May 23, 1961 S. S. GOLDEN 2,985,228

CHAIR CONSTRUCTIONS

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Fig. 1.

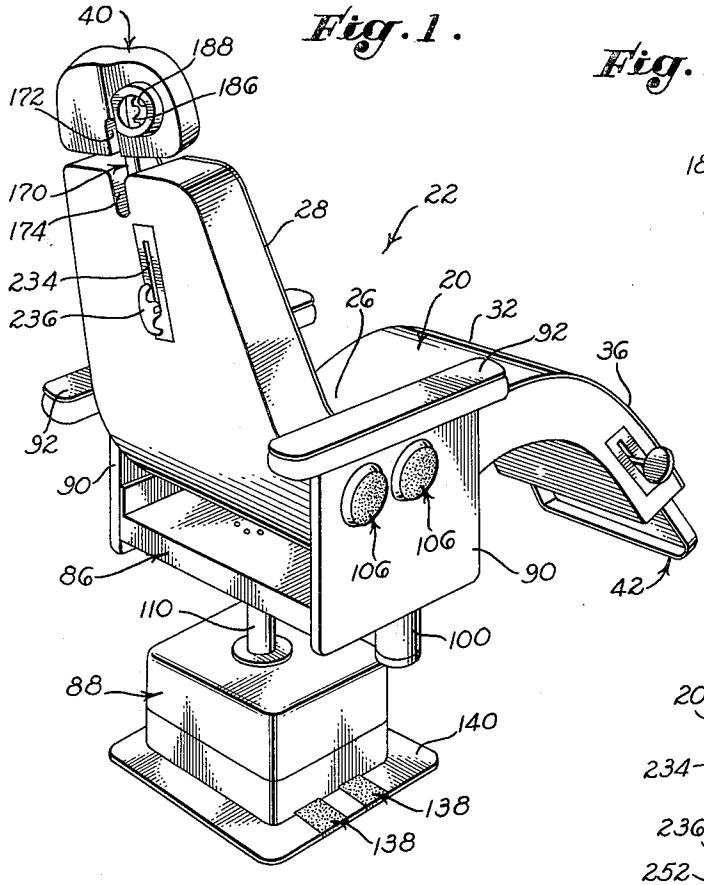
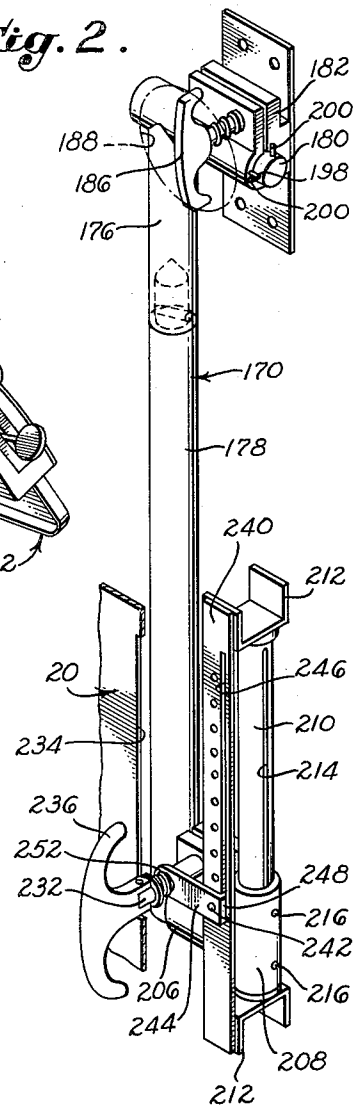


Fig. 2.



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Fig. 4.

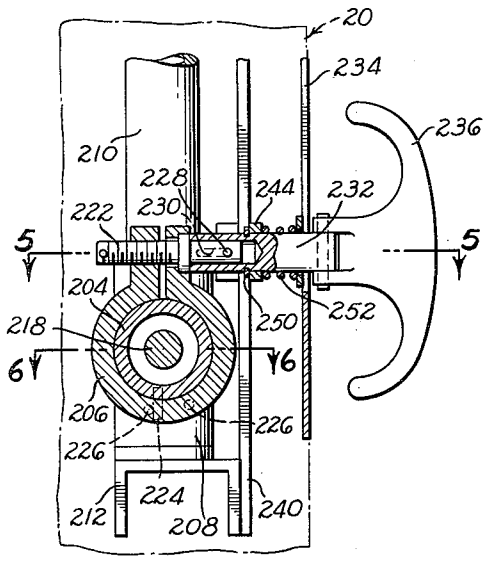


Fig. 5.

