

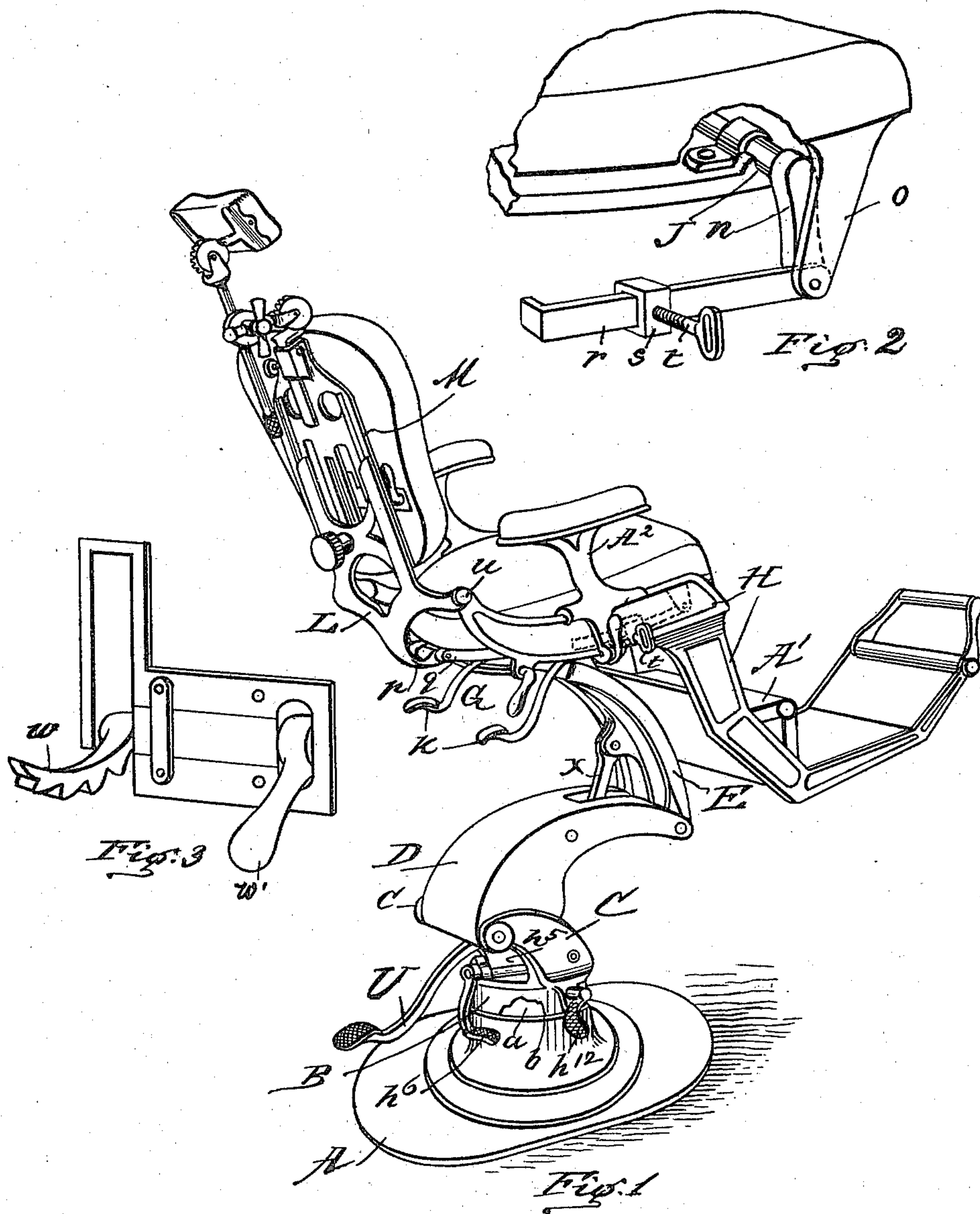
(No Model.)

5 Sheets—Sheet 1.

A. P. GOULD.
DENTAL CHAIR.

No. 581,986.

Patented May 4, 1897.



