No. 697,449. Patented Apr. 15, 1902.

T. J. COLLINS.

HYDRAULIC BARBER CHAIR.

(Application filed Dec. 30, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

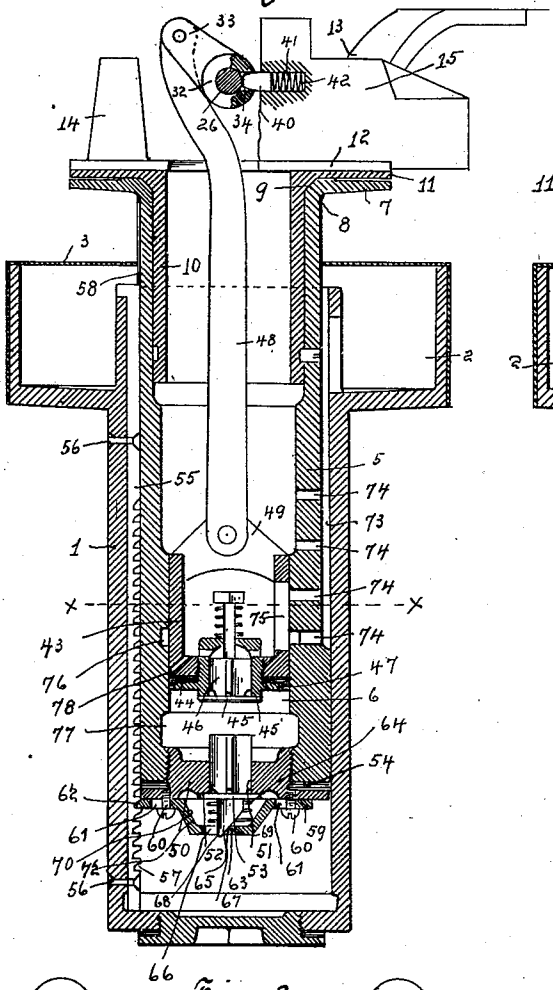


Fig. 2.

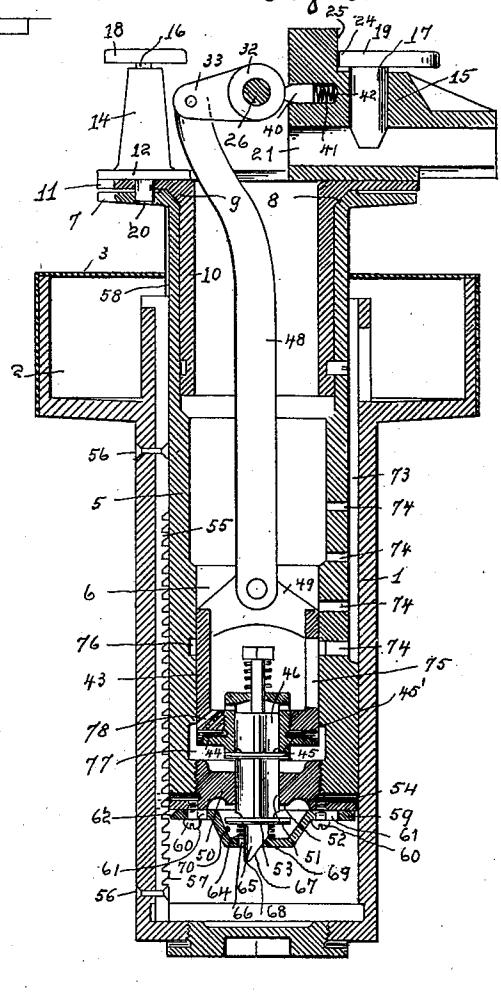


Fig. 3

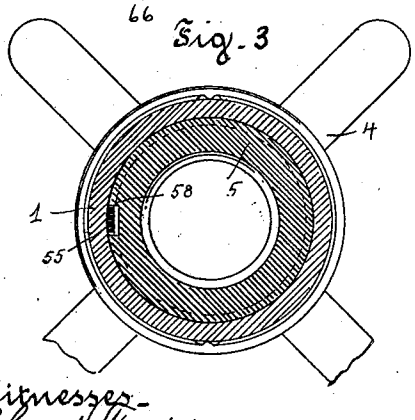
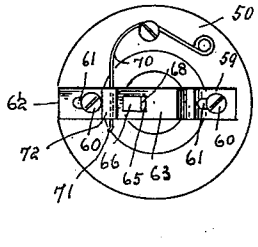


