

(No Model.)

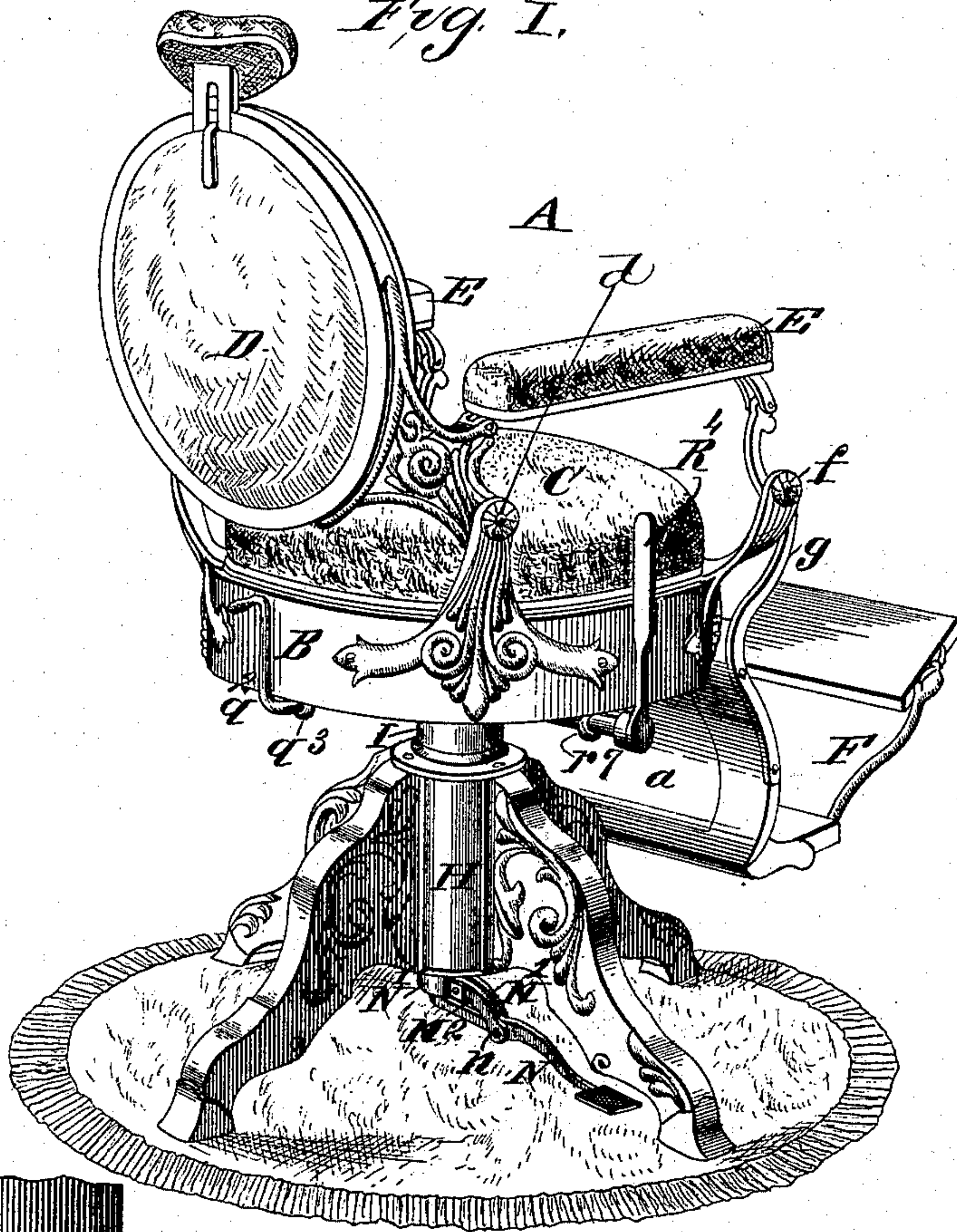
4 Sheets—Sheet 1.

