

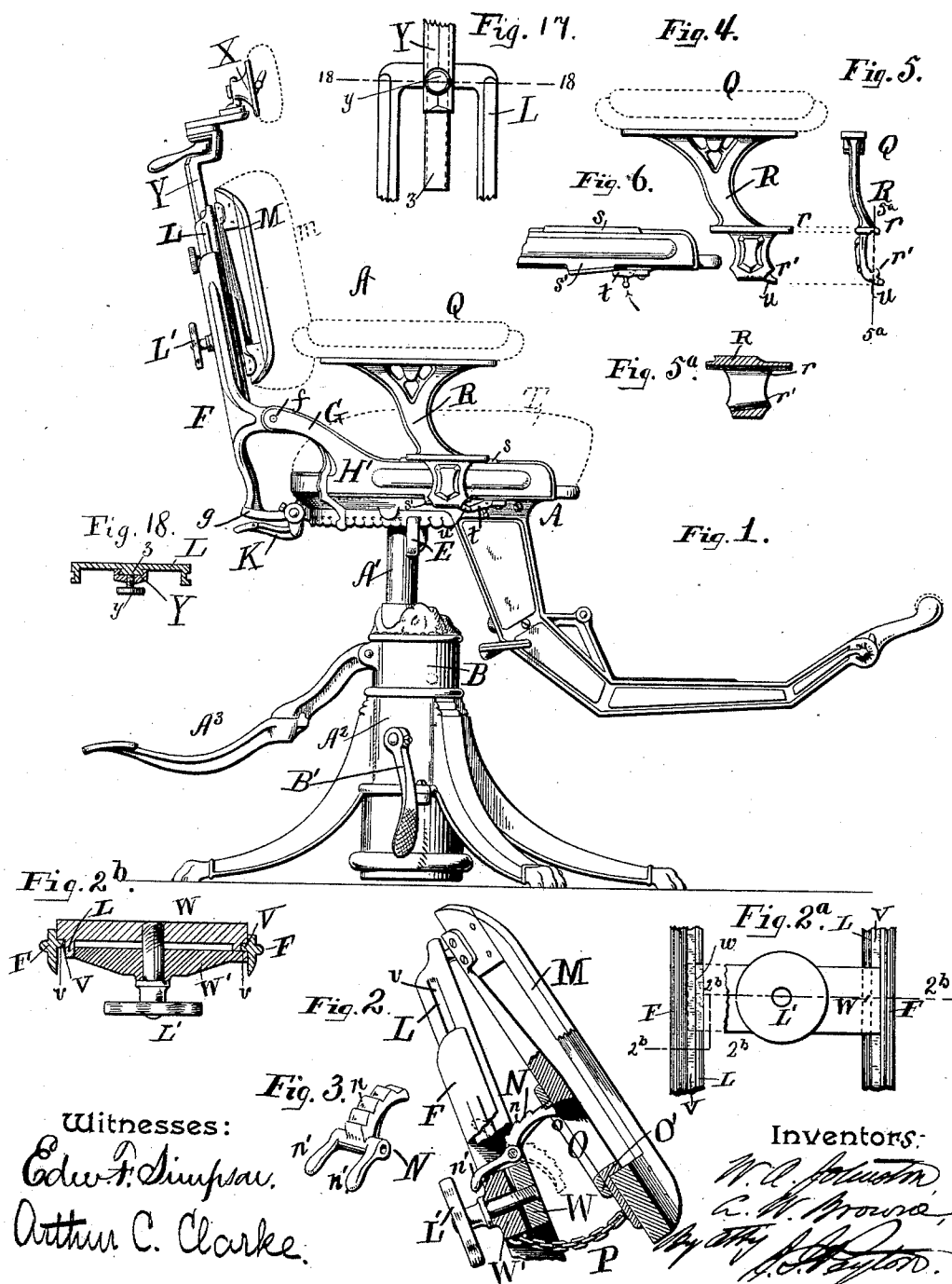
(No Model.)

2 Sheets—Sheet 1.

W. A. JOHNSTON & A. W. BROWNE.
DENTIST'S CHAIR.

No. 483,807.

Patented Oct. 4, 1892.



UNITED STATES PATENT OFFICE.

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DENTIST'S CHAIR.

