

(Model.)

2 Sheets—Sheet 1.

H. A. KIMBALL & C. KILBURN.

TILTING AND REVOLVING CHAIR.

No. 270,081.

Patented Jan. 2, 1883.

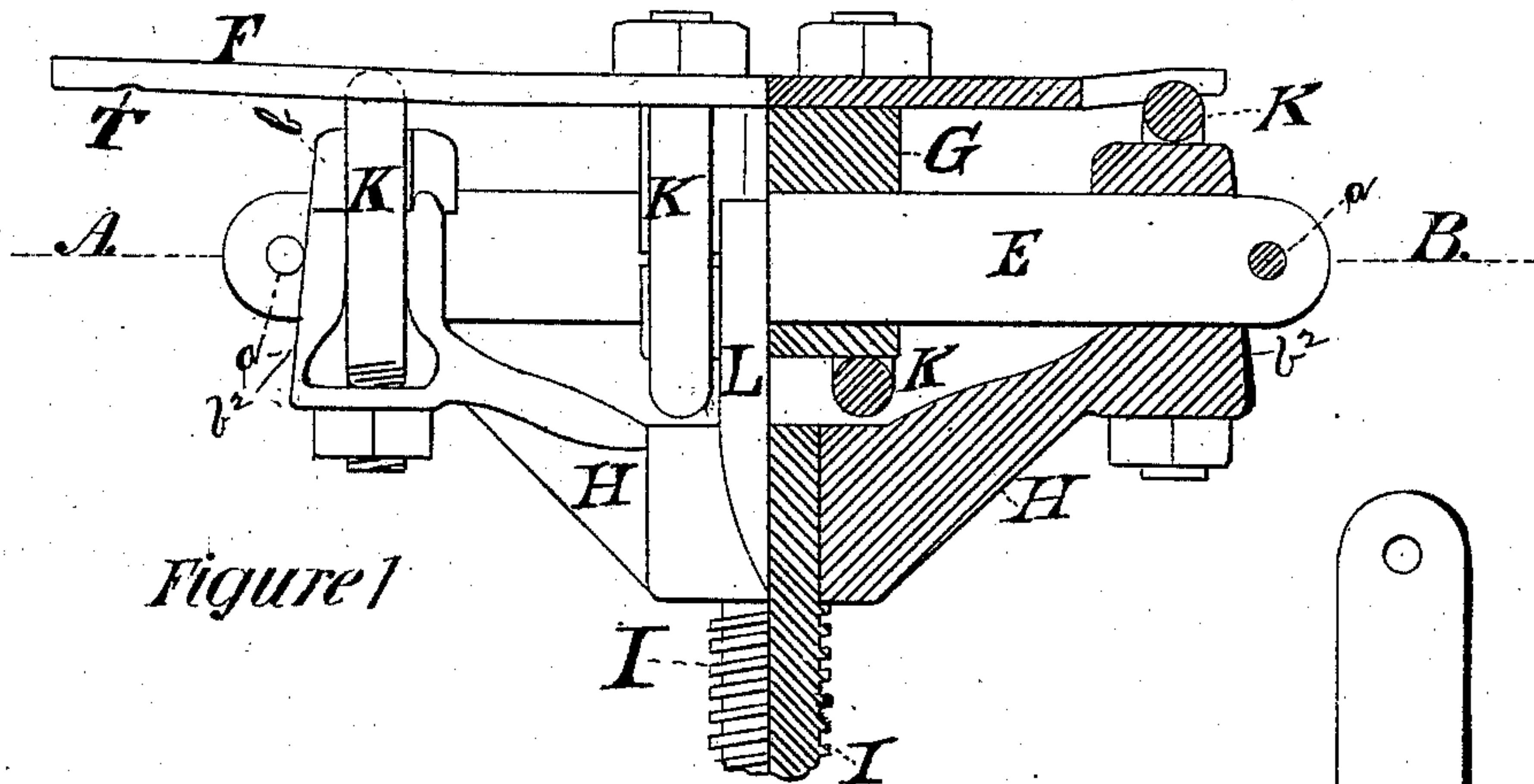


Figure 1

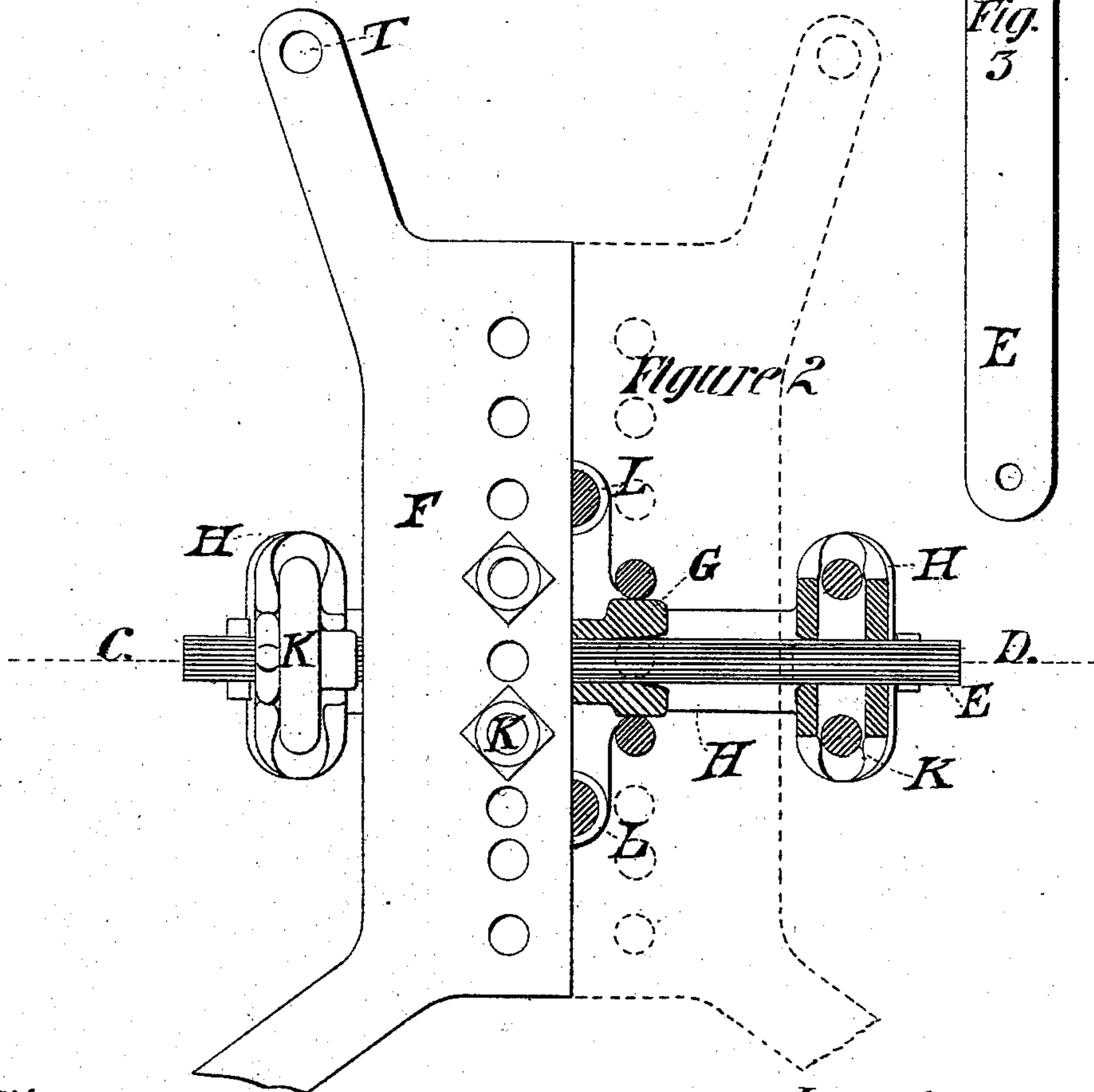


Figure 2

Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

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TILTING AND REVOLVING CHAIR.

SPECIFICATION forming part of Letters Patent No. 270,081, dated January 2, 1883.

Application filed March 21, 1882. (Model.)

