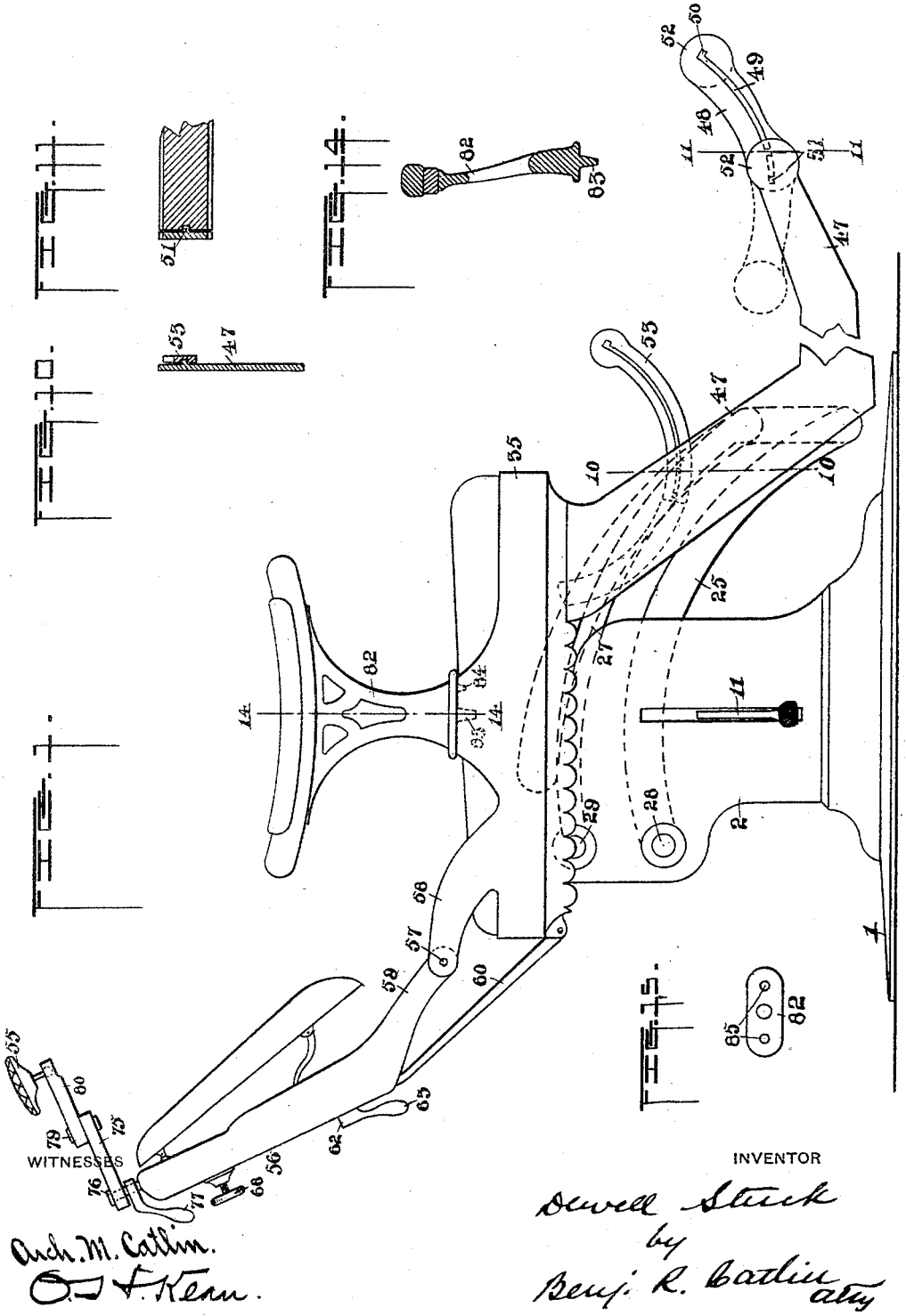
(No Model.) 5 Sheets—Sheet 1.

D. STUCK.

DENTAL CHAIR.

No. 491,611. Patented Feb. 14, 1893.



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D. STUCK.

DENTAL CHAIR.

