Aug. 23, 1932. D. R. COLLIER ET AL 1,872,894

CHAIR IRON

Filed May 13, 1930

Fig. 1.

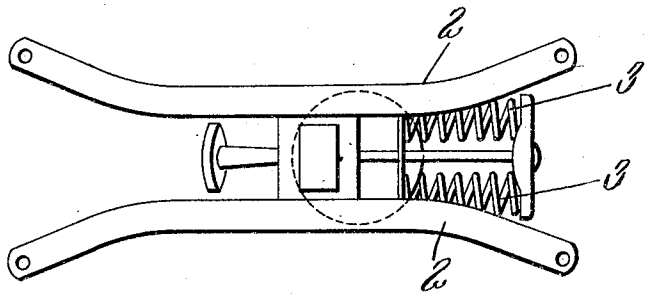


Fig. 2.

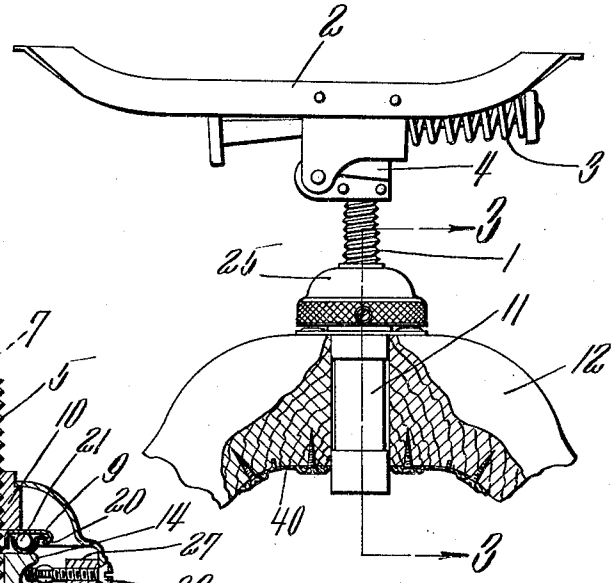


Fig. 3.

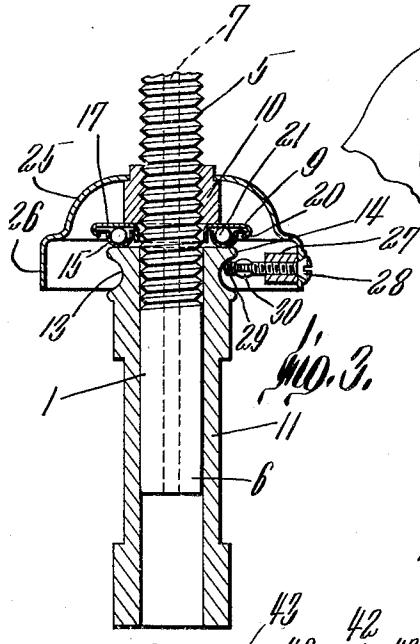


Fig. 4.

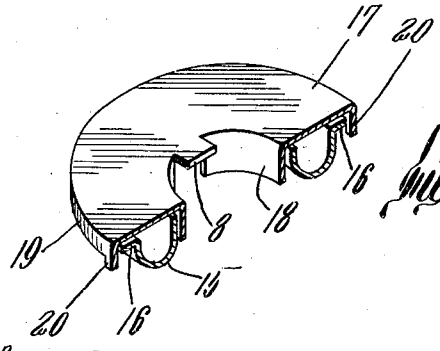
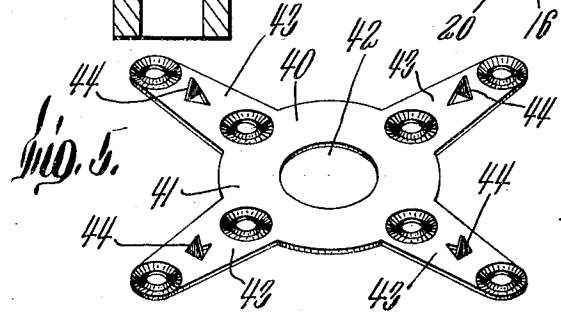


Fig. 5.