Fig. 4



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(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

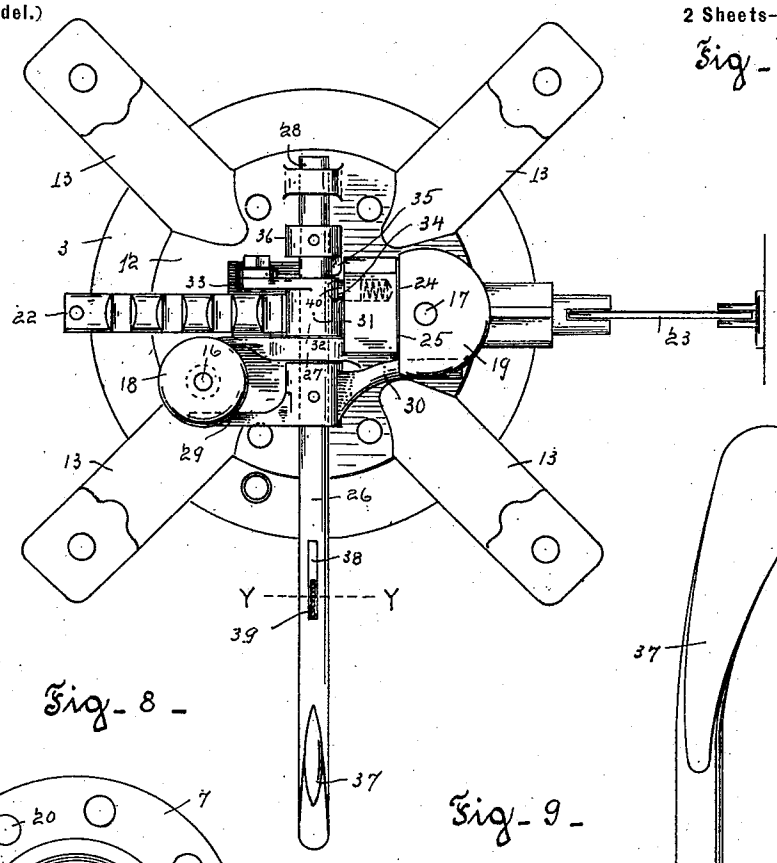


Fig. 8.

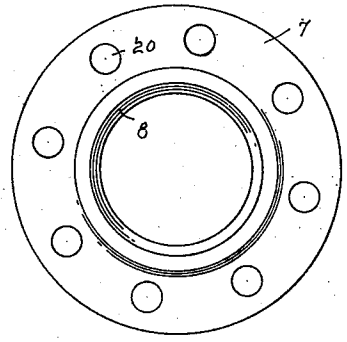


Fig. 9.

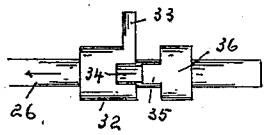


Fig. 7.

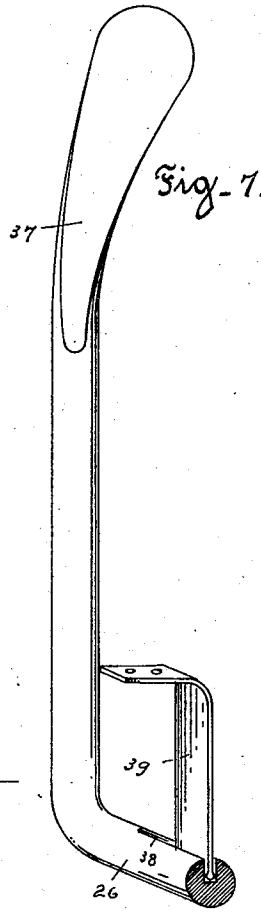
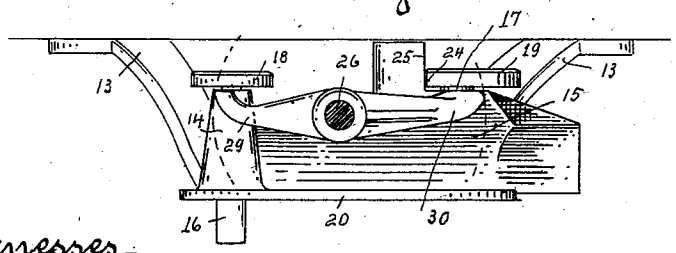


Fig. 6.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

TIMOTHY J. COLLINS, OF TOLEDO, OHIO.