E. E. KOKEN.  
CHAIR.

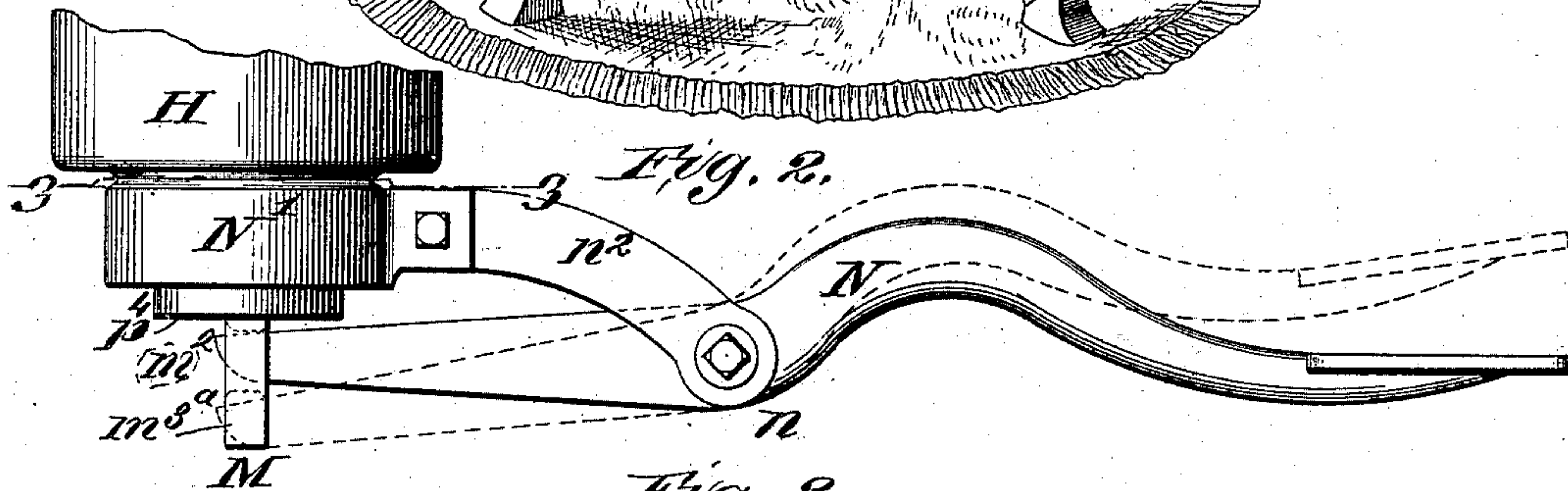
No. 540,320.

Patented June 4, 1895.

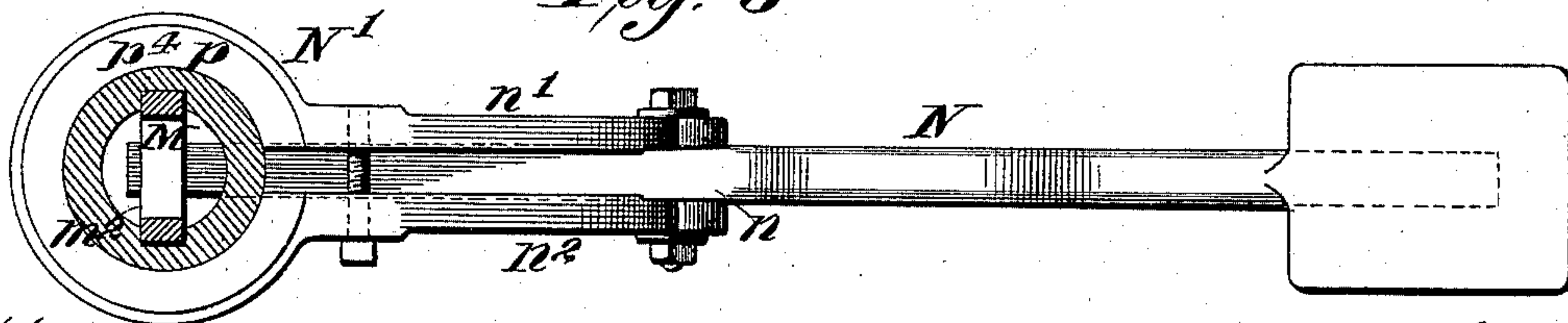
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Attest*  
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*Inventor:*  
*Ernest E. Koken*  
*By* *Wm. T. Moody*  
*his Atty*

