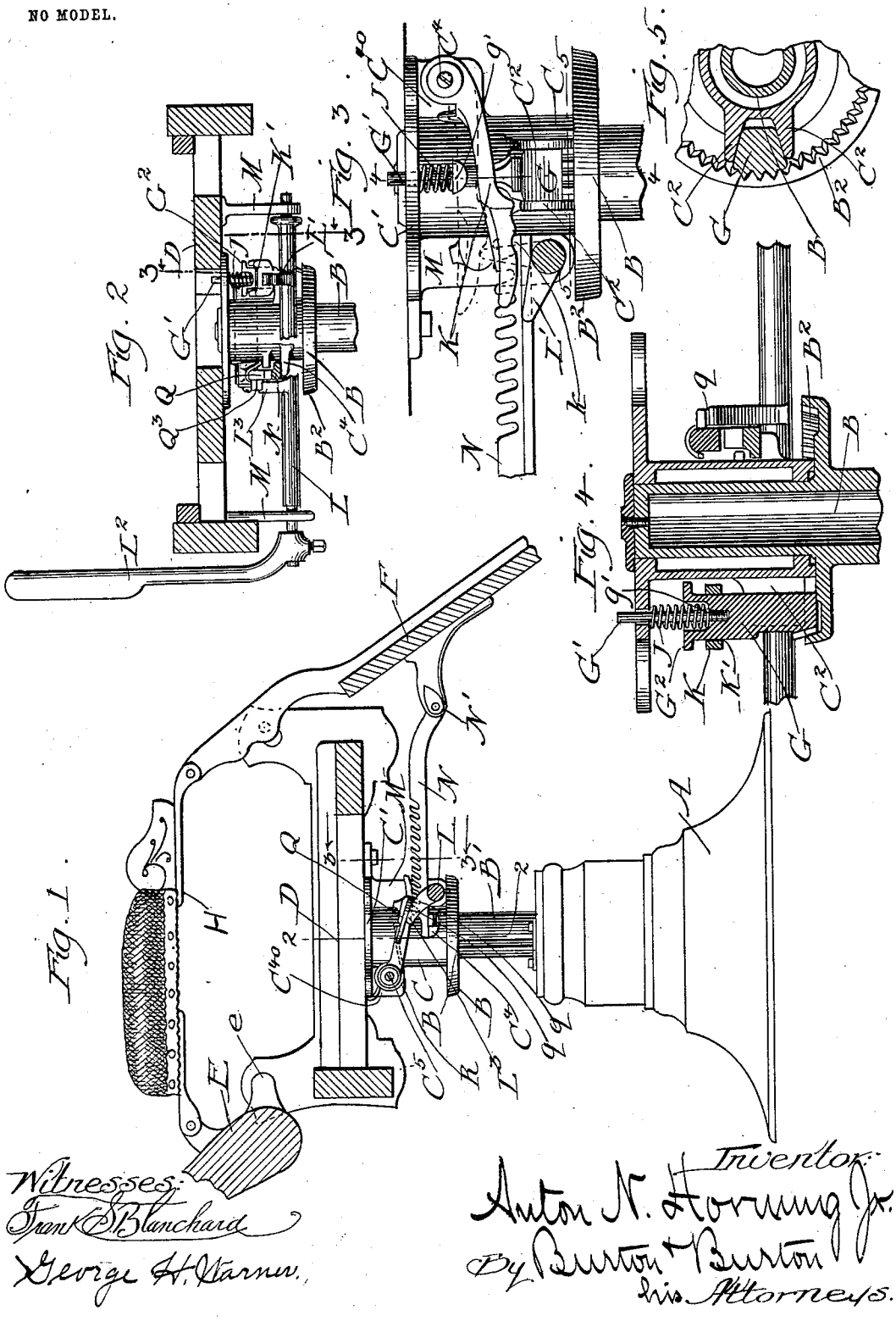
No. 723,465. PATENTED MAR. 24, 1903.

A. N. HORNUNG, JR.

CHAIR.

APPLICATION FILED OCT. 14, 1901.

NO MODEL.



Witnesses:
Frank S. Blanchard
George H. Varner.

