Jan. 25, 1938. W. F. HEROLD 2,106,174

CHAIR IRON

Filed June 12, 1936

Fig. 1.

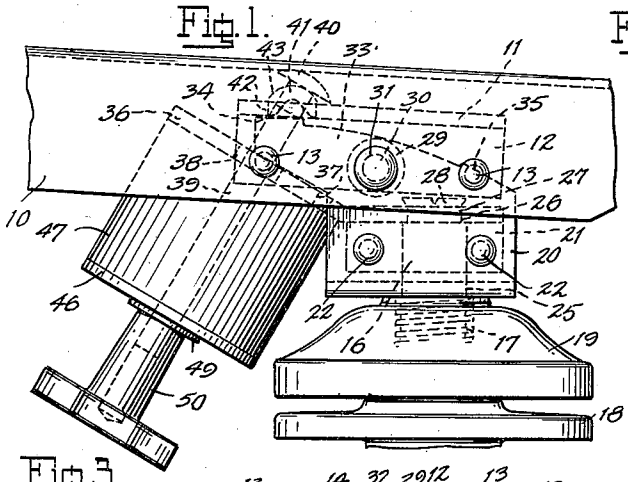


Fig. 2.

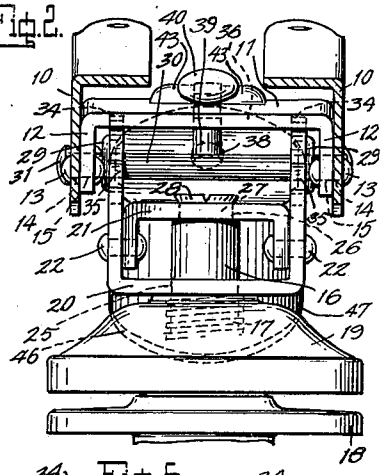


Fig. 3.

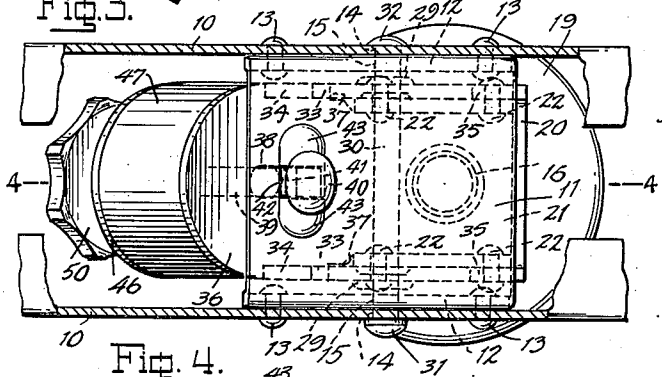


Fig. 5.

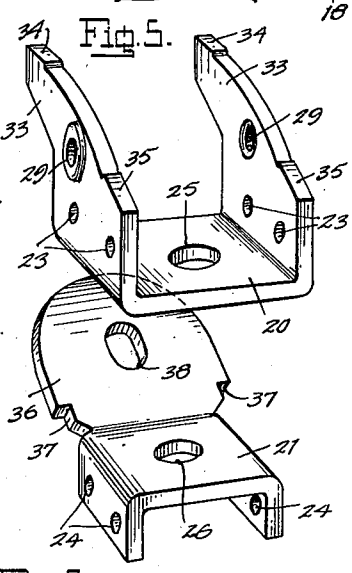


Fig. 4.

