W. F. KOKEN.

BARBER'S CHAIR.

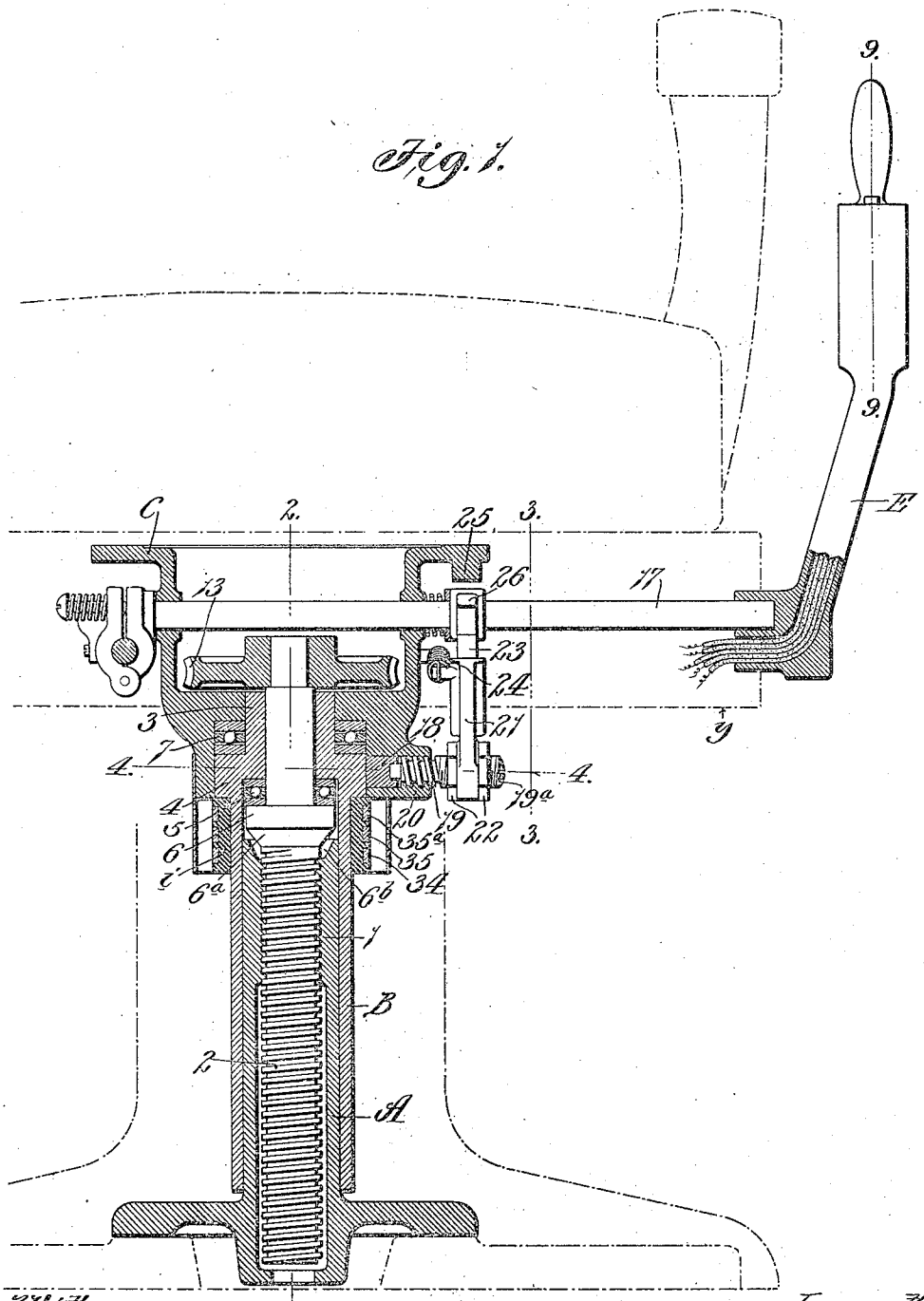
APPLICATION FILED MAR. 12, 1915.

1,242,109.

