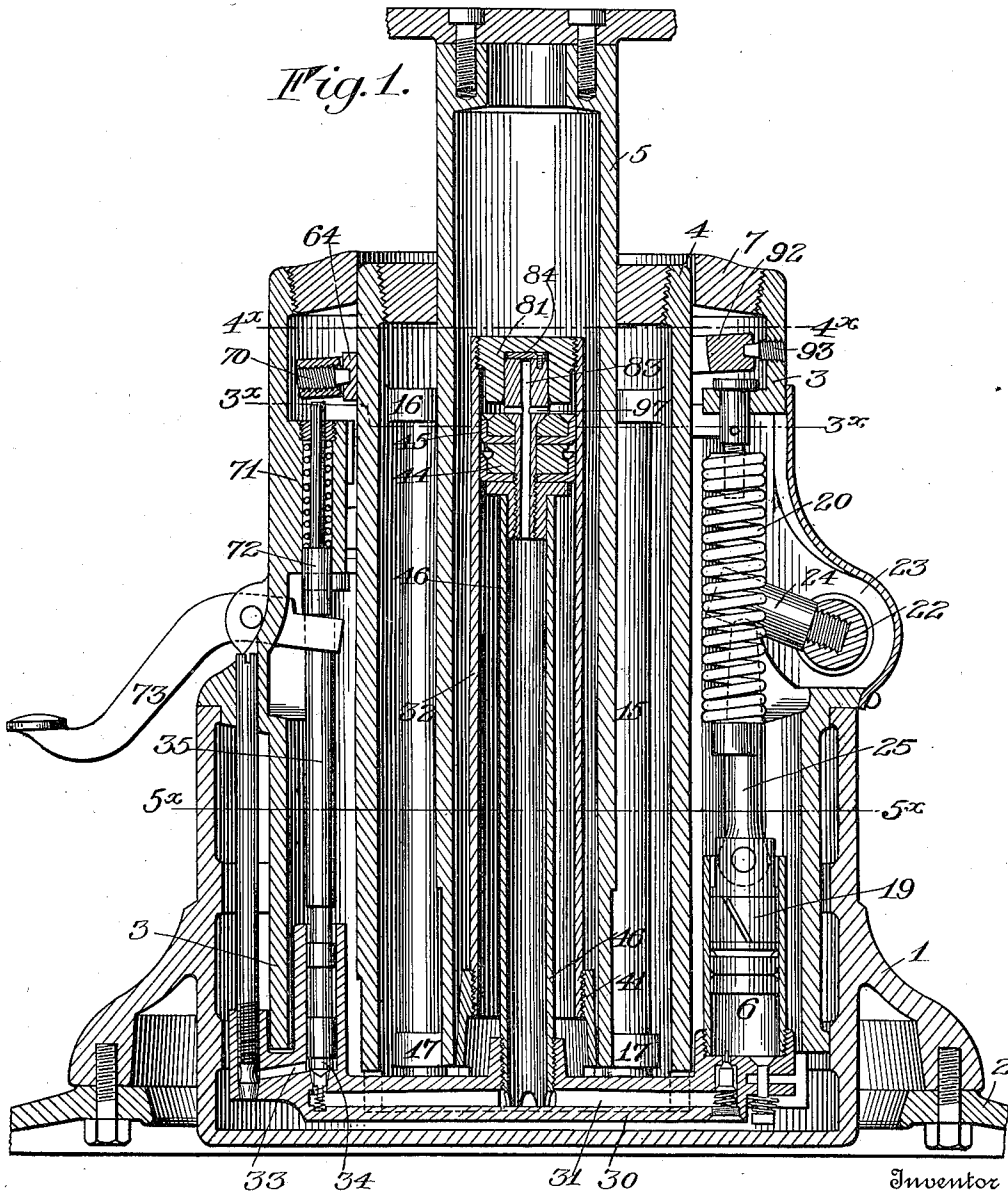


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CHAIR BASE.
APPLICATION FILED MAR. 11, 1910.

