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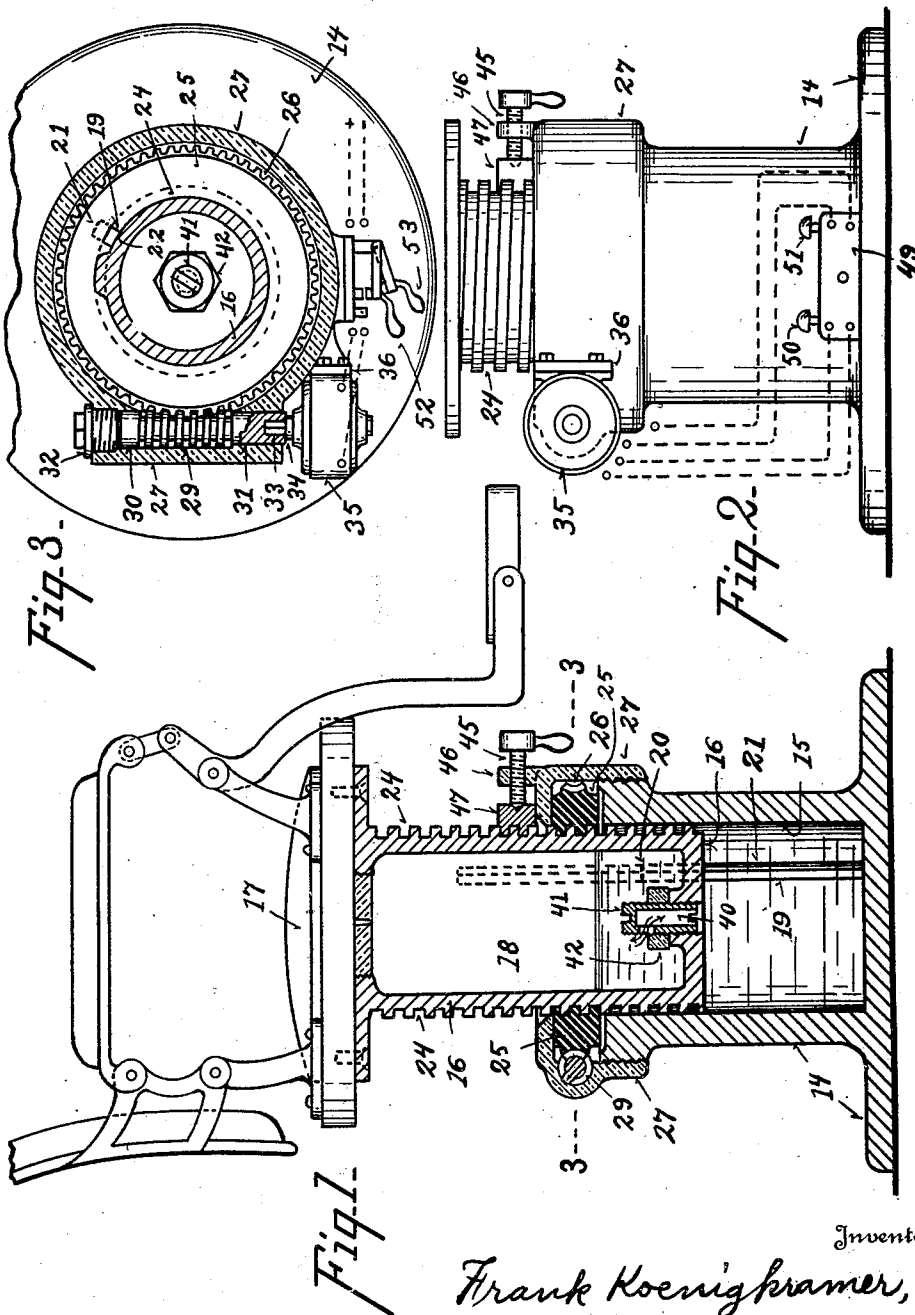
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CHAIR AND TABLE ADJUSTING MECHANISM

