July 9, 1963 M. FOX 3,096,964

SELF-ORIENTING REVOLVING FIXTURE

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FIG. 1

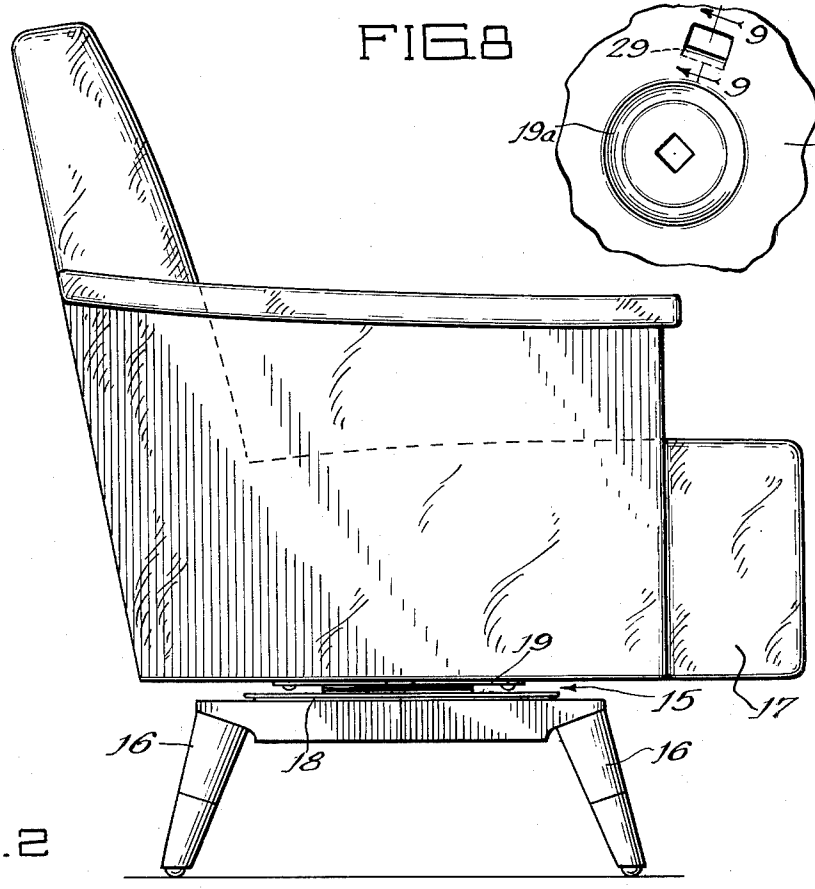



FIG. 8




FIG. 2

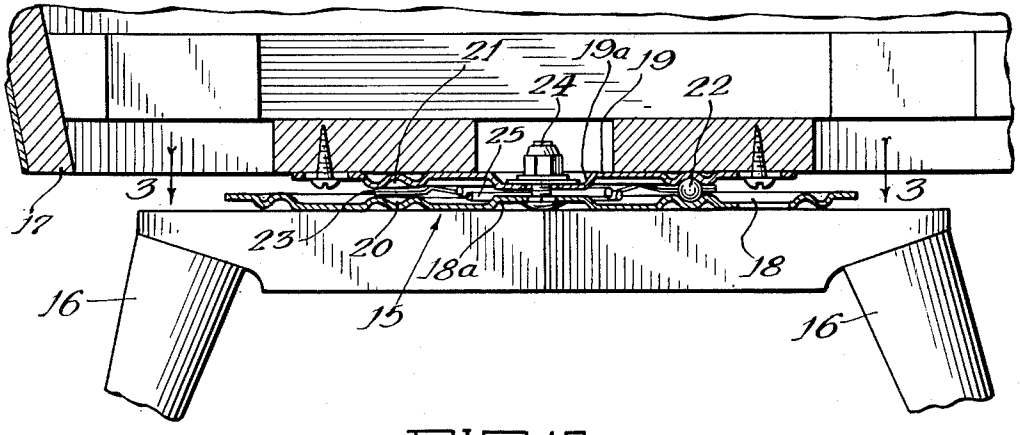



FIG. 9

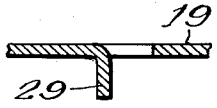
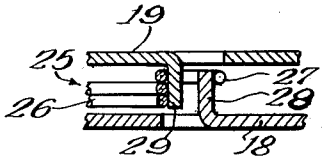



