

April 27, 1926.

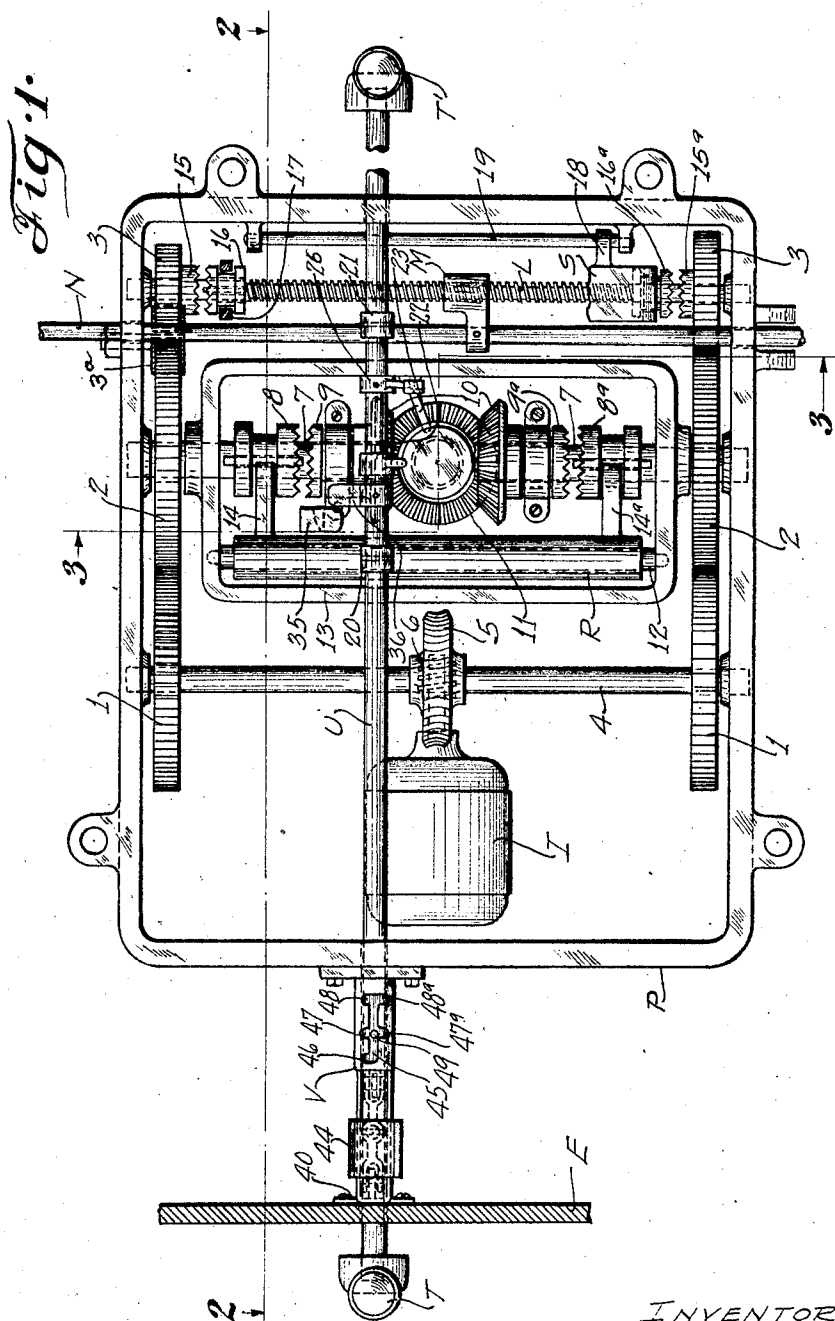
1,582,280

W. F. KOKEN

BARBER'S CHAIR

Filed Jan. 21, 1924

4 Sheets-Sheet 1



INVENTOR
Walter F. Koken
By *Bakewell & Church*
ATTORNEYS

April 27, 1926.