No. 491,611. Patented Feb. 14, 1893.

FIG. 2.

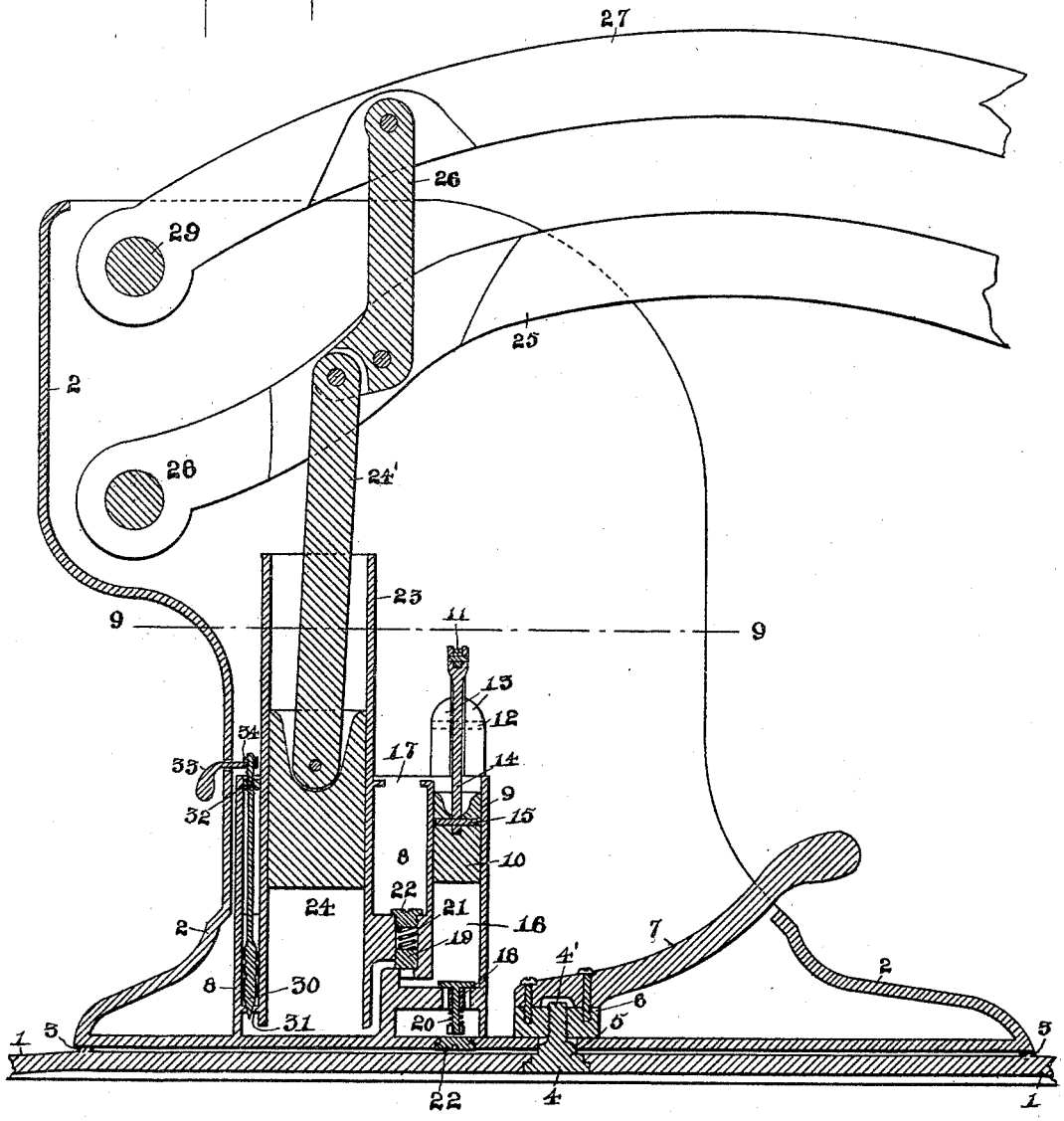

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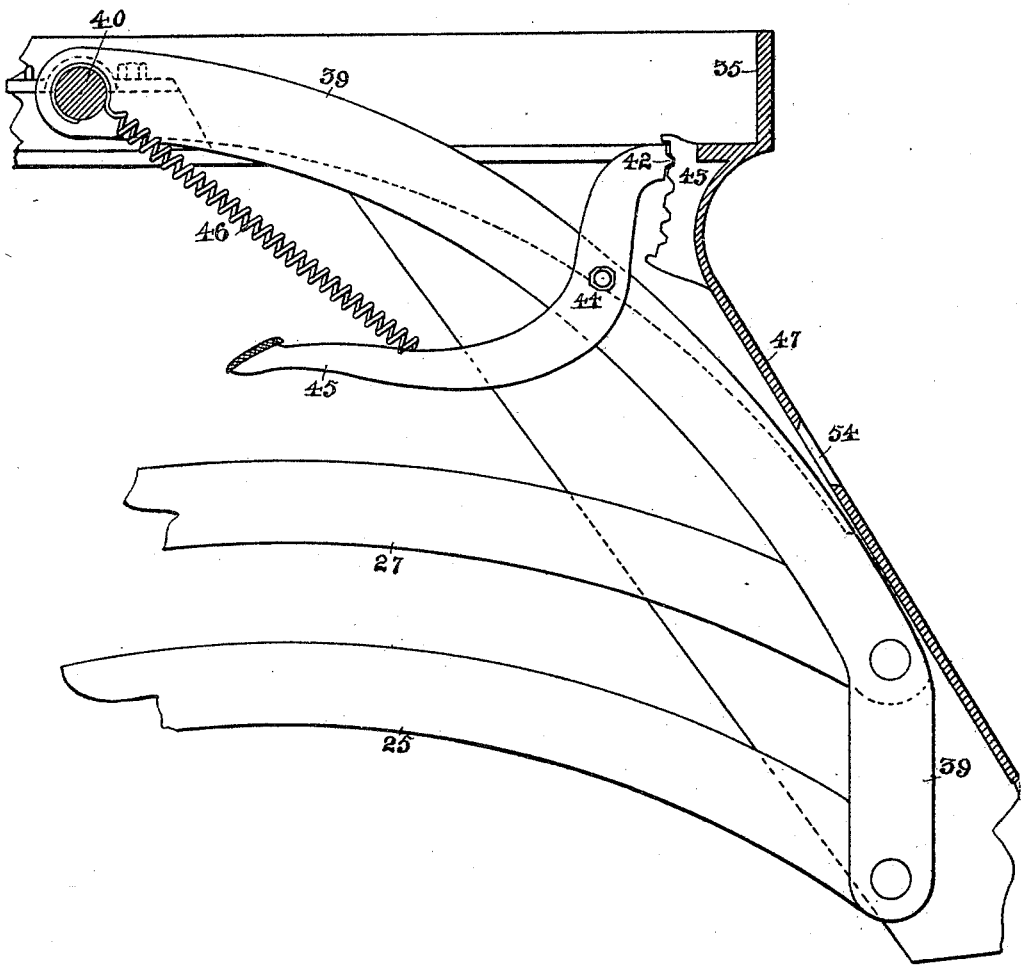
FIG. 3.



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(No Model.) 5 Sheets—Sheet 4.

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DENTAL CHAIR.

No. 491,611. Patented Feb. 14, 1893.

FIG. 4.

