E. W. HEDBERG.

CHAIR.

APPLICATION FILED MAR. 2, 1915.

1,228,434.

Patented June 5, 1917.

Fig. 1.

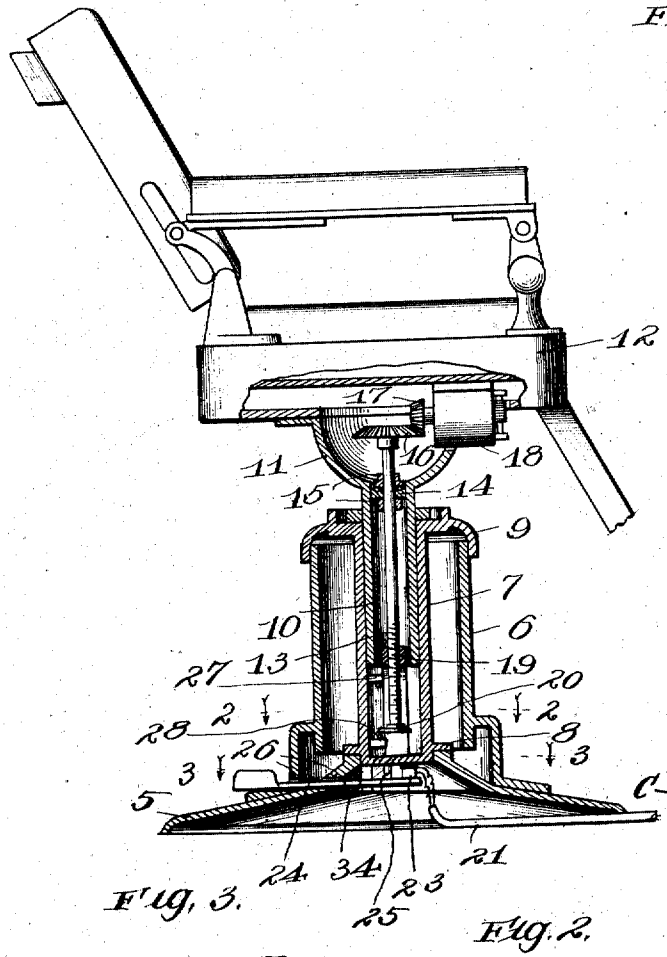


Fig. 3.

Fig. 2.

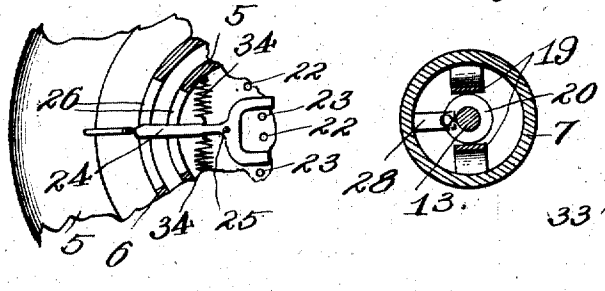
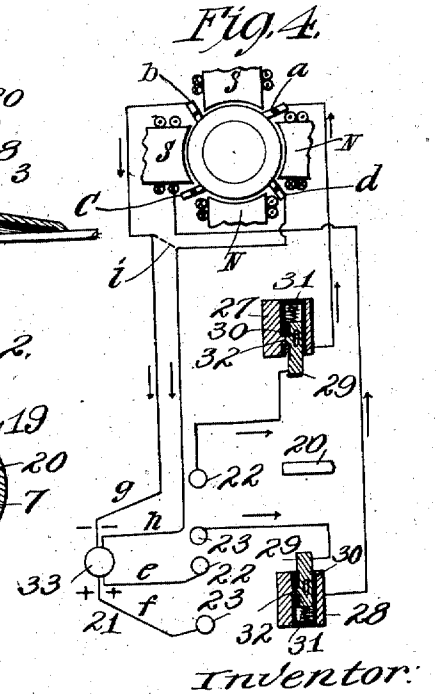


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD W. HEDBERG, OF CHICAGO, ILLINOIS.

CHAIR.

1,228,434. Specification of Letters Patent. Patented June 5, 1917.

Application filed March 2, 1915. Serial No. 11,529.

To all whom it may concern:

Be it known that I, EDWARD W. HEDBERG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Chairs, of which the following is a specification.

This invention relates to chairs of the character used by barbers, dentists and others, wherein the seat of the chair is mounted for rotation and also for up-and-down movement with relation to the base.

One of the objects of the invention is to produce improved means for moving the seat, by which the vertical movement of the seat, either rising or falling, may be stopped at any desired point to suit the wish of the operator.