W. F. KOKEN

1,582,280

BARBER'S CHAIR

Filed Jan. 21, 1924

4 Sheets-Sheet 2

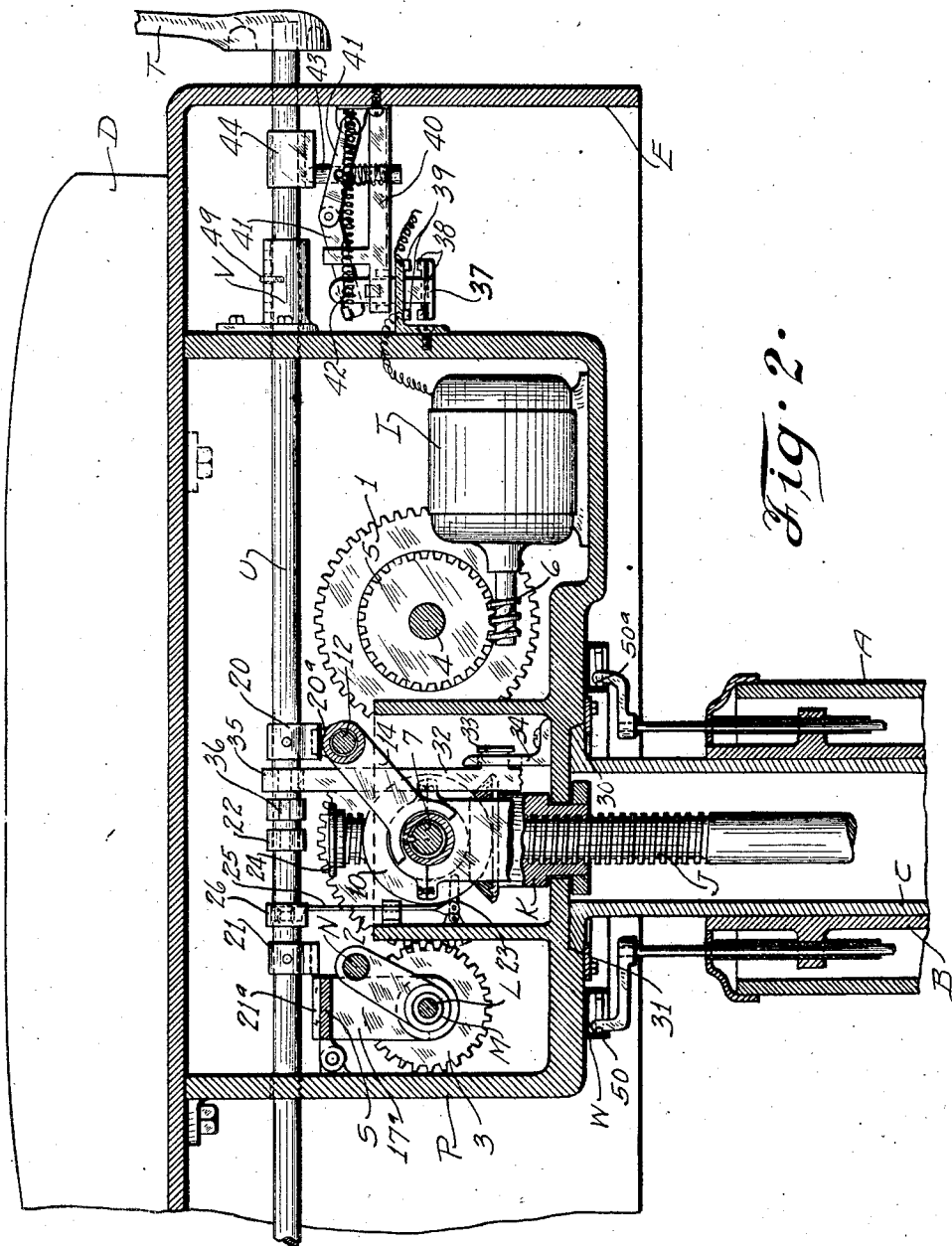


Fig. 2.

INVENTOR
Walter F. Koken.
BY *Bakewell Chas*
ATTORNEYS

April 27, 1926.

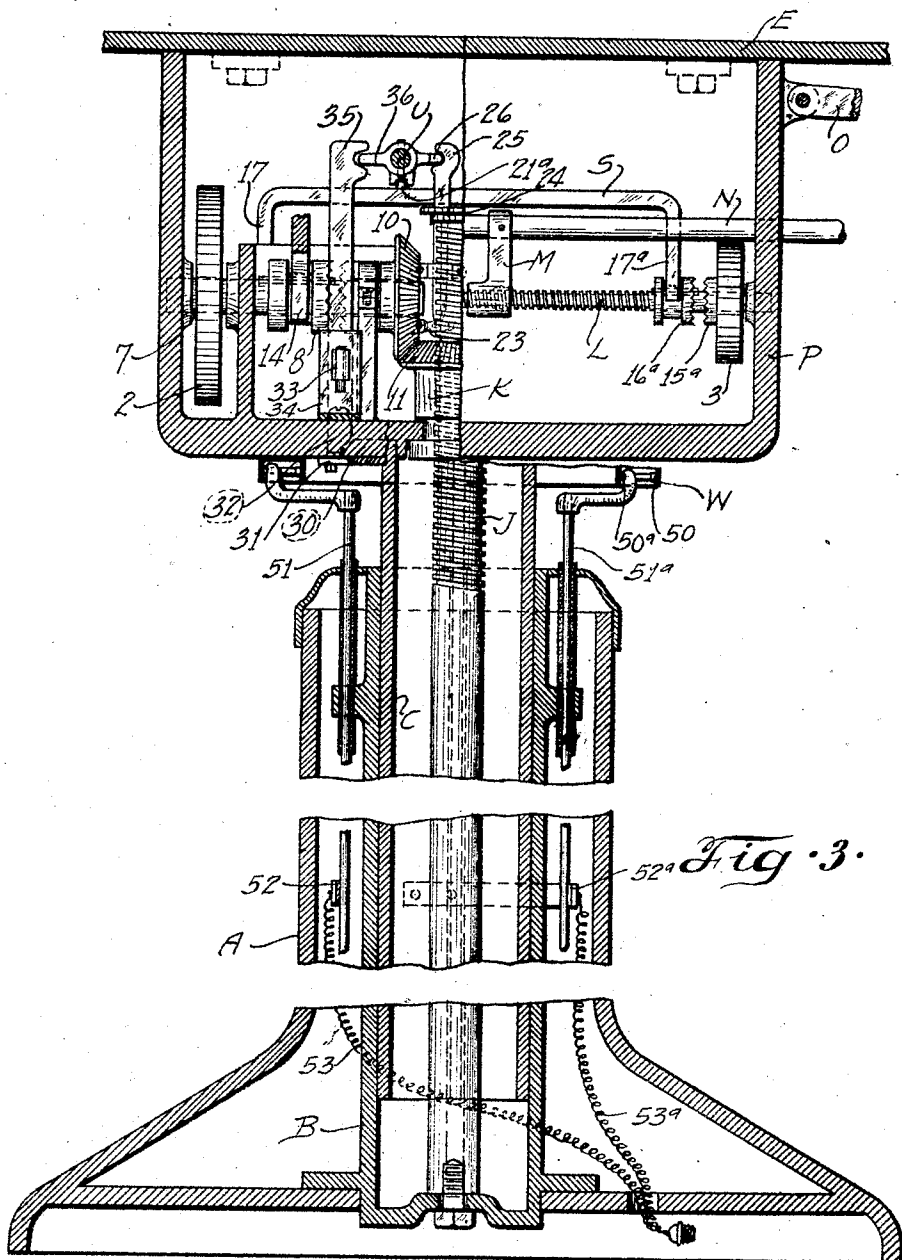
1,582,280

W. F. KOKEN

BARBER'S CHAIR

Filed Jan. 21, 1924

4 Sheets-Sheet 3



INVENTOR
Walter F. Koken.
BY *Bakewell & Church*
ATTORNEYS

April 27, 1926.

