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B. BETHKE.

CHAIR IRON.

APPLICATION FILED DEC. 10, 1904.

Fig. 1.

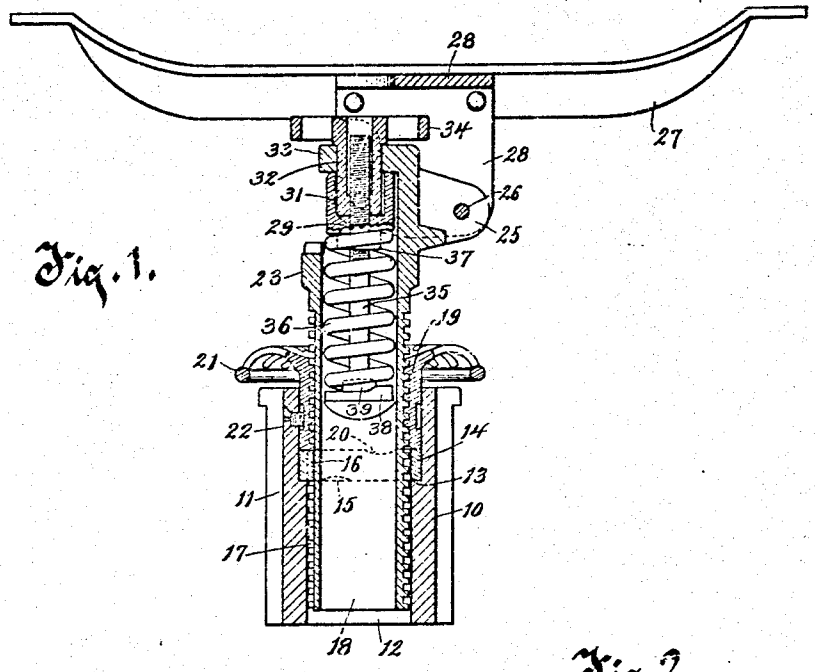


Fig. 2.

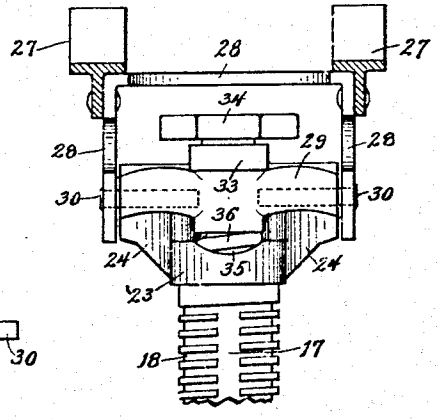


Fig. 4.

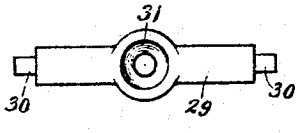


Fig. 5.

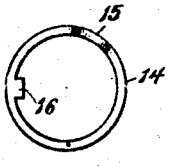
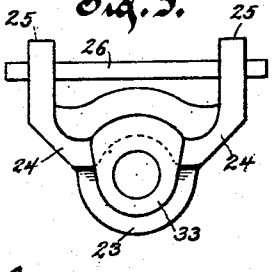


Fig. 3.



Witnesses.

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CHAIR-IRON.

No. 805,522. Specification of Letters Patent. Patented Nov. 28, 1905.

Application filed December 10, 1904. Serial No. 236,273.

To all whom it may concern:

Be it known that I, BERNHARD BETHKE, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Chair-Irons, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to chair-irons, and has for its object to provide a chair-iron which will permit of a revolving reclining-chair having its retracting-spring housed within the tubular spindle thereof.

Another object of the invention is to improve upon the construction of chair-irons in general.

With the above and other objects in view the invention consists in the devices and parts and their equivalents, as hereinafter set forth.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts in the several views, Figure 1 is a central vertical sectional view of a chair-iron embodying the present invention. Fig. 2 is an elevation thereof with parts in section looking toward the back of the chair-iron. Fig. 3 is a plan view of the spindle-head with the seat-frame removed. Fig. 4 is a plan view of the pivoted yoke member, and Fig. 5 is a plan view of the nut-engaging ring.

In the drawings, 10 represents the ordinary hub or casting, provided with the external leg-engaging sockets 11 and the internal bore 12, as usual. The bore of the casting is countersunk at its upper end to produce an internal annular shoulder 13, on which loosely rests a ring 14, having depressions 15 on its top and bottom surfaces and provided with an inwardly-projecting key-lug 16, which is adapted to ride in a longitudinal groove or keyway 17 in the threaded surface of a tubular spindle 18, which passes through the ring and the bore of the hub or casting. The tubular spindle 18 is supported by a nut 19, which is threaded thereon and enters the countersunk portion of the bore 12 of the hub, bearing on the upper surface of the ring 14. On its bearing-surface the nut 19 is provided with one or more rounded projections 20, corresponding with the depressions 15 and adapted to bind the ring and nut against accidental independent movement of either, but permitting of the nut being forcibly turned by means of the hand-wheel 21 on the upper end thereof for adjusting the elevation of the spindle 18, and therefore of the chair-seat supported thereby. The nut 19 is prevented from being accidentally withdrawn from the hub or casting by means of a screw 22, threaded through the side wall of the casting and entering an annular groove 23 in the side of the nut 19.

