

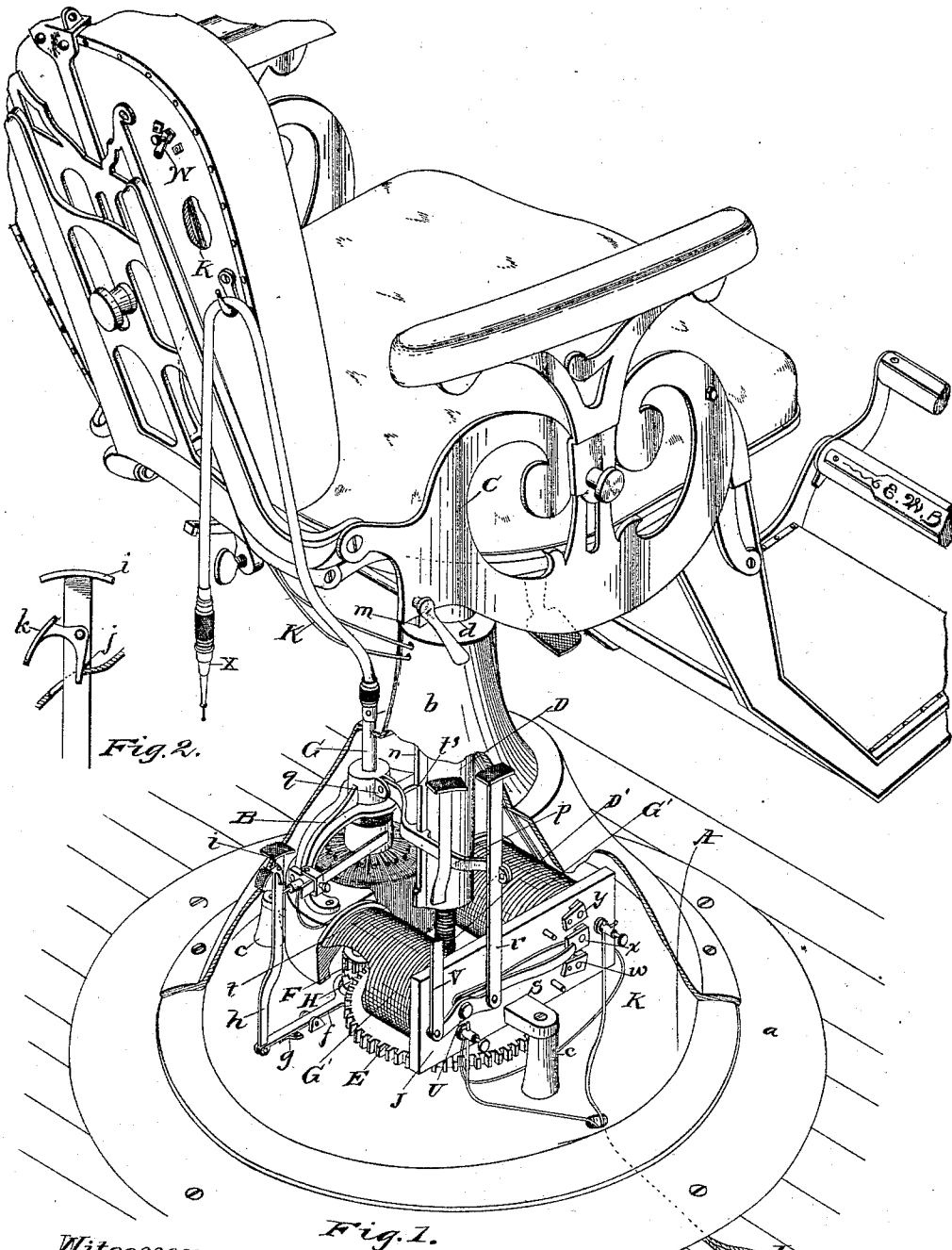
(No Model.)

2 Sheets—Sheet 1.

A. P. GOULD.  
DENTAL CHAIR.

No. 489,675.

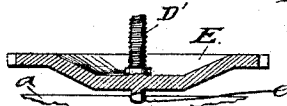
Patented Jan. 10, 1893.



Witnesses:

*E. J. Lane*  
*Chas. A. Miller*

*Fig. 3.*



*Inventor*  
*Aaron P. Gould*  
*By* *M. K. Miller*  
*Attorney.*

(No Model.)