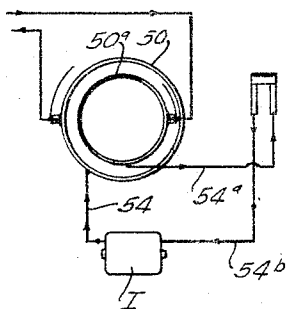
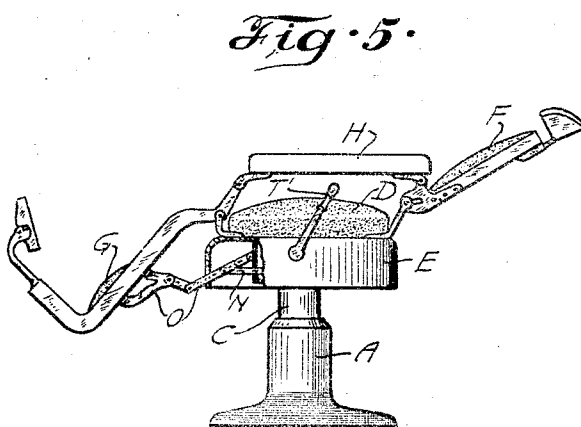
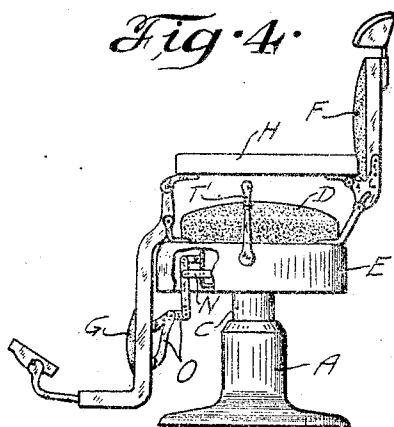
W. F. KOKEN

1,582,280

BARBER'S CHAIR

Filed Jan. 21, 1924

4 Sheets-Sheet 4



INVENTOR
Walter F. Koken.
By *Bakewell & Chueh*
ATTORNEYS

UNITED STATES PATENT OFFICE.

WALTER F. KOKEN, OF WEBSTER GROVES, MISSOURI.

BARBER'S CHAIR.

Application filed January 21, 1924. Serial No. 687,539.

To all whom it may concern:

Be it known that I, WALTER F. KOKEN, a citizen of the United States, residing at Webster Groves, Missouri, have invented a certain new and useful Improvement in Barbers' Chairs, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to chairs of the kind used by barbers, dentists, hair dressers and other specialists, and particularly chairs of the type that are equipped with an operating mechanism comprising an electric motor and a mechanical means such as a gear, worm or screw for transmitting movement from said motor to a part of the chair that is adapted to be adjusted or shifted from one position to another position in the normal use of the chair.

One object of my present invention is to provide a barber's chair or the like that is equipped with a novel electrically-operated means for adjusting the back of the chair to recline the back and to arrange said back in its upright position.

Another object is to provide a chair of the general type referred to that is equipped with an electrically-operated mechanism that adjusts the back that also locks and securely holds the back in adjusted position.

Another object is to provide an electrically-operated barber's chair or the like that is inexpensive to manufacture, easy to maintain in operative condition and of such design that the movements of the various adjustable elements of the chair such as the seat and back, can be effected by one hand of the operator in charge of the chair. Other objects and desirable features of my invention will be hereinafter pointed out.

To this end I have devised a chair that comprises a vertically-adjustable seat that can be raised and lowered, a back that can be swung downwardly into a reclined position or moved upwardly into an upright position, and an operating mechanism comprising an electrically-operated primary driving means and two independent mechanical means, one of which is adapted to be connected with said driving means to effect the raising and lowering of the seat and the other adapted to be connected with said primary driving means to effect the

movement of the back into its reclined position and into its upright position.

Figure 1 of the drawings is a top plan view of the complete operating mechanism of my improved chair, showing a portion of the skirt of the seat frame in horizontal section.

Figure 2 is a vertical transverse sectional view, taken on the line 2—2 of Figure 1, looking in the direction indicated by the arrows.

Figure 3 is a vertical sectional view, taken on the line 3—3 of Figure 1, looking in the direction indicated by the arrows, showing the base of the chair and the spindle that moves vertically in the base.

Figure 4 is a side elevational view of the chair, showing the back straightened or arranged in its upright position.

Figure 5 is a side elevational view, showing the back arranged in its reclined position; and

Figure 6 is a diagrammatic view, showing how the motor and the switch in the motor circuit are electrically-connected with the electric supply circuit.

Referring to the drawings which illustrate the preferred form of my invention, A designates the base or pedestal of the chair, B designates a vertically-disposed, tubular member in said base that serves as a guide for a stem C which can be raised and lowered, D designates the seat of the chair which is carried by a seat frame E that is mounted on the stem C in such a way that it can revolve and F designates the back of the chair which is mounted on the seat frame in such a way that it can be swung downwardly into a reclined position, as shown in Figure 5, or moved upwardly into an upright position, as shown in Figure 4. The chair herein illustrated is also equipped with an adjustable apron G and adjustable arms H that are combined with the back F in such a way that they will move in unison with same, when movement is imparted to the back or apron, or vice versa.