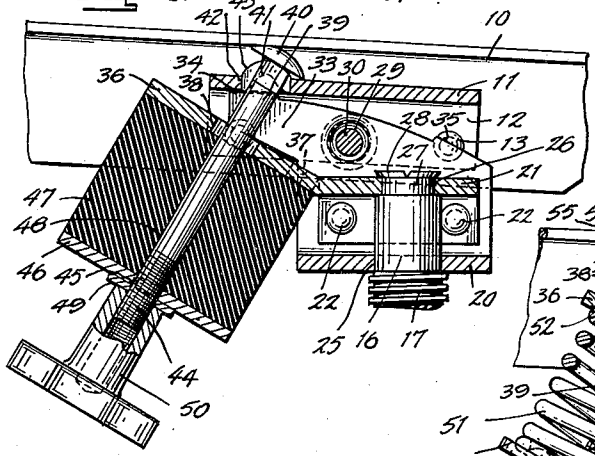
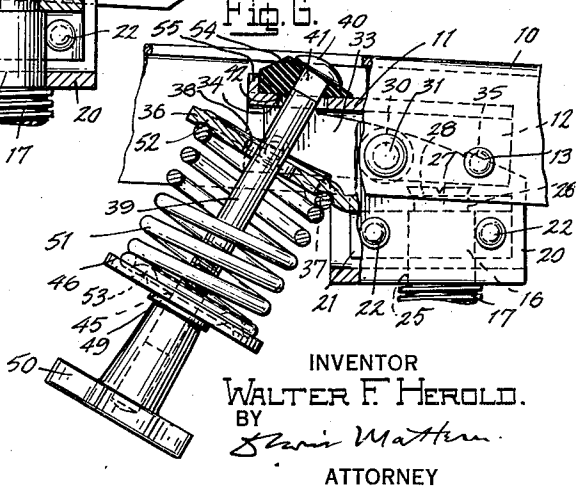


Fig. 6.



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CHAIR IRON

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Application June 12, 1936, Serial No. 84,837

4 Claims. (Cl. 155—77)

The present invention relates to an improvement in chair irons, particularly for use with tilting chair seats, and usually mounted for swivelling movement upon a base support. An object of the invention is to provide a chair iron in which most of the parts may be formed of sheet metal bent to shape, which may be very inexpensively manufactured, and in which the assembly may be carried out by simple and inexpensive manufacturing methods. A further object is to provide a chair iron structure in which the parts of the structure which are subjected to strain will be supported by other parts in a manner to prevent any breakage or distortion thereof. Another object is to provide a chair iron in which the resilient means may be in the form of a resilient rubber block, or may be in the form of a helical spring, without otherwise altering the structure of the iron, and further to provide such resilient means which may be readily replaced by the user of the chair in the event of damaging, deterioration or breakage.

With the above and other objects in view embodiments of the invention are shown in the accompanying drawing and these embodiments 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 side elevation of a chair iron embodying the present invention, end portions of the spider arms being broken away.

Fig. 2 is a rear end elevation, the spider arms being shown in section.

Fig. 3 is a top plan view, portions of the spider arm being broken away.

Fig. 4 is a vertical longitudinal sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of two of the frame parts of the structure in separated relation.

Fig. 6 is a view partially in side elevation and partially in vertical section of a modified form of the invention, in which the resilient element is in the form of a helical spring.

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

Referring to the drawing, and more particularly to Figs. 1 to 5, the chair iron, according to the illustrated exemplary embodiment of the invention, comprises a pair of angular cross-section spider arms 10—10 adapted to be screwed to the under side of the chair seat in the usual manner, and which are mounted for tilting movement upon the fixed part of the chair iron structure, as will presently more fully appear.

The spider arms are rigidly connected in separated relation by means of a spanner element, preferably formed of sheet metal, comprising a top portion 11 of rectangular outline provided at each side with right angularly bent flanges 12—12 secured by rivets 13 to the sides of the spider arms, there being aligned holes 14—14 and 15—15 in the sides of the spider arms and in the flanges 12—12 for receiving the shaft hereinafter more fully described, for tiltably connecting the spider arms to the fixed part of the chair iron.

