Oct. 18, 1960 G. J. SCHERER 2,956,619

TILT BACK CHAIR

Filed Oct. 3, 1958 4 Sheets-Sheet 1

Fig. 1.

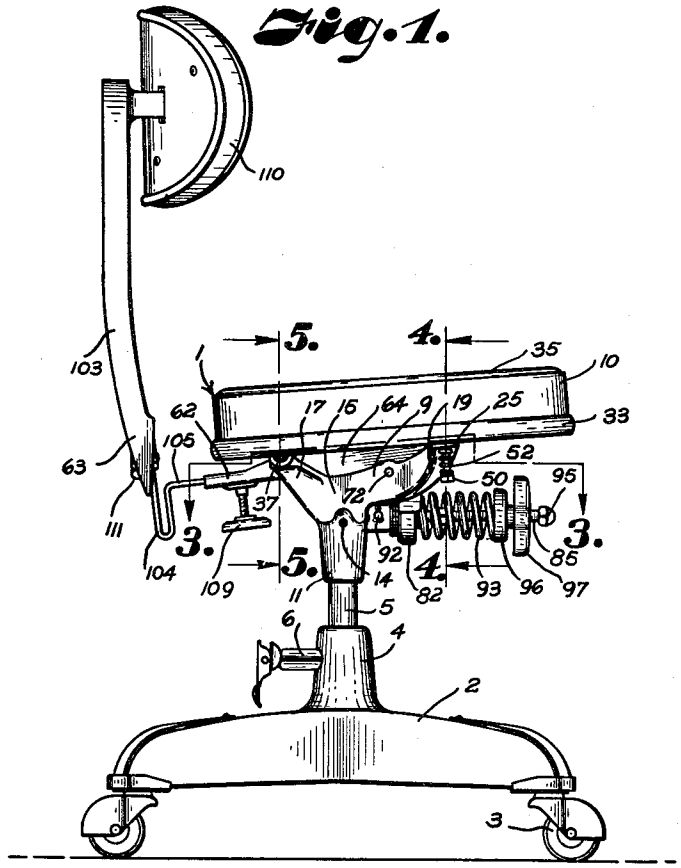
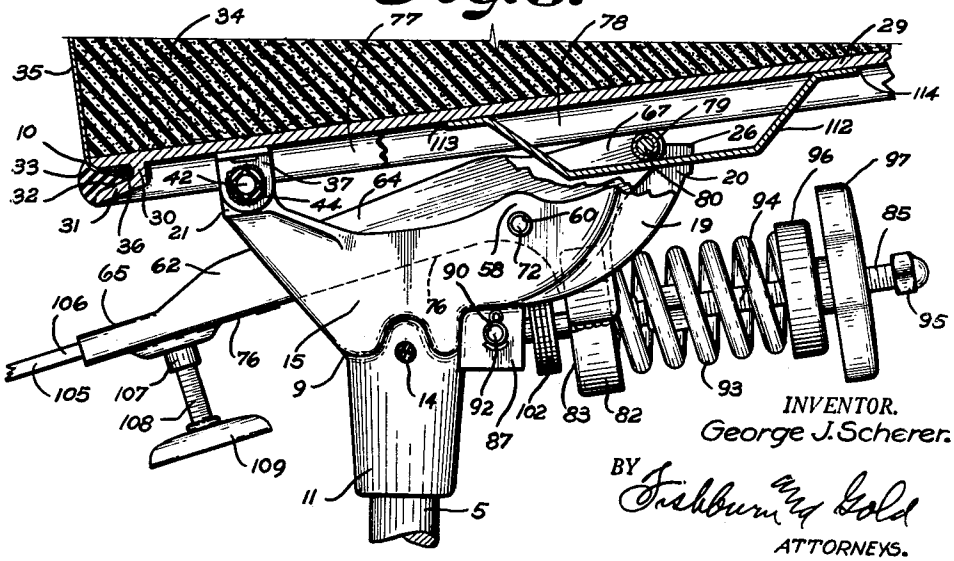


Fig. 8.



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Fig. 2.