Patented Oct. 2, 1917.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

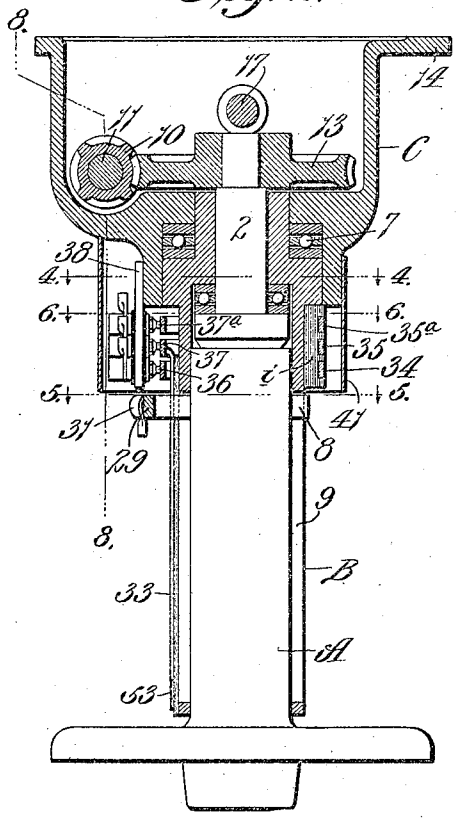


Fig. 3.

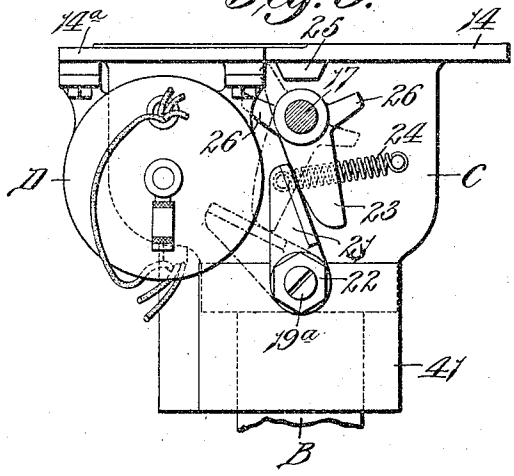


Fig. 5.

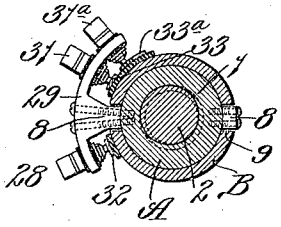


Fig. 4.

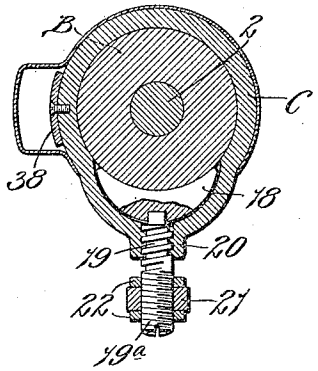
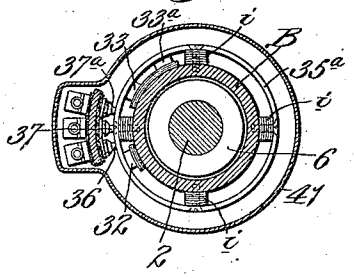


Fig. 6.



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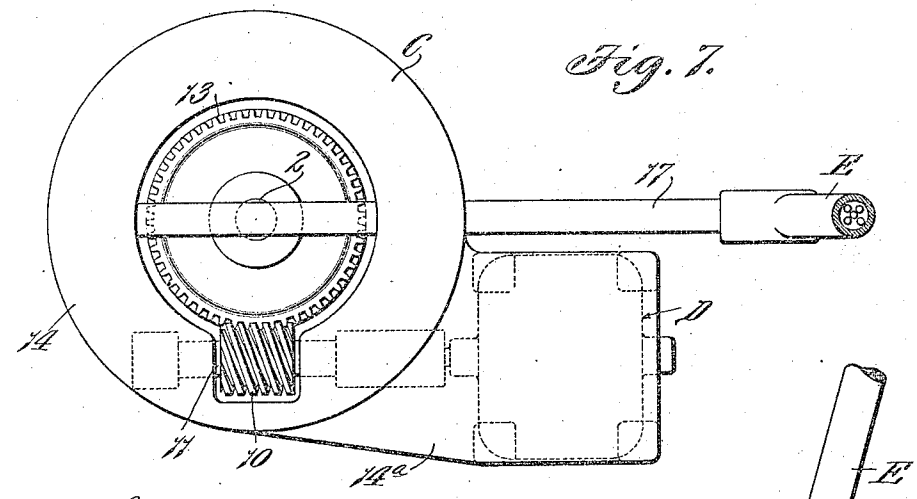
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4 SHEETS—SHEET 3.

Fig. 7.



