

June 1, 1926.

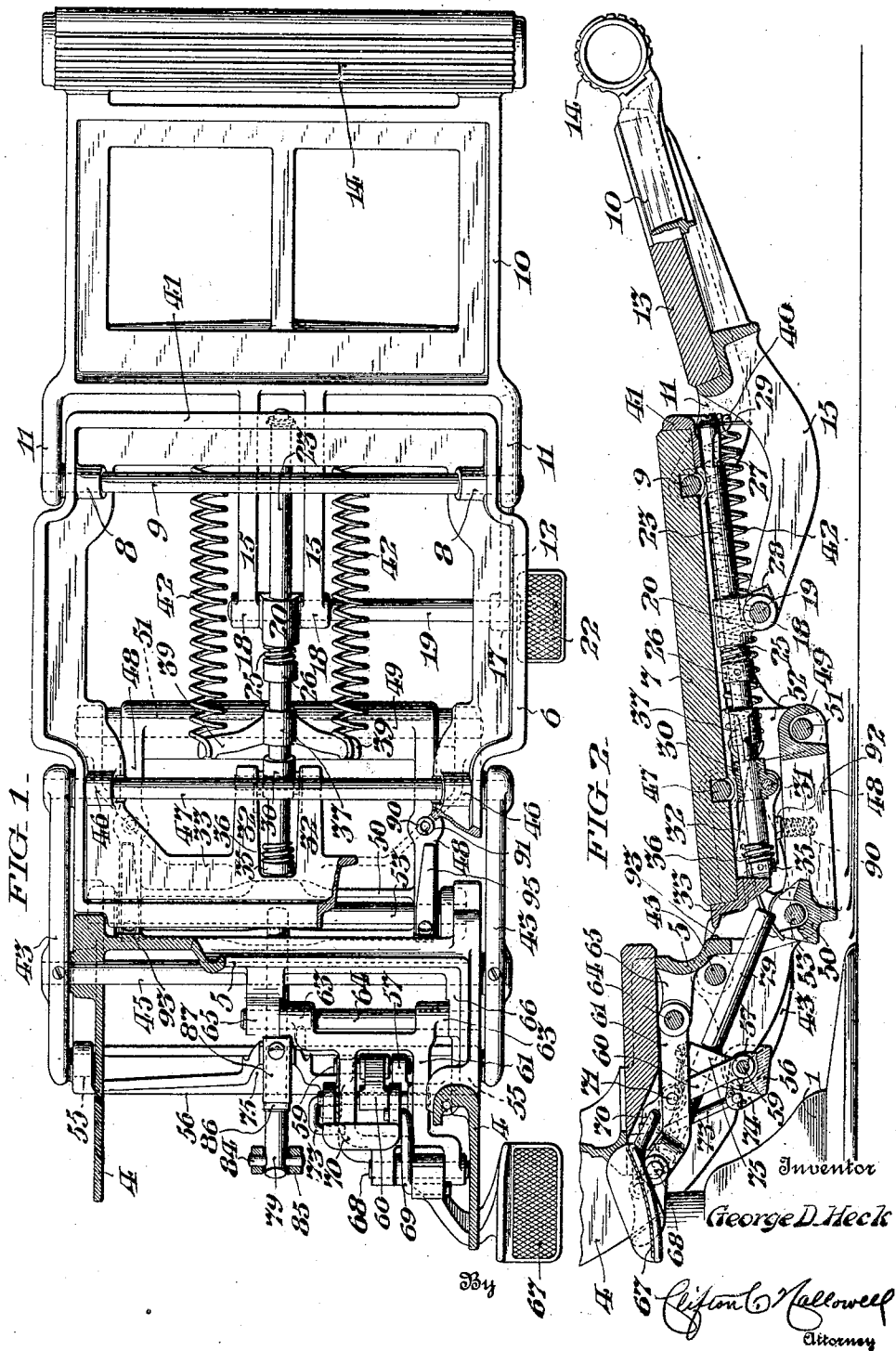
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G. D. HECK

DENTAL CHAIR

Filed April 18, 1922

6 Sheets-Sheet 1



June 1, 1926.

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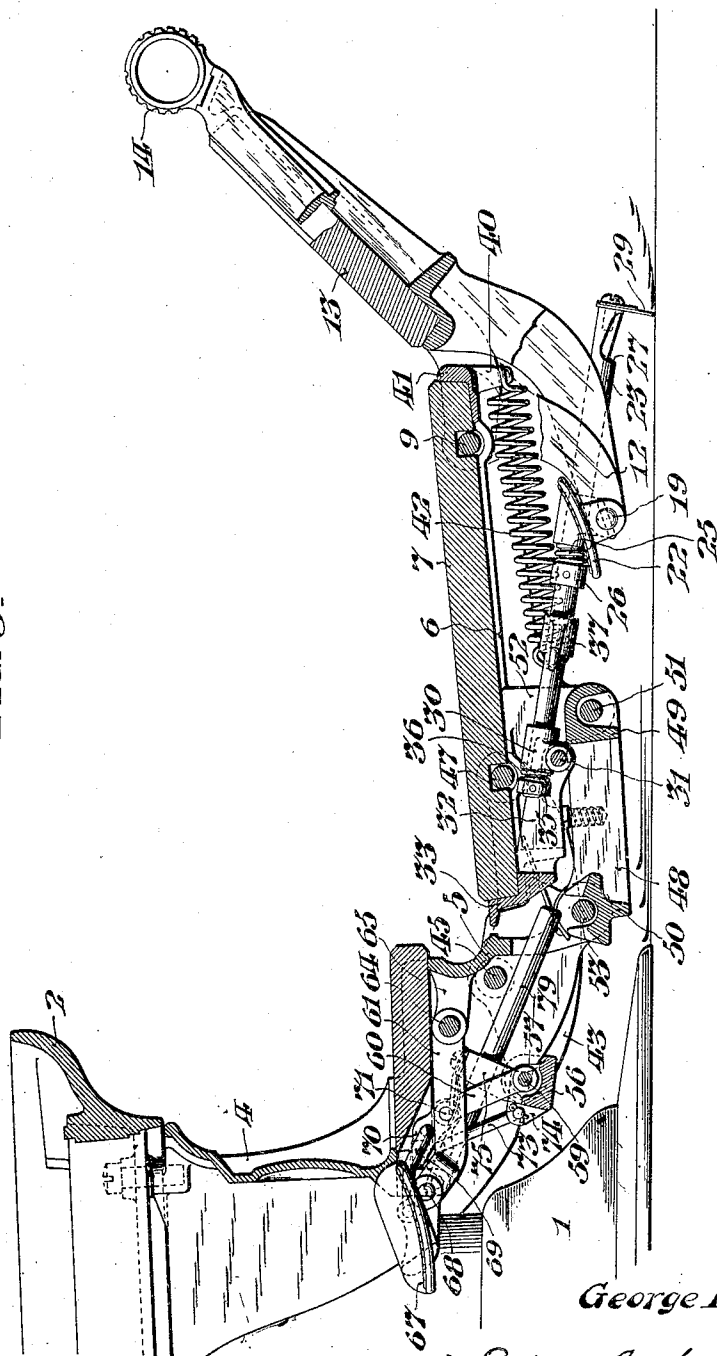
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DENTAL CHAIR

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FIG. 3.



