

(No Model.)

3 Sheets—Sheet 1.

G. W. ARCHER.
DENTAL CHAIR.

No. 463,348.

Patented Nov. 17, 1891.

Fig. 10.

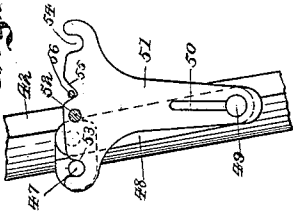


Fig. 1.

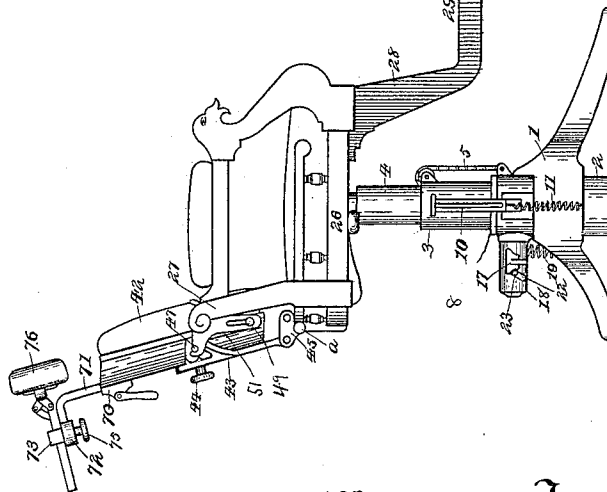


Fig. 11.

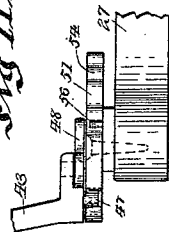
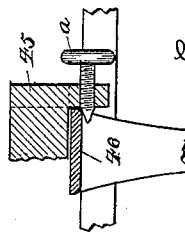


Fig. 12.



Witnesses

Watson Sims
and S. Church.

Inventor

George W. Archer
by Chas. K. Church
his Attorneys

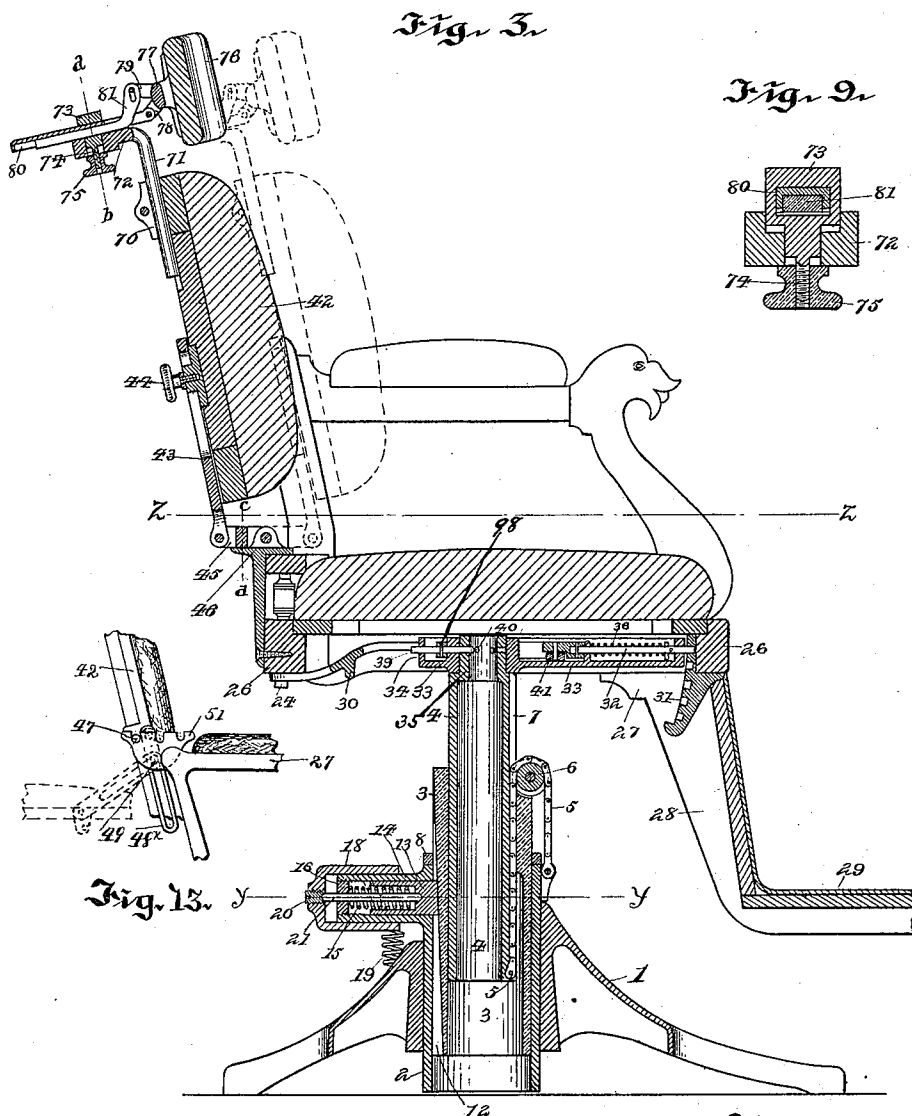
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Witnesses
J. Watson Sims
Fred S. Church.

