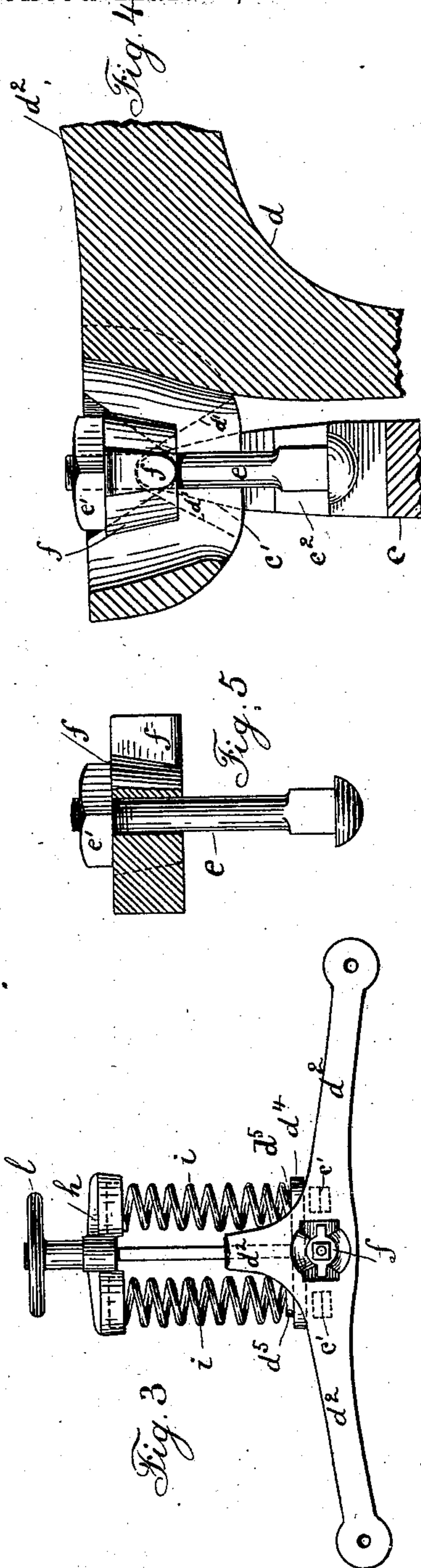


J. W. KENNA.
TILTING CHAIR.

Patented Mar. 4, 1884.



Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPH W. KENNA, OF CHICAGO, ILLINOIS.

TILTING CHAIR.

SPECIFICATION forming part of Letters Patent No. 294,391, dated March 4, 1884.

Application filed April 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. KENNA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tilting Chairs, of which the following is hereby declared to be a full, clear, and exact description, sufficient to enable others skilled in the art to which said improvements appertain to make and use the same.

In the drawings, wherein like letters of reference denote like parts, Figure 1 is a front view, partly in section, of a tilting chair embodying the improvements; Fig. 2, a sectional view through the chair-standard and spider; Fig. 3, a detail top plan view of the standard and spider in position; Fig. 4, a detail sectional view, enlarged, through standard and spider; Fig. 5, a view in detail of the tie-plate and retaining-bolt.

The nut or base-block *a* consists of a hollow casting, having rectangular recesses on its outer face, within which are set the feet *a'*, the whole constituting a base-support for the chair. The feet are secured in position by screw-bolts or the like passing through the flanged base *a''* of nut *a* and through the cap-plate *a'''*.

In process of making the nut *a*, the threaded spindle *b*, with which it engages, is coated with linseed-oil or a slip of clay and dusted with graphite or white lead, and so disposed in the mold as to form both a core and a chill to the hollow nut *a*. Hence it is that when the cast is made the threads on the nut *a* will be in exact counterpart with those on spindle *b*, and will be hardened by reason of the "chill," so that in this simple way a firm, even, and durable connection between nut and spindle is effected, which prevents the chair from becoming rickety and loose. The long threaded spindle *b* carries the chair-seat and frame, and, being free to revolve within nut *a*, may be quickly raised or lowered therein to adjust the chair to the comfort of the occupant.

Rigidly secured to the top of spindle *b* is a cast-metal standard, *c*, the vertical projecting tongues *c'* of which are tapered to an edge, and preferably chilled or case-hardened, to enable them to better resist wear. The tongues *c'* bear upon the spider *d* within suitable seats, as at *d'*, adapted to receive said tongues, the seats being slightly cut away, so as to allow

said spider *d* a limited play or poise after the manner of an ordinary balance about the edges of the tongues *c'* as points of suspension. The seats *d'* for the tongues *c'* are preferably chilled or case-hardened in process of making the spider, to increase their durability. The arms *d''* of the spider are secured at their ends to the chair-seat frame in any suitable manner. A vertical retaining-bolt, *e*, is freely set within an open-front recess in the upper part of standard *c*, there being shoulders *e''* at the sides of the recess, against which the head of the bolt *e* may abut. The bolt *e* extends upwardly through a hole in spider *d*, and about its upper end carries loosely a tie-plate, *f*, the side wings of which are reduced to a bearing-edge, and preferably chilled or case-hardened. The wings of the plate *f* bear against the depressed socket of spider *d*, within which they rest. By turning the set-nut *e'* on the bolt *e* the spider *d* is forced down upon the vertical tongues *c'* of the standard *c*, and as well the wings of the plate *f* are forced against the base of the depressed socket in spider *d*.

