

(No Model.)

3 Sheets—Sheet 1.

A. P. GOULD & H. R. SPENCER.

SURGICAL CHAIR.

No. 321,809.

Patented July 7, 1885.

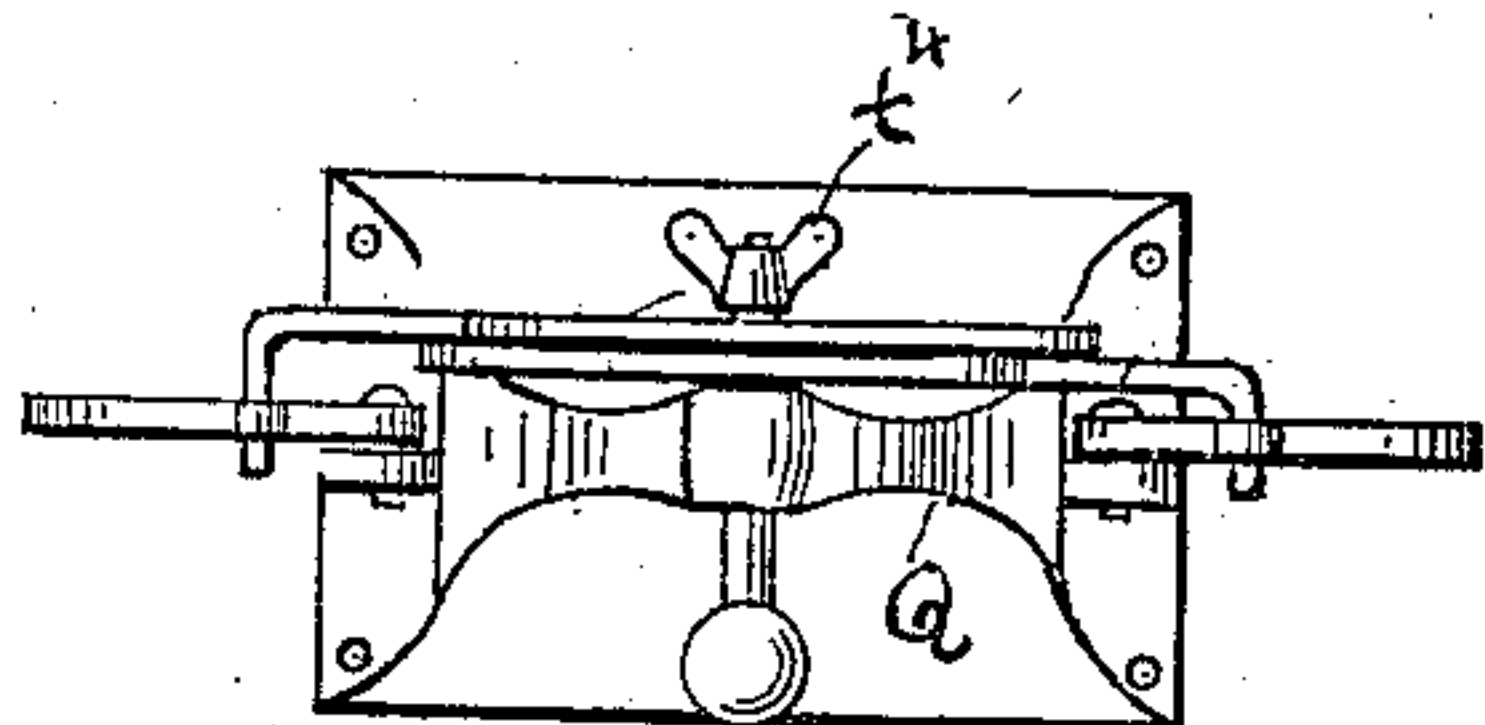


Fig. 10.