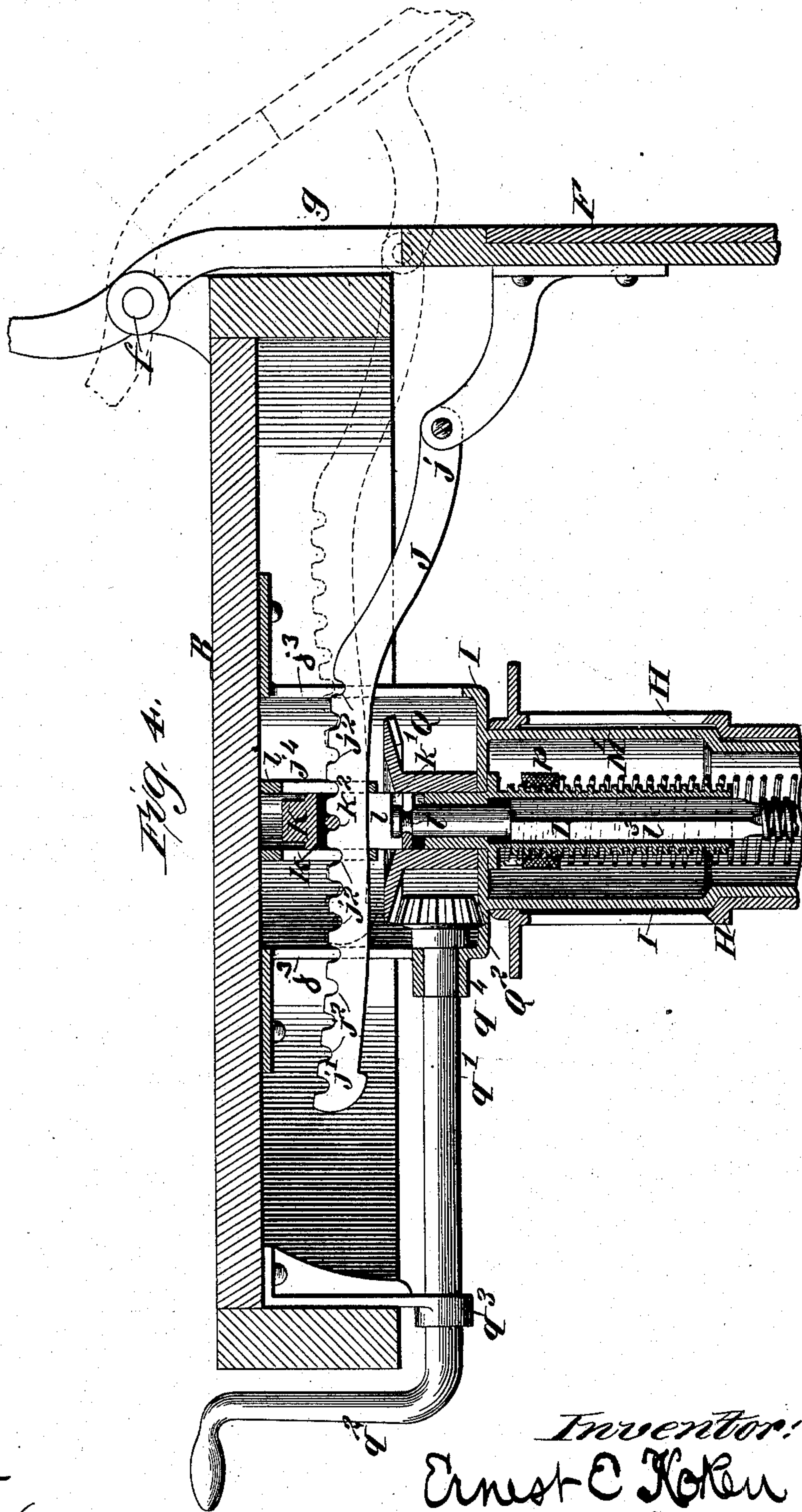
(No Model.)

4 Sheets—Sheet 2.

E. E. KOKEN.  
CHAIR.

No. 540,320.

Patented June 4, 1895.



*Attest*  
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*A. Bonville*

*Inventor:*  
*Ernest C Koken*  
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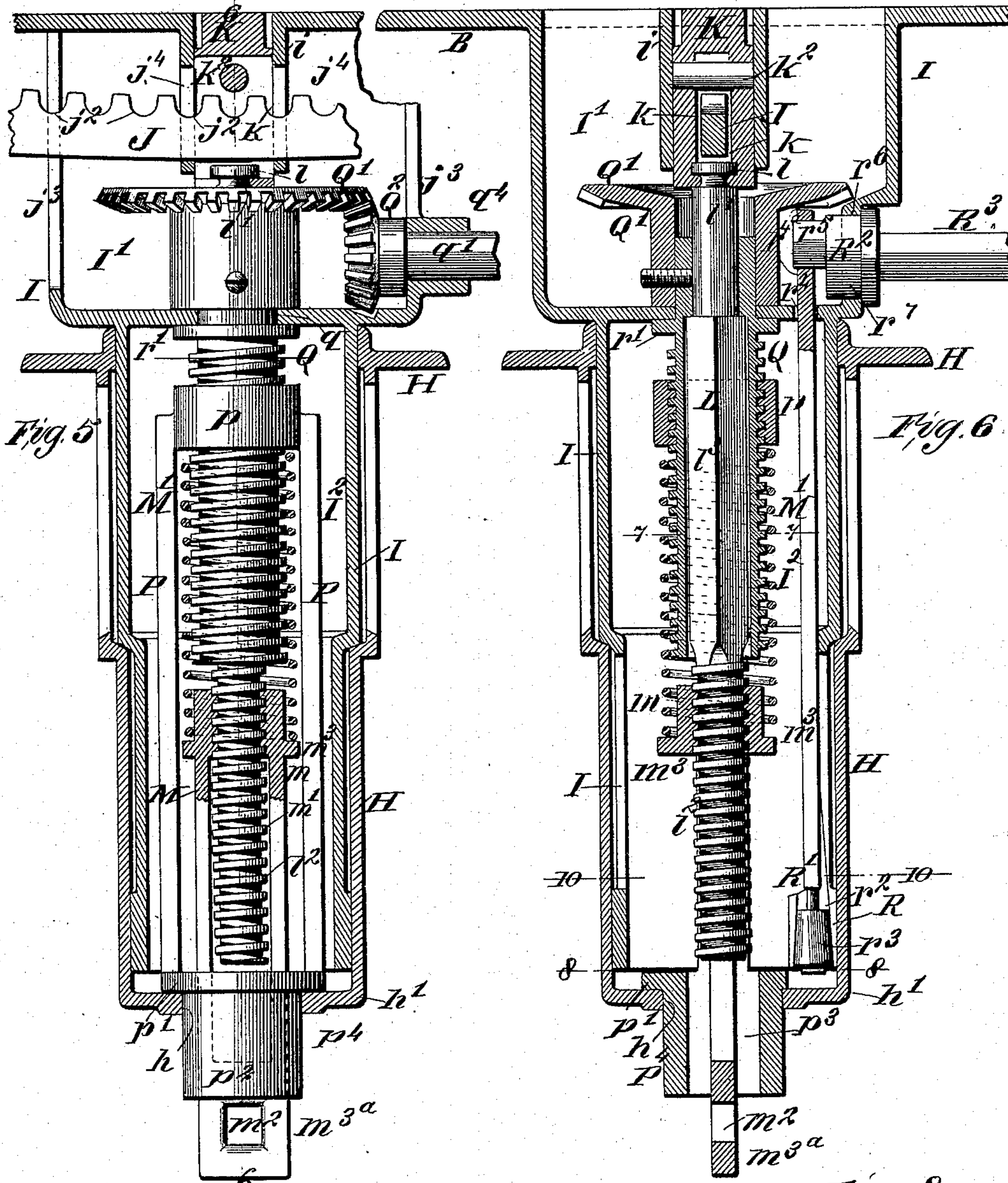