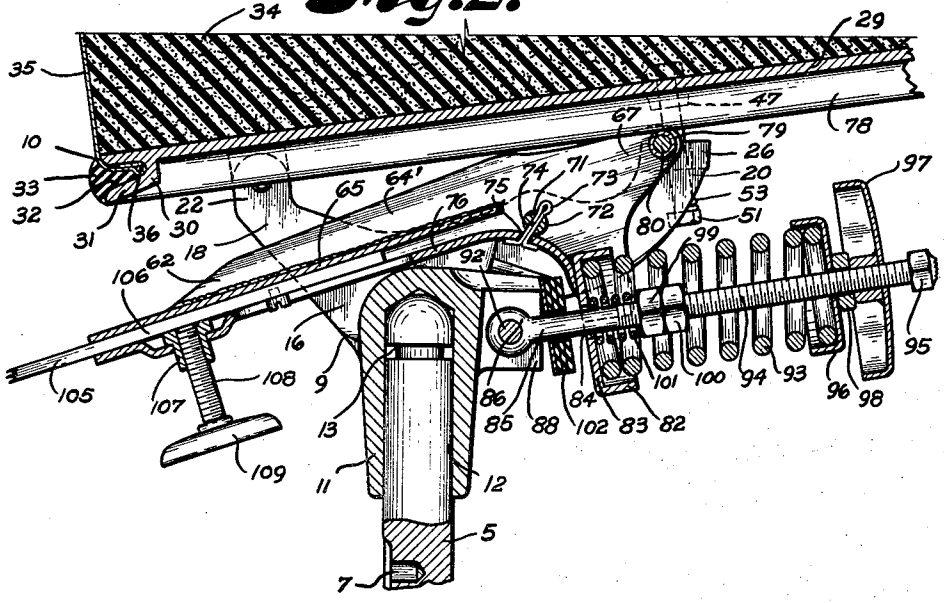
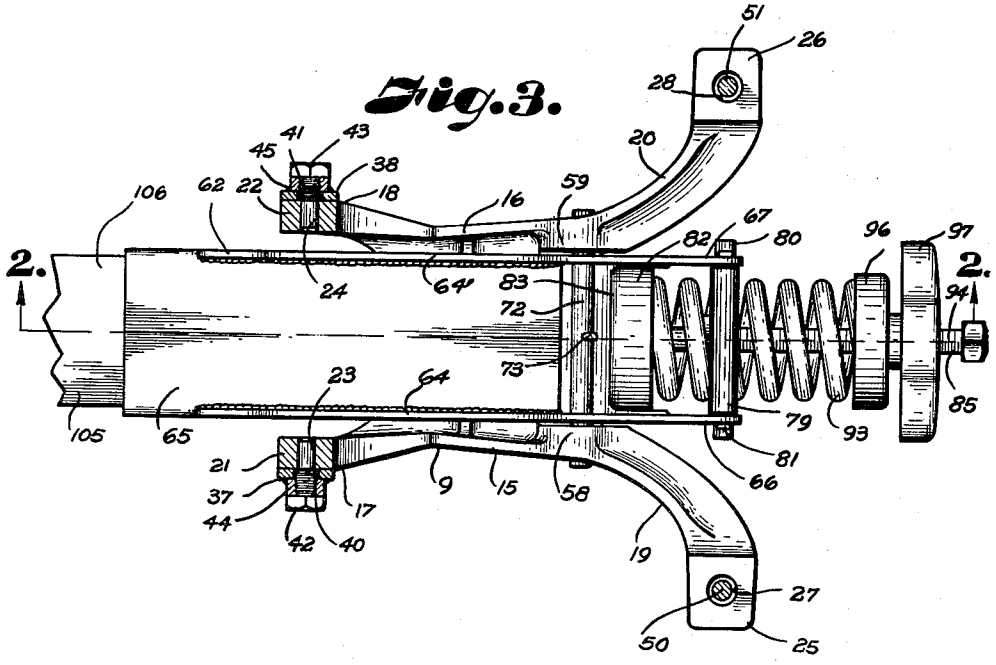


Fig. 3.



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Fig. 4.

