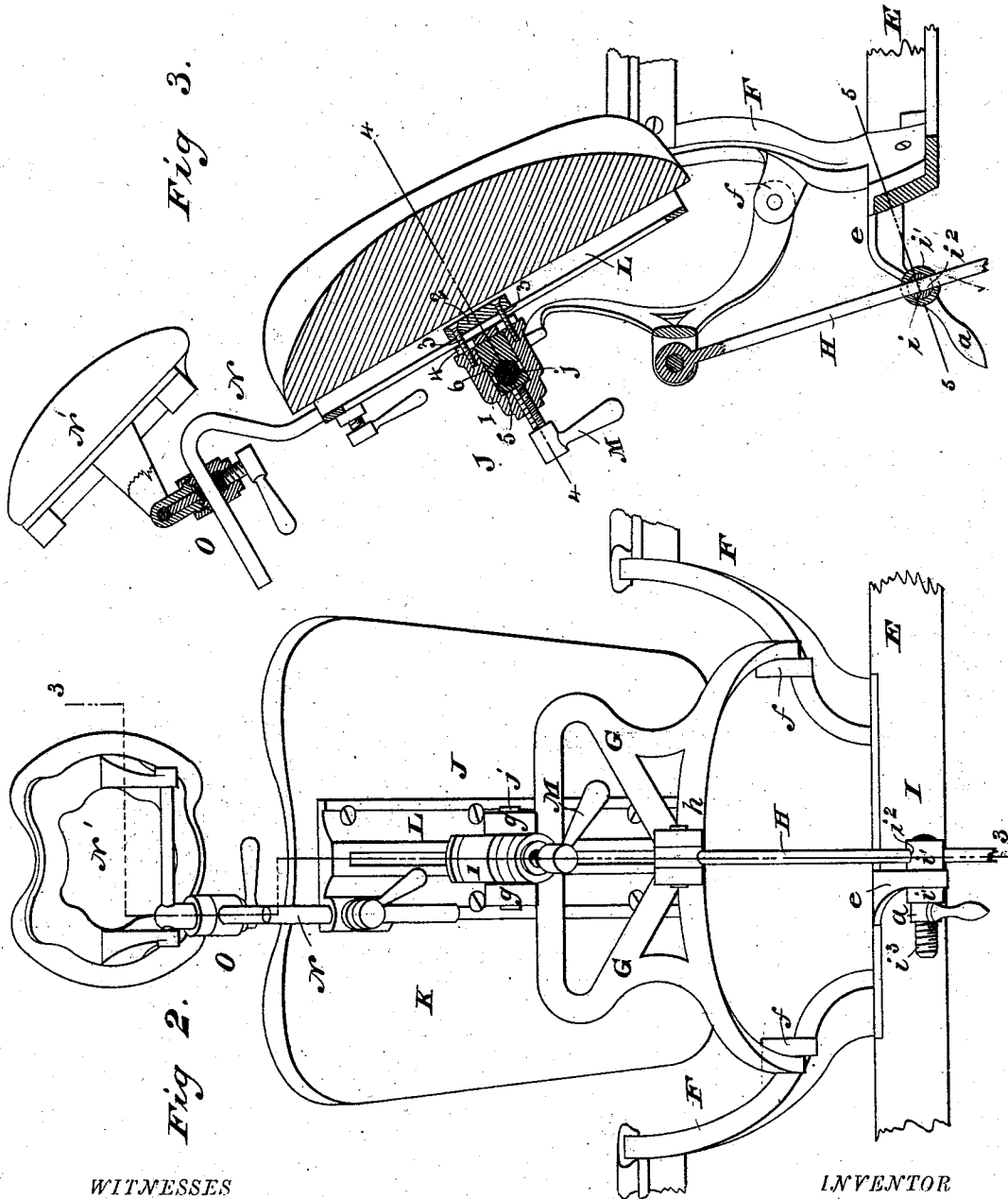
By his Attorneys

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Fig. 6.

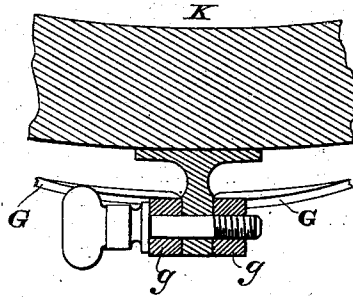


Fig. 7.