The operating mechanism of the chair consists of a primary driving means an electric motor I for actuating said driving means which is carried by the seat frame E, a mechanical means for raising and lowering the seat frame, an independent mechanical means for moving the back rela-

tively to the seat and clutches or the like for enabling said mechanical means to be connected with and disconnected from said primary driving means, said clutches being
5 combined with a governing means under control of the operator in charge of the chair which is constructed in such a way that the adjustment of the various elements of the chair can be effected and accurately
10 controlled by one hand of the operator in charge of the chair. In the form of my invention herein illustrated the mechanical means that is used to move the seat vertically, either to raise the seat or to lower the
15 seat, consists of a stationary screw or worm J carried by the base of the chair and a rotatable nut K on said screw combined with the seat frame E in such a way that said seat frame will move downwardly when
20 said nut revolves in one direction and will move upwardly when said nut revolves in the opposite direction. The mechanical means that is used to effect the movement of the back relatively to the seat consists of
25 a rotatable worm or screw L carried by the seat frame and a traveling nut M on said screw rigidly connected to a rod N which is connected by a system of links or levers, designated as an entirety by the reference
30 character O in Figures 4 and 5, with the apron G in such a way that the movement of said rod N forwardly shifts the apron and back into reclined position, as shown in Figure 5, and the movement of said rod
35 N rearwardly shifts the apron and back into upright position, as shown in Figure 4. By using a rotating screw and a traveling nut to actuate the back I overcome the necessity of equipping the chair with a separate
40 locking device for holding the back in adjusted position, for when the screw L is at rest the back is securely held against movement in either direction.

The motor I is operatively connected with
45 two trains of gears 1, 2 and 3, and clutches or other suitable devices are provided for connecting and disconnecting the gears 2 with the rotatable nut K that forms part
50 of the means for raising and lowering the seat and for connecting and disconnecting the gears 3 with the rotatable screw L that forms part of the means for reclining and straightening the back F of the chair. As
55 shown in Figure 1, one of said trains of gears is equipped with an idler 3^a arranged between the gear 3 and the gear 2 so as to cause the gear 3 of one train to revolve oppositely to the gear 3 of the other train. In the form of my invention herein illustrated the co-operating parts of the operating
60 mechanism are arranged inside of a casing P that is housed within the seat frame E, said casing being connected to the upper end of the stem C in such a way that it will
65 move vertically with said stem but is capa-

ble of revolving on said stem. The stationary screw or worm J is arranged vertically inside of the stem C and projects upwardly through the rotatable nut K, which
70 nut is journaled in the bottom wall or portion of the casing P in such a way that it is free to revolve relatively to the bottom of the casing, but is prevented from moving
75 vertically relatively to the bottom of the casing. Consequently, when the nut K revolves in one direction on the stationary screw J, the casing P and the seat frame carried by same will move upwardly, and
80 when said nut revolves in the opposite direction on said stationary screw said casing and seat frame will move downwardly.

The companion gears 1 of the two trains of gears that form part of the primary
85 driving mechanism are rigidly connected to a horizontally-disposed shaft 4 in the casing P that is equipped with a worm gear 5 which meshes with a worm 6 on the armature shaft of the motor I, as shown clearly
90 in Figures 1 and 2, and the companion gears 2 of said trains of gears are connected to two short, horizontally-disposed shafts 7 in the casing P that are arranged in longitudinal
95 alignment with each other, as shown in Figure 1. The remaining companion gears 3 of said trains of gears are loosely mounted on the rotatable worm or screw L, which
100 screw L is arranged horizontally in the casing P in parallel relation to the short shafts 7 previously referred to.

Any suitable means can be used for enabling the rotatable nut K of the seat moving
105 means to be connected with and disconnected from the primary driving means and for enabling the rotatable screw L of the back moving means to be connected with
110 and disconnected from said primary driving means. In the chair herein illustrated the short shafts 7 are equipped with two driving clutch members, designated 8 and 8^a, that
115 co-operate with driven clutch members 9 and 9^a connected to beveled pinions 10 that mesh with a beveled pinion 11 on the rotatable nut K. The driving clutch members 8 and 8^a are splined to the shafts 7 in such a way
120 that they can be moved longitudinally of said shafts into and out of engagement with their co-operating driven clutch members 9 and 9^a, and a clutch shifting member R is provided for governing the position of said
125 driving clutch members and for moving them into and out of engagement with their co-operating driven clutch members. As shown in Figure 1, the clutch shifting member R consists of a sleeve slidingly mounted on a horizontally-disposed shaft 12 supported
130 by the end walls of a gear box 13 inside of the casing P, and said clutch member is provided with two yokes 14 and 14^a that are arranged in annular grooves in the hubs of the driving clutch members 8 and 8^a. When

the clutch shifting member R is arranged in its neutral position, as shown in Figure 1, the rotatable nut K of the seat operating means will remain at rest, even though the motor I is in operation, due to the fact that the driving clutch members 8 and 8^a are disengaged from the driven clutch members 9 and 9^a. If it is desired to move the seat vertically in one direction the clutch shifting member R is moved longitudinally of its supporting shaft so as to cause the driving clutch member to engage the driven clutch member, whereupon the nut K will start to revolve. After the seat has moved the desired distance the clutch shifting member R is restored to neutral position so as to disconnect the primary driving means from the nut K. If it is desired to move the seat vertically in the opposite direction, the clutch shifting member R is moved longitudinally of its supporting shaft so as to cause the driving clutch member to engage its co-operating driven clutch member, thus causing the nut K to revolve in the opposite direction on the stationary screw J.