It will be noted from Fig. 4 that the bearing-edges or supports of tongues *c'* are in alignment with the like supports on the wings of tie-plate *f*. Hence it is that spider *d* may rock about the bearing-edges of tongues *c'* as a pivot without wrenching the retaining-bolt *e*, which remains substantially vertical by reason of the poise or adjustment of the tie-plate *f* about its bearing-edges with each change in position of spider *d*. In lieu of wings to the tie-plate, said plate may be hemispherical in shape and adapted to rest within a recess of spider *d*, made with like contour; or, if desired, the tie-plate may be entirely omitted, though in such event the shearing strain on the retaining-bolt is much increased and the security of spider *d* in equipoise above standard *c* correspondingly lessened. The bearings for side wings of tie-plate *f* should be suitably hardened while casting spider *d* or otherwise, to enable them better to resist wear. Should the parts become loosened or rickety, it is necessary merely to tighten up the set-nut *e'* to insure firm and even movement of the spider about its bearing-edges on the standard. A rod, *g*, which may be permanently joined to standard *c* in casting or be secured thereto afterward, projects forward from said standard

into and through an elongated slot, d^3 , in a dependent extension of spider d , and carries near its front end a sliding plate, h , which is socketed to receive the ends of recoil-springs i . The springs i , at their opposite ends, rest against the ears d^1 on the dependent extension of spider d , and there may be studs d^5 on said ears d^1 , to better retain the spring i in place. A hand-wheel, l , threaded to rod g , forces sliding plate h along said rod, so as to compress the springs i against the dependent extension of the spider d . The bearing-edges or points of oscillation between spider d and standard c are preferably located slightly back of the center of gravity of the chair-seat, so that in ordinary use the dependent extension of the spider will bear firmly against the upright portion of standard c , and the chair-seat will rest steadily in horizontal position. The tension of springs i also serves to keep the seat in place. When the chair is in use and the occupant shifts his position, so that the center of gravity is back of the points of oscillation, then the chair-seat and spider may tilt in even poise about the vertical bearing-edges c' and against the tension of springs i , giving an easy rocking movement to the chair. The tilting of the chair-seat is checked by contact of the bottom of slot d^3 with the rod g .

The elements of structure formed and united as herein described, being in the main of cast metal and few in number, are easily and cheaply made, require little or no fitting together if the molds are accurate, and when set up produce an easy-moving and durable tilting chair which is less liable to get out of order than the more complicated forms heretofore in use.

By hardening all of the bearing parts or faces, as hereinbefore set out, the loosening or rickety condition of the chair consequent upon uneven wear is very much reduced.

It is to be noted that sliding plate h should preferably have an angular perforation corresponding with rod g , so that while free to slide it may not turn thereon to disarrange the springs i .

In lieu of the double springs i , which make the tilting movement of the chair more equitable, there may be more, or there may be merely a single spring encompassing spindle g . It is plain that the knife-edge supports may be transferred to the spider and the bearings therefor to the standard, thus reversing or making the knife-edge pivots the counterpart of what is shown. These and all other like modifications are obviously within the range of the skilled mechanic to adopt, and equally within the spirit of the present invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, the spindle, a standard fixed thereon, and provided with knife-edge tongues extending in the same general direction with the spindle, and the spider recessed, substantially as described, to receive the said tongues, whereby a vertical bearing-edge is produced for the chair-seat, substantially as set forth.

2. The combination, with the base-support, of the projecting spindle, the standard secured thereto and having vertical knife-edge tongues extending therefrom, and the spider to which the chair-seat is attached, said spider being suitably recessed to receive said tongues, substantially as set forth.

3. The combination, with the base-support, of the projecting spindle, the standard secured thereto and having vertical knife-edge tongues extending therefrom, the recessed spider to which the chair-seat is attached, and the retaining-bolt which holds said standard and spider together, substantially as described.

4. The combination, with the base-support, of the spindle, the standard secured thereto and having vertical knife-edge tongues extending therefrom, the recessed spider, the retaining-bolt, and the tie-plate co-operating therewith to hold said standard and spider in position, substantially as described.

5. The combination, with the base-support, of the projecting spindle b , the standard c , secured thereto and having vertical bearing-edges c' , the recessed spider d , the retaining-bolt e , and adjustable spring mechanism, substantially as described, co-operating with said standard and spider to return the latter to position when tilted about the vertical bearing-edges, substantially as set forth.

6. The combination, with the base-support, and with the projecting spindle b , of the standard c , secured thereto, the spider d , provided with a dependent portion, as described, and tilting about said standard, the rod g , extending from the standard and through the dependent portion of the spider, the sliding plate h and adjusting-wheel l , mounted on said rod, and the double recoil-springs i , retained between the sliding plate and the dependent extension of the spider, substantially as set forth.

In testimony whereof, witness my hand this 20th day of April, 1883.

JOSEPH W. KENNA.

Witnesses:

GEO. P. FISHER, Jr.,

CHARLES W. RASMUSEN.