April 20, 1954 C. E. CUSHMAN 2,675,861

CHAIR ADJUSTING MECHANISM

Filed Nov. 17, 1950 2 Sheets-Sheet 1

Fig. 1.

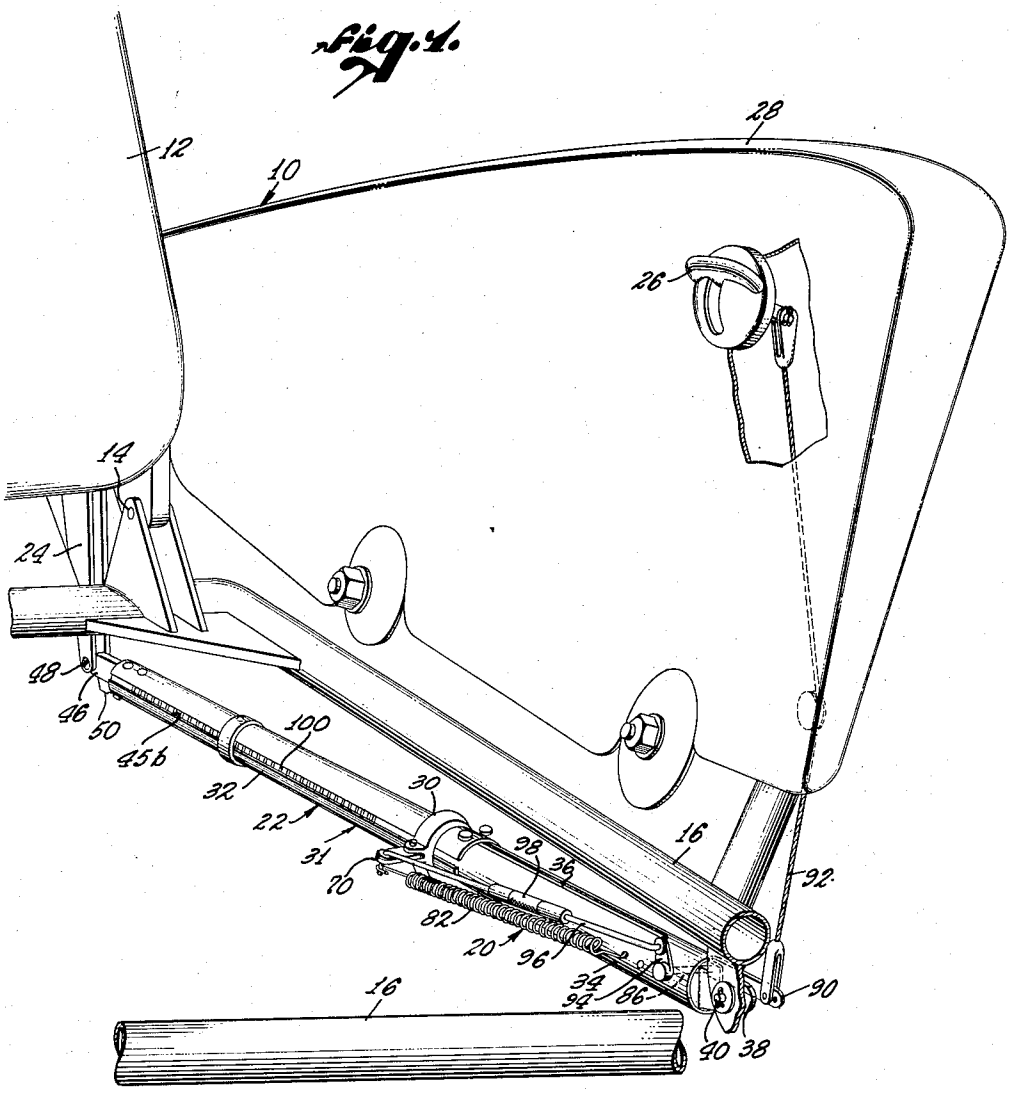
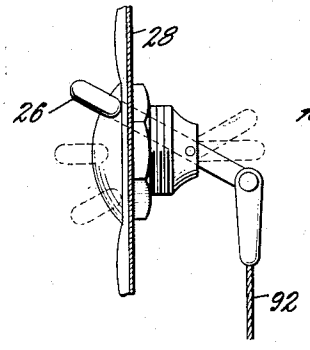


Fig. 2.