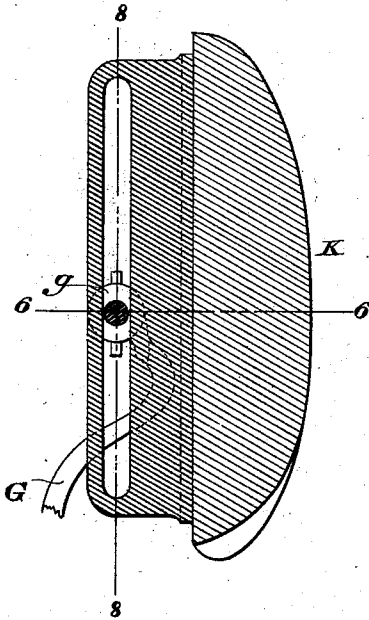
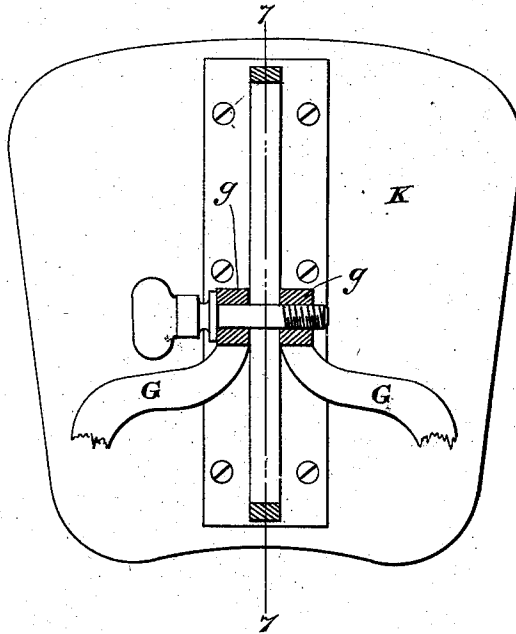


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SAMUEL S. WHITE, OF SAME PLACE.

CHAIR.

SPECIFICATION forming part of Letters Patent No. 224,489, dated February 10, 1880.

Application filed April 16, 1879. Patented in England, July 26, 1879.

To all whom it may concern:

Be it known that I, ELI T. STARR, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Chairs, of which the following is a specification.

My invention relates to chairs of the class having a wide range of adjustment, and more especially designed for the use of dentists, whereby the patient while in the operating-chair is completely under the control of the operator, and may be placed in the various positions necessary for the easy, skillful, and expeditious performance of dental operations, the chair being adjustable in its several parts, in order to accommodate persons of different size and insure their ease and comfort.

My present invention constitutes an improvement on the dental chairs shown in reissued Letters Patent No. 8,389, of August 27, 1878; in original Letters Patent No. 187,573, of February 20, 1877, and in an application for Letters Patent filed by me November 21, 1878, my said invention also being an improvement upon the vertically and horizontally adjustable rocking back or pad shown in reissued Letters Patent No. 8,131, dated March 19, 1878.

The object of my invention is to improve the construction of dental chairs by giving the backs thereof, while connected with and supported by the chair-frame, a wider range of adjustment relatively to the chair-seat than has heretofore been possible, while rendering the back capable of being firmly locked at any desired point in its range of movement, thus insuring easy, reliable, and comfortable support to the patient in whatever position placed.

My invention consists of certain new combinations of devices, which are recited at the close of the specification.

In the accompanying drawings, which represent all my improvements as embodied in a dental chair in the best way now known to me, Figure 1 is a view, in elevation, of a complete chair with my improvements attached; Fig. 2, a view, from the rear, of so much of the chair, on an enlarged scale, as is necessary to exhibit my improvements clearly; Fig. 3, a vertical central section therethrough on the line 3 3 of Fig. 2; Fig. 4, a transverse section

on the line 4 4 of Fig. 3; Fig. 5, a section on the line 5 5 of Fig. 3; Fig. 6, a sectional view on the line 6 6 of Fig. 7, through a modified form of device; Fig. 7, a sectional view thereof on the line 7 7 of Fig. 8, and Fig. 8 a section therethrough on the line 8 8 of Fig. 7.

