

H. E. WEBER.
DENTAL CHAIR.
APPLICATION FILED NOV. 26, 1906.

958,048.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

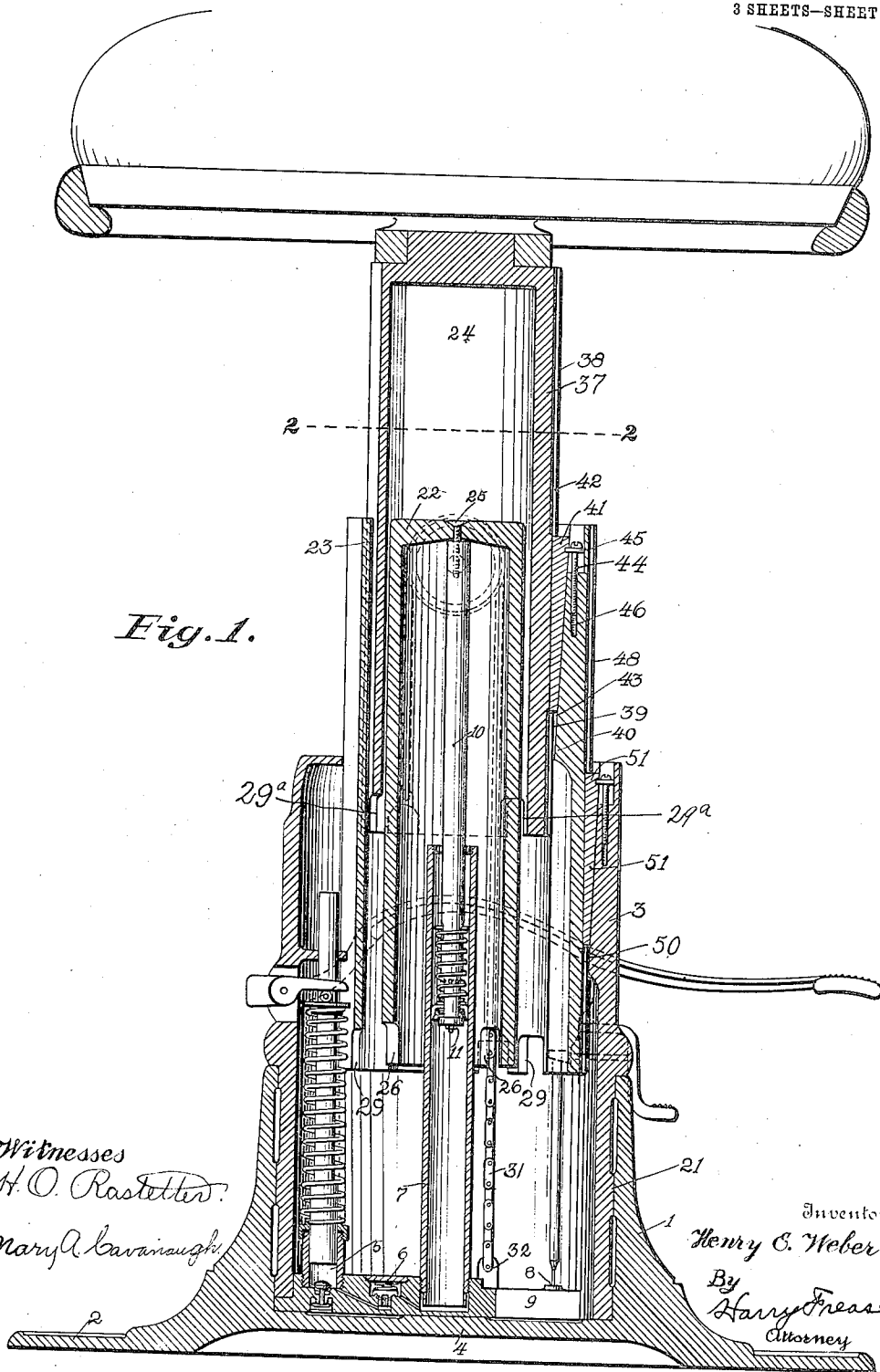


Fig. 1.