1,136,617.

Patented Apr. 20, 1915.
4 SHEETS—SHEET 1.

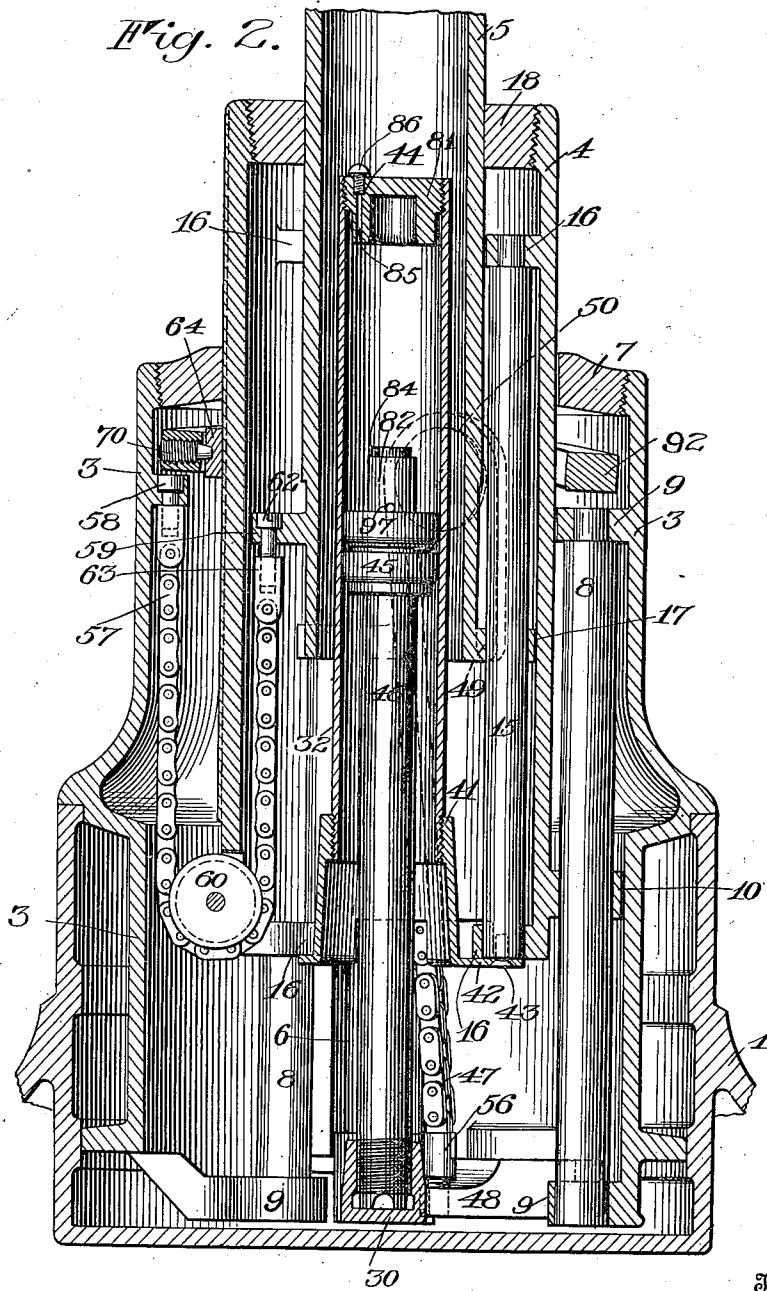


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4 SHEETS-SHEET 4.

Fig. 5.