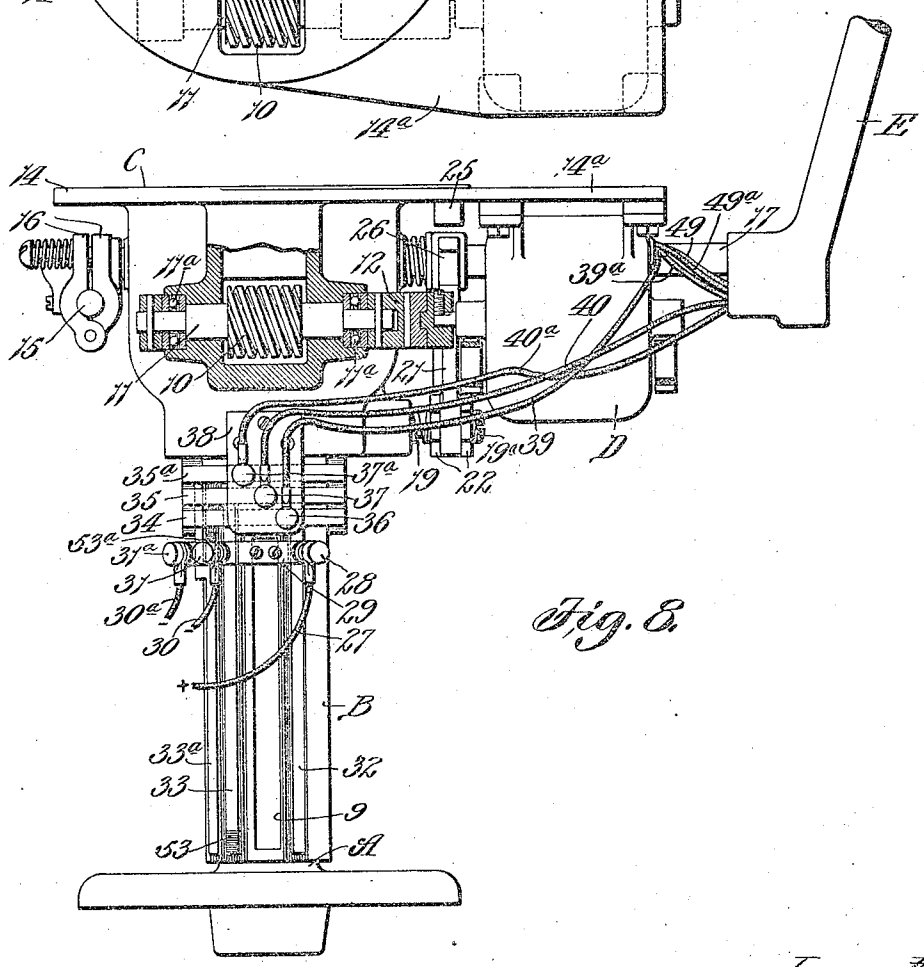


Fig. 8.

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4 SHEETS—SHEET 4.

Fig. 9.

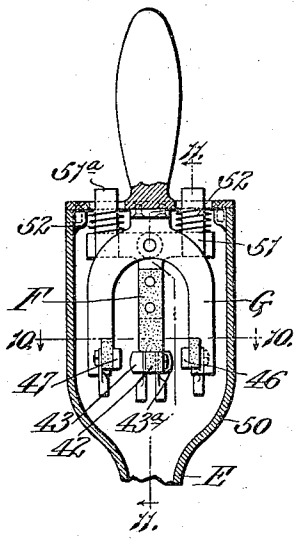


Fig. 10.

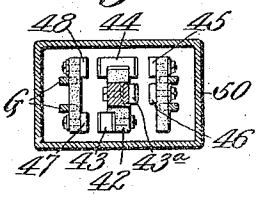


Fig. 11.

