

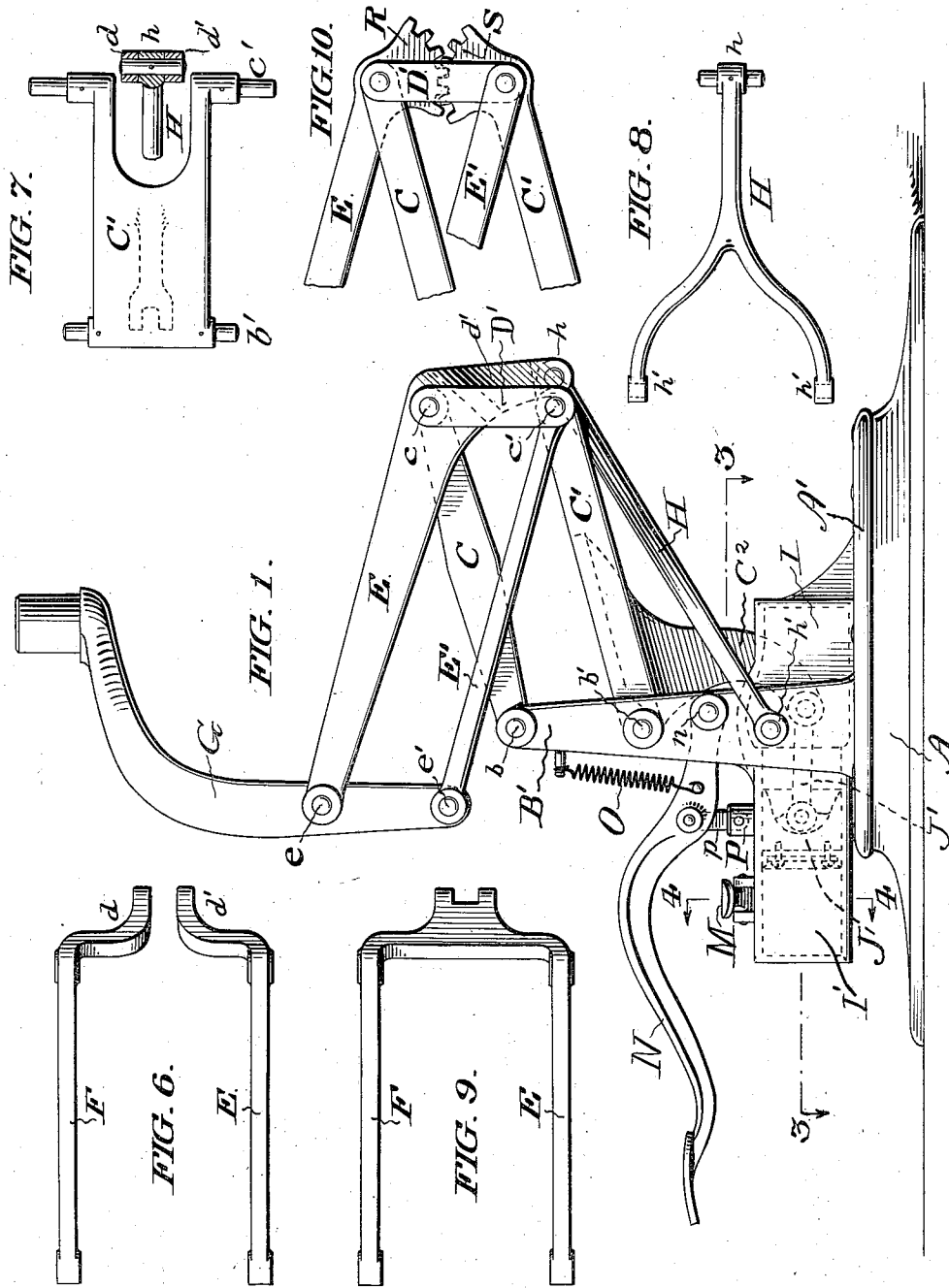
(No Model.)

3 Sheets—Sheet 1.

A. W. BROWNE.  
DENTAL CHAIR.

No. 521,256.

Patented June 12, 1894.



