

No. 759,189.

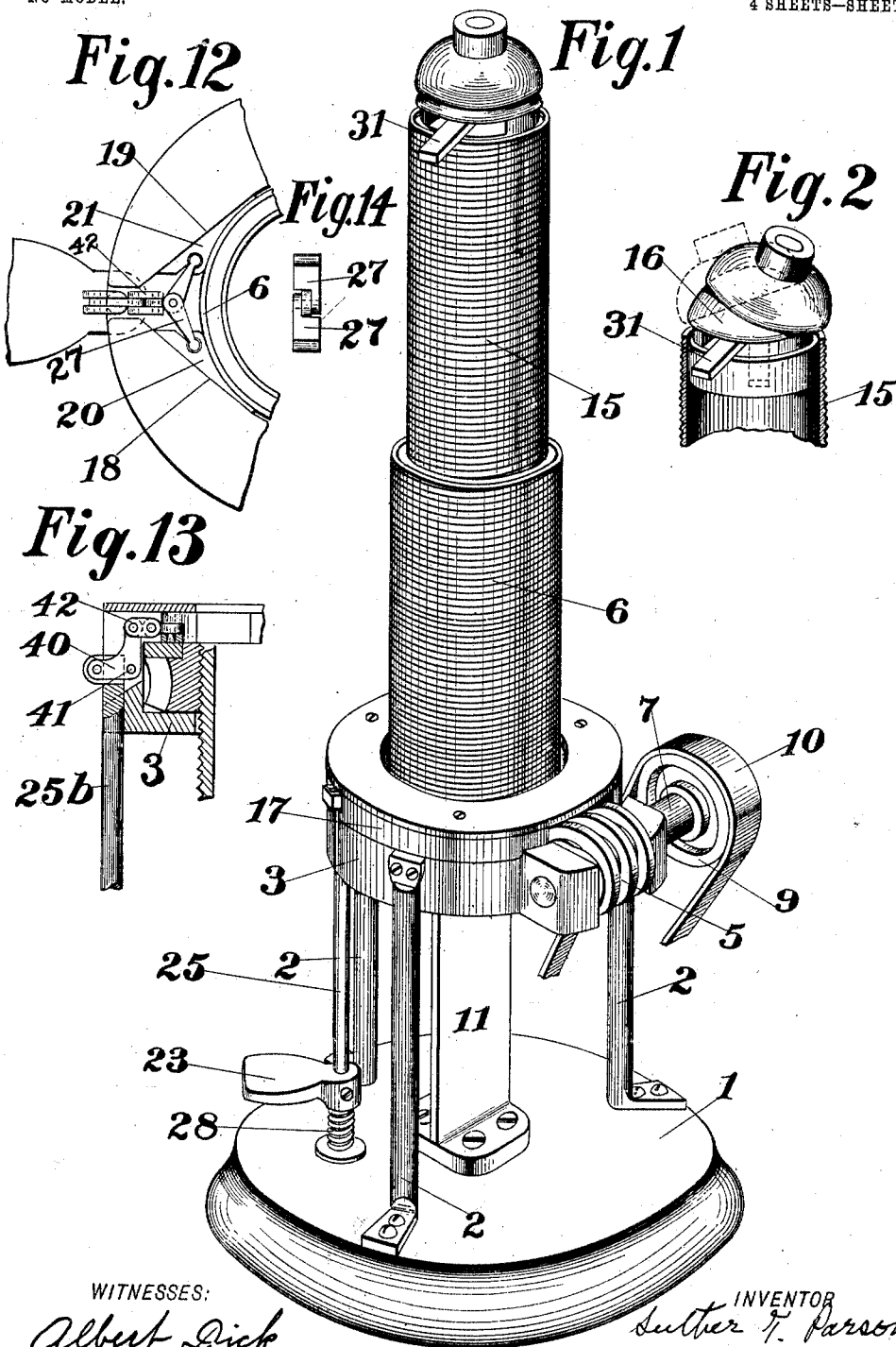
PATENTED MAY 3, 1904.