To all whom it may concern:

Be it known that we, HIRAM A. KIMBALL and CHENEY KILBURN, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rocking or Oscillating Revolving Chairs for Offices, &c.; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention has reference to tilting or oscillating revolving chairs for offices and similar uses. We provide a simple strong plate-spring which is easily moved and readily adjusted. It possesses great elasticity and insures a proper return into the normal position when the tilting force is removed. We use a spring composed of two or more steel plates secured at either end by reliable bolts, and having washers interposed between them at this point. We have found that five of such plates are usually required; but the number may be varied. This spring is secured at the ends to the frame to which the screw is attached, and at mid-length to a frame-work secured to the under side of the chair-seat. The springs are set up edgewise. By means of the end bolts or securing means which bind the several plates together to form the spring a strong endwise tension is given, thereby forming what may be termed a "tension-torsion spring." The central attaching-plate under the chair-seat is arranged to allow the fastening of the spring thereto to be adjusted. The means for securing the spring to both the screw-frame and the seat-frame are such as to allow tilting, while they insure great stability and allow the grip upon the spring to be tightened or loosened, as may be desired.

The accompanying drawings form a part of this specification, and illustrate what we consider the best means for embodying the invention in practice.

Figure 1 represents a front elevation and

half in section on the line C D of Fig. 2. Fig. 2 is a plan view and half-section on line A B, Fig. 1. The dotted lines in Fig. 2 represent the full development of the frame which is secured to the under side of the chair-seat, showing the line of holes, also in dotted lines, corresponding to the line of holes on the portion shown in full line on the plan portion of this figure. Fig. 3 is a detail of one plate of the spring. Fig. 4 is a perspective of our device in position on a chair.

Similar letters of reference indicate corresponding parts in all the figures.

E is the spring, which is composed of a series of steel plates, as shown in Fig. 2.

F is the plate, secured to the chair-seat by means of screws passing through holes T.

G is a cast piece, which grips the spring E at mid-length. It is formed of two parts, so as to allow a yielding movement when necessary, and is held to the plate F by means of the lock staples or bolts K, which pass through the double row of holes in the plate F, and are secured by means of nuts working on their screw-threaded ends. The rows of holes in the plate F allow adjustment forward or backward to suit the weight of the occupant of the chair, as it gives a different center to the chair-seat.

H H is the frame which carries the screw upon which the chair revolves. It forms supports for the ends of the spring, which are secured thereto by caps b, fitted upon the supports of the frame H with liberty for a little movement thereon to assist in the vibratory action of the spring which lies between them. The cap b, with the spring which it fits upon, is securely held in place by staples or bolts K, similarly equipped and secured as those in the center of the spring, which bind the casting G.

L L represent stops in the front and rear of the chair, which limit the forward and backward tilting action. They strike upon the plate F when the chair is in its extreme positions.

The spring-plates are bound together at the ends by means of bolts a, which unite the ends firmly and insure a unanimity of action in the plates. The spring is set with the plates in an edgewise vertical position, and the firm binding

by the bolts K at either end and centrally entirely obviates all sagging or weakening of the spring. The washers interposed between the plates of the spring allow the necessary elasticity, which is insured by each spring being thus allowed an independent movement in the torsional line. This gives great delicacy to the elastic quality of the spring, while it detracts nothing from its strength. The inner edge of the clamps at either end of the spring E and both ends of the grip or clamp G are slightly rounded, so that in the twist of the spring it shall not bend over a sharp corner or angle. The casting G being formed of two pieces and the removability of the caps *b* allow the spring to be removed without taking the chair entirely apart. As shown in Fig. 1, the end faces, *b*², of the grips and cap-pieces *b* are inclined, so that the distance from one outer face to the other is less at the top than at the bottom, so that when the springs E are set in place and the extended ends of the pins *a* brought against the faces *b*² *b*² and forced down with the spring an end tension is caused in the spring, and the farther down the spring and pins are forced the greater will become the tension, and the spring will be held very firmly and securely, with no liberty for sagging or other movement.

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

1. In a chair, the spring E, composed of two or more metallic plates secured together at the ends and set edgewise, in combination with the end grips, the center grip, G, and connecting means to the chair-seat, constructed and operated substantially as and for the purpose set forth.

2. In a chair, the spring E, having end pins, *a*, in combination with the caps *b* and frame forming the end grips having the inclined faces *b*², against which rest the pins *a*, constructed and operated substantially as set forth.

3. The combination of the middle grip, G, and stops L L, one in either front and rear of the grip, with the iron plate F, having a double row of holes for the reception of the bolts K, and with said bolts, whereby the parts are adjustably secured together, substantially as herein set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HIRAM A. KIMBALL.
CHENEY KILBURN.

Witnesses:

CHAS. H. OTTERSON,
R. M. KENNEDY.