WITNESSES
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Chas. M. Ball

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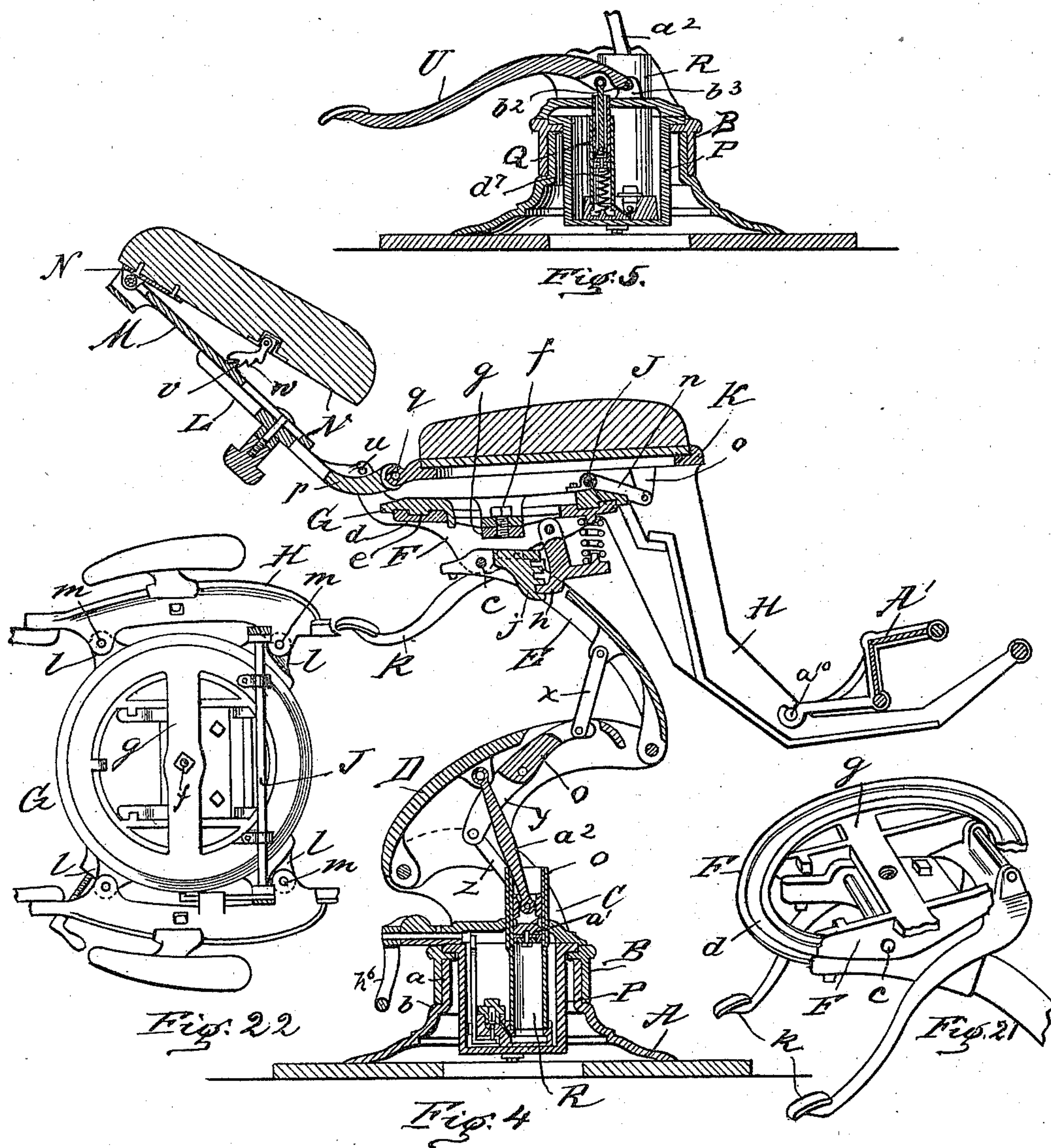
