March 3, 1959 M. FOX 2,876,051

SWIVEL CHAIR IRON

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FIG. 1

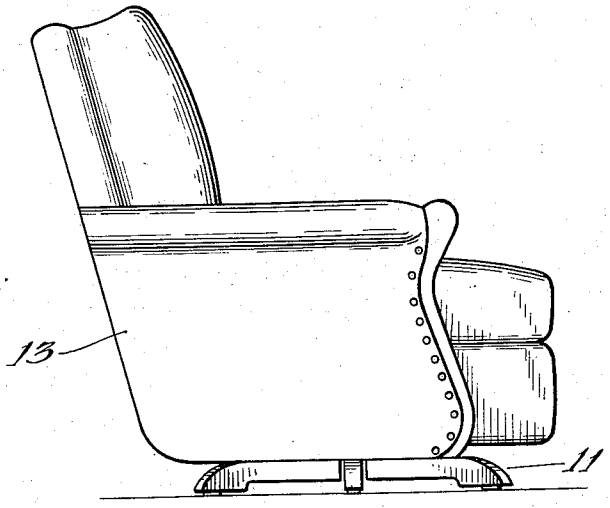
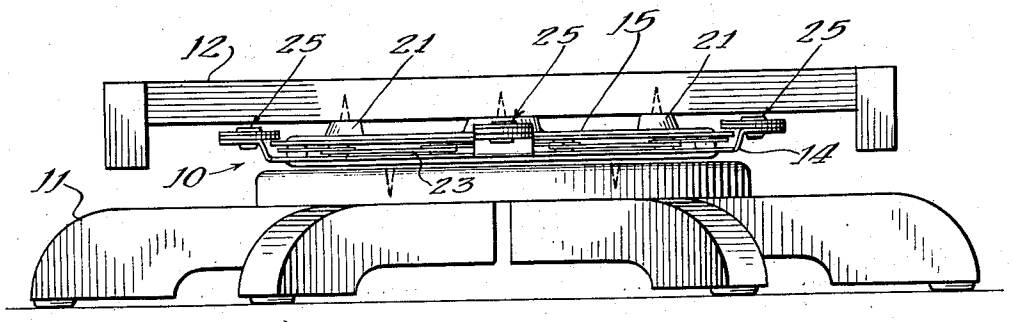