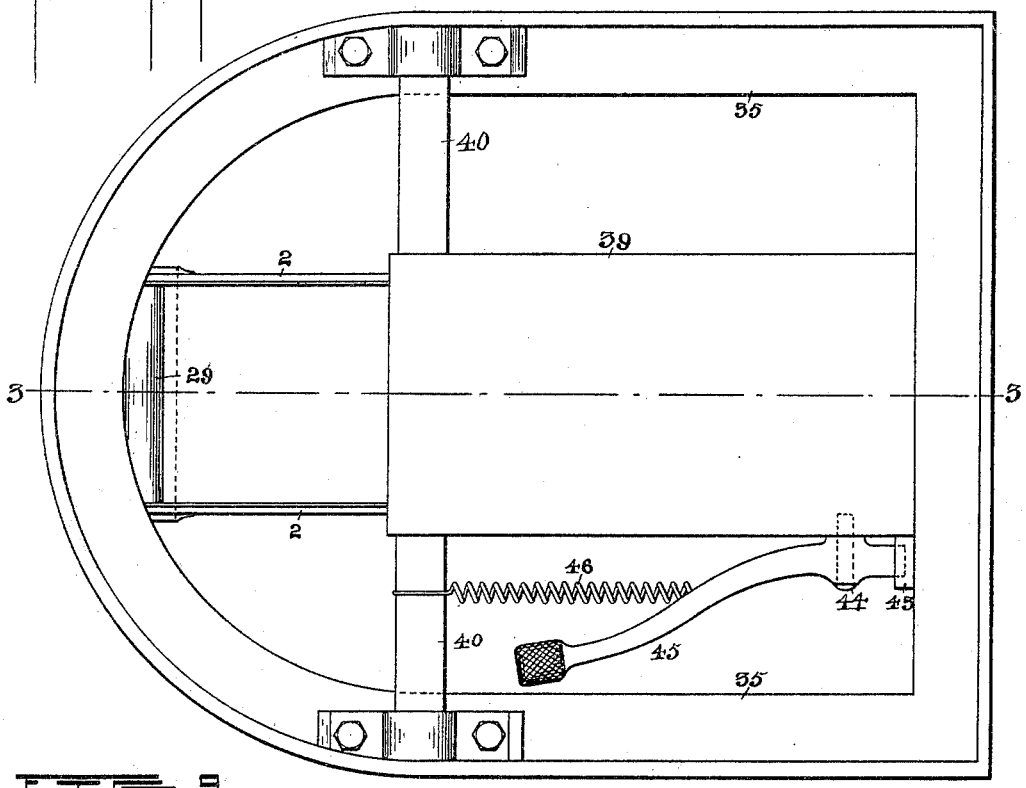
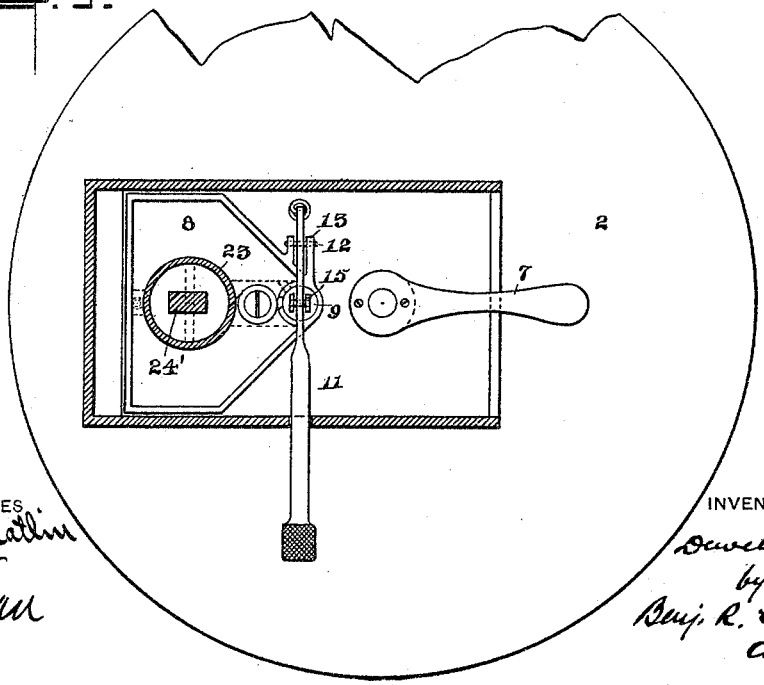


FIG. 9.



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(No Model.) 5 Sheets—Sheet 5.

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No. 491,611. Patented Feb. 14, 1893.

FIG. 5.