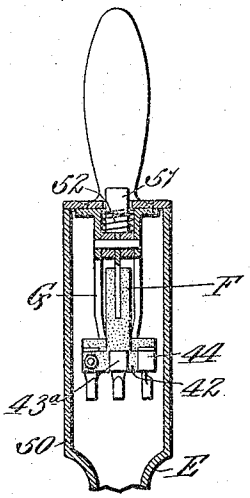
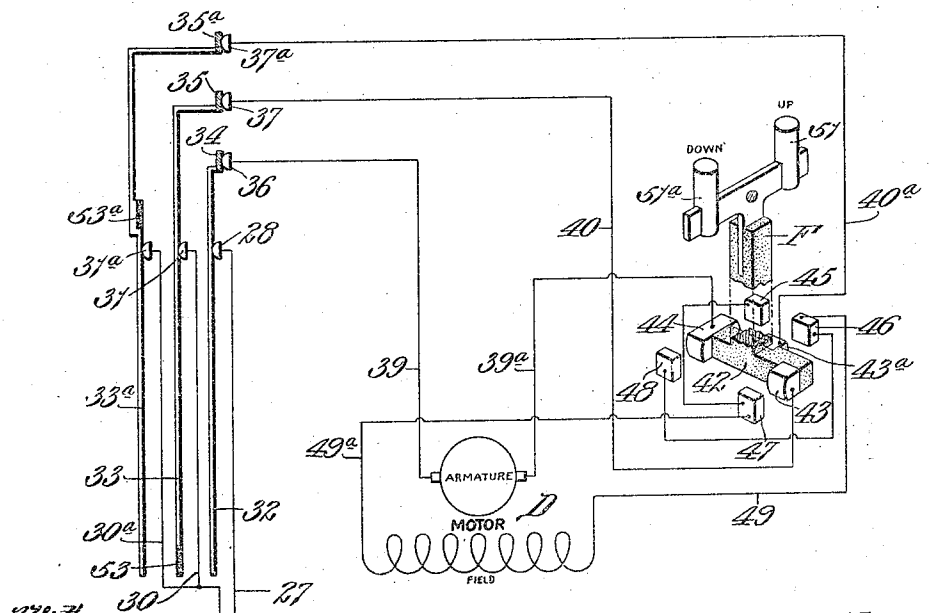


Fig. 12.



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UNITED STATES PATENT OFFICE.

WALTER F. KOKEN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO KOKEN BARBERS' SUPPLY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BARBER'S CHAIR.

1,242,109. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed March 12, 1915. Serial No. 14,043.

To all whom it may concern:

Be it known that I, WALTER F. KOKEN, a citizen of the United States, residing at St. Louis, 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 adjustable chairs of the type that are used by barbers, dentists and other specialists and which comprise a vertically adjustable seat that can be raised and lowered.

One object of my present invention is to provide a chair of the general type mentioned, in which the seat is moved positively, both upwardly and downwardly, by means of a member which is actuated by an electrically-operated mechanism.

Another object is to provide a chair of the character just referred to, which is so designed that the seat can be stopped at any point within its limit of movement during the operation of raising or lowering the seat.

Another object is to provide an electrically-operated barber's chair of novel design, in which the devices for controlling the vertical adjustment of the seat are carried by a hand lever that controls the reclining bar clamp and also the locking device that holds the seat against rotary movement.

Another object is to provide an electrically-operated chair which comprises means for automatically cutting off the supply of electric current when the seat of the chair reaches its upward or downward limit of movement.

Another object is to provide a barber's chair that comprises a locking device of novel construction for holding the seat of the chair against rotary movement.

And still another object is to provide a practicable barber's chair that comprises a motor-driven screw for raising and lowering the seat, the chair being so designed that friction in the operating mechanism and side thrusts on the raising and lowering screw are reduced to a minimum. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a vertical sectional view of a chair-operating mechanism constructed in accordance with my invention that is particularly adapted for barbers' chairs, the seat and seat frame of the chair being shown in broken lines.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a side elevational view, taken on the line 3—3 of Fig. 1, illustrating certain parts of the mechanism for locking the seat of the chair against rotary movement.

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 2.

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 2.

Fig. 7 is a top plan view of the operating mechanism illustrated in Fig. 1.

Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig. 2.

Fig. 9 is a vertical sectional view taken on the line 9—9 of Fig. 1.

Fig. 10 is a horizontal sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a vertical sectional view taken on the line 11—11 of Fig. 9; and

Fig. 12 is a diagrammatic view, illustrating the electrical connections between the pole-changing switch, the motor and the co-operating conductor bars, contact rings and brushes that bear upon the contact rings.

Referring to the drawings, which illustrate the preferred form of my invention, A designates the standard of my improved chair, which consists of a vertically disposed, tubular-shaped member open at its upper end and provided with an internally screw-threaded portion 1 that receives an operating screw 2 which is rotatably mounted in a hollow stem B that surrounds the standard A, said standard A being carried by the pedestal of the chair, as indicated by broken lines in Fig. 1. The seat frame *y*, shown in broken lines in Fig. 1, carries a member C which is rotatably mounted on the stem B, and an electrically-operated mechanism hereinafter described is employed for rotating the operating screw 2 in one direction so as to raise said seat frame and for rotating said screw in the opposite direction so as to lower the seat frame. The stem B slides vertically on the standard A, and at the upper end of said stem is a vertically-disposed, tubular-shaped