FIG. 10




Inventor:
Martin Fox
By: Hofgren, Brady, Wegner, Allen & Stellman
Attorneys

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SELF-ORIENTING REVOLVING FIXTURE

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FIG. 3

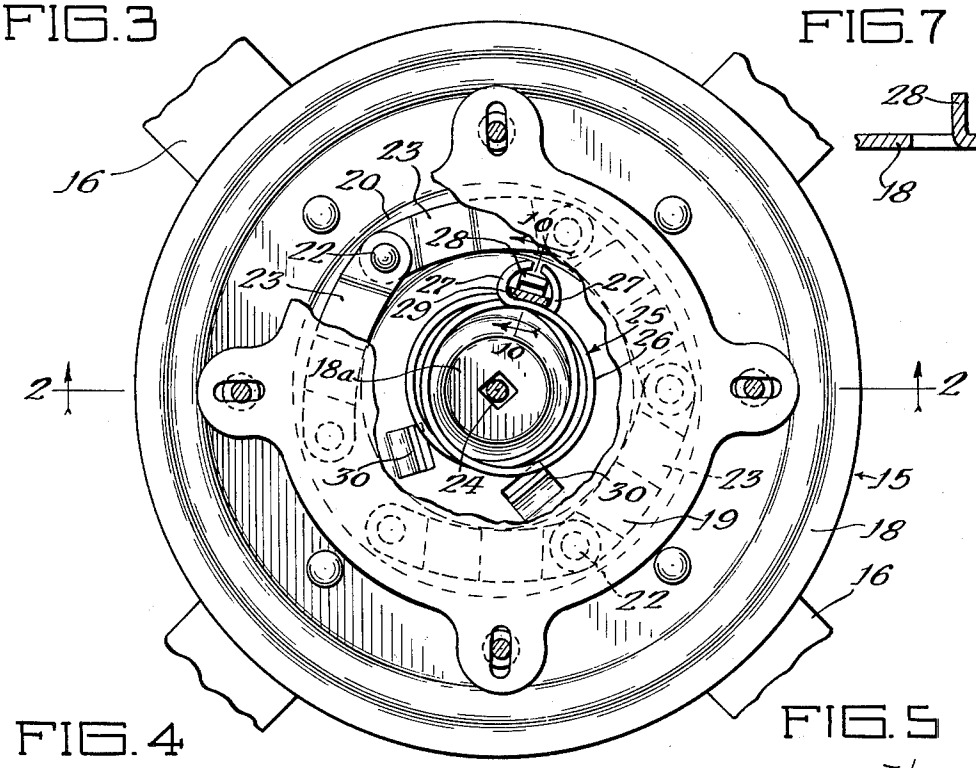



FIG. 7




FIG. 4

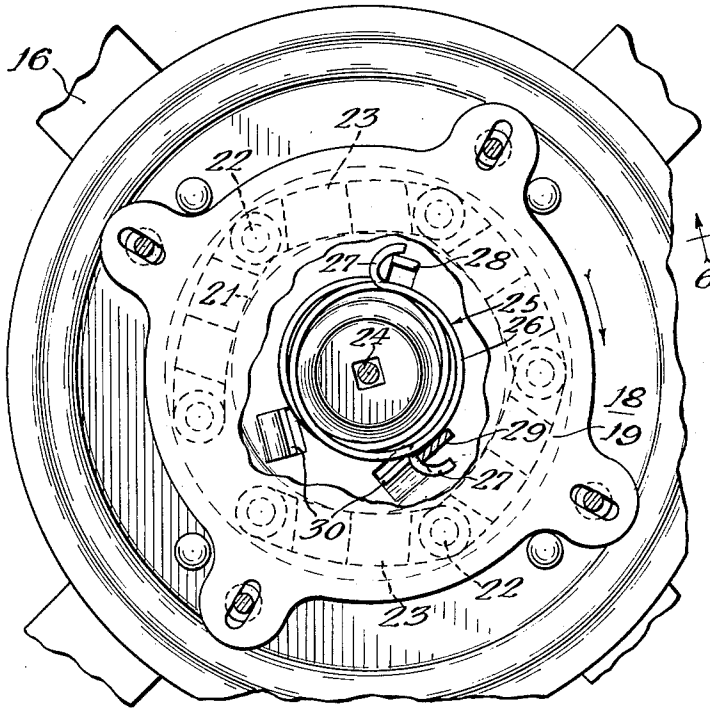



FIG. 5

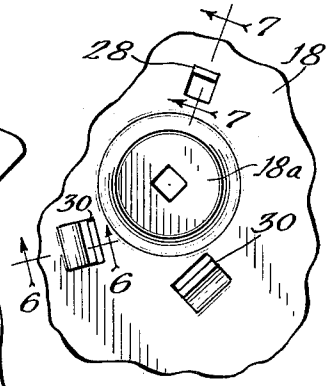
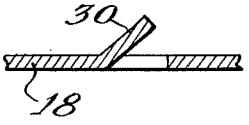