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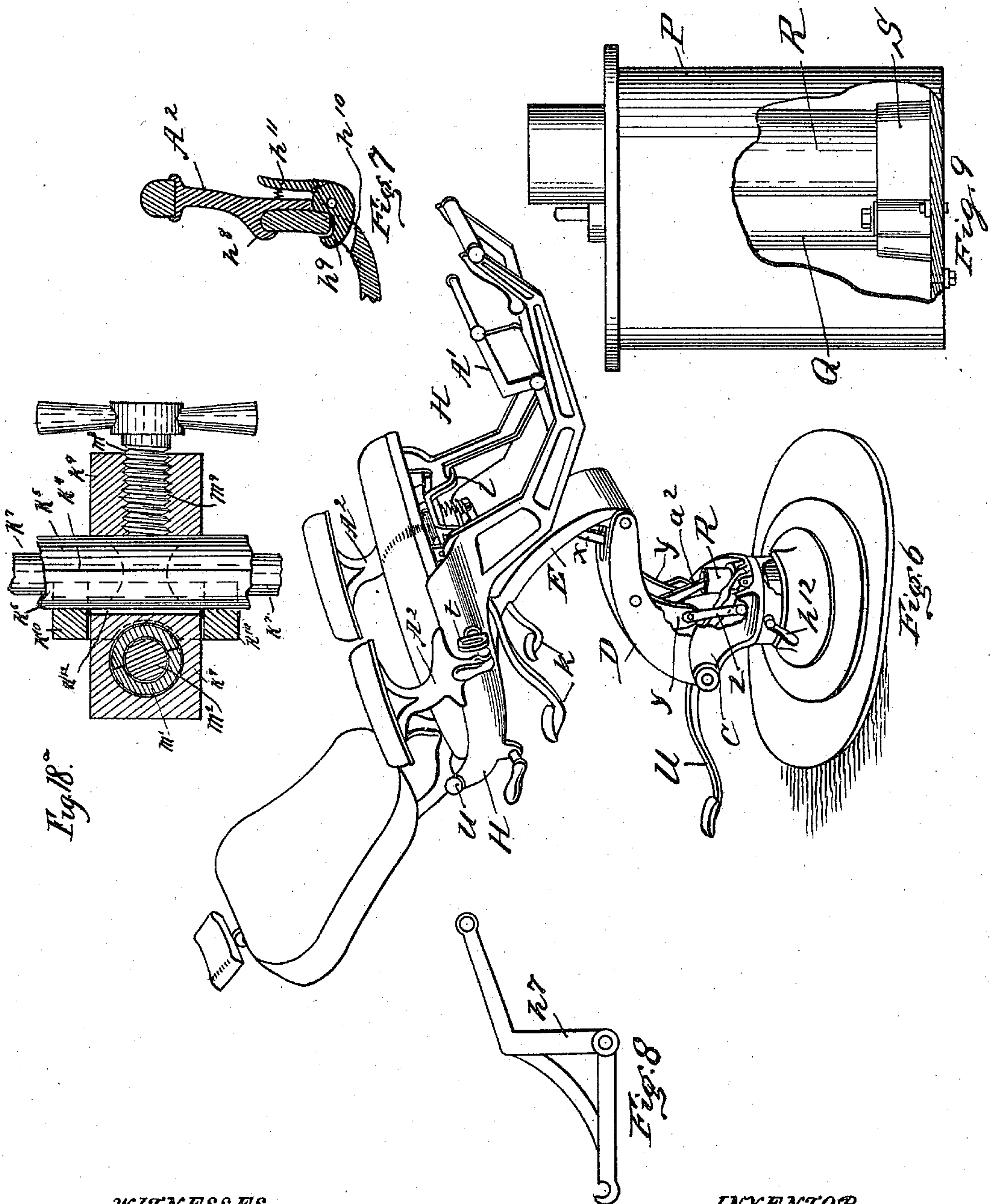
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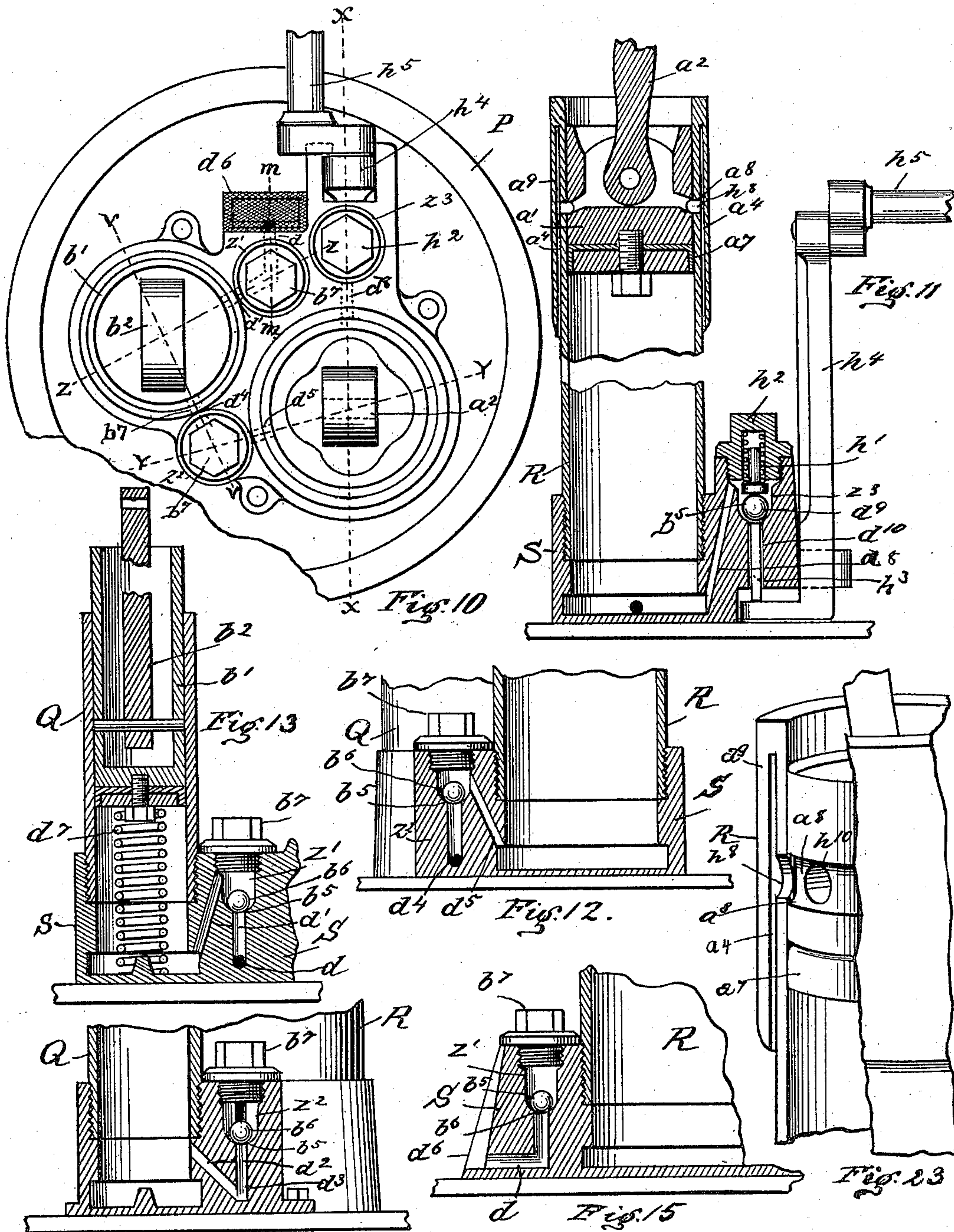
