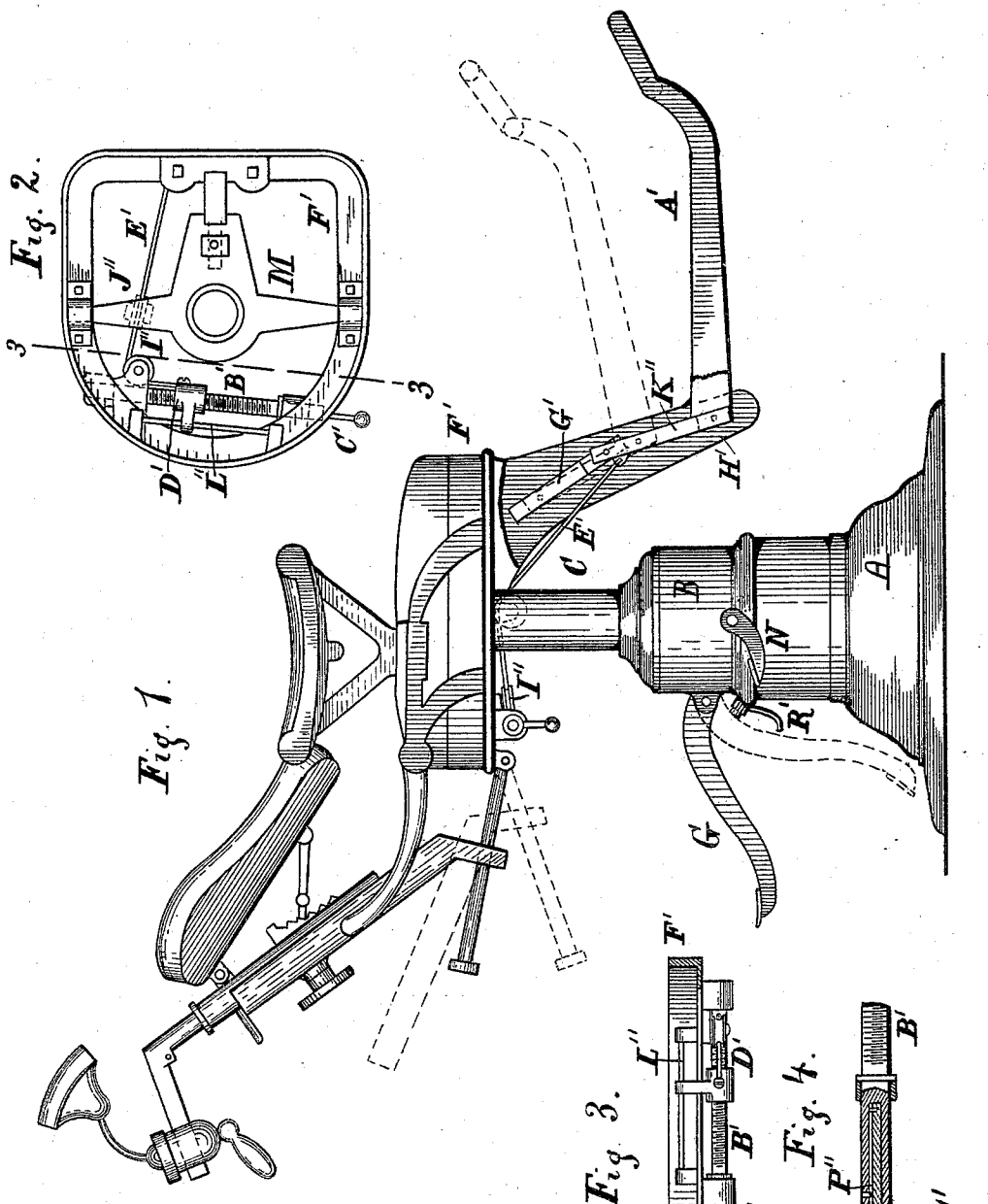
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D. STUCK.

DENTAL CHAIR.

No. 457,060. Patented Aug. 4, 1891.