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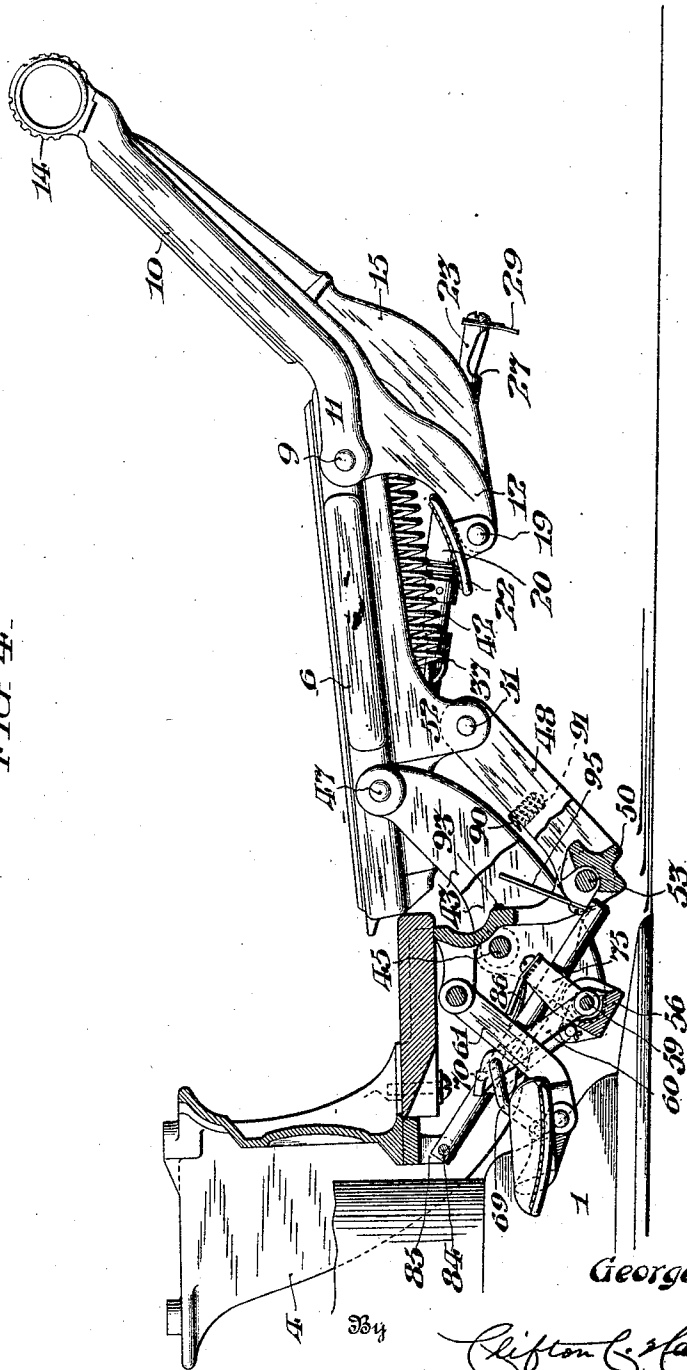
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DENTAL CHAIR

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FIG. 4.



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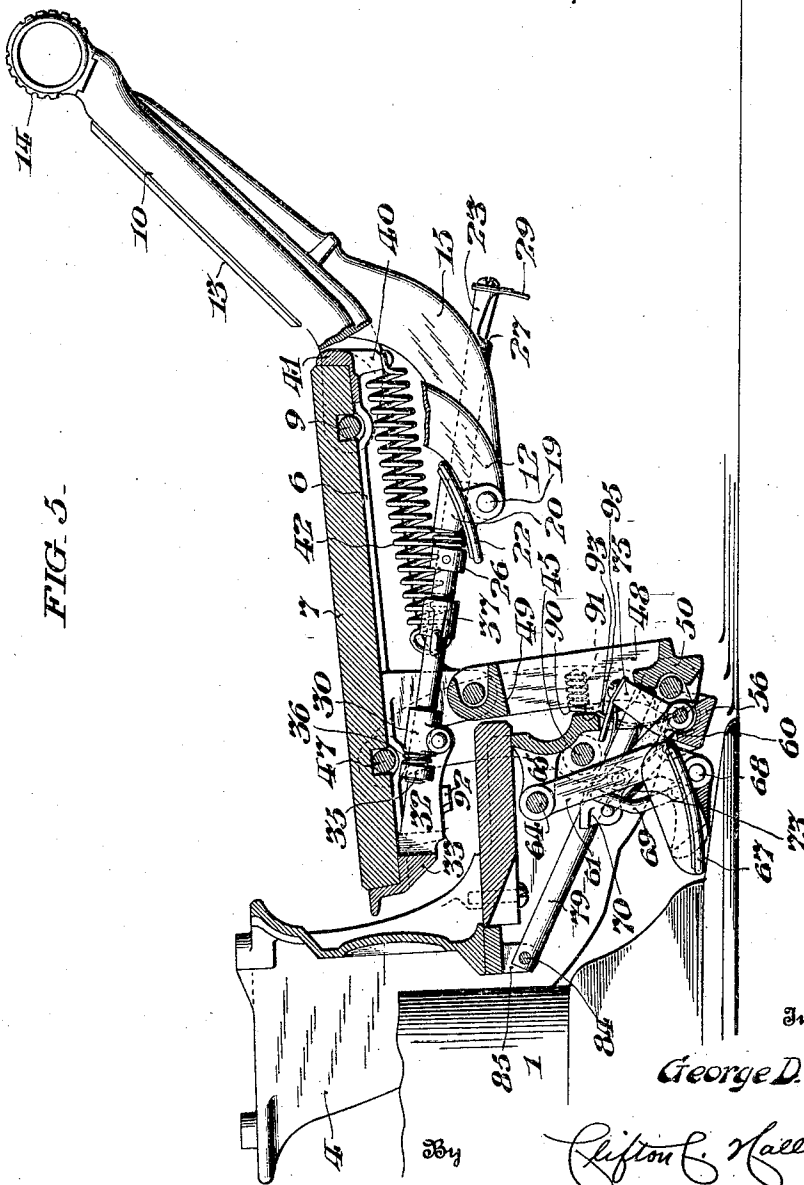
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DENTAL CHAIR

