Aug. 18, 1936. W. F. HEROLD 2,051,043

CHAIR IRON

Filed June 22, 1934

Fig. 1.

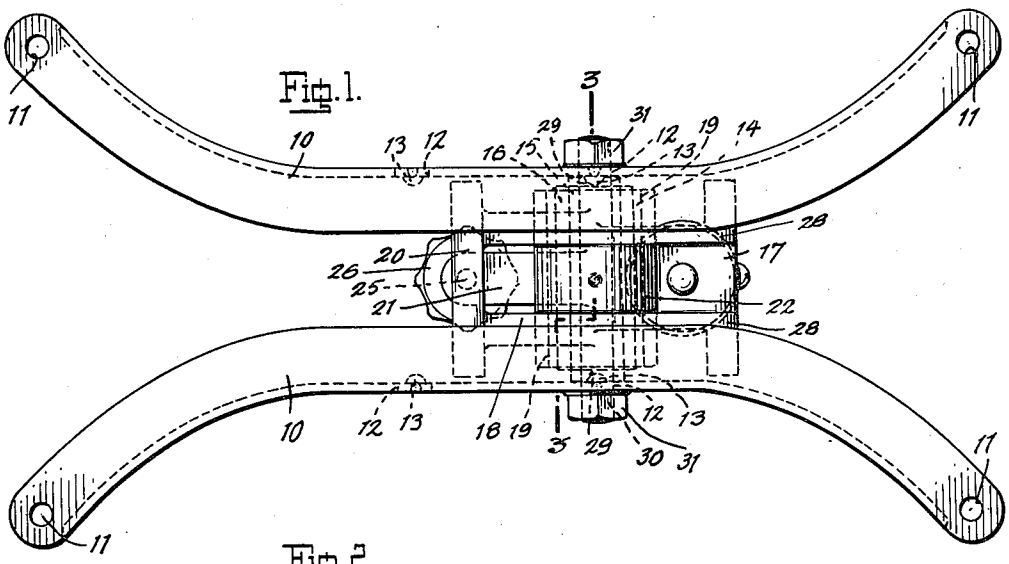



Fig. 2.

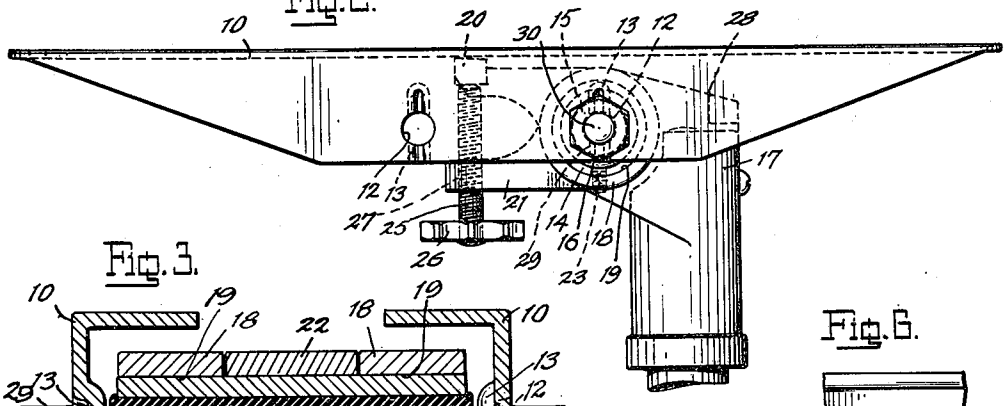



Fig. 3.

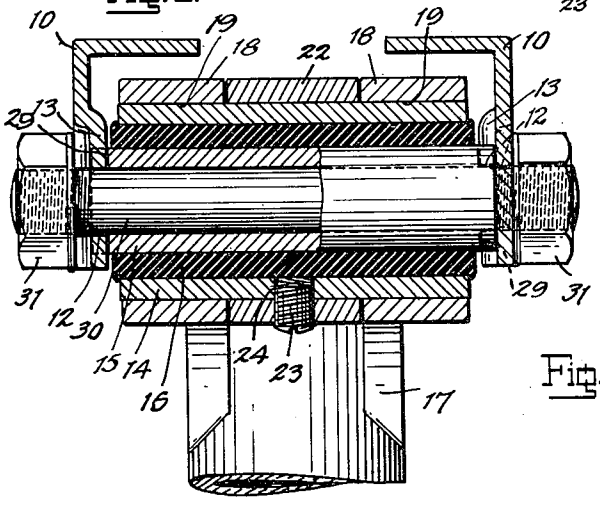



Fig. 4.

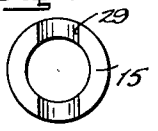



Fig. 5.