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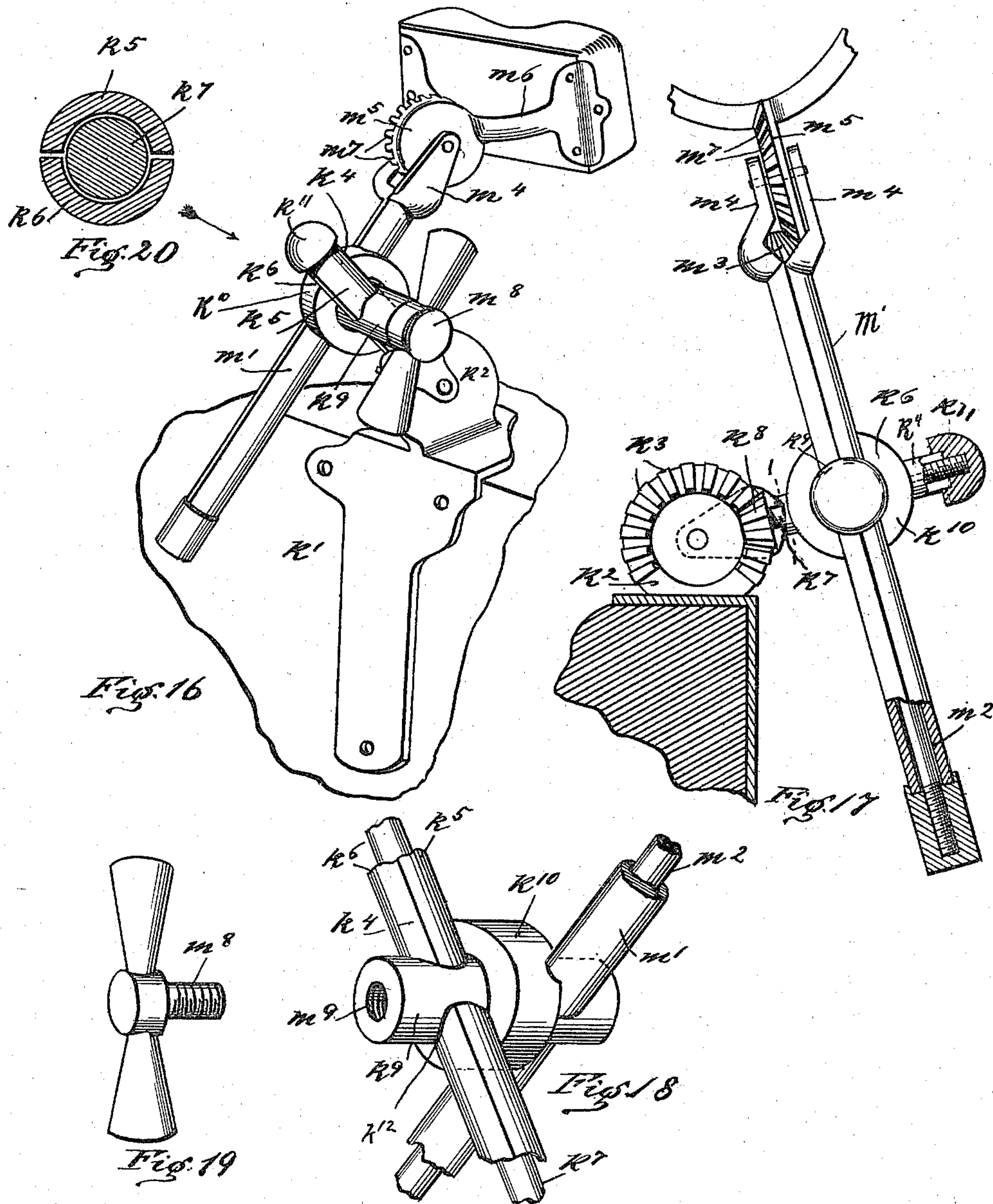
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UNITED STATES PATENT OFFICE.