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6 Sheets-Sheet 4



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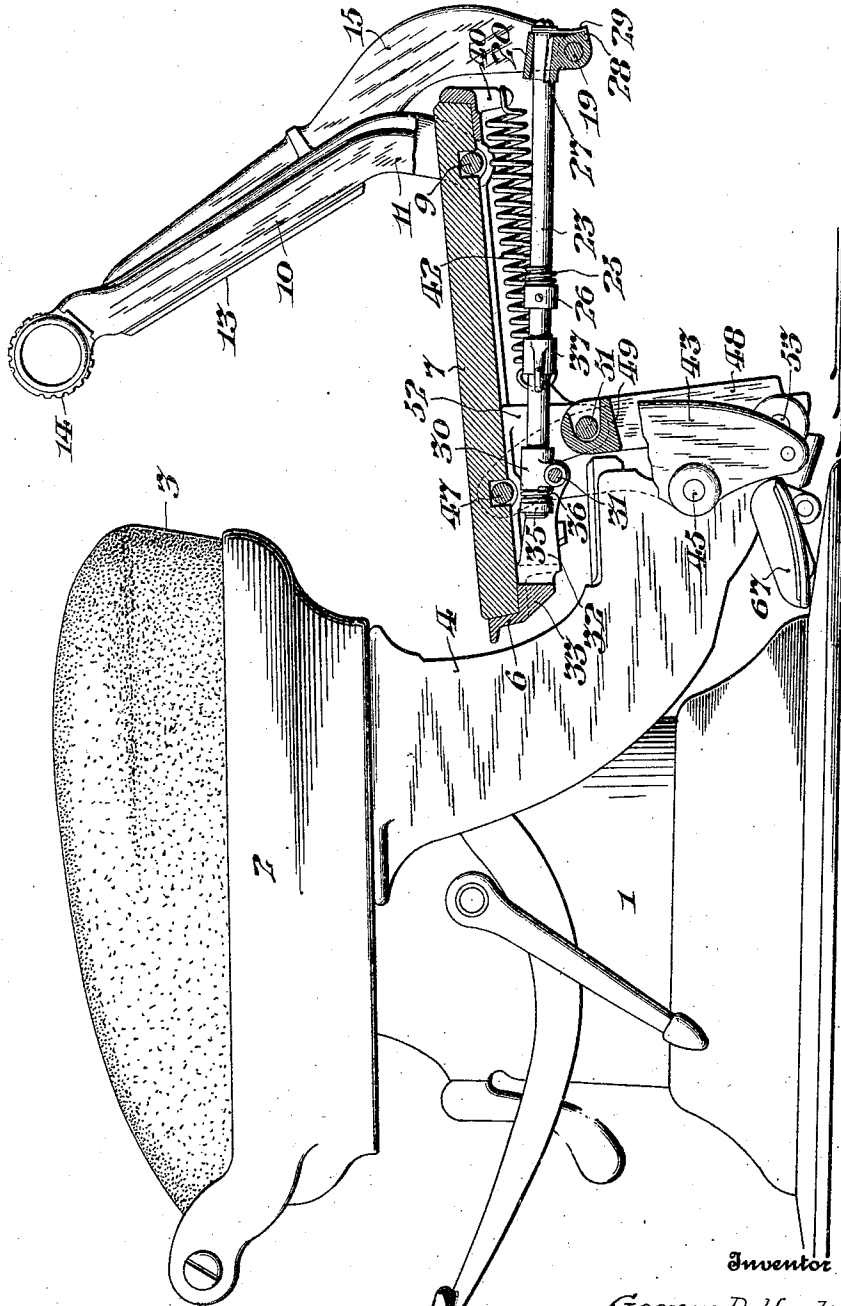
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DENTAL CHAIR

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6 Sheets-Sheet 5

FIG. 6.