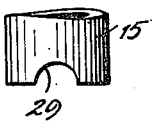



Fig. 6.

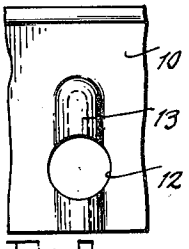
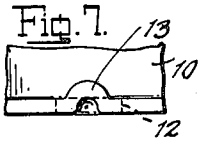



Fig. 7.




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# UNITED STATES PATENT OFFICE

2,051,043

## CHAIR IRON

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Application June 22, 1934, Serial No. 731,848

6 Claims. (Cl. 155—77)

The present invention relates to an improvement in chair irons, and is a continuation in part of my co-pending patent application for Chair iron, Serial No. 695,989, filed October 31, 1933, which matured into Patent No. 2,008,209 on July 16, 1935. The invention relates more particularly to the construction and assembly of the spider arms with the cooperating tilting joint element, an object being to provide a construction by which the spider arms may be very conveniently assembled with the joint element. Another object is to provide a construction permitting assembly or disassembly of the joint element after the spider arms are attached to the chair seat. It is further proposed to provide a standard form of spider arm which may be used either for the right or left side of the chair iron, and with which the joint element may be assembled or disassembled as a complete unit merely by the insertion or removal of a single bolt. A further object is to provide a structure with which a standard form of joint element may be assembled with spider arms of varying sizes designated to fit different sizes or types of chair seats, so that, instead of the necessity of carrying a stock of complete chair iron assemblies to fit the various sizes and types of chairs, as heretofore, it will be only necessary to carry a stock of various sized spider arms, which are comparatively inexpensive and easily stored, and a stock of standard joint elements to be assembled with the various sized spider arms as occasion requires.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawing and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a top plan view of the chair iron, according to the exemplary illustrated embodiment of the invention.

Fig. 2 is a side elevation.

Fig. 3 is a vertical sectional view, enlarged, taken along the line 3—3 of Fig. 1.

Fig. 4 is an end view of the spindle sleeve employed.

Fig. 5 is a plan view of one end of the spindle sleeve.

Figure 6 is a fragmentary inside elevation of a portion of the spider arm employed.

Fig. 7 is a fragmentary bottom edge view thereof.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing, the chair iron, according to the exemplary illustrated embodiment of the invention, comprises generally a pair of spider arms and a swivel joint element disposed between them, the spider arms adapted to be screwed to the under side of the chair seat and the joint element being mounted for swiveling movement upon a chair base.

The spider arms 10—10, which are of identical form, are of angular cross-section, and their ends are bent outwardly and are provided with holes 11 for the attaching screws. Each spider arm, according to the preferred embodiment of the invention, is symmetrical at each side of its center and is provided in its side wall, in equally spaced relation to the center, with a pair of apertures 12—12, and with inwardly embossed vertically extending ribs 13—13 extending above and below the respective apertures. The apertures are adapted to receive the spindle disposed rearwardly of the center of the spider arms so that by providing the pair of apertures the same spider arm may be used at either side.

The particular construction of the tilting joint element forms no part of the invention, except insofar as it is a complete element adapted for attachment to the spider arms by a single bolt, as will presently more fully appear, the one illustrated being of the general type disclosed in my said co-pending patent application, Serial No. 695,989, filed October 31, 1933. The joint element comprises an outer tubular member 14, an inner tubular spindle member 15, and a cylindrical body of rubber 16 between them, this rubber body being highly compressed and confined between the members 14 and 15 and being in effect bonded to their surfaces, so that upon relative movement between the members 14 and 15 the rubber body is put under torsional strain. The bracket 17 which carries the joint element is provided with a forwardly projecting yoke portion 18, in the sides of which are provided cylindrical bearing openings 19—19, in which the end portions of the outer joint member 14 are engaged for rotary adjustment, as will presently more fully appear. A transverse connecting bridge portion 20 is provided at the forward end of the yoke portion of the chair seat. Within the space between the sides of the yoke portion a tension adjustment lever 21 is disposed and projects beneath the bridge portion 20, its collar portion 22 being engaged about the intermediate portion of the outer joint member 14 and secured thereto by a set screw 23, the member 14 having a hole 24 therein in which the end of the set screw lockingly engages. An adjustment screw 25 having a hand wheel or nut 26 at its end is engaged in a threaded opening 27 in the end of the lever 21 and bears at its upper end upon the bridge portion. The upper surface of the bracket is inclined rearwardly and downwardly, as at 28, to form a limit stop to the tilting movement of the spider arms.