CLIFFORD E. CUSHMAN,
INVENTOR.

BY Reed & Lawlor
ATTORNEY.

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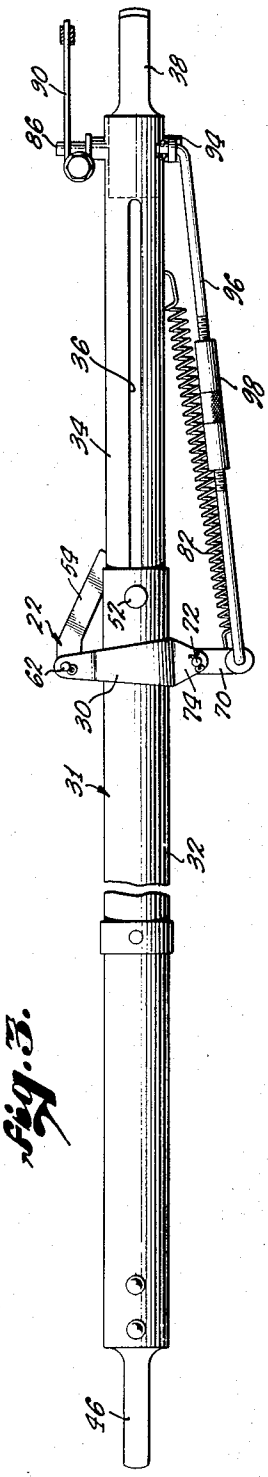


Fig. 3.

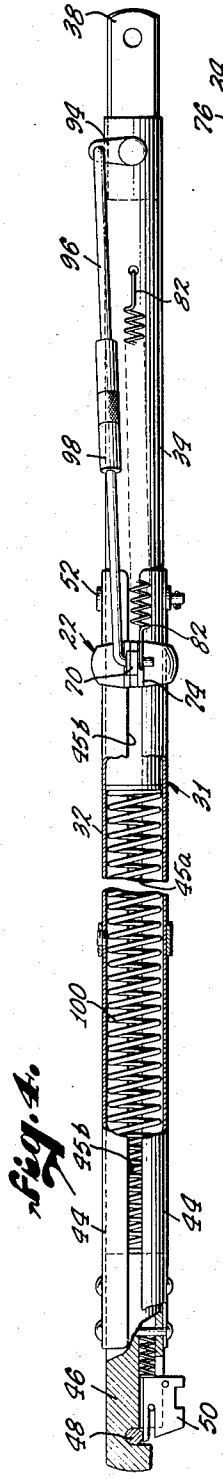


Fig. 4.

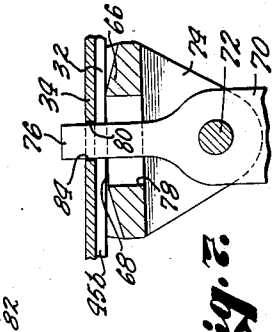


Fig. 7.

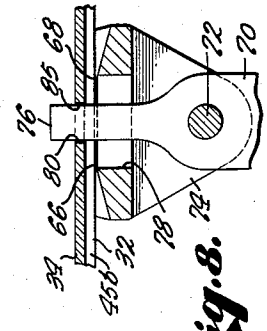


Fig. 8.