L. T. PARSONS.
DENTAL AND SURGICAL CHAIR.

APPLICATION FILED MAY 14, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES:

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4 SHEETS—SHEET 2.

Fig.3

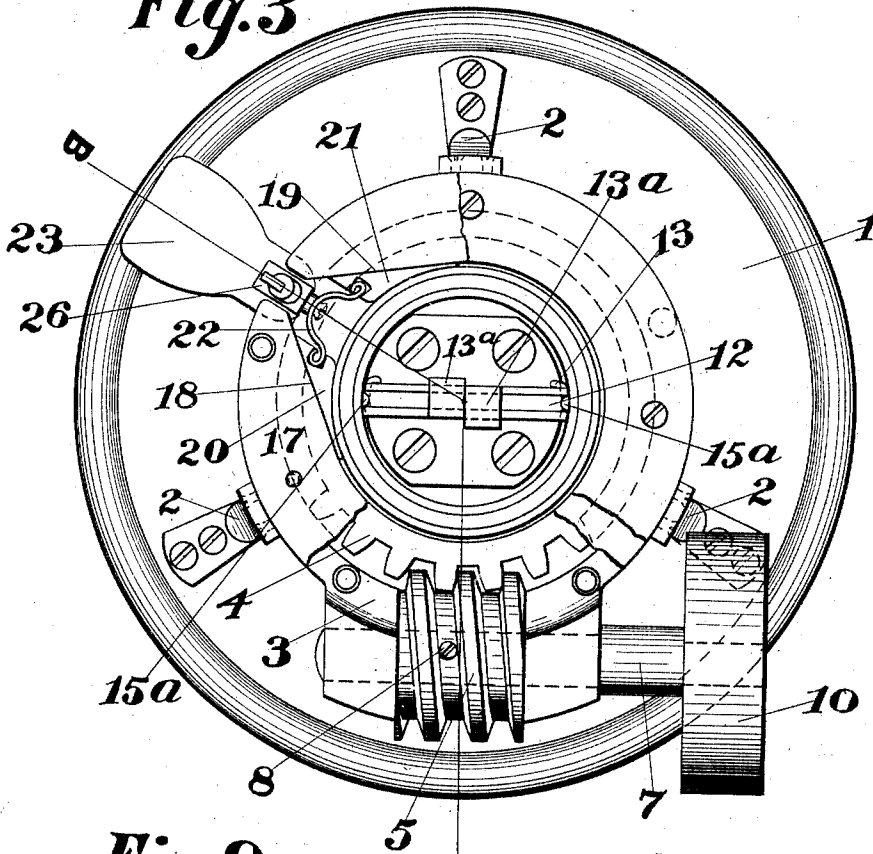


Fig.9

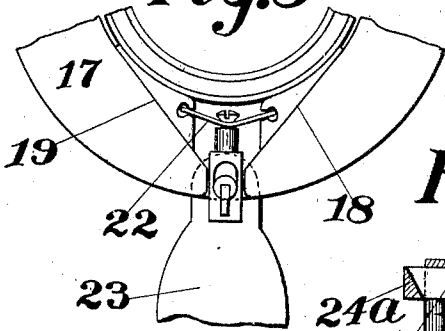


Fig.10

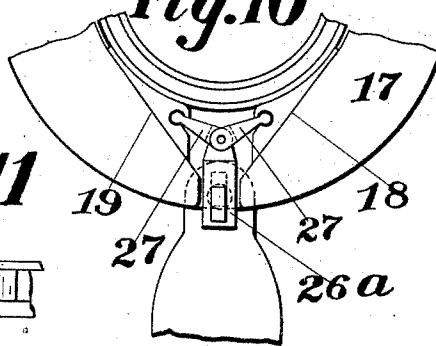
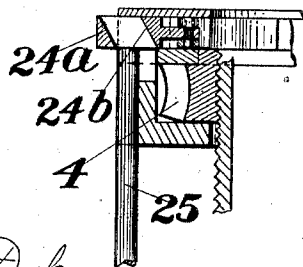