In Fig. 1 I have shown a complete chair, resembling in its general appearance the pedal-lever hydrostatic chair shown in my application hereinbefore referred to, and it will, consequently, be unnecessary to give a description in detail of the base A, the plunger or spindle B, the foot-board or platform C, the adjustable foot-rest D, the seat and seat-frame E, or the chair-frame proper, F, and especially is such a description unnecessary, as my improvements are applicable to other forms of base, &c., than those shown.

The chair-frame F is provided at each side, above and in rear of the seat preferably, with lugs or bearings *f f*, to which is pivoted, in this instance, a supporting-frame or carrier, G, which carries the back of the chair. This carrier, by reason of its pivotal connection with the chair-frame, has the capacity of being rocked or adjusted backward and forward relatively to the chair-seat E, and is locked and braced in its adjusted position through the intervention of a rod or bar, H, pivoted to said carrying-frame at *h*, and passing through a clamping or locking device, I, mounted upon the chair-frame, or a lug or projection, *e*, extending therefrom in this instance. This clamp consists, in the example shown, of a bolt, *i*, extending through an opening or bearing in the lug *e* of the seat or chair frame, said bolt being surrounded by suitable sleeves or washers *i' i'* upon each side of the supporting-lug *e*. The bolt has a transverse opening or socket, *i²*, at one end, through which the rod H passes, as well as through a similar opening in the sleeve or washer *i'*, surrounding that end of the bolt, and said bolt is also provided at its opposite end with screw-threads *i³*, for the reception of a crank-handle or clamp-nut, *a*. By tightening this handle or clamp-nut the rod is clamped by the bolt and its sleeve *i'*, because said bolt is moved endwise in the sleeve and draws the rod H firmly against the edges or walls of the slot or opening in the

sleeve. The clamping of the rod H necessarily clamps the carrier G, with which said rod is connected. By loosening the clamping-handle the rod H is left free to move endwise in the locking device, to permit the carrier or support G to be adjusted. Any other suitable clamping device, however, may be employed for the purpose of locking the carrier in its adjusted position.

The carrier or support G consists, preferably, of the skeleton-frame curved as shown in the drawings, and is provided at its upper end with suitable bearings *g g*, for the reception of a bolt, rod, or suitable trunnions *j*, which forms the pivot or axis of the joint or connection J, which connects the carrier and the back or pad K, and permits the back to be turned, rocked, or swiveled independently of the adjustment of the carrier-frame G. This joint or connection is fitted with a clamp, which has a hollow flat-sided frame, 1, working between the bearings or lugs *g g* around the bolt *j*, which is locked or keyed from turning in said lugs. This frame 1 carries at its front end a plate, 2, the two being firmly connected together, while held a short distance apart, by suitable connections or bolts 3 3. The plate 2 fits within a longitudinally-slotted slide, L, which is firmly secured to the back or pad K, or forms part thereof, and which is constructed to slide longitudinally upon the plate 2. By reason of the connection of the back and carrier by the plate and slide the said pad is supported and allowed to slide up and down, or be adjusted endwise or vertically, relatively to the carrier and to the chair-seat.

Interposed between the slide L and the front end of the frame 1 is a friction plate or block, 4, which is prevented from displacement by the bolts 3 3; and in order that the back may be locked or clamped in any position to which it may be adjusted by being slid upon the connection with the carrier, or by being inclined or rocked upon its pivot or axis, the clamp-frame 1 is provided with clamping-shoes 5 6, as clearly shown in Fig. 3, which are tightened by means of the screw or handle M. The tightening of the screw M forces the shoe 5 tightly against the bolt *j*, and, as the frame 1 is moved outward by the tightening of said screw, also draws the shoe 6 firmly against the bolt *j* and the plate 2 against the inside of the slide L, thus clamping said slide L firmly between the plate 2 and the friction-block 4, and the frame 1, by its shoe, to the bolt *j*, thereby locking the back firmly to the carrier or support in the desired position.