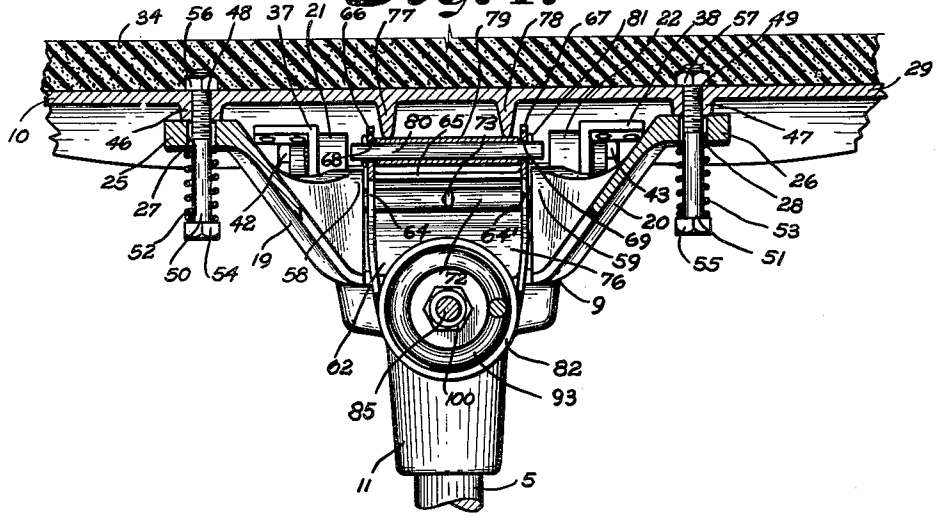
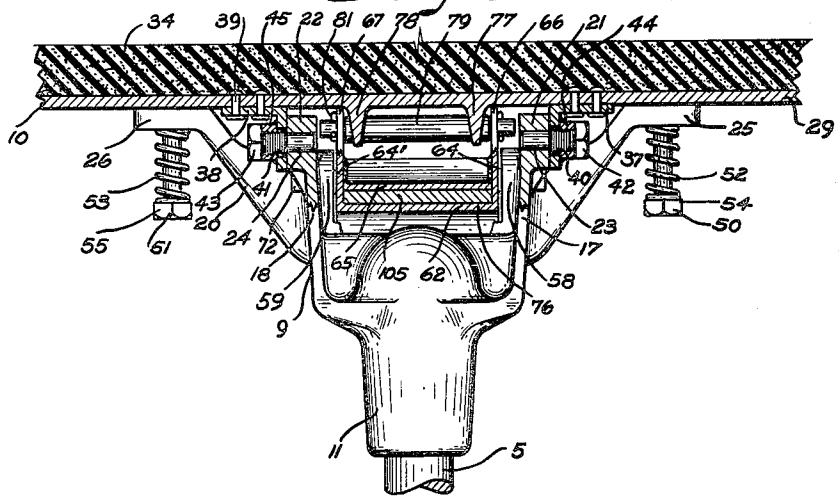


Fig. 5.



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Fig. 6.