Fig.11



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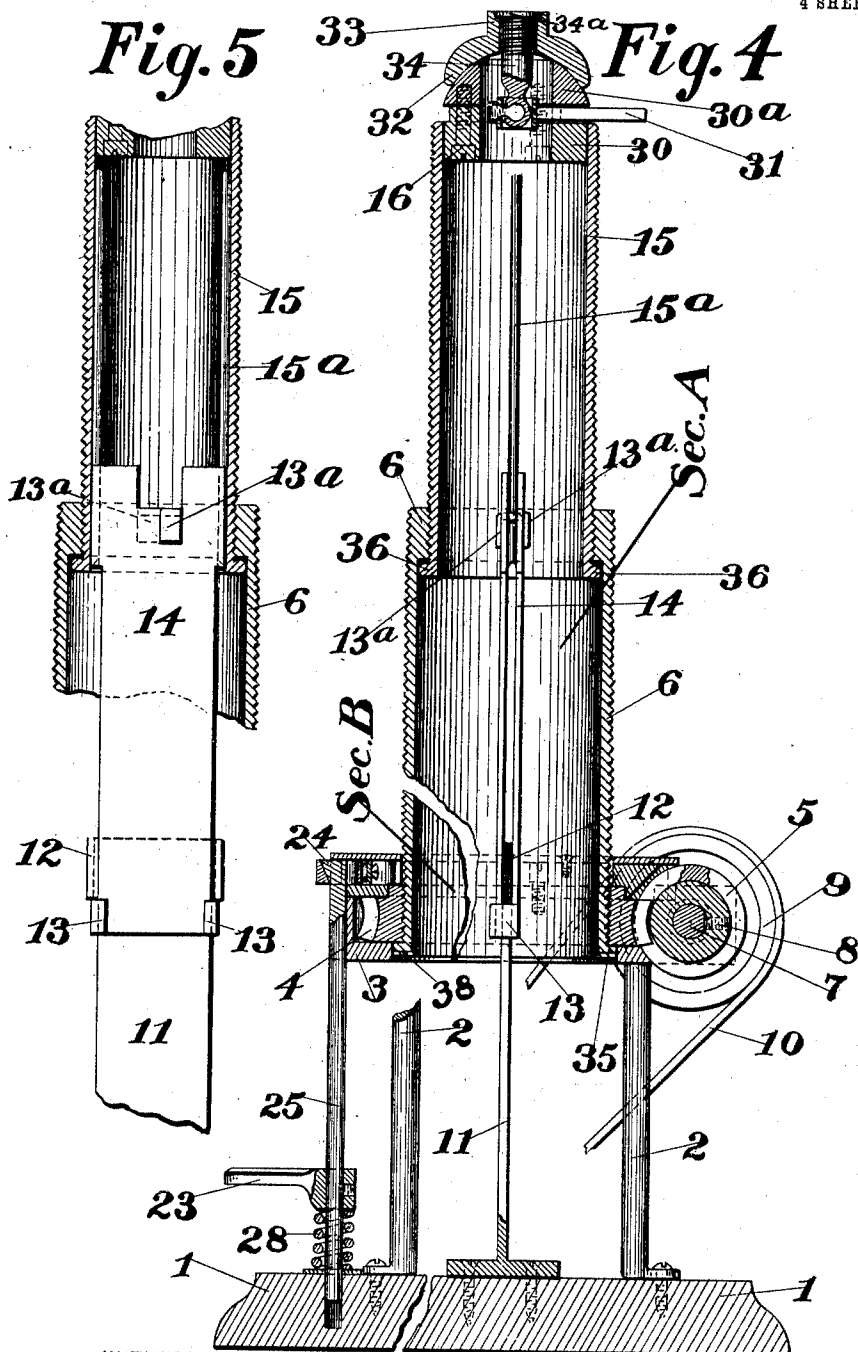