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R. F. Osgood

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

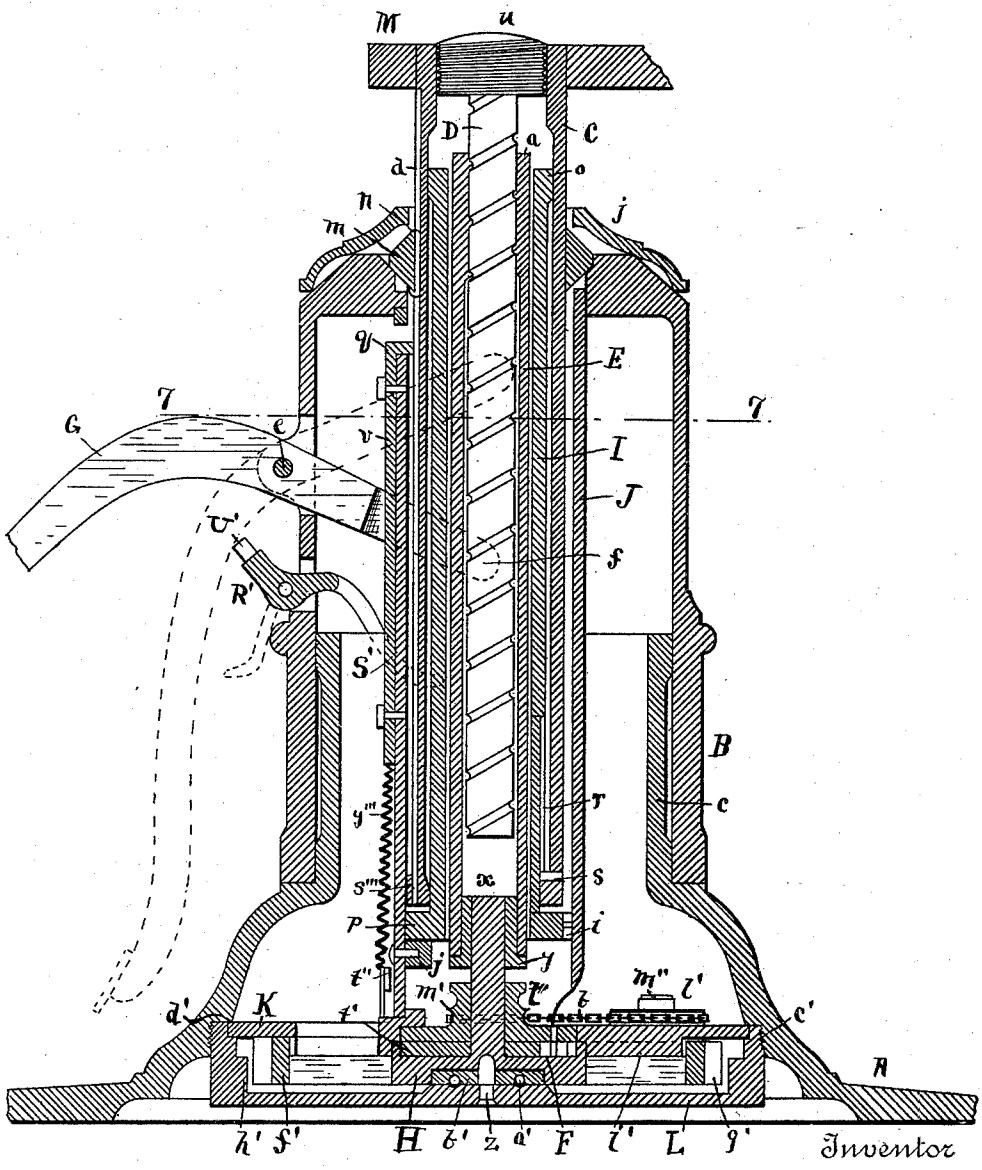
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FIG. 5.



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DENTAL CHAIR.

No. 457,060. Patented Aug. 4, 1891.

FIG. 6.

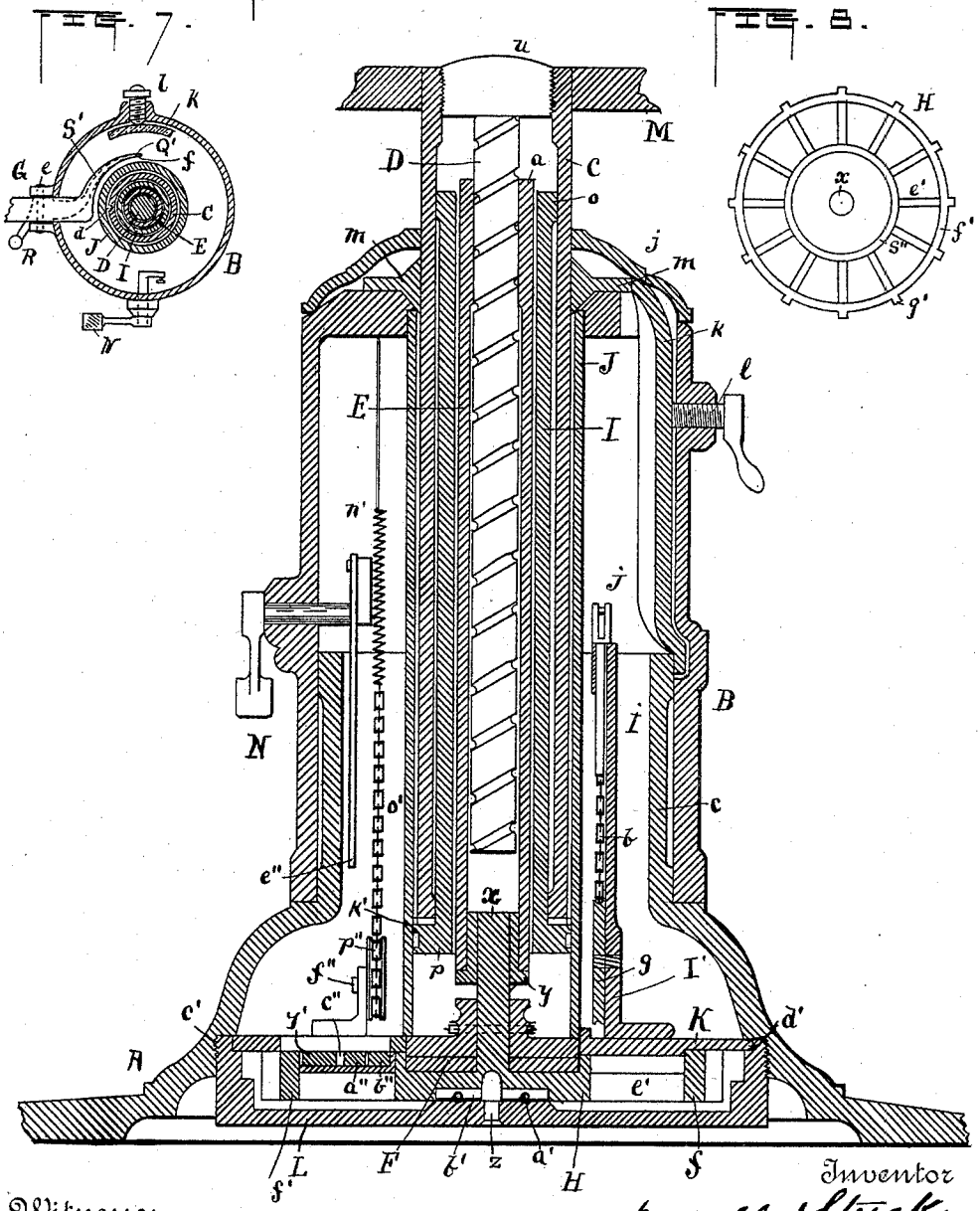


FIG. 7.