SPECIFICATION forming part of Letters Patent No. 483,807, dated October 4, 1892.

Application filed October 31, 1889. Serial No. 328,787. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. JOHNSTON and ARTHUR W. BROWNE, of Prince's Bay, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Dentists' Chairs, of which the following is a specification.

Our invention relates to improvements applicable to chairs of the class in which the chair frames or bodies are so mounted upon suitable supports or plungers as to be vertically and horizontally adjustable, our improvements being in this instance shown as applied to the well-known "Wilkerson" chair, for which United States Letters Patent No. 197,441 were granted November 20, 1877.

Our invention comprises certain improvements, to be hereinafter designated by the claims, whereby the chair frame or body may be so attached to its vertically-adjustable support or plunger as to bring the lever by the actuation of which the chair-body is raised to either the rear or side of the chair-body to suit the convenience of the operator, the back be adjusted relatively to the seat and locked in position, and the arms adapted to be readily removed to leave either side of the seat-frame clear of projections, while provision is made for quickly adjusting and securing the arms in position.

In the accompanying drawings, Figure 1 is a side elevation of the improved chair. Fig. 2 is a side elevation, with parts in section, of the back-pad, its carrier, &c. Figs. 2^a and 2^b are detail views showing the manner in which the back-pad carrier is rendered vertically adjustable and adapted to be locked to the back-frame, Fig. 2^a being a rear elevation with parts broken away, and Fig. 2^b a cross-section in different planes, as indicated by the line 2^b of Fig. 2^a. Fig. 3 is a view in perspective of the back-pad-locking latch. Fig. 4 is a side elevation, and Fig. 5 a front elevation, of one of the arm-frames. Fig. 5^a is a section on the line 5^a of Fig. 5. Fig. 6 is a side elevation of a portion of the seat-frame. Fig. 7 is a top or plan view of the seat-frame portion of the chair-body and attachments thereof. Fig. 8 is a rear view of a portion of

the seat-frame and attachments thereof. Figs. 9 and 10 are detail views of the back-carrier-clamping devices. Fig. 11 is a section on the lines 11 of Figs. 7 and 8. Figs. 12 and 13 represent portions of the support or plunger and the yoke by which the chair-seat frame is removably and adjustably connected with the plunger. Figs. 14, 14^a, 15, and 16 are views showing modifications of the means employed for adjustably connecting the frame-carrying cross-bar or yoke with the chair-seat support or plunger. Fig. 17 is a detail view showing in rear elevation portions of the back-pad carrier and head-rest support, and Fig. 18 is a section on the line 18 of Fig. 17.

A support for the chair frame or body A is shown as consisting of the plunger A', having vertically-adjustable connection with the base or pedestal A² and actuated by means of the jointed lever A³ and suitable connections, the lever being jointed to the cylinder B, which is adapted to turn in the pedestal and to be locked therein by the locking-lever B', all as set forth in the above-mentioned patent, No. 197,441. As in said patent the supporting-plunger has no horizontal or turning movement in the cylinder B, to which the elevating-lever is attached, and as the cylinder and the plunger turn together in the pedestal, the only variation in the relative positions of the lever and chair-seat are due merely to alterations in the altitude of the chair-frame seat or body by the up-and-down movements of its supporting-plunger.

To provide for a horizontal adjustment of the chair-seat relatively to the elevating-lever, in order that the lever may be caused to project either rearwardly or sidewise relatively to the seat-frame, this frame and its connections—that is to say, the entire chair-body—are detachably connected to the plunger, and provision is made for adjusting the chair-body horizontally upon the plunger in the following way:

The frame-carrying cross-bar or yoke C, upon journals or trunnions at the ends of which the seat-frame of the chair-body is pivoted to rock, as usual, is split at one side of

its socket for embracing the upper end of the plunger or support and provided with the clamp-screw *c*, by the turning of which the size of the socket may be slightly reduced or enlarged, as will readily be understood, to enable the carrying bar or yoke to be properly adjusted and clamped upon the plunger. In addition to this clamping attachment formed by the split yoke and clamp-screw an interlocking connection between the carrying-yoke and plunger by which to clamp or lock them together is provided, consisting of a threaded inclined pin or lug *D*, screwed into a hole in the wall of the socket of the carrying-frame, projecting into said socket, and adapted for engagement with the desired one of the holes *d* in the plunger end. Two of these holes are shown; but three or more may be provided, as desired, according to the required horizontal adjustments of the chair-seat.