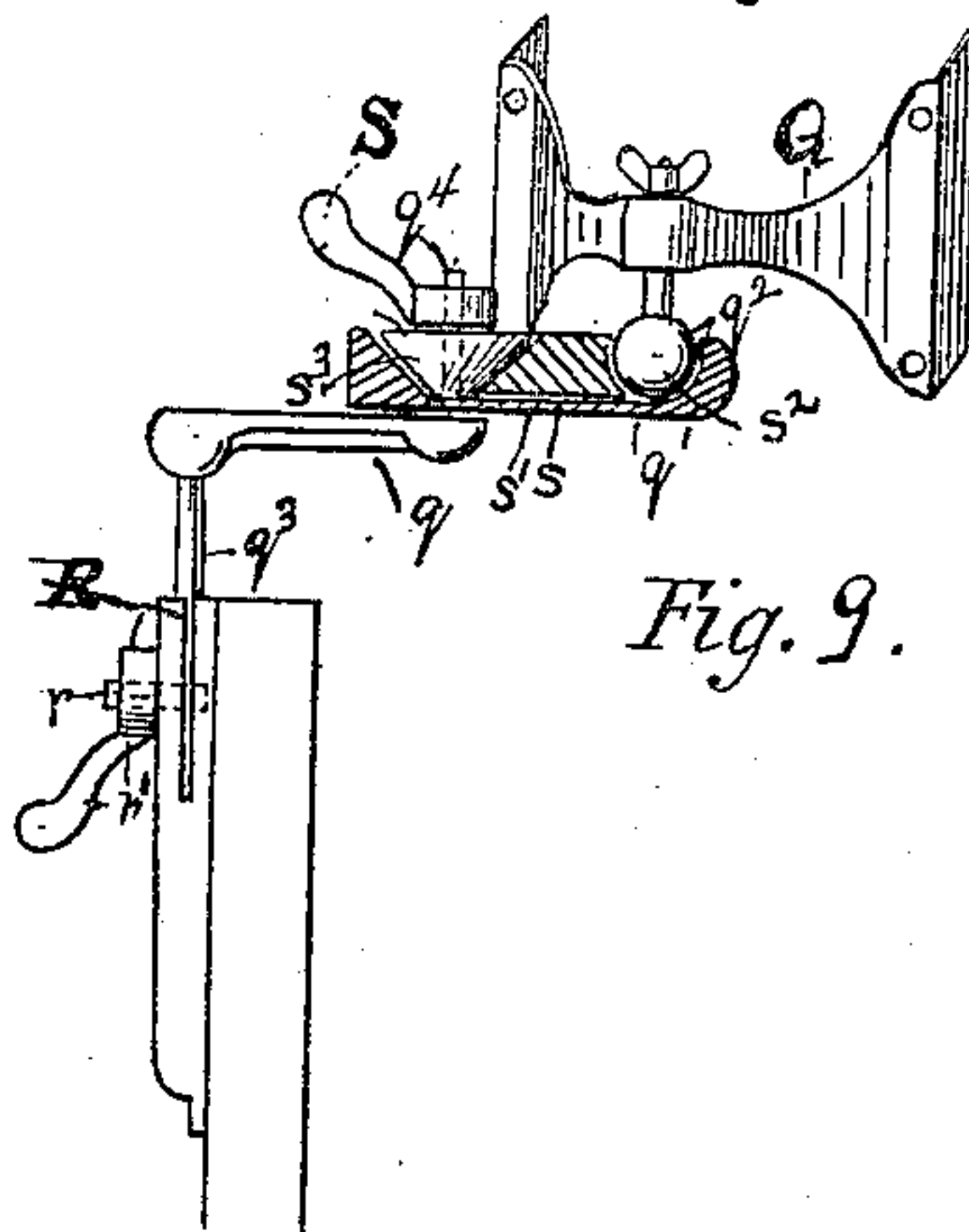


Fig. 9.