FIG. 8.

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5 Sheets—Sheet 4.

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DENTAL CHAIR.

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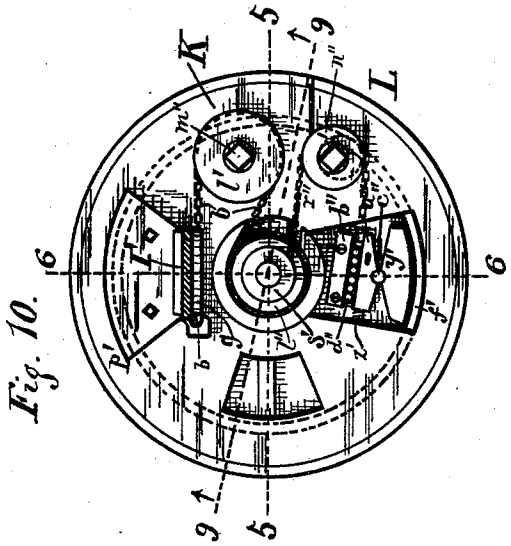


Fig. 10.

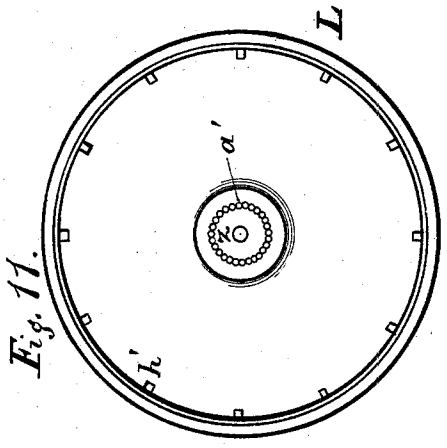


Fig. 11.

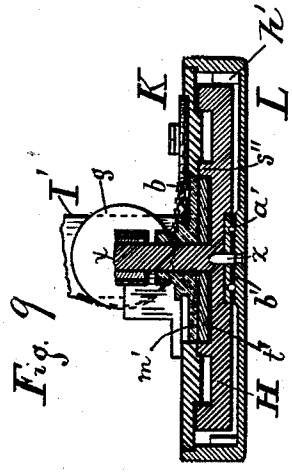


Fig. 9

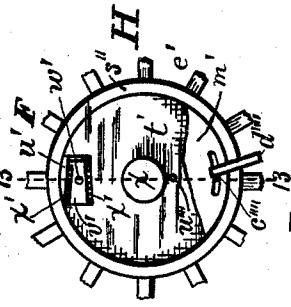


Fig. 12.

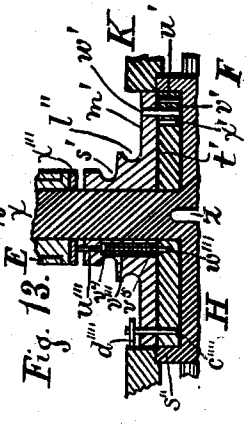


Fig. 13.

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(No Model.)

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DENTAL CHAIR.

No. 457,060. Patented Aug. 4, 1891.

Fig. 14.

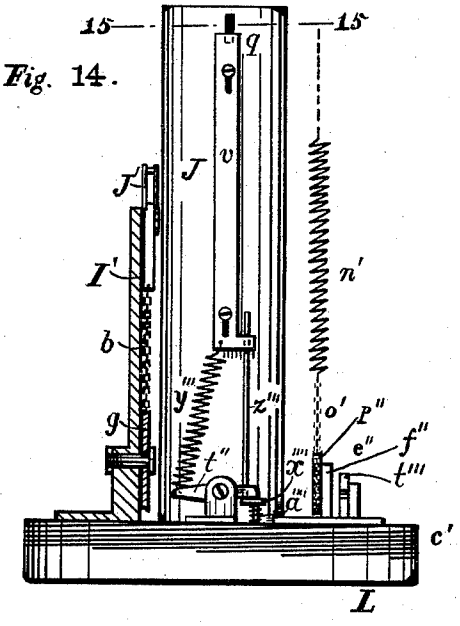


Fig. 15.

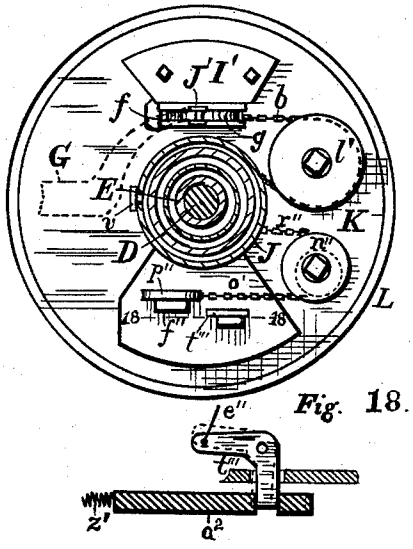


Fig. 18.

Fig. 16.

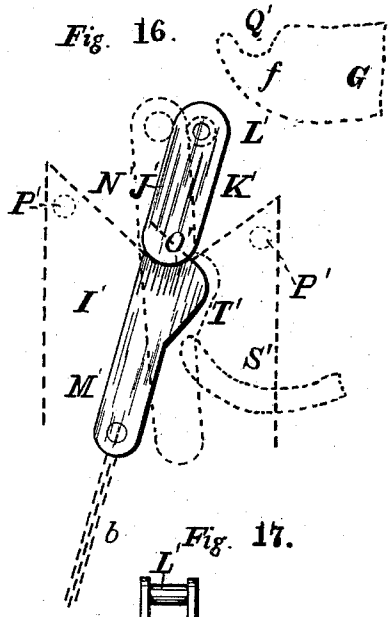


Fig. 17.