Inventor
George W. Archer
by *Charles H. Church*
his Attorneys.

(No Model.)

3 Sheets—Sheet 3.

G. W. ARCHER.
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Fig. 4.

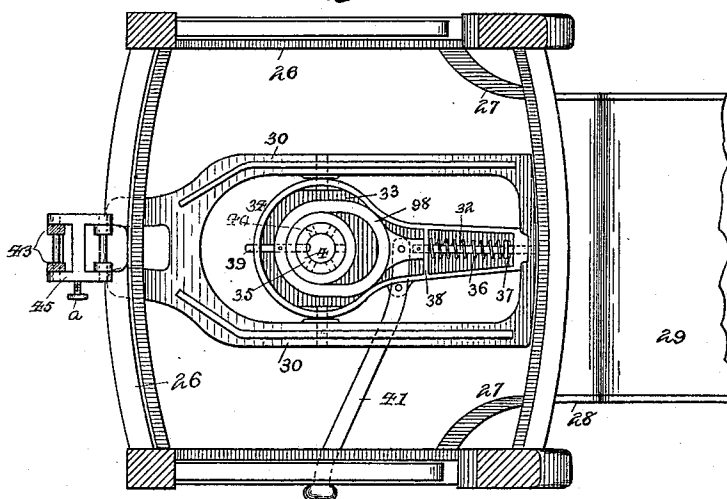


Fig. 5.

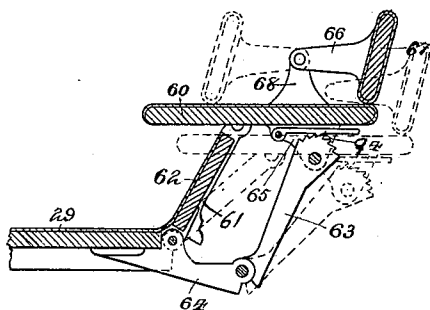


Fig. 6.

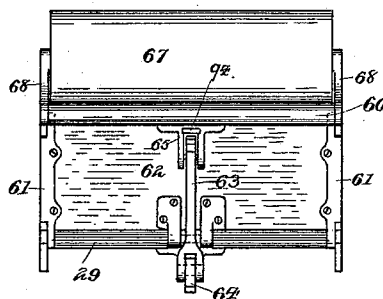


Fig. 7.

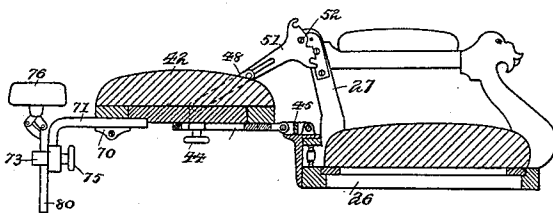
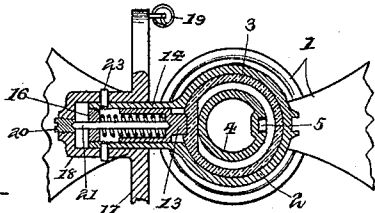


Fig. 8.



Witnesses

Johnston Sims
Fred J. Church

Inventor

George W. Archer
by Church & Church
his Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. ARCHER, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE
ARCHER MANUFACTURING COMPANY, OF SAME PLACE.

DENTAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 463,348, dated November 17, 1891.