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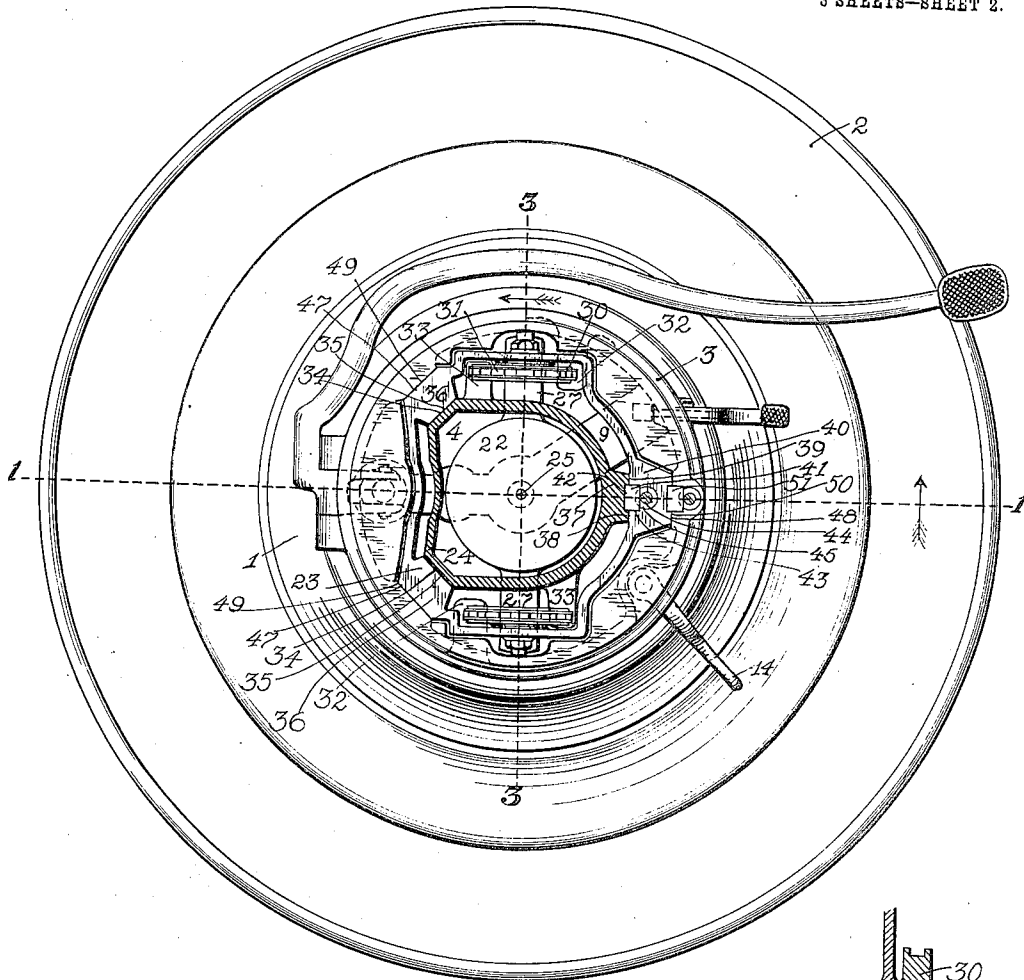


Fig. 2.

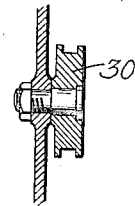
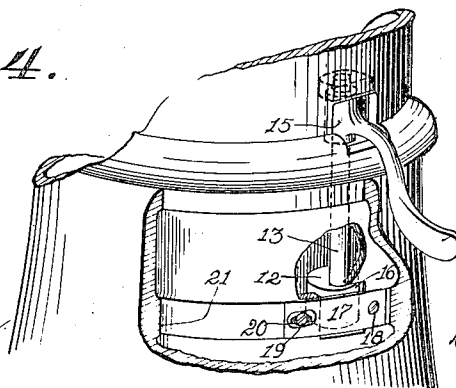


Fig. 5.

Fig. 4.