Filed August 15, 1921

2 Sheets-Sheet 1



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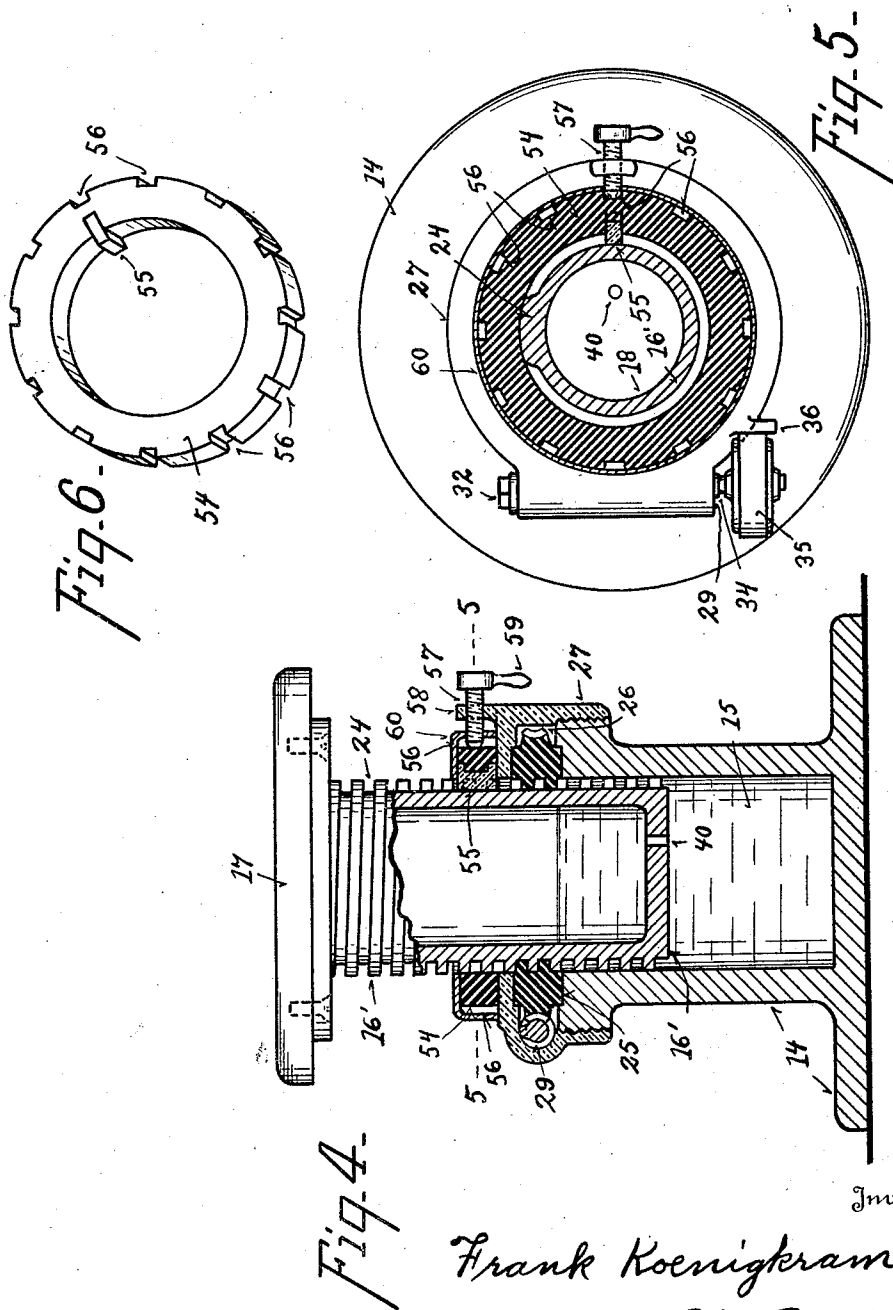
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UNITED STATES PATENT OFFICE.

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CHAIR AND TABLE ADJUSTING MECHANISM.

Application filed August 15, 1921. Serial No. 492,463.

My invention relates to improvements in mechanism to support and raise and lower chairs and tables, as for instance dental, barber, and similar chairs, and surgical, chiropractic, and similar tables. One of its objects is to provide a simple and reliable motor actuated supporting and adjusting mechanism adapted to be employed for long periods of time without getting out of order or requiring repairs. Another object is to provide an improved motor driven supporting and adjusting means with provision to rigidly mechanically lock the adjustable portion in any adjusted position. Another object is to provide an improved motor driven mechanically actuated adjusting mechanism. Another object is to provide an improved motor driven adjusting mechanism in which the adjustable member is both vertically and rotatably adjustable and also adapted to be rigidly locked to any desired position of adjustment. My invention also comprises certain details of form, combination and arrangement, all of which will be fully set forth in the description of the accompanying drawings, in which;

Fig. 1 is a central vertical section through a chair adjusting mechanism embodying my invention.

Fig. 2, is a side elevation of a portion of Figure 1.

Fig. 3, is a horizontal section taken on line 3—3 of Fig. 1.