From the above description it will be seen that the chair-body may be raised from its support, turned, and then lowered upon the support and interlocked therewith, thus locating the elevating-lever in the position suited to the convenience of the operator.

In lieu of the above-described clamping and interlocking connection between the chair-body and its support or plunger modifications thereof—such, for example, as next to be described—may be employed.

As shown by Figs. 14 and 14^a, the upper end of the plunger is reduced, thus forming a shoulder *D'*, upon which the cross-bar or yoke *C* rests, so that it may be turned when desired. Two or more vertical holes *d* are provided at proper intervals in the edge of the reduced end of the plunger or support *A'*, and a similar hole is formed in the wall of the yoke-socket. When this hole in the yoke is brought to register with either of the holes in the plunger end, the yoke may be prevented from turning by the insertion of the locking-pin *D* in the registering holes in the plunger and yoke. This locking-pin may be an ordinary screw, as shown, to render it readily removable when the yoke is to be turned to adjust the chair-body relatively to the lifting-lever, or this pin may be left unthreaded and made of a length such as to project, when in place, sufficiently above the plunger and yoke to be taken hold of for ready removal to allow of adjustment of the yoke. Obviously instead of duplicating the holes in the periphery of the plunger end but one hole may be there provided and duplicate holes made in the wall of the yoke-socket instead of the one hole, as shown and above described.

Instead of reducing the plunger end to form the shoulder *D'* this shoulder may be formed by a collar (see Fig. 15) firmly secured to the plunger, thus leaving the plunger proper of uniform diameter throughout.

Fig. 16 shows the yoke *C* as provided with a socket extending only part way there-through and fitting upon the plunger so as to be capable of turning thereon. A removable

threaded locking-pin *D*, adapted to pass through a threaded hole in the yoke, engages by its unthreaded tapered end with the desired one of a series of correspondingly-tapered holes in the edge of the plunger end. By making the locking-pin tapering at its end for engagement with the holes formed partly in the yoke-socket wall and partly in the plunger and tapered, as shown, it serves as a clamp to draw the yoke-socket firmly against the side of the plunger opposite to that engaged by the pin, and thus prevents any movement between the parts.

The mechanism for inclining the chair-body by rocking it about its pivotal connection, with its support, is substantially similar to that shown in the above-mentioned Wilkerson patent, consisting of the lever *E*, pivoted to the frame-carrying yoke, acted upon by the spring *e*, and adapted to operate in an obvious way in connection with a detent-rack *E'*, carried by the chair-frame.

An adjustable back frame or carrier *F* is pivoted at *f* to arms or rearward extensions *G* of the seat-frame of the chair-body and is extended below its pivotal connection, terminating at its lower end in a curved forwardly-projecting arm or tongue *g*. As the back-frame is pivoted in advance of its center of gravity, the normal tendency of the frame is to tilt at its upper end rearwardly, or away from the chair-seat.

The back-frame is clamped in any desired position in the following way: To the rear portion *H* of the seat-frame, which, as shown, is made separate from and bolted to the side portions *H'* *H'* thereof, is secured a forked clamp-piece *I* by means of a screw *h*. A socket in which the arm *g* of the back-frame may slide and be clamped in the desired position is provided between the arms or side portions *i i* of the clamp, which are adapted to yield or spring slightly to release and lock the arm *g*. The arms of the clamp-socket project between two lugs *J J* on the rear of the seat-frame, and these lugs are perforated and threaded to receive clamping-screws *k k*, provided with actuating handles or levers *K K*, projecting sufficiently from the chair to be readily reached by the foot, knee, or hand of the operator. It will be seen that by depressing the clamp-handles *K K* the yielding-armed clamp will be caused to tightly embrace the arm *g* and lock the back-frame in position and that by raising the handles the back-frame will be released from its clamp.