The fixed part of the chair iron is rigidly mounted upon the upper end portion 16 of a vertically disposed spindle 17 which is screw threaded and mounted for vertical adjustment in the supporting base member 18, the vertical adjustment being accomplished by means of the nut 19. As these vertical adjustment parts form no part of the present invention, but are of well known construction, a further detail description of them is not deemed necessary.

The fixed part of the chair iron structure comprises a pair of channel shaped sheet metal members 20 and 21, the member 20 being of U-shape in cross-section, and the member 21 being of inverted U-shape in cross-section and fitted within the member 20, to which it is rigidly secured by means of rivets 22 engaging holes 23 and 24 respectively in the sides of the members 20 and 21. The transverse portion of the member 20 is provided with an aperture 25 engaged by the upper end portion 16 of the post 17, and the transverse portion of the member 21 is provided with an aperture 26 engaged by the reduced stud portion 27 formed upon the upper end of the portion 16 and headed over, as at 28, to thus rigidly secure the members 20 and 21 upon the post.

The sides of the member 20 extend above the transverse portion of the member 21 and are provided with apertured bearing portions 29—29, preferably embossed outwardly, and through which is engaged the tilting mounting shaft 30, the ends of this shaft being engaged in the apertures 14 and 15 of the spider arms and spanner member 11 and being secured thereto by the head 31 upon one end of the shaft and a riveted over head 32 upon the other end. The sides of the member 20 are also provided with forwardly projected inclined arms 33—33 provided upon their upper surfaces with forward stop portions 34—34 against which the spanner member 11

engages in the non-tilted position of the chair seat.

The upper edges of the side portions of the member 20 are also provided at their rearward ends with downwardly inclined stop portions 35—35, against which the spanner member is adapted to engage at the limit of the rearwardly tilted position of the chair seat, it being understood that the resilient element, presently to be more fully described normally retains the chair seat in non-tilted position, the chair seat being tilted against the pressure of the resilient means.

The member 21 is provided at the forward end of its transverse portion with an extension 36 bent into an upwardly inclined plane and which constitutes the upper supporting head of the resilient element. The extension 36 is engaged and supported by the undersides of the arms 33—33, the rearward edge portions of the extension being notched, as at 37—37, to clear the forward edges of the sides of the member 20.

A slightly elongated hole 38 is provided in the extension through which the rod 39 of the resilient element extends. This rod is provided at its upper end with a head 40 below which there is a squared portion 41, which is engaged in a slot 42 provided in the spanner member 11, outwardly embossed rounded pillar portions 43—43 being provided at each side of this slot upon which the head 40 rockingly engages. The rod 39 is screw-threaded at its lower end, as at 44, and extends through the central aperture 45 of a plate 46, and between this plate 46 and the extension 36 there is disposed a cylindrical resilient rubber block 47, having a central passage 48 therethrough in which the rod 39 is engaged. A washer 49 and an adjustment and retaining nut 50 are provided upon the threaded end of the rod for retaining the plate 46 and cylindrical rubber element in place. Also by adjusting the nut 50 the initial tension in the rubber block may be adjusted as desired, so that more or less force will be required to tilt the chair seat against the pressure of the rubber block.

In operation the spider arms and spanner member are tilted by the rearward pressure exerted by the person seated in the chair, this pressure causing the spider arms and the spanner member to tilt about the axis of the shaft 30 pulling the plate 46 toward the extension 36 and compressing the rubber block. It will be noted that the pressure exerted upon the extension 36 is taken upon the arms 33—33, so that there is no tendency for the extension 36 to bend with respect to the member 21, even though the latter may be constructed of relatively thin metal.

In Fig. 6, I have shown a modified form of the invention, in which a helical spring 51 is employed as the resilient element instead of the rubber block 47. In this case the extension member 36 is preferably provided with a circular recess 52 for positioning the upper end of the spring and the plate 46 is provided with an embossed circular rib 53 which positions the lower end of the spring. In this illustration I have also shown a modified form of pivot or rocking support for the upper end of the rod 39, and which consists of an apertured rubber block 54 disposed upon the upper side of the spanner member 11 above the slot 42, the spanner member being provided at its forward end with an upwardly bent flange 55 for retaining the rubber block. It will be understood that this type of rubber support may be used in the embodiment illustrated in Figs. 1 to 5, and that the embossed support illustrated in Figs. 1 to 5 may be used in the embodiment illustrated in Fig. 6.