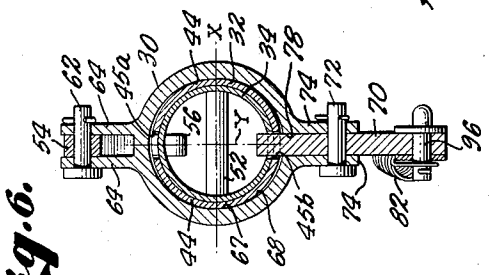


Fig. 6.

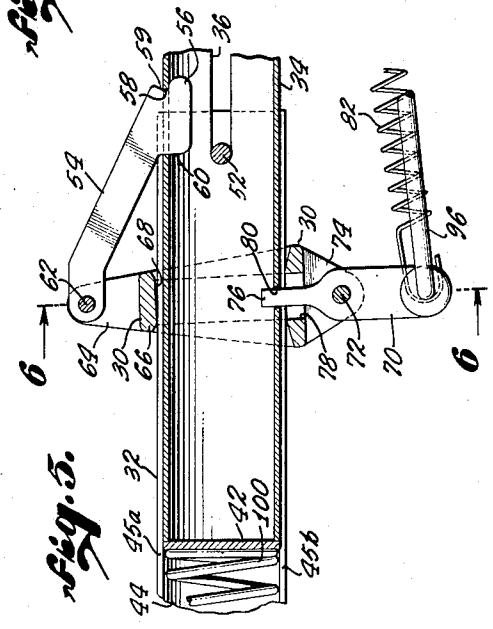


Fig. 5.

CLIFFORD E. CUSHMAN,
INVENTOR.

BY Reed & Lawlor
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,675,861

CHAIR-ADJUSTING MECHANISM

Clifford E. Cushman, Burbank, Calif., assignor to Sturgess, Inc., a corporation of California

Application November 17, 1950, Serial No. 196,209

16 Claims. (Cl. 155—161)

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This invention relates to adjustable mechanical structures and particularly to improved position adjusting mechanisms employed therein. The invention possesses particular utility in connection with reclining chairs having tiltable backs and for this reason it is described in detail in connection therewith.

The position adjusting mechanism of this invention is an improvement over one of those described and claimed in copending patent application Serial No. 4,347, filed by me January 26, 1948, now Patent No. 2,579,305. In that application there is described a special form of position adjusting mechanism of the canting-lever type that employs a smooth rod and canting leaves frictionally engageable therewith as brake elements for locking the back of a chair in a predetermined tilted position. When locked, these brake elements hold the back of a chair set in a predetermined position so long as the compression and extension loads applied to the position adjusting mechanism lie below corresponding predetermined limits. In that type of position adjusting mechanism suitable control means are provided for releasing the grip of the canting leaves on the rod to permit the chair occupant to move the chair back from one position to another. In locking the chair back in a new position the control means is manipulated to cause the canting leaves to grip the rod at the new position so as to lock the position adjusting mechanism. In practice, in employing that position adjusting mechanism, it has been found that the canting leaves often grip the rod so quickly that a certain amount of unpleasant shock is experienced if the chair is still in motion at the time that the canting leaves engage the rod.

Accordingly, it is one of the objects of the present invention to provide an adjustable chair with an adjustable positioning device of the canting lever type that cushions the shock of locking when the positioning device is locked while the chair back is in motion.

Another object of the invention is to provide such an adjustable positioning device which holds the chair locked against relatively large rearward-tilting forces but which permits the back member to be moved by forward-tilting forces exceeding a relatively low value.

Another object of the invention is to provide a position adjusting mechanism of the canting lever type in which the grip of the canting member upon the rod member is applied gradually during locking.

Another object of the invention is to provide

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an adjustable position mechanism of the canting lever type which is of light weight and of rugged inexpensive construction.

To accomplish the objects of the present invention the rod member of a canting lever type position lock is designed to be yieldable or compressible transversely so that the rod member is compressed slightly when the canting lever bits into it during locking action. In the particular embodiment of the invention illustrated herein the yielding action of the rod member is provided by constructing the rod member in two parts, namely, a shaft member and a sleeve member which are telescopically arranged. Very effective cushioning effects are obtained with such an arrangement by employing a shaft member of tubular construction and a split or divided sleeve member. The various means by which the desired results have been achieved simultaneously with the attainment of other desired results in an adjustable positioning mechanism for a tiltable chair are set forth in the following detailed description of one embodiment of the invention.