A similar means is used for connecting and disconnecting the primary driving means to and from the rotatable screw L that forms part of the means that moves the back relatively to the seat. Thus, as shown in Figure 1, the gears 3 have driving clutch members 15 and 15^a rigidly connected to same and the screw L is provided with two driven clutch members 16 and 16^a splined to said screw in such a way that they can be moved longitudinally of same into and out of engagement with the driving clutch members 15 and 15^a. The clutch shifting member S is used to govern the position and effect the movement of the driven clutch members splined to the screw L, said clutch shifting member S being equipped with two yokes 17 and 17^a that are arranged in annular grooves in the hubs of the driven clutch members 16 and 16^a and being mounted in such a way that it is normally maintained in horizontal position directly over the rotatable screw L, as shown in Figure 1, the means herein illustrated for guiding said clutch shifting member and holding it in position consisting of perforated lugs 18 on said member that receive a horizontally-disposed guide rod 19 arranged on the inside of the casing P. When the clutch shifting member S is in its neutral position shown in Figure 1, the worm or screw L will remain at rest, even though the motor is in operation, owing to the fact that the driven clutch members 16 and 16^a on said screw are disengaged from their co-operating driving clutch members 15 and 15^a. If it is desired to move the back of the chair relatively to the seat in one direction, the clutch shifting member S is moved in a direction to cause the driven clutch member 16 thereon to en-

gage the driving clutch member 15, and after the back of the chair has reached the desired position, said clutch shifting member S is moved back to neutral position so as to disengage said clutch member S. It will be obvious that movement of the back of the chair in the opposite direction can be effected by moving the clutch member S in a direction to cause the driven clutch member 16^a thereon to engage the driving clutch member 15^a.

Various means can be used to operate the clutch shifting members R and S, but I prefer to equip the chair with two controlling levers T and T' secured to the opposite ends of a horizontally-disposed governing shaft U that is mounted in the casing P in such a way that it can be oscillated forwardly and rearwardly and also moved endwise so as to bring actuating devices thereon into and out of engagement with the clutch shifting members R and S. As shown in Figures 1 and 2, the governing shaft U is provided with an actuating device 20 formed by a rigid sleeve or collar equipped with a jaw or slot which can be moved into engagement with a lug or tooth 20^a on the clutch shifting member R by moving said shaft U endwise or transversely of the clutch shifting member R. Said governing shaft is also provided with a similar actuating device 21 equipped with a slot or jaw that is adapted to be moved into engagement with a lug or tooth 21^a on the upper side of the clutch shifting member S. The actuating devices 20 and 21 are arranged on the governing shaft U in such a manner that when the actuating device 20 is in engagement with the clutch shifting member R, the actuating device 21 will be disengaged from the clutch shifting member S, and when said actuating device 21 is engaged with its co-operating clutch shifting member S, the actuating device 20 will be out of mesh with the clutch shifting member R. Assuming that it is desired to lower the seat of the chair, one or the other of the controlling levers is manipulated so as to shift the governing shaft U longitudinally into such a position that the actuating device 20 thereon is interlocked with the clutch shifting member R, as shown in Figure 2, and said controlling lever is thereafter rocked forwardly, which movement causes the clutch shifting member R to move in a direction to carry the driving clutch member into engagement with the driven clutch member. Assuming that the electric motor has previously been set in operation, the engagement of the driving clutch member with the driven clutch member will cause the nut K to travel downwardly on the stationary screw or worm J, and when the seat reaches the desired position, said controlling lever is rocked in the opposite direction back to its upright posi-

tion, so as to restore the member R to neutral position. If it is desired to raise the seat of the chair, the controlling lever is rocked rearwardly after the actuating device 20 on the governing shaft U has been engaged with the clutch shifting member R, so as to cause the driving clutch member to engage the driven clutch member, the controlling lever being restored to its upright position after the seat has moved upwardly the desired distance. When it is desired to change the position of the back of the chair this can be accomplished by simply manipulating one or the other of the controlling levers so as to move the governing shaft endwise into such a position that the actuating device 21 thereon is interlocked with the clutch shifting member S, and thereafter rocking said controlling lever forwardly or rearwardly so as to move the clutch shifting member S into such a position that one or the other of the driven clutch members on the screw L will be rendered operative for transmitting movement from the primary driving mechanism to the screw L.

In order to prevent injury to the operating mechanism of the chair, in the event the operator in charge of the chair fails to manually move the controlling lever to its upright position, after the element of the chair that is being adjusted has reached its extreme limit of movement, means is provided for automatically disconnecting the primary driving means from the rotatable nut K when the seat reaches its extreme upper position and its extreme lower position, and the traveling nut M on the rotatable screw L is so arranged that when it reaches a certain position in its movement in either direction it will automatically trip the clutch which is then operative for connecting the screw L with the primary driving means. As shown in Figure 1, the governing shaft U has rigidly connected thereto a collar 22 provided with a laterally-projecting arm that extends over the upper end of the stationary screw or worm J. Assuming that the seat is moving downwardly and that the operator in charge of the chair fails to manipulate the controlling lever to trip the clutch which is then operative for connecting the nut K with the primary driving mechanism when the seat reaches its extreme lower position, the arm on the collar 22 will engage the upper end of the stationary screw J just before the seat reaches its extreme lower position, thus causing the upper end of the screw J to exert pressure on the arm of the collar 22 in a direction to cause the shaft U to be automatically restored to its neutral position, which movement of the governing shaft restores the clutch shifting member R to neutral position. During the upward movement of the seat, failure on the part of the operator to manually move the controlling