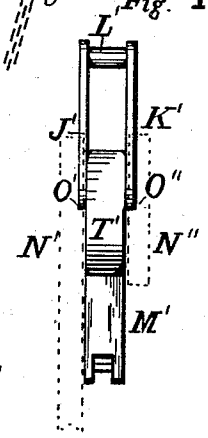
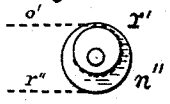


Fig. 19.



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UNITED STATES PATENT OFFICE.

DEWELL STUCK, OF ROCHESTER, NEW YORK.

DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 457,060, dated August 4, 1891.

Application filed March 29, 1890. Serial No. 345,880. (No model.)

To all whom it may concern:

Be it known that I, DEWELL STUCK, a citizen of the United States, residing at Rochester, in the county of Monroe, in the State of New York, have invented certain Improvements in Dental Chairs, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to certain improvements in dental chairs, and its main object is to obviate some of the evils heretofore experienced in the use of devices holding liquids for retarding the descent of the chair. In all such retarding mechanism the liquid is at times necessarily subjected to great pressure, which renders it difficult and often impracticable to prevent escape of the liquid through the joints and through small holes, which are very liable to exist in the casting surrounding the liquid. Prior devices were also objectionable for the reason that upward movement of the chair-seat tended to produce a partial vacuum below a piston or other part moving in the liquid, so that when the elevating mechanism was released from the foot or other means of applying power, the chair and piston dropped through a small space, causing a noisy and disagreeable jar or blow on the liquid-column. Horizontally-rotating friction devices have been used without a liquid; but such have proved objectionable for the reason that their action is liable to great irregularities. In case any part of such friction device becomes rusty, the descent of the seat would be too much retarded, while, on the other hand, a few drops of lubricating-oil falling accidentally thereon would entirely defeat its operation. These and other defects are designed to be overcome by my improvements, which are fully described and illustrated in the following specification and the accompanying drawings, and the novel features thereof specified in the claims annexed to the said specification.

My improvements in dental chairs are represented in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a plan view of the seat-frame, showing the mechanism for raising and lowering the foot-rest. Fig. 3 is a section of the seat-frame on the line 3 3, Fig. 2, showing the parts in rear of that line. Fig. 4 is a longitudinal section of the foot-seat raising and lowering screw. Fig. 5 is a vertical section through the base on the line 5 5, Fig. 10. Fig. 6 is a vertical section through the base on the line 6 6, Fig. 10. Fig. 7 is a horizontal section on the line 7 7, Fig. 5. Fig. 8 is a plan view of the fan-wheel which controls the descent of the chair by revolving in a suitable liquid. Fig. 9 is a bottom plan of a guide or corner pulley. Fig. 10 is a plan view of the liquid-pan and cover, the resistance-wheel pulleys and clutch being indicated, and the lever-supporting standard shown in section. Fig. 11 represents the liquid-pan detached and with its cover and the fan-wheel and clutch removed. Fig. 12 is a plan view of the clutch. Fig. 13 is a central vertical section of the clutch on the line 13 13, Fig. 12. Fig. 14 is a side elevation of the fluid-reservoir and parts attached thereto. Fig. 15 is a plan view of the same, the elevating-screw and closely-surrounding parts being shown in horizontal section on line 15 15 of Fig. 14. Fig. 16 is a side elevation of the detachable link on the end of the lifting-chain. Fig. 17 is an edge view of the detachable link. Fig. 18 is a section on the line 18 18, Fig. 15. Fig. 19 is an inverted view of one of the corner pulleys.

The mechanism for raising the seat in my improved dental chair consists, essentially, of a suitable support comprising a base A and standard B, a tubular plunger C, arranged to slide up and down in the standard, a screw D, fastened to the seat, a revoluble sleeve E, provided with screw-threads *a* at its upper end and arranged to be revolved for the purpose of elevating the chair by a clutch F, operated by the foot-lever G and connecting-chain *b*. The foot-lever is pivoted to the standard, and a vibrating movement imparted to it by the operator is transmitted to the clutch by the cord or chain *b*, Fig. 5, which causes the sleeve E to revolve about its vertical axis, and the threads on the sleeve, engaging with the thread or threads on the screw D, elevates the chair. At its lower end the sleeve E is attached to a fan-wheel H by the medium of a spindle X, which, as the chair descends, revolves in a pan or vessel containing a suitable liquid, the resistance of which controls the speed at which the sleeve revolves,

and thus prevents the chair and its occupant from descending too rapidly. A clutch is applied to the fan-wheel to prevent the chair from settling back during the return-stroke of the foot-lever, and a clamp *m* is provided, by which the chair is secured in any given position to which it may have been adjusted. Provision is also made for swinging the chair about the vertical axis, the standard B being arranged to turn on the base A.

As indicated in the drawings, the base A is a casting of suitable shape and dimensions to contain the parts located within it and to afford suitable support for the chair. At its upper end it is provided with the sleeve *c*, on which the lower part of the standard B is fitted, so as to turn freely, its lower end resting on a suitable shoulder formed on the base. At its upper end the standard B forms a suitable guide for the tubular plunger C, which, along with the screw D, is secured to the seat-frame. The plunger C is provided with a longitudinal groove, (shown at *d*, Fig. 7,) into which a pin or key attached to the clamp *m* projects, so that the plunger is thereby prevented from turning axially in the standard. The lifting-lever G is pivoted on a pin *e*, Fig. 7, inserted in suitable lugs on the standard, and passes inward through a slot, being bent around the screw and the other parts, as indicated at *f*, Fig. 7, to the point of attachment of the cord or chain *b*, which operates to raise the chair. The bent portion of the lever is made on a curve sufficiently large to permit the vibration of the lever. A spring *n'* is provided, which secures the return movement of the lever after it has been forced down by the operator's foot. At the upper end of the standard a clamp *m*, Figs. 5 and 6, is provided, by which the plunger is firmly secured in the standard, so as to support the chair positively in any desired position. This clamp is closed up on the plunger by means of the lever *k* and screw *l*. The lower end of the lever *k* bears on the ring *c* at the top of the base, as indicated in Fig. 6, so that the plunger is secured in the standard and the standard locked against turning on the base at the same time by the lever *k* and the screw *l*. The clamp *m* carries a feather or key *n*, which lifts the longitudinal groove *d* in the plunger. The standard is provided with a cap or cover *j*.