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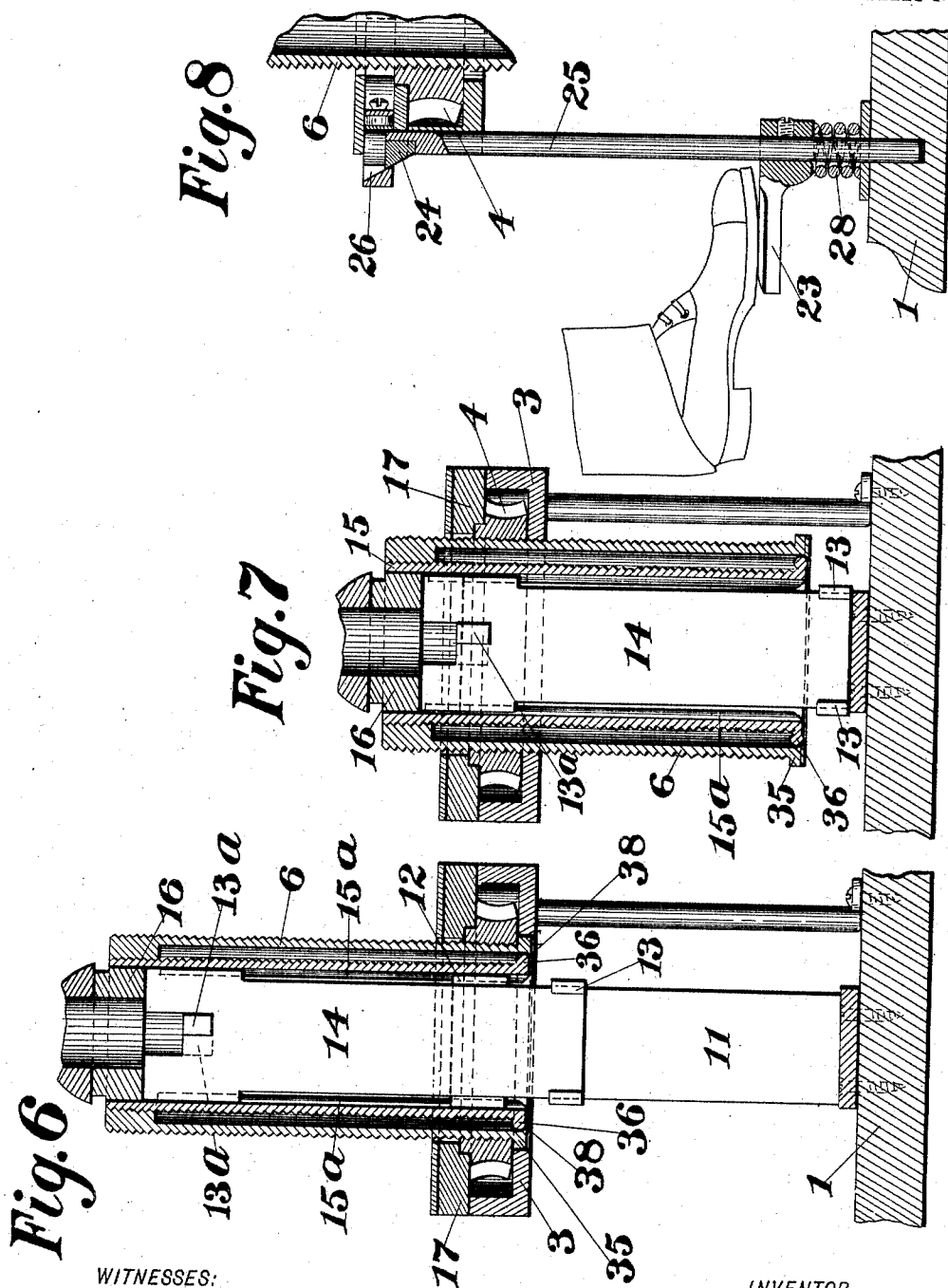
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