lever so as to trip the clutch which is then operative causes a pivotally mounted arm 23 carried by the casing P (see Figure 2) to engage a flange 24 at the upper end of the screw J and impart downward movement to a link 25 which is connected at its upper end to a laterally-projecting arm 26 on the governing shaft U, thus causing said shaft to be rocked automatically in a direction to restore the clutch shifting member R to neutral position and trip the clutch which is then operative for effecting the upward movement of the seat. As previously stated, the means for adjusting the back is also constructed in such a way that it will be automatically disconnected from the primary driving means in the event the operator fails to manually operate the controlling lever when the back reaches the end of its movement in either direction. In the chair herein illustrated the driven clutch members 16 and 16^a that are splined to the rotary screw L are arranged at such points on said screw that the traveling nut M on said screw will engage one of said driven clutch members and exert pressure on same in a direction to cause the clutch shifting member S to move and trip the other driven clutch member which is then operative, in the event the operator fails to restore the controlling lever to its upright position when the back reaches its extreme reclined position or its extreme upright position.

In chairs of the type to which my invention relates a locking device is generally provided for locking the seat frame so as to prevent it from rotating. In the form of my invention herein illustrated the stem C is provided at its upper end with a tapered head piece 30 which fits in a tapered recess formed in the underside of the casing P, as shown in Figure 2, said head piece being retained in said recess by a keeper plate 31 on the casing that laps over the underside of the head piece on the stem. The casing P is free to revolve on the head piece 30 of the stem when a locking device that acts on said head piece is inoperative. Said locking device consists of a vertically-disposed reciprocating member 32 mounted in the casing P and arranged so that it can be moved downwardly into engagement with the beveled edge of the tapered head piece 30 on the stem C, and thus exert sufficient frictional pressure on said head piece to prevent the casing P from rotating relatively to the stem. As shown in Figures 2 and 3, the locking device 32 is provided with a laterally-projecting lug 33 that slides in a guideway formed in a bracket 34 mounted on the bottom portion of the casing P, and said locking device is provided at its upper end with a bifurcated portion 35 that is adapted to receive an arm 36 on the governing shaft U when said shaft is in a certain position. When the arm 36 on

the governing shaft is in engagement with the bifurcated portion of the locking device 32, either of the controlling levers T or T' can be rocked in one direction to render said locking device operative and rocked in the opposite direction to render said locking device inoperative.

Any suitable type of switch can be used for governing the electric circuit in which the motor I is arranged, but I prefer to use a switch that is combined with the governing shaft U in such a way that the motor circuit will be closed automatically whenever the controlling lever is actuated to raise or lower the seat or to recline or arrange the back in an upright position. In the chair herein illustrated the switch that governs the motor circuit is provided with a shiftable circuit closing device 37 equipped with contacts 38 that move into and out of engagement with stationary contacts 39 in the motor circuit. Said circuit closing device is reciprocatingly mounted in a supporting structure 40 mounted inside of the seat frame of the chair at a point below the governing shaft U, as shown in Figure 2, and is combined with pairs of toggle links 41 in such a way that movement of said toggle links in one direction causes the circuit closing device 37 to snap into its open position and movement of said toggle links in the opposite direction causes said circuit-closing device to snap into its closed position. The toggle links 41 are carried by a bracket on the supporting structure 40 and are combined with springs 42 which normally hold the toggle links in an angular position with relation to each other and with the connecting pivot of said links disposed either above or below the springs 42. One pair of said links is combined with a spring-pressed pin 43, as shown in Figure 2, and the governing shaft U is provided with a tripping device 44 which is adapted to engage said pin, in certain positions of the governing shaft, and exert pressure on said pin in a direction to cause the toggle links to move the circuit-closing device 37 into its closed position when the controlling lever is rocked to effect the downward or upward movement of the seat or to effect the movement of the back into its reclined or upright position. As shown in broken lines in Figure 2, the tripping device 44 on the governing shaft is provided on its underside with a notch. When the governing shaft is arranged in a position to render the locking device 32 operative, and thus hold the seat frame of the chair against rotary movement, the tripping device 44 on the governing shaft is positioned far enough to the right of the pin 43, looking at Figure 2, to clear said pin and not exert pressure on same when the controlling lever is rocked from its upright position. When the controlling

lever is manipulated to move the governing shaft endwise, however, preparatory to raising or lowering the seat, or to recline the back or arrange the back in its upright position, the tripping device 44 on the governing shaft will be brought into engagement with the pin 43, and thereafter whenever the controlling lever is rocked in either direction from its upright position, the device 44 will exert downward pressure on the pin 43, thereby causing the toggle links 41 to shift from one position to the other position under the influence of the springs 42, and thus move the circuit-closing device 37 upwardly to bring the contact 38 thereon into engagement with the stationary contacts 39 in the motor circuit.

As shown in Figures 1 and 2, the governing shaft U extends through a sleeve V on the casing P which is provided with an elongated slot 45 that has three notches 46, 47 and 48 at one side of same and two notches 47^a and 48^a as its opposite side. The governing shaft is provided with a pin 49 that moves lengthwise of the elongated slot 45 in the sleeve V when the governing shaft is moved endwise and which enters one or the other of the notches that branch laterally from said slot when the governing shaft is rocked forwardly or rearwardly. When it is desired to lock the seat frame of the chair so as to prevent it from rotating one of the controlling levers is manipulated so as to move the governing shaft longitudinally or endwise in a direction to position the pin 49 on said shaft in the outer end of the slot 45 in the sleeve V, looking at Figure 1, and said controlling lever is then rocked in a direction to move said pin into the notch 46 at one side of the slot in the sleeve V. This longitudinal movement of the governing shaft positions the arm 36 thereon in the bifurcated portion 35 at the upper end of the locking device 32 and the rocking movement imparted to said shaft by rocking the controlling lever causes the locking device 32 to move downwardly into clamping engagement with the tapered head piece 30 on the upper end of the stem C, thereby securely holding the seat frame of the chair against rotary movement. At this time, namely, when the locking device 32 is operative, the clutch shifting members R and S occupy their neutral positions, and the switch that governs the motor circuit is in its open position. If it is desired to raise the seat of the chair the controlling lever is rocked in a direction to arrange it vertically or in an upright position so as to withdraw the pin 49 on the governing shaft U from the notch 46 in the sleeve V, and said controlling lever is then manipulated so as to move the governing shaft U endwise far enough to bring the pin 49 thereon into alignment with the notch 47