Application filed January 11, 1890. Serial No. 336,667. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ARCHER, of the city of Rochester, county of Monroe, 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 same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

My present invention relates to dentists' chairs, and has for its object to provide one simple in construction and capable of being readily adjusted, so as to place the occupant in the most convenient position to be operated upon; and it further has for its object to provide means whereby the chair can be adapted for children and whereby also the patient can be quickly supported at full length should this be desirable or necessary—as, for instance, in a case of heart-failure or fainting following an operation or the use of anesthetics.

To these and other ends the invention consists in certain novelties of construction and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out particularly in the claims at the end of this specification.

In the drawings, Figure 1 is a side elevation of a chair constructed in accordance with my invention; Fig. 2, a rear elevation of the same; Fig. 3, a vertical sectional view of the same, taken on the line *xx* of Fig. 2; Fig. 4, a sectional view on the line *zz* of Fig. 3; Fig. 5, a longitudinal sectional view of the adjustable foot-rest; Fig. 6, an end view of the same; Fig. 7, a view similar to Fig. 3, showing the chair-back in horizontal position; Fig. 8, a sectional view taken on the line *yy* of Fig. 3; Fig. 9, a sectional view taken on the line *ab* of Fig. 3. Fig. 10 is a detail side view of the back-support and links with the chair-arm removed; Fig. 11, a top plan view of the same; Fig. 12, a sectional view on the line *cd* of Fig. 3. Fig. 13 is a view of a modification.

Similar letters and numerals of reference in the several figures denote similar parts.

The base of the chair consists of a suitable

casting 1, having spreading legs and a central recess or socket for the reception of the standard-carrying casting 2, which latter in the present instance is made separate from the base-casting 1 for convenience of construction; but it could as well be made integral with it, if desired, and for the purpose of description the casting 2 will be called the "base," its means of support, being immaterial and the arrangement shown being but one form.

The standard upon which the chair-seat is mounted is preferably constructed in two telescoping-sections 3 and 4, the former fitting the socket in base 2 and the latter inside of it, as shown, said inner section 4 being connected to the base 2 by a chain or other flexible connection 5, passing over a roller or pulley 6, secured to the upper portion of section 3, said chain operating in a groove 7, formed in section 4 and also projecting a slight distance into section 3, thereby preventing independent rotary motion of the sections, though any other means of accomplishing this could be employed. It will thus be seen that if the standard-section 3 is raised a given distance by any suitable lifting device the loop of the chain over the pulley 6 will be raised, thereby causing the inner standard-section 4 to be raised twice the distance that the outer section is, this differential action permitting the operator to raise the chair rapidly to any height desired. Any suitable device could be employed for raising the standard; but I prefer to arrange a clamping-ring 8 around section 3, said ring being connected on one side to a link 9, pivoted to a foot-lever 10, the latter being pivoted upon the chair-base. In normal position this ring rests upon the top of the base, as in Figs. 1, 2, and 3, (full lines;) but when the outer end of the lever is moved down by the operator the ring will be tilted, grasp the standard, and the continued movement of the lever will raise the latter a short distance, the differential movement raising the seat twice the distance, as described. A spring 11 serves to return the lever and clamp to first position, when it can be again operated to raise the standard, a suitable retaining device (farther on de-

scribed) serving to retain the standard in elevated position. The foot-lever is preferably made in two parts hinged together at 25, so that the outer section can be swung beneath the chair out of the way when desired.

The means herein employed to retain the standard in elevated position and which permits the gradual lowering of the chair when desired is constructed as follows: In the side of the standard-section 3 is provided a groove 12, gradually increasing in depth from top to bottom and forming an inclined surface, with which co-operates a wedge or retaining-block 13, mounted in a suitable boss 14 in base-section 2, said block being normally pressed into engagement with the incline by means of a strong spring 15, confined in said recess between the block and an adjustable nut or abutment 16 in the boss, and the strength of the spring is such that as the standard is raised the block will follow in and support it by co-operating with the incline. As a means for releasing said block and allowing the gradual descent of the standard, I mount upon the boss 14 a lever 17, having a sleeve 18 encircling it and connected to the base at its rear end by a spring 19. At the end of the sleeved portion is an adjustable screw 20, against which bears one end of a rod 21, its other end bearing against block 13, and in the sides of the sleeve are provided inclined or spiral slots 22, into which project pins 23, secured to the boss 14, (see Figs. 1 and 8,) the arrangement of the parts being such that as the standard is raised and the block 13 forced in by its spring the spring 19 will turn the sleeve and raise lever 17 through the slot-and-pin connection, following the block and causing a portion of the outward thrust on the latter to be maintained by the lever. The sleeve, it will be noted, constitutes a set-nut, which automatically follows the wedge-block as it moves in and prevents its outward movement. When the block is nearest the center of the standard, the lever 17 is in highest position, and by pressure on its outer end the set-nut will be withdrawn from the block and the standard permitted to descend gradually. Even should the standard be raised and sustained by means other than the wedge-block, the latter serves as an admirable means for regulating its descent, the compression of the spring being gradual as the chair descends and the space occupied by the parts small.