FIG. 2



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FIG. 3

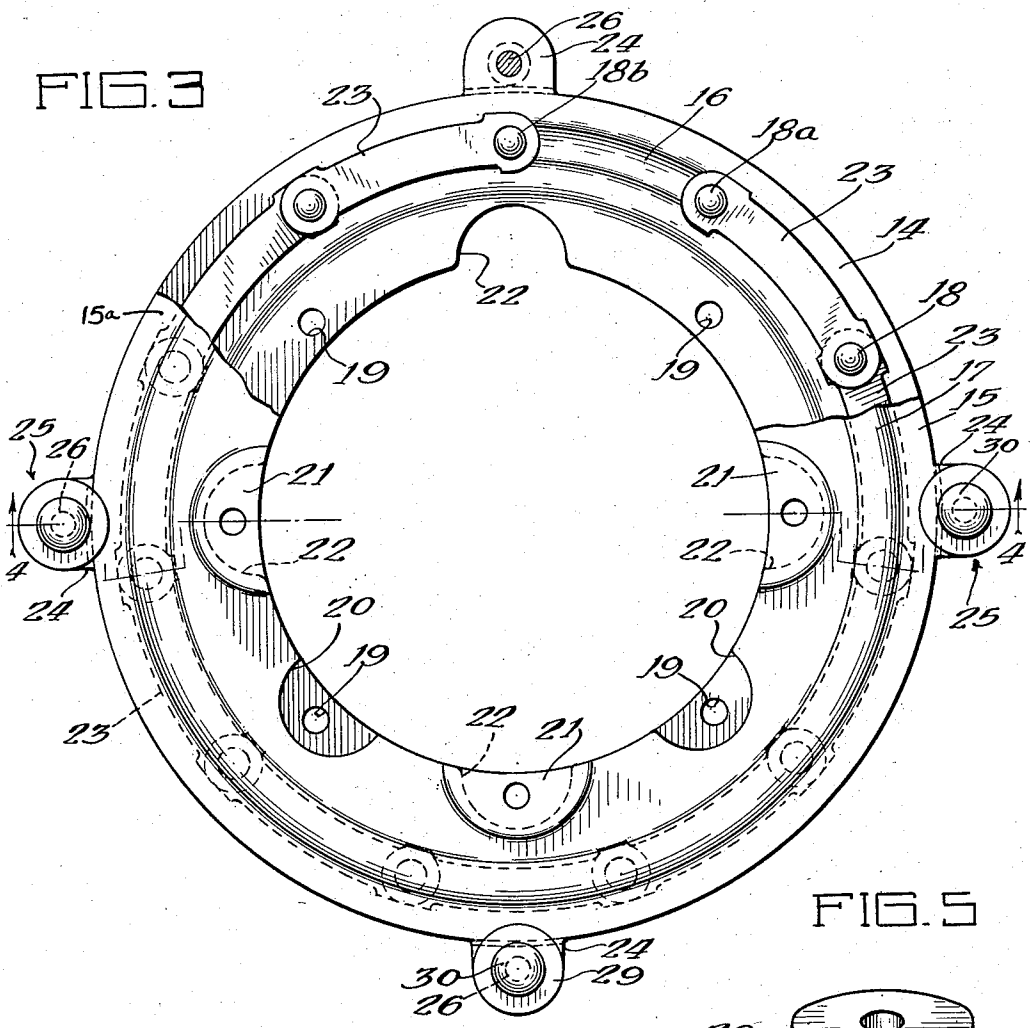


FIG. 5

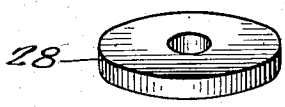
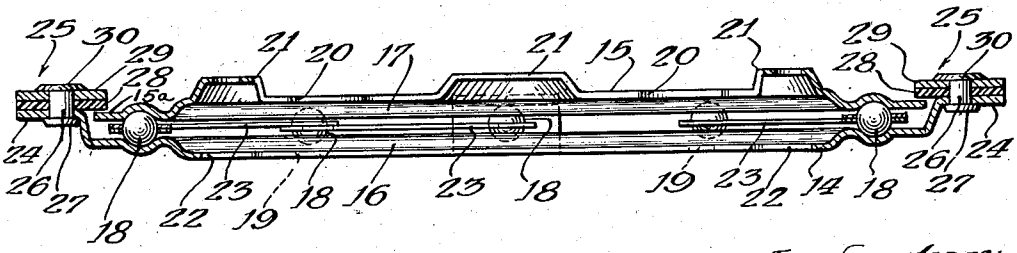


FIG. 4



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SWIVEL CHAIR IRON

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

Application June 1, 1954, Serial No. 433,366

4 Claims. (Cl. 308—227)

This invention relates to a swivel chair iron for swivelly supporting a chair on a base.

The primary object of the present invention is to provide a chair iron which may be economically fabricated from sheet metal to provide a pair of opposed plates which form an annular ball bearing race, and which are held together by simple keepers to prevent separation of the plates, the keepers having non-metallic bearing surfaces.

A further object of the invention is to provide a keeper construction which includes a nylon bearing supported by a rigid metal backing piece.

The invention is illustrated in a preferred and an alternative embodiment in the accompanying drawings in which:

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

Fig. 2 is a side elevational view of the chair base and chair bottom connected by the preferred form of swivel chair iron;

Fig. 3 is a plan view of the preferred form of chair iron with parts broken away to more clearly show the construction;

Fig. 4 is a section taken as indicated along the line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of an antifriction bearing.

In the embodiment illustrated, the preferred form of swivel chair iron, indicated generally at **10** in Fig. 2, is interposed between a conventional chair base **11** and a chair bottom **12** which is surmounted by an upholstered chair **13**.

The chair iron comprises a lower plate **14** which is screwed to the chair base **11** and a coacting generally similar upper plate **15** which is screwed to the chair bottom **12**. As best seen in Fig. 3, the plates **14** and **15** are stamped out of sheet metal in the form of annuli, and have complementary annular grooves **16** and **17**, respectively, which cooperate to form a ball race for a plurality of ball bearings **18**. The lower plate **14** has screw holes **19** which are positioned beneath recesses **20** in the upper plate **15**, while the upper plate **15** has bosses **21** to receive attaching screws which are opposite recesses **22** in the lower plate so that the screws for attaching the respective plates to the chair elements may be readily installed. The ball bearings **18** are held in spaced relationship in the ball race by means of overlapping perforated link bars **23** which have mating apertures in their end portions so that a pair of adjacent link bars may be held in assembled relationship by the ball bearings **18** which are positioned in the apertures.