in the sleeve V. This movement of the governing shaft causes the actuating device 20 thereon to be interlocked with the clutch shifting member R, and when the controlling lever is rocked in a direction to carry the pin 49 into the notch 47 in the sleeve V, the clutch shifting member R moves the driving clutch member 8 into engagement with the driven clutch member 9, thus causing the nut K to revolve and travel upwardly on the stationary screw or worm J. When the seat reaches the desired height the controlling lever is rocked in a direction to restore the clutch shifting member R to neutral position, and if it is desired to lower the seat the controlling lever is rocked in the opposite direction so as to arrange the pin 49 on the governing shaft in the notch 47^a in the sleeve V, this rocking movement of the governing shaft causing the clutch shifting member R to move the driving clutch member 8^a into engagement with the driven clutch member 9^a. When the seat reaches the desired position the controlling lever is again restored to its normal upright position, thus causing the clutch shifting member R to be returned to its normal neutral position. Whenever it is desired to change the position of the back of the chair, the controlling lever is manipulated so as to move the governing shaft endwise far enough to arrange the pin 49 in alignment with the notches 48 and 48^a at opposite sides of the elongated slot 45 in the sleeve V, this longitudinal movement of the governing shaft disengaging the actuating device 20 thereon from the clutch shifting member R and causing the actuating device 21 to be interlocked with the clutch shifting member S. When said actuating device 21 is interlocked with the clutch shifting member S the rocking movement of the governing shaft in a direction to position the pin 49 in the notch 48 causes the driven clutch member 16^a to be engaged with the driving clutch member 15^a, thus causing the screw or worm L to revolve in a direction to recline the back, and when said governing shaft is rocked in a direction to carry the pin 49 into the notch 48^a in the sleeve V, the clutch shifting member S will move the driven clutch member 16 into engagement with the driving clutch member 15, and thus cause the worm L to revolve in a direction to move the back into its upright position. In the event the operator fails to manually move the controlling lever into its upright position when the seat of the chair reaches its extreme depressed position or elevated position, or when the back reaches its extreme reclined position or upright position, the governing shaft U is rocked automatically by the means previously described so as to trip the clutch which

is then operative, thereby preventing injury to the operating mechanism of the chair.

In order that the chair will not have numerous loose wires or flexible conductors that might interfere with the raising or lowering of the seat or revolving the seat, or interfere with the movement of the back relatively to the seat, I attach a collector ring insulator W to the underside of the casing P on the seat frame, as shown in Figure 3, and provide said insulator with two collector rings 50 and 50^a that co-operate with vertically-disposed conductor bars 51 and 51^a that are reciprocatingly mounted in the pedestal of the chair and arranged in sliding engagement with contacts 52 and 52^a in the pedestal to which electric supply wires 53 and 53^a are connected, the exposed portions of said conductor bars being covered with insulating material and each of said bars being provided at its upper end with a shoe or brush that acts on one of the collector rings carried by the insulator W. One of the collector rings is connected by a wire 54 with the motor I, and the other collector ring is connected by a wire 54^a with one of the stationary contacts 39 of the controlling switch, the other stationary contact of said switch being connected by a wire 54^b with the motor. The conductor bars 51 and 51^a are mounted in the pedestal A of the chair and are combined with the collector rings in such a way that they will move vertically in said pedestal when the seat frame is raised and lowered, and the shoes or brushes at the upper ends of said conductor bars are combined with the collector rings in such a way that the seat frame can be revolved without disturbing the electrical connection between the supply wires of the energizing circuit and the contacts of the switch in the motor circuit.

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

1. A chair provided with a seat, a back, a mechanical means for moving the back relatively to the seat comprising two co-operating threaded devices arranged so that movement imparted to one device causes the other device to actuate the back, a primary driving means, a motor for operating said driving means, and means under control of the operator in charge of the chair for connecting and disconnecting said mechanical means to and from said driving means.

2. A chair provided with a seat, a back, a mechanical means for actuating said back comprising two co-operating threaded devices arranged so that movement imparted to one device causes the other device to actuate the back, a primary driving means,

a motor for operating said driving means, and two devices under control of the operator in charge of the chair, one of which is adapted to be actuated to connect said mechanical means with said driving means to cause the back to move downwardly and the other adapted to be actuated to connect said mechanical means with said driving means to cause the back to move upwardly.

3. A chair provided with a seat, a back, a mechanical means for actuating said back comprising two co-operating threaded devices arranged so that movement imparted to one device causes the other device to actuate the back, a primary driving means, a motor for operating said driving means, and a manually-operable means for connecting said mechanical means with said driving means to effect the movement of the back in one direction, said mechanical means being so constructed that it will be automatically disconnected from said driving means in the event the operator fails to actuate said manually-operable device when the back reaches its limit of movement in one direction.