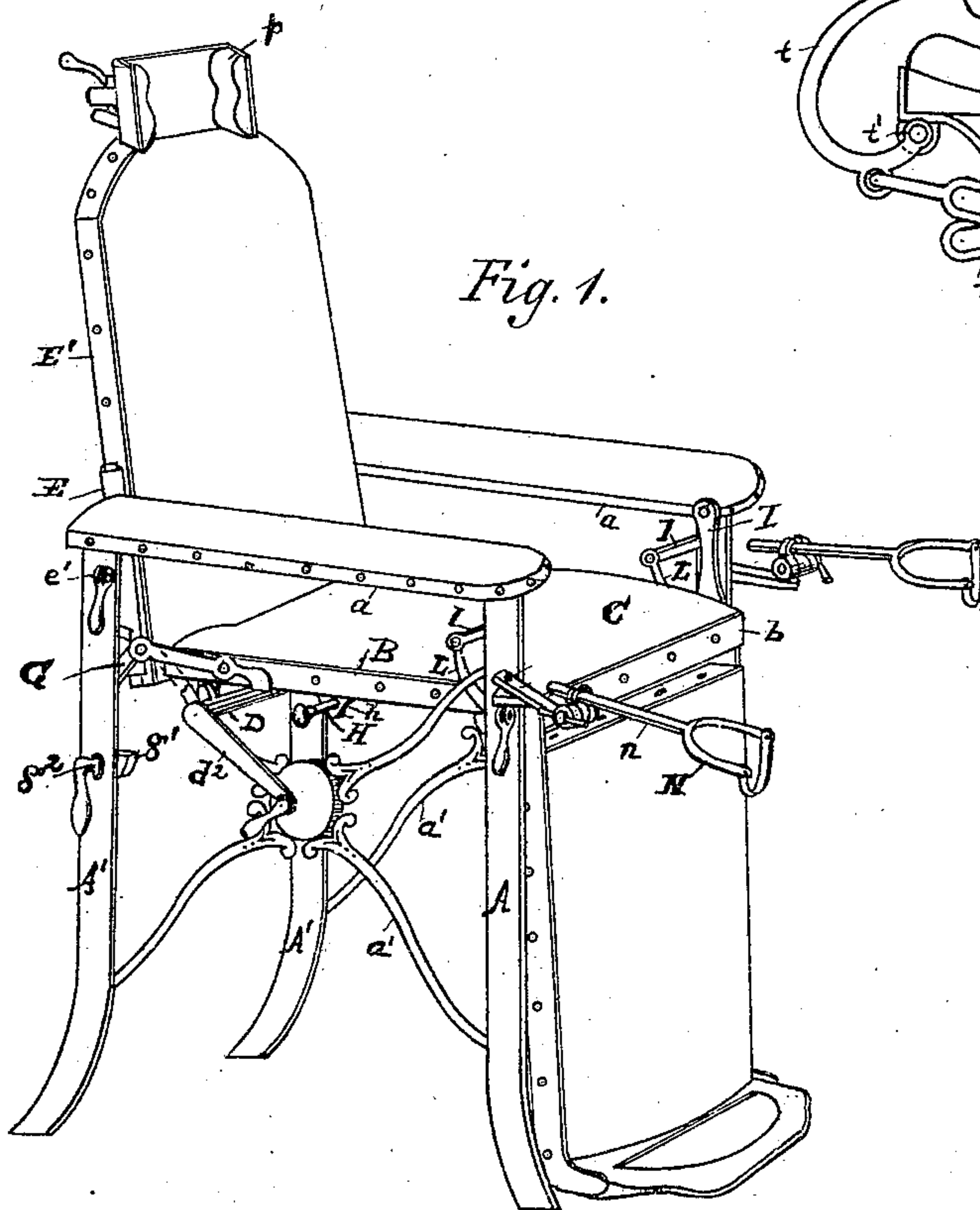


Fig. 1.

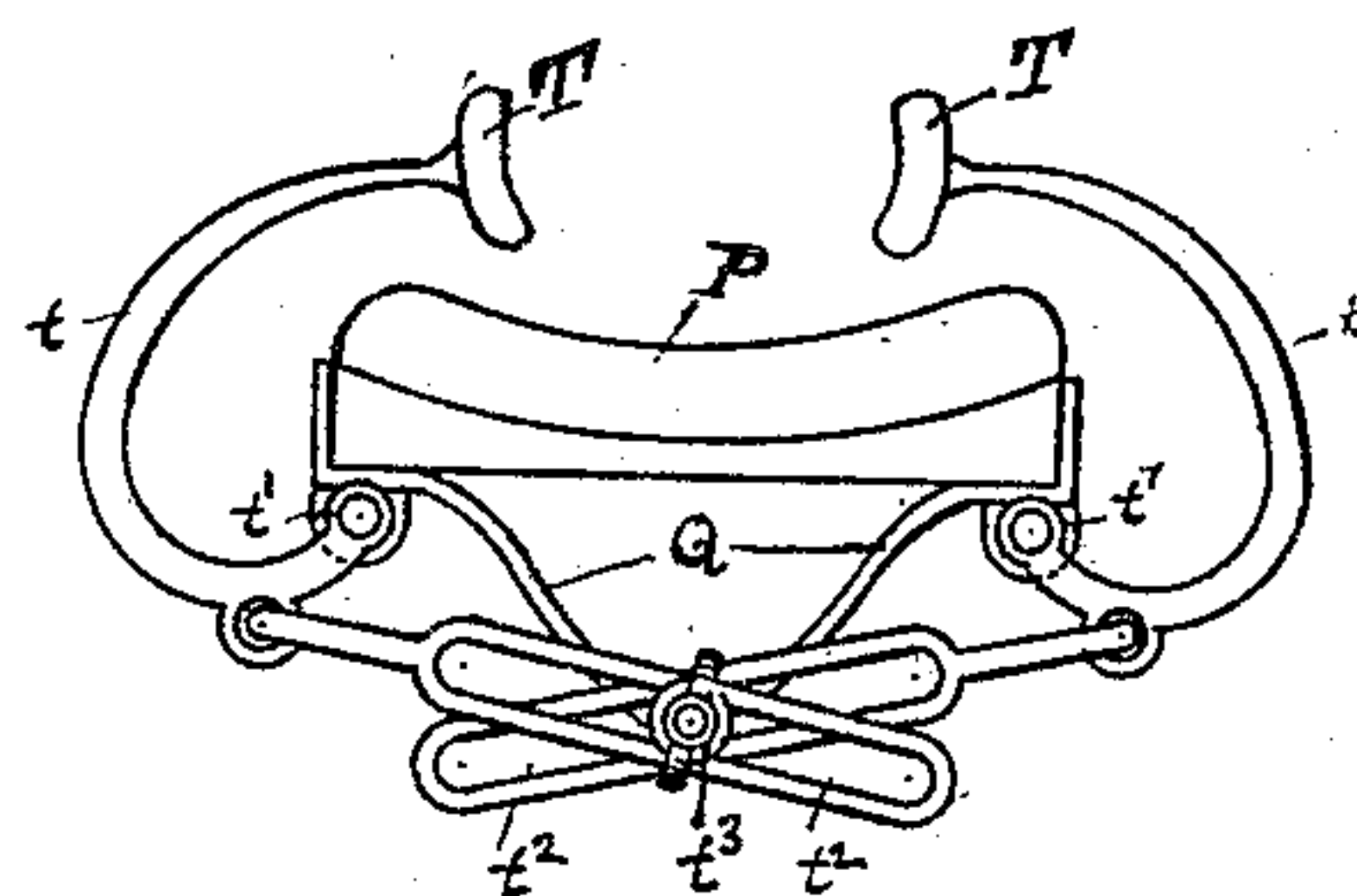


Fig. 8.

