A. WHITE.

CHAIR IRON.

APPLICATION FILED OCT. 11, 1917.

1,305,042. Patented May 27, 1919.

Fig. 1.

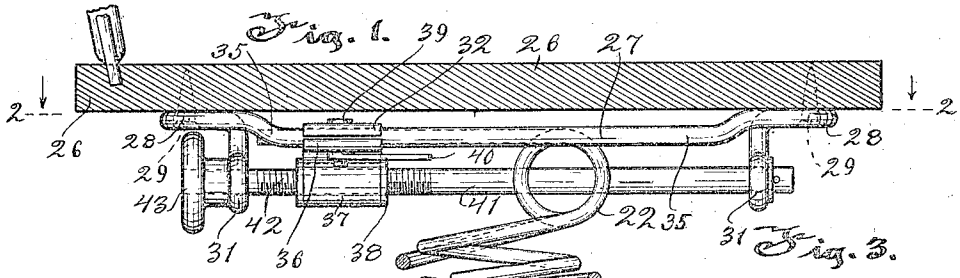
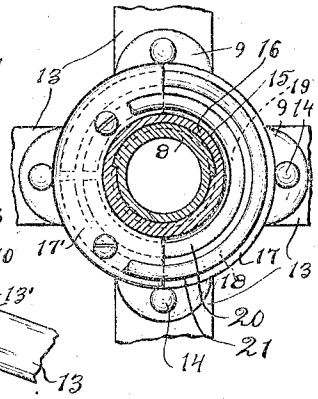


Fig. 3.



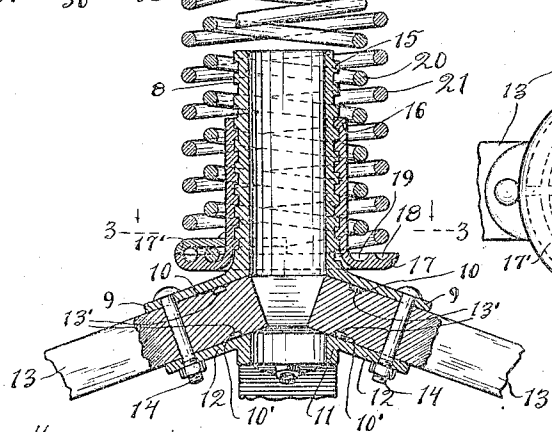


Fig. 2.

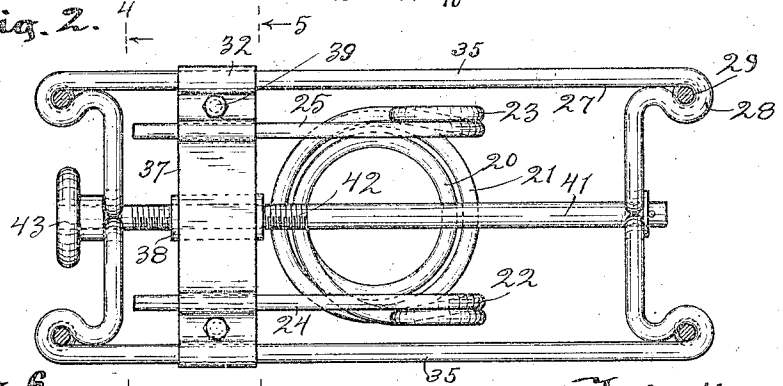


Fig. 6.

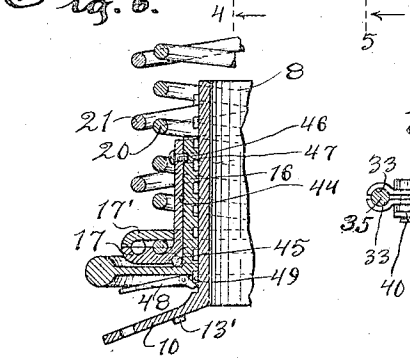


Fig. 4.

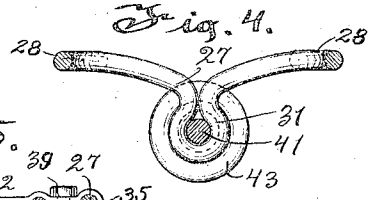
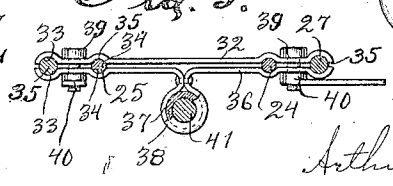


Fig. 5.



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CHAIR-IRON.

1,305,042. Specification of Letters Patent. Patented May 27, 1919.

Application filed October 11, 1917. Serial No. 195,993.

To all whom it may concern:

Be it known that I, ARTHUR WHITE, a citizen of the United States, and resident of Sheboygan Falls, county of Sheboygan, 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 improvements in chair irons of the yielding type.