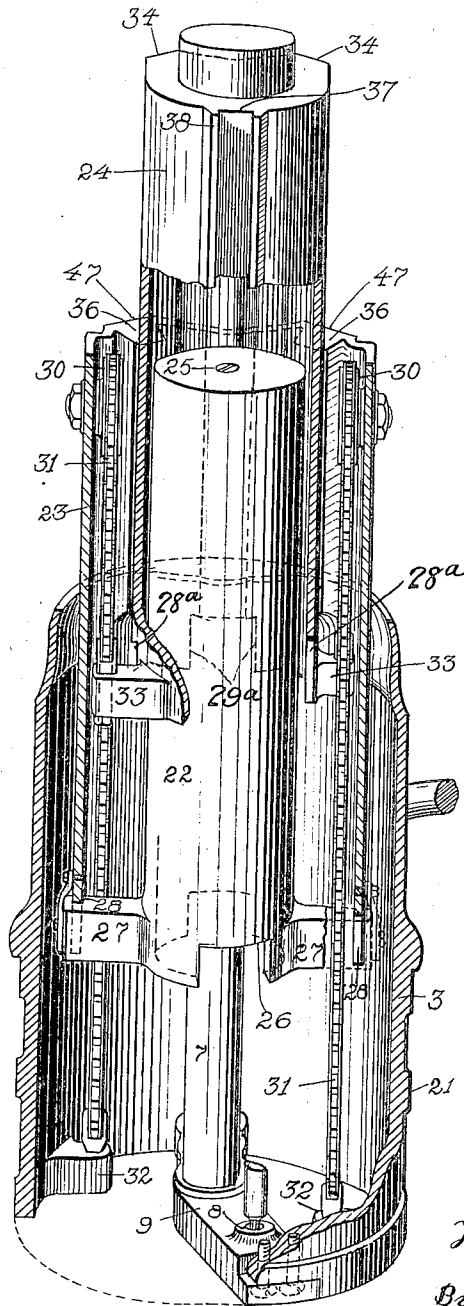
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3 SHEETS—SHEET 3.



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Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY E. WEBER, OF CANTON, OHIO, ASSIGNOR TO THE WEBER DENTAL MANUFACTURING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

DENTAL CHAIR.

958,048.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed November 26, 1906. Serial No. 345,006.

To all whom it may concern:

Be it known that I, HENRY E. WEBER, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Dental Chairs, of which the following is a specification.

The invention relates to adjustable chairs which are adapted to be rotated and vertically raised and lowered on the base, the raising and lowering being accomplished by a hydraulic pump or other suitable means. In chairs of this class, it is theoretically very desirable that the center of gravity of the load on the chair shall coincide with the vertical axis of the base, so that there will be no lateral binding of the extensible parts of the base in their movements; but as it is practically impossible in the use of a chair to exactly center the load thereon, as for instance in the various manipulations and movements of a patient, it is very desirable that the base should be so constructed as to overcome or minimize the lateral strains and bindings caused by the eccentric location of the load on the chair. This general object, and other minor improvements relating to the adjustment and locking of the several sections of the base, are attained by the construction, mechanism, and arrangement illustrated in the accompanying drawings, in which—

Figure 1 is a median line vertical section of the chair base showing a seat in outline thereon; Fig. 2, a plan view of same, showing the seat-standard in section on line 2—2, Fig. 1; Fig. 3, a perspective view of the extensible parts of the base showing some parts in vertical section on line 3—3, Fig. 2; Fig. 4, a fragmentary view, with parts broken away showing the device for locking the base-standard with the base-proper; and Fig. 5, is a fragmentary sectional view of one of the chain-pulleys.

Similar numerals refer to similar parts throughout the drawings.

The base-proper 1 is cylindric in general form, and is preferably provided with the wide annular foot rim 2 on the bottom to give it an extended bearing. The base-standard 3 is cylindric in general form and is rotatably mounted in the base-proper, the bottom plate 4 of the base-proper forming also the bottom closure of the base-standard. The pump 5, the check-valve 6, the cylinder

7, and the release valve 8, are preferably formed or attached in the cross-frame 9, which is formed or attached in the lower end of the base-standard and preferably rests and rotates on the bottom plate of the base-proper, especially in the central part thereof. The piston 10, having the valve 11, is adapted to operate in the cylinder, which is located in the axial line of the base. The pumping or elevating devices may be any of the ordinary and well known kinds used in chairs of this class.

The base-standard is locked or held against rotation in the base-proper by means of the eccentric or cam 12, which is mounted on the rotatable shaft 13 which is vertically journaled in suitable bearings within the base-standard, and is operated by the handle 14, which extends outward through the aperture 15 in the side of this standard. The cam 12 is adapted to operate in and through the aperture 16 formed in the wall of the base-standard, which aperture is bridged on the outer side by the stiff but flexible plate 17, which is securely attached, as by the screw 18, on one side of the aperture, and loosely attached, as by a screw 19 passed through the slot 20 in the plate, on the other side of the aperture; whereby the plate is adapted to be thrust outward by the rotation and wedge action of the cam which abuts its inner side. The annular rib 21 is preferably formed on the inner wall of the base-proper adjacent to the flexible plate, against which rib the plate is adapted to be forced by the rotation of the cam; by which means the base-proper and its standard can be locked together as against the rotation of the latter. It is evident that if the cam abutted directly against the wall of the base-proper the rotation of the base-standard in one direction would tend to rotate the cam and thus release the pressure thereof; but by providing the intervening, flexible plate, which is fixed at one end but loosely attached at the other end, the pressure of the cam through the intervening plate against the wall of the base-proper can be held against any tendency to rotate the cam by a rotation of the base-standard.