bearing 3 in which a non-threaded portion of the operating screw 2 is journaled, as shown in Fig. 1. The member C of the seat frame has a portion that surrounds the bearing 3 on the stem and also a portion that surrounds a horizontally-disposed flange 4 on the stem B which sustains the weight of the seat frame. The weight or load on the stem B is sustained or carried by the operating screw 2 and the weight or load on said operating screw is sustained or carried by the coöperating screw threads on the screw 2 and on the internally screw-threaded portion 1 of the standard A. In order to reduce the friction between the various coöperating members just described I arrange a thrust bearing 5 between a horizontally-disposed flange 6 on the operating screw 2 and an oppositely-disposed bearing surface on the stem B, and I also arrange a thrust bearing 7 between the member C and the flange 4 at the upper end of the stem B. By constructing the chair in this manner I insure a free movement of the operating screw and also free rotary movement of the member C that carries the seat frame. If desired, the flange 6 on the operating screw can be provided on its underside with a tapered portion 6^a, shown in Fig. 1, that fits in a tapered seat 6^b in the upper end of the standard A when the seat of the chair is in its lowest position, thus relieving the strain on the coöperating threads on the screw 2 and on the internally screw-threaded portion of the standard A. The stem B reciprocates longitudinally of the standard A, but it is prevented from rotating relatively to said standard by means of one or more blocks or other suitable devices 8 on the standard A that project laterally through vertically-disposed elongated slots 9 in the stem B.

The means for actuating the screw 2 consists of an electric motor D carried by the member C, a worm 10 on a shaft 11, which is coupled to the shaft of the motor D, preferably, by means of a flexible coupling 12, shown in Fig. 8, and a worm gear 13 meshing with the worm 10 and securely connected to the upper end of the operating screw 2, as shown in Fig. 1, the teeth on said worm gear and the coöperating threads on the worm 10 being of such pitch that the worm 10 can turn freely, or, in other words, travel around the periphery of the worm gear 13 when the member C is rotated, without causing the operating screw 2 to turn in the standard A. In the chair herein shown the electric motor D is connected to the underside of a laterally-projecting extension 14^a on a horizontally-disposed flange 14 at the upper end of the member C, and thrust bearings 11^a are combined with the shaft 11 to take up the end thrusts on the worm 10. When the motor D turns in one direction the operating screw 2 will cause the seat frame of the chair to move upwardly, and when said motor turns in the opposite direction said operating screw will cause the seat frame to move downwardly, thus providing an electrically-driven means for raising the seat of the chair positively both upwardly and downwardly and also enabling the seat to be stopped at any point intermediate its highest and lowest position by simply stopping the motor D. The hollow stem B forms a housing that incases the operating screw when the seat of the chair is in its elevated position, and at all times said stem coöperates with the standard A to reduce the side thrusts on the operating screw.

The chair is provided with a reclining back and an adjustable apron which have not been illustrated in the drawings, as they are of standard construction, said back and apron being held in adjusted position by means of a reclining bar 15 that passes between clamping plates 16 which are preferably of similar design to the clamp illustrated in U. S. Patent #954,524 to E. E. Koken, dated April 12, 1910. Said clamping plates 16 are rendered inoperative so as to release the reclining bar 15 by means of a horizontally-disposed shaft 17 that is mounted in the member C and which is provided at its outer end with a controlling handle or lever E. When said handle E is moved in one direction away from its normal neutral position the reclining bar 15 will be released, thereby enabling the back and the apron of the chair to be adjusted, and when said controlling handle E is moved in the opposite direction away from its neutral position, a locking device that holds the seat frame of the chair against rotary movement will be rendered inoperative.

The locking device of the chair herein illustrated, which prevents the seat frame from rotating, is of novel construction and consists of a segmental clamping shoe 18 in the member C that bears against the periphery of the flange 4 on the stem, as shown in Figs. 1 and 4. Said clamping shoe 18 is moved horizontally into and out of engagement with the stem B by means of a horizontally-disposed screw 19 mounted in an internally screw-threaded bearing 20 at the lower end of the member C and having its inner end swiveled in the clamping shoe 18. A lever 21, which is adjustably connected to a screw-threaded extension 19^a on the screw 19 by means of two lock nuts 22 arranged on opposite sides of said lever, coöperates with a depending arm 23 on the shaft 17 to turn the screw 19 in such a direction that the clamping shoe 18 will be moved out of engagement with the stem B. When the shaft 17 is restored to its normal neutral position a spring 24 that is connected to the

upper end of the lever 21 will turn the screw 19 in the opposite direction, or, in other words, back to its former position, and thus cause the clamping shoe 18 to be forced tightly into engagement with the periphery of the flange 4 on the stem B. By loosening the nuts 22 and changing the position of the lever 21 on the extension 19ª of the screw 19 the frictional pressure of the clamping shoe 18 on the stem B can be varied, thereby enabling the clamping shoe to be adjusted to compensate for wear. A stationary stop 25 that coöperates with two lugs 26 on the upper end of the arm 23, as shown in Fig. 3, limits the movement of the shaft 17 in both directions when said shaft 17 is actuated to release the reclining bar clamping plates and to release the shoe 18 that holds the seat of the chair against rotary movement.