It is one of the objects of the present invention to provide a chair iron with a spring portion which will afford a yielding support for the seat and which will also permit the seat to be tilted or rocked.

A further object of the invention is to provide a chair iron of the yielding type with means for adjusting the tilting tension of the yielding means.

A further object of the invention is to provide a chair iron of the yielding type which may be easily adjusted vertically.

A further object of the invention is to provide a chair iron having novel means for connecting the springs and the legs thereto.

A further object of the invention is to provide a chair iron in which the seat frame is formed in part of commercial rod metal bent to the desired form and which will not easily break.

A further object of the invention is to provide a chair iron having a plurality of springs arranged to prevent side tilting of the chair seat.

A further object of the invention is to provide a chair iron which is of very simple construction and is strong and durable and is well adapted for the purpose described.

With the above and other objects in view the invention consists of the improved chair iron and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Figure 1 is in part a vertical sectional view of the improved chair iron shown mounted on portions of a chair seat and legs;

Fig. 2 is a top view of the chair iron shown removed from the chair seat;

Fig. 3 is a transverse sectional view thereof taken on line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional detail view taken on line 4—4 of Fig. 2;

Fig. 5 is a detail view of the adjusting means; and

Fig. 6 is a vertical sectional view in part of a modified form of chair iron.

Referring to the drawing the numeral 8 indicates the hub portion of the improved chair iron which is of tubular form and at its lower end is provided with downwardly extending radial leg arms 9 provided with downwardly projecting knobs 10. A clamping leg member 11 positioned below and spaced from the hub portion is also provided with radial arms 12 having upstanding knobs 10′. Legs 13 extending between the upper and lower radial arms are clamped firmly therebetween by bolts 14 which extend vertically through the arms and through the legs. The knobs 10 and 10′ extend into recessed portions 13′ of the legs and maintain said legs in proper position. The upstanding tubular portion of the hub is provided with an exterior thread 15 on which is threaded an adjusting nut 16 having a lower annular flanged portion 17. With this construction the nut 16 is turned on the hub member 8 to bring the chair to the proper height. The flange portion is provided with two concentric grooves 18 and 19 for receiving the lower horizontally disposed convolutions of supporting springs 20 and 21. The lower convolutions of the springs 20 and 21 are wound in opposite directions from each other and while the inner spring is of less diameter than the outer spring, either the cross sectional area of the metal of the springs or the pitch of the springs may be so varied as to make both springs of the same strength so that both will act equally. It will also be noted that the springs 20 and 21 being wound in opposite directions any tendency of one to side tilting will be counteracted by the other. The springs 20 and 21 are secured to the nut 16 by a half ring 17′ fitting on their lower ends and secured to the flanged portion 17.

From the lower convolutions the springs 20 and 21 extend upwardly to form upper vertically disposed convolutions 22 and 23 or tilting coils from which the ends 24 and 25 of the said springs project rearwardly. The center of the tilting coils is offset from the axis of the lower compression coils and the hub member and disposed in front of said

axis, as shown in Fig. 1, so that the tilting movement of the chair through the resiliency of the tilting coils will be substantially independent of any action of the lower compression coils. Thus the springs are so formed as to provide not only a cushioning support for the chair for the up and down movement of the chair but also a yielding tilting support.

The ends 24 and 25 of the springs 20 and 21 are connected to the bottom 26 of the chair through an adjustable connection with the chair spider 27.

This spider 27 of commercial rod metal is of substantially rectangular form bent at its corners to form eyes 28 for receiving the screws 29 or other fastening means to secure it to the chair bottom 26 and is thence bent downwardly at its sides so as to form bearings 31, thus making an integral spider of simple, economical and efficient construction.

The adjustable connection between the springs 20 and 21 and the spider 27 consists of a device for clamping the spider 27 at different positions on the ends 24 and 25 of said springs and means for moving this clamping device. The clamping device comprises an upper plate 32, having curved recesses 33 and 34 for receiving the side portions 35 of the spider and the ends 24 and 25 of the springs respectively, a lower plate 36 having similar recesses 33 and 34 and a central bearing portion 37 in which a barrel nut 38 is mounted, and bolts 39 passing through the plates 32 and 36 and carrying hand operated nuts 40 secure the plates together against the spider and springs. On the loosening of the nuts or clamping devices the plates are moved with respect to the ends 24 and 25 of the springs by means of a rod 41 journaled in the bearings 31 of the spider and having a threaded portion 42 engaging the nut 38 and a handle 43 for turning the rod to move the clamping device to different positions along the side portions 35 of the length of the ends 24 and 25 of the springs and thus apply the weight of the load at different distances from the center of the tilting coils to thereby regulate the force acting upon said coils so as to accommodate lighter or heavier persons and have the proper resiliency on the tilting of the seat.