The extensible parts of the base comprise the lifting-standard 22, the intermediate-standard 23, and the seat-standard 24. The lifting-standard is preferably tubular in

general form and is adapted to telescope within the seat-standard, while the intermediate-standard is arranged to telescope outside of the seat-standard and to operate within the base-standard. The lifting-standard 22 is preferably closed at the top and rests on the upper end of the piston 10, to which it is preferably attached as by means of the screw 25; and the lower ends of this standard are preferably provided with the notches 26 adapted to receive the cross-frame 9 in the bottom of the base-standard, thus permitting the lower end of the lifting-standard to descend to the bottom plate of the base proper. The diametrically opposite radial arms 27 are formed or attached on the lower end of the lifting-standard and extend beyond the lower end of the walls of the intermediate-standard and are preferably attached in notches 28 provided therein for that purpose, so that the intermediate-standard can descend entirely to the bottom plate of the base proper, the notches 29 being provided therein adapted to receive the cross-frame 9 in the bottom of the base-standard. The pulleys 30, are rotatably mounted on opposite sides at or near the upper end of the intermediate-standard, over which pulleys the chains 31 are passed, the chains being attached at one end to the internal lugs 32 formed or attached on the lower part of the base-standard and at the other end to the external lugs 33 formed or attached on the lower part of the seat-standard; which seat-standard, like the lifting- and intermediate-standards, is provided with the notches 29^a adapted to receive the cross-frame 9, and the notches 28^a adapted to receive the radial arms 27, so that the lower end of this standard, as well as of the others, can descend to the bottom-plate of the base-proper.

It is evident that when the piston is forced upward by the operation of the pump, it thrusts the lifting-standard upward, which carries with it the intermediate-standard by means of the radial arms 27. The elevation of the intermediate-standard likewise raises the seat-standard at an accelerated speed by means of the chain and pulley connections; and it will be noted that a great advantage of this peculiar construction and arrangement consists in the fact that the extensible parts of the base rest on a board or wide bearing, namely the outer ends of the radial arms of the lifting-standard, and that the seat-standard is located within the intermediate-standard. In other words the extensible parts of the base when extended might be said to have the external outline of a pyramid or cone resting on its base, instead of the same configuration with its base upward, as is the case when the intermediate-standard telescopes inside of the seat-standard, and by these means the extensible

parts of the base are provided with a wide and firm bearing or support at the bottom, which adds greatly to the stability and firmness of the chair. Furthermore it will be noted that the thrust of the piston is applied substantially in the vertical axis of the base, that the arms of the lifting-standard act on the intermediate-standard at substantially equal distances on diametrically opposite sides from the axis of the base, and that likewise the pulleys and the attachments for the chains are at substantially equal distances on diametrically opposite sides from the axis of the base, so that each and all of the extensible parts of the base are lifted directly upward and are exactly balanced on the center line, and that by reason of this construction and arrangement there is absolutely no straining or binding of one part against another in the operation of the chair, if the load is exactly centered thereon. Furthermore, the open lower ends of all the extensible standards are permitted to descend entirely to the bottom-plate of the base-proper, because of the notches provided in the respective standards which fit over the cross frame 9 in the lower end of the base-standard and the radial arms 27 on the lower end of the lifting-standard.

Referring more particularly to the plan view of the chair it will be noted that the lifting-standard 22, is preferably formed circular in cross section, while the seat-standard which telescopes there around is preferably formed with a semi-circular section on the rear side and with the forward side squared, with the corners beveled to form the flat faces 34 which are preferably located equi-distant in each side of the median line of the base and at right angles with the radial lines from the center thereof. These faces are adapted to abut against and slide vertically on the reversely positioned faces 35 on the vertical ribs 36 formed on the inner side of the intermediate-standard. The vertical rib 37 is provided on the rear side of the seat-standard, the flat face 38 of which rib is adapted to bear against or to be adjacent to the opposing flat face 39 on the vertical rib 40 formed on the inner side of the intermediate-standard. These three points of contact comprise the bearings of the seat-standard in its vertical movements in the intermediate-standard, and the ribs 36 and 40 on the inner side of the intermediate-standard are preferably of considerable length, as shown on Figs. 1 and 3, to provide a bearing of sufficient extent to prevent any binding of one standard with the other when the extensible parts of the base are subjected to lateral strains when the load on the chair is off the center thereof. In order to prevent, or to take up any looseness in these bearings the elongated wedge key 41 is preferably provided and located in

