

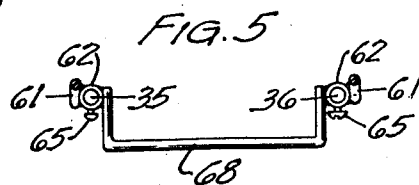
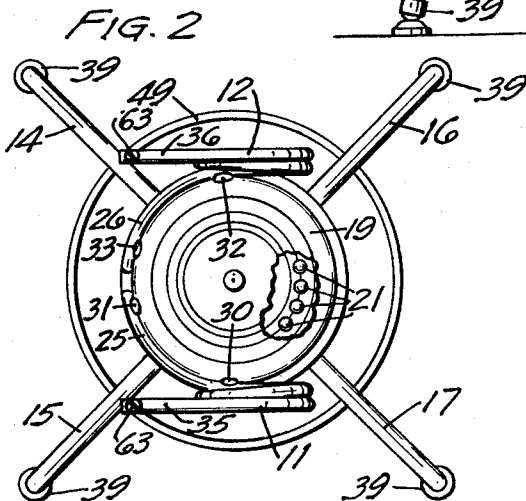
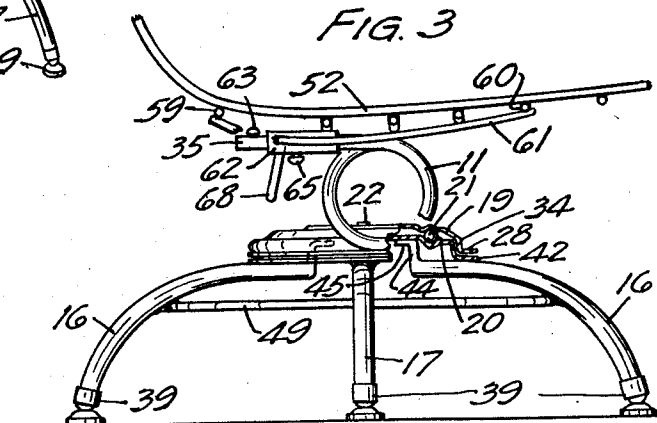
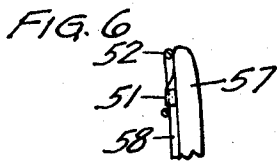
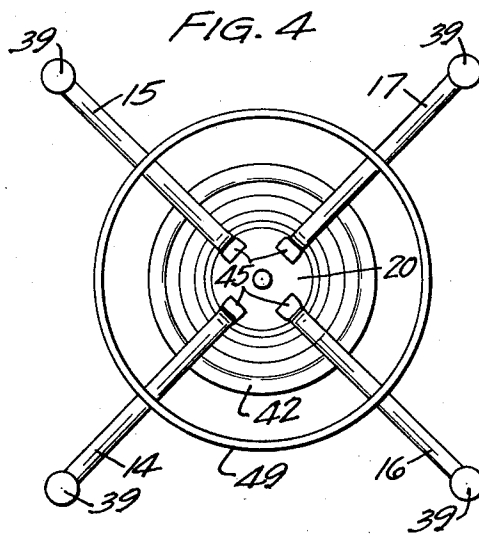
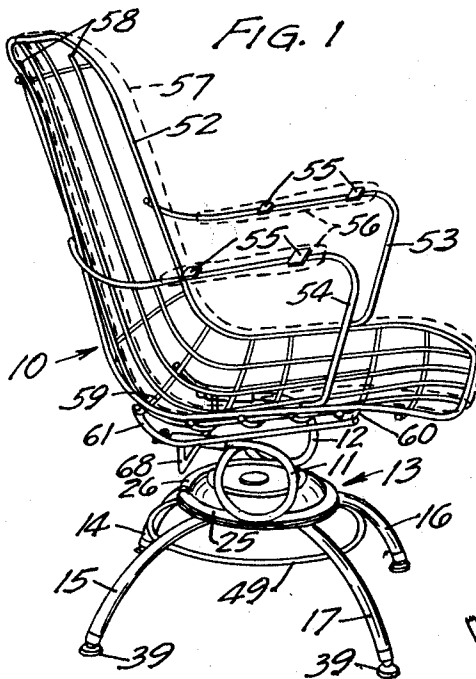
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2,916,084

SWIVEL CHAIR

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2,916,084

SWIVEL CHAIR

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7 Claims. (Cl. 155—95)

The present invention is concerned with a swivel chair, and more particularly with one which provides for a rocking action.