Fig. 7.

Fig. 8.

Attest:  
Lib. H. Carson,  
A. Bonville

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Res. T. Moody  
his Attys.  
By



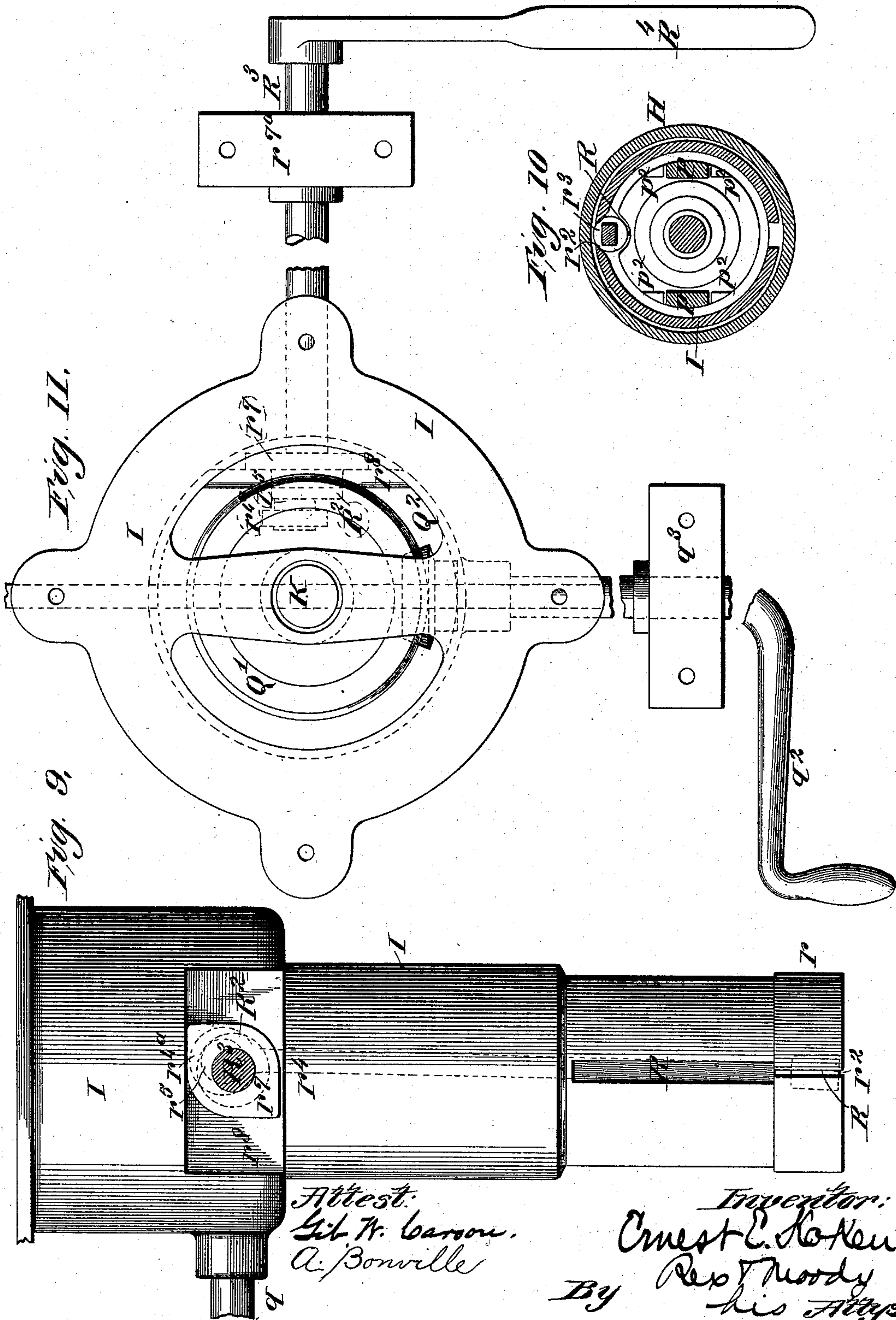
(No Model.)

4 Sheets—Sheet 4.

E. E. KOKEN.  
CHAIR.

No. 540,320.

Patented June 4, 1895.





# UNITED STATES PATENT OFFICE.

ERNEST E. KOKEN, OF ST. LOUIS, MISSOURI.