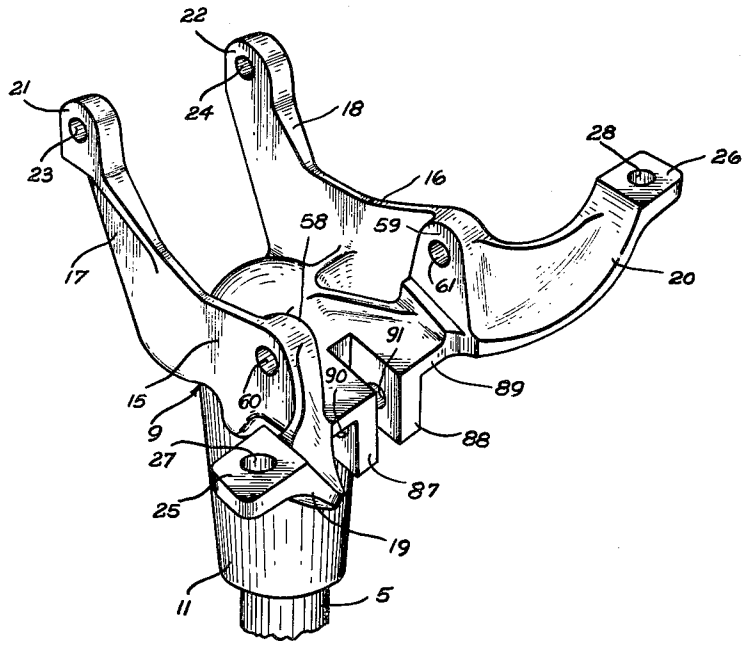
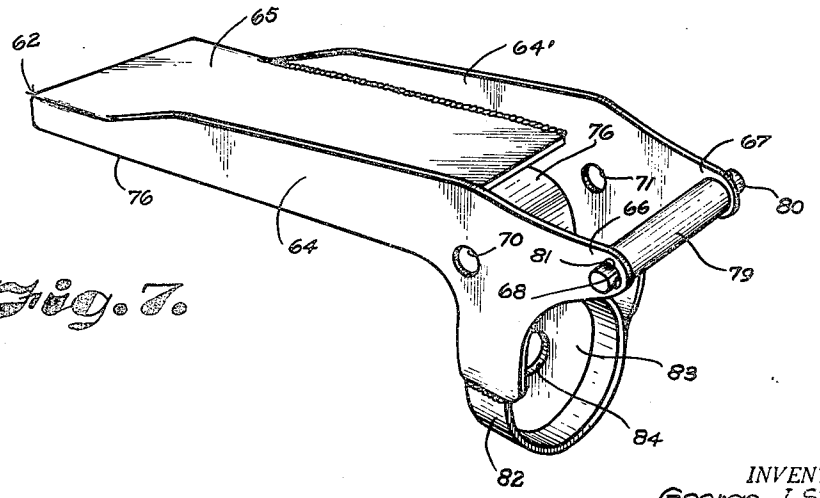


Fig. 7.



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TILT BACK CHAIR

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Filed Oct. 3, 1958, Ser. No. 765,212

9 Claims. (Cl. 155—157)

This invention relates to tilting-back chairs, and more particularly to improvements in posture chairs of the swivel type, having a tilting back and a seat which moves backwardly and tilts upwardly at the forward end during the tilting movement.

Various chairs of swivel type have adjustable features and chairs with the seat and back tilting as a unit have been devised, but applicant believes the present invention employs a mechanism whereby the forward portion of the seat will move upwardly in addition to the seat tilting backwardly along with the back of the chair, the present invention being an improvement over Patent No. 2,845,992 of August 5, 1958.

The principal object of the present invention is, therefore, to provide a chair of this character having a tilting back and seat, and the seat moving upwardly at the forward end against spring tension while the tilting movement is accomplished.

Other objects of the present invention are to provide a spider for the mounting of the seat of the chair on the pedestal supported on a base having roller casters; to provide means for pivotally mounting a seat on the spider at one end of the spider and for mounting of the seat at the forward end of the spider so that the seat will move upwardly away from said spider when pressure is applied to the back of the chair; to provide means for tiltably mounting the back of the chair to the spider separately from said seat; to provide a seat structure made from a one-piece molded material having an annular groove around the periphery thereof for securing the cushion portion of the seat thereto; to provide the seat with depending spaced ribs, for engaging the mounting means of the tilting back mechanism, and to provide a device of this character simple and economical to manufacture.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings wherein:

Fig. 1 is a side view of my chair, particularly illustrating the tension means in mounting of the seat on the spider.

Fig. 2 is a cross-sectional view through the chair taken on a line 2—2, Fig. 3, particularly illustrating the mounting of the seat, the seat being in a tilted position.

Fig. 3 is a cross-sectional plan view taken on a line 3—3, Fig. 1.

Fig. 4 is a vertical cross-sectional view taken on a line 4—4, Fig. 1.

Fig. 5 is a vertical cross-sectional view on a line 5—5, Fig. 1.

Fig. 6 is a perspective view of the spider.

Fig. 7 is a perspective view of the tilting back mounting member.

Fig. 8 is a cross-sectional view of a modified form of mounting of the seat.

Referring more in detail to the drawings:

1 designates a chair embodying the features of my

invention comprising a base 2 mounted upon casters 3. The base has an upstanding boss or sleeve 4, for mounting a post or standard 5, the standard 5 being adjustable with respect to sleeve 4 by a lever mechanism 6; said standard 5 is provided with spaced sockets 7 (Fig. 2) for receiving the end of a lever rod for adjustably locking the standard at spaced points to adjust the height of the chair as is the usual practice, and as illustrated in Patent No. 2,845,992.