The construction of the clamp and parts connected therewith, having been fully set forth in my pending application, Serial No. 324,428, filed September 19, 1889, need not be further described here.

Inside the tubular plunger and between it and the sleeve E, I employ an intermediate cylinder I, which assists in guiding and steadying the plunger, especially at the upper extremity of its travel. At its upper end the intermediate cylinder I fits the interior of the tubular plunger, as represented at *o*, Figs. 5 and 6. At its lower end the intermediate cylinder carries the collar *p*, which fits the tube J, which is supported by the standard B at its upper end and at the bottom is sustained by the cover K of the liquid pan or reservoir L. The collar *p* is preferably provided with a suitable packing *i*, containing lubricating material. On the side the intermediate cylinder I is provided with a longitudinal groove *r*, Fig. 5, into which a pin *s* on the tubular plunger fits. The groove extends only for a portion of the length of the cylinder, so that when the plunger is elevated by the turning of the threaded sleeve E the pin *s* will travel along the groove until it arrives at its upper end, after which it will cause the cylinder I to travel upward with the plunger during the remainder of its movement. As the intermediate cylinder I has at its lower end a collar *p*, Fig. 5, which fits the interior of tube J, it will be seen that the plunger, when elevated, will be supported against lateral strains by the intermediate cylinder I. By this construction I am enabled to increase the range of the movement given the chair with a given height of standard and base.

The threaded sleeve E is connected with a fan-wheel H by the spindle *x* and collar *y*, Figs. 5 and 6, these parts being rigidly secured together in any convenient manner. The fan-wheel revolves on a pin or pivot *z* inserted in the bottom of the pan or fluid reservoir L, but the pivot acts as a guide merely, the weight being carried by a ring of balls *a'*, (see Fig. 11,) arranged in a circular groove in the bottom of the pan. A wearing-plate *b'*, provided with a corresponding groove, may be attached to the lower side of the fan-wheel.

The reservoir L is circular in form, as represented in the detached view, Fig. 11, and of a sufficient depth to receive the wheel H, and it is secured to the base A in any suitable manner—such, for instance, as by being threaded and screwed into the base, as indicated at *c'*. The reservoir is provided with a circular cover K, which fits in a groove in the top, being held down by a shoulder on the base, as represented at *d'*, Fig. 5. The cover K is connected with the standard B by the tube J, and turns with the standard whenever the chair is swung about its vertical axis, said parts being rigidly connected.

The reservoir L is filled with a suitable liquid or semi-liquid—such as a heavy lubricating oil, or such as oil mixed with sawdust or other powder—adapted to afford sufficient resistance to the wheel H to prevent the too rapid descent of the chair. A mixture of a heavy petroleum lubricating-oil with calcined magnesia or other suitable powder answers the purpose effectively. The fan or resistance wheel is shown detached in Fig. 8. It is provided with a number of radial arms *e'*, a rim *f'*, on which the friction-brake represented in Fig. 10 acts, and also, if desired, with the projecting lugs *g'* on the exterior of the rim. The reservoir is provided with a corresponding series of lugs *h'*, Fig. 11, which project inward and act, in connection with the

lugs g', to retard the passage of the liquid around the wheel when the latter revolves. The cover K may also be provided on its lower side with a series of radial ribs i', Fig. 5, arranged to act to prevent the too rapid passage of the liquid around the arms e' of the wheel. On the release of the friction-brake from the rim of the wheel H the weight on the chair, acting through the screw D and the threads a, causes the sleeve E and the wheel connected thereto to revolve, but the too rapid revolution of the wheel is prevented by the resistance of the liquid in the reservoir, and the speed at which the chair descends is thus controlled, so that it travels down smoothly and softly, without jar, shock, or noise. The descent is finally arrested by a suitable stop—such, for instance, as is represented at j', Fig. 5—a cushion of rubber or leather being interposed, if desired, and a similar cushion being placed between the tubular plunger C and the intermediate cylinder I, if desired, as represented at k', Fig. 6.

Any suitable form of clutch may be used for imparting the rotary motion to the sleeve E necessary to elevate the chair. In the accompanying drawings I have represented a friction-clutch which works smoothly and without noise. The cord or chain b is led from the inner end f of the foot-lever G around the corner-pulley g, secured on the bracket I', and thence around the grooved pulley l', Figs. 5 and 10, which is free to revolve on the spindle m'' inserted in the cover K, and thence to the pulley l'' on the clutch-disk m', Fig. 13. The disk is free to revolve on the spindle x, and has formed integral with it the two pulleys l^2 s'. The end of the chain b is fastened to the pulley l''. The vibrating movement of the lever will thus impart a reciprocating rotary movement to the pulley l'' and the disk m', the return motion of the pulley and disk being secured by the spring n', Fig. 6, acting through the pulley p'' and cord o' on pulley n''. The spring n' serves to keep the chain b under tension, and effects the return movement of the clutch and also the elevation of the foot-lever. The pulley p'' is arranged to turn freely on a stud f'', supported by the cover K. The cord or chain o' is connected to the pulley n'' by the eccentric r', represented in the inverted view, Fig. 19, of the pulley n''. The spring n' is connected by the chain o' to the eccentric r' on the pulley n'', the object of this arrangement being to equalize the pull of the spring on the chain r'', by which the strain is carried to the disk m'. The chain r'' winds about a grooved pulley s', connected with the disk m'. The spring n' is fastened to the upper part of the standard. Provision is thus made for securing the return movement of the pulley l'' and disk m' by means of the spring n', and this movement, through the chain o', produces the upstroke of the outer end of the foot-lever G.