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(No Model.)

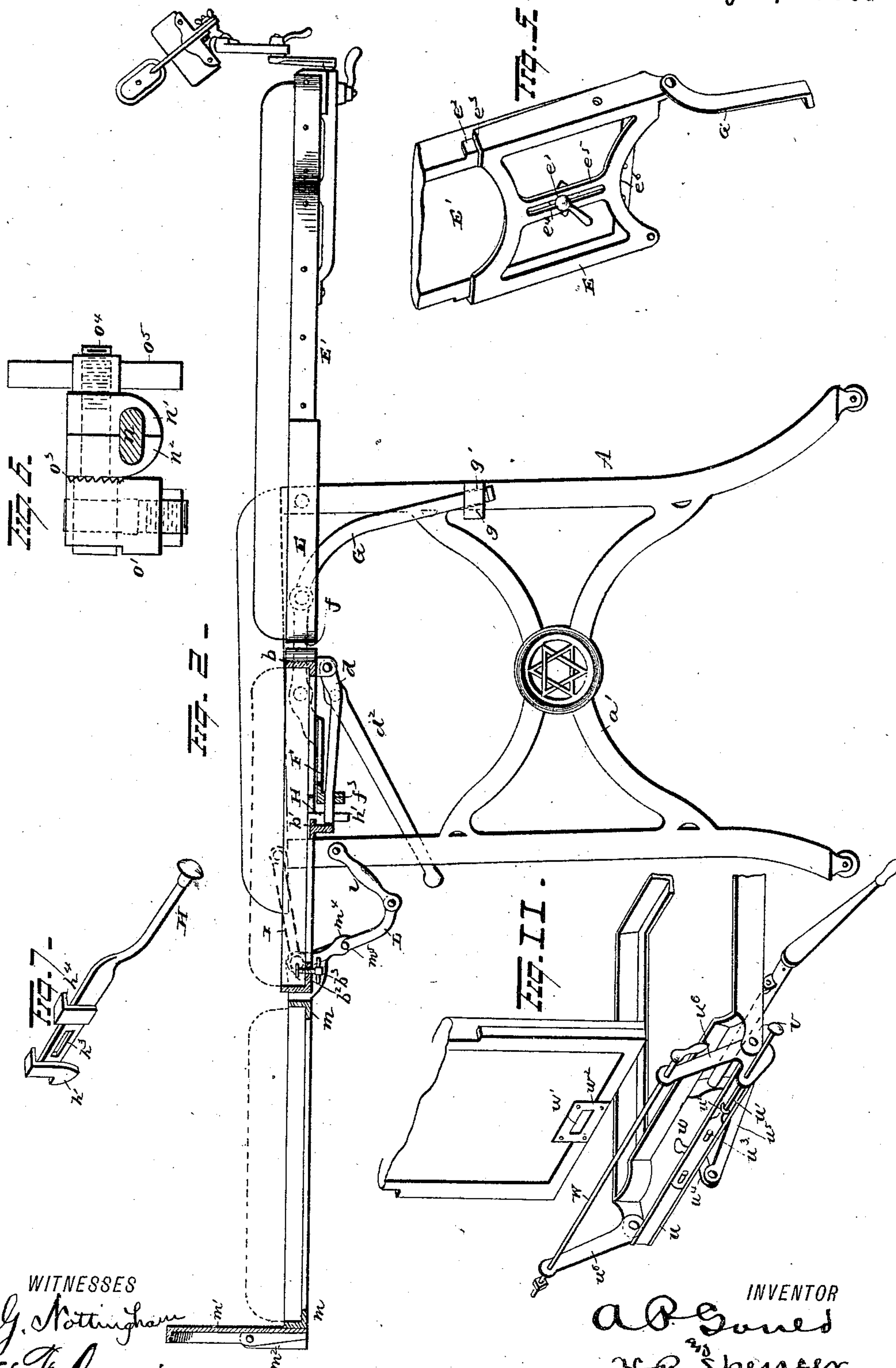
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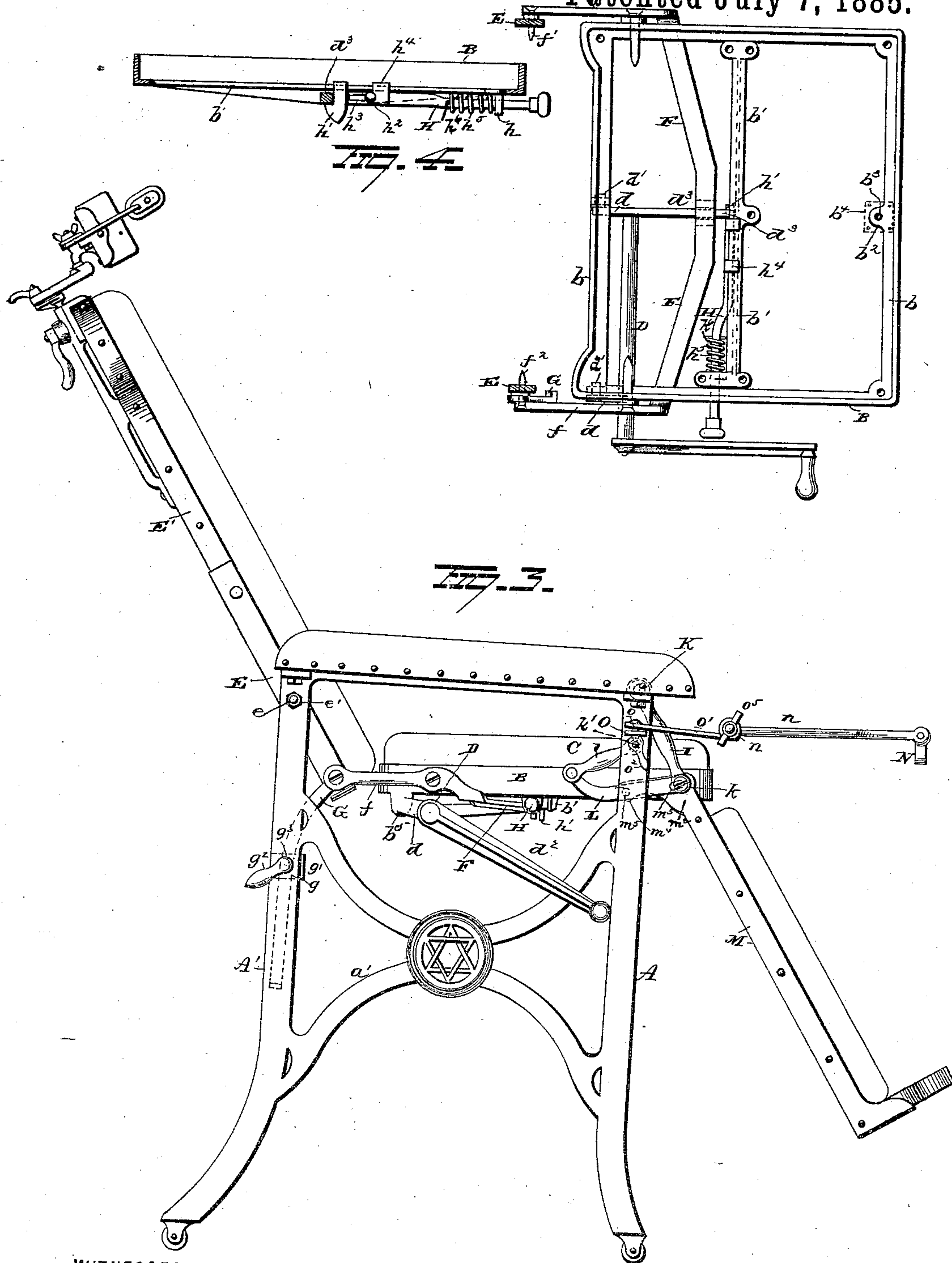
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SURGICAL CHAIR.