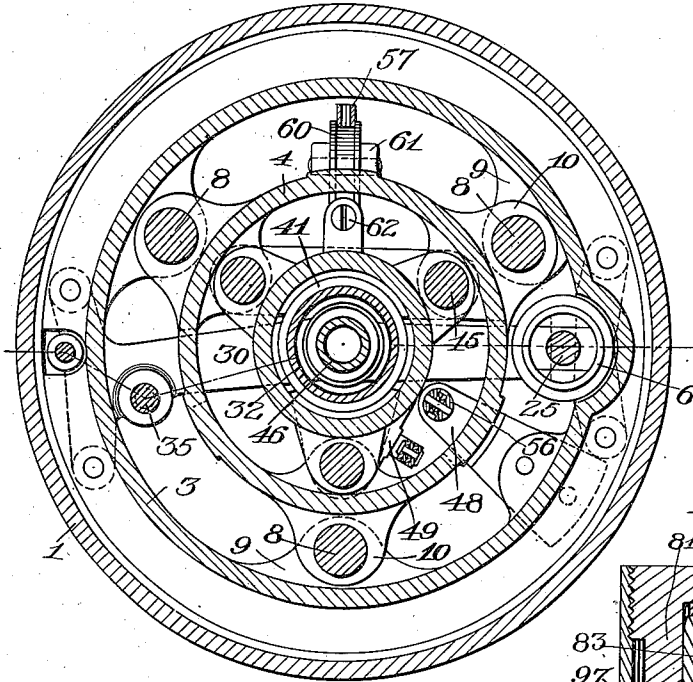


Fig. 7.

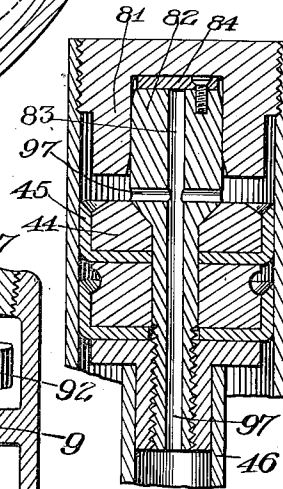
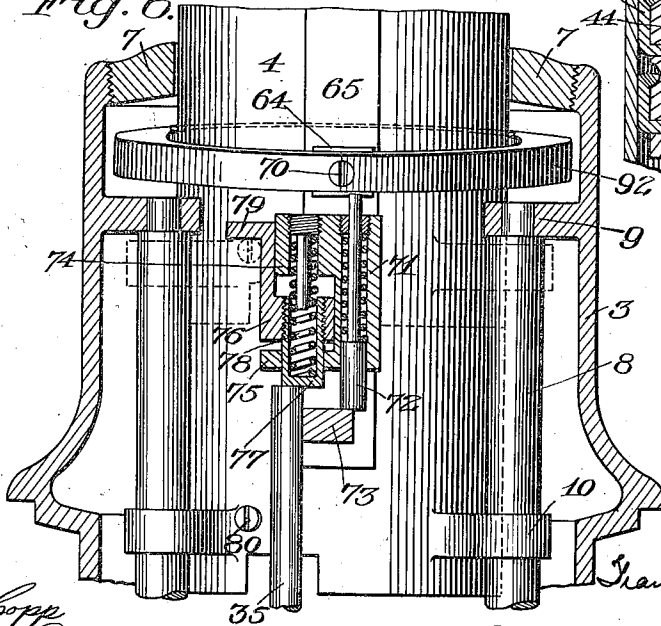


Fig. 6.



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CHAIR-BASE.

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To all whom it may concern:

Be it known that I, FRANK RITTER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Chair-Bases; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference-numerals marked thereon.

My present application relates to the adjustable bases used for supporting dental, surgical or barbers' chairs, and it has for its object to provide a new and improved form of mechanism therefor. In this connection my invention provides means for operating the telescoping sections of the chair base and controlling them, whereby an even and regular movement of the inner and outer sections is obtained when they are advanced to elevate the chair or allowed to recede for the purpose of lowering the latter.

A further object of my invention is to provide means for locking the sections of the base in adjusted position and arranging the devices for releasing the locking means so that they operate conjointly with the relief valve of the usual hydraulic system.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a vertical sectional view of the base or pedestal of a chair showing the mechanism therein constructed in accordance with my invention, the parts being illustrated in their normal or lowermost position. Fig. 2 is a similar view showing the telescoping sections elevated. Fig. 3 is a horizontal sectional view taken on the line 3*-3* of Fig. 1. Fig. 4 is a similar view taken on the line 4*-4* of Fig. 1. Fig. 5 is a similar view taken on the line 5*-5* of Fig. 1. Fig. 6 is a vertical sectional view taken on the line 6*-6* of Fig. 3 showing the lock releasing devices, and Fig. 7 is an enlarged detail view showing the upper end of the lifting cylinder and piston illustrating the construction and operation of the check.