## CHAIR.

SPECIFICATION forming part of Letters Patent No. 540,320, dated June 4, 1895.

Application filed September 4, 1894. Serial No. 522,094. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST E. KOKEN, of St. Louis, Missouri, have made a new and useful Improvement in Chairs, of which the following is a full, clear, and exact description.

The improvement relates chiefly to revolving and reclining chairs.

The features of the improvement will be hereinafter set forth and designated in the claims.

In the annexed drawings, making part of this specification and exhibiting the most desirable mode of carrying out the improvement, Figure 1 is a view in perspective of my improved chair. Fig. 2 is a side view of the treadle-lever and connecting parts. Fig. 3 is in part a top view of the same lever and the arms supporting it and in part a cross-section along the line 3 3, Fig. 2, looking downward, of the slotted bar which said lever is used to raise and the parts surrounding said bar. Fig. 4 is an enlarged vertical cross-section of the seat of a chair and the upper portions of my improved operating mechanism. Fig. 5 is an enlarged detailed view, partly in vertical cross-section and partly in elevation, of the central portion of said operating mechanism, the treadle-lever being omitted. Fig. 6 is a vertical cross-section along the line 6 6 of the same parts shown in Fig. 5. Fig. 7 is a horizontal section through the rectangular rod L and tubular screw D along the line 7 7, Fig. 6. Fig. 8 is in part a view looking upward of the lower end of the spindle attached to the chair-seat and on which the chair turns and in part a horizontal cross-section along the line 8 8, Fig. 6, of the sleeve or socket within which the spindle rotates. Fig. 9 is an enlarged view, in elevation, of the chair-spindle. Fig. 10 is a horizontal cross-section of the sleeve in which the chair-spindle revolves and contained parts along the line 10 10 of Fig. 6, looking downward; and Fig. 11 is an enlarged top view of the spindle and the crank and levers used, respectively, to raise and lower the chair and to lock it in position.

Similar letters of reference refer to similar parts throughout the several views.

The chair A (Fig. 1) used to illustrate my improvement, is of the type known as a "barber's chair," the improvement being more especially applicable thereto. By means of it

the chair can be readily revolved to expose the occupant to any desired light or to enable him to be conveniently reached and also raised and lowered so as to adapt it to the size of the occupant or the barber using it, and may be locked in position; and, the chair back, and foot rest inclined and adjusted as may be needed.

The chair base B, seat C, back D, arms E E, and foot rest F are of familiar construction and hardly require detailed description, saving to say that the back is pivoted at its lower end, *d*, to the seat frame. The foot rest is, by means of the arms *g g* pivoted at *f* to the seat frame, and the arms E E at their ends respectively, are jointed to the back D and to the extended foot rest arms, so that when the back is turned downward the foot rest is turned upward and when the back is raised the foot rest is dropped.

H (Figs. 1, 2, 5, 6, 8 and 10) represents a sleeve attached rigidly to the legs of the chair.

I (Figs. 1, 4, 5, 6, 8, 9, 10 and 11) is a hollow spindle attached to the seat of the chair and revolving within the sleeve H.

J (Figs. 4, 5 and 6) represents a bar pivoted at its forward end *j* to the foot rest F and in its rear end *j'* having a series of notches *j''*. The bar extends backward from its point of connection with the foot rest, through slots *j'''* in the spindle I, the slots *j''''* in the sleeve *i* and the slot *k* in the slotted dog K by which it is designed to be locked in position. The dog K (Figs. 4, 5, 6, and 11) reciprocates within the slotted sleeve *i*. It contains the vertical slot *k* for the passage of the bar J and the horizontal slot *k'* (Fig. 4) to allow of the introduction of the head *l* of the rod L by means of which it is raised and lowered. Across the upper portion of the slot *k* is a tooth *k''*. The tooth *k''* engages the bar J when in its lowest position and is disengaged by lifting the dog.

The dog K is raised and lowered by means of the mechanism which will now be described.

L is a rod having a head *l* and an annular groove *l'*, extending around it beneath its head. The head is inserted horizontally by pushing it into the groove *k'* of the dog K. In the special form shown in the drawings the sides of the rod L are rectangular for a portion of its length but at its lower end *l''*, it is screw threaded. The end *l''* of the rod



L connects with a slotted sleeve M, provided with a tubular head screw threaded internally. The connection is made by screwing the rod L into the head  $m$  of the sleeve M.  
 5 The slot in this sleeve is lettered  $m'$  and is intended to permit of the vertical movement of the rod L within the sleeve. The lower end of the sleeve M contains the perforation  $m^2$  (Figs. 2, 3, 5 and 6) for the introduction of  
 10 the end of a lever.