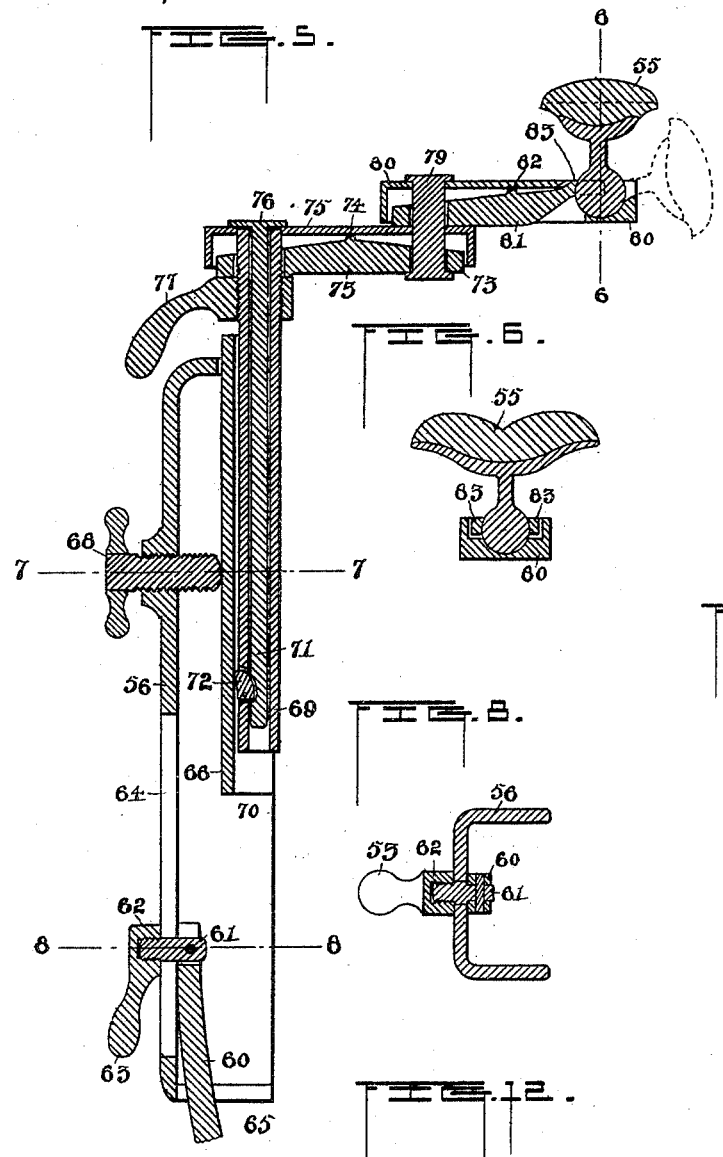


FIG. 6.

FIG. 7.

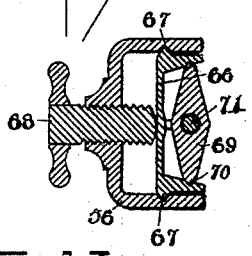


FIG. 8.

FIG. 13.

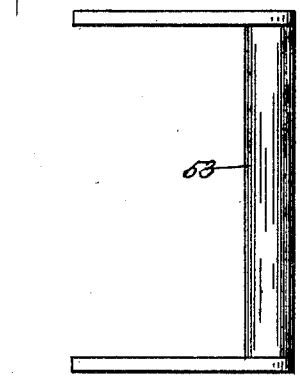
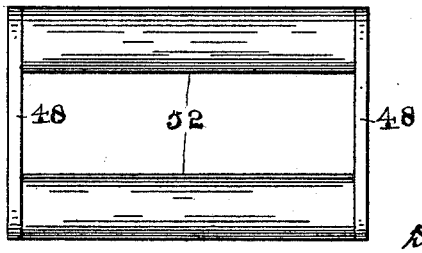


FIG. 12.



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UNITED STATES PATENT OFFICE.

DEWELL STUCK, OF ROCHESTER, NEW YORK.

DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 491,611, dated February 14, 1893.

Application filed March 19, 1892. Serial No. 425,548. (No model.)

To all whom it may concern:

Be it known that I, DEWELL STUCK, a resident 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 invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to dental chairs and has for its object to increase the ease, certainty and range of adjustment of various parts; and it consists in the construction hereinafter described and particularly pointed out.

