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H. W. BOLENS

2,359,966

TILTING CHAIR

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*Fig. 1.*

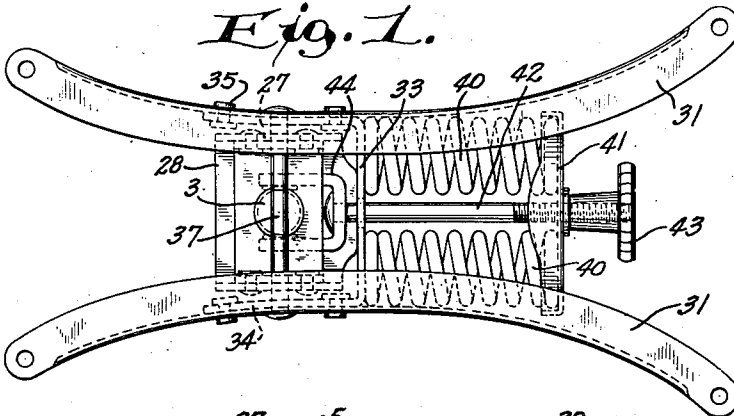


*Fig. 2.*

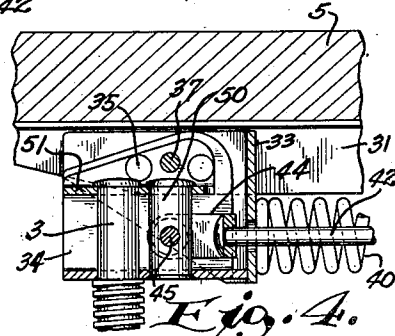
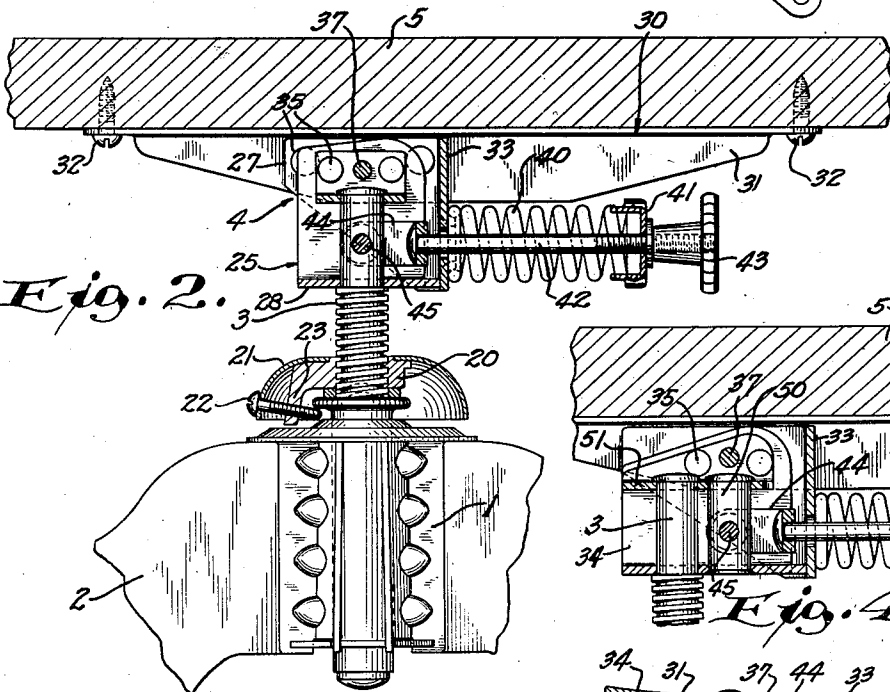


*Fig. 4.*

*Fig. 3.*

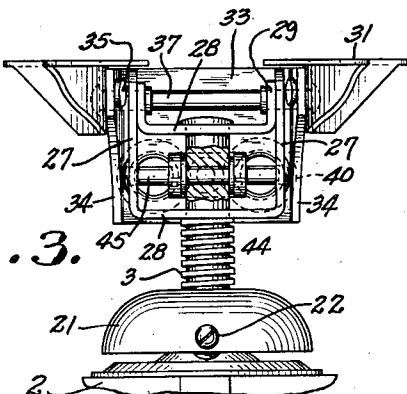
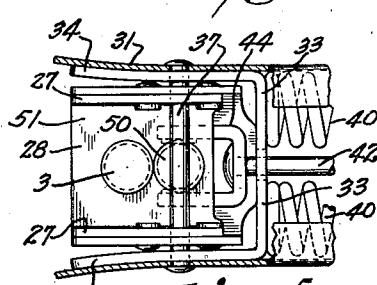