9 designates a spider for mounting of a seat 10 on the post 5, and includes a depending boss or sleeve 11 forming a longitudinal socket 12 for engaging over the top of the standard 5. The standard 5 is provided near its top with an annular groove 13 and the sleeve 11 has a lateral threaded opening for receiving a set screw or the like 14 having its end engaging in the annular groove 13 for retaining the spider rotatably mounted on the standard 5.

The boss 11 of the spider 9 has upwardly extending spaced walls 15 and 16 having rearwardly and upwardly extending arms 17 and 18 and forwardly and upwardly extending arms 19 and 20. The arms 17 and 18 have upwardly extending ears 21 and 22 provided with transverse openings 23 and 24. The forwardly extending arms 19 and 20 have outwardly extending heads 25 and 26 provided with vertically extending openings 27 and 28.

The seat 10 consists of a substantially flat base member 29 having a depending portion 30 and a parallel extending flange 31 forming a groove 32 around the periphery of the seat for receiving a resilient bumper member 33. A cushion 34 is provided for the seat and has a covering 35 which extends over the seat and is held in the annular groove 32 by a wire 36 and springs (not shown) secured to the bottom of the seat as is the usual practice.

The seat 10 is provided on the underneath side near the rear thereof with L-shaped brackets 37 and 38, secured to the seat by rivets or the like 39, the depending portions of the brackets being provided with openings 40 and 41 for alignment with the openings 23 and 24 in the ears 21 and 22 of the arms 17 and 18 of the spider. The seat is pivotally mounted on the spider by bolts or the like 42 and 43 and held thereon by nuts 44 and 45. The underside of the forward portion of the seat is provided with depending bosses 46 and 47 having vertical openings 48 and 49 for receiving the threaded ends of bolts 50 and 51 extending through the openings 27 and 28 in the arms 19 and 20 of the spider 9. Coil springs 52 and 53 are provided on the bolts 50 and 51 between the heads 54 and 55 of the bolts and the heads 25 and 26 of the arms 19 and 20. The bolts are secured to the seat by nuts 56 and 57.

The longitudinally extending walls 15 and 16 at substantially their centers and slightly forwardly of the post 5 are provided with enlarged portions or bosses 58 and 59 having transverse openings 60 and 61. Adapted to engage between the walls 15 and 16 and underneath the seat 10 is a channel member 62 for securing the back 63 to the spider of the framework of the chair. The channel member 62 has sides 64 and 64' and elongated plane surface 65. The sides 64 and 64' of the channel member have forwardly extending brackets 66 and 67 provided with transverse openings 68 and 69. The side members 64 and 64' also have transverse openings 70 and 71 slightly at a lower elevation than the openings 68 and 69 for securing the channel member to the spider 9. A pin 72 is provided for engaging through the openings 60 and 61 in the bosses 58 and 59 of the spider arms and through the openings 70 and 71 of the channel member to pivotally mount the channel member on the spider. A cotter key 73 extends

through an opening 74 in the pin 72 and an opening 75 in the bottom 76 of the channel member 62 to force the pin 72 to rotate in the openings 60 and 61 of the bosses 58 and 59 as the channel member swings up and down. The underneath side of the seat 10 is provided with longitudinally spaced ribs 77 and 78 for engaging on a sleeve roller 79 and a pin 80 engaging in the openings 68 and 69 of the forwardly extending brackets 66 and 67 on the channel member 62. The pin 80 is held in place by cotter keys as indicated at 81. It will be obvious the ribs 77 and 78 will contact the roller sleeve 79 on the pin at all times to stabilize the spider structure and allow the forward portion of the seat to exert tension on the springs 52 and 53 on the bolts 50 and 51 previously referred to.