The ends of the inner tubular member 15 of the joint element project beyond the rubber member

16, as well as beyond the outer joint member 14 and the yoke portion 18 of the bracket, and are provided with grooves 29 which are adapted to be interlockingly engaged with the ribs 13 of the spider arms, a tie-bolt 30 being engaged through the bore of the member 15 and having its threaded ends extended through the apertures 12 of the spider arms and secured by nuts 31—31, this assembly rigidly connecting the spider arms to the member 15 and providing a supporting spacer or strut between the arms. It will be seen that the joint may be easily slid into place between the spider arms even though the latter are secured to the chair seat.

It will be obvious that by adjusting the screw 25 the outer joint member 14 is rotated with respect to the bracket and the inner joint member, and through the torsional strain imposed on the rubber member 15 any desired initial tension may be set up in the latter, the greater the initial tension the more force required to tilt the chair. When assembling the joint element between the spider arms, or when disassembling, the tension in the rubber is completely relieved by turning the screw 25 so as to swing the lever 21 toward the bridge portion 20.

The spider arms may be made in various sizes to fit various sizes or types of seats, the holes 12 and ribs 13 being of the same size in each case however, so that a standard size joint element may be interchangeably connected to any of them merely by the insertion of the bolt 30. The principal variation in the spider arms will be in their length and the outward curvature of their ends, the intermediate portions of the two spider arms employed in an assembly being the same in each case.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

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

1. In a chair iron, a unit joint element comprising a pair of coaxial relatively rotatable parts and resilient means coacting between said parts, a pair of spider arms one at each side of said joint element adapted to be secured to a chair seat and detachable with respect to said unit joint element, and securing means demountably securing said spider arms to said joint element, said joint element being completely removable as a unit from said spider arms when unsecured by said securing means.

2. In a chair iron, a unit joint element comprising a pair of coaxial relatively rotatable parts and resilient means coacting between said parts, a pair of spider arms one at each side of said joint element adapted to be secured to a chair seat and detachable with respect to said unit joint element, said spider arms being separable from each other whereby their transverse spacing may be varied in accordance with the transverse dimension of said joint element, and securing means demountably securing said spider arms to said joint element, said joint element being completely removable as a unit from said spider arms when unsecured by said securing means.

3. In a chair iron, a unit joint element comprising a pair of coaxial relatively rotatable parts, one of which is a transverse tubular member, and resilient means coacting between said parts, a pair of spider arms one at each side of said joint element adapted to be secured to a chair seat and detachable with respect to said unit joint element, said spider arms each having a side portion having an aperture co-axial with said tubular member, and a removable tie-bolt extended through said tubular member and said apertures and demountably securing said side portions to said joint element, said joint element being completely removable as a unit from said spider arms upon removal of said removable tie-bolt.

4. In a chair iron, a unit joint element comprising a pair of coaxial relatively rotatable parts, one of which is a transverse spindle, and resilient means coacting between said parts, a pair of spider arms one at each side of said joint element adapted to be secured to a chair seat and detachable with respect to said unit joint element, said spider arms each having a side portion having an aperture co-axial with said spindle, interlocking means cooperating between the ends of said spindle and said side portions to prevent relative rotation between them, said interlocking means being engageable and disengageable through movement transversely to the axis of said spindle and securing means demountably engaged with said apertures and securing said side portions to said spindle.

5. In a chair iron, a unit joint element comprising a pair of coaxial parts having relative rotary movement between them, and resilient means coacting between said parts, a pair of identical spider arms adapted to be secured to a chair seat, one at each side of said joint element, and each being of symmetrical form at each side of its center and each having a pair of joint element engaging portions equally spaced in relation to its center whereby one of said joint element engaging portions of each of said identical spider arms may be disposed in relation to the respective ends of said joint element, by the reversal of one of said spider arms relative to the other, with both of said spider arms extending the same distance in the front and the same distance in the rear of said joint element, and assembling means cooperating between said joint element and the respective joint element engaging portions of said spider arms in relation thereto to connect said joint element to said spider arms.

6. In a chair iron, a unit joint element comprising a pair of coaxial relatively rotatable parts, one of which is a transverse spindle, and resilient means coacting between said parts, a pair of identical spider arms adapted to be secured to a chair seat, one at each side of said joint element, and each being of symmetrical form at each side of its center and each having a pair of apertures equally spaced in relation to its center whereby one of said apertures of each of said identical spider arms may be disposed in relation to the respective ends of said spindle of said joint element, by the reversal of one of said spider arms relative to the other, with both of said spider arms extending the same distance in the front and the same distance in the rear of said joint element, and assembling means engaged with said apertures of said spider arms respectively in relation to said spindle of said joint element and securing said spider arms to said spindle.

WALTER F. HEROLD.