HYDRAULIC BARBER-CHAIR.

SPECIFICATION forming part of Letters Patent No. 697,449, dated April 15, 1902.

Application filed December 30, 1901. Serial No. 87,697. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY J. COLLINS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Hydraulic Barber-Chairs, of which the following is a specification.

My invention relates to a hydraulic barber-chair, and has for its objects to provide a chair of the kind with a hydraulic base, whereby the chair-body may be readily raised and lowered by a pump, and that is automatically locked and mechanically supported at any desired height and unaffected by any leakage of the valves; furthermore, to provide a chair of the kind the body of which is rotatable on its base and adjustable to place the occupant in various positions, from sitting to recumbent, with means whereby the chair will automatically be positively locked against movement in each position; furthermore, to provide a chair of the kind in which all the movements for raising and lowering and unlocking are effected by a single lever. I accomplish these objects by constructing my invention as hereinafter described, and illustrated in the drawings, in which—

Figure 1 is a vertical section through a hydraulic base constructed in accordance with my invention and showing the lock-bar in engagement with the rack-bar to support the piston. Fig. 2 is a like view showing the position of the plunger and piston-valve to withdraw the lock-bar from engagement with the cylinder-rack to lower the piston. Fig. 3 is a horizontal section through the cylinder, piston, and rack-bar on the line X X of Fig. 1. Fig. 4 is a view of the bottom of the piston-closure, showing the lock-bar in position therein. Fig. 5 is a top plan view of the spider-support for the chair-body. Fig. 6 is a side elevation of the same. Fig. 7 is a section through the handle on line Y Y of Fig. 5. Fig. 8 is a top plan view of the piston-flange and conical bearing for the top, and Fig. 9 is a side elevation of the clutch.

In the drawings, 1 designates the cylinder, which is formed with an enlarged bore at the top to provide an oil-reservoir 2, which is covered by a cap 3 of a diameter to telescope over the reservoir. The cylinder is adapted to be mounted upon a suitable base (not shown) and is secured to the bottom of the base by means of a spider 4, adapted to prevent rotation of the cylinder in the base. The top of the cylinder is also secured to the base in a suitable manner. Within the cylinder there is mounted a tubular piston 5, provided with a plunge-barrel 6 at the bottom of the piston, and at the top with a radial flange 7, concentric to the conical bearing 8, which is adapted to receive the conical seat 9, formed integral with the tubular stem 10, rotatably mounted in the bore at the top of the piston. The tubular stem 10 is also provided with a radial flange 11, to which the bed-plate 12 is suitably secured. The bed-plate 12 is provided with integral radial arms 13, curved upward to a suitable distance and adapted to support a reclinable chair-body, (not shown,) which is suitably secured upon the arms. Upon the bed-plate are formed integral vertically-projecting bosses 14 and 15, respectively bored to receive locking-pins 16 and 17, which are provided, respectively, with heads 18 and 19, of a diameter to project a portion of the heads beyond the rim of the bosses. The bore through the boss 14 extends through the bed-plate flange 11 and is adapted to be brought into vertical alinement with any one of a plurality of apertures 20, concentrically arranged and spaced equidistant in the flange 7 by the rotation of the bed-plate, and the pin 16 is of a length to enter an aperture 20 and positively lock the bed-plate 12 against rotation, being spring-pressed downward to such engagement. The boss 15 is formed with a transverse horizontal bore 21, intersecting at right angles the vertical bore for the locking-pin 17, and bore 21 is of a diameter to receive the rack-bar 22, to which the chair-back, arms, and platform, (not shown,) suitably hinged to the chair-seat and linked together in a suitable manner, are operatively connected by a link 23. The locking-pin 17 is prevented from rotation in the bore by forming the head with a flat plane 24, which travels along a vertical guiding-plane 25, formed integral with and projecting vertically above the boss 15 at one side of the bore through the same.

The operating-shaft 26 is journaled in bearings 27 and 28, also integral with the bed-plate and adapted to support the shaft a suitable distance above the same and independent of

the chair-body. Upon the shaft are rigidly mounted arms 29 and 30, adapted to alternately engage the locking-pin heads 18 and 19 to unlock the bed-plate for rotation and rack-bar 22 for reclining the chair by rocking the shaft in either direction.