Inventor:
Anton N. Hornung Jr.
By Burton & Burton
His Attorneys.

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UNITED STATES PATENT OFFICE.

ANTON N. HORNUNG, JR., OF CHICAGO, ILLINOIS, ASSIGNOR TO LOUIS HANSON, OF CHICAGO, ILLINOIS.

CHAIR.

SPECIFICATION forming part of Letters Patent No. 723,465, dated March 24, 1903.

Application filed October 14, 1901. Serial No. 78,526. (No model.)

To all whom it may concern:

Be it known that I, ANTON N. HORNUNG, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Chairs, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved chair of a general class suitable for dentists' or barbers' chairs or surgeons' operating-chairs, in which adjustments of the seat about a vertical axis and of a leg or foot rest and back in respect to the seat are to be made and in which perfect fixedness of position of the several parts as adjusted is essential.

It consists in the features of construction set out in the claims and which are fully described and shown herein by reference to the drawings, in which—

Figure 1 is a partly-sectional side elevation of my improved chair, section being made fore and aft through the chair frame, back, and leg-rest. Fig. 2 is a detail section at the line 2 2 on Fig. 1. Fig. 3 is a detail side elevation, partly sectional, at the plane denoted by the line 3 3 on Fig. 2, but on an enlarged scale. Fig. 4 is a section at the line 4 4 on Fig. 3. Fig. 5 is a detail section at the line 5 5 on Fig. 3.

In the drawings I have shown the features of my invention as applied to a chair which is provided with hydraulic means for raising and lowering it, these means being contained in the hydraulic base A and not specifically illustrated and not to be herein described, since they are shown in and covered by my application, Serial No. 54,833, filed April 8, 1901, and now pending in the Patent Office. My present invention is concerned with the portion of the chair above said hydraulic base, and this portion will now be described.

B is a base, having a stem B′, which extends into the hydraulic base when such base is employed.

C is a standard, vertically pivoted by its stem C′ in the base B and having the chair-bottom D mounted on its upper side.

E is the back, which is pivoted at *e* to the chair-bottom D.

F is the foot or leg rest, hinged to the chair-bottom D at the side opposite the back.

There are two links H, of which one is shown so formed as to serve as side arms for the chair, said links extending, respectively, from the opposite sides of the foot or leg rest to the corresponding sides of the back E, to which they are connected at points above the hinge of the back to the chair-bottom, their connection with the foot or leg rest being above the hinge-line of said rest and the said hinge-lines of the back and foot-rest and the points of connection of the said arms or links to said parts, respectively, being such that the tilting or swinging of the foot-rest from lower to higher position for bringing the limbs of the user up toward horizontal position inclines the back rearward.

The base B has formed rigid and preferably integral with it a circular horizontal rack B^2, and a dog G is provided adapted to engage said rack, said dog being mounted and adapted to slide vertically between lugs C^2 C^2, which project from the standard C, the dog having further guidance by means of its stem G′, whose upper end projects through the horizontal flange *c*, which constitutes the means by which the standard is secured to the chair-bottom. The dog is held normally downward by gravity and further kept in engagement with the rack B^2 by means of a spring J, which is coiled around said stem G′ of the dog, being stopped between the shoulder *g*′ of latter and the flange *c* of the standard.

In order to prevent any play or lost motion between the dog and the rack, which would permit the chair to oscillate about its vertical axis notwithstanding the engagement of the dog with the rack, four features of construction are adopted, each of which singly tends to this result, but all of which coöperate thereto. First, the teeth b^2 of the rack are beveled or tapered, so that the dog, having teeth adapted to mesh with those of the rack, shall by its engagement with such teeth be wedged thereon to more or less, taking up any lateral play which might otherwise exist; second, the teeth of the dog are beveled or