Another object is to simplify and improve the construction of chairs of this character.

In the accompanying drawings, Figure 1 is a view partially in side elevation and partially in central section illustrating a chair embodying the features of my invention. Fig. 2 is a horizontal section on a slightly enlarged scale taken in the plane of line 2—2 of Fig. 1. Fig. 3 is a section in the plane of line 3—3 of Fig. 1. Fig. 4 is a diagrammatic view illustrating the manner of electrically connecting the switch contacts, the motor and the circuit breakers, the latter being shown in detail in this view.

I will herein describe the preferred embodiment of my invention, but it should be understood that I do not thereby intend to limit myself to the precise details of construction shown in the drawings, but aim to include all modifications falling within the scope of my invention as defined in the appended claims.

The chair comprises a base which is shown as composed of three parts, to-wit, the lower flaring part 5 which rests upon the floor, an upper outer tubular part 6 resting on said lower part, and an inner tubular guide or cylinder 7 positioned centrally within the part 6, the lower end extending into a central opening in the lower part 5 and having a flange 8 which rests on said lower part. At the upper end of said tubular guide is an outwardly and downwardly extending flange 9 which telescopes over the upper end of the outer part 6.

Within the tubular guide 7 is a coöperating tubular post or plunger 10 which is vertically slidable, said plunger having a flared upper end 11 which is rigidly secured to the underside of the seat 12 of the chair. A vertical screw-threaded shaft 13 is located within the plunger 10, being rotatable in a bearing 14 in said plunger and having ball-bearing collars 15 fixed thereon above and below said bearing. On the upper end of this shaft is fixed a bevel pinion 16 which meshes with a bevel pinion 17 fixed on or connected to the armature shaft of a motor 18, which is suitably fixed to the underside of the chair seat. This motor is of the reversible type and is adapted to be run in opposite directions to raise and lower the seat, as will be presently explained.

The lower end of the shaft 13 is threaded into a bearing member 19 which may be of inverted U shape, the shaft passing through the base of the U and the arms of the U extending downwardly and being bent outward at their lower ends which rest upon the bottom of the tubular guide 7 of the base. The upper end of this bearing member is adapted to be received in the lower end of the plunger 10 and said member is arranged to give or yield to prevent any binding of the parts.

Rigidly fixed on the lower end of the screw shaft 13 concentric therewith is a circular head 20. It will be understood that the screw shaft moves up and down along with the plunger 10 and the chair seat, and at the upper and lower limits of movement of these parts the head 20 is carried into engagement with a pair of circuit breakers to be presently described.

The electric current to drive the motor 18 is supplied through a cable or conduit 21, part of the wires therein being attached to two pairs of contacts 22 and 23 which are mounted upon and insulated from the lower end of the tubular guide 7. A foot lever 24 is pivoted at 25 to swing in a horizontal plane, one end of said lever passing through slots 26 in the base elements and having its outer end upturned or twisted to facilitate engagement of the lever by the operator's foot. The inner end of the lever is forked to provide two arms which are adapted to bridge the respective pairs of contacts 22 and 23. These pairs of contacts are connected by suitable wires in the manner indicated in Fig. 4, with the motor 18 through two circuit breaker devices 27 and 28 as previously mentioned. These two devices are fixed to the inner wall of the tubular guide

7 at a point below the lowermost position of the plunger 10 and respectively above and below the head 20 on the screw shaft 13, as shown in Fig. 1. Each of said devices comprises a body having an opening therein in which a switch member 29 is vertically slidable, said member having a pin-and-slot connection 30 with the body and being normally pressed outwardly by a coiled spring 31. Two lugs 32 fixed respectively on the body and the switch member are arranged to contact with each other when the switch is in its outermost position. The opening in the body is lined with insulating material so that the switch member 29 cannot come into electrical contact with the body except through the lugs 32.