In the drawings wherein the same numbers in the several views represent like parts:

Figure 1 is a fragmentary view of a tiltable chair incorporating the invention;

Fig. 2 is a fragmentary view showing the control button for locking and releasing the positioning device;

Fig. 3 is a top plan view of an embodiment of the position-adjusting mechanism of this invention;

Fig. 4 is a side elevational view, partly broken away, of the position-adjusting mechanism;

Fig. 5 is a detailed sectional view of the position-adjusting mechanism;

Fig. 6 is a sectional view taken on the plane 6—6 of Fig. 5; and

Figs. 7 and 8 are fragmentary views showing the action of the locking device.

In the drawings there is illustrated an adjustable chair employing an adjustable positioning mechanism in accordance with the present invention. As illustrated in Fig. 1 the chair 10 comprises a tiltable back member 12 which is pivotally attached to a stationary support member 16 by suitable means including a pivot pin 14. The adjustable positioning mechanism 20 comprises a position lock 22 pivotally attached at the forward end of the support member 16 and at the rear end to a portion of the frame 24 of the back member 12 at a point below the pivot pin 14. The positioning device 20 also includes a manually controllable lever 26 mounted on the chair arm

28 in order to effect the locking and the releasing of the position lock 22.

The position lock 22 comprises a canting lever in the form of a locking collar 30 that encircles a rod structure 31 that comprises a split sleeve member 32 and a shaft member 34 telescopically arranged. The shaft member 34 is of hollow tubular construction and is provided with a pair of slots 36 extending lengthwise thereof and providing a transverse or radial elongated opening therethrough. The slots 36 are of equal length and terminate somewhat short of the ends of the shaft member 34 and are sometimes hereinafter referred to as a single slot. A tang 38 is firmly secured to the front or outer end of the shaft member 34 and extends outwardly therefrom. The tang 38 is suitably pivoted about a horizontal axis by means of a horizontally extending pin 40 secured to the stationary support member 16. The rear or inner end of the shaft member 34 is capped by means of a disk 42.

The sleeve member 32 is in the form of two parallel rod members 44 of convex arcuate configuration separated by slots 45*a* and 45*b*. The two rod members are firmly secured to a tang 46 which is pivotally supported on a horizontal pin 48 at the lower end of the frame 24 of the back member 12. A spring-loaded catch 50 is employed to hold the tang 46 in position on the pin 48. The front ends of the rod members 44 are secured together by means of a pin 52 that extends through the shaft slot 36.

The sleeve member 32 and the shaft member 34 are of circular cross-section and are frictionally engageable and they are machined and treated to provide a pair of non-galling long-wearing contacting surfaces. With this arrangement the rod structure 31 is compressed when the back member 12 of the chair is tilted rearwardly and is extended when the back member 12 of the chair is raised to its upright position. During compression and extension of the rod member 22 the sleeve member 32 and the shaft member 34 move longitudinally in sliding frictional engagement.

The range of movement of the sleeve member 32 and the shaft member 34 is determined by the length and position of the slot 36. The pin 52 engages the front end of the slot 36 in the most compressed position corresponding to the most rearward tilted position of the back member 12. The pin 52 engages the rearward end of the slot 36 in the upright or most forward position of the back member 12.