AARON P. GOULD, OF CANTON, OHIO.

DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 581,986, dated May 4, 1897.

Application filed September 16, 1896. Serial No. 606,061. (No model.)

To all whom it may concern:

Be it known that I, AARON P. GOULD, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Dental Chairs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to improvements in dental chairs; and it consists of certain features of construction and combination of parts, as will be hereinafter described and claimed.

Figure 1 of the accompanying drawings is a view in perspective from right rear illustrating my invention. Fig. 2 is a similar view showing a fragment of the seat-frame and upholstered frame and a check or stop to regulate the horizontal movement of the seat one way. Fig. 3 is a similar view of a holding-frame and rack by which the upholstered back may be adjusted forward or back, as desired. Fig. 4 is a vertical section through the center of the chair. Fig. 5 is a similar view through the base of the chair, a distance to the right of that shown in Fig. 4, through the pump. Fig. 6 is a perspective right front view. Fig. 7 is a vertical section of the arm and seat-frame and arm-retaining clamp. Fig. 8 is a side view of frame-piece of a child's foot-rest. Fig. 9 is a side view of oil-tank, with a portion cut away to show the chair-supporting cylinder and the pump-cylinder. Fig. 10 is a plan view of the oil-tank with the lid off, showing the contents. Fig. 11 is a vertical section on xx of Fig. 10. Fig. 12 is a similar section on line yy of Fig. 10. Fig. 13 is a similar section on line zz , Fig. 10. Fig. 14 is a similar section on line vv , Fig. 10. Fig. 15 is a similar section on line mm , Fig. 10. Fig. 16 is a perspective from rear right of a fragment of the chair-back, showing the head-rest support and head-rest in normal position. Fig. 17 is a view in elevation of the left side of the head-rest support, partly sectional, looking in the direction of the arrow, Fig. 16, and showing the cushion-support turned at a right angle to the position it occupies in Fig. 16. Fig. 18 is a perspective of the clamp by which the head-rest is secured in desired adjustment.

Fig. 18^a is a horizontal sectional view of said clamp. Fig. 19 is a perspective view of clamping-screw. Fig. 20 is a transverse section on ll , Fig. 17. Fig. 21 is a perspective of the circular chair-body support. Fig. 22 is a plan view showing the circular rotatable support for the chair-body. Fig. 23 is a fragment of hoisting-piston, showing piston and return-tubes.

A denotes a stationary base having at its top portion an upwardly-projected annular flange a and an annular shoulder b , on which is placed a rotatable section B, having upwardly and rearwardly projected arms C, to which is pivotally secured an arm, as D, to the forward end of which is pivotally secured a rearwardly-projecting arm E. The section B is adapted to turn on the base A and be locked thereto by a set-screw h^{12} .