tapered, so that entering between any two consecutive teeth of the rack they tend to take up the lost motion and effect an engagement without play; third, the rack is inclined outwardly at the upper edge, so that the circumference at the outer upper end of the rack-teeth is greater than at the lower inner end of the teeth, causing the interspace between said consecutive teeth, even though the teeth were not beveled, to be wider at the upper outer end, whereby the teeth of the dog entering directly downward between the teeth of the rack become wedged therein regardless of the bevel, if any, of the teeth of the dog or of the teeth of the rack; fourth, the dog is tapered in horizontal cross-section, widening from the inner or back side toward the outer side at which the teeth are formed on the lower end to engage the rack, and the lugs C^2 C^2, between which the dog is guided, have their proximate faces beveled to correspond with the taper of the dog in horizontal cross-section, so that the dog tends to seat without play in the space between the lugs, the feature of construction or action which operates to guide or force the dog inward toward the axis of the chair having the effect to take up or prevent such play and render the dog fixed as respect to lateral motion with respect to the standard. The inclination of the rack above described has the effect to guide the dog inward when it is forced downward by its spring or by gravity, and thus cooperates with the horizontal taper of the dog and its guide-bearing to produce engagement without play between the dog and the standard at one side and between the dog and the rack at the other side, thus making the rack rigid with the standard without play when it is locked thereto by the dog. The inclination of the rack and the wedging of the teeth of the dog in engagement therewith by virtue of such inclination has another function—namely, that whereas if the rack were horizontal with beveled or V-shaped teeth for engagement with similar teeth of the dog said dog might be forced out of engagement by forcibly swinging the chair around its axis, the bevel of the engaged teeth of rack and dog facilitating their disengagement under such action. The inclination of the rack and the engagement with wedging effect which is rendered possible by the taper of the spaces between the teeth which such inclination causes adapts the rack to resist any tendency of the dog to become disengaged therefrom when force is applied tending to rotate the chair.

For the purpose of operating the dog to lift it out of engagement with the latter I provide a lever K, fulcrumed on a stud C^4, projecting horizontally from a boss C^{40} on the standard C. The lever has an aperture K', and the dog has the cross-bar G^2 at the lower end of the stem, the under face of said bar constituting a shoulder for stopping the spring J, the cross-bar being adapted to pass through the aperture K', and the dog then being turned one-quarter way around said cross-bar overhangs the sides of the aperture, so that the lever may engage the cross-bar to lift the dog. A rock-shaft L is journaled in hangers M M, projecting downward from the chair-bottom, and is provided with a handle or lever-arm L^2, extending up alongside the chair within reach of the user, by which the shaft may be rocked. The rock-shaft has also a lever arm or finger L', which operates as the shaft is rocked in one direction to lift the lever K by engaging under said lever at its outer end, thereby causing the lever to lift the dog out of engagement with the rack. A small notch *k* in the under face of the lever at a position vertically above the rock-shaft when the lever is upholding the dog forms a seat for the end of the finger L', in which it becomes lodged and engaged when said finger is erect from the rock-shaft, thus rendering the parts comparatively difficult to disturb from this position, so that the dog may be held out of engagement without continuous attention of the user when the chair is to be left free to rotate or even during the short time during which it is being swung from one position to another.

N is a rack-bar hinged at N' to the rear under side of the foot or leg rest F and extending rearward from its hinge under the chair-bottom alongside the stem of the standard C, said stem of standard having a ledge or lug C^4, on which the rack-bar rests and may slide back and forward.

Q is a dog fulcrumed upon a stud C^5, which juts horizontally from the boss C^{40} in the opposite direction from the stud C^4. The dog Q is provided at its forward end and lower side with teeth *q q*, adapted to engage the teeth of the rack-bar N, the pivot of the dog being somewhat above the level of the rack, so that the dog trends downward from its pivot to its engagement with the rack. The teeth of the rack are inclined forward, so that they stand substantially at right angles to the trend of the dog when it is engaged therewith, and the teeth of the dog are correspondingly inclined to effect good engagement, the intention and result being to cause the dog to lock the rack positively against disengagement by mere movement of the rack either back or forward.