The wheel H is provided with a central circular recess, into which the clutch-disk t', Figs. 5, 9, and 13, is fitted. The clutch-disk is provided with a friction-shoe u', Figs. 12 and 13, which is forced outward against the wall s'' of the recess in the wheel by the wedge v', actuated by a pin w', Fig. 13, in the disk m'. This wedge v' is situated in a recess in the clutch-disk t'. Friction-rollers x' may be interposed between the wedge and the friction-shoe u', and also between the wedge and the side of the recess in the clutch-disk. The pin w' passes through a hole in the wedge, and operates to move the wedge lengthwise and to force the shoe outward whenever the disk m' is moved through the chain b by pressing the outer end of the foot-lever downward. The friction thus caused between the shoe and the wheel H causes the threaded sleeve E to revolve, so as to elevate the chair. When the disk m' executes its return movement, the pin w' moves the wedge v' backward, so as to release the friction and to permit the clutch-disk t' to turn freely in the recess in the wheel. When the lever is again pressed downward by the operator, the clutch again turns the wheel and sleeve and the chair is thus elevated by a step-by-step movement to the desired position or until the extremity of its upward movement is reached. The clutch-disks are at rest or out of engagement with the resistance-wheel when the shoe u' is released from the rim s^2 on the said wheel; otherwise it would be impossible to lower the chair. In order to accomplish this result, I provide a stop which limits the return movement of the lower clutch-disk t'. The stop may be attached in any convenient way. In the construction shown in the accompanying drawings it is represented as a pin c'''', Fig. 13, inserted in the lower clutch-disk t' and projecting through a slot in the upper disk, so that its upper end comes in contact with a pin d'''' on the cover K. The pin c'''', striking against the pin d'''', arrests the motion of the lower disk, and the upper disk, being under a constant strain from the spring n' through the chain r'', moves the wedge v' against the widest end of the recess in which it is situated, so as to release the pressure between the shoe u' and the rim s''. The disks are thus disengaged from the resistance-wheel, and the chair is at such time permitted to descend whenever the friction-clutch y' is released by the lever N; but as soon as the upper clutch-disk is turned by the depression of the foot-lever G the shoe u' is again engaged with its rim, so as to elevate the chair.

As it will be observed that the screw D is of such a pitch that the chair will run down of its own weight, it is necessary to provide a brake or mechanism for preventing the rotation of the threaded sleeve, except when it may be desired to lower the chair. This result I accomplish by means of the friction-brake represented in plan view in Fig. 10 and in section in Fig. 6. The shoe y' is

forced outward against the rim f' of the wheel H by the spring z', acting on the movable piece a'', arranged to bear on one side against the inclined way b'' and on the other against the shoe y', through the roller c'', which permits the shoe to adjust itself to the rim. Friction-rollers d'' may be interposed between the sliding piece a'' and the inclined way b''. The whole device is supported in a recess or depression in the cover on a suitable plate, and the spring z' is arranged to bear at one end against the side of the recess and at the other against the end of the slide a''. The friction produced by the shoe y' on the rim f' prevents the sleeve E from turning in the direction to lower the chair. The sleeve is, however, permitted by the friction device to turn freely in the other direction whenever the operator depresses the foot-lever.

When it is desired to lower the chair, the friction of the shoe on the wheel is released by the operator, who depresses the lever N, which acts through the cord e'' to force the slide a'' back, so as to compress the spring z'. The chair will descend as long as the operator holds the lever N depressed, and will stop at any desired point when the hand or foot is removed from the lever, because as soon as the compression of the spring z' is released it will again force the shoe y' into contact with the rim f'. (See Figs. 10 and 18.) The cord e'' is attached to the inner end of the lever N, inside the standard, and passes downward to the bell-crank lever t''', Figs. 14 and 18, supported on the cover K by a suitable bracket, the lower end of this lever entering an opening in the slide a''. An upward pull on the cord e'' moves the slide a'' so as to compress the spring z', thus releasing the friction between the shoe y' and the rim f' and permitting the revolution of the sleeve E and the descent of the chair-body. This friction device also holds the chair from descending during the upstroke of the outer end of the lifting-lever G, and as the rim f' is at or near the outer edge of the wheel H there is practically no settling down of the chair-seat at the end of any of its upward movements, since the shoe y' will engage with the rim f' before the screw has made anything more than a very small fraction of a revolution.

In order to prevent the operator from elevating the chair too high and screwing the sleeve D out of the nut a, I provide a device which comes into operation when the chair reaches its highest point, and which locks the clutch-disks m' and t' so that they will turn together without causing any friction against the rim s'', in which case any further movements of the lifting-lever G become inoperative to lift the chair. The lock by which the clutch-disks m' and t' are fastened together is represented in the sectional view, Fig. 13. It consists of a pin u''', Figs. 12 and 13, which slides in a hole in the upper disk m' and engages in a hole in the lower disk t', when the two are to be locked together. A spring v''', Fig. 13, normally holds the pin up, so that its lower end is not engaged in the hole in the lower disk, and the two disks are free to turn independently of each other. The spring bears at its upper end on a collar v^4 on the pin, and at its lower end on a collar or bush v^5, inserted in the opening in the upper disk, which contains the pin and the spring. The upper end of the pin projects above the surface of the upper disk, and in order to force its lower end down into the hole w''' in the lower disk, I employ the plate x''', which is caused to move up and down by the slide v, spring y''', and lever t'', represented in Fig. 14. This plate partially surrounds the spindle x, (see Fig. 13,) and has an end projecting through a slot in the tube J, as indicated in Fig. 14. At its upper end the slide v has a lug q, which projects inward through a slot in the tube J (see Figs. 5 and 14) and comes in contact with a projecting portion s''' of the plunger C at the end of its upward movement, by which the slide v is moved upward, and this movement is transmitted by the spring y''' and the lever t' to a projecting part x'''' of the plate x''', so as to give the plate x''' a tendency to move downward and force the lower end of the pin u''' into the hole w''' when the pin comes opposite the hole. The slide v is arranged to move lengthwise on the tube J on screws secured to the tube and passing through slots in the slide or other suitable devices. The lever t'' is pivoted on an arm projecting upward from the cover K. A guide-rod z''', Fig. 14, is provided for the plate x''', which guide moves up and down with the plate in suitable supports. A spring a'''', Fig. 14, may also be provided to carry the weight of the guide rod and plate. It will be understood that if the slide v is moved upward at a time when the pin u''' is not immediately over the hole w''' the spring y''' will be extended without moving the plate x''' downward; but that as soon as the pin, by the revolution of the upper clutch-disk, comes over the hole the spring y''' will force the plate downward and cause the pin to enter the hole, locking the clutch-disks together and preventing their relative movement, which is necessary in order to cause the wedge v' to force the shoe u' outward against the rim s''. The clutch-disks will then turn together without turning the threaded sleeve, and the motion of the foot-lever G will be inoperative to raise the chair-seat farther. As soon as the chair is allowed to descend by the release of the friction between the shoe y' and the rim f' by the lever N and its connections, as already described, the slide v will descend, the plate x''' will rise upward, and the spring v''' will lift the pin u''' out of the hole w''', leaving the clutch-disks independent of each other.