The locking collar 30 is pivotally supported at the outer end of a pivot arm 54 that is secured to the shaft member 34 at a position aligned with one of the slots 45*a* of the split sleeve member 32. The pivot arm 54 is itself pivotally attached to the shaft member 34 by means of a finger 56 that projects loosely through a short slot 58 in the shaft member 34, thus permitting the outer ends of the locking collar 30 to move laterally relatively to the axis of the sleeve member 32. The pivot arm 54 is sufficiently narrow to permit the sleeve member 32 to move past it freely during extension and compression. A notch 59 just above the finger 56 and a straight edge 60 at the rear end of the finger 56 serve to retain the pivot arm 54 in the slot 58 without, however, interfering with slight pivotal movement of the pivot arm 54. The pivoting of the locking collar 30 on the pivot arm 54 is accomplished by means of a pin 62 that projects through the outer end of the pivot arm 54 and through the opposite sides of a U-shaped bracket 64 projecting outwardly from the locking collar 30.

The locking collar 30 is arranged to be canted forwardly about the pivot pin 62 so that walls 66 on opposite sides of the aperture 68 of the locking collar are engageable with the outer surface of the sleeve member 32 at the edges of the slots 45*a* and 45*b*. In practice, the aperture 68 is of oval or elliptical configuration having a minor axis X just slightly greater than the outer diameter of the sleeve member 32 and a major axis Y of somewhat greater length. With this arrangement the outer edges of the rod members 44 intermediate the slots 45*a* and 45*b* engage the sidewalls 67 of the aperture 68 and the slots 45*a* and 45*b* are slightly narrowed as the locking collar 30 bites into the sleeve member 32.

A locking lever 70 is pivoted on the other side of the rod member 22 from the pivot arm 54. The pivotal connection of the locking lever 70 is accomplished by means of a pivot pin 72 projecting therethrough and also through the opposite arms of a second U-shaped bracket 74 extending from the locking collar 30 on the opposite side thereof from the first U-shaped bracket 64.

A straight arm 76 at the inner end of the locking lever 70 projects through a window 78 in the locking collar and through the adjacent sleeve slot 45*b* and into a short slot 80 formed in the shaft member 34. A tension spring 82 is attached at one end to the outer end of the locking lever 70 and at the other end to the shaft member 34 at a position aligned with the sleeve slot 45*b*. The tension spring 82 normally urges the outer end of the locking lever 70 forwardly and counterclockwise of the pivot pin 72. During this action the inner arm 76 of the locking lever 70 engages the rear end 84 of the slot 80, thus permitting the locking lever to pivot about this point thereby urging the locking collar 30 counterclockwise and forcing the walls 66 into gripping engagement with the sleeve member 32.

A shaft 86 extends transversely through the shaft member 34 in a plane common with the major axis Y of the collar member 30. The shaft 86 is journalled to the shaft member 34 and is rotatable therein. A crank 90 at one end of the shaft is connected by means of a cable 92 to the end of the control lever 26 that is concealed within the chair arm 28. A crank 94 at the other end of the shaft 86 is connected with the outer end of the locking lever 70 by means of a link 96 including a turnbuckle 98. With the arrangement illustrated downward movement of the exposed end of the control arm 26 causes the shaft 86 to rotate and to operate through the linkage comprising the crank 94 and the link 96 to push the outer end of the locking lever 70 clockwise and in opposition to the force of the spring 82. When this occurs the inner arm 76 first engages the forward end 85 of the slot 80 causing the locking lever to pivot at this point and to move the locking collar 30 clockwise. As the locking collar 30 is moved clockwise about the pivot pin 62 the grip of the aperture walls 66 on the sleeve member 32 is released.

In order for the seat occupant to move the back member 12 of the chair, the control lever 26 is pressed downwardly causing the grip of the locking collar 30 of the sleeve member 32 to be released. With the grip of the locking collar 30

released, it is an easy matter to tilt the back member 12 forwardly or rearwardly to any desired position. During this action the shaft member 34 slides freely within the sleeve member 32. To lock the back member 12 in any desired position the control lever 26 is returned to its upper position, thus permitting the tension spring 82 to pull the locking lever 70 counterclockwise and to cause the locking collar 30 to grip the sleeve member 32. If the back member 12 is in motion at this time, the shock of locking is cushioned to a large extent by virtue of the fact that the locking collar compresses the sleeve member 32 and the shaft member 34.