Fig. 4 is a view similar to Fig. 1, illustrating a modification of Fig. 1, in which the chair is both rotatably and vertically adjustable.

Fig. 5 is a horizontal section taken on line 5—5 of Fig. 4.

Fig. 6, is a perspective view of an adjusting collar detached.

The accompanying drawings illustrate the preferred embodiment of my invention, in Figs. 1, 2, and 3, of which 14 represents a chair or table base adapted to be rigidly mounted or supported upon the floor. The base 14 is provided with a vertical cylindrical recess 15 to receive a vertically movable standard or member 16 to the upper end of which the chair or table top 17 is attached. The standard 16 is preferably hollow to constitute a storage reservoir 18 for the storage of lubricant material to keep the operative parts constantly and automatically lubricated. The exterior of the standard 16 close-

ly fits and is guided in its movements up and down, and laterally supported by the side walls of the recess 15 in the base. A key 19 terminating at its upper end at 20 is seated in a vertical channel 21 in the wall of the recess 15, and projects into said recess so as to engage a vertical slot 22 in the periphery of the standard 16, to prevent the standard 16 moving rotatably relative to the base 14.

The periphery of the standard 16 has cut therein a coarse pitch thread or spiral groove 24 by means of which the standard 16 is threaded into an annular driving member 25 which is seated upon the upper edge of the base, encircling the mouth of the recess 15 so as to be rotatably movable relative to the base 14 and standard 16. The annular member 25 has a worm wheel 26 cut upon its exterior, and is held in position and against displacement upon the upper edge of the base 14 by means of an annular cap member 27 which is threaded or otherwise rigidly attached to the base member, and serves as a bearing for the upper edge of the annular member 25 to prevent its displacement relative to the base 14.

A worm 29 meshes with the worm-wheel 26 to rotatably drive the annular member 25 in either direction. The worm 29 is journaled at opposite ends in bearings 30 and 31 formed in the walls of the cap member 27, and is held in place by a threaded cap 32 which serves as a thrust bearing for the worm 29, and also to lock the worm in position when the cap is in place and to permit the worm to be removed when the cap is removed. The opposite end of the worm 29 projects outside of the cap member 27 and is provided with a polygonal socket 33 into which the polygonal end of a motor shaft 34 is adapted to enter to thereby drive the worm and worm wheel. I preferably employ an electric motor 35 which is attached to a bracket 36 projecting from the cap member 27, and said motor is provided with either hand operated or foot operated switch mechanism adapted to cause the motor to rotate in either forward or reverse direction, and to thereby drive the worm and worm-wheel and the annular member 25 in either direction as may be required to feed the standard 16 either upwardly or downwardly due to the threaded engagement of the member 25 with the standard 16, to thereby raise or lower the chair or table.

In order to provide for automatically lubricating the operative parts comprising the worm, worm-wheel, member 25, and standard 16, I preferably provide a port or recess 40 leading from the interior of the standard 16 into the recess 15 below the standard, and provide within the recess 15 and reservoir 18 a body or column of liquid lubricating material of sufficient height to automatically feed lubricant to the bearing surfaces of the annular member 25 and the worm 29 as well as to the standard 16, and recess 15 where they have bearing or sliding relations. Suitable oil holes and channels are provided, not shown specifically to lead the lubricant to any moving part requiring to be lubricated. As shown in Fig. 1 the port 40 leads through an adjustable member 41 threaded into a recess in the bottom wall of the standard 16, and locked to its adjusted position by means of a lock nut 42, which provides for so adjusting the lock nut 42 and member 41 as to partly or almost entirely close the port 40 and thereby to more or less obstruct the flow of liquid through the port 40, which may be utilized to force the lubricant from the recess 15 upwardly into the bearing requiring lubrication. It may also be utilized to check too rapid movement of the standard 16 either upwardly or downwardly, due to the liquid being unable to pass through the restricted port 40 at a high rate of speed necessary to transfer the requisite volume of liquid.

A set screw 45 is threaded through a projection 46 carried by the cap member 27, and its end engages a brake-shoe 47 which bears upon the periphery of the standard 16 above the cap member 27 to rigidly lock the standard against movement when desired.