N, (Figs. 1, 2 and 3) is a treadle lever pivoted at  $n$  to the arms  $n', n^2$ , of the split sleeve  $N'$ . Its inner end enters the opening  $m^2$  in the sleeve M and when its outer end is depressed the sleeve M and connecting parts including the dog K are lifted and the tooth  $k^2$  of the dog, disengaged from the bar J and said bar may then be freely moved through the slot  $k$  and the parts connected therewith  
 15 adjusted. When the downward pressure is removed from the outer end of the treadle the dog is drawn down again into engagement with the bar I by the action of the coiled spring  $M'$  (Figs. 4, 5, and 6) whose lower end rests upon an annular flange  $m^3$  surrounding the head  $m$  of the slotted sleeve M. Gravity alone may be depended upon but I prefer to assist it by a spring as the action is in that way made more positive and certain. The  
 20 upper end of the spring  $M'$  bears against the under side of the tubular head  $p$  of the slotted sleeve P (Figs. 4, 5, and 6) which surrounds said spring and the sleeve M. The lower end  $p^4$  of the sleeve P, is round and passes through the open lower end of the spindle I and a central opening  $h$  in the bottom  $h'$  of the sleeve H and the split sleeve  $N'$  is attached to it. It is prevented from passing too far downward by its annular flange  $p'$   
 25 which rests upon the bottom  $h'$  of the sleeve H, and it is caused to revolve with the spindle I by the stops  $p^2, p^2, p^2, p^2$ , (Figs. 8 and 10) cast in or otherwise attached to the interior of said spindle. When the spindle I is moved vertically the stops or lugs  $p^2$  slide along the corresponding faces of the sleeve P, whose relative positions are clearly shown in Fig. 10. I prefer to use four stops but as will be obvious two only, would answer. Said stops  
 30 are preferably located near the lower end of the spindle I, but may be placed farther up so long as they are in a position to engage the side pieces of the sleeve P and prevent said sleeve from turning within the spindle I.  
 35 They cause the sleeve P, and the lever N and split sleeve  $N'$  therewith connected to always revolve with the spindle I, when the chair is caused to revolve in order to secure a better light, or for any other purpose. The end  $p^4$   
 40 of the sleeve P, contains a central vertical slot  $p^3$  through which the lower end  $m^{3a}$  of the sleeve M passes and in which it reciprocates. The lower end  $m^{3a}$ , of the sleeve M and the slot  $p^3$  in which it reciprocates are so  
 45 formed as to prevent the sleeve M from revolving within the sleeve P. In the form of my device shown in the drawings the slot  $p^3$

is oblong in cross section and the lower end  $u^{3a}$ , of the sleeve M corresponds with it in shape. The head  $p$  of the sleeve P is internally screw threaded to receive the screw Q.  
 5 The screw Q (Figs. 4, 5, and 6) is made tubular so as to permit of the passage of the bar L and is so formed internally as to fit the upper end  $l^3$  of said bar for at least a portion of its  
 10 length, so as to cause the bar to revolve with it when it is turned. As will be obvious it is not necessary that all sides of the portion  $l^3$  of the bar L should be flat or that either side should be. It may be made any shape except  
 15 round as all that is desired is to force it to revolve with the screw Q while leaving it free to move independently vertically, and so far as the fit of the screw Q is concerned, all that is necessary is to so form its interior as  
 20 to gain the ends above mentioned. The upper end of the screw Q passes up through the opening  $q$  into the chamber  $I'$  of the spindle I. Its upward movement is limited by the flange  $r'$ . On its upper end it bears the bevel  
 25 wheel  $Q'$  which is rigidly attached to it and is located in the chamber  $I'$ . This wheel meshes in with the bevel wheel  $Q^2$  (Figs. 4 and 5) attached to the end of the shaft  $q'$  which is bent at its outer end so as to form the crank  
 30  $q^2$  (Figs. 1 and 4,) by means of which it is designed to be turned. The crank shaft is journaled in the bracket  $q^3$  attached to the chair seat and a tubular bearing  $q^4$  in the spindle I.

By turning the crank  $q^2$  motion is communicated through the gears  $Q'$  and  $Q^2$  to the screw Q and which is thus caused to revolve. As the sleeve P is unable to revolve with it, turning the screw Q in one direction elevates the chair and turning it in the opposite direction causes it to descend which last it is assisted in doing by the force of gravity. By these arrangements all the various adjustments desirable may be readily secured. It remains to describe the means for so locking  
 35 the chair as to prevent its being accidentally turned when in a desired position. The spindle I is split by a vertical slot R (Figs. 8, 9, and 10) which makes it possible to increase the diameter of the spindle by springing the  
 40 sides of the slot R apart. The lower end of the spindle is preferably strengthened by casting the part  $r$  thicker than the part directly above it. The outside of the part  $r$  is preferably formed to fit the inside of the sleeve H in which it is intended to turn and reciprocate, snugly, but not so tightly as to interfere with the movement of the spindle when not spread in the manner hereinafter described. The part  $r$  is made thickest on  
 45 the side where the slot R is located where it is reinforced by the pieces  $r' r'$  (Fig. 8). At the point where the parts  $r', r'$ , are located a conical vertical, open topped socket  $r^2$  (Figs. 6, 8, 9, and 10) is formed in the spindle. This  
 50 socket is divided vertically by the said slot R. Within the socket  $r^2$  is placed a conical wedge  $r^3$  (Figs. 6, 7, 8, and 9) which is attached to the lower end of the vertical rod  $R'$  which passes



