

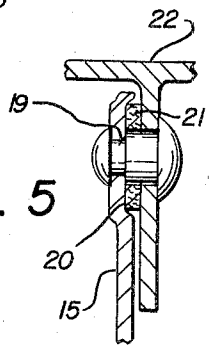
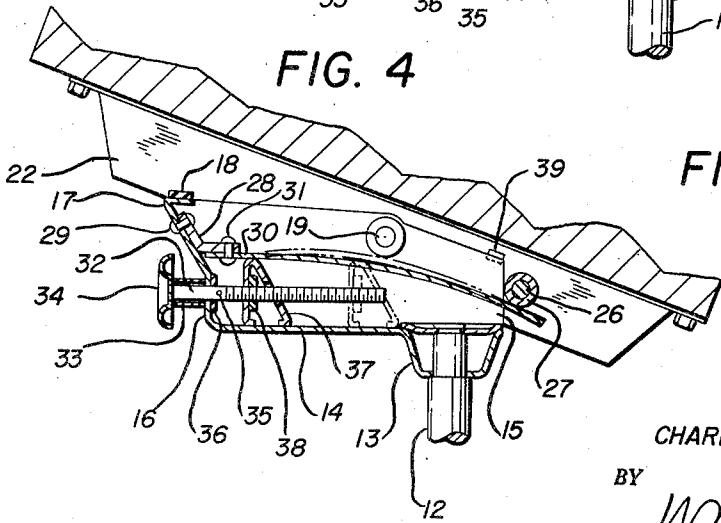
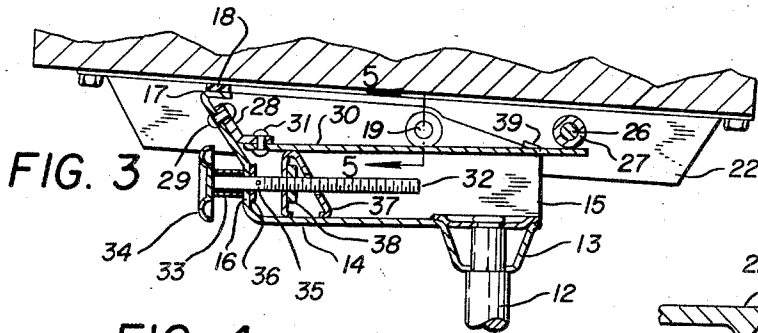
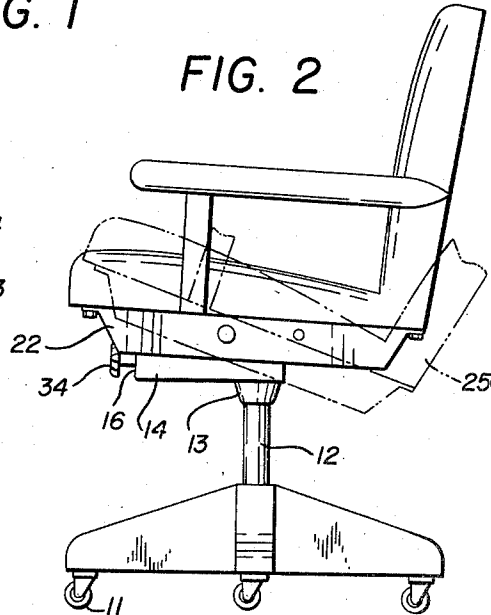
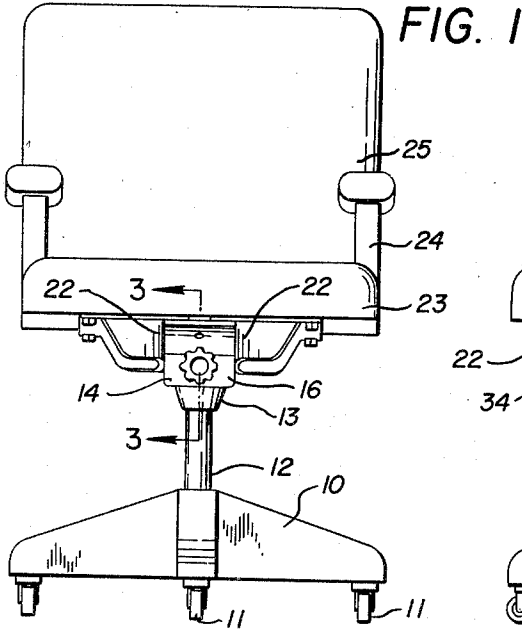
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TILTABLE OFFICE CHAIR

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TILTABLE OFFICE CHAIR

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This invention relates to a chair iron and more particularly to an improved chair iron for use with tiltable office chairs and the like.

The principal object of the invention is the provision of an improved chair iron for an office chair incorporating a swiveling and adjustable tilting mechanism.

A further object of the invention is the provision of an improved chair iron incorporating novel means for actuating and adjusting the tilting movement of a chair.

A still further object of the invention is the provision of an improved chair iron for a tiltable swivel chair which requires fewer moving parts and a less expensive structure to obtain an improved tilting action and noiseless tilting and moving.

