(No Model.) 2 Sheets—Sheet 1.

E. B. CUSHING.

DENTAL CHAIR.

No. 526,071. Patented Sept. 18, 1894.

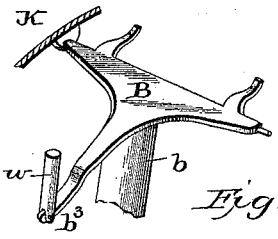


Fig. 10.

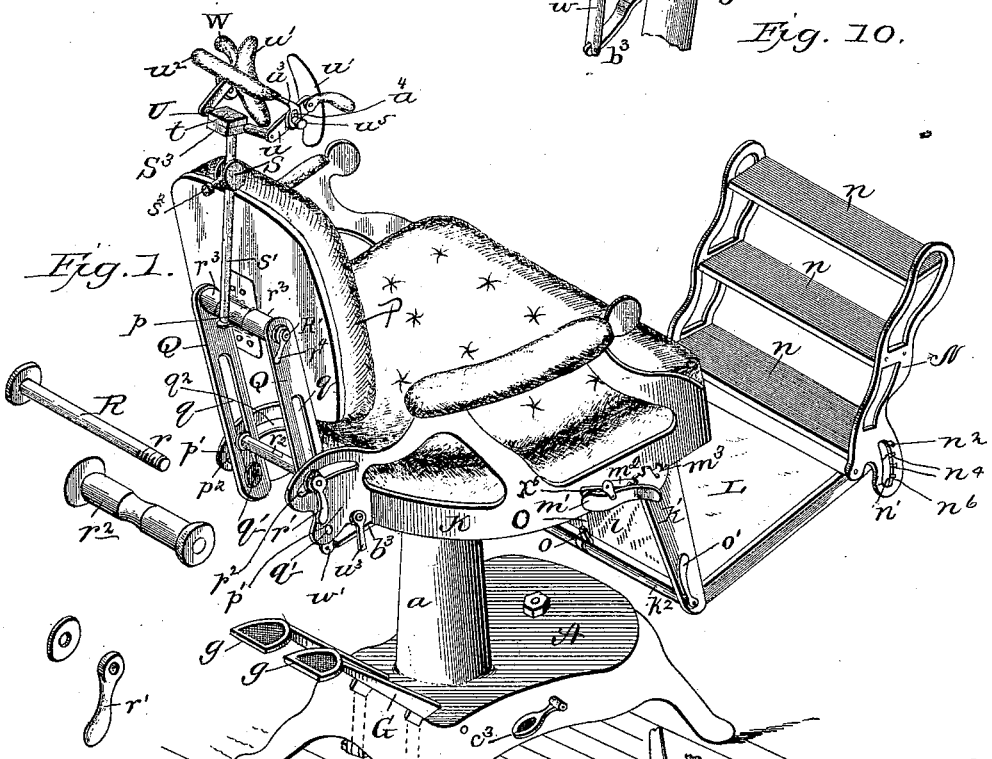
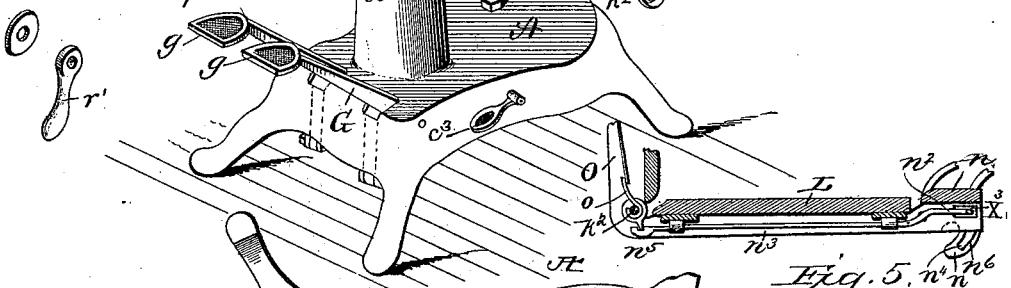


Fig. 1.