Any form of lifting-clutch could be used instead of the one shown, and the construction of the standard itself could be greatly varied without departing from the spirit of my invention. The upper end of standard-section 4 is reduced slightly, as shown, and upon this reduced portion is mounted a plate or casting 33, capable of rotary movement thereon, and the seat-frame 26 is provided with a central yoke or casting 30, pivoted to said plate 33 by bolts 24, thereby permitting the seat to be tilted backward, as desired. The upper portion of plate 33 is preferably pro-

vided with a flange 34, and sliding in apertures formed therein is a bolt 32, with its outer end in position to engage with one of a series of apertures in a plate 31, formed upon casting 30 or attached to the seat-frame and adapted to maintain the seat when tilted. This bolt is normally projected by a spring 36, confined between pin 37 and a cross-flange 38, and its rear portion is provided with a yoke 98, surrounding a boss 35, formed around the standard end. Secured to the yoke and passing through apertures in flange 34 and boss 35 is a pin or bolt 39, adapted when the bolt 32 is projected to co-operate with one of a series of perforations 40, formed in the end of the seat-standard, said pin 39 being slightly longer than the projecting end of bolt 32, to which it is connected, so that the latter can be withdrawn a short distance and the chair tilted without withdrawing bolt 39 and permitting the rotary movement of the chair on the standard. A handle or lever 41, pivoted to plate 33 and to the bolt 32, projects to the side of the chair in convenient position for the operator. It will be seen that if it is desired to tilt the chair the bolt 32 is only moved back slightly, releasing the plate 31; but if desired to rotate the seat on the standard the bolt is moved clear back, releasing the plate 33 as well, when the latter can be turned and the bolt 39 permitted to enter one of the apertures 40, securely locking it in position.

Mounted upon the chair-frame are the arms 27, and secured to the lower portion are the downwardly and forwardly projecting arms or brackets 28, supporting at their outer portions the platform 29, to which the adjustable foot-rest is connected, as hereinafter described.

The back of the chair 42, preferably cushioned, as shown, is secured to a supporting plate or casting 43 by a screw or bolt 44, passing through a slot in said casting and serving to clamp the parts together with the back in any desired position of vertical adjustment. The back plate or casting 43 is pivoted at its lower end to a link 45, which latter is pivoted to a bracket 46, secured to the chair-seat frame, said link, when the back is in normal position, resting upon the bracket, as in full lines, Fig. 3 or when adjusted for a child (as farther on described) it occupies the position shown in dotted lines in said figure. The upper portion of the back-plate 43 is extended laterally, and on the ends of the extensions are studs 47, and inside of these are pivoted the ends of depending links 48, the other ends being provided with pins 49, entering slots in plates 51, pivoted at 52 to the arms 27 of the chair. The plates 51 are further provided on their upper sides with notches 53 54, with which the studs 47 on the back-plate are adapted to engage when desired, and notches 55 are also formed therein adapted to engage with pins 56 on the chair-arms, preventing the upward movement of the forward portion of the plates 51 when the weight of the chair-back

is in rear of the pivot in normal position. When the parts are in the position shown in Figs. 1, 3, and 10, the link 45 is turned to the rear, and studs 47 are in notches 53, thus throwing the weight of the back on the rear sides of plates 51, and as this is the normal position of the parts, I prefer to lock them by means of a screw *a*, passing through a lug formed on link 45 and engaging the under side of bracket 46, as in Fig. 12.

When desired to shorten up the seat to adapt the chair for the use of children, the screw *a* may be loosened and the back-plate and back lifted up, disengaging studs 47 from notches 53, turning link 45 over, and dropping studs 47 into notches 54 in plates 51, as in Fig. 3 in dotted lines.