In the accompanying drawings: Figure 1 is a side elevation of the chair; Fig. 2 is a partial central vertical section; Fig. 3 is a partial section on line 3—3 of Fig. 4; Fig. 4 is a plan of the seat frame and locking mechanism; Fig. 5 is a vertical central section of the head rest support; Fig. 6 is a section on line 6—6 of Fig. 5; Fig. 7 is a section on line 7—7 of same figure; Fig. 8 is a section on line 8—8 of Fig. 6; Fig. 9 is a section on line 9—9 of Fig. 2; Fig. 10 is a section on line 10—10 of Fig. 1; Fig. 11 is a section on line 11—11 of same figure; Fig. 12 is a plan of the main foot rest; and Fig. 13 is a plan of a supplementary foot rest. Fig. 14 is a section on line 14—14 of Fig. 1; and Fig. 15 is a plan of the part of the seat frame upon which the arm rest is supported.

Numeral 1 denotes the base or floor plate and 2 the standard of the chair. This standard preferably in horizontal section is closed at the bottom. It has an open front and top and is rearwardly extended at its upper part the whole being arranged and constructed to adapt it to receive elevating mechanism to be hereinafter described. 3 denotes a supporting rib formed on the base and upon which the standard rests.

4 indicates a plug having a flanged head fitted or seated in the base as represented and provided with an angular body 5 passing through the bottom of the standard 2, and with a screw threaded portion 4′.

6 is a clamping nut engaging said screw to which nut is secured by fastening screws a lever 7. The standard can be clamped to the base by suitably turning the nut down upon the screw.

8 denotes a fluid reservoir, 9 a pump of which 10 is the piston and 11 the piston lever. This has a fulcrum 12 in the studs or brackets 13 fixed on the reservoir. Under its inner or short arm is a spring adapted to draw it down after it has been raised by the forcing down of the lever arm. This lever is loosely connected with the piston by a rod or bar 14 having pivots 15.

16 denotes the piston cylinder and 17 is an opening in the top of the reservoir to permit fluid overflow to return to the reservoir. The inlet and check valves are respectively denoted by 18 and 19 and their closing springs by 20 and 21. Removable plugs are indicated by 22.

23 is the main cylinder and 24 its piston loosely connected by a supporting rod 24′ with lever 25 and by the medium of link 26 with lever 27, said levers having fulcrums supported in the standard at 28 and 29 respectively.

30 is a valve having its seat in the diaphragm 31. Its stem has a screw thread connection with plug 32.

33 is a valve operating handle and 34 a handle retaining nut.

To elevate the seat support the pump is operated in a well known manner the valve 30 being securely closed. Liquid such as oil, glycerine or the like is drawn from the reservoir and forced under piston 24. The pumping being suspended when the seat has been raised to the desired height the valve 19 is automatically closed by its spring and the seat is held at a fixed elevation. To lower the seat the valve 30 is opened and the liquid permitted to flow from cylinder 23 into the surrounding reservoir.

The chair seat frame denoted by 35 is supported upon the standard and upon piston 24 by means of the pivoted rod 24′ and the two wide levers 25 and 27 having fulcrums 28 and 29 in the standard and pivotally connected at their ends opposite said fulcrums to a broad bar or lever 39 which latter has journals 40 turning in bearings on a horizontal flange of the seat frame and strongly secured thereto. By forcing up the piston said levers are turned upon their fulcrums and the bar or lever 39 with the seat frame supported thereon is elevated. True vertical movement largely multiplied is secured by the parallel levers connected as described and

a large range of vertical adjustment is secured. The seat is locked in any desired position with reference to a horizontal plane by means of the pawl 42 adapted to engage a rack 43 situated near the junction of the seat and foot rest frames. The pawl has a fulcrum 44 in the seat elevating bar and a treadle arm 45.

46 is a spring normally holding said pawl in engagement with the rack.

A foot rest platform is denoted by 47 and a foot rest roll frame by 48. This frame has in each of its end walls a slot 49 having a notch or pocket 50. Lugs adapted to fit and be moved in said grooves are denoted by 51, and foot rests or foot rest rolls by 52. This frame and the rests are adapted to be adjusted by sliding upon the lugs and they are locked in their extreme position by the lugs dropping into the notches 50. A similar rest for children is indicated by 53 the foot rest platform support being cut away at 54 to receive the supporting arms of said foot rest when it is pushed inwardly as indicated by dotted lines.