In Fig. 6 I have shown a modified form of construction in which the springs 20 and 21 are not attached directly to the nut 16 but are secured to a sleeve 44 which is rotatively mounted upon ball bearings 45 on the nut 16 and is provided with a set screw 46 passing into an annular groove 47 in the nut 16 to prevent vertical movement of the sleeve with respect to the nut. When the nut 16 has been turned upon the hub member 8 to bring the chair to the desired height further movement is prevented by a dog 48 pivotally secured to the nut 16 and adapted to engage in a key way 49 in the hub 8 so that while the nut 16 is prevented from turning, the sleeve and the chair are free to turn about the nut 16.

With these constructions it is to be noted that the legs and the chair iron may be readily secured assembled together, that the seat is yieldingly supported for vertical movement and for tilting movement, that tension upon the tilting springs may be adjusted and that the height of the chair seat may be adjusted with respect to its support. It will be further noted that the springs form the only connection between the chair and its base and that said springs are so arranged as to permit the seat to yield and tilt, the tilting action being independent of the yielding action.

I am aware that the details of construction herein shown and described are subject to modification and change and I therefore desire it to be understood that such changes in construction as come within the scope of the appended claims I deem to be within the spirit of my invention.

What I claim as my invention is:

1. In a chair, the combination with the seat parts and the base parts, of a spring connection between said parts comprising springs, each having convolutions to permit the seat to yield and having convolutions acting independently of said first named convolutions to permit the seat to tilt.

2. In a chair, the combination with the seat parts and the base parts, of a spring connection therebetween comprising springs, each having horizontally disposed coils to permit the seat to yield and vertically disposed coils to permit the seat to tilt, the horizontally disposed coils of one spring being disposed within those of the other.

3. In a chair, the combination with the seat parts and the base parts, of a spring connection therebetween comprising springs, having coaxial horizontally disposed coils to permit the seat to yield and vertically disposed coils offset from the vertical axis of said horizontally disposed coils to permit the seat to tilt independently of the horizontally disposed coils.

4. In a chair, the combination with the seat parts and the base parts including a threaded hub member, of a nut mounted upon said hub member, springs carried by the nut and having coaxial horizontally disposed coils and vertically disposed coils, and means for adjustably securing the springs to the seat parts.

5. In a chair, the combination with the seat and a spider secured thereto and the base parts, of a spring connection between the base parts and the spider comprising springs having coaxial horizontally disposed

compression coils wound in opposite directions and secured to the base parts and tilting coils offset from the axis of the compression coils and connected to the spider.

6. In a chair, the combination with the spider and base parts of the chair, of a spring connection between the base parts and the spider comprising springs having coaxial horizontally disposed compression coils secured to the base parts to permit the seat to yield and tilting coils to permit the seat to tilt, the ends of the springs extending rearwardly and a clamping device for securing the spider to the ends of the springs at different distances from the tilting coils.

7. In a chair, the combination of a spider formed of rod metal bent to form a rectangular frame with eyed corners and depending bearing eyes at its ends, a chair iron, springs secured to said chair iron, a clamping device securing the upper ends of the springs to the spider, and means for moving the clamping device along the spider and the ends of said springs, including a revoluble rod journaled in the eyed bearing of said spider.

8. In a chair iron, the combination of a hub member having an upstanding threaded portion, an adjusting nut threaded on the upstanding portion, means for locking the nut in adjusted position on the said upstanding portion, a sleeve rotatively carried by the adjusting nut, a seat frame positioned above the hub member, and a connection between the sleeve and the seat frame comprising springs constructed to permit both vertical and a tilting movement.

9. In a chair iron, the combination of a hub member having an upstanding threaded portion and a vertically extending groove, an adjusting nut threaded on the upstanding portion, a dog carried by the adjusting nut and entering the groove to lock the nut in adjusted position, a sleeve rotatively carried by the nut, means for preventing independent vertical movement of the sleeve with relation to the nut, a seat frame positioned above the nut member, and springs connected to the sleeve and the seat frame and having both horizontal and vertical convolutions to permit both vertical and a tilting movement of the seat frame.

10. In a chair iron, the combination of a hub member having an upstanding threaded portion and a vertically extending groove, an adjusting nut threaded on the upstanding portion, a dog carried by the adjusting nut and entering the groove to lock the nut in adjusted position, a sleeve rotatively carried by the nut, means for preventing independent vertical movement of the sleeve with relation to the nut, a ball connection between the sleeve and the nut, a seat frame positioned above the hub member, and a yielding and tilting connection between the seat member and the sleeve comprising springs having coaxial horizontally extending coils wound in opposite directions and secured to the sleeve and tiltable coils offset from the axis of the other coils and connected to the seat frame.

In testimony whereof, I affix my signature.

ARTHUR WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."