WITNESSES:

*E. J. Starr*  
*Edw. A. Simpson, Jr.*

INVENTOR

*A. W. Browne*  
*By J. H. Peyton*

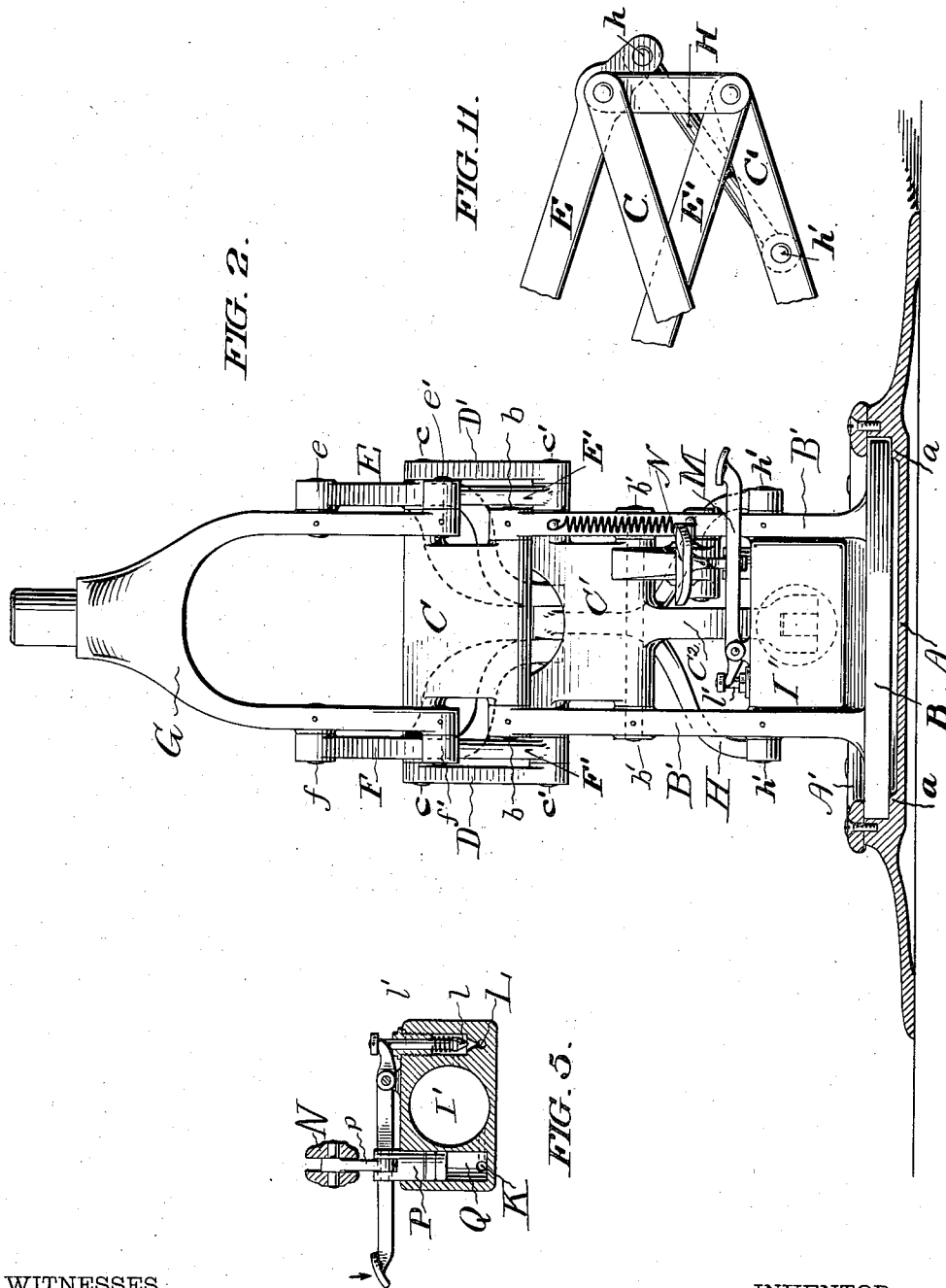
(No Model.)

3 Sheets—Sheet 2.

A. W. BROWNE.  
DENTAL CHAIR.

No. 521,256.

Patented June 12, 1894.