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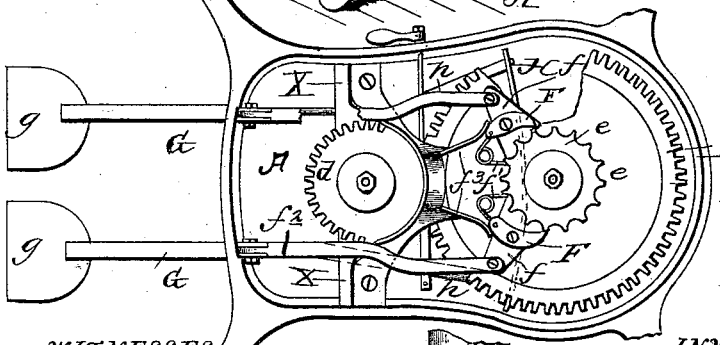

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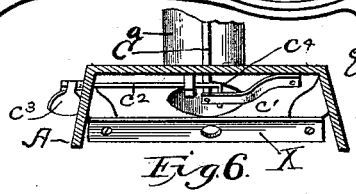

Fig. 6.

WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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DENTAL CHAIR.

No. 526,071. Patented Sept. 18, 1894.

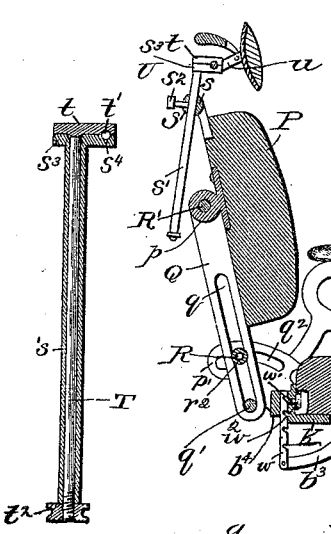

Fig. 7.

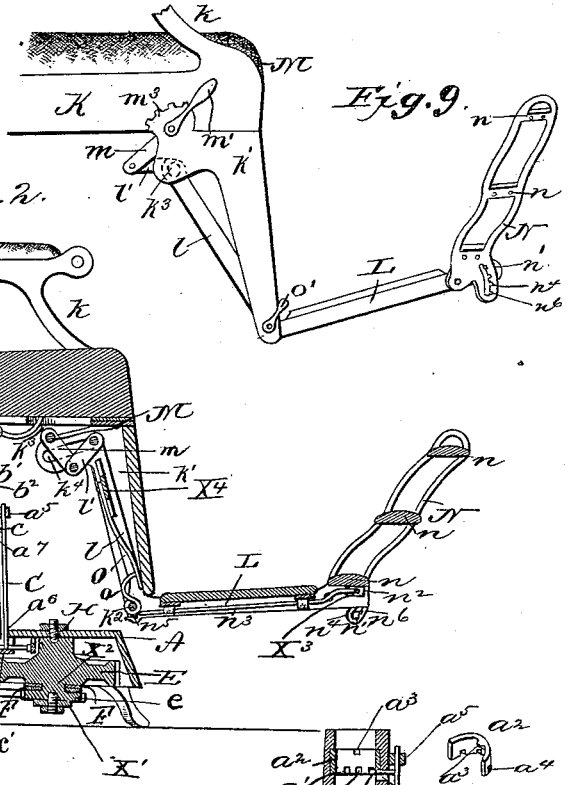

Fig. 2.

Fig. 9.

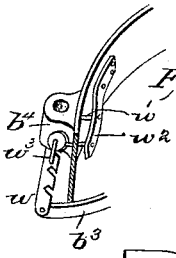

Fig. 11.

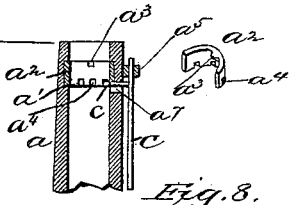

Fig. 8.

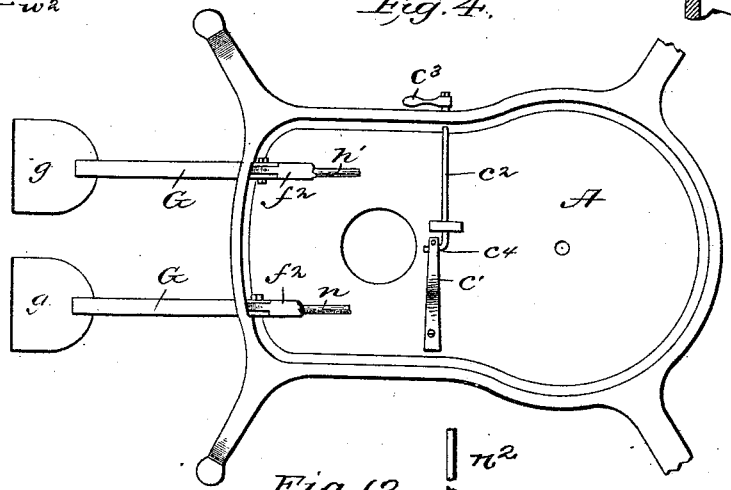

Fig. 4.