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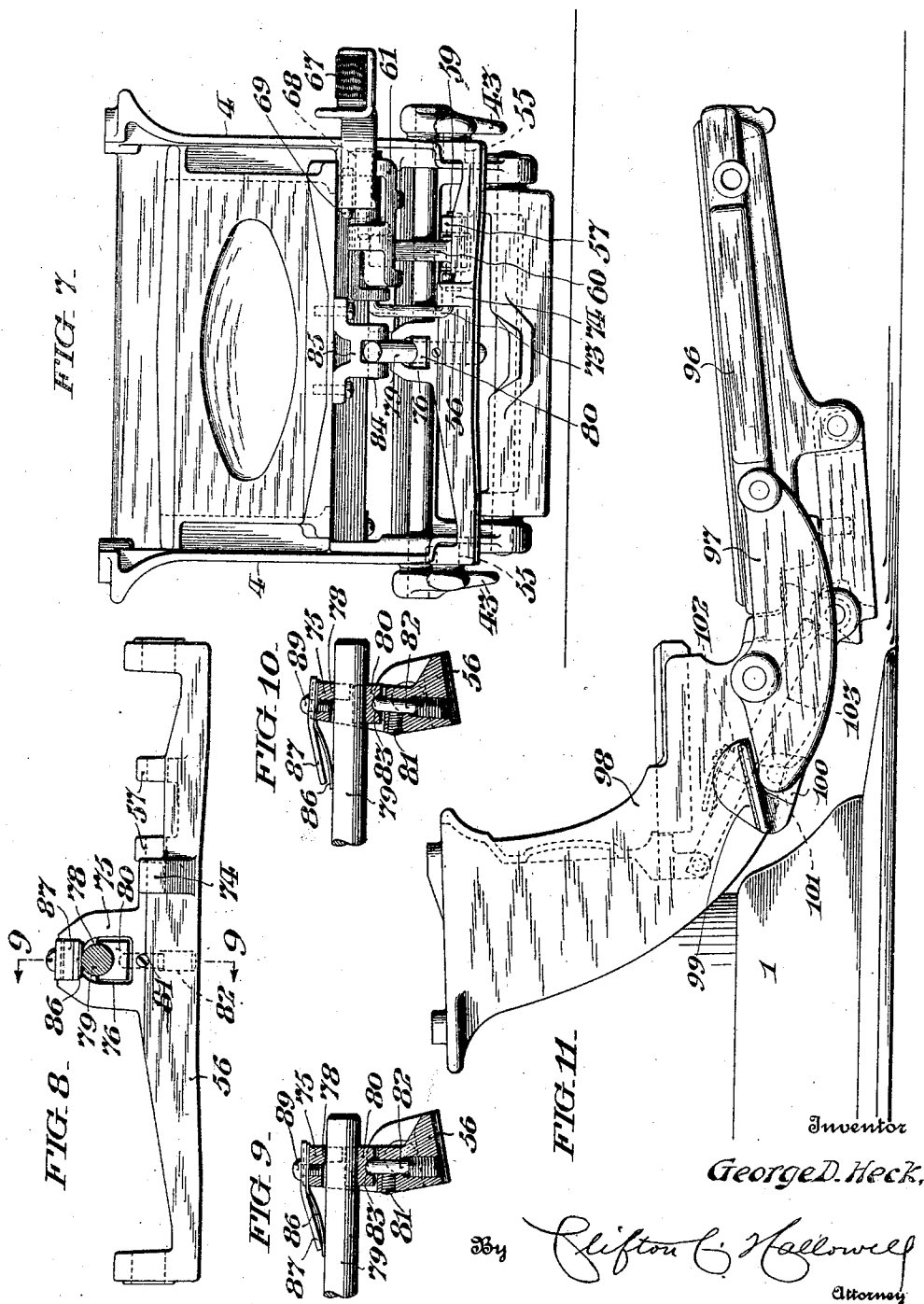
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DENTAL CHAIR

Filed April 18, 1922

6 Sheets-Sheet 6

1,586,740



UNITED STATES PATENT OFFICE.

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DENTAL CHAIR.

Application filed April 18, 1922. Serial No. 555,141.

My invention relates particularly to foot-rests for dental chairs and is especially directed to that class of foot-rests in which the foot-rest frame is supported by, and pivotedly connected with, the chair frame and is capable of adjustment toward and from the seat of the chair.

The principal objects of my invention are to provide a dental chair with a foot-rest that may normally assume a position closely approaching the floor, and that may be adjusted to closely approach the chair seat and be retained in any position intermediate of its range of movement.

Other objects of my invention are to provide novel means to so yieldingly support the toe-board in inclined relation to the foot-board that it will yield to any abnormal pressure exerted by the patient in the chair, to assume a position substantially alined with the foot-board or platform whereby possible injury to the patient or chair may be avoided.

Further objects of my invention are to provide compensating means arranged to be conveniently actuated by the foot of the operator to effect the adjustment of the foot-board toward and from the chair seat with minimum effort, and to automatically retain said foot-board in any adjusted position within its range of movement, when released by the operator.

My invention also comprehends a foot-rest having its toe-board frame pivoted to the foot-board frame so as to swing, from its normal outwardly inclined position, toward the chair seat and be retained inwardly inclined, and means conveniently actuated by the foot of the operator to effect its release and movement.

The form of my invention as hereinafter described comprises an operating chair provided with a foot-rest having a foot-board frame pivoted to the chair frame, to swing toward and from the chair seat, and be maintained in a substantially horizontal position; a toe-board frame pivoted to the foot-board frame, and arranged to swing independently thereof toward and from the chair seat and to be yieldingly held in its normally inclined position intermediate of its range of move-

ment by a spring actuated plunger rod, and a foot-board actuating pedal connected by compensating lever and link mechanism, with means arranged to effect the actuation of the foot-board, and to automatically retain said foot-board in its adjusted position, and release it when desired.

In the accompanying drawings, Figure 1 is a plan view, partially in section, of a foot-rest constructed in accordance with my invention, the foot-board and toe-board being removed for convenience of illustration; Fig. 2 is a central vertical longitudinal sectional view of said foot-rest showing certain of the parts in elevation for convenience of illustration and showing the parts extended to their full limit and in their lowermost position to closely approach the floor; Fig. 3 is a central vertical sectional view of said foot-rest, similar to Fig. 2, but showing the toe-board frame in its normally inclined position; Fig. 4 is a sectional elevational view of said foot-rest showing the foot-board frame raised with respect to the chair seat to accommodate the patient of relatively smaller stature than would be comfortably accommodated by the foot-rest in the position shown in Fig. 3; Fig. 5 is a sectional elevational view showing the foot-rest frame further elevated with respect to the chair seat and in position to accommodate a child patient in the chair; Fig. 6 is a side elevational view of a dental chair having the foot-rest shown partially in longitudinal section and partially in elevation, with the toe-board frame folded back so as to occupy the smallest possible space and in a position to afford a support for the feet of a very small child; Fig. 7 is a rear elevational view showing the compensating and locking mechanism as shown in Fig. 3; Fig. 8 is an enlarged detailed view showing the locking bar; Fig. 9 is a transverse sectional view taken on the line 9—9 in Fig. 8, showing said locking bar in its released position; Fig. 10 is a transverse sectional view similar to Fig. 9, but showing the locking bar in its locked position, and Fig. 11 is a side elevational view of a modification of the foot-rest actuating and locking mechanism.

In said figures the chair comprises the

base frame 1, seat frame 2, carrying the seat 3, and has the usual depending frame bracket arms 4, which are connected forwardly by the transverse bar 5, and which carry the foot-board or platform frame 6, having the foot-board 7 supported thereon. The platform or foot-board frame 6 is provided near its forward end with bearings 8 for the shaft 9 upon which the toe-board frame 10, having the lateral rearwardly extending arms 11, is mounted for oscillation, one of said arms 11 being extended beyond the shaft 9 to provide the lever 12, as shown in Figs. 1, 3, 4 and 5.

The toe-board frame 10 carries the toe-board 13, is provided at its outer end with the usual foot-rest bar 14 and has the rearwardly extending centrally disposed lever arms 15 normally projecting beneath the foot-board 7. The lever arms 12 and 15 terminate in bearings 17 and 18 respectively, in which the rock-shaft 19 carrying the slide-bracket 20 and controlling pedal 22 secured thereto, is mounted.