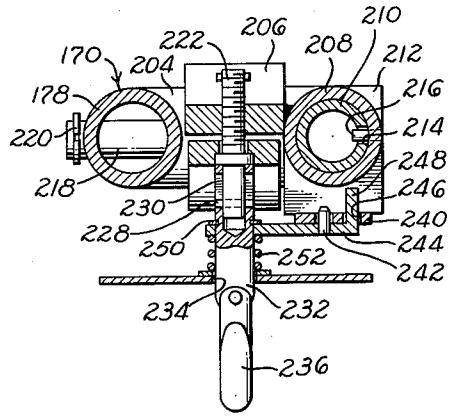


Fig. 3.

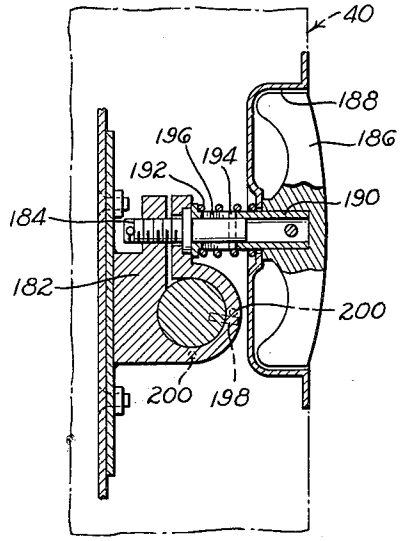
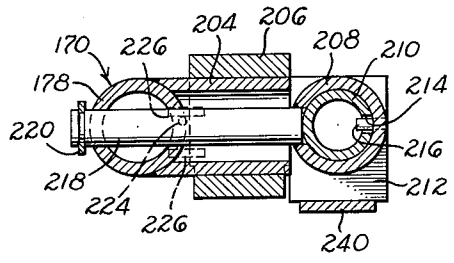


Fig. 6.



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CHAIR CONSTRUCTIONS

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3 Claims. (Cl. 155—177)

The present invention relates in general to chairs and, more particularly, to mechanism for adjusting and locking in a desired position of adjustment the head rest of a chair, for example, the head rest of a dental chair.

An object of the invention is to provide a head rest particularly useful in dental chairs which is pivotally mounted on a head-rest support for pivotal fore and aft movement, means being provided to lock the head rest relative to the head-rest support in any one of a plurality of angular positions.

Another object is to provide means mounting the head-rest support for up and down reciprocatory movement relative to the contour seat, means mounting the head-rest support for fore and aft pivotal movement relative to the seat, locking means for locking the head-rest support against up and down reciprocatory movement in any one of a plurality of positions, another locking means for locking the head-rest support relative to the seat against fore and aft pivotal movement in any one of a plurality of angular positions, and common control means for locking and unlocking both of these locking means. A related object is to provide a common control means which includes a common control element, means connecting such common control element to the locking means first mentioned for locking and unlocking such locking means in response to in and out reciprocatory movement of the common control element, and means connecting the common control element to the other locking means mentioned for locking and unlocking such other locking means in response to rotational movement of the common control element. Thus, either of the locking means for the head-rest support relative to the seat may be locked or unlocked by means of the same common control element merely by varying the type of motion imparted to such control element.

The foregoing objects, advantages, features and results of the present invention, together with various other objects, advantages, features and results thereof which will become apparent, may be attained with the exemplary embodiments of the invention which are illustrated in the accompanying drawings and which are described in detail hereinafter. Referring to the drawings:

Fig. 1 is a perspective view of a detal chair embodying the invention;

Fig. 2 is an enlarged fragmentary perspective view of a head rest supporting an adjusting structure embodied in the dental chair of Fig. 1;

Fig. 3 is a vertical sectional view through the upper end of Fig. 2 and illustrating means for adjusting the head rest relative to a head rest support in a fore and aft direction;

Fig. 4 is a fragmentary vertical sectional view through

the lower end of Fig. 2 and illustrating means for adjusting the head rest support relative to the seat in a generally vertical direction and in a fore and aft direction;

Fig. 5 is a fragmentary sectional view taken along the arrowed line 5—5 of Fig. 4; and

Fig. 6 is a fragmentary sectional view taken along the arrowed line 6—6 of Fig. 4.

Referring to Fig. 1 of the drawings illustrated therein, is a contour seat **20** for a dental chair **22**, the entire seat **20** being pivotable in the fore and aft direction about a transverse horizontal pivoted axis (not shown). Contour seat **20** may be regarded as divided longitudinally into an intermediate concave section **26** for the support of the hips and portions of the back and legs there adjacent. A first substantially linear terminal section **28** for supporting the upper portions of the back and the shoulders and approximately tangent to the concave section **26** and intermediate convex section **32** for supporting the legs and the regions of the knees and approximately tangent to the concave section **26** and a second substantially linear terminal section **36** for supporting the lower extremities of the legs and approximately tangent to the convex section **32**. A head rest **40** and a foot rest **42** both of which are adjustable are mounted on the contour seat **20** adjacent the upper or rearward end of the linear section **28** and adjacent the lower or forward end of the linear section **36**, respectively, so as to support the head and the feet, respectively.