Referring more specifically to the manner of wiring these parts, as shown in Fig. 4, the reference numeral 33 indicates an ordinary lamp socket which constitutes the source of power, said socket being connected with one of the contacts 22 and 23 and the motor. One of the contacts 22 is connected directly to the socket and its complementary contact is connected to the switch member 29 of the upper circuit breaker, the body of the latter being connected to the motor, so that when the switch member 29 is in its normal position the circuit will be complete when the lever 24 bridges the contacts 22. The other pair of contacts 23 are connected respectively to the socket and to the switch member of the lower circuit breaker, the body of the latter being connected to the motor. The motor armature terminals are *a*, *b*, *c* and *d*. Terminal *a* is connected to the lamp socket 33 through the normally open foot switch contacts 22, the normally closed travel limit switch 27 and the lead *e*. The terminal *c* is similarly connected to the lamp socket 33 through the contacts 23, the other limit switch 28 and the lead *f*. Terminals *b* and *d* are connected directly to the lamp socket through the leads *g* and *h*, respectively. Within the motor the terminals *b* and *d* may be connected together as shown at *i* and each terminal *a* and *c* is suitably connected to one end of the armature winding as shown in Fig. 4. Thus when the foot lever 24 is in contact with the pair of contact pieces 22, the motor armature 18 will be driven in a clockwise direction to elevate the chair seat since the current flows through the armature in one direction, and when the lever 24 is in engagement with the other pair of contacts 23, the motor armature will be driven in a counter clockwise direction to lower the seat, since the current flows through the armature in the opposite direction with respect to the field flux of the motor for the direction of the field current and consequently that of the field flux remains unchanged. Herein, I have not shown the motor field circuit since the current flowing therein is not to be reversed. It may be directly connected to the lamp socket 33 or any other suitable source of energy as desired. A pair of springs 34 acting on the lever tend to hold it in its central or neutral position in which it is in engagement with none of the contacts.

It will thus be seen that when the operator wishes to raise or lower the chair seat, it is only necessary for him to horizontally swing the lever 24 in one direction or the other with his foot and remove his foot when the chair has come to the desired elevation. In case the operator should forget to remove his foot before the seat has reached the limit of its travel, the circuit breakers 27, 28 would act to break the circuit and stop the motor, so that no damage to the parts would be occasioned.

I claim as my invention:

1. The combination of a part to be raised and lowered, a plunger rigid therewith and extending downwardly, a base having a tubular guide in which said plunger fits slidably and rotatably, a vertical screw-shaft mounted within said plunger and extending below the same, a reversible motor stationarily mounted with respect to said first-mentioned part and connected to the upper end of said vertical shaft, a bearing member in said base in which said shaft is threaded, said part, plunger, motor and shaft moving longitudinally in opposite directions as a unit when said shaft is rotated in opposite directions, a circuit for said motor, a switch device in the circuit for controlling the motor, a member mounted on the end of said shaft and longitudinally slidable therewith, and a pair of circuit breakers in said motor circuit in series with and independent of said switch device and mounted on the inner wall of said tubular guide below the lowest position of said plunger and arranged to be operated by said member at the extremities of movements of the first-mentioned parts for stopping the motor.

2. The combination of a base having a vertical tubular guide, a part having a vertical plunger slidable in said guide, a vertical screw-threaded shaft positioned within said plunger and mounted to travel therewith, a bearing on the base in which said shaft is threaded, a reversible motor carried by said part and connected to said shaft, the said part, plunger, motor and shaft moving vertically together as a unit, a circuit for said motor, an upper and a lower circuit breaker in said motor circuit and mounted on the inner wall of said tubular guide, a head rigidly fixed on the lower end of said shaft and arranged to operate said circuit breakers at the limits of movement of the said part, a switch device in series with said circuit breakers and independent thereof in series with said circuit breakers for control-

ling the motor, and suitable electrical connections for the switch device, motor, and circuit breakers.

3. The combination of a part to be raised and lowered, a plunger rigid therewith, a base having a tubular guide in which said plunger fits slidably, a screw-shaft mounted within said plunger, a reversible motor stationarily mounted with respect to said first mentioned part and connected to said shaft, a bearing member in said base in which said shaft is threaded, said part, plunger, motor and shaft moving longitudinally as a unit in opposite directions when said shaft is rotated in opposite directions, a circuit for said motor, a switch device in said circuit for controlling the motor, a member mounted on said shaft and longitudinally slidable therewith, and a pair of circuit breakers in said motor circuit in series with and independent of said switch device and arranged to be operated by said member at the extremities of movements of the first mentioned part for stopping the motor.

In testimony whereof, I hereunto set my hand in the presence of two witnesses.

EDWARD W. HEDBERG.

In the presence of—
C. PAUL PARKER,
MARGARET MANN.

Correction in Letters Patent No. 1,228,434.

It is hereby certified that in Letters Patent No. 1,228,434, granted June 5, 1917, upon the application of Edward W. Hedberg, of Chicago, Illinois, for an improvement in "Chairs," an error appears in the printed specification requiring correction as follows: Page 2, lines 129–130, claim 2, strike out the words "in series with said circuit breakers"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of June, A. D., 1917.

[SEAL.]

R. F. WHITEHEAD,

Acting Commissioner of Patents.

Cl. 172—152.