I have illustrated and described preferred and satisfactory embodiments 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 structure, a supporting post, a frame rigidly mounted on said post, a pair of spider arms, a spanner member rigidly connecting said spider arms in spaced relation, said spanner member having a slot, an apertured rubber block disposed at the upper side of said spanner member, its aperture registering with said slot, joint means connecting said spider arms and spanner member to said frame for tilting movement about a horizontal axis, an apertured resilient element supporting head rigidly connected to said frame, a rod engaging said slot of said spanner member and the aperture of said block and extending through said apertured head, a head on said rod resiliently supported by said rubber block, a resilient element supporting base adjustably mounted on said rod in spaced relation to said head, and resilient means disposed about said rod between said head and said base.

2. In a chair iron structure, a supporting post, a frame rigidly mounted on said post, a pair of spider arms, a spanner member rigidly connecting said spider arms in spaced relation, joint means connecting said spider arms and spanner member to said frame for tilting movement about a horizontal axis, said frame comprising a U-shaped frame member, a second frame member secured between the sides of said first frame member, forwardly projecting arms forming a continuation of the sides of said U-shaped frame member adapted to engage said spanner member in the non-tilted position of said spider arms, stop means on said arms adapted to engage said spanner member to limit the tilted position of said spider arms, a forwardly projecting integrally formed apertured resilient element supporting head on the transverse portion of said second frame member engaging the under sides of said arms, a rod rockingly connected to said spanner member and extending through said apertured head, a resilient element supporting base adjustably mounted on said rod in spaced relation to said head, and resilient means disposed about said rod between said head and said base.

3. In a chair iron structure, a supporting post, a frame rigidly mounted on said post, a pair of spider arms, a spanner member rigidly connecting said spider arms in spaced relation, joint means connecting said spider arms and spanner member to said frame for tilting movement about a horizontal axis, said frame comprising a U-shaped frame member, an inverted U-shaped member secured between the sides of said U-shape member, forwardly projecting arms forming a continuation of the sides of said U-shaped frame member adapted to engage said spanner member in the non-tilted position of said spider arms, stop means on said arms adapted to engage said spanner member to limit the tilted position of said spider arms, apertured resilient element supporting head integrally formed on the transverse portion of said inverted U-shaped member engaging the under sides of said arms, a rod rockingly connected to said spanner member and extending through said apertured head, a

resilient element supporting base adjustably mounted on said rod in spaced relation to said head, and resilient means disposed about said rod between said head and said base.

4. In a chair iron structure, a supporting post, a frame rigidly mounted on said post, a pair of spider arms, a spanner member rigidly connecting said spider arms in spaced relation, joint means connecting said spider arms and spanner member to said frame for tilting movement about a horizontal axis, said frame comprising a U-shaped frame member having an aperture in its transverse portion engaged by said post, a second frame member secured between the sides of said first frame member and having an aperture in its transverse portion also engaged by said post, said post being secured with respect to said apertures against vertical displacement, forwardly projecting arms on the sides of said U-shaped frame member adapted to engage said spanner member in the non-tilted position of said spider arms, stop means on said arms adapted to engage said spanner member to limit the tilted position of said spider arms, a forwardly projecting integrally formed apertured resilient element supporting head on the transverse portion of said second frame member engaging the under sides of said arms, a rod rockingly connected to said spanner member and extending through said apertured head, a resilient element supporting base adjustably mounted on said rod in spaced relation to said head, and resilient means disposed about said rod between said head and said base.

WALTER F. HEROLD.