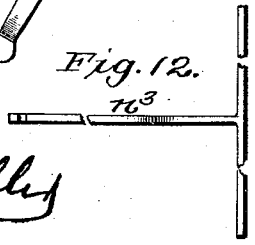

Fig. 12.

WITNESSES

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UNITED STATES PATENT OFFICE.

EMERY B. CUSHING, OF LACONIA, NEW HAMPSHIRE.

DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 526,071, dated September 18, 1894.

Application filed May 31, 1892. Serial No. 434,936. (No model.)

To all whom it may concern:

Be it known that I, EMERY B. CUSHING, a citizen of the United States, and a resident of Laconia, county of Belknap, State of New Hampshire, have invented a new and useful Improvement in Surgical, Dental, and Barbers' 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 an improvement in chairs, and more particularly to that class designed for the use of dentists, surgeons and barbers.

The object of my invention is to provide a strong, compact chair which will admit of the several adjustments which may be required, and which may be operated with ease and convenience.

With these objects in view, the invention consists in certain features of construction and combination of parts which will be hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1, is a perspective view of a chair adjusted for use, showing in detail certain separable parts. Fig. 2, is a vertical longitudinal sectional view of the same. Fig. 3, is a bottom plan view showing the raising and lowering gearing in position. Fig. 4, is a similar view with the gearing removed. Fig. 5, is a vertical sectional view of the foot platform of the chair and the mechanism for locking it. Fig. 6, is a transverse vertical sectional view of the base of the chair; Fig. 7, is a detached sectional view of the head-rest supporting arm. Fig. 8, is a detail view in section of a portion of the mechanism by which the rotatable movement of the chair seat is controlled. Fig. 9, is a detailed view in side elevation of the mechanism for operating the foot platform and foot rest. Fig. 10, is a detail perspective view of the seat support. Fig. 11, is a detail view of a portion of the mechanism for locking in tilted adjustment the back of the chair. Fig. 12 is a detail view of the rod n^2.

A, denotes the base upon which the chair body is supported. It is, for convenience, formed of one piece, hollowed out underneath and provided with an upright tubular portion a. The chair body is journaled to tilt forward and back on a yoke B provided with a depending hollow stem b having a female screw thread B′ therein. The stem B is fitted to slide freely up and down in the tubular support a and is held in desired rotary adjustment therein by the following mechanism: On the inner face of the tube a is formed a transverse groove a' in which is fitted a curved slide a^2 with its inner face flush with the inner face of the tube. The slide is provided at its upper edge with a feather a^3 which enters a vertical groove b^2 in the stem B. Thus the stem is allowed to rotate only when the slide a^2 is free to move, but may be moved vertically whether the slide is locked or not. The slide is further provided with a series of notches a^4 along its lower edge which receive a locking pin c on a vertically movable rod C. This rod is held in position by a bearing a^5 on the tubular portion a and by a bearing a^6 in the base A. The locking pin c projects through the slot a^7 in the upper portion of the tubular portion a and has sufficient play in the slot to allow it to be depressed out of engagement with the notches a^4 of the slide when it is desired to rotate the stem B. The pin is held in normal engagement with the notches in the slide by a spring c' secured to the under side of the base A, and to the rod C, and is operated by means of a rock-shaft c^2 journaled in the base. This rock-shaft is provided at one end, outside the base with an operating treadle c^3 and at its opposite end with an arm c^4 bearing upon the free end of the spring.