upward through the chamber I<sup>2</sup> of the spindle and through the opening r<sup>4</sup>, into the chamber I' of said spindle. At its upper end is formed the ring r<sup>4a</sup> (Figs. 6, 9, and 11). In this ring the wrist r<sup>5</sup> of the disk crank R<sup>2</sup> works. The disk crank R<sup>2</sup> is journaled in a bearing r<sup>6</sup> (Fig. 6) formed in the spindle I and the outer end of its shaft R<sup>3</sup> is journaled in the bracket r<sup>7a</sup> (Figs. 1 and 11), attached to the chair seat. Motion is communicated to said shaft by means of the lever R<sup>4</sup>. This motion is limited by the stop r<sup>7</sup> attached to the shaft R<sup>3</sup> which works in the outer recess r<sup>8</sup>, of the spindle I. When the lever R<sup>4</sup> is moved so as to elevate the wedge r<sup>3</sup> the lower end of the spindle I is spread and thus locked in its bearings. By turning said lever in the opposite direction the wedge r<sup>3</sup> is depressed and the lower end of the spindle I left free to contract to its normal size. That it does instantly and it is then free to revolve within the sleeve H as before.

I claim—

1. The combination in a revolving chair of a spindle attached to the chair seat and revolving within a supported sleeve; said spindle having the reinforcement r' at its lower end, and having a split or slot extending from its lower end upward, a socket formed in said reinforced part and divided by said split or slot, a wedge, for increasing the width of said split or slot when forced into said socket, and means for operating said wedge, substantially as described.

2. The combination of the hollow spindle I, reinforced at r, and having the single slot R extending from its bottom upward, and the socket r<sup>2</sup> divided by said slot, the wedge r<sup>3</sup>, the rod R', having at its upper end the ring r<sup>4a</sup>; the disk crank R<sup>2</sup> journaled in a bearing in the spindle and engaging with its wrist rod, the ring r<sup>4a</sup>, and means for turning the disk crank, arranged substantially as described.

3. The combination in a chair, of a sleeve, a support for the sleeve, a hollow spindle attached to the chair seat and rotating within the sleeve, a tubular screw rotating within the spindle, means for turning said screw, a dog, a bar operating said dog, and reciprocating within said screw, but revolving with it, and screw threaded for the whole or a part of its length below said screw, a sleeve with which said bar is connected by screwing it therein, a third sleeve internally screw threaded and engaging said tubular screw, and supported at its lower end by the sleeve surrounding the spindle; means for forcing the third sleeve to revolve with the spindle while allowing independent vertical movement, a perforation through the bottom of the third sleeve through which the lower end of the innermost sleeve extends downward, said perforation and the end of the sleeve passing through it preventing by their form the revolution of the innermost sleeve, within said third sleeve, and means for communicating vertical movement

to said innermost sleeve, substantially as described.

4. The combination in a revoluble chair having an adjustable foot rest, of a sleeve, a support for the sleeve, a spindle attached to the chair seat and rotating in said sleeve; a tubular screw rotating within said spindle; means for causing said screw to rotate within said spindle, a bar connected with said foot rest; a lock for said bar; a bar operating said lock, passing down through said tubular screw with which it rotates and within which it reciprocates, and below which it is screw threaded for the whole or part of its length, a second sleeve internally screw threaded at its upper end with which said last mentioned bar is connected by being screwed therein, means for preventing the revolution of said second sleeve within said spindle; means for elevating said second sleeve, a third sleeve surrounding the second sleeve, internally screw threaded at its upper end and engaging said tubular screw, and supported at its lower end by the sleeve in which said spindle rotates, and passing through an opening in the bottom of said sleeve, means for forcing said third sleeve to rotate with said spindle and means carried by the lower end of said third sleeve, for communicating vertical motion to said second sleeve and the bar connected therewith, substantially as described.

5. The combination of a sleeve, a spindle rotating therein, a tubular screw rotating within said spindle, means for causing said screw to rotate, a reciprocating bar passing down through said screw rotating therewith, and being screw threaded below it, a sleeve internally screw threaded connected with said bar by the bar being screwed therein, a sleeve screw threaded internally and engaging said tubular screw, and passing down through and projecting below an opening in the bottom of the sleeve in which the spindle rotates; a flange limiting the downward passage of the sleeve connected with said tubular screw, means forcing said sleeve to revolve with the spindle and preventing its independent revolution; a perforation through the bottom of said last mentioned sleeve through which the sleeve connected with said bar passes and below which it projects; means which prevent said innermost sleeve from revolving independently of said surrounding sleeve and forcing it to revolve therewith; a fulcrum carried by said sleeve connected with the tubular screw, and a lever supported by said fulcrum and operating said innermost sleeve and the bar which it engages, substantially as described.