*Fig. 5.*



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## UNITED STATES PATENT OFFICE

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## TILTING CHAIR

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3 Claims. (Cl. 155-77)

This invention relates to an improvement in tilting chairs, and more particularly to an improvement in the base of such chairs and in the chair iron which supports the seat on the base for tilting movement.

An object of the invention is to provide a chair iron for tilting chairs of the type having a tension screw and nut for varying the compression of the springs to resist backward tilting movement of the chair, and wherein the connection between the screw and the head provided at the upper end of the spindle is improved and strengthened so as to avoid breakage and provide a construction which will stand up and operate efficiently over a long period of time.

A further object of the invention is to provide a chair iron having the advantages and capacities mentioned, and which may be embodied in different types of constructions designed and adapted for use by persons of different weights.

Other objects and advantages reside in certain novel features of the construction, arrangement, and combination of parts, which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawing forming a part of this specification, and in which:

Figure 1 is a view in top plan showing a chair iron embodying the present invention;

Figure 2 is a view thereof partly in central, vertical, longitudinal cross section and partly in side elevation;

Figure 3 is a view in end elevation looking toward the right hand side of Figure 2 and with parts broken away and shown in section for the sake of illustration;

Figure 4 is a fragmentary view similar to Figure 2 showing a modified form of the invention;

Figure 5 is a fragmentary view in top plan of the structure shown in Figure 4.

Referring to the drawing, and more particularly to Figure 2, it will be seen that the chair comprises generally a metal base or hub 1 to which legs 2 are connected. The hub 1 also supports the spindle 3 of a chair. A chair iron, designated generally at 4, is mounted on the upper end of the spindle and it provides a support for the seat 5 of the chair.

In the assembly the spindle 3 extends into the hub 1. A nut 20 is threaded on the spindle and engages the top of the hub. The adjustment of the nut determines the height of the seat.

The usual hand wheel 21 and screw 22 are combined with the nut 20 and the flange formation at the upper end of the hub in the conventional manner.

A head 25 is provided and consists of a U-shaped piece of heavy gauge sheet metal having its body portion formed with an opening through which the smooth upper end portion of the spindle projects. The body bears on the shoulder presented at the juncture of the threaded and smooth portions of the spindle. The side plates 27 of the head are connected by a cross-piece 28 which has lugs 29 at its ends engaging the inner surfaces of the side plates of the head and are riveted thereto. The central portion of this cross-piece is formed with an opening receiving the extreme upper end of the spindle. The top of the spindle is upset or staked over into permanent and rigid connection with the cross-piece 28. A spider, designated generally at 30, is pivotally supported on the head 25. The spider comprises a pair of transversely spaced, longitudinally extending spider arms 31, the ends of which are apertured to adapt them to be secured by means of screws 32 to the under side of the seat 5 of the chair. Intermediate their ends the arms 31 of the spider are interconnected by means of a sheet metal yoke or frame, designated at 33. The yoke 33 has side plates 34 vertically disposed and parallel to each other. These side members 34 are riveted, as at 35, or otherwise suitably secured to the spider arms 31. These side members of the yoke 33 are cross connected by the integral cross-piece 36. The spider arms and their yokes are pivotally supported to the unit on the head by means of a pivot pin 37.