The electric current that energizes the motor D is controlled by a pole-changing switch which is preferably arranged in the handle E so as to enable all of the adjustments or movements of the chair to be controlled easily from a single point by one hand of the person in charge of the chair. The conductors of the supply circuit lead to binding posts that are mounted on the standard A of the chair and which are provided with contacts that bear against vertically-disposed conductor bars carried by the vertically adjustable stem B of the chair. Each of said conductor bars is electrically connected at its upper end to a contact ring mounted on the stem B, and the member C on the seat frame of the chair which revolves about the stem B is provided with brushes that always remain in engagement with said contact rings. Flexible conductors lead from binding posts on said brushes to the motor D and to the pole-changing switch in the handle E, and flexible conductors also lead directly from the motor to said pole-changing switch. The chair is preferably so designed that the supply of electric current will be cut off automatically when the seat frame reaches its upper and lower limits of movement by means of current-interrupting insulators on the vertically-disposed conductor bars on the stem B of the chair. In order that the motor D may be started without first shifting the position of the current-interrupting insulator that caused the current to be cut off automatically, I have split one side of the supply circuit into two parts, each of which coöperates with a separate set of conductor bars, contact rings and brushes, and have arranged the current-interrupting insulators in such a manner that the energizing circuit can be closed after the seat has been stopped automatically by the action of one of said insulators, by simply actuating the pole-changing switch in the handle E. As shown in Fig. 8, the positive side of the supply circuit is connected by means of a flexible conductor 27 to a binding post 28 carried by a segmental-shaped bracket 29 that is secured to one of the laterally-projecting guide blocks 8 on the standard A of the chair, as shown in Fig. 5. The negative side of the supply circuit is split and is connected by means of two flexible conductors 30 and 30ª with binding posts 31 and 31ª, respectively, on the bracket 29. The binding posts 28, 31 and 31ª are provided with contacts that bear upon vertically-disposed conductor bars 32, 33 and 33ª, respectively, carried by the stem B and having their upper ends securely connected to contact rings 34, 35 and 35ª, respectively, that are embedded in strips *i* of insulating material connected to the stem B at a point just below the horizontally-disposed flange 4 adjacent the upper end of said stem. Three brushes 36, 37 and 37ª, which bear upon the contact rings 34, 35 and 35ª, respectively, as shown in Figs. 2 and 6, are connected to the member C of the seat frame in such a manner that they will travel over said contact rings when the seat of the chair is revolved. In the chair herein shown said brushes are carried by a plate 38 that is carried by and which projects downwardly from the lower end of the member C on the seat frame, each of said brushes being provided with a binding screw to which a flexible conductor is connected. The brush 36 on the positive side of the supply circuit is connected by means of a flexible conductor 39 to the armature of the motor D, and the two negative brushes 37 and 37ª of the supply circuit are connected by means of flexible conductors 40 and 40ª to the pole-changing switch in the handle E of the chair. If desired, a housing 41 can be mounted on the lower end of the member C, as shown in Fig. 2, so as to protect the contact rings, the brushes and the binding posts on said brushes just referred to.

The pole-changing switch mounted in the handle E of the chair is of novel design and consists of a rockable member F having a vertically-disposed shank which is provided at its lower end with a cross piece 42 which carries two negative contacts 43 and 43ª and a positive contact 44. A positive conductor 39ª which leads from the armature of the motor is connected to the positive contact 44 of the switch, as shown in Fig. 12, and the two negative conductors 40 and 40ª are connected to the negative contacts 43 and 43ª, respectively, of said switch. Said switch comprises four stationary contacts designated by the reference characters 45, 46, 47 and 48, which are so arranged with relation to the movable member F of the switch that the positive contact 44 and the negative contact 43 on said member F will engage the stationary contacts 48 and 47,