LUTHER T. PARSONS, OF PRINCEBAY, NEW YORK.

DENTAL OR SURGICAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 759,189, dated May 3, 1904.

Application filed May 14, 1903. Serial No. 157,090. (No model.)

To all whom it may concern:

Be it known that I, LUTHER T. PARSONS, a resident of Princebay, in the county of Richmond and city and State of New York, have invented certain new and useful Improvements in Dental or Surgical Chairs, of which the following is a specification.

My invention is an improvement in dental and surgical chairs; and it consists in a new and improved mechanism for raising and lowering the chair and in means whereby the chair-elevating mechanism is automatically locked at all times, excepting only when released manually by the operator, as for raising or lowering the chair or for revolving it.

The invention further consists in the various combinations and details of mechanism hereinafter described and claimed.

In the accompanying drawings, which form a part of this specification, I have only shown my improved mechanism and have for the sake of clearness omitted the chair proper, it being understood that my mechanism is applicable to dental and surgical chairs generally.

In the drawings, Figure 1 is a perspective view of the chair mechanism. Fig. 2 is a detail of the rocking head, showing how the head is fitted into the upper cylinder and showing the head itself thrown over to one side and in dotted lines showing the position which it would occupy when thrown to the opposite side of the cylinder. Fig. 3 is a plan view with the rocking head removed and with certain of the parts broken away in section to more clearly show the operation of the mechanism. Fig. 4 is a sectional side elevation showing the upper and lower cylinders fully elevated, the section A being taken on line A of Fig. 3 and section B on the line B of Fig. 3. Fig. 5 is a broken section taken at right angles to section A of Fig. 4 with the two cylinders fully elevated as in Fig. 4. Fig. 6 is a sectional side elevation shown on the same lines as Fig. 5 with the lower cylinder elevated to its uppermost position and with the upper cylinder telescoped into the lower cylinder. Fig. 7 is a side elevation similar to that of Fig. 6, excepting that in Fig. 7 both cylinders are shown in their lowermost positions. Fig. 8 is a detail, partly in section,

showing in an enlarged view several of the parts shown in section B of Fig. 4, the parts being shown in this figure in their chair-unlocking position, while in Fig. 4 they are shown in their chair-locking position. Fig. 9 is a plan view of certain parts shown in Fig. 3, the chair-locking spring of Fig. 9 being somewhat differently shaped from that in Fig. 3. Figs. 10 and 11 are respectively a plan view and sectional side elevation of a modified chair-locking device. Figs. 12 and 13 are similar plan and sectional side views of another modified chair-locking device, and Fig. 14 is a detail view of the toggle-joint by which the locking is effected.

For the purpose of illustration I have shown my mechanism mounted upon base 1. Ordinarily, however, the base will be larger and deeper and adapted to contain within it the motive power—as, say, for example, an electric motor or a water-motor or any other of the well-known motors adapted for the class of work to which this invention relates. In the same manner I have shown three upright posts 2, supporting the gear-box 3 upon the base. Mounted on the gear-box is the worm-wheel 4, which meshes with the worm 5 and is internally threaded to mesh with the lower cylinder 6. The worm 5 is rigidly fixed on the worm-shaft 7 by means of set-screw 8, and the driving-pulley 9 is securely fastened to the outer end of the shaft 7. The work may be connected with the driving power by means of pulley 9 and the driving-belt 10 or by any other suitable manner.

Screwed securely to the base is the stationary guide-plate 11, which in the form that I have shown consists of a perpendicular plate that at its upper end is formed with a broader shouldered head 12. The upper guide-plate 14 consists of two parallel perpendicular leaves slidably connected with plate 11, one leaf on either side of plate 11, connected together at their lower ends by ears 13 and at their upper ends by ears 13^a, which permit guide-plate 14 to slide up and down over plate 11 and hold them in place thereon.

The lower cylinder 6 is internally threaded at its upper end, and the upper cylinder 15 is externally threaded to fit into the internal

thread of the lower cylinder. The upper cylinder 15 is provided with two tracks or guides 15^a on opposite sides of the cylinder, which fit in between the two leaves of guide-plate 14 and serve at all times to prevent the upper cylinder from revolving.