It will be noticed that, although preferable, it is not necessary to provide duplicate clamps *k* and that the combination of parts is such that when the two clamps are provided proper actuation of one of them will suffice to grip and release the back-frame. A back-pad carrier *L* is carried by the back-frame *F*, being vertically adjustable by sliding up and down and suitably guided in its movements and locked, when adjusted, by a clamp-screw *L'*. The back-rest or back-pad proper *m* (see dot-

ted lines, Fig. 1) is secured to its frame M, which is hinged at its upper end to the corresponding end of its vertically-adjustable carrier L, so that the back-pad is adapted to be swung back and forth.

To hold the back-pad in the position to which it may be adjusted by swinging it about its jointed connection with the carrier L, a detent or locking-latch N, pivoted to this carrier in a recess thereof, so as to rock vertically, is provided for engaging with the back-pad frame. This vertically-vibrating latch or detent is curved in advance of its pivot and provided on its upper surface with a series of shoulders or ratchet-like teeth *n* and in rear of its pivot has an operating-handle *n'*, by means of which to rock the latch about its pivot. The teeth of the locking-latch are adapted to engage with a detent stop or shoulder *o*, shown as formed by the protected upper wall of an opening O in the back-pad frame. The lining or protecting plate O' of the opening O may be dispensed with, if desired. In adjusting the back-pad this opening provides for the movements of the latch, the forward portion of the latch as rocked downward projecting into this opening, as will readily be understood. Normally the back-pad frame lies close to and parallel with its carrier, with the locking latch or detent occupying the position in which it is represented by dotted lines, Fig. 2. As the pad-frame is inclined the teeth of the latch engage it nearer to or farther from the latch-pivot, according to the inclination of the pad. The range of movement of the pad is limited by the chain P, which connects it with the carrier.

Each arm Q of the chair is detachably connected with the seat-frame in such manner that it may be quickly placed in position and locked securely against accidental displacement and be readily removed. The construction of the sides of the seat-frame is such that when the arms are removed the sides of the chair are left free from any projection liable to interfere with the movements and work of the operator. Each arm is carried by a standard or frame R, the lower portion of which (projecting slightly inward by preference) is provided with two inwardly-projecting flanges or lugs *r r'*, the one above the other, which lugs have shallow longitudinal grooves formed in them, the groove in the upper lug *r* being on the under side thereof and extending horizontally to fit and slide upon a vertical horizontally-extending flange or rib *s* upon the top surface of the side of the seat-frame, while the groove in the lower lug *r'* is formed in the upper surface thereof and is inclined, so as to fit and slide upon a vertical rib *s'* on the under surface of the side of the chair-seat frame, which rib is inclined downward toward the rear of the seat-frame, and, like the rib *s*, extends in the direction of from front to rear of the chair-seat frame. This construction constitutes a wedge-like locking connection between the arm-frame and seat-

frame, the grooves of the arm-frame nicely fitting and freely sliding upon the ribs of the seat-frame, while these are so formed, as will be apparent upon reference to the drawings, as to leave no lateral projection on the seat-frame to interfere with the movements of the operator by catching in his clothing or watch-guard.

To securely lock the arm in place when adjusted, instead of relying solely upon frictional contact of the parts, a lock consisting of a latch *t* is pivoted at one of its ends—that next the front of the chair—to the seat-frame slightly inside of the line of the rib *s'* and in advance thereof. An inclined laterally-projecting lug *u* on the arm-frame, at the front lower corner thereof, rides under the lock and lifts it as the arm-frame is being slid in place, and when the arm-frame has completed its sliding movement, its lug having passed beyond and released the lock, the arm-frame is retained in position by the fall of the lock, the rear end of which abuts against the lug, as shown in Fig. 1. In removing the arm-frame the lock is first lifted by means of the downwardly-projecting handle or knob thereof, and the arm-frame having been started in its movement of displacement the stop-lug *u*, passing beneath the latch, holds it up out of the way and no impediment is offered to the outward slide of the arm-frame.