Similar reference numerals in the several figures indicate similar parts.

One of the objects comprehended in my

present invention is the arrangement, between the stationary portion of a chair base or pedestal and the telescoping chair supporting and guiding members, which are usually elevated by hydraulic power, of means whereby the movable parts may be caused to travel relatively to each other and to the pedestal both in an upward and downward movement. More specifically, in connection with a chair base comprising an inner chair supporting section and an outer guiding section, which is also capable of elevation and is guided in the pedestal, I provide operating connections between the parts mentioned so that the ascent and descent of the guiding section will be positively effected and occur simultaneously with the movement of the inner chair supporting section and thus afford a support for the latter in all positions of adjustment.

In illustrating the present embodiment of my invention I have shown a chair base or pedestal comprising the stationary, outer cylindrical frame 1 held securely upon a broad base formed by a ring 2. Fitted within the cylinder and revoluble therein, although stationary in respect to elevation, is the pedestal 3 carrying the chair raising mechanism comprising generally the telescoping sections 4 and 5 and the hydraulic pump 6. The guiding section 4 is tubular and is centered within the ring nut 7 secured to the top of the pedestal 3, and within the latter are arranged three guide rods 8 supported at their upper and lower ends in the lugs 9 and surrounded by the ears 10 projecting outwardly from the lower end of the guide section 4. The latter is provided interiorly with similar guide rods 15 supported in the lugs 16 which receive the ears 17 on the lower end of the inner section 5, the upper end of the latter being movable through and guided by the ring nut 18.

Any suitable form of elevating mechanism may be employed for projecting the telescoping tubular sections 4 and 5, but the preferred construction which I desire to employ is the one illustrated, comprising the pump cylinder 6 containing the piston 19 which may be operated in one direction, against the tension of the spring 20, by means of the pumping lever 21, having the shaft portion 22 journaled in the lugs 23 on the pedestal and carrying a pin or finger 24 bearing against the pitman 25 which is connected to the piston. The pump cylinder

is connected to the spider 30 rigidly attached to the lower end of the pedestal 3 and in which is provided the fluid passage 31 communicating with the ram cylinder 32 and leading therefrom to the outlet or discharge port 33. The latter is normally closed by the release valve 34 formed at the lower end of an upwardly extending rod 35. The ram cylinder is arranged concentrically within the section 4 and is secured thereto at its lower end by a collar 41 having laterally extending ears 42 by means of which it is rigidly connected to the bottom of the guide section 4, preferably by means of screws 43 passing into the lower ends of the guide rods 15. Located within the cylinder is the piston 44 having the packing rings or washers 45 located on the tube 46 which is supported on the spider and connected at its lower end with the passage 31, its upper extremity being in communication with the ram cylinder through the passage 97. The advantage of locating the cylinder on the column and making the piston the stationary part is that by so doing these parts may be large in size and capable of holding a large quantity of fluid which from a practical standpoint is the desideratum in mechanism of this character as a large volume of fluid enables the movement of the parts to be controlled with greater accuracy than is the case when the cylinder and other parts are of small capacity.