At the upper end of arm E is pivotally secured a seat-support F by the transverse pivot c , by which the support F may be tipped or rocked with respect to the arm E and swung longitudinally with said arm. In the upper face of the circular track portion of the seat-support F is provided an annular groove d , in which is placed a corresponding rib e on the under face of the seat-frame G. The two circular frames F and G are pivotally secured together by the vertical bolt f , passed through the cross-bars g .

On the front side of frame F is pivotally secured a spring-pawl h , adapted to engage a rack j , which may be released by a downward pressure on the rearwardly-projected arms or pedals k , the front ends of which are integral with the said pawl, the object of which is to provide means for securing the body of the chair in desired tilted adjustment.

On the circular portion G of the seat-frame are provided lugs l , to which the sides H of the chair-body are secured by the bolts m . (See Fig. 22.) On the top front of part G is journaled a rock-shaft J, having downwardly-projected arms n , to which are pivotally secured lugs o , projected down from the front side of the seat-cushion support K. The arms n are provided at each end of the rock-shaft J and lugs o on each side of the cushion-support K. By pivoting the lugs to the arms n , as shown in Fig. 2, a swinging connection is effected between the cushion-support K and

the frame G, at the front end thereof. The back-rest frame L is pivotally secured to the rear end portion of the side frame II by pivot u and is provided with a central and downwardly and forwardly projected arm p , that is pivotally connected to lugs q , projected rearwardly from the cushion-support K. It will be seen that by a forward-and-back movement of the top of the back-frame the seat-cushion frame K will have a reverse movement—that is, when the chair-back is moved backward the seat will be moved forward, and when the back is moved forward the seat will be moved backward.

At the right-hand side of the chair-body is provided a check-bar r , that is passed through a loop s , secured to inner side of one of the arms of the frame H and pivotally secured to the lug O and arm n , as shown in Fig. 2. A thumb-screw t passes through the loop s and engages the bar r , whereby the back and seat may be secured in desired adjustment.

The back-frame L has secured thereto in a sliding relation an extension-frame M, having hinged to its upper end a cushion-board N. On the front side of the frame M is provided a transverse rib v , and to the cushion-board N is pivoted a gravity-pawl w , having teeth on its lower side to engage the rib v to hold the cushion at desirable adjustment, whereby the cushion may be thrown out or forward at its lower end to support the back of the patient. The pawl is provided with a handle W' to throw the pawl out of engagement with the rib v to allow the cushion-board to fall back against the frame M.

To the arm D and about central thereto is pivoted a sway-bar O, having at its upper end a link x , that is pivoted to the arm E. The lower end of the bar O is bifurcated to form prongs y , which are connected to upper portion B of the base by the links z .

To raise the arm D, and thereby the arm E and chair-body, I provide an oil-well P, (see Figs. 4, 9, and 10,) in which is placed a pump Q and a lifting-cylinder R. In the latter is provided a suitable piston-head a' , the upper portion of which is cupped or cylindrical, having pivotally secured therein a connecting-rod, as a^2 , the upper end of which has a pivotal connection with the under side of arm E.

To the same base S that supports the cylinder R is secured the pump-cylinder Q. In the cylinder Q is a hollow plunger b' , having pivotally secured at its inside lower portion a connecting-rod b^2 , the upper end of which is connected with a foot-lever U, the front end of which is pivotally secured to lugs b^3 on the top of base-piece B, as shown in Fig. 5. Below the plunger b^2 is placed a coiled spring d^7 , by which the free end of the lever and the plunger are raised when the foot-pressure is released.

In the base S are provided sockets z' z^2 z^3 . In the bottom of each is provided a valve-seat b^5 , and in the sockets z' z^2 are provided valves

b^6 , and at the upper end of said sockets z' z^2 are provided closing screw-caps b^7 .

In operation as the piston b' is raised oil will flow from the well through the screen-covered take-in conduit d to socket z' , thence through conduit d' to the pump-cylinder. On the descent of the plunger the oil will be forced from the pump via conduit d^4 , the socket z^2 , and conduit d^5 to the hoisting-cylinder, by which the piston-head a' is raised. In other words, by each elevation of the plunger b' by the spring d^7 a quantity of fluid will be drawn from the well P into the pump-cylinder, and at each descent of the plunger the fluid will be driven through the before-mentioned conduits d^4 d^5 into the hoisting-cylinder, by which whereby the piston a' will be raised to raise the arms D and E and the chair-body, and the valves b^6 will prevent the return flow of the oil, thereby holding the chair-body at a desired elevation. To lower the chair-body, (see Fig. 11,) the socket z^3 is provided, which communicates with the hoisting-cylinder R through a conduit d^8 . In the socket z^3 is provided a valve d^9 , covering an exit-conduit d^{10} , which leads out into the well P.