The channel member 62 at the forward end thereof has a depending housing or spring seat 82 and has a back wall 83 provided with an opening 84. In order to apply a spring tension upon the back 63 a rod 85 extends through the opening 84 in the housing 82 and has an eye 86 on the end thereof which engages between depending flanges 87 and 88 on the forward body portion 89 of the spider. Transverse openings 90 and 91 are provided in the flanges for receiving a pin 92 for retaining the eye of the rod 85 therebetween. A coil spring 93 surrounds the bolt or rod 85 and the rod is threaded as indicated at 94 and has a nut 95 on its outer end. One end of the coil spring 93 engages in the housing 82 and the other end in a retainer member 96 slidably engaged over the rod 85. A hand wheel 97 is threaded on the rod and is spaced from the member 96 by a washer 98 whereby rotation of the hand wheel will adjust the tension on the coil spring 93. Adjusting tilt stop nuts 99 and 100 are provided on the threaded rod 85 and mounted between the nut 99 and the back wall 83 of the housing 82 is a bumper spring 101 for adjusting the tilt of the chair as disclosed in Patent No. 2,845,992. Mounted between the housing 82 and the depending flanges 87 and 88, on rod 85, are resilient washers 102.

The back 63 consists of vertical members 103 secured to the U-shaped end 104 of an arm 105 the horizontal portion 106 thereof slidably engaging between the plane portion 65 and the bottom 76 or the channel member 62. The bottom side 76 of the channel member 62 is provided with a threaded boss 107 adapted to receive the threaded shank 108 of a hand wheel 109 for rotation of the shank so that the inner end of the shank may contact the horizontal portion 106 of the arm 105 to adjust the back member forwardly and rearwardly of the chair seat as desired. The back 63 is provided at the upper end with a back rest 110 and the back 63 is vertically adjustable on the end 104 by a nut and bolt as indicated at 111 (Fig. 1).

With the chair constructed and assembled as described the height of the chair seat may be adjusted by operation of the lever 6. The tilting tension is adjusted by the hand wheel 97 on the rod 85 to exert tension on the coil spring 93. In use of the chair when the occupant leans against the back 110, the seat and back of the chair will tilt backwardly by movement of the horizontal portion 106 of the back member downwardly with the channel member 62 and the sleeve roller 79 on the pin 80 will apply pressure to the ribs 77 and 78 on the bottom of the chair seat tilting the seat 10 so that the rear portion will move downwardly independently of movement of the spider. Pressure on the back rest 110 will cause the front portion of the seat to exert a pressure on the coil springs 52 and 53 of the bolts 50 and 51 and cause the forward portion of the seat to be raised upwardly and when in this position the heads 25 and 26 of the spider are disengaged from the bosses 46 and 47 of the seat as best illustrated in Fig. 2, so that in operation of the chair the forward portion of the seat will follow the body of the user and particularly the portion of the legs which rests on the forward edge of the seat and the cushion thereon to retain the cushion of the seat in contact with the body at all times. It will be obvious that the back and seat tilt at a different degree or angle during the tilting operation; in other words the back rest will tilt a greater degree than the seat. The movement of the channel member 62 due to downward movement of the horizontal portion 106 of the back member will cause forward movement of the housing 82 to exert a tension on the spring 93 of the rod 85 to provide resistance of the pressure on the back. Further tilting will also compress the spring 101 between wall 83 and nuts 99 and 100 until said spring is completely compressed and thus provide a final stop of the tilting movement. The washers 102 will provide resiliency between the back 83 of the housing and the flanges 87 and 88 of the body of the spider.

In Fig. 8 I have illustrated a modified form of the tilt unit wherein the bolts 50 and 51, and the springs 52 and 53 are eliminated by providing a depending bracket 112 between the ribs 77 and 78 having its ends welded or otherwise suitably secured to the underneath side of the seat as indicated at 113 and 114 forming a trackway 115 on the inner portion of the bracket for keeping the sleeve roller 79 in constant engagement with the ribs 77 and 78. In operation of this modified form of the invention, the tension on the back member 63 will cause the channel member to rotate on the pin 72 the same as in the preferred form and the forward end of the channel member moving upwardly will cause the roller to roll in the trackway 115 along the ribs 77 and 78 to allow the forward portion of the seat to move upwardly when the pressure is applied on the back member.

It will be obvious from the foregoing that I have provided an improved chair structure wherein the back member may move at a greater degree than the seat will tilt and by movement of the back member, the forward portion of the seat member will raise so that the seat member will contact the body at all times during the movement of the seat at a comfortable angle with respect to the back rest.