The slide-bracket 20 is mounted to slide upon the longitudinally extended slide-rod 23, and normally rests against the buffer spring 25 interposed between it and the collar 26 secured on said slide-rod 23. The slide-bracket 20 is capable of sliding forwardly on the slide-rod 23 to cause the toe-board frame to assume its folded back position, as shown in Fig. 6, wherein said slide-bracket 20 may engage the notch 27 at the free end of said slide-rod 23, to retain said toe-board frame 10 in such folded back position.

As best shown in said Fig. 6, the slide-bracket 20 is provided with a forwardly projecting lug 28 arranged to engage the flat spring 29 at the forward end of the slide-rod 23, which not only forms a buffer for said slide-bracket 20, but also holds it in the notch 27 and tends to start it rearwardly, when it is released from the notch 27 by a slight anti-clockwise twist of the pedal 22, conveniently effected by the foot of the operator, who, by further moving his foot backward in engagement with said pedal 22, may cause the toe-board frame 10 to assume its normal position shown in Figs. 3, 4 and 5.

The slide-rod 23 is arranged to slide longitudinally in the pivoted slide-bearing 30, mounted for oscillation on the pintle 31, which is carried by the lugs 32 extending forwardly from the rearward transverse bar 33 of the foot-rest frame 6. The slide-rod 23 is provided at its rear end with the collar 35 between which and the pivoted slide-bearing 30, is disposed the spiral buffer spring 36, arranged to engage said slide-bearing 30 when said slide-rod 23 is drawn forward to its normal position, as shown in Figs. 3, 5 and 6.

The slide-rod 23 is also provided with the

yoke 37 secured thereto and having its laterally extended wings 39 connected with suitable lugs 40 depending from the forward transverse bar 41 of the foot-board frame 6, by springs 42 tending to shift the slide-rod 23 longitudinally forward with the buffer spring 36 engaging the slide-bearing 30.

The foot-rest frame 6 is supported for relative movement with respect to the chair seat, and is connected with the depending frame bracket arms 4 by the levers 43 which are pivoted intermediate of their ends to said frame bracket arms 4 and arranged to oscillate on the shaft 45, to which they are rigidly secured. Said foot-rest frame 6 has the bearings 46 for the shaft 47 which is preferably pinned or otherwise rigidly secured to the forward free ends of said levers 43, so that when they are rocked upon the shaft 45, the foot-rest frame will be raised or lowered in a movement about the axis of said shaft 45.

As shown in Figs. 2, 3, 4, 5, and 6 of the drawings, the foot-board is maintained in a definite slightly inclined angular relation to the floor, regardless of its elevated position, by the link frame comprising the lateral links 48 rigidly joined by the transverse connecting bars 49 and 50. The links 48 connect the shaft 51 which is mounted in the bearing lugs 52 depending from the side bars of the foot-rest frame 6, with the shaft 53, which is mounted in the free lower extremities of the depending frame bracket arms 4.

It will be obvious that, as the axes of the shafts 45, 47, 51 and 53 pass through the four corners of a parallelogram, any movement of the movable shafts 47 and 51 about the axes of the shafts 45 and 53 will be in a definite relation, and consequently the angle of inclination of the foot-board will be invariable.

The actuation of the foot-rest is conveniently effected by a foot pedal connected therewith by a series of compensating and compounding links and levers, the foot-rest supporting levers 43 being extended rearwardly and provided with trunnions 55, upon which is pivoted the locking bar 56, arranged to oscillate thereon to effect the locking and release of the foot-rest in its different adjusted positions as will be hereinafter described.

The locking bar 56 is provided with the bearing lugs 57 carrying the shaft 59, which is connected by the link 60 with the lever 61, having the lateral bearings 62 mounted on the shaft 64 which is carried by the lugs 65 and 66 projecting inwardly from the transverse bar 5 of the chair frame.

The lever 61 carries the foot pedal 67, which is pivoted thereto at its free end, on the shaft 68 and which is connected by the link 69 with the rocking yoke 70 mounted

to rock on the shaft 71, to which one end of the link 60 is connected. Said rocking yoke 70 is connected by the link 73 with the lug 74 projecting from the locking bar 56, so that a downward movement of the rear end of the foot pedal 67 rocked on the shaft 68 tends to rock the yoke 70 and connected locking bar 56 on their respective axes of oscillation, which effects the release of the lock which holds the foot-rest in any raised position.

The locking bar 56 carries at its center the locking lug 75 which is provided with the aperture 76 therein, having the forward portion of its upper wall slightly extended to provide a gripping pad 78 and arranged to embrace the upper surface of the locking rod 79, as best shown in Figs. 8, 9 and 10. Disposed within the aperture 76 and opposed to the gripping pad 78 is loosely mounted the shoe 80, having the semi-cylindrical surface which substantially conforms to the lower surface of the locking rod 79, being held in cooperative engagement therewith by the threaded adjusting stud 82 in threaded engagement with the locking bar 56 and having the end of its shank rounded and entered into a semi-spherical socket 83 in the shoe 80, to form a pivot therefor so that said shoe may be free to rock upon said rounded end of the shank and thereby accommodate its movement to bear uniformly on the locking rod 79 in any angular position which said rod may assume on its supporting pin-
 35 tle 84 in the bracket 85 depending from the chair frame, to which said bracket is rigidly secured, as best shown in Figs. 4, 5 and 7.

The locking lug 75 carries the leaf spring 86 which bears against the top surface of the locking rod 79 and tends to rock the locking bar 56 into its locked position, as shown in Fig. 10. Superimposed upon said spring 86 is the guard plate 87, which is engaged with said lug 75, to hold the spring 86 in position, by the screw 89. The guard plate 87, as best shown in Fig. 9, is arranged to limit the rocking movement of the locking bar 56 when actuated by the pedal 67 to release the locking lug from the locking rod 79 when it is desired to lower the foot-rest from any adjusted position. As best shown in Figs. 9 and 10, the adjusted stud 82 is arranged to be held in its adjusted position by the set-screw 81.

The movement of the foot-rest is limited by the cushioning springs 90, which are disposed in suitably formed sockets or recesses 91 in the links 48, and so project therefrom as to engage the buffer pads 92 on the foot-rest frame when in its lowered position, as shown in Fig. 1, and arranged to abut against the buffer pads 93, provided on the transverse frame bar 5, when said foot-rest is raised to its uppermost position, as shown in Fig. 5.