Over the valve d^9 is placed a plunger and spring h' to reseat the valve, and a retaining screw-cap h^2 . To lift the valve d^9 to allow the outflow of the fluid, a trip is provided consisting of a pin h^3 of less diameter than the conduit d^{10} and placed therein, one end resting under the valve, the other on a toe extension of a link h^4 , the upper end of which has a crank connection with a rock-shaft h^5 , having on its outer end a pedal-lever h^6 . By placing the foot on the pedal-lever h^6 the shaft h^5 will be rocked to lift the valve d^9 to allow the fluid to flow from the cylinder R to the well P.

To provide against overflowing of oil that may have leaked past the packing a^7 , an annular groove a^8 is provided in the piston a' , as shown in Fig. 23, into which the oil gathers and flows about the piston to one or more of the apertures h^8 , through which it will pass into the grooves or channels a^4 , formed in a band a^9 , that encircles the upper end of the cylinder R, and thence down into the well. There is also provided an aperture h^{10} , leading from the groove a^8 to the inside or cup portion of the piston, into which the leakage may flow and remain when the chair is used on low grades, so that when the chair is raised to a point where the groove a^8 of the piston registers with the aperture h^8 of the cylinder the oil may escape from the cup portion of the piston through the groove a^4 back into the well. To the seat-frame H, or that portion extending down to form a leg-rest, is hinged a detachable foot-rest A' , having side pieces h^7 , formed substantially as shown in Fig. 8, one end of which is adapted to hook over studs a^{10} , projecting from the frame H.

To the side frame H is detachably secured the arm-rest A^2 , having a lug h^8 , that caps

over the top of side H, and at the lower end portion a locking mechanism, which in this instance consists of a pivoted snap-hook h^9 , the bill of which passes through an aperture h^{10} in the side H and engages the inner face thereof. To remove the arm A^2 , the handle h^{11} of the hook h^9 is pressed inwardly, which movement will release the hook h^9 from frame H to allow of the removal of the arm-rest A^2 .

My improved head-rest consists of the support k' , secured to the chair-back, said support having at its upper end a circular portion k^2 , having on one face a series of cogs k^3 . To said circular portion is pivotally secured a tubular portion k^4 , formed of two parts k^5 and k^6 , that inclose a shaft k^7 , on one end of which is mounted a pinion k^8 , that engages the teeth k^3 on the circle k^2 . On the outer screw-threaded end of the shaft k^7 is placed a cupped nut k^{11} , that embraces the ends of the parts k^5 and k^6 , holding them in tubular form on the shaft. This tube and shaft are passed through an elongated aperture k^{12} in a coupling-link k^9 . On the opposite side of the tube k^4 is provided a washer k^{10} , that has been passed over the end of the coupling-link k^9 . A tube m' , similar to k^4 , embraces a shaft m^2 , having mounted on one end a pinion m^3 . On one end of the parts that form the tube m' are provided prongs m^4 , that embrace the circular portion m^5 , projected from the cushion-support m^6 . On one face of the circular portion m^5 are provided teeth m^7 , that engage similar teeth on the pinion m^3 . A cupped nut m^{10} is provided at the lower end of the two-part tube m' and has the same function as the cap k^{11} . To secure the parts in desired adjustment, a hand-screw m^8 is turned into a threaded aperture m^9 in the end of the link k^9 .

In operation, to adjust the cushion or head-rest the screw m^8 is turned back to lessen the pressure of the tubes on the shafts to allow the cushion to be raised or lowered or rocked on its pivotal connection with the tube m' , the teeth m^7 on the circle m^5 engaging the teeth of pinion m^3 . On the shaft m^2 will rotate the released tube m' , and the cushion may be carried or rocked over the back of the chair by moving the shaft k^7 about its pivotal connection with the support k' , the teeth of pinion k^8 engaging the teeth k^3 on the circle k^2 , and by turning in the screw m^8 the inner end will engage the tube k^4 and force it lengthwise the longitudinal aperture k^{12} against the washer k^{10} , which will be forced against the tube m' , thus locking the parts in desired adjustments.