From the arrangement thus far described it will be seen that when a sufficient quantity of oil or other fluid is supplied within the frame 1, it may be forced through the passage 31 by the reciprocation of the pump piston 19, when operated by the lever 21, to force the ram cylinder and guide section 4 upwardly. Now, in order to cause the projection of the chair supporting section 5 I provide an operating connection between it and the guide section so that the simultaneous operation of these parts is effected. In the present instance this connection is arranged to produce a differential movement between the sections so that the chair supporting section will travel at a greater speed relatively to the base or pedestal than the guiding section. To accomplish this result I employ a chain 47 connected at one end to a rigid projection or finger 48 extending inwardly from the bottom of the pedestal 3 and attached at its opposite extremity to the lower end of the section 5, as indicated at 49. The chain or connection is looped over a pulley 50 (shown in dotted lines in Fig. 2 and full lines in Fig. 4) carried on one of the movable sections preferably the guiding section 4 to which it is attached by the journal stud 55 located between the guide rods 15. The attachment between the end of the chain 47 and the finger 48 is preferably effected by a screw

passing through the last mentioned part and entering the anchor block 56 at the end of the chain whereby the latter may be initially set at the desired tension and afterward adjusted to take up any slack occurring from the stretching or wearing thereof.

The connection just described will cause the relative movements of the inner and outer telescoping sections when they are projected upwardly, but for practical reasons, hereafter mentioned, it is essential that additional devices be employed for insuring the retraction of the chair supporting section 5 within the guiding section 4, so that both of these parts will be caused to move downwardly at the same time. To this end I employ another connection similar to the one described, but arranged to operate in opposition thereto. This section connection comprises the chain 57 attached at its outer end to the lug 58 on the pedestal 3 and at its inner end to the lug 59 on the section 5 and passing around the pulley 60 journaled between the lugs 61 at the bottom of the guiding section 4, as shown in Figs. 2 and 5. The length of this chain is also adjustable by means of the screw 62 which passes through the lug 59 and enters the anchoring block 63. By arranging the two chains or connections 47 and 57 in the manner illustrated and described, the former is operated by the pulley 50 upon the upward movement of the guide section to project the inner section 5 and upon the descent of the parts the pulley 60 acts upon the chain 57 to cause the positive retraction of section 5 within the guide column 4, thus preventing the latter from descending without causing the relative descending movement of the chair supporting section therein as might be the case in the event only one connection, such as the chain 47, was employed.

A particular advantage is obtained in arranging the chains 47 and 57 in opposition to each other, as it is necessary to take into consideration the fact that the weight supported on the section 5 is not always evenly distributed and the latter may sometimes be cramped within the guide so that when said guide is released it will descend, while the supporting section remains locked to the guide by frictional engagement so that no relative movement between these two parts occurs. Hence, more or less slack would be given to the chain 47 with the consequent result of allowing the inner section 5 to drop suddenly the instant the frictional engagement is released. Such an effect would be detrimental not only to the chair adjusting mechanism itself, but a source of annoyance and inconvenience to the operator and the occupant of the chair. This action is entirely obviated by employing the opposing connection 57 which is operated upon by the downward movement of the guide

section to cause the chair supporting section to recede within it, so that these parts move downwardly relatively to each other and to the stationary portion of the pedestal when they are released.

The locking device for holding the elevating mechanism in adjusted position consists of a ring 92 surrounding the guide column 4 and located within the upper end of the pedestal 3 where it is pivotally supported upon the screw studs 93 which are spaced at a sufficient distance apart to steady the ring, the points of said studs entering depressions or recesses in the periphery of the ring to hold it loosely and permit it to be freely tilted with such lateral movement between the ring and studs as may be required. Spaced at equidistant points within the ring are the brake shoes 64 which normally rest in engagement with longitudinally extending ribs 65 on the exterior of the guide column. One of these shoes, preferably the one bearing against the side of the column farthest removed from the studs 93, is held in position by a set screw 70 which may be adjusted to cause all of the brake shoes to engage more or less tightly against the cooperating ribs on the column. The ring 92 being supported at only one side normally cants causing the brake shoes to frictionally engage the different points on the face of the column to support and lock it in adjusted position, yet permitting the column to be freely moved upward or projected, as will be understood.