As shown in Fig. 1 of the drawing, the base **86** is generally U-shaped and includes transversely spaced supports **90** for arm rests **92**. The concave section **26** of the contour seat **20** being disposed between the arm rest supports.

The contour seat **20** is also pivotally mounted for fore and aft movement on the base **86** which in turn is mounted on a sub-base **88** for pivotal movement on a vertical axis so that the dental chair may be rotated on such axis in the usual manner. Suitable foot controls as indicated at **138** through a center post **110** actuates an electric motor within the base **88** to raise and lower the superstructure of the chair. Electric motor **100** is provided to tilt the contour chair about a horizontal axis through knee controls **106**.

Referring to Figs. 1 and 2 of the drawings, the head rest **40** is mounted on a head-rest support **170** for fore and aft pivotal movement about a transverse horizontal axis in a manner to be described hereinafter, the head rest being notched, as indicated at **172** in Fig. 1, to permit such fore and aft pivotal movement of the head rest relative to the support. The head-rest support **170** extends downwardly into the upper or rearward linear section **28** of the contour seat **20** and is mounted on the internal structure of the contour seat for upward and downward reciprocatory movement and for fore and aft pivotal movement about a transverse horizontal axis, all as will be described in detail later herein, the upper end of the linear section **28** of the seat being notched, as indicated at **174**, to permit such fore and aft pivotal movement of the head-rest support.

To permit changing head rests **40**, the head-rest support **170** is made in readily separable, upper and lower sections **176** and **178**, the upper section, as shown in Figs. 2 and 3, being provided with a transverse shaft **180** at its upper end within the head rest. Also within the head rest is a clamp **182** which is connected to the internal structure of

the head rest to support same and which encircles the shaft **180**. This clamp includes two arms through which a screw **184** extends, this screw being threaded into one of the arms of the clamp and being seated against the other arm thereof, as best shown in Fig. 3. A handle **186** is set in a recess **188** in the back of the head rest **40** and is provided with a tubular stem **190** which is telescoped over the outer end of the screw **184** and which is biased inwardly by a compression spring **192**, there being a pin **194** and slot **196** connection between the tubular stem **190** and the screw **184** which permits pulling the handle **186** outwardly out of this recess **188** for accessibility, or it may be rotated within the recess if desired. As will be apparent, by rotating the handle **186** to rotate the screw **184**, the clamp **182** may be caused to engage or disengage the shaft **180** to lock the head rest **40** in a predetermined angular, fore and aft position about the shaft, or to release it for movement to another position. As best shown in Fig. 2, a stop pin **198** on the clamp **182** is engageable with either of two stop pins **200** on the shaft **180** to limit fore and aft pivotal movement of the head rest relative to the support **170**, the angular range of such movement preferably being of the order of magnitude of 30°.

Referring to Figs. 2 and 4 to 6 of the drawings, the lower section **178** of the head-rest support **170** is provided with a transverse tubular shaft **204** which extends into a clamp **206** similar to the clamp **182**, the clamp **206** being connected to a sleeve **208** which is vertically slidable, i.e., slidable longitudinally of the linear section **28** of the seat **20**, on a guide rod or tube **210** having secured to its ends brackets **212** for attachment to the internal structure of the linear section **28** of the seat in a manner not specifically shown. To prevent rotation of the sleeve **208** about the axis of the guide tube **210**, the latter is provided with a slot **214** receiving pins **216** on the sleeve. The shaft **204** is retained within the clamp **206** by means of a shaft **218**, Fig. 6, extending through the shaft **204** and the lower section **178** of support **170**, the shaft **218** having a snap ring **220** on its outer end.

Extending through arms of the clamp **206** and threaded into one of such arms is a screw **222** by means of which the clamp may be engaged with and disengaged from the tubular shaft **204** to permit fore and aft tilting of the head-rest support **170** so as to move the head rest **40** forwardly and rearwardly. A stop pin **224**, Fig. 4, on the tubular shaft **204** engageable with stop pins **226** on the clamp **206** limits the angular fore and aft movement of the head-rest support **170**. Preferably, the range of fore and aft pivotal movement of the head-rest support **170** is of the order of magnitude of 30°, 20° forwardly of alignment with the linear section **28** of the contour seat **20** and 10° rearwardly of such alignment.