SPECIFICATION forming part of Letters Patent No. 321,809, dated July 7, 1885.

Application filed January 5, 1885. (No model.)

To all whom it may concern:

Be it known that we, AARON P. GOULD and HERBERT R. SPENCER, citizens of the United States, and residents of Canton, in the county of Stark and State of Ohio, have jointly invented certain new and useful Improvements in Surgical Chairs, of which the following is a specification.

Our invention relates to an improvement in surgical chairs. The object is to provide a chair which may be made to assume all the positions required for the various surgical operations by means of more simple and effective adjusting mechanism than has hitherto been employed; and with these ends in view our invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of the chair in upright position. Fig. 2 is a view of the same in horizontal adjustment with cushions removed. Fig. 3 shows the operating mechanism in side elevation, in the position it assumes when the chair-back and foot-rest are in a position at about an angle of forty-five degrees with the floor. Fig. 4 is a detached view of the seat-frame and operating mechanism connected therewith. Fig. 5 is a detached view of the back-frame. Figs. 6 and 7 are enlarged detached views of parts. Figs. 8, 9, 10 are detachable views of the head-rest. Fig. 11 is a modification.

The chair consists, essentially, of four frame-sections—viz., the leg-section or supporting-frame, the seat, back, and foot-rest sections. The sections are constructed, connected, and supplied with attachments as follows:

A represents the front legs of the chair, and A' the back legs. The four legs are connected by the top side rails, *a*, and by side, front, and back braces, *a'*, of such shape and size as to bind the legs firmly together and furnish a supporting-frame of the required strength.