Having thus fully described my invention, what I claim is—

1. In a dental chair, the combination with the chair-base and chair-body, and means for connecting the same, of lifting mechanism consisting of a pump which communicates with the well, a chamber within the well having a valve-controlled communication with the pump, a band surrounding the upper por-

tion of said chamber, leaving an intervening space which communicates with the chamber through a hole in its side near its upper end, a hollow piston within the chamber, provided with an annular groove intersected by an aperture which communicates with the hollow of the piston and means for connecting the piston with the chair-body.

2. In a dental chair, the combination with the seat-support, and a seat-frame pivoted to turn on said support, a cushion-frame having lugs projecting downward from its forward under portion, a shaft journaled upon the forward portion of the seat-frame, and provided with arms or cranks which are pivoted to said lugs, whereby a swinging movement is effected between the seat-frame and cushion-frame.

3. In a dental chair, the combination with the seat-support, the seat-frame pivoted to turn thereon, sides secured to the seat-frame and provided with upwardly-extended rear ends, a cushion-frame having at its forward end downward-extending lugs, a shaft journaled on the forward portion of the seat-frame and provided with arms which are pivoted to said lugs, a back-frame having an extension pivoted to the rear end of the cushion-frame, and extensions pivoted to the rear ends of the sides.

4. In a dental chair, the combination with the seat-support, a seat-frame mounted thereon, a cushion-frame arranged above the latter, sides secured to the seat-support, a cross-shaft journaled at the forward portion of the seat-frame and provided with arms that are pivoted to lugs depending from the cushion-frame, a check-bar pivoted to one of said lugs, and one of said arms, and passing through a sleeve secured to the inner face of one of the sides, and a set-screw passed through said side and the sleeve and engaging said bar.

5. In a dental chair, the combination with the sides thereof, having apertures, of the arm-rests having lugs or hooks on their inner sides intermediate their ends for embracing the upper edges of the sides, and hooks pivoted to their lower ends to project through the apertures in the sides and engage the inner faces of the sides.

6. In a dental chair, the combination with the sides thereof, having apertures, of the arm-rests having lugs or hooks on the inner sides intermediate their ends for embracing the upper edges of the sides, and spring-actuated hooks pivoted to their lower ends to project through the apertures in the sides and engage the inner faces of the sides.

7. In a dental chair, the combination with the foot-rest section, the inner faces of the side, pieces of which are provided with studs, of a supplemental or child's foot-rest section having hooked rear ends adapted to engage the studs so that it may be tilted into and out of use or be removed.

8. In a head-rest for dental chairs, the combination with the head-rest support, adapted

to be secured to a chair and provided with segmentally-arranged teeth, a tube pivoted to said support, a shaft in said tube having a pinion to engage the segmentally-arranged teeth, a head-cushion frame, connections between the cushion-frame and the tube, and means for clamping the tube to the shaft to prevent the rotation of the shaft and to hold the pinion to the teeth.

9. In a head-rest for dental chairs, the combination with the head-rest support adapted to be secured to the chair, and provided with segmentally-arranged teeth, a two-part tube pivoted to said support, a shaft embraced by said tube, and provided at one end with a pinion to engage the teeth of said support, a head-cushion frame, connections between the cushion-frame and the tube, means for clamping the tube to the shaft, and a cap for embracing the free end of the tube, to hold it in tubular form and prevent the separation of its parts when the clamping means are released or loosened.

10. In a head-rest for dental chairs, the combination with the head-rest support, adapted to be secured to the chair, of a head-cushion frame having a plate provided with segmentally-arranged teeth, a two-part sleeve pivoted to said plate, a shaft within said tube provided with a pinion to engage said teeth,

connections between the said support and tube, and means for clamping the tube to the shaft to hold the pinion in engagement with the teeth aforesaid.

11. A head-rest for dental chairs, comprising a support adapted to be secured to the back of the chair and provided with a segmental row of teeth, two tubes, each consisting of two parts, a head-cushion frame having a plate provided with a segmental row of teeth, one of said tubes being pivoted to said plate, and the other to said support, a shaft in each tube, a pinion on each shaft, one pinion engaging the teeth of the support, and the other pinion engaging the teeth of the head-cushion frame, a tubular link provided with two apertures, one of which is elongated, said tubes being inserted through said apertures, a washer on said link interposed between said tubes, and a set-screw working in the end of the link for clamping the tubes to their shafts.

In testimony whereof I have hereunto set my hand this 14th day of September, A. D. 1896.

AARON P. GOULD.

Witnesses:

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CHAS. M. BALL.