R is a spring which is coiled around the hub of the dog or around the boss from which the stud-pivot projects, having one end stopped against the under side of the flange *c* of the standard and the other end hooked, so as to engage above the dog, thus operating to hold the latter downward at its toothed end into engagement with the rack. The rock-shaft L has, in addition to the lever arm or finger L', a lever arm or finger L^3, which stands in a vertical fore-and-aft plane just outside of the rack N, and the dog Q has a lug or flange Q^3, which overhangs the lever arm or finger L^3 in position to be encountered

by the latter when the shaft L is rocked in the opposite direction from that which causes its finger L′ to operate the lever K, whereby the dog is lifted out of engagement with the rack-bar and the latter left free to move fore and aft as the user or operator adjusts the foot and leg rest, and thereby the back, to desired position. The two lever-arms L′ and L^3, which project from the rock-shaft L, are at such an angle to each other in view of the relative positions of the portions or points of the lever K and dog Q, respectively, with which said lever-arms respectively engage or against which they act, that when both said lever K and dog Q are in the position for locking the rack B′ and rack-bar N, respectively, said lever and dog are in contact with the lever-arms L′ and L^3, respectively, so that the pressure of the two springs operating upon said lever and dog, respectively, checks the rock-shaft against rocking movement in either direction, causing it to be steady and free from rattling at the normal or locked position of both the parts which it controls, this normal position being intermediate the positions to which it is rocked in opposite directions to release, respectively, the dog which engages the circular rack and the dog which engages the rack-bar to permit the adjustment of the chair about its axis or the adjustment of the foot or leg rest and back with respect to the chair-bottom.

I claim—

1. In combination with a chair-bottom, a base or support upon which it is vertically pivoted, a circular rack rigid with the base having its teeth inclined bodily in radial direction with respect to the plane of rotation, and a dog mounted on a chair-bottom guided in a direction parallel to the axis of rotation to engage between the inclined teeth of the rack.

2. In combination with a chair-bottom, a base or support upon which it is vertically pivoted, a circular rack rigid with such base having its teeth inclined with respect to a horizontal plane and beveled, and a dog mounted on a chair-bottom guided vertically into engagement with the inclined and beveled teeth of the rack.

3. In combination with a chair-bottom, a base or support upon which it is vertically pivoted, a circular rack rigid with such base, having its teeth inclined outwardly, and a dog guided on the chair-bottom adapted to be thrust vertically into engagement with the teeth of the rack, said dog being tapered in horizontal cross-section narrowed inwardly, and a correspondingly-tapered seat in which it is guided; whereby the thrust of the dog into engagement with the inclined rack-teeth tends to crowd it into its tapered seat.

4. In combination with a chair-bottom, a base or support in which it is vertically pivoted, a circular horizontal rack rigid with such base having its teeth beveled and inclined with respect to a horizontal plane, a dog mounted on the chair-bottom and guided into and out of engagement with the rack-teeth, said dog being tapered in horizontal cross-section and provided with a correspondingly-tapered seat whereby the pressure which tends to hold it engaged with the rack, tends to wedge it into its tapered seat.

5. In combination with a chair-bottom, a standard to which it is secured, a foot or leg rest hinged to the chair-bottom, a rack-bar hinged to the foot or leg rest and extending under the chair-bottom alongside of the standard, the latter having a suitable lodgment for the rack-bar on which it may slide back and forward, a dog pivoted to the standard adapted to engage the rack, a rock-shaft journaled on the chair-bottom and extending under the dog and provided with a lever-arm adapted to lift the dog as the shaft is rocked and a lever-arm extending up at the side of the chair for operating the rock-shaft.

6. In combination with a chair-bottom, a base or support upon which it is vertically pivoted, a circular rack rigid with the base and a dog mounted on the chair-bottom adapted to engage the rack, a foot or leg rest pivotally connected to the chair-bottom, a rack-bar hinged to the foot or leg rest and extending under the chair-bottom, a dog mounted on the chair-bottom adapted to engage the rack-bar, a rock-shaft extending transversely under the chair-bottom having two lever-arms, one adapted to operate the dog which engages the circular rack, and the other adapted to operate the dog which engages the fore-and-aft rack-bar, said lever-arms and dogs and operating parts being so located respectively that the dogs are operated respectively by opposite rocking movements of the rock-shaft and means for rocking the shaft in opposite directions at will.

In testimony whereof I have hereunto set my hand, at Chicago, Illinois, this 3d day of October, A. D. 1901.

ANTON N. HORNUNG, JR.

Witnesses:
CHAS. S. BURTON,
GEORGE H. WARNER.