FIG. 6



United States Patent Office 3,096,964 Patented July 9, 1963



3,096,964

# SELF-ORIENTING REVOLVING FIXTURE

Martin Fox, Chicago, Ill., assignor to The Seng Company, a corporation of Illinois

Filed Oct. 19, 1960, Ser. No. 63,530
4 Claims. (Cl. 248—425)

This invention relates to a self-orienting revolving fixture, and more particularly to a flat and self-orienting swivel chair iron for swivelly supporting a chair on a base.

A primary object of this invention is to provide a swivel chair iron having upper and lower plates movably mounted with respect to each other by bearings between the plates, with the plates constantly urged toward a predetermined oriented position, and arranged to provide a thin flat support.

Another object of this invention is to provide a thin, flat, self-orienting swivel chair iron in which substantially flat and parallel upper and lower opposed plates are normally maintained in a predetermined oriented position and are spaced apart just sufficiently to receive bearings between the plates for relative rotary movement of the plates about a vertical axis, and with the plates constantly urged toward the oriented position by a spring received between the plates inwardly of the bearings and having ends engaged by lugs on the plates upon movement of the plates from the oriented position, to stress the spring for returning the plates to the oriented position.

A preferred embodiment of the invention is illustrated in the accompanying drawings in which:

FIGURE 1 is a side elevational view of an upholstered swivel chair of a type to which the invention may be applied;

FIGURE 2 is an enlarged, sectional, fragmentary, side elevational view, taken on the line 2—2 in FIGURE 3, of a chair base and chair body connected by the swivel chair iron;

FIGURE 3 is a sectional plan view of the swivel chair iron, in a predetermined oriented position, and taken on the line 3—3 in FIGURE 2, with parts broken away to more clearly illustrate the construction;

FIGURE 4 is a sectional plan view of the swivel chair iron, with parts broken away to more clearly illustrate the construction, and similar to FIGURE 3, but with the chair rotated from the oriented position;

FIGURE 5 is a fragmentary plan view of the lower plate of the swivel chair iron;

FIGURE 6 is a sectional view taken on the line 6—6 of FIGURE 5;

FIGURE 7 is a sectional view taken on the line 7—7 in FIGURE 5;

FIGURE 8 is a fragmentary plan view of the top plate of the swivel chair iron;

FIGURE 9 is a sectional view taken on the line 9—9 in FIGURE 8; and

FIGURE 10 is a sectional view taken on the line 10—10 in FIGURE 3.

Referring to FIGURE 1, in the embodiment illustrated a swivel chair iron 15 is positioned between a suitable chair base 16 and chair 17.

As may best be seen in FIGURE 2, the chair iron 15 comprises a substantially flat lower plate 18 screwed to the chair base 16, and a similar substantially flat upper plate 19 generally parallel to the lower plate 18 and screwed to the bottom of the chair 17. The upper and lower plates 18 and 19 are preferably stamped out of sheet metal and each is formed with a shallow circular groove 20 and 21, respectively, which cooperate to form a ball race receiving small ball bearings 22. With reference to FIGURE 3, the ball bearings 22 are spaced apart



in the ball race by overlapping link bars 23 which have mating apertures in overlapping end portions so that a pair of adjacent link bars are held in assembled relationship by the ball bearings 22 which are positioned in the apertures, providing bearing means mounting the plates for relative, rotary, horizontal movement. The plates are prevented from separating and rotate about a vertical axis defined by impaling means comprising a pin in the form of nut and bolt 24 passing through aligned central apertures in the upper and lower plates.