The normal locking of the chair is controlled by the following mechanism, reference being had to Figs. 1 to 8, inclusive: A ring-shaped cap 17 is placed upon and securely screwed to the gear-box 3 and at one side is formed with the oppositely-disposed cam-faces 18 and 19, between which and the outer cylinder are inserted the locking-wedges 20 and 21, which normally are forced apart and against the outer cylinder 6 by the locking-spring 22, which is bow-shaped under tension and constantly tends to unbend, thus forcing the wedges 20 and 21 forcibly against the cylinder 6, thereby causing the wedges 20 and 21 to perform the function of a brake which locks the lower cylinder 6. The locking-wedges 20 and 21 thus serve directly to lock the lower cylinder 6, and they also serve indirectly to lock the upper cylinder 15, since tracks 15^a prevent the upper cylinder from being elevated or lowered while the lower cylinder is locked. Whenever it is desired to release the chair from the brake or lock, the treadle 23 may be depressed by the operator, as indicated in Fig. 8, thus causing the wedge-shaped face 24 at the upper end of the treadle-shaft 25 to force the slide 26 outwardly, thereby buckling spring 22 and relieving the cylinder 6 of the brake-pressure of the wedges 20 and 21. When in their normal chair-locking position, the wedges 20 and 21 serve as a steadying device for the chair, particularly when the cylinders are elevated to their highest positions.

In the modification of Figs. 10 and 11 a toggle-joint 27 serves to force the wedges apart to lock the chair or to draw them toward each other to unlock the chair, according to the position of the slide 26^a, the position of the slide being determined by raising and lowering treadle-shaft 25. The construction shown in Figs. 12, 13, and 14 differs principally in the fact that the toggle-joint 27 is normally forced inwardly to lock the chair by means of spring 28 and bell-crank lever 40.

The rocking head 16 comprises the base 30, which is securely fastened in the upper cylinder 15, and the cylindrical head 30^a, the two parts 30 and 30^a together forming a slot at one side to receive lever 31. The rocking-head cap 32 is spherical interiorly to match the spherical surface of the cylindrical head-base 30^a, and exteriorly it is formed with the neck 33 to receive the cross-head or other supporting part of the body of the chair. It is bored out and tapped to receive the binding-screw 34, which screw is provided with a head 34^a, that fits into the rocking-head cap, as indicated in Fig. 4. At its lower end the

screw 34 engages the clamping-lever 31 by means of a universal joint.

The mode of operation of the device is as follows: The operator first depresses the treadle 23, thereby compressing the treadle-lifting spring 28, as indicated in Fig. 8, drawing down the wedge 24 at the upper end of shaft 25, causing the spring 22 to buckle, and thus drawing the two wedges 20 and 21 toward each other, releasing the cylinder 6 from the locking-clutch. While the treadle 23 is held depressed by the operator, the driving power is applied, through belt 10, to pulley 9, shaft 7, and worm 5, thus causing the worm-gear 4 to be revolved. Means (not shown) are provided for applying the propelling power to turn the pulley 9 and worm 5 in one direction for elevating the chair and in the opposite direction for lowering the chair. When the parts are in the position shown in Fig. 7, if power is applied to turn pulley 9 in the direction for elevating the chair the upper and lower cylinders are elevated together until the upper cylinder assumes the position shown in Fig. 6. During the movement for elevating the chair from the position shown in Fig. 7 to that shown in Fig. 6 or during the reverse movement of lowering the chair from the position of Fig. 6 to that of Fig. 7 the worm-gear revolves around the cylinder 6; but neither cylinder 6 nor cylinder 15 revolves. This is so, because cylinder 15 is secured to the stationary guide 11 by slide 14 and tracks 15^a in such a way that the cylinder can be elevated or lowered, but never revolved, and it is true of the cylinder 6, because the cylinder 15 is threaded friction-tight into cylinder 6, while the worm-gear 4 is threaded over the cylinder 6 relatively loosely.