When it is desired to lower the head of the patient suddenly, as in case of fainting or heart-failure, due to the use of anæsthetics, the operator can lift the back-plate bodily, taking the studs 47 out of notches 53 or 54 and move it down to horizontal position, as in Fig. 7, the links 48 and plates 51 supporting the back at or near the middle and the link 45 and bracket 46 supporting its lower end, and, if desired, the whole chair can then be tilted back in the manner previously described.

While I prefer to secure the back adjustably to the supporting-plate 43, it is obvious that it could be rigidly secured thereto, in which event, and in fact when adjustably secured to the plate, said back and plate are practically integral, except for the capability of adjustment. The links 48 could also, if desired, be connected directly to the arms by the same sort of a slot-and-pin connection described between them and the plates 51, as in Fig. 13, 48^x indicating the links; but I prefer the arrangement shown, as it does not take up as much room, and the links 48 serve in a measure to support the back when in normal position.

Near the upper portion of the chair-back 42 is arranged an ordinary eccentric split clamp 70 for holding the head-support standard 71, the latter consisting of a rod having the rearwardly-extending arm 72 at the top, to which the adjustable head-rest is secured. The arm 72 is provided with a vertical aperture, through which extends a clamping-block 73, having an aperture therein and a threaded shank 74, to which is applied a hand-nut 75, co-operating with the lower side of said arm.

The head-rest proper 76 consists, preferably, of a suitable cushion, to the rear portion of which is connected a bracket 77, having two arms 78 79, the one 78 pivoted to the end of a plate 80, preferably recessed on its under side and provided with a recess at the forward portion, through which projects a bar or plate 81, connected at its upper end to the other arm 79 by a slot-and-pin connection, as shown. Both the plates 80 and 81 extend through the eye of clamping-block 73, the latter resting on the arm 72, so that by

screwing the nut 74 up tightly they will be clamped together and to said arm. By loosening this nut the head-rest can be tilted forward or backward, (the plates sliding upon each other and permitting this,) or the whole rest can be moved bodily forward on arm 72 and again secured by tightening the nut. This form of head-rest is very simple, and any position of adjustment can be had without the employment of a great number of parts or securing and adjusting screws.

The foot-rest consists of a board or plate 60, pivoted upon parallel links connected to platform 29, two of said links 61 61 being pivoted to the sides of the platform and preferably connected by a board or plate 62, and the third link 63, pivoted at one end to a bracket 64, secured to the platform, and at the other to a bracket 65 on board 60, as shown, this arrangement insuring board 60 being maintained level, no matter what its elevation may be. As a means for locking it at any desired elevation, I prefer to form the end of link 63 with segmental ratchet-teeth, with which co-operate a pawl 94, capable of being readily released by the operator, allowing the rest to be moved, if desired, level with platform 29. The ratchet is so constructed as to permit the elevation of the foot-rest without lifting the pawl by hand.

Secured to the upper side of plate 60 are brackets 68, to which are pivoted arms 66, connected to a board 67, against which the patient may brace himself while undergoing painful operations, and said board can be turned over to the position shown in dotted lines when desirable.

While I have described the standard supporting and lowering devices as applied to a telescoping standard having a differential action, it will be understood that the arrangement of the wedge-block and set-nut could as well be applied to a chair or other device having a single standard, the telescoping and differential arrangement being for the purpose of providing for a chair capable of very high or very low adjustment without the use of an unnecessarily long standard.

I do not claim herein the construction of the head-rest shown and described, as the same forms the subject-matter of a divisional application filed December 26, 1890, Serial No. 375,888.

I claim as my invention—

1. In a chair, the combination, with the base, of a standard composed of two telescoping sections, one carrying the chair-seat and the other having a pulley thereon, a flexible connection between one section and the base passing over the pulley, a lifting-lever, and clutch devices between said lever and the standard-section carrying the pulley, substantially as described.

2. In a chair, the combination, with the base, of a standard composed of two telescoping sections, one carrying the chair-seat and the other having a pulley thereon, a flexible

connection between the base and the first-mentioned section passing over the pulley, a lifting-lever, clutch devices between said lever and the standard-section carrying the pulley, and a supporting device co-operating with the last-mentioned section, substantially as described.

3. In a chair, the combination, with the base-section 2, of the telescoping section 3, a lifting device for elevating section 3, the roller 6, the section 4, and the chain passing over roller 6 and connected at its ends with sections 2 and 4, substantially as described.