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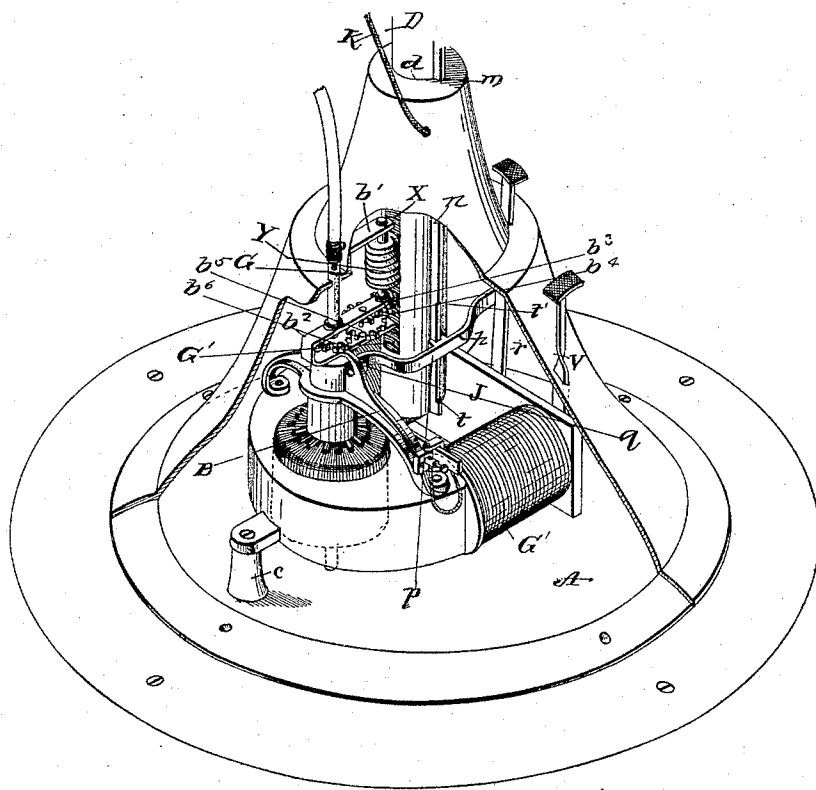


Fig. 4.

WITNESSES:

*E. S. Lane*  
*Chas. R. Miller*

*Arden P. Gould* INVENTOR

BY *W. K. Miller*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

AARON P. GOULD, OF CANTON, OHIO.

## DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 489,675, dated January 10, 1893.

Application filed February 24, 1890. Serial No. 341,379. (No model.)

*To all whom it may concern:*

Be it known that I, AARON P. GOULD, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have  
5 invented a new and useful Improvement in Dental Chairs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

10 My invention relates to an improved mechanism for raising and lowering dental chairs, and for operating dental instruments.

The object of my invention is to provide means whereby an electric motor or mechanism operated by a current or currents of electricity may be applied to operate mechanism  
15 for raising or lowering a dental chair and for actuating dental instruments.

With these ends in view my invention relates to and consists of certain features of construction and combination of parts as will be hereinafter described and pointed out in the claims.

Figure 1. of the accompanying drawings, is a view in perspective illustrating my invention. Figs. 2 and 3 are views of details, and Fig. 4. is a view in perspective of a modification showing another application of my invention.

30 The base A or support of the chair body is composed of a bottom portion *a* and an upper or cap portion *b*.

For the purpose of this application I have shown an electric motor of a well known and  
35 approved form, and as I make no claim to any part thereof, I will proceed with a description of my invention referring to the motor only as conjunctional thereto or in combination therewith.

40 The body C of the chair may be of any of the well known forms, having devices provided for rotating, tipping or rocking about and over the base, and will need no further notice or explanation.

45 On the bottom portion *a* of the base is secured an electric motor B supported by pedestals *c* as shown, the shaft G of the armature vertical, and the axes of the field magnets G'

horizontal. In the upper end portion *b* of the base A, is provided an aperture *d*, to receive 50 the chair body supporting stem D, said stem having a central longitudinal aperture, in which is provided an annular screw thread of slow pitch. A supporting screw D', is also provided having a similar screw thread adapted to be turned in the thread in the stem D, the forward and back movement of said screw to raise or lower said stem, to raise or lower the chair body. The lower end of said screw is supported in a step box *e* in the central 60 portion of bottom plate *a* of the base, and on its lower end portion is mounted a gear wheel E having peripheral teeth, that engage similar teeth on a driving pinion F, that is loosely mounted on the lower end portion of the armature shaft G, and to engage said pinion with the shaft G, a clutch H is provided having teeth to engage similar teeth on the lower face of said pinion. The clutch is held in engagement with the pinion F by the lever *f* 70 which may be of any of the well known and approved forms of gear shippers, and is held out of such engagement by the spring *g*. An extension *h* of lever *f* is projected through the base, having at its upper end a pedal portion *i* and a notch *j* to engage the shell of the base, and a trip *k* pivoted to said lever by which said lever may be disengaged from the base, as will be hereinafter explained.

I would not limit myself to the use of any 80 particular form of gear wheels, as other forms than those shown may be used. The contact or engagement between the driving pinion and the driven wheel may be frictional.