By the terms "friction-tight" and "relatively loosely" I do not mean to imply any particular tightness or looseness of fit, but merely a relative degree between the two fits, resulting in a frictional connection between the inner cylinder 15 and outer cylinder 6 sufficient to prevent the outer cylinder 6 from revolving during the movement from the position of Fig. 6 to that of Fig. 7, or vice versa.

The cylinder 6 is provided at its lower end with an enlarged collar 35, which when cylinder 6 has been elevated to the position shown in Fig. 6 banks against the lower surface of worm-gear 4. The friction between the collar 35 and the under surface of the worm-gear then becomes greater than that between the inner and outer cylinders, whereupon on a further movement of the worm-gear for elevating the chair above the position shown in Fig. 6 the outer cylinder revolves with the worm-gear as though it were an integral part thereof, thus serving to elevate the chair from the position shown in Fig. 6 to that shown in Fig. 4. I have provided an enlarged collar 36 at the lower end of the inner cylinder to bank underneath the internally-threaded up-

per portion of the outer cylinder to prevent the inner cylinder from being elevated too far, and I have provided a plate 38 at the lower end of cylinder 6, against which the collar 36 abuts when the inner cylinder is lowered to its lowermost position in cylinder 6, the plate 38 and collar 36 serving to create sufficient friction between the inner and outer cylinders to overcome the friction between the collar 35 and the worm-gear 4 to loosen cylinder 6 from worm-gear 4 for lowering the chair below the position shown in Fig. 6. The collar 36 also performs the function of a steadying device for cylinder 15 in all positions of cylinder 15 when collar 36 is out of engagement of plate 38, and for this purpose the diameter of collar 36 is made of such size as to accurately fit within cylinder 6, so that cylinder 15 is steadied both by its screw engagement at the upper end of cylinder 6 and by its collar 36.

In Figs. 3, 4, and 8 the lock is applied by the expansive force of the locking-spring 22, and it is relieved by the pressure of the foot on treadle 23, overcoming the force of spring 28. The same is substantially true of the lock shown in Fig. 9, the spring 22 being merely somewhat different in shape from that of Fig. 3.

In Figs. 10 and 11 at the upper end of the treadle-shaft 25 there are two parallel beveled or wedge faces 24^a and 24^b, the one, 24^a, serving to lock the toggle-joint 27 when the treadle 23 is in its elevated position and the other, 24^b, serving to buckle the toggle-joint, and thus release the lock when the treadle is depressed. Hence in the constructions of Figs. 10 and 11 the lock is applied by means of the treadle-spring 28.

In Figs. 12, 13, and 14 the toggle-joint 27 is substantially similar to that shown in Fig. 10; but in this construction I employ instead of the parallel faces 24^a and 24^b of Fig. 11 the bell-crank lever 40, pivoted by pin 41 to the worm-gear box 3 and pinned to the upper end of treadle-shaft 25^b and connected to the toggle-joint by means of the connecting-link 42.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a power-driven dental or surgical chair, the combination of two cylinders, the one adapted to telescope into the other to lower the chair to its lowermost position, means actuated by the driving power for elevating the two cylinders simultaneously to raise the outer cylinder to its uppermost position and the chair to a position intermediate between its lowest and highest positions, and means actuated by the driving power for clamping the outer cylinder in its said uppermost position and for automatically elevating the inner cylinder alone, to raise the inner cylinder and the chair to their uppermost positions.

2. In a power-driven dental or surgical chair, the combination of two cylinders, the one adapted to telescope into the other to lower the chair to its lowermost position, means actuated by the driving power for elevating the two cylinders simultaneously to raise the outer cylinder to its uppermost position and the chair to a position intermediate between its lowest and highest positions, and means actuated by the driving power for clamping the outer cylinder in its said uppermost position and for automatically elevating the inner cylinder alone, to raise the inner cylinder and the chair to their uppermost positions, and means actuated on the reversal of the driving power for first telescoping the inner cylinder into the outer cylinder to lower the chair to its said intermediate position, while the outer cylinder remains in its said uppermost position, and for then automatically unclamping the outer cylinder and lowering the two cylinders simultaneously to lower the chair to its said lowermost position.