At its upper end the tubular spindle 18 is provided with an enlarged head 23, with a pair of outstretched arms 24, having parallel forwardly-projecting ears 25 on the ends thereof, with a pivotal pin 26 extending therethrough and constituting a pivotal connection for the seat-frame. The chair-seat frame comprises a pair of curved flanged seat-supporting rails 27, connected at their middle portions by an inverted-U-shaped sheet-metal web 28, with its parallel depending side plates pivotally mounted on the pivot-pin 26 outside of the ears 25.

A yoke member 29 has its trunnion-pins 30 at the ends of its oppositely-extending arms pivotally connected in the side plates of the web connection 28, and at its middle portion it is provided with an upwardly-opening cup-shaped socket 31, into which loosely fits the lower end of a tubular nut 32. The tubular nut 32 bears upon the bottom of said socket and is loosely mounted in an opening through an overhanging ear 33, which is carried by the head of the tubular spindle 18 from the upper edge of the arms 24 and extends over the bore of said tubular spindle. The nut 32 is provided with a shoulder to bear upon the top of the overhanging ear 33 and has at its upper end a hand-wheel 34, by which it may be turned to adjust a bolt 35, which is threaded in the lower portion thereof and which loosely slides through an opening in the bottom of the yoke 29 to compress a coil-spring 36 within the bore of the tubular spindle surrounding said bolt and confined between the head thereof and a shouldered boss 37 on the bottom of the yoke 29. The lower end of the coil-spring 36 is seated on a shouldered ring 38, which is provided with an inclined surface leading from said shoulder to fit the curvature of the spring and also has an upwardly-projecting boss 39 fitting inside the coil-spring. The ring 38 has a flattened bot-

tom surface to bear upon the head of the bolt 35 and is prevented from turning on said bolt by fitting on a squared portion of the bolt-shank.

From the foregoing it will be seen that the chair-seat frame may be pivotally swung upon the pivotal pin 26 within the limits of the movements of the yoke 29 between the head of the tubular spindle 18 and the overhanging ear 33 and that this extent of movement of the chair-seat frame is positively limited by the engagement of the yoke 29 with these obstructions in its path. Further, as the downward movement of the yoke 29 causes the coil-spring 36 to be compressed such downward movement of the yoke, which takes place with the backward movement of the chair-seat frame, is cushioned by the spring, and the degree of this cushioning effect may be varied by the adjustment of the bolt 35 by means of the hand-wheel 34 on nut 32, so as to increase or diminish the initial compression of the coil-spring 36.

It will be noted that the trunnion-bearings of the yoke 29 enable it to remain in its proper relation toward the immovable bolt 35, as it slides up and down on said bolt, due to the tilting of the chair-seat frame, and consequently no binding between these parts can occur. The telescoping fit between the walls of the socket 31 and the lower end of the tubular nut 32 serves as a guide for the yoke 29 to assist it in keeping its upright position during its oscillations while the chair-seat frame is being tilted upon the pivotal pin 26. The coil-spring 36, bearing at its ends against the lug on the boss 37 and the shoulder on the ring 38, which is keyed to the bolt 35 by being fitted on the squared portion thereof, prevents the bolt from turning as the nut 32 is being tightened, and thereby assures a ready adjustment of the compression of the spring.

The vertical adjustment of the chair-seat is accomplished by the turning of the nut 19 on the tubular spindle 18 by means of the hand-wheel 21, the nut being then forced to ride its projections 20 over the depressions 15 of the ring 14, which does not turn independent of the chair-seat because of its being keyed to the tubular spindle 18. When, however, the desired vertical adjustment is attained, the turning of the chair-seat will not disturb such adjustment, inasmuch as the nut 19 is forced to rotate with the tubular spindle 18, on which it is threaded, by the engagement of these projections 20 on the bottom of the nut with the depressions 15 of the ring 14, which is loose within the countersunk portion of the bore of hub 10 and supports the weight of the chair-seat upon the shoulder 13 of said hub.

It is obvious that many of the details of construction here shown and described are not essential to the efficient operation of the tubular-spindle-housed retracting-spring, but that many variations and modifications may be made in these details without departing from the spirit and scope of this invention.

It is apparent that the tilting feature of the chair-iron here shown and described is not in any way limited in its application to a revolving chair, but might equally well be applied to a non-revolving chair, in which a tubular stem or support might replace the tubular spindle 17, and as in such event the stem or support would be the full equivalent of the spindle for the purposes of this invention such equivalents are intended to be comprehended by the term "tubular spindle" and its substitutes as employed in the claims.