The present invention is particularly concerned with a swivel chair which also rocks, and which is of an extremely simple construction.

An object of the present invention is to provide a chair of the swivelling and rocking type which, except for the upholstery, can be formed entirely of metal parts.

A further object of the present invention is to provide a chair of this type in which all of the parts, except for the upholstery, can be made by forming or stamping operations.

A still further object of the invention is to provide a chair as described above in which simple means are provided for adjusting the force required to rock the chair.

A further object of the invention is to provide such an arrangement in which the chair seat can be readily assembled and disassembled from the base structure so as to facilitate shipping.

A further object of the present invention is to provide in such a chair, an extremely simple stop construction to limit the rearward tilting of the chair.

A still further object of the invention is to provide an extremely simple base construction for such a chair.

Broadly, we accomplish the above objects by securing coil springs directly to the upper swivel plate of a swivel unit, the chair seat being adjustably and removably secured to the upper ends of these coil springs.

Further objects of the invention and the manner in which the recited objects are accomplished will be apparent from the accompanying specification, claims, and drawing, in the latter of which:

Figure 1 is a perspective view of our improved chair with the upholstery shown in dotted lines;

Figure 2 is a top plan view of the base construction of our chair;

Figure 3 is a side elevational view of our chair with the base rotated 45° from the position of Figures 1 and 2 and with portions broken away or shown in section;

Figure 4 is a bottom plan view of the base construction of our chair;

Figure 5 is an elevational view of the stop means in our chair to limit the rocking movement.

Figure 6 is a detail view showing how the upholstery pad is retained in position on the frame of the chair seat.

Referring now to the drawing, it will be noted that the chair consists of a main chair seat 10 secured to coil springs 11 and 12, which are rigidly secured to a swivel unit 13 supported by a plurality of legs 14, 15, 16, and 17. The swivel unit 13 comprises a pair of stamped sheet metal plates 19 and 20, which are formed to provide a bearing race therebetween containing bearings 21. The two plates 19 and 20, and the bearings 21 are held in assembled relation by a central pin 22, which is provided with a head on one side and is peened over on the other side.

A pair of one-and-a-half turn coil springs 11 and 12

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are secured to the upper plate 19, as best shown in Figures 2 and 3. Coil spring 11 is provided with an elongated lower end 25 corresponding in curvature to the periphery of the upper swivel plate 19. Coil spring 12 has a similar curved lower end 26, curved in the reverse manner. The lower ends 25 and 26 snugly engage a flange portion 28 of the upper swivel plate 19 and are welded thereto at a plurality of points, as indicated by welds 30, 31, 32, and 33. As best indicated in Figure 3, the upper plate 19 extends upwardly from the flange portion 28 to provide a vertical wall 34 against which the coil spring engages and to which it may be welded. The fact that the flange portion 28 is depressed below the rest of the plate 19 not only strengthens the swivel unit but aids in carrying away the heat of the welding operation from the springs.

The upper ends 35 and 36 of the coil springs 11 and 12, respectively, likewise are elongated and extend horizontally. These elongated and horizontal ends 35 and 36 are provided for supporting the chair seat portion of the chair as will be described shortly.

The four legs 14, 15, 16, and 17 are of hollow metal tubing and are secured to the lower swivel plate 20, as best shown in Figures 3 and 4. Each of these legs is curved and has secured to its lower end a conventional glide 39, or some other suitable device for minimizing the tendency of the legs to press into the floor surface. The upper end of each leg is bent at right angles and then flattened. Referring to leg 16, for example, the leg is curved until it extends horizontally. This horizontal portion is welded to a flange 42 of the lower plate 20, which flange corresponds to and mates with the flange 28 of the upper plate 19. The innermost portion of leg 16 is then bent vertically at 44 and horizontally at 45, the horizontal portion 45 being flattened and welded to the underside of the lower swivel plate 20. Each of the legs 14, 15, 16, and 17 is similarly fastened at two points to the lower swivel plate. It will be noted that as downward pressure is applied to the swivel unit, pressure is applied through flange 42 to the horizontal portion of the leg. The leg is prevented, however, from rocking about flange 42 because of the end 45 thereof being welded to the lower plate 20. The construction provided is a very rigid one. To further increase the rigidity of this base portion, there is a circular ring 49 which extends within the legs 14, 15, 16, and 17, and is welded to each of these legs. This ring serves to further prevent spreading apart of the legs.