4. A chair, comprising a seat, a back, a rotatable screw, a traveling nut on said screw for moving the back relatively to the seat, a primary driving means comprising two rotatable elements that revolve in the same direction, and means for enabling said screw to be connected with one of said elements when it is desired to recline the back and connected with the other of said elements when it is desired to straighten the back or arrange it in its upright position.

5. A chair, comprising a seat, a back, a rotatable screw, a traveling nut on said screw for moving the back relatively to the seat, a primary driving means comprising two rotatable elements that revolve in the same direction, clutch members splined to said screw for connecting same with said rotatable elements, and a manually-operable clutch shifting device for moving and governing the position of said clutch members.

6. A chair, comprising a seat, a back, a rotatable screw, a traveling nut on said screw for moving the back relatively to the seat, a primary driving means comprising two rotatable elements that revolve in the same direction, clutch members splined to said screw for connecting same with said rotatable elements, and a manually-operable clutch shifting device for moving and governing the position of said clutch members, said nut being so arranged that it will engage said clutch shifting member and move it in a direction to disconnect said screw from said driving means in the event the operator fails to move said clutch shifting member after the back reaches its extreme limit of movement.

7. A chair, comprising a seat, a back, a mechanical means for actuating said back comprising two co-operating threaded devices, one of which serves to drive the other and thus cause it to actuate the back, clutches associated with said driving device, a primary driving means, an element for shifting said clutch members into and out of engagement with said primary driving means to effect the movement of the back in opposite directions, and a manually-operable member for moving said clutch shifting element, said mechanical means being so constructed that the clutch shifting element will be moved automatically after the back reaches a certain position so as to automatically disconnect said mechanical means from said primary driving means.

8. A chair provided with a seat, a back, an electric motor, a pair of gears operated by said motor and arranged to revolve in the same direction, a mechanical means for actuating said back comprising two co-operating threaded devices arranged so that movement imparted to one device causes the other device to actuate the back, and means whereby said mechanical means can be connected with one of said gears to move the back downwardly towards its reclined position and connected with the other gear to move the back upwardly into its upright position.

9. A chair, comprising a seat, a back, an electric motor, a pair of gears operated by said motor and arranged to revolve in the same direction, driving clutch members connected to said gears, a rotatable screw, driven clutch members splined to said screw and adapted to move into and out of engagement with said driving clutch members, a traveling nut on said screw, and means for transmitting movement from said nut to said back to move the back relatively to the seat.

10. A chair, comprising a seat, a back, a mechanical means for actuating said back comprising two co-operating threaded devices arranged so that movement imparted to one device causes the other device to actuate the back, a primary driving means, an electric motor for operating said means, and means under control of the operator in charge of the chair that is adapted to be actuated to start the motor and also connect said mechanical means with said driving means so as to move the back relatively to the seat.

11. In a chair of the kind described, the combination of two separate and distinct mechanical means, an electrically-operated primary driving means, two clutches associated with each of said mechanical means for enabling same to be connected with said primary driving means, two clutch shifting members associated with said pairs of

clutches and arranged in parallel relation to each other, a single governing shaft arranged transversely of said clutch shifting members and adapted to be moved endwise or longitudinally, and co-operating elements on said shaft and clutch shifting members arranged so that they can be brought into interlocking relation by endwise movement of said shaft.

12. In a chair of the kind described, the combination of two separate and distinct mechanical means, an electrically-operated primary driving means, pairs of clutches associated with said mechanical means for connecting the same with said primary driving means, two clutch shifting members associated with said pairs of clutches, a single governing shaft mounted on the seat frame in such a manner that it can be oscillated and also moved endwise, co-operating devices on said shaft and clutch shifting members that can be brought into interlocking relation with each other by endwise movement of said governing shaft, and a switch for controlling the circuit in which the motor of said primary driving means is arranged combined with said governing shaft in such a way that movement of said shaft in a direction to render any one of said clutches operative closes the motor circuit and movement of said shaft in a direction to render said clutch inoperative causes said switch to open the motor circuit.

13. In a chair of the kind described, the combination of two separate and distinct mechanical means, an electrically-operated primary driving means, clutches associated with said mechanical means for connecting same with said primary driving means, two clutch shifting members arranged in parallel relation, a single governing shaft arranged transversely of said clutch shifting members and adapted to be oscillated and also moved endwise, and cooperating devices on said shaft and clutch shifting members arranged so that said shaft can be con-

nected with one of said clutch shifting members by moving said shaft endwise and thereafter disconnected from said clutch shifting member and connected with the other clutch shifting member by moving said shaft endwise into a different position.

14. In a chair of the kind described, the combination of two separate and distinct mechanical means, a primary driving means, an electric motor for operating said driving means, clutches associated with said mechanical means for enabling same to be connected with said primary driving means, two clutch shifting members for rendering said clutches operative and inoperative, a single governing shaft on the seat frame, means for enabling said shaft to be connected with either of said clutch shifting members at the will of the operator in charge of the chair and then actuated to render a selected clutch operative or inoperative, and a switch for the motor circuit combined with said governing shaft in such a way that movement of said shaft in a direction to render a selected clutch operative causes the motor to start and movement of said shaft in a direction to render said selected clutch inoperative causes said motor to stop.

15. In a chair of the kind described, the combination of two separate and distinct mechanical means, a primary driving means on said seat frame, an electric motor for operating said driving means, clutches associated with said mechanical means for enabling same to be connected with said primary driving means, a single governing shaft on the seat frame for controlling said clutches arranged so that it can be oscillated and also moved endwise, a switch for controlling the circuit that energizes said motor housed within the seat frame, and means on said governing shaft for causing said switch to close the motor circuit whenever said shaft is actuated to render any one of said clutches operative.

WALTER F. KOKEN.