As illustrated in Fig. 2 a switch mechanism 49 is adapted to start, stop, and reverse the direction of the motor 35, said switch mechanism being designed to be actuated by the foot of the operator, as is customary in operating dental chairs for instance. Thus for instance the operator to elevate the chair and its standard depresses the push-rod 50 with his foot, which closes the motor circuit so as to drive the motor in the direction necessary to elevate the chair. When the foot is removed from the push-rod 50 the motor circuit is automatically opened. When the push-rod 51 is depressed by the foot of the operator the motor circuit is closed to drive the motor in the direction to lower the chair, and when the foot is removed from push-rod 51 the motor circuit is automatically opened. In Fig. 3 I have illustrated a plurality of hand actuated switch levers 52 and 53, by means of which the motor circuit may be opened and closed by hand, substantially as heretofore described to elevate or lower the chair. It is customary for barber chairs to be raised and

lowered by some type of hand actuated mechanism as distinguished from foot actuated means.

In the modification Figs. 4, 5, and 6, I have illustrated means to enable the standard 16' to be rotatably adjusted relative to the base 14 as well as to be adjusted vertically relative thereto as heretofore described. In order to rotatably adjust the standard and the chair or table member carried thereby an annular member or collar 54 splined to the standard by means of a key 55, and said collar is located above, and preferably resting upon the upper face of the cap member 27. A series of recesses 56 are formed at frequent intervals in the periphery of said collar 54, which recesses are to be selectively engaged by the end of a set screw 57 which is threaded through a projection 58 extending upwardly from the cap member 27. The set screw 57 is operated by a hand lever 59 to force the collar, acting as a brake-shoe against the periphery of the standard 16' to rigidly lock the standard against movement relative to the base 14.

When the set-screw 57 is retracted to clear the recess 56 the chair and standard 16' may be freely rotated relative to the base 14, carrying the collar 54 with them. When the chair standard 16' and collar 54 have reached the desired new position rotatably, the set-screw 57 is adjusted into loose engagement with another recess 56 of the collar, which will serve to prevent further rotary movement of the chair and standard, but leave the standard free to be elevated or lowered relative to the base by means of the motor 35, the worm 29, and annular member 25, after which the set screw 57 may be tightened to rigidly lock the parts together and take up all lost motion if desired. A light sheet metal housing 60 is preferably employed over the collar 54 to add to the appearance of the chair and to protect the parts from dirt and dust, or the garments of the operator becoming caught in the operative parts.

Where it is inconvenient to supply or provide motors, the motor may be replaced by a hand crank or other known type of manually operable means to drive the worm or equivalent gear in either forward or reverse direction.

The apparatus herein illustrated and described is capable of considerable modification without departing from the spirit of my invention.

What I claim is:

1. A supporting mechanism comprising a base having a vertical cylindrical recess to serve as a lateral support for a supporting standard, an externally screw-threaded cylindrical supporting standard telescopically mounted in said recess in the base and provided with a vertical keyway, an annular driving member threaded to said standard

and journaled to said base at the upper end of said vertical recess, means to rotate said annular driving member relative to said base to feed said standard vertically relative to said base, an annular collar keyed to and rotatable with said standard relative to said base, and means to detachably rigidly lock said annular collar to said base.

2. A supporting mechanism comprising a base having a vertical cylindrical recess to serve as a lateral support for a supporting standard, an externally screw-threaded cylindrical supporting standard telescopically mounted in said recess in the base and provided with a vertical keyway, an annular driving member threaded to said standard and journaled to said base at the upper end of said vertical recess, means to rotate said annular driving member relative to said base, an annular collar keyed to and rotatable with said standard relative to said base, and means to selectively detachably rigidly lock said annular collar in a plurality of different positions relative to said base to face said standard in a plurality of different positions rotatively relative to said base.

3. A supporting mechanism comprising a base having a vertical recess closed at the lower end to serve as a lubricant container and as a lateral support for a vertically adjustable supporting standard, a supporting standard telescopically mounted in said recess in the base, an annular driving member journaled to said base and threaded to said

standard, gear mechanism to engage and drive said annular driving member in either direction, and means having splined relation to said standard and rotatably adjustable relative to said base and adapted to be adjusted rotatably to different positions upon said base carrying said standard therewith and to be rigidly locked to different adjustable positions relative to said base to adjustably face said standard in different positions relative to said base.

4. A supporting mechanism comprising a base having a vertical recess to serve as a lateral support for a vertically adjustable supporting standard, a supporting standard telescopically mounted in said recess in the base, an annular driving member journaled to said base at the upper end of said recess and threaded to said standard, gear mechanism to engage and drive said annular driving member in either direction, and means having splined relation to said standard to hold said standard non-rotatably relative to said base, and rotatably adjustable relative to said base and adapted to be rotatably adjusted to different positions relative to said base carrying said standard therewith and to be rigidly locked at relatively different positions to said base to adjustably face said standard in different positions relative to said base.

In testimony whereof I have affixed my signature.

FRANK KOENIGKRAMER.