Referring now to the chair seat portion 10 of our improved chair, it will be noted that this portion is formed of a plurality of rods which extend at right angles to each other and are welded together and to an outer rod 52, which forms an outer rim for the chair seat. Secured to, and forming part of the chair seat construction, are a pair of rods 53 and 54 which extend horizontally and then nearly vertically to form arms of the chair. Brackets 55 are provided on these arms for securing pads 56 shown in dotted lines. Also shown in dotted lines, in Figure 1, is a pad 57, designed to cover the frame of the chair seat and to cushion the same.

The pad 57, as partially shown in Figure 6, is retained in place by having a plurality of button holes 51 in the back thereof (only one of which is shown), which engage over the ends of rods 58 of the chair seat construction. In this manner, the pad 57 can be quickly removed by merely slipping the button holes 51 in the back thereof off the ends of rods 58.

Secured to opposite ends of cross rods 59 and 60 of the chair seat are a pair of main supporting bars 61, only one of which is visible in its entirety in the drawing and more particularly in Figures 1 and 3. Secured to each of these bars 61 is a sleeve 62, as by welding. The

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sleeve 62 has an internal diameter substantially the same as the external diameter of the upper horizontal ends 35 and 36 of the coil springs 11 and 12, and is designed to slide over these ends. The sleeves 62 are spaced apart a distance similar to the spacing between rods 35 and 36 so that the chair seat construction can be secured to the ends 35 and 36 by sliding the sleeves 62 over these ends. The ends 35 and 36 are provided with set screws 63 which are inserted after the sleeves 62 have been slid on to the ends 35 and 36, and these set screws 63 prevent accidental removal of the chair seat from the base. The sleeves 62 are provided with further set screws 65 which extend through the sleeve and engage the springs upon being tightened. As evident from Figure 3, the sleeves 62 can be adjusted longitudinally to shift the position of the chair seat with respect to the center of springs 11 and 12. This provides an adjustment of the rocking action. The farther out the sleeves 62 are, the greater is the leverage exerted by the occupant of the chair and the easier it is for the chair to be rocked. As the sleeves 62 are adjusted inwardly towards a point directly above the center of the springs, more force is required to rock the chair and the effect is that of a stiffer spring. The set screws 65 provide for locking the sleeves 62 in the position in which the chair seat is in the best position for the comfort of the user.

It is to be noted, looking at Figure 3, that the center of springs 11 and 12 is slightly forward of the center of the base construction. This provides for the center of gravity of the body of the occupant being more nearly over the center of the swivel. This, in turn, results in smoother swivelling action.

It is to be further noted that the chair seat is supported on the base structure by two rods 61, which are fastened to the chair seat only at their outer ends. These rods, while sufficiently rigid to prevent bending thereof, during normal occupancy of the chair, can be bent for adjustment purposes at the factory to adjust the angle with respect to the horizontal at which the chair seat is normally disposed.

The rocking motion of the chair is limited by a U-shaped bar 68 (best shown in Figures 3 and 5), which has upturned ends welded to sleeves 62. As will be apparent from Figure 3, the stop bar 68 serves to limit the rocking motion of the chair because of the stop bar engaging the upper swivel plate 19. The bar 68 also helps to maintain the correct spacing between sleeves 62.

It will be readily apparent that the present chair provides both a swivelling and rocking action. The rocking action is due to the flexing of the coil springs 11 and 12, while the swivelling action is due to the action of swivel unit 13. It will be further seen that the construction of our chair is extremely simple and can be made of parts that are stamped or formed, no cast parts being required.

While we have shown a specific embodiment of our chair, it is to be understood that this is for purposes of illustration only and that the invention is to be limited solely by the scope of the following claims.

We claim as our invention:

1. In a swivel and rocking chair, a swivel unit comprising upper and lower relatively rotatable swivel members, base means secured to said lower swivel member to support the chair, a pair of parallel coil springs having upper and lower horizontally extending end portions, said lower end portions being rigidly secured to said upper swivel member, a chair seat, sleeves secured to the under portion of said chair seat, said sleeves having an internal size and shape substantially the same as the external size and shape of the upper horizontally extending end portions of said springs and spaced apart the same distance as said upper coil end portions so that said coil end portions slidably receive said sleeves, means for securing said sleeves and chair seat in a selected position

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with respect to said coil springs, and a bar whose ends are secured to said sleeves to maintain the same properly spaced and whose intermediate portion extends downwardly to engage said upper swivel member when said chair seat is rocked backwards a predetermined amount.