It will be observed that when the foot-rest is raised to the upper limit of its movement, as shown in Fig. 5, it will have passed what may be termed its "dead center"; that is to say, the axes of the shafts 47 and 51 will be disposed behind the vertical plane of the shafts 45 and 53, and therefore its initial movement therefrom must be effected by an agent other than gravity. To effect the initial movement of the foot-rest from its uppermost position, shown in Fig. 5, the links 48 are provided with flat leaf springs 95, which are provided to bear against the transverse frame bar 5 under such flexed tension that when the locking mechanism is released, said springs will be effective to force the foot-rest forward to a position where its further movement will be effected by gravity.

In the form of my invention, shown in Fig. 11, the foot-rest frame 96 is carried by the links 97, which are pivoted upon the depending frame bracket arms 98, said levers 97 being arranged to be actuated to raise and lower the foot-rest frame 96 by the foot pedal 99, which is mounted on the locking bar 100, pivoted to rock on the axis 101 and having the locking lug 102 cooperative with the locking bar 103. In this form of my invention the compensating and compounding links and levers are eliminated, the foot pedal and locking bar, being directly connected to the levers 97, will necessitate greater application of power and also must very closely approach the floor and, therefore, this form does not possess the advantages of the compounding and compensating mechanism shown in Figs. 1 to 10 inclusive.

It will be obvious that while a foot-rest, constructed in accordance with my invention, will withstand the pressure incident to supporting the foot of the patient in the chair under normal conditions; yet the toe-board will yield to any abnormal pressure which the patient may exert as by reason of the influence of an anesthetic.

My invention is advantageous in that by compounding the lever mechanism between the foot-rest and its operating pedal said foot-rest may be adjusted with but little power and may very closely approach the floor, while the operating pedal may have ample room to function without inconvenience to the operator.

I do not desire to limit my invention to the precise details of construction and arrangement as herein specified, as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

Having thus described my invention, I claim:

1. In a dental chair, the combination with

a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-rest frame and arranged to be inclined either toward or from said seat, a slide-rod carried by said foot-rest frame, and means on said toe-board frame cooperative with said slide-rod to retain the toe-board frame inclined toward the chair seat or yieldingly retained inclined away from said seat.

2. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivoted to swing toward and from the chair seat, a toe-board frame pivoted on said foot-board frame to swing toward and from said seat independent of the movement of said foot-board frame, a slide-rod pivotally carried by said foot-rest frame, and a slide-bracket carried by said toe-board frame and arranged to slide on said slide-rod, means on said slide-rod to retain said slide-bracket in position to hold the toe-board frame inclined toward said seat, and springs to yieldingly hold said slide-rod in position to retain said toe-board frame inclined from said seat.

3. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to swing on said foot-board frame toward and from said seat and having levers extending below said toe-board frame, a slide-rod pivotally mounted on said foot-board frame and arranged for longitudinal movement with respect thereto, springs tending to force said slide-rod forward, a slide-bracket carried by said levers and arranged to slide on said slide-rod and to engage a notch thereon to retain said toe-board frame inclined toward said seat, and arranged to engage means on said slide-rod to sustain said toe-board inclined from said seat in opposition to the tension of said springs, which may yield to permit the longitudinal movement of said slide-rod and permit said toe-board frame to assume a position beyond its normal yieldingly sustained position.

4. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-rest frame and arranged to be inclined either toward or from said seat, and having levers extending rearwardly, a slide-bearing mounted to rock on said foot-rest frame, a slide-rod having a notch, mounted for longitudinal movement in said slide-bearing, means on said slide-rod arranged to limit its forward movement in said bearing, a yoke on said slide-rod, springs connecting said yoke with said foot-board frame and tend-

ing to force said slide-rod forward, an abutment on said slide-rod, and a slide-bracket carried by said levers and normally held by said abutment in position to yieldingly sustain the toe-board frame inclined from said seat, and arranged to engage said notch to rigidly retain said toe-board frame inclined toward said seat.

5. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally mounted thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-board frame and arranged to be inclined with respect to said foot-board frame either toward or from the chair seat and having levers extended below said foot-rest frame, a slide-bearing mounted to rock on said foot-rest frame, a slide-rod mounted for longitudinal movement in said slide-bearing, means arranged to limit the movement of said slide-rod, yielding means tending to force said slide-rod forward, an abutment on said slide-rod, a slide-bracket carried by said levers and normally held by said abutment in position to yieldingly sustain the toe-board inclined from said seat, and arranged to engage said notch to rigidly retain said toe-board frame inclined toward said seat.

6. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-board frame and arranged to be inclined with respect thereto either toward or from said seat, a slide-bearing mounted to rock on said foot-rest frame, a slide-rod mounted for longitudinal movement in said slide-bearing, means arranged to limit the movement of said slide-rod, a shaft mounted to rock on said toe-board frame and carrying a slide-bracket arranged to slide on said slide-rod, an abutment for said slide-bracket arranged to yieldingly sustain said toe-board frame inclined from said seat, a notch on said slide-rod arranged to rigidly retain said slide-bracket in position to retain said toe-board frame inclined toward said seat, and a pedal on said rock-shaft whereby said shaft may be rocked to release said slide-bracket from said notch and moved to effect the adjustment of said toe-board frame with respect to said seat.

7. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-rest frame and arranged to be inclined with respect to said foot-board frame either toward or from said seat, a slide-rod carried by said foot-rest frame, means on said toe-board frame cooperative with said slide-rod to

rigidly retain the toe-board frame inclined toward the chair seat and yieldingly sustained inclined away from said seat, and means whereby said foot-rest frame may
 5 closely approach the floor, comprising compensating and compounding links and levers arranged to adjust said foot-rest frame toward and from said seat.

8. In a dental chair, the combination with
 10 a seat supporting frame, of a foot-rest frame pivotally supported thereon and arranged to be adjusted toward and from the chair seat, a toe-board frame pivoted to said foot-rest frame and arranged to be inclined
 15 either toward or from said seat, a slide-rod carried by said foot-rest frame, and means on said toe-board frame cooperative with said slide-rod to retain said toe-board frame inclined toward the chair seat, and yieldingly sustain it inclined away from said seat,
 20 locking mechanism automatically actuated to support said foot-rest frame in any adjusted position within its range of movement, and means comprising compensating
 25 and compounding link and lever mechanism arranged to release said lock and effect the adjustment of said foot-rest frame.