A screw D, is supported in the base of the chair by a cross bar X and is fitted to engage the female screw thread in the stem B, and has secured to its lower end a pinion d. Journaled in the base on a cross bar X′ is a drive wheel E, which meshes with the pinion d, and has fixed thereon or cast integral therewith a spur wheel e, with which operating pawls F engage. A pair of pawl carrying arms f are loosely mounted on an axis corresponding with that of the spur wheel e and shown in the present instance as the neck or hub X^2 connecting the drive wheel E and spur wheel e. The pawls F are pivoted on these arms and are engaged by springs f' which tend to throw the pawls into engagement with the spur wheel. As a convenience

of construction one end of each of the springs is attached to the arms f and the other end to the heel of the pawl. The free ends of the pawl carrying arms are connected with bell-crank levers G by connecting rods f^2 and the levers G are pivotally secured at the rear of the base and are provided with treadles g, within convenient reach of the foot of the operator. The pawl carrying arms f are held normally at the rearward limit of their movement and the treadles g, elevated by a spring H secured to the base, the ends of the spring being connected by rods h with the short arms of the levers G. When the pawl carrying arms f, are so held, the heels of the pawls F will be brought into engagement with the guides f^3, preferably made flaring as shown, to receive them. Thus the pawls will be held by said guides out of engagement with the spur wheel e, and as soon as the arms f are advanced the heel of the pawls will be released from the guides f^3, and the toes of the pawls will be thrown into engagement with the spur wheel. Thus, when it is desired to elevate the chair body, one of the treadles g, is depressed, thereby throwing the pawl operated thereby into engagement with the spur wheel e, which with the drive gear E will be rotated, thereby rotating the pinion d, and hence the screw D, which being held against vertical movement in its bearings will cause the stem b to slide up wardly within the tubular support a.

The strokes of the lever G may be repeated until the desired elevation is reached, the spring H serving to return the treadle to its normal position after each downward stroke. To lower the chair body, the other treadle is operated in the same manner as just explained and its connected pawl engaging the spur wheel on its opposite side, the said spur wheel will be rotated in a direction opposite to that in elevating the chair body.

K, represents the seat portion of the body frame, the same having fixed thereto arm frames k and depending hangers k' for supporting the platform frame L. In the upper ends of the hangers k' are formed curved recesses k^4 for purposes hereinafter explained.

The platform frame L, is hinged at the lower ends of the hangers k', preferably upon a journaled rod k^2 and has fixed to its rear edge on each side an upwardly extending portion l. The upper ends of the parts l are provided with bearings which rest loosely within the recesses k^4, and links l' are attached to the parts l preferably in line with the bearings that engage the recesses k^4, and the opposite ends of the links l' are loosely connected with the operating arms m secured to a transverse rock-shaft M journaled in the lugs k^3 of the hangers k'. This rock shaft is provided at one end with an operating handle m' carrying a pawl X^6 which engages a rack m^3 to secure the rock-shaft in desired rotary adjustments. By rocking the shaft M the parts l of the platform through the arms m and links l' may be tilted backward and forward upon the journaled rod k^2, thereby elevating and depressing the front of the platform as desired.

A foot rest consisting of sides N, and steps or treads n connecting the side pieces at different heights and in different vertical planes, as shown, is pivoted to the front of the platform L. The side pieces N are provided with depending ears n^6 in which are formed curved slots n', the slots being curved in an arc, the center of which is at the pivoted connection of the pieces N with the platform. A pair of locking dogs n^2, preferably the ends of laterally extending branches of an endwise moving rod n^3, project through slots X^3 in the ends of the platform frame L, into the curved slots n' and engage notches n^4 formed in the walls of the curved slot, thus holding the foot-rest in the desired adjustment with respect to the platform. The dogs n^2 are held in the notches, by means of a spring O, secured to a cross bar X^4 connecting the parts l of the platform. The free end of this spring bears on the long arm o of a lever secured to the journal rod k^2 so as to rock freely therewith, the short arm of said lever being engaged in a notch n^5 in the endwise moving rod n^3. A handle o' on the end of the journaled rod k^2 enables the rod to be rocked against the tension of the spring O and release the foot rest for adjustment.