A still further object of the invention is the provision of a chair iron which may be universally used in the chair industry for mounting a chair in a tilting swiveling relation on a base.

A still further object of the invention is the provision of a chair iron in which the weight of the chair and occupant thereof is concentrated downwardly at the pivotal point and opposed by a straight leaf spring mounted in the chair iron and positioned over an adjustable fulcrum, longitudinally of said spring.

A still further object of the invention is the provision of a chair iron for a tiltable swivel chair incorporating a straight leaf spring arranged to be activated by a bending action when the chair is tilted and wherein the pivotal point is so located in relation to the supporting spindle and base that upon tilting, the center of gravity moves forward and results in a decreased return thrust on the part of the spring even though the same is under greater load tension.

A still further object of the invention is the provision of a chair iron for a tilting swivel chair which will allow the occupant to tilt backward to a certain degree without effort and return without effort while at the same time not be thrust forward by the spring mechanism in the chair iron.

The chair iron disclosed herein comprises an improvement in the art of tilting swivel constructions as used primarily in office chairs and which have generally heretofore comprised tiltable structures opposed by coil springs acting to uniformly resist the tilting of the chair with respect to the base supporting the same.

The improved chair iron differs in structure and action from such leaf spring opposed chair iron constructions as have heretofore been known in that tilting action of the chair with respect to the swivel and base supporting the same is directly received by the free end of a leaf spring which is engaged upon a movable fulcrum member intermediate the ends of the spring, and which movable fulcrum is located forwardly of the pivotal point of the chair iron while said pivotal point is located forwardly of the swivel mechanism and supporting base.

In the improved chair iron, the tiltable portion of the chair iron includes a roller on a supporting stem en-

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gaging the free end of the leaf spring and movable therealong in slight degree as the chair is tilted.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a front elevation of a chair incorporating the improved chair iron.

Figure 2 is a side elevation of the chair illustrated in Figure 1 with broken line showing the tilted position of the chair.

Figure 3 is an enlarged vertical section taken on line 3-3 of Figure 1.

Figure 4 is a cross section similar to that of Figure 3 showing the chair in tilted position.

Figure 5 is an enlarged detail taken on line 5-5 of Figure 3 illustrating a silencing washer disposed between the movable portions of the chair iron.

By referring to the drawings and Figures 1 and 2 in particular it will be seen that a chair base 10 having a plurality of casters 11 thereon supports a central spindle 12, the upper end of which rotatably supports an apertured cup-shaped depending portion 13 of a housing 14 which includes a section extending horizontally forwardly from the cup-shaped portion 13 with oppositely disposed spaced side walls 15 joined by a front wall 16. The upper edge of the front wall 16 is tapered outwardly and inwardly as at 17 and is provided with a rubber stop pad 18. The side walls 15 taper downwardly toward the rear and are apertured on a common transverse line to receive pivot members 19.

The areas of the side walls 15 about the pivot members 19 are embossed inwardly on their outer surfaces as indicated by the numerals 20 to receive and retain nylon washers 21 which space the side walls 15 of the housing 14 with respect to downturned spaced flanges of a chair spider 22, which downturned flanges lie on spaced parallel planes with respect to the side walls 15 of the housing 14.

The pivot members 19 join the side walls 15 of the housing 14 and the downturned flanges of the chair spider 22, as best shown in Figure 5 of the drawings. The chair spider 22 is of conventional construction and supports the chair thereon including a seat 23, arms 24 and back 25. The sides of the seat 23 may be flanged downwardly if desired so as to hide the chair iron.

The pivot members 19 will thus be seen to pivotally mount the chair spider 22 and the chair thereon in pivotal relation to the housing 14 and it will be observed by referring to Figures 3 and 4 of the drawings that the pivot members 19 are located forwardly of the spindle 12. The downturned flanges on the sides of the chair spider 22 carry a transversely positioned support rod 26 therebetween which has a roller 27 thereon. The rod 26 is attached to the downturned flanges of the chair spider 22 at a point rearwardly of the spindle 12 and on the opposite side thereof with respect to the pivot members 19.

The front wall 16 of the housing 14, and more particularly the outwardly tapered portion thereof, carries an angular bracket 28 on its inner surface which is secured thereto by fasteners 29, the lower end of the angular bracket 28 extending inwardly of the housing 14 on a substantially horizontal plane and has one end of a leaf spring 30 secured thereto as by fasteners 31. The leaf

spring 30 extends backwardly within the housing 14 and near its free end, engages the lower portion of the roller 27.

The vertical portion of the front wall 16 of the housing 14 is apertured and carries an adjusting screw 32 through said aperture. The adjusting screw 32 is retained in horizontal position in the housing 14 by a collar 33 positioned on the forward side of the front wall 16 of the housing 14 and extending between the front wall 16 and an adjustment cap or wheel 34 which is secured to the extending end of the adjusting screw 32.