Inventors
David R. Collier
Henry W. Sheldrick
by Wright Brown Quinby & May
Attys

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UNITED STATES PATENT OFFICE

DAVID R. COLLIER AND HENRY W. SHELDRICK, OF GARDNER, MASSACHUSETTS, ASSIGNORS TO COLLIER-KEYWORTH COMPANY, OF GARDNER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

CHAIR IRON

Application filed May 13, 1930. Serial No. 451,938.

This invention relates to chair irons for revolving chairs. Heretofore it has been customary to place between the adjusting nut on the threaded spindle, which supports the chair seat, and a sleeve carried by the legs and within which the spindle may be rotated, a member called a J washer, which has a spline projecting into a slot extending longitudinally of the spindle. In accordance with the present invention the J washer is formed as a raceway member of an anti-friction bearing.

For ease of manufacture and assembly it is desirable to extend the spindle slot to its lower end. It is also desirable for ease of shipment and for other purposes that the seat portion of the chair should be readily detachable from the base or leg portion, the spindle being removable from the sleeve. Such disassembly, however, in the absence of special provision thereagainst, would permit the J washer to drop off at the lower end of the spindle, and as it is a relatively small part it would be liable to be lost during shipment. A further feature of invention, therefore, relates to means for preventing detachment of the J washer from the spindle.

For a more complete understanding of the invention, reference may be had to the accompanying drawing in which

Figures 1 and 2 are a top plan and a fragmentary side elevation, respectively, of a chair iron embodying this invention.

Figure 3 is a section to a larger scale on line 3—3 of Figure 2.

Figure 4 is a fragmentary perspective of the J washer and bearing.

Figure 5 is a perspective view of the bottom plate in its flat form prior to being bent to conform to the under edges of the chair legs.

Referring to the drawing, at 1 is indicated a chair spindle for supporting the seat of the chair (not shown). This spindle is shown as carrying at its upper end, frame pieces 2 to which the chair seat may be fixed in the usual manner and as shown these pieces 2 are secured for tilting movement opposed by springs 3 to a head portion 4 carried at the upper end of the spindle. As shown best in Figure 3, this spindle 1 is threaded throughout its upper portion as at 5, but is unthreaded at its lower portion as at 6. This lower unthreaded portion is shown as of a diameter larger than the roots of the threads at 5, and, preferably, as shown, is of the same diameter as the stock in which the threads are cut to form the upper threaded portion 5.

Extending longitudinally of this spindle 1 is a slot 7 within which rides a projecting spline 8 of a combined J washer and bearing indicated generally at 9. This J washer and bearing is placed between a nut 10 engaging the threaded portion 5 of the spindle and a sleeve 11 in which the spindle is slidably guided and which is carried by the base portion 12 of the chair, this base portion including the chair legs. The sleeve 11 is shown as provided near its upper end with a peripheral groove 13 and between this groove and the adjacent upper end of the sleeve, its maximum diameter portion as at 14, is less than the maximum diameter of the combined J washer and bearing 9, for a purpose which will later appear. As shown this combined J washer and bearing 9 comprises a lower annular member 15 trough-shaped in cross section and having a marginal outwardly extending flange 16. An upper raceway member 17 is shown as provided with an internal depending flange 18 which extends inwardly of the member 15 and it also is shown as provided with a depending outer flange 19 projecting downwardly beyond the flange 16 and being provided at suitably spaced intervals with lug portions 20, which, after the bearing is assembled, are bent under the flange 16 of the lower member, thus to retain these members in assembled relation as shown in Figure 3. Before these raceway members are attached together as thus described, anti-friction rolling elements such as balls 21 are placed therebetween. The flange 18 is not essential but when employed provides a longer bearing on the spindle 7 than when it is omitted and thus avoids any possibility of this combined J washer and bearing cramping thereon.