The seat-frame is preferably of a rectangular shape, and consists of the side rails, B, the front and rear cross-bars, *b*, and the central cross-bar, *b'*, all firmly united together and provided with the following attachments: A rearwardly-extending lug or ear, *b*², is formed on the inside central portion of the front cross-

bar *b*, and provided with a threaded perforation, through which a thumb-screw, *b*³, extends, and bears against a plate, *b*⁴, secured to the lower front edge of the cushion C, for the purpose of tilting the cushion into positions at different vertical angles to the seat-frame. Two depending lugs or ears, *b*⁵, are formed integral with or firmly secured to the rear cross-bar *b*, and are provided with lateral perforations adapted to form bearings for a rock-shaft, D. The rock-shaft D is the fundamental element in transmitting the power of the operator to the several sections of the chair. It is pivotally secured in the lugs *b*⁵ by means of two arms, *d*, rigidly secured to the shaft, and provided with hinge-pintles *d'*, which enter the perforations in the said lugs. The outer end of the rock-shaft is provided with an operating-crank, *d*².

The means for attaching the seat-frame to the back-frame and foot-rest frame, and hence indirectly to the supporting-frame, and the means for transmitting the motion of the rock-shaft to the several sections, and locking them in closed adjustment, will be particularly described farther on.

The back-frame consists, preferably, of two sections, E and E'. The section E is hinged or pivoted to the back legs, A', near their upper ends, by means of trunnions or pivotal bolts *e*, which pass through slots in the legs, and are locked therein by nuts *e'*, of the ordinary form, or by short levers having cam projections on their faces, which impinge against the frame at the sides of the slots. The trunnions of the frame E are located a short distance above its lower end. The back-section E' is provided with tongue projections *e*² on its side edges, which are adapted to slide in suitable grooves, *e*³, formed in the sides of the section E. An elongated slot, *e*⁴, is formed in the central cross-bar, *e*⁵, of the frame-section E, and a corresponding slot is formed in a standard or brace, *e*⁶, on the back of the section E'. A set-screw, *e*⁷, or its equivalent, is located in the said slots, and serves to lock the section E' to the section E in any desired longitudinal adjustment within the limits of the length of the slot *e*⁴.

An auxiliary rocking frame consisting of an open V-shaped portion, F, and two arms, *f*,

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extending from the ends of the V-shaped portion parallel to each other, is pivotally secured to the side rails of the seat-section near their rear ends, and to the sides of the back section, E, near their lower ends, by bolts or studs f' f^2 , which extend through suitable perforations in the arms f . The V-shaped portion of the rocking frame, when in position, is located beneath the seat-section and pointing toward the front or downwardly.

The rock-shaft D is provided with a third laterally-extending arm, d^3 , which is conveniently a prolongation of the inner arm, d , upon the opposite side of the shaft. The arm d^3 extends through a slot, f^3 , at the vertex of the V-shaped portion F of the rocking frame, and has a free sliding motion therein.

A curved arm, G, is loosely mounted at its upper end on the pivotal bolt or stud f' , and extends downwardly through a slot, g , in an inwardly-extending lug, g' , secured to or formed integral with the back leg, A'. A set-screw, g^2 , provided with a suitable operating-handle, extends through a threaded perforation, g^3 , in the leg A', and impinges against the curved arm G, for the purpose of locking the arm in any desired vertical adjustment within the slot g .

A spring-actuated catch consists, preferably, of a rod, H, having a sliding motion in a perforation formed in a depending ear, h , secured to or formed integral with the cross-bar b' near its outer end. The inner end of the rod H is provided with a depending catch or hook, h' , adapted to take under the end of the arm d^3 when the latter is in elevated adjustment. The rod H is further secured in position along the side of the cross-bar b' by a headed bolt, h^2 , which is secured to the cross-bar b' through an elongated closed slot, h^3 , formed in the rod, and by a short upwardly-extending arm, h^4 , which lips over the upper edge of the said cross bar b' . A spiral spring, h^5 , is secured on the rod H between the ear h and a shoulder, h^6 , the tension of which tends to hold the catch h' in locked adjustment. The front of the seat-section is attached to the inner faces of the front legs, A, in a swinging adjustment, by means of a pair of depending arms, I, loosely secured at their upper ends on inwardly-projecting studs or bolts K, set in the legs, and on studs or bolts k , set in the side rails of the seat-section near their front ends. The pivotal bolts k on each side are also connected with bolts k' on the inner faces of the legs A, below the bolts K, by jointed arms consisting of the sections L l.