The keeper means of the preferred form of the invention consists of a plurality of spaced upwardly and outwardly extending ears **24** which are formed integrally with the lower plate **14** and extend peripherally beyond the matching margins of both plates to receive bearing means, indicated generally at **25**. As best seen in Fig. 4, the bearing means includes a pin or stud **26** which extends through an aperture in the ear **24** and has a head **27** abutting the bottom of the ear, an annular or disc-like nylon bearing **28** impaled by the pin **26**, and a rigid metal backing piece or washer **29** overlying the nylon bearing **28**, the bearing **28** and backing piece **29** being firmly secured with a marginal bearing portion overlapping a flat marginal portion **15***a* of the plate **15** by means of an enlarged top head **30** on the pin **26**.

As seen in Fig. 5, the nylon bearing **28** takes the form of a large, flat washer, and the backing piece **29** is also a washer. As seen in Fig. 4, there is only a small clearance between the top face of the upper plate **15** and the overlapping bearing surfaces of the nylon bearings **28**. The use of a nylon bearing in the keeper permits a very close fit between the keeper and the top plate **15** without any undesirable noise such as would be caused by the use of a simple metal flange overlying the top plate. Likewise no lubrication is necessary at the margin of the top plate **15** because of the use of a nylon bearing.

The spacers **23** do not extend entirely around the ball race formed by the grooves **16** and **17**, there being no spacer between the ball bearings identified as **18***a* and **18***b* in Fig. 3. This is possible because the positions of the bearings **18***a* and **18***b* are fixed by the spacers which extend around the balance of the ball race.

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. In a swivel chair iron: upper and lower opposed plates provided with complementary grooves forming a ball race; a plurality of spaced balls in said race; a plurality of integral circumferentially spaced, radially extending mounting ears on the outer margin of one of said plates and extending peripherally beyond the opposed portions of said plates; a plurality of flat, disc-like bearing members, there being a bearing member abutting each of said ears with a planar bearing surface portion loosely overlapping the outer margin of the other of said plates, said bearing members being of non-metallic material which is strong in compression but relatively weak to torsional strains; a separate rigid metal backing piece abutting each of said bearing members and backing up said bearing surface portions; and means firmly securing each bearing member and associated backing piece to a mounting ear.

2. In a swival chair iron: upper and lower opposed plates provided with complementary grooves forming a ball race, one of said plates having an uninterrupted flat, circular marginal portion and the other plate having a plurality of integral, circumferentially spaced, radially extending mounting ears with plane surfaces in a plane parallel to and immediately adjacent said marginal portion; a plurality of spaced balls in said race; a plurality of flat, disc-like bearing members, there being a bearing member abutting the plane surface of each of said mounting ears, each of said members having a planar bearing surface portion extending radially from the ear and loosely overlapping said marginal portion, said bearing members being of a non-metallic material which is strong in compression but weak to torsional strains; a separate rigid metal backing piece abutting each of said bearing members and backing up said bearing surface portions; and means firmly securing each bearing member and associated backing piece to a mounting ear.

3. In a swivel chair iron: upper and lower opposed annular plates provided with complementary grooves forming a ball race; a plurality of spaced balls in said race; a plurality of circumferentially spaced mounting ears integral with a margin of one of said plates and extending radially with respect to said margin and the

corresponding margin of the other of said plates; a plurality of flat, disc-like bearing members, there being a bearing member abutting each of said ears with a planar bearing surface portion loosely overlapping said corresponding margin of said other of said plates, said bearing members being of non-metallic material which is strong in compression but relatively weak to torsional strains; a separate rigid metal backing piece abutting each of said bearing members and backing up said bearing surface portions; and means firmly securing each bearing member and associated backing piece to a mounting ear.

4. In a swivel chair iron: upper and lower opposed annular plates provided with complementary grooves forming a ball race; a plurality of spaced balls in said race; a plurality of circumferentially spaced integral mounting ears on a margin of one of said plates and extending radially with respect to said margin and the corresponding margin of the other of said plates; a plurality of flat bearing washer members, there being a bearing washer member abutting each of said ears with a

planar bearing surface portion loosely overlapping said corresponding margin of said other of said plates, said bearing washer members being of non-metallic material which is strong in compression but relatively weak to torsional strains; a separate rigid metal washer member abutting each of said bearing washer members and backing up said bearing surface portions; and a separate two flanged stud impaling each of said ears and the associated washer members to secure both said members to the ear.

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