The chair back P, is provided with an eye bracket p fixed to its back by which it is secured to the back supporting frame in the following manner:—A pair of standards Q, each provided with an elongated slot q are supported at their lower ends by studs q' projected laterally from the lower rear portions of a pair of brackets or ears p' extending rearward from the seat frame K. The said studs have a loose engagement in the slot q so as to allow the standards to slide up and down and rock thereon. The brackets or ears p' are provided above the studs q' with elongated curved slots q^2 through which and the slots q in the standards extends a bolt R, provided with a screw threaded end r, to receive a handle nut r'. A spacing sleeve r^2 is interposed between the standards Q on bolt R, so that when the handle nut is screwed up tightly the standards will be thereby clamped to the brackets or ears p' and thereby be secured in the desired vertical adjustment. A bolt R' extends through the upper ends of the standards Q and through the eye of the bracket p. Spacing sleeves r^3 are located on the bolt R' on each side of the eye and between it and the standards Q. The bolt R' has a threaded end to receive a tail nut r^4 which when screwed up tightly clamps the back P between the standards in the desired tilted adjustment.

The above described mechanism admits of the tilting of the chair back independently

of its supporting standards and of moving it forward and back and up and down, with the supporting standards, and of securing it in its several adjustments.

To the back P, a head rest is secured in the following manner:—A clamp S, of any desired construction is secured to the upper portion of the back to swing or rock forward or rearward. A tubular supporting stem s' is secured in vertical adjustment to said clamp by a set screw s^2. Thus it will be seen that the stem may be rocked forward or rearward and adjusted vertically. The upper end of the stem is provided with a head s^3 having a transverse half bearing s^4 formed therein, and a bolt T having a head t corresponding to the head s^3 and provided with a half bearing t' corresponding to the half bearing s^4 extends through the stem s' and is provided at its lower screw threaded end with a nut t^2 for drawing the two half bearings together. A short rod or shaft U is seated in the half bearing t' and s^4 and has at each end a forwardly extending arm u carrying on its end a concavo-convex head support u' in position to engage the back portion of the patient's head. An arm rest u^2 is supported at the back of the head supports u' by a pair of standards u^3 having elongated slots u^4 formed in their ends for the reception of binding screws u^5 by which the rest may be adjusted in the desired positions. Supplemental arm rests W are secured at the sides of the head supports u' to the arms u, for convenience in certain classes of operation. The several adjustments of the head rest are obvious and need not be further described.

The chair body as a whole may be tilted forward and backward and locked in the tilted adjustment by means of a vertically sliding bar w loosely secured at its lower end to a projection B^3 of the yoke B and seated in a perforated lug b^4 at the back of the seat frame K. The bar w is provided with notches for the reception of a detent w' having a longitudinal movement through the back of the seat frame and held normally in locked adjustment by a spring w^2 attached to it. The spring is thrown forward and the detent withdrawn by means of a cam or any well known device, operated by the handle w^3.

The chair as thus constructed has its working mechanism well housed and its operating levers within convenient reach of the operator while its adjustments are varied and may be made with precision.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a base and a chair body, of a vertically sliding screw-threaded tubular supporting stem, a screw journaled in said base and engaging the thread of the stem, a pinion fixed to said screw, a drive gear journaled in said base and in mesh with the pinion and having an integral spur wheel e and hub X^2, arms f journaled on said hub and provided with spring actuated pawls F, actuating levers G, journaled in the base and connected with said arms, and guides f^3 secured to the base and located in the path of movement of the said pawls, substantially as herein described.

2. The combination with the slotted platform frame, of a foot rest hinged at its forward end to said platform frame and provided with ears or lugs having curved slots or openings with notches formed in their walls, a spring controlled sliding rod mounted under the platform frame and provided with laterally projected extensions which project through the slotted sides of the platform and engage the notches in the ears, and means for retracting said rod consisting of a rod k^2 a lever secured thereto and engaging the spring controlled sliding rod and a handle o', substantially as herein described.

3. The combination with a seat frame, and hangers secured thereto and provided with ears having elongated recesses, of a platform hinged to the lower ends of said hangers and provided with upwardly extending arms having bearings to engage said elongated recesses, an operating lever journaled in one of the hangers, means for locking the lever in its adjusted position, linked connection between the said lever and the upwardly extending arms, whereby when said lever is actuated the platform will be tilted into and locked in an inclined or horizontal position, substantially as herein described.

In testimony whereof I have hereunto set my hand this 21st day of March, A. D. 1892.

EMERY B. CUSHING.

Witnesses:
W. A. PLUMMER,
S. S. JEWETT.