The chair 17, which is secured to the upper plate 19, and the base 16, which is secured to the lower plate 18, are normally maintained in a predetermined oriented position by resilient means in the form of a spring 25 having a convoluted portion 26 terminating in free ends having hooks 27 which are engaged by an upwardly extending lug 28 on lower plate 18 and a downwardly extending lug 29 on upper plate 19, to position the spring 25 between the plates and to stress it upon rotation of the chair in either direction from the oriented position. When stressed, the spring urges the chair toward the oriented position. Both lugs 28 and 29 are stamped from the metal of the plates. The chair 17 may be rotated in either direction until the lug 29 on the upper plate 19 engages stop means in the form of circumferentially spaced stop fingers 30, stamped upwardly from the metal of the lower plate 18 into the path of rotation of lug 29. The lower plate 18 and upper plate 19 are provided, respectively, with centrally disposed inwardly projecting bosses 18*a* and 19*a* having the central apertures which receive the bolt 24, and providing a retaining means, along with the bolt 24, for maintaining the spring 25 properly centered.

In FIGURE 4, the chair 17 has been rotated in a clockwise direction until the lug 29 engages a stop finger 30. The lug 29 is engaged in the right-hand hook 27 of the spring 25, moving the hook in a clockwise direction from the oriented position illustrated in FIGURE 3, and stressing the spring 25. The left-hand spring hook is in contact with the lug 28 on the lower plate 18. Similarly, the chair may be moved counterclockwise from the oriented position, whereupon the lug 29 of the upper plate 19 engages the left-hand spring hook 27, rotating the hook counterclockwise until the lug 29 engages the left-hand stop finger 30, with the right-hand spring hook 27 in engagement with the lower plate lug 28.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations are to be understood therefrom, as some modifications will be obvious to those skilled in the art.

I claim:

1. A chair iron, comprising: upper and lower opposed, substantially flat, parallel plates; means between said plates, spacing said plates apart, and mounting said plates for rotation with respect to each other in either direction from a predetermined oriented position; resilient means between said plates normally retaining said plates in said oriented position and urging said plates toward said oriented position upon relative rotation of said plates in either direction from said oriented position, said resilient means comprising a spring having opposite ends, and a lug on each of said plates, each lug engaging an opposite one of the opposite spring ends upon relative rotation of said plates from said oriented position to stress said spring; and circumferentially spaced stop means on said plates for limiting relative rotation of said plates from said oriented position.

2. A chair iron, comprising: upper and lower opposed, substantially flat, parallel plates having shallow, opposed grooves forming a ball race; small ball bearings in said ball race slightly spacing said plates and mounting said plates for rotation with respect to each other in either direction

from a predetermined oriented position; resilient means between said plates normally retaining said plates in said oriented position and urging said plates toward said oriented position upon relative rotation of said plates in either direction from said oriented position, said resilient means comprising a spring having opposite ends, and a lug on each of said plates, each lug being received between the spring ends, and each lug engaging an opposite one of the opposite spring ends upon relative rotation of said plates from said oriented position to stress said spring.

3. A chair iron, comprising: upper and lower opposed, substantially flat, parallel plates having shallow, opposed, circular grooves forming a ball race; small ball bearings in said ball race slightly spacing said plates and mounting said plates for rotation with respect to each other in either direction from a predetermined oriented position; an axial pin impaling the plates to prevent separation of said plates; resilient means between said plates urging said plates toward said oriented position upon relative rotation of said plates from said oriented position, said resilient means comprising a spring having opposite ends and a convolution connecting said opposite ends, said convolution encircling said pin inwardly from said ball race, and a lug on each of said plates, each lug being received between the spring ends, and each lug engaging an opposite end of said spring upon relative rotation of said plates from said oriented position; and a pair of circumferentially spaced stop fingers on one of said plates for engaging the lug on the other plate upon relative rotation of said plates in either direction from said oriented position, to limit said rotation.

4. A chair iron, comprising: upper and lower opposed, substantially flat, parallel plates having shallow, opposed, circular grooves forming a ball race; small ball bearings in said ball race slightly spacing said plates and mounting said plates for rotation with respect to each other in either direction from a predetermined oriented position; an axial pin impaling the plates to prevent separation of said plates; an inwardly extending boss concentric with said pin on each of said plates; resilient means between said plates normally retaining said plates in said oriented position and urging said plates toward said oriented position upon relative rotation of said plates from said oriented position, said resilient means comprising a spring having opposite ends and a convolution connecting said opposite ends, said convolution encircling said bosses inwardly from said ball race, and a lug on each of said plates, each lug being received between the spring ends, and each lug engaging an opposite one of the opposite spring ends upon relative rotation of said plates from said oriented position; and a pair of circumferentially spaced stop fingers on one of said plates for engaging the lug on the other plate upon relative rotation of said plates in either direction from said oriented position, to limit said rotation.



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