4. The combination, with the two telescoping base-sections, one carrying the chair-seat and the other having the roller, of the section 2, the separate lifting and sustaining devices mounted thereon, and the chain connected to said section at one end and at the other to the section carrying the chair and passing over the roller, substantially as described.

5. The combination, with the base and the standard consisting of the two telescoping sections, one carrying the chair and having the groove therein and the other having the roller, of the chain connected to the first-mentioned section, passing over the roller and secured to the base, and a lifting device operating on the section carrying the roller, substantially as described.

6. In a chair, the combination, with the base and a standard carrying the seat and having the incline thereon tapering toward the bottom, of a wedge or block in the base co-operating with the incline on the standard, a spring for pressing said block in contact, a following piece for preventing the outward movement of the block under the control of the operator, and a lifting device for the standard, substantially as described.

7. In a chair, the combination, with the base and a standard carrying the seat and having an incline thereon, of a spring-pressed wedge or block co-operating with said incline, an automatically-following set-nut under the control of the operator for holding the block in position, and a lifting device for the standard, substantially as described.

8. In a chair, the combination, with the base and a standard carrying the seat and having an incline thereon, of a spring-pressed wedge or block co-operating with said incline, an automatically-following set-nut for holding the block in position, a releasing-lever connected thereto, and a lifting device for the standard, substantially as described.

9. The combination, with the standard carrying a seat and having the incline and the spring-pressed block or wedge co-operating therewith, of the set-nut co-operating with the block, the spring for rotating it, and the lever connected to the nut, substantially as described.

10. The combination, with the standard carrying a seat and having the incline thereon, of the base in which the standard operates, having the boss, the spring-pressed block or

wedge, the sleeve on the boss having a screw connection therewith and connected to the block, and the lever and spring connected to the sleeve, substantially as described.

11. The combination, with the standard having the series of apertures near its end, of the plate capable of rotation thereon, the seat pivoted on said plate having the series of apertures, the movable bar on the plate, and the two bolts thereon, one co-operating with the aperture in the standard end and the other with the apertures on the seat, substantially as described.

12. The combination, with the standard having the series of apertures near its end, of the plate capable of rotation thereon, the seat pivoted on said plate having the series of apertures, the yoke encircling the end of the standard, the two bolts connected thereto, one co-operating with the aperture in the standard and the other with the apertures on the seat, and a lever for actuating said yoke, substantially as described.

13. The combination, with the standard, of the plate thereon capable of rotation, the chair-seat pivoted on the plate, and two bolts, one for locking the plate to the standard and the other, shorter than the first-mentioned one, for locking the seat to the plate, connected for simultaneous operation, whereby the seat and plate may be released to tilt the former without disengaging the plate and standard, substantially as described.

14. The combination, with a chair having the arms, of a chair-back having lugs on the sides, a link pivoted to the lower end of the back and the seat, and plates on the chair-arms having two or more notches for the reception of the lugs on the back, substantially as described.

15. The combination, with a chair having the stationary arms, of a chair-back pivoted at its lower end to the seat, and the slotted links separate from said pivotal connection with the seat connected to the arms and back, whereby the back can be extended substantially horizontal when desired, as set forth.

16. The combination, with a chair having the arms, of a chair-back pivoted at the lower end to the seat and having the lugs on the sides, the plates on the arms having notches for the reception of the lugs, and the links connecting the back and arms, substantially as described.

17. The combination, with a chair having the arms, of a chair-back pivoted at the lower end to the seat and having the lugs on the sides, the plates pivoted on the arms having notches for the lugs, and the links connected to the plates and to the back, substantially as described.

18. The combination, with the chair having the arms, of a chair-back, a back-supporting plate having the lugs at the sides and pivoted to the seat at the bottom, the plates pivoted to the arms having notches for the lugs on the back-support, and the links pivoted

to said plates and the back-support, substantially as described.

19. The combination, with the chair having the arms, of a back-supporting plate pivoted to the seat at the bottom and having lugs on the sides, a chair-back adjustably connected to said plate, and plates supported on the chair-arms having one or more notches for the reception of the lugs on the back-support, substantially as described.

20. The combination, with a chair and a

platform thereon, of a foot-rest, the links connecting it to the latter and maintaining it parallel therewith, the brackets on the top of the foot-rest, and the board 67, having arms 66 pivoted to the brackets and adapted to be turned to the front or rear, substantially as described.

GEORGE W. ARCHER.

Witnesses:

FRED F. CHURCH,
C. D. KIEHEL.