The devices for releasing the lock are arranged to cooperate with the free side of the ring and to operate conjointly with the relief valve 34 so that the ring may be first moved into the inoperative position before the fluid pressure in the ram cylinder is released. Within the pedestal 3 is a projection or boss 71 provided with an aperture in which is located a spring operated plunger 72 arranged with its lower end resting upon the inner end of the pivoted release lever, 73, its upper end being located in position to engage the lower edge of the locking ring when moved upwardly by the lever. The boss 71 is provided at one side with a recess forming upper and lower shoulders 74 and 75 between which is arranged the holding member employed for normally holding the relief valve of the hydraulic system closed. This member comprises a movable block 76 carrying a tubular guide 77 projecting downwardly through a perforation in the shoulder 75 and normally engaging the upper end of the relief valve rod 35. Within this guide is arranged the spring 78 having sufficient tension to hold the valve 34 closed against the pressure of the fluid in the passage 31. The part 77 projects at one side of the rod 35 and overlies the edge of the lever 73 so

that it may be elevated thereby to release the valve. The block 76 is further provided with an extension 79 projecting in the path of a tripping pin 80, located on the exterior of the column 4, for the purpose of elevating the holding member to automatically release the relief valve 34 when the guide column reaches the limit of its upward movement to permit the oil or other fluid to escape in the event the operation of the pump is continued after the telescoping sections have been elevated to the full extent of their movement. It will be noticed that the lower end of the plunger 72 projects a short distance below the end of the member 77 and in practice this difference in the length of these parts is made sufficient to permit the ring 92 to be tilted into substantially a horizontal position, to completely disengage its brake shoes from the guide column, before the lever operates the holding member and elevates it to release the relief valve. In the reverse operation which occurs in checking the downward movement of the chair, this arrangement of the parts permits the relief valve to be closed before the lock engages the column, thus cushioning the downward movement of the parts by the fluid in the ram cylinder, preventing any sudden arresting of the parts. The lock being brought into action after the column has been arrested, secures and holds it firmly in adjusted position preventing its further descent should any leakage occur in the hydraulic system.

Another improvement comprehended in my present invention consists in providing within the ram cylinder a check which is brought into action as the elevating members reach the limit of their downward movement whereby they are gradually allowed to come to a point of rest. In carrying out this feature of my invention I provide within the cylinder head of the ram a cup 81 within which fits a projection 82 on the end of the piston 44. A very slight clearance is provided between the walls of the cup and the projection and as the latter descends into the former, the fluid therein must escape gradually through the space provided between them, making a very effective cushion. Now, in order to relieve the suction which would ordinarily occur when the piston moves upwardly, I provide the projection 82 with a vent or passage 83, which is covered by a washer 84 for preventing the outward escape of fluid through the passage as the projection descends into the cup, but which opens said passage as the projection is withdrawn, allowing the fluid to pass into the bottom of the cup, thereby permitting the projection to be easily withdrawn. At one side of the cylinder head is a small passage 85, normally closed by a screw 86, which may be employed as a vent

for the cylinder when the parts are being assembled.

A chair base embodying the various features of my invention consists of few parts 5 which are simple in construction and compactly arranged.

I claim as my invention:

1. In a chair base, the combination with a pedestal, a movable section telescoping 10 therein having longitudinally extending ribs and mechanism for elevating the section, of a locking ring surrounding the movable section, brake shoes located between the ring and said ribs, means for adjusting one of 15 said shoes relatively to the ring at one side thereof and an adjustable stud on the pedestal pivotally engaging the opposite side of the ring and positioning the latter, relatively to the telescoping section with which 20 it cooperates.

2. The combination with a chair base and hydraulic operating mechanism comprising

a cylinder and a piston arranged therein, of a cup located within the cylinder, a projection on the piston fitting the cup and having 25 a relief passage and a valve closing the latter during the entrance of the projection into the cup.

3. The combination with a chair base and hydraulic operating mechanism comprising 30 a cylinder and a piston arranged therein, of a cup located within the cylinder, a projection on the piston fitting the cup and having a relief passage leading from a point outside 35 of the cup to the bottom thereof when the parts are together and a valve closing and opening the passage during the entrance and withdrawal of the projection into and out of the cup.

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