A retaining pin 35 affixed transversely of the adjusting screw 32 engages against a washer 36 on the inner side of the front wall 16 of the housing 14 to secure the adjusting screw 32 in rotatable horizontal position in the housing 14. A cross sectionally triangular fulcrum member 37 is positioned in the housing 14 on the horizontal portion thereof forwardly of the spindle 12 and is provided with a threaded section 38 engaged on the threaded adjustment screw 32. Thus, rotation of the adjustment cap or wheel 34 will revolve the adjusting screw 32 and move the fulcrum member 37 longitudinally in the housing 14 and longitudinally of the leaf spring 30. The fulcrum member 37 is thus supported on the housing 14 with its uppermost portion or apex engaging the lower surface of the leaf spring 30 between the ends thereof. By moving the fulcrum member 37 beneath the leaf spring 30, varying degrees of spring resistance to the tilting motion of the chair may be realized, as the spring is in effect lengthened or shortened thereby.

It will be observed that the free end of the leaf spring 30, which is engaged by the roller 27, is at all times freely movable in an arc based on the fulcrum 37 as modified by the attachment of the opposite end of the leaf spring 30 to the front wall 16 of the housing 14.

The action obtained is illustrated in Figure 3 of the drawings showing the chair in upright horizontal position and the fulcrum member 37 positioned well forward in the housing 14, while in Figure 4 of the drawings a broken line illustrates the fulcrum member 37 as positioned inwardly of the housing 14 adjacent the spindle 12 and a broken line illustrates the alternate positioning of the leaf spring 30 under such conditions, it being observed that a cantilever springing action is obtained.

It will thus be seen that the tilting mechanism of the chair iron is adjustable so that the downward and return thrust on the leaf spring may vary to a greater or lesser degree depending upon the weight of the individual in the chair. This action allows the occupant to tilt backward to a certain degree without effort and to be able to return to horizontal or upright position without effort while not being thrust forwardly or backwardly with a rapid motion.

The chair iron is so designed that in the event of spring failure, the chair spider 22 will engage the housing 14 and more particularly the side walls 15 thereof, at points adjacent the roller 27 as defined by the rubber pads 39. It will be seen that the utilization of the movable fulcrum 37 with the leaf spring secured only at its forward end results in a longer or shorter lever arm and consequently the forward and return thrust may be increased or decreased.

It will also be observed that the roller 27 is so located that upon assembly, a slight downward tension is applied to the free end of the leaf spring 30. It will be noted that when the chair is tilted backward, as shown in Figure 4 of the drawings, the leaf spring 30 is activated

by a bending action which in turn provides a return thrust, the pivotal members 19 being located forwardly of the spindle 12 so that upon tilting, the center of gravity moves forward and, therefore, at a given location or a fixed point of tilt the return thrust is lessened even though the leaf load is under greater tension. This feature is desirable since the tilting mechanism must have a certain build up of thrust and yet not have the tendency upon tilting backward to urge the chair occupant forward.

It will thus be seen that the several objects of the invention are met by the chair iron disclosed herein.

Having thus described my invention, what I claim is:

1. A chair iron for a tiltable swivel chair comprising a housing mounted on a spindle and a chair spider having depending portions pivotally secured to said housing, said housing comprising an elongated horizontally disposed member having spaced vertical side walls and a front wall joining said vertical side walls, and means forming said pivotal mounting comprising pivot members engaging depending portions of said chair spider and said side walls and located rearwardly of said front wall of said housing and forwardly of said spindle, the top edges of said side walls inclining downwardly and rearwardly of said pivotal members, a bracket secured to said front wall and extending inwardly of said housing on a horizontal plane, and a leaf spring one end of which is secured to said bracket and extending longitudinally of said housing in spaced relation to the top of said chair spider and the bottom of said housing, a support rod on said chair spider between said depending portions thereof, a roller on said support rod engaging said leaf spring adjacent the free end thereof, a fulcrum member disposed in said housing between the front wall thereof and said spindle and movable therebetween, and a threaded screw rotatably positioned in said housing and threadably engaged in said fulcrum member for moving the same, the fulcrum member engaging the bottom of said leaf spring between said pivotal members and said front wall, said support rod and roller being located rearwardly of said spindle.

2. A chair iron for a tiltable swivel chair comprising an elongated member having spaced vertical side walls, an upwardly and outwardly inclined front wall at one end and an apertured cup-shaped depending portion near its opposite end, said elongated member mounted on a spindle engaging said apertured cup-shaped portion, a chair spider having depending portions pivotally secured to said side walls by pivot members forwardly of said cup-shaped portion, a leaf spring, one end of which is attached to said inclined front wall and the remainder of which extends inwardly therefrom on a normal horizontal plane in spaced relation to said elongated member and spider, a support rod on said spider above said spring, a roller on said rod engaging said spring inwardly from the free end thereof and rearwardly of said spindle, a fulcrum member positioned on said elongated member for longitudinal movement with respect thereto and means for moving said fulcrum member, said fulcrum member engaging the bottom of said leaf spring between said pivotal members and said inclined front wall.

References Cited in the file of this patent

UNITED STATES PATENTS

144,349	Morrison	Nov. 4, 1873
2,339,953	Schlorman	Jan. 25, 1944
2,440,172	Gibbons	Apr. 20, 1948
2,478,112	Larsen	Aug. 2, 1949