9. In a dental chair, the combination with a seat supporting frame, having depending
 30 frame brackets, of a foot-rest frame pivoted to said brackets and arranged to move toward and from the chair seat without tilting, automatically actuated locking means arranged to support said foot-rest frame in
 35 any adjusted position within its range of movement, and means comprising compensating and compounding link and lever mechanism arranged to effect the release of said locking mechanism and the adjustment
 40 of said foot-rest frame.

10. In a dental chair, the combination with a supporting base, of a seat supporting frame having frame brackets, levers pivotally mounted on said brackets, a foot-rest
 45 frame pivotally connected with said levers, links rigidly joined transversely, pivotally connected with said brackets and with said foot-rest frame, the pivotal axes of said levers and links passing through the four angles of
 50 a parallelogram whereby movement of said links effects the adjustment of said foot-rest obliquely toward or from the chair seat, maintaining the foot-rest in a definite angular relation to the axis of said base.

11. In a dental chair, the combination with a supporting base, of a seat supporting frame having depending frame brackets, levers pivoted to rock on said frame-brackets,
 55 a foot-rest frame pivotally mounted on said levers, links pivotally connected with said frame-brackets and with said foot-rest frame, disposed in parallel relation with said levers whereby the movement of said foot-rest may be effected toward and from said
 60 seat without changing its angular rela-

tion to the axis of said base, and locking means carried by said levers arranged to automatically support said foot-rest in any adjusted position within its range of movement, and means operative to contemporaneously release said locking means and effect
 70 the adjustment of said foot-rest frame.

12. In a dental chair, the combination with a seat supporting frame, of levers forming rocker-arms mounted to rock on
 75 said frame, a foot-rest frame carried by said rocker-arms arranged to swing thereon toward and from the chair seat in the natural direction of the leg of a patient in the chair, means arranged to maintain the foot-rest
 80 frame substantially horizontal in any adjusted position, and compounding means arranged to effect the adjustment of said foot-rest frame, comprising a pedal lever and a link operatively connecting said pedal lever
 85 with said rocker-arms.

13. In a dental chair, the combination with a seat supporting frame, of levers mounted to rock on said frame, a foot-rest frame carried by said levers arranged to
 90 swing thereon toward and from the chair seat in the natural direction of the leg of a patient in the chair, means connecting said frames arranged to maintain the foot-rest frame substantially horizontal in any ad-
 95 justed position, means for locking said foot-rest frame in its adjusted position, comprising a locking-bar oscillatably carried by said levers and having automatically actuated gripping means, a locking-rod co-
 100 operative with said gripping means arranged to retain said foot-rest frame in any adjusted position within its range of movement, and means arranged to effect the adjustment of said foot-rest frame.
 105

14. In a dental chair, the combination with a seat supporting frame, of levers mounted to rock on said frame, a foot-rest frame carried by said levers arranged to
 110 swing thereon toward and from the chair seat, means connecting said frames arranged to maintain the foot-rest frame substantially horizontal in any adjusted position, means for locking said foot-rest frame in its ad-
 115 justed position, comprising a locking-bar oscillatably carried by said levers and having automatically actuated gripping means, a locking-rod cooperative with said gripping means arranged to retain said foot-rest frame in any adjusted position within its
 120 range of movement, a pedal lever pivoted to said seat supporting frame, and a link operatively connecting said pedal lever with said rocker-arms.

15. In a dental chair, the combination with a seat supporting frame, of levers mounted to rock on said frame, a foot-rest frame carried by said levers arranged to
 125 swing thereon toward and from the chair seat, means connecting said frames ar-
 130

ranged to maintain the foot-rest frame substantially horizontal in any adjusted position, means for locking said foot-rest frame, comprising a locking-bar oscillatably carried by said levers and having a lug provided with an aperture, a locking-rod pivotally connected with said seat supporting frame and extending through said aperture, means tending to rock said locking-bar in position to bite said locking-rod and thereby retain said foot-rest frame in any adjusted position within its range of movement, and pedal mechanism connected to effect the adjustment of said foot-rest frame and having means to rock said locking-bar and thereby release its bite on said locking-rod.

16. In a dental chair, the combination with a seat supporting frame, of levers forming rocker-arms mounted to rock on said frame, a foot-rest frame carried by said rocker-arms arranged to swing thereon toward and from the chair seat, means connecting said frames arranged to maintain the foot-rest frame substantially horizontal, a locking-bar oscillatably carried by said levers, a locking-rod connected with said seat supporting frame cooperative with said locking-bar to retain said foot-rest frame in any adjusted position within its range of movement, means tending to cause said locking-bar to bite said locking-rod, a pedal lever pivoted to said seat supporting frame, a link connecting said pedal lever with said rocker-arms, a pedal mounted to rock on said pedal lever, links connecting said pedal with said locking-bar to effect the oscillation thereof and thereby contemporaneously release its bite on said locking-rod when said foot-rest frame is adjusted by the movement of said pedal.

17. In a dental chair, the combination with a seat supporting frame, of levers mounted to rock thereon, a foot-rest frame pivotally carried by said levers and arranged to be swung thereby toward and from chair seat, means for retaining said foot-rest frame in any adjusted position within its range of movement, a locking-bar carried by said levers and having an aperture therein, a locking-rod pivoted to said seat supporting frame and extending through said aperture, a shoe disposed in said aperture and arranged to bear against said locking-rod, means tending to cause said locking-bar to bite said locking-rod, a pedal lever pivoted to said seat supporting frame, a link connecting said pedal lever, and means connecting said pedal with said locking-bar whereby the movement of said pedal with respect to the pedal lever effects an oscillatory movement of said locking-bar to release its bite on said locking-rod and permit the adjustment of said foot-rest frame toward and from the chair seat.

18. In a dental chair, the combination

with a seat supporting frame, of levers forming rocker-arms mounted to rock on said frame, a foot-rest carried by said rocker-arms and arranged to be adjusted toward and from the chair seat, a locking-bar pivotally carried by said rocker-arms and having an aperture therein, a locking-rod pivoted to said seat supporting frame and extending through said aperture, yielding means tending to cause said locking-bar to bite said locking-rod, a pedal lever pivoted to said seat frame, a link connecting said pedal lever with said locking-bar, a pedal pivotally mounted on said lever, a rocker member carried by said pedal lever, a link connecting said pedal with said rocker member, a link connecting said rocker member with said locking-bar whereby the rocking movement of said pedal on the pedal lever effects an oscillatory movement of said locking-bar in opposition to said yielding means to release its bite on said locking-rod and permit the free adjustment of the foot-rest.