Fixed to the nut 10 is a bell member 25 which depends from the nut and encloses the J washer and bearing 9 and the upper portion of the sleeve 11. It is shown as provided at

one portion on the inner face of its flange 26 with a block 27 through which and the flange 26 is extended a screw 28. This screw, when in normal position, has its inner end 29 projecting into the groove 13 of the sleeve and thus prevents the sleeve 11 from being detached from the spindle. It may, however, be withdrawn by unscrewing until it passes out of the groove 29, whereupon the sleeve 11 may be removed from the spindle so that the base portion of the chair may be separated from the seat portion and spindle. As shown, however, the screw 28 is mutilated as at 30 at such a point that it cannot be withdrawn sufficiently to permit the combined J washer and bearing 9 to be moved therepast, this member being of greater diameter than the upper end of the sleeve, as heretofore mentioned, so that the J washer and bearing cannot be taken off from the lower end of the spindle 1. Since this screw 28 is carried by the nut 10 and the nut 10 cannot pass down over the unthreaded lower portion of the spindle, the J washer is thus held from accidental detachment, as its possible extent of motion between the lower face of the nut 10 and the end of the screw 28 is less than the length of the unthreaded portion of the spindle. Thus accidental detachment of the J washer and bearing is prevented, while separation of the seat portion and the spindle from the base portion is permitted when desired and this without requiring the slot 7 of the spindle to be terminated above its lower end.

In order to stiffen and strengthen the chair base, a bottom plate 40 is attached to the chair legs. This plate may consist of a sheet metal stamping in the form of an annulus having a central aperture 42 and radiating arms 43, one arm for each chair leg. The plate is provided with suitably placed holes for screws. On each arm 43 a prong 44 may be struck up. In assembling the chair base, the plate 40 is placed against the under edges of the assembled chair legs and is struck to bend it from the flat condition shown in Figure 5 to the dished form shown in Figure 2. The prongs 44 enter the legs and hold the plate in position while wood screws are inserted through the screw holes of the plate.

An embodiment of this invention having thus been described, it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from the spirit or scope of this invention as defined by the appended claims.

We claim:

1. A combined bearing and J washer, comprising an annular raceway member having a channel for rolling elements, rolling elements in said channel, an annular washer for closing said channel and forming the mating raceway member, and means for holding said raceway members assembled for relative rotation, said washer having an inwardly projecting element for engagement in the longitudinal slot in a chair spindle and a downwardly projecting flange on its outer edge overlapping the outer edge of said channel.

2. A combined bearing and J washer, comprising a lower annular trough-shaped raceway member having a radial marginal flange, an upper raceway member comprising an annular plate having an inward projection for engagement in the longitudinal slot of a chair spindle and rolling elements between said members, said upper raceway member also having inner and outer flanges extending downwardly from the edges of said plate and overlapping the adjacent edges of the lower raceway member, and elements on the outer flange extending under said radial flange to prevent disassembly of said raceway members.

3. In combination, a threaded chair spindle having a slot longitudinal thereof, a sleeve for receiving said spindle and having a peripheral groove adjacent to one end, a nut engaging the threads of said spindle, a J washer between said nut and the grooved end of said sleeve and of an outer diameter greater than that of said sleeve between said groove and its adjacent end, and means carried by said nut normally engaging in said groove to prevent disengagement of said sleeve and spindle and retractable sufficiently to permit removal of said sleeve, but insufficiently to permit removal of said J washer.

4. In combination, a threaded chair spindle having a slot longitudinal thereof, a sleeve for receiving said spindle and having a peripheral groove adjacent to its upper end, a nut engaging the threads of said spindle, a J washer between said nut and the grooved end of said sleeve and of an outer diameter greater than that of said sleeve between said groove and its upper end a bell carried by and covering said nut and also enclosing said J washer and the upper end of said sleeve, a screw carried by said bell in position to have its inner end engaging in said groove to normally prevent detachment of said sleeve from said spindle, said screw having a portion formed to prevent its withdrawal sufficiently to permit removal of said J washer but permitting sufficient withdrawal to permit removal of said sleeve from said spindle.

5. In combination, a threaded chair spindle having a longitudinal slot, a J washer having a projection engaging in said slot, a nut on said spindle and removable therewith from a chair base, and means carried by said nut for preventing removal of said J washer from said spindle apart from said nut.

6. In combination, a chair spindle threaded at its upper portion and unthreaded at its lower end where it is of a diameter substantially greater than the thread roots of the threaded portion, said spindle having a slot

extending longitudinally to its lower end, a nut engaging said threaded portion, a J washer having a portion engaging in said groove, and means carried by said nut to limit the possible separation of said nut and J washer to less than the length of said unthreaded portion, thereby to prevent the removal of said J washer at the lower end of said spindle.

In testimony whereof we have affixed our signatures.

DAVID R. COLLIER.
HENRY W. SHELDRICK.