For the purpose of yieldably resisting rearward tilting of the chair and seat, and normally biasing it to a horizontal position, one or more springs 40 are provided. In the construction illustrated, two springs are shown, but of course only one may be employed if desired. One end of each spring 40 bears against the cross member 36 of the yoke 33. The outer end of each spring is engaged in the spring seat provided in an adjustable abutment or cross-head 41. A tension rod 42 extends through a central opening in the cross-head, and its outer end is threaded and is engaged by a hand nut 43 which bears against the cross-head 41 and the inner end of the tension rod is headed and is engaged with the yoke 44 of U-shaped form. The arms of this yoke straddle the upper por-

tion of the spindle and are pivotally interconnected therewith by means of a cross-pin 45 supported centrally in a transverse opening in the upper portion of the spindle and supported at its ends in the side members of the head. This manner of interconnecting the tension rod with the chair iron is specially advantageous since the pin to which the yoke of the tension rod is connected is supported at three points, and the force is applied close up to the portion of the cross-pin which is rigidly secured to the spindle. Consequently, the force applied to the cross-pin acts through minimum leverage. Such a construction will stand long usage with little wear and will not be liable to break.

In some constructions it is necessary to have the hinge-pin combined with its head at a point forwardly of the center of the head, and in such instances instead of utilizing an extension in the spindle to aid in the support of the cross-pin connecting the tension rod, yoke, and head, a separate post 50 is combined with the head, as illustrated in Figures 4 and 5. In such instances the cross-piece corresponding to the cross-piece 29, designated at 51, must be somewhat longer and be provided with two openings to accommodate both the post and the spindle.

While I have shown and described several constructions in which the invention may be advantageously embodied, it is to be understood that the constructions shown have been selected merely for the purpose of illustration or example, and that various changes in the size, shape, and arrangement of the parts may be made without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A chair iron of the character described comprising a spindle, a U-shaped head-piece supported on the upper end of the spindle, the spindle projecting up through the body plate of the head-piece and in between the side plates thereof, a cross-piece extending between and secured at its ends to the side plates of the head-piece adjacent the upper ends thereof, said cross-piece having an opening in which the upper end of the spindle is fitted and secured, a spider having a U-shaped yoke straddling and pivotally supported on the head-piece, a spring having its inner end abutting the body plate of said yoke, an abutment for the outer end of the spring, said abutment having an opening therethrough, an adjusting rod having its outer end threaded and extending loosely through said opening, a hand nut threaded on the outer end of the rod and bearing against the abutment, a yoke connected to the inner end of the rod and straddling the portion of the spindle located between the body plate of the head-piece and the cross-piece, said

last-named yoke, said spindle, and the side plates of the head-piece having transversely aligned openings therein, and a fulcrum pin for the yoke extending through said openings and snugly fitted therein so as to be supported by the spindle and the side plates of the head piece, the side members of the yoke engaging the pin closely adjacent the spindle so that the forces applied from the yoke to the spring act through a minimum lever arm.

2. A chair iron of the character described comprising a spindle, a head-piece supported on the upper end of the spindle, said spindle projecting up into the head-piece, a spider having a yoke pivotally supported on the head-piece, a spring having its inner end bearing against the yoke, an enlarged opening in said yoke, an adjustable abutment engaging the outer end of the spring, an opening in said abutment, a tensioning rod having its outer end threaded and extending loosely through said openings, a hand nut threaded on the outer end of the tensioning rod and bearing against the abutment, a yoke connected to the inner end of the rod and straddling the portion of the spindle projecting into the head-piece, and a pivot pin for the yoke supported directly on the head-piece and directly on the spindle.

3. A chair iron comprising a spindle, a vertically disposed U-shaped head-piece having its horizontal body plate formed with an opening through which the upper end portion of the spindle projects, a cross-piece extending between and secured to the vertical side plates of the head-piece adjacent their upper ends and having an opening in which the extreme upper end of the spindle is fitted and secured, a spider having a horizontally disposed U-shaped yoke straddling the head-piece and pivotally supported thereon, a pair of springs having their inner ends bearing against the body plate of said yoke, an enlarged opening in said body plate, a cross-head having spring seats engaged with the outer ends of said springs, said cross-head having an opening intermediate said spring seats, an adjusting rod having its outer end threaded and extending loosely through said openings, a hand nut threaded on the outer end of said rod and bearing against said cross-head, the inner end of said rod being headed, a yoke engaged with the headed end of the rod and having its side members straddling and closely adjacent the portion of the spindle disposed between the body plate of the head-piece and cross-piece, and a pin pivotally interconnected with the side members of said last-named yoke and supported directly on the spindle and directly on the side plates of the head-piece.

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