31 designates a crab-clutch mounted upon the shaft between the bearings and comprising a collar 32, loosely mounted upon the shaft, and provided with a crank-arm 33 and a crown incut or slot 34, adapted to receive the intermeshing tooth 35, integral with the collar 36, rigidly secured to the shaft 26, which has a limited longitudinal movement in the bearing to engage the slotted crank-collar 32 and remove the arms 29 and 30 from under the pin-heads 18 and 19 by pulling the shaft outward. The reverse movement of the shaft will disengage the crank-collar 32 and place the arms 29 and 30 in position to reëngage with the locking-pins 29 and 30. The shaft is provided with an integral handle 37, and the position of the handle relative to the shaft for engaging or disengaging the crab-clutch is preferably vertical, and to automatically maintain the handle in the vertical position I have provided a slot 38, formed in the top of the shaft at some suitable point. The slot extends to or beyond the center of the shaft and has a width to receive a leaf-spring bar 39, which is preferably bulbed at the terminal in the slot, and the other end of the spring is rigidly secured to the under side of the chair-body in vertical position over the slot. By rocking the shaft to operate the pump or the locks the leaf-spring is flexed and recedes from the bottom of the slot in the shaft toward the periphery the further the rocking motion is extended in the arc of a circle, and by releasing the handle at any point in the arc of movement the tension of the spring will force the handle back to a vertical position. The slot 38 is elongated to permit the longitudinal movement of the shaft for the purpose hereinbefore stated. In order to maintain the slot 34, formed in the pump-crank collar, in position for engagement by the clutch-tooth 35, there is provided a yielding locking-pin 40, which is housed in a bore 41, formed in the side of the boss 15 in alinement with the slot 34. When the crank-collar 32 is in the position shown in Fig. 1, the pin 40 is urged to enter the slot 34 by a spring 42, which is interposed between the pin 40 and the bottom of the bore, whereby the crank-collar is secured against movement and held in position for reëngagement by the clutch member 36, rigidly secured to the shaft.

The free end of the pin 40 is slightly rounded, and the edge of the tooth 35 is also rounded in the same manner, whereby when the handle is in the vertical position to move the shaft longitudinally to engage the crank-collar the clutch-tooth 35 will upon entrance into the slot 34 readily displace the pin 40 therefrom and crowd the pin into its bore 41, in which position the crank-arm may be rocked to operate the pump. When the shaft is shifted to release the clutch as the tooth 35 recedes from the slot 34, the pin 40 will automatically reënter the slot 34 and hold the crank-collar in position for further engagement.

Within the barrel 6 in the base of the piston there is located a rotatable tubular plunger 43, provided with a packing 44 and a spring-pressed caged valve 45, which is vertically seatable upon the valve-seat 45′, which is formed concentric around the central bore 46 for the valve-stem in the closure-plate 47, and the plate is screw-threaded to the bottom of the plunger. The plunger is operatively connected to the crank-arm 33 by means of a pitman 58, which is of suitable length and curved at the top to centrally aline the pitman with the plunger connection 49. The bottom of the piston is closed by means of a cap 50, suitably secured thereto, and the cap is provided with a central valve-port 51, at the base of which there is formed a concentric seat 52 for the winged check-valve 53. The piston is also provided with a packing-ring 54, which is interposed between the bottom of the piston and the cap.

To the side wall of the cylinder, in parallel alinement with the movement of the piston, there is rigidly secured a bar 55 by means of rivets 56 or other suitable fastening, and in the face of the bar there are formed a plurality of serrations or ratchet-teeth 57, extending along the length of the bar to the limit of the travel of the piston. In the wall of the piston there is formed a coincident longitudinal slot 58, having an area to snugly receive the rack-bar, and the slot extends the full length of the piston through the packing and the bottom closure-cap and is adapted to prevent the rotation of the piston in the cylinder by engaging the rack-bar.