respectively, when said member F is in one position, and the positive contact 44 and negative contact 43ª on said member will engage the stationary contacts 45 and 46, respectively, when said member F is in its other position. One end of the field of the motor D is connected by means of a conductor 49 to the stationary contacts 46 and 48 of the switch and the other end of said field is connected by means of a conductor 49ª to the stationary contacts 45 and 47 of of said switch, as shown diagrammatically in Fig. 12. The stationary contacts 45, 46, 47 and 48 are carried by a forked supporting member G on which the movable member F is pivotally mounted in such a manner that the cross piece 42 at the lower end of its shank will be positioned intermediate the portions of the stationary member G that carry the contacts 45, 46, 47 and 48, when the member F is in its neutral position, as shown in Fig. 9. The supporting member G of the switch is arranged inside of a housing 50 at the upper end of the handle E, and the movable member F is provided with two operating buttons 51 and 51ª that are arranged on opposite sides of the axis of oscillation of the member F and which project upwardly through openings in the top wall of the housing 50, as shown in Fig. 9. Coiled springs 52 that surround said operating buttons and which are arranged between the top wall of the housing 50 and the portion of the member F that carries said buttons operate to normally hold the member F in its neutral position shown in Figs. 9 and 12. When the button 51 is depressed the motor D will operate in the direction to cause the operating screw 2 to move the seat frame of the chair upwardly, the seat frame coming to rest as soon as the operator releases the button 51. If it is desired to lower the seat of the chair the operator depresses the button 51ª, thereby causing the motor D to rotate in the opposite direction and cause the operating screw 2 to move the seat frame downwardly, the seat coming to rest as soon as the operator releases the button 51ª. It will thus be seen that the seat of the chair can be stopped at any point intermediate its highest and lowest positions during the operation of raising or lowering the seat, by simply releasing the button that was depressed to cause the motor D to operate. In order that the seat of the chair will come to rest automatically when it reaches its extreme upper or lower position, I have provided means for automatically cutting off the supply of current that energizes the motor D when the seat reaches its highest or lowest position, in case the person in charge of the chair fails to release the controlling button after the seat has reached its extreme limit of movement in either direction. The means that I prefer to use for this purpose consists of a current-interrupting insulator 53 arranged at the lower end of the conductor bar 33 and a similar insulator 53ª arranged at the upper end of the conductor bar 33ª. When the contact that bears upon the conductor bar 33ª strikes the insulator 53ª, during the downward movement of the seat, the circuit that energizes the motor D will be opened automatically, and thus cause the motor and the operating screw 2 to come to rest. One branch of the negative side of the supply circuit is broken or out of service when the contact that coöperates with the conductor bar 33ª is in engagement with the current-interrupting insulator 53ª, but the other branch of the negative side of said supply circuit is in operative condition, owing to the fact that the contact that coöperates with the conductor bar 33 is then in engagement with said bar. Consequently, when the operator depresses the button 51 the circuit that energizes the motor D will be closed and the seat frame will start to move upwardly. When the seat frame reaches its upper limit of movement the contact that cooperates with the conductor bar 33 will engage the current-interrupting insulator 53, and thus automatically break or open the supply circuit.

In a chair of the construction above described the seat frame is moved positively, both upwardly and downwardly, by means of a screw 2 or other suitable operating device that is actuated or driven by an electric motor. The seat can be stopped at any point between its extreme upper and lower limits of movement by simply releasing the controlling button that was depressed to cause the seat to move, and in view of the fact that the seat starts to move as soon as one or the other of the controlling buttons is depressed, the seat can be adjusted quickly in both directions and also adjusted accurately. All of the movements of the chair are controlled from a single point by one hand of the operator, owing to the fact that the switch that controls the electric circuit which energizes the motor is mounted in the handle E of the chair, which handle causes the reclining bar clamping mechanism to be released when it is moved in one direction and causes the stem B to be released from the clamping shoe 18 when said handle is moved in the other direction. The motor D is mounted on the seat frame of the chair and the various conducting members that are interposed between the switch and motor and the main supply conductors are so arranged that the seat can be raised and lowered and also revolved without liability of any of said conducting members becoming tangled, broken or rendered inoperative. The fact that the chair is provided with means for automatically breaking the sup-

ply circuit, in case a careless operator fails to actuate the controlling switch properly, eliminates the possibility of the operating mechanism becoming broken or injured by reason of inattention on the part of the operator when the seat is being raised or lowered; and still another desirable feature of such a chair is that the coöperating parts of the operating mechanism are so constructed and arranged that friction is reduced to a minimum and the operating screw 2 that raises and lowers the seat frame is not subjected to excessive side thrusts or strains. The means for locking the seat frame against rotary movement is of simple construction and is very efficient, in view of the fact that it comprises a segmental-shaped clamping shoe that is moved positively into engagement with the stem B of the chair by means of an oscillating screw. Furthermore, said locking mechanism is so designed that it can be adjusted to compensate for wear on the clamping shoe or on the stem of the chair. While I have illustrated this improved locking device in combination with an electrically operated chair that comprises a screw for raising and lowering the seat, I wish it to be understood that said locking device is applicable to various other types of barbers' chairs and is not limited to use with a chair of the particular construction herein illustrated.