2. In a swivel chair; a swivel unit comprising an upper metallic swivel plate having a raised center portion, a lower metallic swivel plate having a corresponding raised center portion, bearings interposed between said swivel plates, and means for rotatably interconnecting the swivel plates; a chair seat; means securing said chair seat to and supporting it on said upper swivel plate; and base means secured to said lower swivel plate to support said chair, said base means comprising a plurality of radially extending tubular legs having their inner ends flattened and fastened to the under side of the raised center portion of said lower swivel plate and having intermediate tubular portions thereof fastened to the under side of the outer portion of said lower swivel plate.

3. In a swivel chair; a swivel unit comprising an upper metallic swivel plate having a rim and a raised center portion, a lower metallic swivel plate having a corresponding rim and raised center portion, bearings interposed between said swivel plates, and means for rotatably interconnecting the swivel plates; a chair seat; means securing said chair seat to and supporting it on said upper swivel plate; and base means secured to said lower swivel plate to support said chair, said base means comprising a plurality of radially extending legs having their inner ends fastened to the under side of the raised center portion of said lower swivel plate, and having intermediate portions thereof fastened to the under side of said rim.

4. In a swivel and rocking chair; a swivel unit comprising an upper metallic swivel plate, a lower metallic swivel plate, each of said swivel plates having an annular rim, a raised circular center portion, and a shoulder between said rim and said center portion, bearings interposed between said center portions of said plates, and means for rotatably interconnecting said swivel plates; a pair of parallel coil springs having upper and lower end portions, said lower end portions being elongated and extending horizontally around the rim of said upper swivel plate adjacent the shoulder thereof and welded to the rim, said shoulder and the heat radiating characteristics of said rim serving to retard the transmission of the heat of welding to the center portion and the bearings; a chair seat; means securing said chair seat to the upper end portions of said coil springs; and base means secured to said lower swivel plate to support said chair.

5. In a swivel and rocking chair; a swivel unit comprising an upper metallic swivel plate, a lower metallic swivel plate, bearings interposed between said swivel plates, and means for rotatably interconnecting the swivel plates; a pair of parallel vertical coil springs, each having at least one and a half turn coils and each having upper and lower end portions, said lower end portions being elongated and curved and extending horizontally along and welded to said upper swivel plate to hold said springs rigidly in vertical position, with the major extent of said lower end portions in direct engagement with said swivel plate and with the centers of said coils on a line which is not substantially displaced horizontally from the center of said swivel units; a chair seat; means securing said chair seat to the upper end portions of said coil springs; and base means secured to said lower swivel plate to support said chair.

6. In a swivel and rocking chair; a swivel unit comprising an upper metallic swivel plate, a lower metallic swivel plate, each of said swivel plates having a rim and a center portion in a plane displaced from the plane of said rim, bearings interposed between the center por-

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tions of said swivel plates, and means for rotatably interconnecting the swivel plates; a pair of parallel coil springs having upper and lower end portions, said lower end portions being elongated and extending horizontally along and welded to the rim of said upper swivel plate, the displacement of said rim from said center portion serving to retard the transmission of the heat of welding to the center portion and bearings; a chair seat; means securing said chair seat to the upper end portions of said coil springs; and base means secured to said lower swivel plate to support said chair.

7. In a swivel and rocking chair; a swivel unit comprising an upper metallic swivel plate, a lower metallic swivel plate, each of said swivel plates having a rim and a center portion in a plane displaced from the plane of said rim, bearings interposed between the center portions of said swivel plates, and means for rotatably interconnecting the swivel plates; a pair of parallel coil springs having upper and lower horizontally extending end portions, said lower end portions being elongated and extending horizontally along and welded to the rim of said upper swivel plate, the displacement of said rim from said center portion serving to retard the transmission of the heat of welding to the central portions and

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bearings; a chair seat; sleeves secured to the under portion of said chair seat, said sleeves having an internal size and shape substantially the same as the external size and shape of the upper horizontally extending end portions of said springs and spaced apart the same distance as said upper coil end portions so that said coil end portions slidably receive said sleeves; means for securing said sleeves and chair seat in a selected position with respect to said coil springs; and base means secured to said lower swivel plate to support said chair.

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