WITNESSES:  
*E. L. Stark*  
*Chas. Simpson, Jr.*

INVENTOR  
*A. W. Browne*  
*By Atty J. S. Fulton*

(No Model.)

3 Sheets—Sheet 3.

A. W. BROWNE.  
DENTAL CHAIR.

No. 521,256.

Patented June 12, 1894.

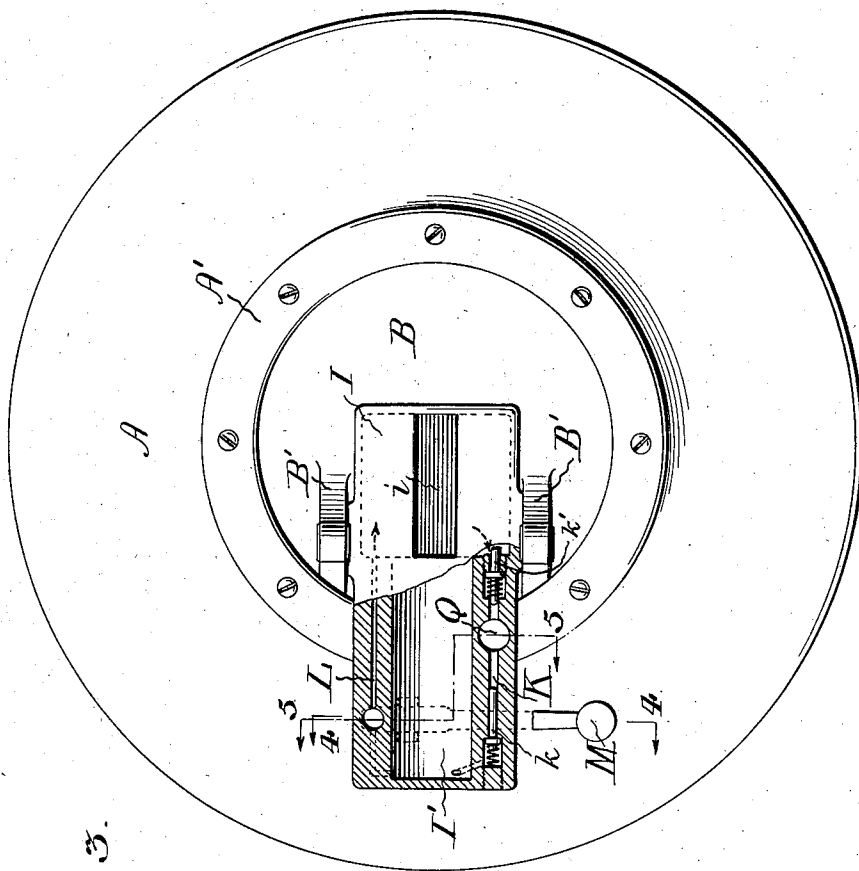


FIG. 3.

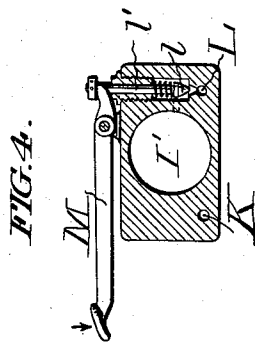


FIG. 4.

WITNESSES:

*E. J. Starr*  
*Edw. F. Simpson, Jr.*

INVENTOR

*A. W. Browne*  
*By atty J. Peyton*

# UNITED STATES PATENT OFFICE.

ARTHUR W. BROWNE, OF PRINCE'S BAY, NEW YORK, ASSIGNOR TO THE  
S. S. WHITE DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA,  
PENNSYLVANIA.

## DENTAL CHAIR.

**SPECIFICATION** forming part of Letters Patent No. 521,256, dated June 12, 1894.

Application filed February 6, 1894. Serial No. 499,283. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. BROWNE, a citizen of the United States, residing at Prince's Bay, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Dental Chairs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements, as hereinafter claimed, in means for supporting and imparting a wide range of vertical adjustment to the bodies of dental chairs.