In order to provide for disconnecting the foot-lever from the chain b, so that its outer end can be dropped down out of the way, as

represented by the dotted lines in Fig. 1, I attach to the chain *b* the movable link J', which is supported by the standard I' when not engaged by the hooked end *f* of the lever. The link consists of a slotted body K', having a pin L' across its upper end, and an extension M', which extends downward and is attached to the chain. The standard I' arises from the cover K and supports the body of the link in the notched jaws N' N'' at its upper end. The body of the link is wider than these jaws, so that the link, when in its lowest position, rests with the shoulders O' O'' on the upper edges of the jaws, which are notched downward, as shown in Fig. 16, to permit the link to swing freely on the shoulders as on a pivot. The jaws N' N'' are secured together at a suitable distance apart by the pins or screws P'. The point *f* of the inner end of the foot-lever is provided with the notch Q', which engages with the pin L', so as to draw on the chain *b* when the outer end of the foot-lever is depressed. If the lever is disengaged from the link, it is engaged therewith by raising its outer end, which causes the inclined edge of the inner end as it descends to strike against the pin L' and to swing the upper end of the link away from the lever until the point of the lever passes below the pin, when the link will swing back and the pin will become engaged with the notch. The swinging movement of the link is indicated by the dotted lines in Fig. 16. If, on the contrary, it is desired to disconnect the lever from the link, the operator depresses the outer end of the lever R', Figs. 1 and 5, and brings its inner end S', Figs. 5 and 16, upward and inward against a projecting lug T' on the link, raising the link bodily and moving it away from the inner end of the foot-lever, so that the outer end of the latter is allowed to settle down out of the way, and the link, so soon as the pressure on the lever R' is removed, again assumes the position indicated by the full lines in Fig. 16. In order to again connect the foot-lever with the link, it is only necessary to raise its outer end, when the notch Q' will engage with the pin L'. The lever R' is provided with a rubber buffer U', which arrests the downward movement of the foot-lever. The inner end of the lever R' is bent around the tube J', so that its extremity may come in contact with the link, as represented in the drawings.

The mechanism by which the foot-rest A' is raised and lowered is represented in Figs. 1, 2, 3, and 4. It consists, essentially, of the screw B', operated by the hand-crank C', the sliding nut D', and the cord or chain E', by which the nut is connected to the foot-rest. The screw B' is arranged in suitable bearings underneath the seat-frame F'. The foot-rest moves up and down, as indicated by the full and dotted lines in Fig. 1, in suitable ways or guides G', formed in the arms H', depending from the chair-seat. The cord E' is fastened at its upper end to the nut D', and, being led over the guide-pulleys I'' J'', is attached to the arms K' of a foot-rest, or a cross-bar connecting these arms. A guide L'' for the nut is provided to prevent its turning with the screw. By turning the handle C' in one direction or the other, the foot-rest is raised or allowed to descend. In order to keep the crank out of the way when not in use, I attach it to the screw B' by a sliding rod P'', Fig. 4, arranged to slide in and out in a hole in the screw, and provided with a slot and pin or other suitable device to prevent its turning in the hole.

Although the admixture of a powder with the liquid is not essential it is decidedly advantageous, as I have demonstrated by practical use extending over a considerable period of time.

No claim is herein made to friction devices which do not employ fluids as a means of retardation, nor to those employing a fluid under pressure and adapted to retard by its compulsory passage through a small opening.

I do not claim to be the first to provide for moving the pedal-levers of a dental chair out of the operator's way, nor the first to move a foot-rest by cords and pulleys.

I am aware that a resistance-wheel moving in a liquid-reservoir with equal freedom in either direction has before been described in a special combination adapted to automatically regulate a steam-valve. Such a wheel is not claimed as my invention, nor is the particular form of the resistance-wheel or its equivalent of the gist of the main improvement.

In my application for dental chair, Serial No. 324,428, filed September 19, 1889, I have described a swinging back-standard pivotally connected to the seat by means of arms connected to the seat-frame, in combination with devices for varying the inclination of the chair-back, all substantially such as indicated in this application. In said case I have also described and claimed a plunger, a stationary base, a standard supported on the base, a divided clamp-ring at the upper end of the standard, and a lever bearing on both the clamp-ring and the base, all combined substantially as indicated in this application.

I claim—

1. A chair having a screw attached to the bottom of its seat, the internally-screw-threaded sleeve engaging said screw, devices for holding the seat and screw against rotation, a resistance-wheel fixed to the said sleeve, a reservoir containing said wheel and resistance material, a pulley also fixed to said sleeve, a lever pivoted in the standard, intermediate devices, including a chain and guides therefor, whereby the sleeve may be rotated by the lever and said intermediate devices, substantially as set forth.