The foot-rest section is preferably rectangular in shape, and consists of a skeleton frame having side rails, M, and an upper and lower cross-bar, m , to the latter of which the foot-rest m' is hinged. The foot-rest section is hinged to the seat-section by means of corner extensions, m^2 , conveniently formed with elongated slots m^3 , which embrace the pivotal bolts k . The extensions m^2 , after passing the bolts k , are bent nearly at right angles, and

extend rearwardly for a short distance, terminating in open hooks m^4 , adapted to receive short studs m^5 on the inner sides of the jointed arm-sections L. The slots m^3 are sufficiently elongated to admit of the extensions m^2 slipping outwardly or upwardly enough to free the hooks m^4 from the studs m^5 , and allow the foot-rest section to depend in a free swinging motion from the bolts k ; but when the hooks m^4 are in engagement with the studs m^5 , the foot-rest section will be subjected to such changes in its position with reference to the seat-section as is determined by the combined action of the arms I and jointed arms L l.

The chair as thus far described is operated as follows: Suppose the crank d^2 to be nearly horizontal, the rocking frame locked in elevated adjustment against the bottom of the seat, and the back and foot-rest sections at or nearly at right angles to the seat-section. If, now, the spring-catch H h' be released from engagement with the rocking frame, and the crank turned to a vertical position, the effect will be to at first lower the rear end of the seat-section, and at the same time swing the lower end of the back-section forwardly, and, finally, when the crank has completed a full quarter-turn, to swing the back-section into a horizontal position, with its lower end projecting over the rear end of the seat-section. If the crank be now turned forwardly and upwardly toward its first position, the seat-section will be gradually swung forwardly and upwardly into a horizontal plane with the back-section, and both on a plane with the side rails of the supporting-frame. This motion of the seat-section will also, by the combined action of the arms I L l and the bent extensions m^2 , with their hooked ends m^4 , in engagement with the studs m^5 on the arm-sections L, gradually elevate the foot-rest section into the same horizontal plane with the seat and back sections, and the spring-catch H h' will lock the seat and foot-rest sections in the same plane as shown in Fig. 2. By turning the set-screw g^2 into engagement with the arm G the three sections are securely locked in horizontal or open adjustment. If, however, the arm G be left free to slide in its socket, a downward pressure on the seat-section will return the chair to its original position. By means of the set-screw g^2 the back and foot-rest sections may be locked in any desired angular adjustments with respect to the seat-section. When the set-screw g^2 is loosened, the occupant of the chair may change the positions of the chair-sections, and hence his position in the chair, by swaying the upper portion of the body forwardly or backwardly.

The side rails, a , the back, seat, and foot-rest sections, may be upholstered in any suitable manner.

For the purpose of holding the feet of the patient in a suitable position for certain classes of operations, we provide the stirrups N, the stems n of which are secured in longitudinal adjustment between the outer and in-

ner jaws, n' n^2 , of rotary adjustable clamps, as follows: On the outer sides of the front legs, A, near their upper ends, laterally - extending lugs or ears O are formed, provided with vertical perforations, in which are secured in rotary adjustment pivotal or hinge bolts o , provided on their upper ends with enlarged heads and on their lower ends with nuts or eccentric levers o^2 , for securing the bolts in the desired rotary adjustments. The heads o' are prolonged in the form of arms, and are provided on their forward ends with a round or partially round serrated - faced shoulder or transverse abutment, o^3 , rigidly secured thereto, from which serrated-faced abutments the bolts o^4 extend transversely to the elongated heads o' . The jaws n' and n^2 are loosely mounted on the bolts o^4 by means of perforated eye portions n^3 , which form an integral part of the jaws. The face of the jaw n^2 adjacent to the serrated face of the abutment o^3 is provided with one or more teeth, which are adapted to engage the serrations in the face of the said abutment when pressed in contact therewith. A tail-nut, o^5 , or its equivalent, works on the end of the bolt o^4 , and serves to press the jaws n' n^2 into close contact with the stem n of the stirrup, and at the same time press the inner jaw, n^2 , into snug contact with the serrated face of the abutment o^3 .

By the above construction the stirrups may be adjusted and locked in any desired vertical or angular adjustment.

The head-rest which we find it advantageous to use in connection with the above-described chair consists of a flexible band, P, adapted to receive the back of the head, and provided with cushions p at each end, to prevent the lateral displacement of the head. The rest P, is held in position by a crotch-frame, Q, secured to the rest P at the rear sides of its ends, and secured to a jointed supporting-arm consisting of the sections q q' by means of a ball-and-socket joint, q^2 . The arm-section q is provided with a long stem, q^3 , which slides vertically in a socket, R, formed in a bracket secured to the back of the chair, and with a short upwardly-extending threaded stem, q^4 , which extends through an eye in the rear end of the arm-section q' . The rest is locked in the required vertical and forward or backward adjustment by means of an eyebolt, r , which embraces the long stem q^3 of the arm-section q , and is provided with a tail-nut, r' , in engagement with its stem, as shown. The rest is simultaneously locked in the desired horizontal adjustment and in the desired universal angular adjustment by means of the tail-nut S, in engagement with the stem q^4 of the arm-section q , as follows: The upper face of the arm-section q' is provided with a deep groove, s , in which is located a sliding bar, s' , having a concave face at the front end adapted to fit one-half section of the ball s^2 , and provided at the rear end with a concave bevel face of circular form adapted to fit the edge