The head rest 55 shown in Fig. 5 is supported from the seat frame 35 by pivots 57 connecting the brackets 58 of said frame with the legs 59 of a swinging back frame 56 U shaped in cross section as shown.

60 is a brace or supporting bar pivoted to the seat frame and adapted to be clamped to the back frame by means of a screw 61 and a nut 62 having a handle 63. The back frame is made vertically movable on the screw 61 and brace 60 by means of the slots 64 and 65 in the frame.

66 denotes a slide or inner back frame similar in cross section to the main or outer frame 56. It is provided with ribs 67 adapted to run in grooves in the said back frame. It is held at any desired elevation by the set screws 68.

69 is a sliding bar the edges of which fit and are adapted to move in grooves 70 formed in the slide 66. 71 is a rod vertically movable in a passage in said bar.

72 denotes a friction pawl pivoted in a slot in the bar 69. One end extends into a recess in the rod 71 and the other is adapted to bear on the interior of the slide 66. The bar 69 passes through an opening in the end of a lever 73 having a fulcrum at 74 within a lever 75 having the form of a shield or cover. The slide 69 also extends toward or into an opening in said shield which opening is covered by the head 76 of the rod 71.

77 is a nut provided with a handle and fitted to the rounded screw threaded upper end of bar 69. The screwing of nut 77 against lever 73 moves said lever about its fulcrum and tends to depress its opposite or right hand end, which through the action of the bolt 79 pulls down the left hand end of lever or cover 80 and raises its opposite end with the effect to clamp the head rest. If the nut 77 be farther screwed up it will produce a relative downward movement in the bar 69 whereby the heel of pawl 72 is thrust against the bottom of the recess in rod 71 with the effect to throw its toe outward against the slide bar 66 and bind the bars together. Though these movements are for the sake of clearness described as successive and as pertaining only to levers 73 and 80 and bar 69 they are practically simultaneous and the effect would be the same if in operation the levers 75 and 81 and rod 71 were moved to a slight extent in the direction opposite that of the movements of the corresponding parts 73, 81 and 69 respectively. To unclamp the head rest the nut 77 is run down on bar 69 whereupon the parts can be adjusted as desired. To clamp the bars together again it is only necessary to screw the nut against lever 75.

The mechanical details of the construction may be varied without departing from the invention provided substantially the same mechanical and operative principles are employed. Thus it is not essential in all cases that the standard be oblong in horizontal section nor that it have an extension of the form shown to receive the fulcrums of the elevating levers, nor that said levers be connected by a link near the point of attachment of the piston rod. It is important that the levers be so arranged and connected that they will give to the seat a large range of movement in a vertical line and in respect to the head rest it is considered material that the same device serves to raise the adjustable slide bar, lock the same and clamp the head rest in position.

In Figs. 1 and 14 is represented a detachable and reversible arm rest 82, provided with an extension or foot 83 fitting a socket in the seat frame. 84 is a pin also entering one or the other of the sockets 85 in the frame which pin holds the arm rest from turning about the extension 83. The post of the arm rest is bent laterally as indicated in Fig. 14, the effect being to widen or narrow the seating space according to the adjustment to suit different persons, or in particular emergencies to permit the operator to get nearer to the patient, the rest being inwardly inclined at such time.

I am aware that chair standards locked to a base by a spring pin engaging a notch or hole, and a system of parallel levers adapted to elevate a bracket stand and to be locked in various horizontal positions by a rack and pawl, and seat elevating pump cylinders with suitable valves and overflow receptacle, and adjustable foot roll frames are not new. My improvements relating to dental chairs are specifically hereinafter pointed out.

Having thus described my invention what I claim is:

1. The combination of the standard, the parallel levers having fulcrums therein, the seat frame, the bar 39 pivoted to each of said levers and extending backwardly and over the point of application of power to said levers and journaled in said frame, and mechanism for moving the levers connected to the same at one

side of said fulcrums and immediately under the connection of bar 39 with the seat frame, consisting of a piston having a rod pivotally connected therewith and with the levers and means for raising the piston; substantially as set forth.