19. In a dental chair, the combination with a seat supporting frame, of levers forming rocker arms mounted to rock on said frame, a foot-rest frame pivotally carried by said rocker-arms, arranged to swing thereon toward or from the chair seat, locking means arranged to support said foot-rest frame in any adjusted position within its range of movement, comprising an oscillatory member carried by said levers, having an aperture therein, a locking-rod carried by said seat frame and extending through said aperture, a spring tending to rock said rocking member to bite said locking-rod and thereby support said foot-rest frame in any adjusted position within its range of movement, a pedal lever pivoted to swing on said seat frame, a link connecting said pedal lever with said rocker-arms, a pedal pivotally mounted on said pedal lever, a bell-crank-lever carried by said pedal lever, a link connecting said pedal with said bell-crank-lever, and a link connecting said bell-crank-lever with said locking member whereby the rocking of said pedal on said pedal lever effects an oscillatory movement of said locking member in opposition to said spring to release its bite from said locking-rod and permit the free adjustment of the foot-rest by said pedal.

20. In a dental chair, the combination with a seat supporting frame, of levers forming rocker arms mounted to rock on said frame, a foot-rest frame pivotally mounted on said rocker-arms and arranged to swing thereon toward and from the chair seat, a pivoted locking-rod having a smooth surface, carried by said seat supporting frame, pedal actuated locking mechanism cooperative with said locking-rod arranged to support the foot-rest frame in any adjusted position within its range of movement, and

yielding means tending to cause said locking means to bite the smooth surface of said locking-rod.

21. In a dental chair the combination with a seat supporting frame, of a foot-rest frame pivotally mounted to swing toward and from the chair seat, locking means arranged to support said foot-rest frame in different adjusted positions with respect to said chair seat, comprising a locking-rod, a locking member having an aperture therein through which said locking-rod extends and provides a gripping pad arranged to engage said locking-rod, and a shoe arranged to bear against said locking-rod to effect the jamming of said gripping pad against said locking-rod, and yielding means tending to rock said locking means to cause the gripping pad to bite said locking-rod.

22. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame pivotally mounted to swing toward and from the chair seat, means for supporting said foot-rest frame in any adjusted position within its range of movement, comprising a locking-rod carried by said seat supporting frame, a locking member oscillatably mounted to bite said locking-rod and having a gripping pad, a shoe adjustable therein, arranged to bear against said locking-rod, and a spring tending to turn said locking member to effect a jamming of said rod between said shoe and said gripping pad.

23. In a dental chair, the combination with a seat supporting frame, of a foot-rest frame arranged to swing thereon toward and from the chair seat, means connected to retain said foot-rest frame in any adjusted position within its range of movement, comprising a locking-rod carried by said seat supporting frame, a locking member cooperative to bite said locking-rod and having a gripping pad arranged to bear against said locking-rod, a shoe arranged to engage said locking-rod in opposition to said gripping pad, means pivotally supporting said shoe, being adjustable toward and away from said locking-rod, means tending to rock said locking member to jam said locking-rod between said shoe and said gripping pad, and means acting in opposition to said yielding means, arranged to rock said locking member to release said locking-rod and contemporaneously effect the adjustment of said foot-rest frame toward or from the chair seat.

24. In a dental chair, the combination with a seat supporting frame, levers pivotally carried by said frame, a foot-rest frame pivotally mounted on said levers, links pivotally connecting the seat frame with said foot-rest frame, and buffer springs carried by said links arranged to limit the movement of said foot-rest frame in either direction toward or from the chair seat.

25. A dental chair provided with a seat supporting frame, a foot-rest frame pivoted to said seat supporting frame and arranged to be adjusted toward and from the chair seat, and yielding means serving as a buffer and tending to force said foot-rest frame away from said seat.

26. A dental chair provided with a seat supporting frame, a foot-rest frame pivoted thereon and arranged to move toward and from the chair seat, and a spring active when said foot-rest closely approaches said seat, serving as a buffer and tending to force said foot-rest away from said seat.

27. A dental chair provided with a seat supporting frame, levers pivoted to said frame, and pivotally supporting a foot-rest frame, links pivoted to said seat supporting frame and to said foot-rest frame, and buffer springs carried by said links arranged to engage the foot-rest frame and limit its lower-most position, and to engage said chair frame to limit the upper-most movement of said foot-rest frame.

28. A dental chair provided with a seat supporting frame and having a foot-rest frame pivoted thereon, a toe-board frame pivoted on said foot-rest frame and arranged to be inclined either toward or from the chair seat, a slide-rod carried by said foot-rest frame and arranged to move longitudinally with respect thereto, springs tending to force said slide-rod forwardly, a slide-bracket carried by said toe-board frame and arranged to slide on said slide-rod, a collar on said slide-rod, a buffer spring between said collar and said slide-bracket, and means including a resilient buffer arranged to limit the longitudinal movement of said slide-rod.

29. A dental chair having a foot-rest frame and provided with a toe-board frame pivoted to swing thereon, and be inclined either rearwardly or forwardly with respect thereto, a pivoted slide-bearing carried by said foot-rest frame, a slide-rod mounted to slide longitudinally in said bearing and to swing with respect to said foot-rest frame, means including a resilient buffer arranged to limit the outward movement of said slide-rod, yielding means tending to force said slide-rod forwardly, a slide-bracket carried by said toe-board frame and arranged to slide on said slide-rod, and means including a resilient buffer, against which said slide-bracket bears, to sustain said toe-board outwardly inclined.

30. A dental chair having a foot-rest frame, a toe-board frame pivoted thereon and arranged to be retained inclined rearwardly with respect to said foot-board frame, normally sustained inclined forwardly with respect thereto, or forced outwardly from said normal outwardly inclined position, a slide-bearing pivotally carried by said foot-rest frame, a slide-rod mounted for longitu-

dinal movement in said bearing and having a notch therein, a slide-bracket carried by said toe-board frame and arranged to slide on slide-rod and be engaged by said notch, 10
* yielding abutments arranged to limit the normal movement of said slide-bracket on said slide-rod, and yielding means tending to force said slide-rod forwardly, and arranged to yield to permit said toe-board frame to be forced outwardly beyond its normal outwardly sustained position.

In witness whereof, I have hereunto set my hand this 13th day of April, A. D. 1922.

GEORGE D. HECK.