Although we have described and shown the lower ribs *s'* of the chair-seat frame as inclined and the upper ribs *s* thereof as horizontal and prefer this construction, we do not wish to be understood as limiting ourselves thereto, as obviously the upper rib may be inclined upwardly from front to rear and the lower rib be made to extend horizontally, and in this event the grooves in the lugs *r r'* would be correspondingly changed, the upper groove being inclined and the lower one horizontal, so as to fit and slide upon the ribs of the chair-seat frame. It will be obvious that neither rib need be inclined provided a shoulder or similar stop on the seat-frame be employed to limit the inward-sliding movement of the arm-frame, accidental outward movement thereof being prevented by the lock. The employment of the inclined guide-rib is, however, advantageous, as it acts not only as a stop to limit rearward movement of the arm-frame, but also insures a snug fit of the arm in place and produces sufficient frictional contact between the parts to effectually prevent motion of the arm when in place. The upholstered seat T is made wider at top than at bottom so that at its sides, above the level of the sides of the seat-frame, the seat is flush with the outer surfaces of the sides of the seat-frame, the outward curvature or inclination of the arm-standards above their lugs *r* permitting of this construction of the seat. A head-rest X is carried by its supporting-bar Y, which has vertically-adjustable connection with the back-pad carrier L. As shown by Figs. 17 and 18, the head-rest support Y has

sliding dovetail connection with an arm or downwardly-projecting portion *z* at the upper end of the back-pad carrier, a set-screw *y* serving to lock the head-rest support in its position of vertical adjustment.

We claim as our invention—

1. The combination of the chair frame or body, the support or plunger therefor, the carrying frame or yoke having the split socket for connecting the chair-frame and its support or plunger and about the journals of which the chair-frame rocks, and the clamp-screw by which the carrying-frame is adjustably secured upon the support or plunger, substantially as set forth.

2. The combination of the chair frame or body, the support or plunger therefor provided with the holes at its upper end, the socketed carrying frame or yoke detachably connecting the chair-frame and its support or plunger and having a hole in the wall of its socket, and the locking-pin for engagement with the holes in the support and yoke, substantially as and for the purpose set forth.

3. The combination, substantially as set forth, of the vertically-adjustable and turning support or plunger, the elevating-lever turning with the support, the carrying frame or yoke connected with and horizontally adjustable by turning about the support, the chair frame or body carried by the yoke, and the locking devices for clamping the yoke to the support in the position of horizontal adjustment, to which the yoke may be brought by turning it about the support, whereby horizontal turning adjustment of the chair-body independently of the support and relatively to the elevating-lever is provided for, the lever is caused to project in the desired direction relatively to the chair-seat, and these relative positions are maintained throughout vertical and turning movements of the support, as described.

4. The combination of the chair frame or body, the back-frame projecting in rear thereof and pivotally connected therewith and provided beneath its pivot with the forwardly-projecting arm, the yielding-armed clamp-piece, and a lever-actuated clamp acting upon the armed clamp-piece for engaging it with the projecting arm of the back-frame, substantially as and for the purpose set forth.

5. The combination of the back-pad carrier, the handled detent or locking-latch pivoted in a recess in the carrier and curved and toothed in advance of its pivot, and the back-pad frame hinged to the carrier, engaged by said locking-latch, and provided with the opening in which said latch works and acts against the shoulder formed by the top wall thereof, substantially as and for the purpose set forth.

6. The arm-frame carrying the arm at top and having on the inside of its lower portion the two grooved lugs, one above the other, the groove in the one lug extending horizontally and that in the other being inclined, substantially as and for the purpose set forth.

7. The combination of the seat-frame provided with the horizontally-extending and inclined top and bottom guide-ribs and the arm-frame having on the inner side of its lower portion the two lugs grooved to adapt them to slide upon the ribs of the seat-frame, substantially as and for the purpose set forth.

8. The combination of the chair-seat frame provided at its side below the level of the upper surface of the upholstered seat with the top and bottom guide-ribs, the detachable arm-frame provided with the grooved lugs to slide upon said guide-ribs, and the lock to retain the arm-frame in position, substantially as set forth.

9. The combination of the seat-frame provided with the horizontally-extending top rib and the inclined bottom rib, the pivoted lock in advance and inside of said bottom rib, and the arm-frame provided with the two inwardly-projecting grooved lugs, one above the other, the upper one extending horizontally and the lower inclined to correspond with the inclination of the bottom rib of the seat-frame, the said arm-frame being also provided at its front lower corner with the inclined laterally-projecting lugs, substantially as and for the purpose set forth.

In testimony whereof we have hereunto subscribed our names.

WILLIAM A. JOHNSTON.
ARTHUR W. BROWNE.

Witnesses:

GILBERT S. BARNES,
THOS. C. TOTTEN.