The screw **222** has a pin **228** and slot **230** connection to a handle stem **232** telescoped over the outer or rearward end of the screw, as shown in Figs. 4 and 5. The handle stem **232** extends outwardly through a vertical or longitudinal slot **234** in the rear wall of the linear section **28** of the contour seat **20**, and pivotally connected to the handle stem **232** is a handle **236** which may be folded substantially flat against the back of the seat when not in use.

As will be apparent, by rotating the handle **236** in one direction, the clamp **206** may be disengaged from the shaft **204** to permit fore and aft pivotal adjustment of the head-rest support **170**. Conversely, by rotating the handle **236** in the opposite direction, the clamp **206** is engaged with the shaft **204** to lock the head-rest support **170** in any desired position.

Interconnecting the brackets **212** is an apertured latch strip **240** adapted to receive a pin **242** on a latch element **244** and provided therein with a guide slot **246** for a guide element **248** on the latch element **244**, the element **248** in the slot **246** guiding the latch element **244** longitudinally of the linear section **28** of the contour seat **20** in response to movement of the clamp **206**, the sleeve **208**, and associated elements, longitudinally of such linear section along the guide tube **210**.

The handle stem **232** extends through the latch element **244**, as shown in Figs. 2, 3 and 4. The latch element **244** is seated against a shoulder, provided by a snap ring **250**, on the handle stem and is biased against such shoulder by a compression spring **252**. As will be apparent, by pulling outwardly on the handle **236** to the limit of the pin-slot connection **228–230**, the latch pin **242** may be withdrawn from one of the apertures in the latch strip **240** to permit upward or downward movement of the head-rest support **170**, the clamp **206**, the sleeve **208**, and associated elements, so as to provide for adjustment of the vertical position of the head rest **40**, i.e., adjustment of the position of the head rest longitudinally of the linear section **28** of the contour seat **20**. Upon completion of the desired longitudinal adjustment of the head rest **40**, the handle **236** may be released to permit the latch pin **242** to enter another aperture in the latch strip **240**.

It will be noted that the handle **236** serves as a common control element for both the locking means for locking the head-rest support **170** against reciprocatory up and down movement, i.e., reciprocatory movement in the direction of the linear section **28** of the contour seat **20**, and the locking means for locking the head-rest support against fore and aft pivotal movement. In other words, by rotating the handle **236**, the locking means controlling fore and aft pivotal movement of the head-rest support **170** is operated, and by moving the handle inwardly or outwardly, the locking means for controlling reciprocatory up and down movement of the head-rest support is operated. Thus, a single handle controls both locking means, which is an important feature.

Although an exemplary embodiment of the present invention has been disclosed herein for purposes of illustration, it will be understood that various changes, modifications and substitutions may be incorporated in such embodiment without departing from the spirit of the invention as defined by the claims hereinafter appearing.

I claim as my invention:

1. In a chair, the combination of: a seat; a head rest adjacent the upper end of said seat; a head-rest support connected to said head rest; means mounting said head-rest support on said seat for reciprocatory up and down movement of said head-rest support relative to said seat and for fore and aft pivotal movement of said head-rest support relative to said seat; locking means for locking said head-rest support against up and down movement relative to said seat in any one of a plurality of positions; another locking means for locking said head-rest support against fore and aft pivotal movement relative to said seat; and common control means for locking and unlocking both of said locking means either separately or simultaneously.

2. In a chair, the combination of: a seat; a head rest adjacent the upper end of said seat; a head-rest support connected to said head rest; means mounting said head-rest support on said seat for reciprocatory up and down movement of said head-rest support relative to said seat and for fore and aft pivotal movement of said head-rest support relative to said seat; locking means for locking said head-rest support against up and down movement relative to said seat in any one of a plurality of positions; another locking means for locking said head-rest support against fore and aft pivotal movement relative to said seat; and a common control means for locking and unlocking both of said locking means, said common control means including a common control element, means connecting said common control element to the locking means first mentioned for locking and unlocking said first mentioned locking means in response to in and out, reciprocatory movement of said common control element, and means connecting said common control

element to said other locking means for locking and unlocking said other locking means in response to rotational movement of said common control element.

3. In a chair, the combination of: a seat including a back section; a head-rest adjacent the upper end of said seat; a head-rest support the lower end of which extends downwardly and into the back section; releasable locking means within the back section and engageable with said head rest support for locking the head rest in a desired fore and aft position with respect to the back rest; releasable locking means within the back section for locking the head rest in a desired up and down position with respect to said back rest; and manually operated means extending through the back of said back rest for releasing both of said locking means, said manually operated means comprising a single element having two

separate locking motions and two separate unlocking motions each of said locking motions and each of said unlocking motions being operable separately or simultaneously.

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