In Figs. 6, 7, and 8 of the drawings I have shown a modified form of slide-connection and clamp for the back, which are sufficiently represented in the drawings to render unnecessary a specific description, these permitting both the independent vertical or endwise adjustment of the back and its rocking or tilting relatively to the carrier or support G, and also enabling the back to be clamped in its various positions. It will thus be seen that

the back or pad K has the capacity of adjustment independently of the carrier or support G—that is, it may be adjusted vertically or endwise, and rocked, tilted, or variably inclined independently of said carrier, and then firmly locked or clamped in its adjusted position. A wide range of movement is consequently given to the back of the chair, as is obvious, said back being capable of adjustment by its support or carrier backward and forward to any desired extent relatively to the seat of the chair, which, together with the capacity for adjustment independently of said carrier, insures the ease and comfort of patients of all sizes and enables the operator to place the patient in the position most convenient for the easy and skillful performance of the delicate dental operations. It will also be noted that if the back-carrier be fixed to the chair-frame the back may be tilted and moved upward and downward relatively to the chair-seat by reason of the tilting and sliding connection between the chair-back and the back-carrier, and that the back when so moved may be clamped or locked in its position. It will also be noted that the back may be moved backward and forward relatively to the seat, and be tilted relatively to the back-carrier without being slid either upward or downward, and that the back when thus moved may be clamped or locked in the position to which it is moved.

The back carries a head-rest bar, N, which forms a connection between said back and a variably-adjustable head-rest, N', (or one having a wide range of adjustment,) the said bar, head-rest, and its clamping or adjusting mechanism O being substantially the same as that shown in S. S. White's Letters Patent No. 187,573, dated February 20, 1877, and as patented to me December 28, 1875, as No. 171,539.

I do not wish to be understood as broadly claiming herein the combination of a chair-frame with a back capable of rocking and sliding endwise and adapted to be locked in its adjusted position relatively to the seat of the chair, as that is not of my invention; nor do I wish to be understood as claiming herein anything shown in the application of T. J. Carrick, of Baltimore, Maryland, filed January 14, 1879. Said Carrick shows, among other things, a back provided with a sliding and rocking connection governed by a single clamp-screw, whereby said back is permitted to slide vertically and to rock or tilt and be firmly secured in its adjusted position.

My invention is limited to the combinations set out in the following claims, which embrace as an element the back-carrier, capable of being adjusted backward and forward relatively to the chair-seat, which element is not found in the invention of Mr. Carrick, and is not shown or described by him.

I claim—

1. The combination, substantially as hereinbefore set forth, of the chair-frame, the back-carrier, the chair-back, the connection between

the back-carrier and chair-frame which permits the said carrier to be moved backward and forward relatively to the chair-seat, the pivotal connection between the chair-back and its carrier which permits the back to rock or tilt, and the clamp which locks the back firmly to the carrier as against its rocking movement.

2. The combination, substantially as hereinbefore set forth, of the chair-frame, the back-carrier, the chair-back, the connection between the back-carrier and chair-frame which permits the said carrier to be moved backward and forward relatively to the chair-seat, the pivotal and sliding connection between the carrier and back which permits the back to both tilt or rock and slide or be adjusted upward and downward relatively to said carrier, and the clamp which locks the back to the carrier both as against its sliding and rocking movements.

3. The combination, substantially as hereinbefore set forth, of the chair-frame, the back-carrier pivoted at its lower end to the frame so as to rock backward and forward relatively to the seat, the clamp to lock the carrier to

its adjusted position, the chair-back connected with the upper end of the carrier by connections which permit said back to rock and slide upon the carrier, the clamp to lock the back and carrier firmly together, and the head-rest carried by the back, so as to partake of its movements while independently adjustable thereon.

4. The combination, substantially as hereinbefore set forth, of the chair-frame, the back-carrier, the connection by which said carrier may be moved backward and forward relatively to the chair-seat, the chair-back, the pivotal connection between the chair-back and its carrier which permits the back to rock or tilt, the clamp to lock the back firmly to the carrier as against its rocking movement, and the head-rest carried by the back, so as to partake of its movements while independently adjustable thereon.

In testimony whereof I have hereunto subscribed my name.

ELI T. STARR.

Witnesses:

CHAS. R. GREEN,
EZEKIEL J. EALER.