A groove as *m* is provided in the aperture 85 *d* in the top portion of the base, and on the side of the stem D, a tongue or feather *n* is provided to pass into said groove to secure the stem from rotation, and to operate a switch by which the motor is cut out of or thrown 90 into connection with a source of supply of electric fluid, said switch in this case comprising an arm *p* one end of which is pivotally secured to the motor frame as shown at *q*; the other end of said arm is connected to the 95 upper end portion of the pedal *r* and the

lower end of said pedal to the switch *s*, which is pivotally secured to the keeper *J*, the arm *p* to engage the shoulder *t* on the feather *n* to throw the motor out of connection with the source of supply of the electric fluid. The switch is provided with a rear extension *U* as shown, to which a pedal extension *v* is pivotally secured, said extension to correspond with the pedal *r*, both of which project through the upper portion *b* of the base, and may be operated either with the foot or hand. In operation a downward movement of the pedal *r* will throw the switch into engagement or contact with the positive pole *w*, which would so connect the conducting wires as to rotate the motor and screw *D'* to raise the stem *D*, and the chair body, and if not sooner stopped by the operator the shoulder *t* will engage and raise the arm *p* by which the switch *s* will be thrown from the positive pole to a neutral position *x*, disconnecting the conducting wires and arresting the movement of the motor, and the further elevation of the chair. And if the operation be reversed by placing the switch in contact with the negative pole *Y*, the chair will be lowered, and if the descent is not arrested by the operator, the shoulder *t'* on the feather will engage the arm *p*, and move it down and throw the switch out of engagement with the pole *Y* and the current, and thus automatically arrest at a fixed point, either the upward or downward movement of the chair, and by the use of the pedals, *r* and *v*, the conductors may be connected to rotate the motor to raise or lower the chair a desired distance, be started, stopped, or reversed at will, or the notch in the extension *h* may be disengaged from the base portion *b*, by pressing down on the pedal *k*, thus allowing the spring *g* to raise the extension *h*, at which instant the spring *g* will disengage the clutch *H*, from the pinion *F* to stop the movement of the screw *D'* without arresting the rotary movement of the motor, when coupled with either one of the poles *w* or *y*, and the motor so run may be used to rotate the drill chuck *X*, with such dental instruments as may be held therein. The direction of motion may be changed by a simple changing of the switch from one pole to the other or stopped by placing the switch between the poles as hereinbefore stated, it being understood that the reverse movement of the switch *S*, from that effected by the pedal *r*, is effected by pressure on the pedal *v*. In addition to the pedal switch *S* there are provided conductors *K*, partially concealed extending to a small switch *W*, on the back of the chair, by which the operator may have control of the direction of the electric current to raise or lower the chair, or reverse the movement of the motor, when used as a dental engine. The high speed of the motor, and the flat or slow pitch of the elevating screw *D'* will produce a very easy movement

of the chair, which may be accomplished during the progress of an operation, as is frequently desired where the operator and the subject are in position, instruments in hand or in position to perform the operation. When it is discovered that the subject is too high or too low, for a successful operation, by a slight movement of the switch *W*, the chair and subject may be raised or lowered, to contribute to the success of the operation, as well as the comfort of the patient, and the operator. Or if preferred a worm as *Y* may be mounted on suitable bearings as *b'* and *b''* to hold it in engagement with a series of teeth *X* having on the side of the stem *D* a concave face adapted to the diameter of the worm *Y*, said teeth to be slightly oblique to the stem *D*, to adapt them to the pitch of the screw *Y*. The worm in this case has a geared engagement with the dynamo shaft *G*, by the use of the wheels *b<sup>3</sup>*, *b<sup>4</sup>*, *b<sup>5</sup>*, *b<sup>6</sup>* as shown, but if preferred friction wheels may be used. When this form of application is used the gear clutch shown in Fig. 1, would be located to engage the wheel *b<sup>6</sup>*.

Having described the nature and object of my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a base, a body-portion, a body supporting stem, a screw journaled in the base and having a screw-threaded engagement with the body supporting stem, of an electric motor for rotating said screw, a switch, means for manually operating said switch to reverse the motion of the armature of said motor and means for automatically stopping the motor when the body portion has reached a certain level, substantially as set forth.

2. The combination with a base, a body-portion, a body supporting stem, a screw journaled in the base and having a screw threaded engagement with the body supporting stem, of an electric motor for actuating said screw, a switch, and a connection between the switch and the body supporting stem, and means carried by the body supporting stem for actuating said connection.

3. In combination with a base, a body-portion, a body supporting stem, a screw for actuating the body supporting stem provided with a gear wheel, of an electric motor the armature shaft of which is provided with a clutch gear in engagement with the first named gear, a gear shipper, and means for automatically stopping the armature shaft of the motor to prevent the body portion raising or lowering too far, substantially as set forth.

4. The combination with a chair body, of a base, *A*, having a vertical aperture, *d*, and a vertical groove, *m*, a chair supporting stem, *D*, a tongue, *n*, adapted to slide in said groove, said tongue having shoulders, *t* *t'*, that engage and move a switch bar, *p*, con-

nected to the switch, S, by which the current of electricity to the motor is interrupted to stop the motor.

5 5. The combination, in a dental chair, of a base and body portion, said body portion adapted for vertical adjustment in said base, a dental tool connected to said chair, and a prime mover for simultaneously rotating said tool and moving vertically said body portion,

and means for throwing the body raising mechanism out of engagement with the prime mover.

In testimony whereof I have hereunto set my hand this 13th day of February, A. D. 1890.

AARON P. GOULD.

Witnesses:

W. K. MILLER,

CHAS. R. MILLER.