In the accompanying drawings showing a suitable embodiment of my invention, with the chair body omitted, Figure 1 is a view in side elevation. Fig. 2 is a view in rear elevation. Fig. 3 is a view partly in plan, with various parts omitted, and partly in section on the line 3 of Fig. 1. Fig. 4 is a detail view, partly in front elevation, and partly in section on the line 4 of Fig. 3. Fig. 5 is a view partly in front elevation and partly in section on the line 5 of Fig. 3. Fig. 6 is a plan view of the upper arms of the supplementary parallel arms. Fig. 7 is a plan view of the lower arm of the main parallel arms, and also showing partly in section a portion of the link or tension rod connecting the supplementary parallel arms with the turning support. Fig. 8 is a plan view of said tension rod. Fig. 9 is a plan view of a modification. Figs. 10 and 11 are side elevations showing portions of the parallel arms with modifications of the means whereby the supplementary arms are caused to rock about their jointed connection with the main arms.

A recessed or hollow base A is provided with an internal annular ledge or shoulder *a* constituting a seat upon which is supported a circular plate or disk B which is adapted to turn horizontally and constitutes in connection with two standards B' B', which are rigid therewith, a turning support for vertically adjustable mechanism which carries the chair body. A ring A' screwed to the base and overlapping the disk B of the turning support serves to hold this disk down to its seat

in the base. Any suitable means permitting of the adjustment of the turning support while serving to lock it against movement after adjustment may be employed.

The vertically adjustable mechanism for raising and lowering the chair body is as follows: A set of parallel arms, in this instance two such arms C C' (hereinafter termed the main parallel arms) are jointed at their inner or rear ends to and between the standards of the turning support by means of pivoting rods *b b'* passing through bearings of the arms, and through the standards to which they are fastened. The lower arm C' of the main parallel arms C C' terminates at its rear or inner end in a downwardly projecting curved extension C<sup>2</sup> rigid therewith and constituting a lever for a purpose in turn to be explained. At their front or outer ends the main parallel arms have connection with each other by way of links D D' to the upper and lower ends of which the arms are jointed by pivots *c c' c' c'*. A set of supplementary parallel arms shown as consisting of two pairs of such arms E E' and F F' have jointed connection with the main parallel arms by means of the links D D' and the pivots *c c' c' c'* at their front ends, while at their rear ends these supplementary arms E E' F F' are pivoted to a chair body carrier G at *e e'* and *f f'*. At their front ends the supplementary arms E F terminate in downwardly projecting extensions *d d'* curved or converging toward each other and connected at their front extremities to constitute an actuating lever. A link or tension rod II is jointed at one end to this actuating lever at *h*, and at its other end to the standards B' B' of the turning support at *h' h'*, this link rod being forked at its inner or rear end so as to embrace the standards. For this link coupling H a chain or equivalent jointed connection may be substituted. A suitable chair body (not shown) is to be attached in well known way to the upper end of the carrier G.

A reservoir I for oil or other liquid, and a horizontal cylinder I' are carried by the disk B of the turning support, with which they are rigid. A piston J adapted to be moved horizontally in the cylinder I' is connected by the connecting rod J' with the extension or actu-

ating lever C<sup>2</sup> of the set of main parallel arms, the connecting rod being pivoted at its opposite ends to the piston and said actuating lever. The liquid reservoir is adapted to communicate with the cylinder in rear of the piston by a liquid way or passage K at the side of the cylinder and provided at or near its opposite extremities with spring-actuated valves *k* *k'*. The valve *k'* when opened against the pressure of its spring admits liquid to the passage K, and when the valve *k* is opened against the pressure of its spring liquid is allowed to pass from this passage to the cylinder behind the piston. These valves are hereinafter termed the inlet valves. A liquid way or passage L at the side of the cylinder opposite that at which the passage K is located is provided with a valve *l* (hereinafter called the outlet valve) normally held closed by a spring. When this valve is opened liquid is allowed to pass slowly from behind the piston to the reservoir by the passage L. A foot-actuated lever M pivoted over the horizontal cylinder engages a rod or stem *l'* of the outlet valve *l* and serves to trip the valve when the outer end of the lever is depressed. An elevating lever N pivoted at *n* to one of the standards of the turning support, is normally maintained in its elevated or inoperative position by a spring O. This lever is coupled by a connecting rod or link *p* to a pump piston P working in its cylinder Q at the side of the cylinder I'. The liquid passage K is intersected by and communicates with this pump cylinder. The reservoir I has a slot *i* in its top through which the actuating lever C<sup>2</sup> projects for engagement with the connecting rod J'.