the groove 42 and the wedge groove 43 formed in the opposing faces of the ribs 37 and 40. The wedge key is adapted to be adjusted by means of the screw 44 passed through the ear 45 formed or attached on the side of the wedge, and thence into the threaded hole 46 in the rib 40. When this wedge is used, the inner side thereof bears directly against the flat bottom of the groove 43 and the same become the bearing and sliding faces; and it is evident that by tightening this wedge all looseness in the contact of the three guiding and sliding faces of the seat-standard with the opposing faces of the intermediate-standard can be taken up, thus insuring a firm and inflexible operation of the one within the other. The elongated flat faces 47, spaced apart at equal distances on each side of the median line on the forward side, and the similar face 48 in the median line on the rear side of the intermediate-standard, respectively abut and slide against the opposing faces 49 in the forward side, and the face 50 in the rear side of the base-standard; thus forming the slide bearings for the vertical movements of the intermediate-standard in the base-standard, similar to the like bearings for the seat-standard in the intermediate-standard; and all looseness in the contact of these bearing faces is taken up by the wedge key 51 in the same manner that the wedge key 41 performs its functions.

What I claim as my invention, and desire to secure by Letters Patent is—

1. In a chair-base having two members with adjacent walls and one arranged to rotate within the other, a locking device comprising a plate between the walls and attached at one end to one member, a rotatable cam mounted on the same member and arranged to abut the plate and to wedge it against the wall of the other member.

2. An extensible chair-base including a base-proper having a bottom plate therein, a rotatable base-standard thereon having a cross frame in its lower end, an intermediate-standard, a seat-standard and a lifting-standard each concentrically arranged to telescope within the base-standard, with slide guides respectively between the base-, intermediate- and seat-standards, axially applied means for raising and lowering the lifting-standard, diametrically-opposite radial arms extending outward from the lower end of the lifting-standard, and diametrically-opposite chain and pulley connections among the base-, intermediate-, and seat-standards, there being notches in the lower ends of the intermediate-, seat-, and lifting-standards, adapted to receive the cross frame in the base-standard, and notches in the seat- and intermediate-standards adapted to receive the radial arms on the lifting-standard.

3. An extensible chair-base including a base-proper having a bottom plate therein, a rotatable base-standard thereon having a cross frame in its lower end, an intermediate-standard, a seat-standard and a lifting-standard each concentrically arranged to telescope within the base-standard, with slide guides respectively between the base-, intermediate- and seat-standards, axially applied means for raising and lowering the lifting-standard, radial arms extending outward from the lower end of the lifting-standard, and chain and pulley connections among the base-, intermediate-, and seat-standards, there being notches in the lower ends of the intermediate-, seat-, and lifting-standards, adapted to receive the cross frame in the base-standard, and notches in the seat- and intermediate-standards adapted to receive the radial arms on the lifting-standard.

4. An extensible chair-base including a base-proper having a bottom plate therein, a rotatable base-standard thereon having a cross frame in its lower end, an intermediate-standard, a seat-standard and a lifting-standard each concentrically arranged to telescope within the base-standard, axially applied means for raising and lowering the lifting-standard, radial arms extending outward from the lower end of the lifting-standard, and chain and pulley connections among the base-, intermediate-, and seat-standards, there being notches in the lower ends of the intermediate-, seat-, and lifting-standards, adapted to receive the cross frame in the base-standard, and notches in the seat- and intermediate-standards adapted to receive the radial arms on the lifting-standard.

5. An extensible chair-base including a base-proper having a bottom plate therein, a rotatable base-standard thereon having a cross frame in its lower end, an intermediate-standard, a seat-standard and a lifting-standard each concentrically arranged to telescope within the base-standard, axially applied means for raising and lowering the lifting-standard, radial arms extending outward from the lower end of the lifting-standard, and operative connections among the base-, intermediate-, and seat-standards, there being notches in the lower ends of the intermediate-, seat-, and lifting-standards, adapted to receive the cross frame in the base-standard, and notches in the seat- and intermediate-standards adapted to receive the radial arms on the lifting-standard.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

HENRY E. WEBER.

In presence of—

MARY A. CAVANAUGH,
HARRY FREASE.