59 designates a movable locking-bar adapted to automatically engage the teeth of the ratchet-bar to support the piston at any height in the cylinder without depending on the hydraulic pressure, which is found to be unreliable by leakage caused by wear of the packing. This leakage causes the piston to sink and lower the chair-body, which defect is wholly overcome by the use of the ratchet-bar and automatic piston-locking bar. The locking-bar is secured to the under side of the piston-cap 50 by means of screw-bolts 60, which extend through the slots 61, formed centrally in the body of the bar on opposite sides of the valve, as shown in Fig. 4. The slots extend from the bolts toward the rack-bar to permit the withdrawing of the end 62 of the locking-bar from the teeth of the ratchet-bar. The central portion 63 of the locking-bar between the bolts 60 is angled to permit the opening of the piston-valve 53 and the interposition of a compression-spring 64 between the piston-valve 53 and the angled central portion of the bar. From the body of the check-valve 53 extends an integral an-

gular latch-pin 65 of a length to project through the central raised portion of the locking-bar and through an aperture 66, having an area to receive the body of the latch. Upon the farther edge of the latch relative to the ratchet-bar there is formed an inclined plane 67, extending from the end 68 toward the base of the latch. This inclined plane on the latch-pin coincides with a similar plane 69, formed in the wall of the aperture 66 in contact with the latch, and the pitch of the incline is such that the limited movement of the valve 53 will withdraw the locking-bar from engagement with the ratchet-bar by forcibly projecting the latch through the aperture 66. Upon the closing of the valve, which is assisted by the spring 64, encircling the latch, the locking-bar 59 is forced into engagement with the teeth of ratchet-bar by means of a spring 70, which is also secured to the under side of the piston-closure cap, and the spring is arranged to project the tension-arm 71 into the area of the angled portion and constantly press against the shoulder 72, formed by angling the central portion of the locking-bar.

The piston is diametrically reduced for a portion of its length to form an annular space 73 between the piston and cylinder walls and is provided with a plurality of apertures 74, extending through the wall of the piston for the in and out flow of liquid from the piston to or from the reservoir through the annular space. The plunger 43 is also provided with a vertical slotted port 75 above the bottom of the plunger, and which slot communicates with an annular groove 76, formed in the wall of the plunger-barrel at a point above the bottom of the plunger when in position shown in Fig. 1. At the base of the plunger-barrel there is formed therein an annular groove 77, adapted to operate as a by-pass for the liquid, when the plunger is depressed to open the piston-valve and release the locking-bar from the ratchet, as shown in Fig. 2, the liquid passes from under the piston through the by-pass 77, and through the port 78, formed through the wall of the plunger, into the interior of the piston, thence to the reservoir. Thus constructed, it is apparent that when the plunger is forced downward through the piston, the liquid therein will force open the check-valve 53, thereby withdrawing the locking-bar 59 from engagement with the ratchet-bar, and the liquid forced out of the piston into the cylinder will lift the piston upward. At the beginning of the upward stroke the check-valve will close, thereby releasing the locking-bar 59, which will be again forced by its spring into engagement with the rack-bar and hold the piston in position while the return stroke of the plunger is made, and so at each downward stroke of the plunger the piston will be lifted, and at the beginning of each upward stroke the piston will be locked against movement by the engagement of the locking-bar with the rack-bar. When it is desired to lower the chair-body, by making a longer stroke of the lever the plunger is brought into contact with the stem of the check-valve 53, thereby forcing it open and disengaging the locking-bar from the ratchet-bar. By holding the plunger in this position the piston will gradually sink as the liquid passes from the cylinder to the piston and from the piston through the by-pass 77 in the plunger. The movement may be arrested at any point by bringing the handle of the shaft to a vertical position. It is further apparent that the vertical groove or slot of the piston being made to fit over the rack-bar smoothly and accurately, with the sides and ends of the teeth touching the sides and bottom of the groove, there will be but little leakage through the groove, and not enough to affect the speed of the piston movement when being raised by the pump, and the piston being supported by the rack-bar in whatever position it is made to assume independent of hydraulic pressure it is not only not affected by any leakage from the cylinder, but the amount of leakage is greatly reduced.

What I claim to be new is—

1. In a hydraulic base for a chair, the combination with a cylinder adapted to be mounted vertically on a base and having a rack-bar secured vertical to its inner wall, of a tubular piston for the cylinder having a vertical longitudinal groove in its outer wall to receive the rack-bar as a guide for the vertical movement of the piston in the cylinder and prevent its rotation therein, and having its lower end closed and provided with a port normally closed by a check-valve; a locking-bar secured to the piston and normally engaging the rack-bar; a pump-plunger for the bore of the piston; means to reciprocate the plunger in the piston; means to disengage the locking-bar from the rack-bar by the downward stroke of the plunger; and means to automatically reëngage it therewith during the upward stroke of the plunger.