2. The combination of the standard, the parallel levers having fulcrums therein, the seat frame, the bar 39 pivoted to each of said levers and extending backwardly and over the point of application of power to said levers and journaled in said frame, and mechanism for moving the levers about the fulcrums consisting of a piston having a rod pivotally connected therewith and with the levers and means for raising the piston; substantially as set forth.

3. The combination of the standard, the parallel levers having fulcrums therein, the seat frame, the bar 39 pivoted to each of said levers and extending backwardly and over the point of application of power to said levers and journaled in said frame, and mechanism for moving the levers about the fulcrums consisting of a piston having a rod pivotally connected therewith and with the levers, means for raising the piston, and means adapted to automatically lower the same; substantially as set forth.

4. In combination a seat frame, a rack fast on said frame, an elevating bar 39 loosely connected to and supporting the frame, mechanism for raising the bar consisting of the parallel bars fulcrumed in a chair standard and the piston and piston rod, said rod being pivotally connected both to the piston and to the levers, and a pawl having a lever extension pivoted to and movable with said elevating bar; whereby the chair seat can be raised and automatically lowered and also tilted and locked in the tilted position at any desired elevation; substantially as set forth.

5. The standard having an open side and top and having its upper part enlarged or laterally entended, levers having fulcrums in said extensions and extending through the open side of the standard, the seat supported on said levers and means for raising and lowering the latter; substantially as set forth.

6. The rotatable chair standard provided with a lateral extension near its upper part and a vertical slot on the side opposite the extension, a seat elevating piston, a reservoir containing the same and situated adjacent to the standard wall below said extension, a centrally situated clamping lever, and seat elevating levers fulcrumed in said extension, both the clamping and the elevating levers extending through said slot; substantially as set forth.

7. The standard having a closed bottom and circumferential walls adapted to inclose seat-elevating devices and provided with a lateral extension and with elevating levers fulcrumed in its extension and slotted at one side for the passage of a standard-clamping handle 7 and of the elevating levers, the open-topped reservoir situated on said bottom at one side of its center, the pump, and the main piston cylinder situated in the reservoir, and a valve having an operating handle situated above the reservoir and extending through the inclosing wall of the standard; substantially as set forth.

8. In combination the seat frame, the back frame slotted in its bottom and rear and pivotally connected to said seat frame, the brace pivoted to the same frame and having at its outer end a pivoted screw and clamping nut, said screw being adapted to move in the rear slot of the frame when not clamped; substantially as set forth.

9. In combination the swinging back frame 56, provided with grooves, the sliding frame 66 fitting said grooves and itself provided with grooves, the bar 69 fitting the latter grooves, the rod situated in a passage in the bar, and a friction pawl pivoted in the bar, and adapted to be operated by the rod to lock the slide bar to the sliding frame, means for relatively moving the bar and rod, means for clamping the main sliding frame to the back frame, and a head rest supported from the bar and rod; substantially as set forth.

10. In combination the head rest, the lever having arms embracing a part of said rest, a second lever crossing the first and having a seat for said part, said levers having a common fulcrum, a second pair of levers having a common fulcrum, and overlapping the pair first named, a bolt passing loosely through the overlapping arms of the four levers and engaging the interior ones, and mechanism for forcing together the ends of the said second pair of levers which are opposite said bolt to clamp the head rest; substantially as set forth.

11. The foot rest roll frame having a curved groove in each end, and a foot rest or platform frame provided with lugs fitting said grooves the roll frame being provided with one or more rolls and adapted to be slid on the lugs to and from the chair seat to give various elevations of a roll; substantially as set forth.

12. A supporting roll-frame having a curved groove in each end and a foot rest frame having lugs fitting said grooves provided with one or more rolls, the roll frame being adapted to be slid on the lugs to and from the chair seat to give various elevations of a roll, one of said grooves communicating with notches on its under side to receive a lug whereby the roll frame is secured in different positions; substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

DEWELL STUCK.

Witnesses:
L. K. NASH,
F. B. HUTCHINSON.