While I have illustrated the forms of the invention which are found to be suitable for my purpose, other forms may be utilized without departing from the spirit of my invention as I do not wish to be limited to the exact details of the form shown.

What I claim and desire to secure by Letters Patent is:

1. In a chair having a standard mounted on a base, a seat and back member the combination of, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion secured in said channel member, said channel member having a housing below said horizontal portion of said back member, means including a coil spring engaging in said housing of said channel member said channel member said housing of said channel member and said last-named means engaging said spider for exerting tension on said back member, means resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, and means on the forward portion of the channel member engaging said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider.

2. In a chair having a standard mounted on a base, a seat and back member the combination of, a spider

rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms having upwardly extending ears and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said ears, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, said channel member having a housing below the horizontal portion of the back member, means including a coil spring engaging the housing of said channel member and said spider for exerting tension on said back member, means resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, and means on the forward portion of the channel member engaging said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider.

3. In combination with a chair having a standard mounted on a base, a seat and back member, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member and said spider for exerting tension on said back member, means resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, said seat having depending ribs on the underneath side, and roller means on the forward portion of the channel member engaging said ribs of said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider.

4. In combination with a chair having a standard mounted on a base, a seat and back member, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets provided with heads having openings therein, said seat having openings aligning with the openings in said heads, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member and said spider for exerting tension on said back member, bolts extending through the openings in said heads and said seat, the bolts extending below the heads, coil springs on said bolts for resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, said seat having longitudinally extending ribs on the underneath side, and roller means on the forward portion of the channel member engaging said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of movement of the spider.

5. In a chair having a standard mounted on a base, a seat and back member the combination of, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member and said spider for exerting tension on said back member, a depending bracket on the forward underneath portion of said seat forming a trackway, and

roller means on the forward portion of the channel member engaging said trackway whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider.

6. In a chair having a standard mounted on a base, a seat and back member the combination of, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member and said spider for exerting tension on said back member, a depending bracket on the forward underneath portion of said seat forming a trackway, and roller means on the forward portion of the channel member engaging said trackway and said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider and the roller to move forwardly on the trackway.

7. In combination with a chair having a standard mounted on a base, a seat and back member, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets provided with heads having openings therein, said seat having openings aligning with the openings in said heads, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member and said spider for exerting tension on said back member, bolts extending through the openings in said heads and said seat, the bolts extending below the heads, coil springs on said bolts for resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, said seat having longitudinally extending ribs on the underneath side, a depending bracket on the forward underneath portion of the seat forming a trackway spaced from said ribs, and roller means on the forward portion of the channel member engaging said ribs on the seat and said trackway whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of movement of the spider.

8. In combination with a chair having a standard mounted on a base, a seat and back member, a one-piece spider rotatably mounted on said standard, said spider having spaced bars and each bar having rearwardly and upwardly extending arms and forwardly extending brackets, means pivotally mounting the rear portion of said seat on said rearwardly extending arms, a member having a channel longitudinally of the seat and pivotally mounted on said spider, said back member having a horizontal portion being slidable in said channel for movement longitudinally thereof and adjustably secured thereon, spring means engaging said channel member and said spider for exerting tension on said back member, means resiliently attaching the forward portion of said seat to the forwardly extending bracket on said spider, said seat member having portions on the underneath side and extending longitudinally thereof, and roller means on the forward portion of the channel member engaging said portions on the underneath side of said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back

member will cause the forward portion of the seat to raise independently of the spider.

9. In combination with a chair having a standard mounted on a base, a seat and back member, a spider rotatably mounted on said standard, said spider having spaced bars having rearwardly extending arms and forwardly extending brackets, means mounting the rear portion of said seat on said rearwardly extending arms, a channel member pivotally mounted on said spider, said back member having a horizontal portion adjustably secured in said channel member, spring means engaging said channel member, means resiliently attaching the forward portion of said seat to the forwardly extending brackets on said spider, said seat having depending ribs on the underneath side, and roller means on the forward portion of the channel member engaging said ribs of said seat whereby pressure on the back member will cause the channel member to pivot on the spider to lower the rear portion of the seat and continued pressure on the back member will cause the forward portion of the seat to raise independently of the spider.

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