of a bevel-edged disk, s^3 , loosely secured on the short stem q^4 . The sliding bar s' has a short play only between the ball s^2 and the stem q^4 , and when the tail-nut S is screwed down on the disk s^3 the pressure of the bevel face of the disk against the bar s' tends to force the bar forwardly into contact with the ball s^2 and to lock the ball in the desired adjustment. The same movement of the tail-nut S also draws the sections q q' into snug contact with each other, and hence locks the section q' to the section q in the desired horizontal adjustment. These several adjustments cover all possible positions which the rest can be required to occupy, and with the fewest and simplest locking devices.

To prevent the head of the patient from rolling from side to side, the pads T are provided. They consist of soft cushions secured to the forwardly-extending ends of spring-arms t , which are pivotally secured in lugs t' at the ends of the crotch-frame Q, and provided with slotted links t^2 , which connect the arms t with a threaded stud, t^3 , secured at the crotch of the frame Q. A thumb-nut, t^4 , on the stud t^3 , is adapted to bind the links in snug contact with each other and the shoulder at the base of the stud t^3 , and lock them in the desired adjustment thereon, and hence lock the pads T in the desired lateral adjustment.

The above-described head-rest is particularly well adapted to use in connection with our improved chair; but we make no claim thereto in the present application, as the same is reserved as the subject-matter of a separate application.

The modification represented in Fig. 11 consists in providing the rear of the seat-frame with projections U, to which is pivoted a swinging bar, u . A sliding catch-bar, u' , is secured to the swinging bar u by means of a perforated lug, u^2 , and rivets u^3 , passing through slots in the catch-bar. The operating rock-shaft is pivoted to the rear of the seat-frame in a manner quite similar to that above described, and is connected with a short arm, u^4 , on the swinging bar u by a link, u^5 . The projections U are provided with upwardly-extending arms u^6 , pivotally secured thereto, between which the back of the chair is pivotally secured by a rod, W, which extends through the slots in the upper ends of the rear legs, through perforations in the ends of the arms u^6 , and through suitable bearings in the back. The catch w on the rod or bar u' is adapted to engage a slot, w' , in a plate, w^2 , secured to the brake-section, and is thrown out of engagement therewith by the action of the catch-bar.

It is evident that many slight changes may be resorted to in the construction of the several parts described without departing from the spirit and scope of our invention; hence we do not wish to limit ourselves strictly to the construction herein set forth.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a surgical chair, the combination, with a supporting-frame, of a back-section pivotally secured to the supporting-frame, a seat-section pivotally secured to the back-section and to the supporting-frame, and a rock-shaft connected with the seat and back-rest for changing their relative positions.

2. The combination, with a supporting-frame provided with arm-rests, of a back-section pivotally secured to the rear portion of the supporting-frame, a seat-section located normally below the side arms and connected with the back-section, swinging arms connecting the seat-section to the supporting-frame, and devices for swinging the seat and back sections into the same horizontal plane on a level with the arm-rests, substantially as set forth.

3. The combination, with the supporting-frame and the back-frame pivotally secured thereto, of a seat-section, swinging arms connecting said seat to the supporting-frame, a shaft, and a rocking frame connected with the back-frame and operated by the shaft, substantially as set forth.

4. The combination, with the seat-section, secured to the supporting-frame at its front by a pair of swinging arms, of a pair of jointed arms, also connecting the seat-section and the supporting-frame, and a foot-rest section hinged to the seat-section and provided with arms adapted to engage the said jointed connection, whereby the forward and upward motion of the seat-section tends to elevate the foot-rest section into the same plane with the seat-section, substantially as set forth.

5. The combination, with the seat and back

sections pivotally secured to the supporting-frame, of an auxiliary rocking frame secured to the seat-section and to the lower end of the back-section, a rock-shaft secured to the seat-section, and having an engagement with the rocking frame, and means for imparting a rotary motion to the rock-shaft, and thereby adjusting the seat and back sections, substantially as set forth.

6. The combination, with the seat and back sections pivotally secured to the supporting-frame and to each other, of a rock-shaft, a handle or crank for operating said shaft, a rocking frame for throwing the said sections into the desired angular adjustments relatively to each other, and means for locking the sections in any desired adjustment, substantially as set forth.

7. The combination, with a supporting-frame, a seat and back section pivotally connected to the frame, a rocking frame connected to the seat, and a rock-shaft for operating said rocking frame, of a spring-actuated catch located beneath the seat-section and adapted to automatically lock the rocking frame in elevated adjustment, substantially as set forth.

8. The combination, with seat and back sections, of a rocking frame connecting the two, and a rock-shaft journaled in bearings on the lower side of the seat and adapted to transmit motion to the rocking frame, substantially as set forth.

Signed at Canton, in the county of Stark and State of Ohio, this 1st day of December, A. D. 1884.

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