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

1. A chair, comprising a hollow standard provided with an internally screw-threaded part, an operating screw mounted in said part, a hollow stem snugly embracing said standard and supported by said screw, a load supporting member revolubly mounted on said stem and having a hollow portion that acts as a housing, mechanism arranged inside of said housing for rotating said screw, and a motor suspended from said load-supporting member for operating said mechanism.

2. A chair of the character described, provided with a standard, a stem that snugly surrounds said standard, an operating screw sustained by said standard and journaled in said stem, an end thrust bearing interposed between coöperating horizontally-disposed surfaces on said screw and stem, a seat frame provided with a hollow member that is revolubly mounted on said stem, an end thrust bearing interposed between said revoluble member and said stem for reducing the friction between said parts, an electric motor suspended from a laterally-projecting portion on said hollow member, and means arranged inside of said hollow member and operatively connected to said motor for driving said screw.

3. A chair, comprising a hollow standard provided with a screw-threaded portion, an operating screw mounted in said part and provided at its upper end with a non-threaded portion and a flange, a hollow stem snugly embracing said standard and sustained by said flange, a load-supporting member revolubly mounted on said stem and provided with an opening through which the upper portion of said stem passes, mechanism arranged inside of said load-supporting member for actuating said screw, and a motor carried by said load-supporting member for operating said mechanism.

4. A barber's chair, comprising a vertically adjustable cylindrical part, a member on the seat frame of the chair that is revolubly mounted on said part, a segmental clamping shoe on said member that bears against said cylindrical-shaped part and thus holds the seat frame against rotary movement, a screw-threaded device arranged in a screw-thread on said member for moving said clamping shoe into and out of operative position, a resilient means for turning said device in one direction, and a manually-operated means for turning said device in the opposite direction.

5. A barber's chair, comprising a vertically adjustable part having a circular-shaped portion, a member on the seat frame of the chair that is revolubly mounted on the top face of said portion, a clamping shoe on said member that bears against the edge of said circular-shaped portion and thus holds the seat frame against rotary movement, a screw-threaded device mounted in an internally screw-threaded hole in said member for moving said clamping shoe into and out of operative position, a resilient means which normally holds said device in such a position that said clamping shoe is pressed tightly against the part with which it coöperates, and an independent means for actuating said device so as to release the clamping shoe.

6. A barber's chair, comprising a vertically adjustable part, a member on the seat frame of the chair that is revolubly mounted on said part, a segmental clamping shoe on said member that bears against a cylindrical shaped portion on said part and thus holds the seat frame against rotary movement, a screw-threaded device in said member for moving said clamping shoe into and out of operative position, a lever connected to said device, a manually operated rock shaft mounted in said member and provided with a part that engages said lever so as to turn said device in one direction, and means connected to said lever for restoring said device to its former position when said rock shaft is restored.

7. A barber's chair provided with a standard, a stem reciprocatingly mounted on said standard, a seat frame provided with a mem-

ber that is revolubly mounted on said stem, an operating screw combined with said stem and passing through an internally screw-threaded part in said standard, an electric motor, an operating mechanism on the seat frame for actuating said screw, a bracket on said standard provided with contacts to which supply conductors are connected, vertically-disposed conductor bars on said stem on which said contacts slide, contact rings connected to said conductor bars, brushes on said seat frame member that travel on said contact rings, and conductors leading from said brushes to said motor.

8. A barber's chair provided with a standard, a stem reciprocatingly mounted on said standard, a seat frame provided with a member that is revolubly mounted on said stem, an operating screw combined with said stem and passing through an internally screw-threaded part in said standard, an electric motor, an operating mechanism on the seat frame for actuating said screw, a bracket on said standard provided with contacts to which supply conductors are connected, vertically-disposed conductor bars on said stem on which said contacts slide, contact rings connected to said conductor bars, brushes on said seat frame member that travel on said contact rings, conductors leading from said brushes to said motor, the negative side of the supply circuit being split and each branch of same being connected to a separate contact that coöperates with an independent conductor bar, current-interrupting insulators in the conductor bars on the negative side of the supply circuit, and a pole-changing switch for controlling the current that energizes said motor.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 8th day of March, 1915.

WALTER F. KOKEN.

Witnesses:
EDGAR W. MEIER,
LEWIS E. MOORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."