3. In a power-driven dental or surgical chair, the combination, with the driving power, of two cylinders for raising and lowering the chair, the one of which is adapted to telescope into the other, a gear internally threaded to mesh with the outer cylinder and actuated by said driving power for raising and lowering the cylinders, and a frictional connection between the outer cylinder and the gear, whereby, when the outer cylinder has attained its uppermost position, the inner cylinder is adapted to be automatically raised to a still higher position by the continued action of the driving power.

4. In a power-driven dental or surgical chair, the combination, with the driving power, of two cylinders for raising and lowering the chair, the one of which is adapted to telescope into the other, a gear internally threaded to mesh with the outer cylinder and actuated by said driving power for raising and lowering the cylinders, means for preventing the inner cylinder from revolving while being raised and lowered, a frictional screw connection between the two cylinders, whereby the outer cylinder is prevented from revolving until brought to its uppermost position, and means for causing the outer cylinder to be revolved by said gear while in its uppermost position, to raise the inner cylinder to a still higher position by the continued action of said driving power, substantially as described.

5. In a power-driven dental or surgical chair, the combination, with an externally-threaded cylinder, of a gear internally threaded to mesh with said cylinder, means actuated by the driving power for revolving the gear, a friction-clutch whereby said cylinder is prevented from revolving with the gear, and a second and more powerful friction-clutch whereby the said first-mentioned clutch is overcome

to cause the said cylinder to revolve with the gear, substantially as described.

6. In a dental or surgical chair, the combination, with a worm and worm-gear, of an internal thread on the worm-gear, an exteriorly-threaded cylinder meshing therein, a second cylinder frictionally connected with said first-mentioned cylinder, means for elevating and lowering said second-mentioned cylinder and for controlling it against revolution while being elevated or lowered, said means operating in combination with said frictional connection to hold the first-mentioned cylinder from revolving with the worm-gear when elevated or lowered by the revolution of the worm-gear, and means for automatically overcoming said frictional connection and for compelling the first-mentioned cylinder to revolve with the worm-gear when the worm-gear is revolved.

7. In a power-driven dental or surgical chair, the combination of two cylinders, the one adapted to telescope into the other to lower the chair to its lowermost position, means actuated by the driving power for elevating the two cylinders simultaneously to raise the outer cylinder to its uppermost position and the chair to a position intermediate between its lowest and highest positions, means actuated by the driving power for clamping the outer cylinder in its said uppermost position and for automatically elevating the inner cylinder alone, to raise the inner cylinder and the chair to their uppermost positions, and a friction-clutch to lock the outer cylinder and means for automatically applying the same.

8. In a power-driven dental or surgical chair, the combination of two cylinders, the one adapted to telescope into the other to lower the

chair to its lowermost position, means actuated by the driving power for elevating the two cylinders simultaneously to raise the outer cylinder to its uppermost position and the chair to a position intermediate between its lowest and highest positions, means actuated by the driving power for clamping the outer cylinder in its said uppermost position and for automatically elevating the inner cylinder alone, to raise the inner cylinder and the chair to their uppermost positions, and a friction-clutch to lock the outer cylinder, a treadle for manually freeing the cylinder from the clutch and a spring for automatically applying the clutch to the cylinder.

9. In a power-driven dental or surgical chair, the combination of two cylinders, the one adapted to telescope into the other to lower the chair to its lowermost position, means actuated by the driving power for elevating the two cylinders simultaneously to raise the outer cylinder to its uppermost position and the chair to a position intermediate between its lowest and highest positions, means actuated by the driving power for clamping the outer cylinder in its said uppermost position and for automatically elevating the inner cylinder alone, to raise the inner cylinder and the chair to their uppermost positions, a friction-clutch to lock the outer cylinder and means whereby the inner cylinder is automatically locked by the locking of the outer cylinder.

Signed by me in New York city this 11th day of May, 1903.

LUTHER T. PARSONS.

Witnesses:

ORLANDO C. SMITH,
ARTHUR H. YETMAN.