2. In a hydraulic base for a chair, the combination of a cylinder closed at the bottom and adapted to be mounted vertically on a base; a rack-bar secured vertical to the inner wall of the cylinder; a tubular piston for the cylinder having a vertical longitudinal slot to receive the rack-bar as a guide for the vertical movement of the piston in the cylinder and prevent its rotation therein, and having its lower end closed and provided with a port normally closed by a check-valve; a locking-bar movably secured to the lower end of the piston and held normally in engagement with the rack-bar when the valve is closed, and adapted to be disengaged therefrom by the check-valve when the valve is opened; a pump mechanism mounted on the piston having a plunger adapted to reciprocate in the bore of the piston forming a barrel for the pump, and to open the check-valve by its downward stroke and disengage the locking-bar from the rack-bar; and means to automatically re-

engage the locking-bar with the rack-bar during the upward stroke of the plunger.

3. In a hydraulic base for a chair, the combination of a cylinder closed at the bottom and adapted to be mounted vertically on a base; a rack-bar secured vertical to the inner wall of the cylinder; a tubular piston for the cylinder having a vertical longitudinal slot to receive the rack-bar as a guide for the vertical movement of the piston in the cylinder and prevent its rotation therein, and having its lower end closed and provided with a port normally closed by a check-valve; a spring-pressed locking-bar movably secured to the lower end of the piston and held normally in engagement with the rack-bar by the spring when the valve is closed, and adapted to be disengaged therefrom by the check-valve when the valve is opened; and a pump mechanism mounted on the piston having a plunger adapted to reciprocate in the bore of the piston, forming a barrel for the pump, and to open the check-valve by its downward stroke and disengage the locking-bar.

4. In a hydraulic base for a chair, the combination of a cylinder closed at the bottom and adapted to be mounted vertically on a base; a rack-bar secured vertical to the inner wall of the cylinder; a tubular piston for the cylinder having a vertical longitudinal slot to receive the rack-bar as a guide for the vertical movement of the piston in the cylinder and prevent its rotation therein, and having its lower end closed and provided with a port; a pump mechanism mounted on the piston having a plunger adapted to reciprocate in the bore of the piston, forming a barrel for the pump; a spring-closing check-valve for the port in the piston adapted to be opened by the downward stroke of the plunger; a spring-pressed locking-bar movably secured to the lower end of the piston and held normally in engagement with the rack-bar by its spring and having a central aperture with an inclined wall; and an axial projection from the valve extending through the aperture of the locking-bar, having an inclined face adapted to engage the incline of the locking-bar and withdraw the bar from its engagement with the rack-bar when the valve is opened by the plunger.

5. In a barber-chair, the combination with a support for the chair-body, rotatably mounted on a hydraulic base provided with a pump mechanism adapted to raise and lower the body of the chair, of locks respectively adapted to automatically lock the chair-body against rotation, and in various reclined positions; a shaft journaled in the support, adapted to be longitudinally shifted in its bearings between fixed limits; arms mounted on the shaft in position to unlock the locks when the shaft is shifted to its limit in one direction, a collar provided with an arm adapted to reciprocate the pump-plunger, loosely mounted on the shaft and adapted to be engaged by a clutch fixed on the shaft, when the shaft is shifted to its opposite limit; a spring-pressed locking-pin normally engaging the pump-arm collar, and locking it against movement and adapted to be automatically disengaged therefrom by the clutch, when brought into engagement with the collar, and a lever for oscillating the shaft.

6. In a barber-chair, the combination with a support for the chair-body, rotatably mounted on a hydraulic base provided with a pump mechanism adapted to raise and lower the body of the chair, of locks respectively adapted to automatically lock the chair-body against rotation, and in various reclined positions; a shaft journaled in the support, adapted to be longitudinally shifted in its bearings between fixed limits; arms mounted on the shaft in position to unlock the locks when the shaft is shifted to its limit in one direction, a collar provided with an arm adapted to reciprocate the pump-plunger, loosely mounted on the shaft and adapted to be engaged by a clutch fixed on the shaft when the shaft is shifted to its opposite limit; a lever for oscillating the shaft; and a leaf-spring adapted to be secured by one end to the chair-body and having the outer end extending into an elongated slot in the shaft adapted to return the lever to its normal position when oscillated in either direction therefrom.

In witness whereof I have hereunto set my hand this 24th day of December, A. D. 1901.

TIMOTHY J. COLLINS.

Witnesses:
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