6. The combination in a revolving and reclining chair of a sleeve H, attached to the chair support; and having a substantially vertical perforation through its lower end; a spindle I connected with the chair seat and revolving with it and within said sleeve; a hollow screw revoluble within said spindle;



means for preventing vertical movement independent of the spindle I on the part of said screw; a sleeve internally screw threaded at its upper end, engaging said screw, and at its lower end passing through said vertical perforation in the sleeve H and projecting below it; means for limiting the downward passage of the sleeve P, through the bottom of the sleeve H; means for forcing the sleeve P, to revolve with the spindle I, a bar L passing down through said tubular screw and projecting below it, screw threaded at its lower end, vertically movable within said hollow screw but revolving with it; a sleeve M internally screw threaded at its upper end and engaging said bar and at its lower end passing down through the opening in the lower end of the sleeve P and projecting below it, and being vertically movable within said sleeve P; means for causing the sleeve M to revolve with the sleeve P and spindle I; a spiral spring M', bearing at its upper end against said sleeve P, and at its lower end against the top of the sleeve M, a fulcrum attached to the lower end of the sleeve P and revolving therewith; and a lever supported by said fulcrum, by which said sleeve M and connecting parts are elevated, substantially as described.

7. The combination in a revolving and reclining chair of a sleeve H attached to the chair and having the opening  $h$  through its bottom; the spindle I attached to the chair seat and revolving within the sleeve H; the hollow gear Q' supported by said spindle I, the hollow screw Q, passing up into and partially but not entirely through the gear Q', and having a recess above its upper end in said gear, means for preventing vertical movement on the part of the screw Q independent of the spindle I, a bar passing down through the screw Q and gear Q', movable vertically therein but revolving therewith and screw threaded at its low end, the sleeve P internally screw threaded at its upper end and engaging the screw Q and at its lower end passing down through the perforation in the bottom of the sleeve H, means for limiting the downward passage of the sleeve P; a vertical perforation through the bottom of the sleeve P; means forcing the sleeve P to revolve with the spindle I when it is revolved, a sleeve M internally screw threaded at its upper end and engaging the said bar and at its lower end passing down through the sleeve P, means forcing the sleeve M to revolve with the sleeve P, a lever fulcrumed on a part connected with the sleeve P and revolving with said sleeve and operating said sleeve M and connecting parts and means for revolving said gear Q' and connecting parts, substantially as described.

8. In a revolving and reclining chair having a movable foot rest, a sleeve connected with the chair legs; a spindle attached to the chair seat and revolving in said sleeve; the slotted dog K having the tooth  $k^2$ ; the slotted sleeve

$i$  within which the dog K reciprocates; the rack bar J connected with the foot rest and passing through the slots in said sleeve and dog; the hollow gear Q having a recess at its upper end to receive the lower end of the dog K; a vertically movable bar L connected with the dog K and means connected with said gear for causing said bar L to revolve, substantially as described.

9. In a reclining and revoluble chair having a movable foot rest; a rack bar J, connected with the foot rest; a dog K having the tooth  $k^2$  to lock said rack bar, a vertical slot through which the rack bar passes, and a horizontal slot  $k'$ ; a vertically reciprocating rod L having its head  $l$  connected with said dog by inserting it horizontally in the slot  $k'$  of the dog K within which it is revoluble; means for preventing the dog and bar L from moving horizontally within the spindle and a rest for the rack bar connected with the chair seat, substantially as described.

10. In a revolving chair, the combination of a hollow spindle attached to the chair-seat and revoluble in a sleeve provided with a support, a tubular screw, supported by, and revoluble within the spindle; means for turning the screw; a bar passing through said tubular screw and revoluble with it but vertically movable within it, and having the whole or a part of the portion below said screw, screw-threaded; a second sleeve with which said bar is connected by screwing it therein, and whose lower end passes down through an opening in a third sleeve, in which it is not revoluble, but is vertically movable; said third sleeve internally screw-threaded at its upper end and engaging said tubular screw, and at its lower end supported by the bottom of said first sleeve, through an opening in which it projects downward; means forcing said third sleeve to revolve with the spindle when it is revolved, while allowing said spindle independent vertical movement when the tubular screw is turned in a direction to withdraw it from said sleeve, and the spindle and chair are thereby elevated; and means carried by the lower end of said sleeve for moving said second sleeve and the bar therewith connected, vertically, substantially as described.

11. In a revolving chair, the combination of a hollow spindle attached to the chair-seat and revoluble in a sleeve provided with a support; a tubular screw supported by, and revoluble within the spindle; means for turning the screw; a bar passing down through said tubular screw and revoluble with it, but vertically movable within it, and having the whole or a part of the portion below said screw, screw-threaded; a second sleeve with which said bar is connected by screwing it therein, and whose lower end passes down through an opening in a third sleeve, in which it is not revoluble but is vertically movable; said third sleeve internally screw-threaded at its upper end and engaging said tubular



5 screw, and at its lower end supported by the  
bottom of said first sleeve, through an open-  
ing in which it projects downward; means  
forcing said third sleeve to revolve with the  
10 spindle when it is revolved, while allowing  
said spindle independent vertical movement,  
when the tubular screw is turned in a direc-  
tion to withdraw it from said sleeve, and the  
spindle and the chair are thereby elevated; a  
15 spring bearing at bottom against said second  
sleeve and at top, against said third sleeve,

and tending to depress the former when said  
spring is compressed; and means carried by  
the lower end of said third sleeve for lifting  
said second sleeve and the bar therewith con- 15  
nected, substantially as described.

Witness my hand this 29th day of August,  
1894.

ERNEST E. KOKEN.

Witnesses:

JOS. H. GOESSLING,  
J. A. SCHARR.