From the above description it will be seen that when the elevating lever is actuated to work the pump piston, liquid from the reservoir will be forced into the cylinder behind its piston, thus forcing forward the cylinder piston and by its connecting rod actuating the lever C<sup>2</sup> of the set of main parallel arms to rock upward their outer ends. The supplementary parallel arms are at the same time elevated with the outer ends of the main parallel arms and are also caused to rock about their pivotal connection therewith by means of the jointed coupling connection between the turning support and the actuating lever of the set of supplementary parallel arms. In this way the chair body carrier may be quickly elevated to any desired extent. To gradually lower the chair body carrier which is maintained at all times in an upright position the outlet valve is tripped to permit of escape of the liquid from the cylinder behind its piston, and thus allow this piston to be moved inward to the extent desired by the weight of the chair body and its elevating mechanism.

It will be seen that by the employment of the horizontal reservoir, cylinder, and piston, the elevating mechanism may be mounted

upon its support low down or near the floor upon which the support rests and yet admit of a desirable wide range of vertical adjustment of the chair body.

My improvements may be modified in various ways while still retaining novel features of my invention. When a range of vertical movement less than that which may be imparted by the employment of the supplementary parallel arms in addition to the main parallel arms will answer, the set of parallel arms which are jointed directly to the support may be employed without the supplementary arms, and the chair body carrier be jointed to the outer ends of the set of arms which are jointed to the support and be maintained at all times in an upright position, as will be understood by reference to United States Letters Patent No. 478,672, dated July 12, 1892; and this set of arms instead of consisting of two members may consist of four members, two in place of each arm C C' as will readily be understood; while instead of the upper arms E F of the set of supplementary parallel arms being made in two separate parts they may be in one piece as shown by Fig. 9. Although it is preferable to have the support for the parallel arms mounted upon the base so as to turn horizontally, the turning movement of this support might be dispensed with and a rigid connection made between it and its carrying base, in which event the chair body could be mounted to turn about the upper end of its carrier in suitable well known way. Instead of the supplementary parallel arms being provided with the actuating lever and controlling link H, other equivalent means for causing them to rock about their jointed connection with the main parallel arms may be provided, such, for instance, as shown by Fig. 10, in which two gear segments R S meshing with each other are rigidly attached to or formed with the outer ends of the arms E F, and C', respectively.

In Fig. 11 the actuating lever of the supplementary parallel arms is made shorter than elsewhere shown, and the link H connects this actuating lever with the lower one (C') of the main parallel arms instead of with the support.

I claim as my invention—

1. The combination, in a dental chair, of a set of parallel arms provided with the actuating lever rigid with one of said arms, the support to which said arms are jointed one above the other, the horizontal cylinder, its piston, the connecting rod jointed to said actuating lever and piston, the chair-body carrier supported by connection with said parallel arms, and means by which said carrier is maintained at all times in an upright position, substantially as set forth.

2. The combination, in a dental chair, of the main parallel arms linked together at their outer ends, the support to which they are

jointed, means for actuating said arms, the supplementary parallel arms jointed to the linked ends of the main parallel arms, means by which the supplementary parallel arms are caused to rock about their jointed connection with the main parallel arms upon actuation of these main arms, and the chair-body carrier jointed to the supplementary parallel arms and maintained at all times in an upright position, substantially as set forth.

3. The combination, in a dental chair, of the main parallel arms linked together at their outer ends, the support to which they are jointed, means for actuating these arms, the supplementary parallel arms having jointed connection with the linked ends of the main parallel arms and provided with the actuating lever, the coupling link making jointed connection between said actuating lever and support, and the chair body carrier jointed to said supplementary arms and maintained

at all times in an upright position, substantially as set forth.

4. The combination, in a dental chair, of the base, the horizontally turning support carried thereby, a set of parallel arms jointed to said support and one of which is provided with the actuating lever rigid with it, the horizontal cylinder, its piston, means for actuating the piston, the connecting rod jointed to said actuating lever and piston, the chair-body carrier supported by connection with said parallel arms, and means by which said carrier is maintained at all times in an upright position.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR W. BROWNE

Witnesses:

E. T. STARR,

EDW. F. SIMPSON, Jr.