2. A chair having a screw attached to the bottom of its seat, the internally-screw-threaded sleeve engaging said screw, devices for holding the seat and screw against rotation, a resistance-wheel fixed to said sleeve, a res-

ervoir containing said wheel and resistance material, and mechanism to revolve the sleeve, said sleeve being supported from its bottom, substantially as set forth.

3. A chair having a screw attached to the bottom of its seat, the internally-screw-threaded sleeve engaging said screw, devices for holding the seat and screw against rotation, a resistance-wheel fixed to the said sleeve, a reservoir containing said wheel and resistance material, whereby the weight of the seat and its occupant may cause the seat to descend without turning and whereby the descent may be retarded by the turning of the sleeve and the wheel, and a friction-brake for the resistance-wheel, substantially as set forth.

4. A chair having a screw attached to the bottom of its seat, the internally-screw-threaded sleeve engaging said screw, devices for holding the seat and screw against rotation, a resistance-wheel fixed to the said sleeve, a reservoir containing said wheel and resistance material, whereby the weight of the seat and its occupant may cause the seat to descend without turning and whereby the descent may be retarded by the turning of the sleeve and the wheel, a friction-brake for the resistance-wheel, and a lever for releasing the brake, substantially as set forth.

5. The combination of the chair body or seat, the elevating-screw secured thereto and supporting said seat, the revolving sleeve provided with screw-threads which engage the screw, a resistance-wheel secured directly to the sleeve and a liquid-reservoir within the base of the chair, said wheel being adjusted to revolve with equal freedom in either direction, and a plunger C, secured to the seat, substantially as set forth.

6. The combination of the chair body or seat, the elevating-screw secured thereto and supporting said seat, the revolving sleeve provided with screw-threads which engage the screw, a resistance-wheel secured directly to the sleeve and a liquid-reservoir within the base of the chair, said wheel being adjusted to revolve with equal freedom in either direction, and a plunger C, secured to the seat, and an intermediate plunger-guiding cylinder I, substantially as set forth.

7. The combination of the chair body or seat, the elevating-screw secured thereto and supporting said seat, the revolving sleeve provided with screw-threads which engage the screw, a resistance-wheel secured directly to the sleeve, a liquid-reservoir within the base of the chair, said wheel being adjusted to revolve with equal freedom in either direction, a plunger C, secured to the seat, an intermediate plunger-guiding cylinder I, a cover K for the reservoir, a cylinder J, standing on said cover, and a standard B, supporting the upper end of the said cylinder, substantially as set forth.

8. The combination of the chair body or seat, the elevating-screw secured thereto and supporting said seat, the revolving sleeve provided with screw-threads which engage the screw, a resistance-wheel secured directly to the sleeve, a liquid-reservoir within the base of the chair, said wheel being adjusted to revolve with equal freedom in either direction, a plunger C, secured to the seat, an intermediate plunger-guiding cylinder I, a cover K for the reservoir, a cylinder J, standing on said cover, a standard B, supporting the upper end of the said cylinder, a friction-clutch acting on the resistance-wheel to prevent the descent of the chair, and mechanism for disengaging the clutch at will, substantially as set forth.

9. The combination of a chair body or seat, an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-lever adapted to raise the seat by revolving said sleeve, a friction-clutch whereby the power of said lever is communicated to the sleeve, and mechanism to render the clutch inoperative at will, substantially as set forth.

10. The combination of a chair body or seat, an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-lever adapted to raise the seat by revolving the sleeve, a friction-clutch, whereby the power of said lever is communicated to the sleeve, and mechanism to render the clutch inoperative at will, said sleeve being supported upon anti-friction balls, substantially as set forth.

11. The combination of a chair body or seat, an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-chain passed around a part connected to said sleeve and adapted to rotate it, a lever, and an intermediate link connecting the chain and lever and guide-pulleys to direct the chain, substantially as set forth.

12. The combination of a chair body or seat, an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-chain passed around a part connected to said sleeve and adapted to rotate it, a lever, and an intermediate link connecting the chain and lever and guide-pulleys to direct the chain, said link being detachable from the lever and adapted to be automatically engaged therewith upon raising its power-arm, substantially as set forth.

13. The combination of a chair body or seat, an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-chain passed around a part connected to said sleeve and adapted to rotate it, a lever, and an intermediate link connecting the chain and lever and guide-pulleys to direct the chain, said link being detachable from the lever and adapted to be automatically engaged therewith upon raising its power-arm, and the link-detaching lever adapted to detach the link from the lifting-lever, substantially as set forth.

14. The combination of a chair body or seat,

an elevating-screw secured thereto, a sleeve provided with screw-threads engaging said screw, a lifting-chain passed around a part connected to said sleeve and adapted to rotate it, a lever, and an intermediate link connecting the chain and lever and guide-pulleys to direct the chain, said link being detachable from the lever and adapted to be automatically engaged therewith upon raising its power-arm, and the link-detaching lever adapted to detach the link from the lifting-lever, and a notched standard to support the link when free from the lifting-lever, substantially as set forth.

15. In a dental chair, seat-lifting mechanism, a pivoted pedal-lever adapted to automatically engage said mechanism, and a device to disengage the pedal-lever from said mechanism, the power-arm of the lever being at such time free to fall to a substantially perpendicular position, which is within the circumference of the chair-base, substantially as set forth.

16. In a dental chair, seat-lifting mechanism, a pivoted pedal-lever adapted to automatically engage said mechanism, and a device to disengage the pedal-lever from the mechanism, said disengaging device being normally inoperative, the power-arm of the lever being free to fall to a substantially perpendicular position within the circumference of the chair-base whenever the disengaging device is intentionally operated, substantially as set forth.

DEWELL STUCK.

Witnesses:
GEO. B. SELDEN,
C. G. CRANNELL.