What I claim as my invention is—

1. In a chair-iron, a suitably-mounted tubular spindle, a head thereon, a chair-seat frame pivoted to the head, and a spring located within the tubular spindle and having connection with the head and with the chair-seat frame.

2. In a chair-iron, a suitably-mounted tubular spindle, a head thereon, a chair-seat frame pivoted to the head and positively limited in its movements by the head, and a spring contained within the tubular spindle and having connection with the head and the chair-seat frame.

3. In a chair-iron, a tubular stem, a head thereon having projecting ears, a chair-seat frame pivoted to the ears, a spring supported within the tubular stem, and a yoke carried by the chair-seat frame and bearing on the spring.

4. In a chair-iron, a hollow stem, a head thereon, a chair-seat frame pivoted to the head, an ear on the head overhanging the hollow of the stem, a yoke pivoted to the chair-seat frame and adapted to have a movement between the overhanging ear and the head, a bolt attached to the overhanging ear and passing through the yoke and into the hollow of the stem, and a coil-spring within the hollow of the stem and confined between the head of the bolt and the yoke.

5. In a chair-iron, a tubular spindle, a head thereon, a chair-seat frame pivoted to the head, an overhanging ear on the head, a yoke carried by the chair-seat frame, a bolt passing through the yoke and entering the tubular spindle, a nut on the overhanging ear threaded to the bolt and adapted to adjust said bolt, and a coil-spring surrounding the bolt and bearing on the bolt-head and on the yoke.

6. In a chair-iron, a tubular spindle, a head thereon, a chair-seat frame pivoted to the head, an overhanging ear on the head, a yoke pivoted to the chair-seat frame, a nut seated in an opening of the overhanging ear and bearing in a socket of the yoke, a bolt passing through the yoke and threaded to the nut, and a coil-spring on the bolt within

the tubular spindle bearing on the head of the bolt and on the yoke.

7. In a chair-iron, a tubular spindle, a head thereon, a chair-seat frame pivoted to the head, an overhanging ear on the head, a yoke member pivoted to the chair-seat frame and limited in its movements by engagement with the head and the overhanging ear, a tubular nut having a hand-wheel thereon seated through an opening in the overhanging ear and bearing in a socket of the yoke, a bolt passing through the yoke and threaded to the nut, a shouldered ring keyed on the bolt and provided with a central boss, a shouldered boss on the yoke, and a coil-spring surrounding the bolt within the tubular spindle and bearing at one end against the shoulder of the ring and at the other end against the shoulder of the yoke with the bosses entering its ends.

8. In a chair-iron, a tubular spindle, a head on the end thereof, a pair of oppositely-extending arms on said head, parallel forwardly-extending ears on the arms, a pivotal pin connecting the ears, a chair-seat frame comprising a pair of chair-supporting rails with a connecting U-shaped web having its parallel side plates pivoted to the pivotal pin, an overhanging ear on the head, a yoke pivoted at its ends in the side plates of the chair-seat frame and having an upwardly-opening socket at its middle portion, a shouldered nut seated in an opening of the overhanging ear and provided with a hand-wheel on its upper end and bearing at its lower end in the socket of the yoke, a bolt passing through the yoke and threaded in the nut, and a coil-spring within the tubular spindle surrounding the bolt and bearing on the bolt-head and on the yoke.

9. In a chair-iron, a tubular stem, a chair-seat frame pivotally mounted on the tubular stem, and a compression-spring located in the tubular stem, said chair-seat frame being adapted to bear upon the compression-spring.

10. In a chair-iron, a tubular stem, a head thereon having projecting ears, a chair-seat frame pivoted to the ears, a spring supported within the tubular stem, and a yoke pivotally mounted on the chair-seat frame and bearing on the spring.

11. In a chair-iron, a tubular stem, a chair-seat frame pivotally mounted on the tubular stem, a coil compression-spring adjustably mounted within the tubular stem, and a member pivotally mounted on the chair-seat frame and bearing on the compression-spring.

12. In a chair-iron, a suitably-mounted tubular spindle, a head thereon, a chair-seat frame pivoted to the head, a compression-spring located within the tubular spindle and having adjustable connection with the head, and means carried by the chair-seat frame bearing on the compression-spring.

13. In a chair-iron, a suitably-mounted tubular spindle, a head thereon, a chair-seat frame pivoted to the head, a compression-spring located within the tubular spindle, means for adjustably connecting one end of the spring with the head, and means pivotally mounted on the chair-seat frame and bearing on the other end of the compression-spring.

In testimony whereof I affix my signature in presence of two witnesses.

BERNHARD BETHKE.

Witnesses:
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ANNA F. SCHMIDTBAUER.