A compression spring 100 is arranged within the sleeve member between the tang 46 and the disk 42. This compression spring acts to extend the rod member 22 when the grip of the locking collar is released, thus aiding the occupant of the chair to tilt the back member 12 forwardly. Though the spring 100 also resists the backward tilting of the back member, the strength of the spring is not so great as to seriously interfere with such action. As the back member 12 is forced rearwardly while the locking device 22 is in locked condition, a compression force is applied to the opposite ends of the rod member 22 tending to force the shaft member 34 into the sleeve member 32. As this occurs the locking collar 30 bites further into the outer surface of the sleeve member 32 compressing it against the shaft member 34 and compressing both the sleeve member 32 and the shaft member 34 as the backward force applied to the back member 12 is increased. Thus, the greater the backward tilting force applied to the back member 12 the stronger is the force applied by the locking collar to the rod member 22. Finally, however, when the rearward tilting force applied to the back member 12 exceeds a predetermined relatively high value, the shaft member 34 commences to slip within the sleeve member 32 and the slipping is resisted by the frictional force between the sleeve member 32 and the locking collar 30 and also by the frictional force between the sleeve member 32 and the shaft member 34. In practice, it is found that the value of the load limit against which the locking device 22 is capable of holding before slipping is determined in part by the transverse stiffness of the shaft member 34 and the sleeve member 32. Thus, for example, the limit of load which can be held by the locking device 22 in compression may be increased by increasing the thickness of the wall of the tubular shaft member 34.

As the back member 12 is forced forwardly while the locking device 22 is in locked condition, a tension force is applied to the opposite ends of the rod member 22 tending to draw the shaft member 34 out of the sleeve member 32. As this occurs the bite of the locking collar 30 on the outer surface of the sleeve member 32 and the force between the sleeve member 32 and the shaft member 34 is slightly relieved more and more as the forward tilting force applied to the back member 12 is increased. During this action, however, the tension spring 82 keeps the locking collar urged against the sleeve member 32 in locking engagement therewith. Finally, however, when the forward tilting force applied to the back member 12 exceeds a predetermined relatively low value, the shaft member 34 commences to slip within the sleeve member 32 and the slipping is resisted by the frictional force between the sleeve member 32 and the locking collar 30 and also by the frictional force between the sleeve member 32 and the shaft member 34.

The strength of extension forces against which the locking device 22 is capable of holding is determined in part by the strength of the tension spring 82 and in part by the leverage of the lock lever 70 and of the locking ring 30. By setting the threshold at which slipping may occur at a conveniently low value, it becomes possible for a person to tilt the back member 12 upwardly by means of a forwardly exerted force applied to the upper end of the back member, even though the control lever 26 is in locked position and even though the chair is occupied.

From the foregoing description of the invention it is readily seen that a position-adjusting mechanism has been provided which is capable of cushioning shock during the locking action and which at the same time is capable of remaining locked against a wide range of forces exerted in one direction thereon below a relatively large load limit but is capable of being readily adjusted by relatively small forces exerted in the opposite direction above a relatively small load limit.

While the invention has been described with particular reference to its application to a reclining chair, it will be understood that it may also be applied to other structures or arrangements in which it is desired to lock two main members in predetermined relative positions. While my invention has been described with reference to the employment of a sleeve utilizing a pair of slots that separate two rod members, more slots may be employed if desired, but in any event some of the advantages of my invention may be obtained by employing a sleeve provided with only a single slot. Also, while my invention has been described with reference to a rod structure employing a shaft member that telescopically engages a split sleeve member, it will be clear that other rod structures may be employed and some of the advantages of the invention still be obtained. Thus, although only one particular embodiment of the invention has been specifically disclosed herein, it is apparent that the invention is not limited thereto but is capable of a wide variety of mechanical embodiments. In addition to the modifications mentioned above, various changes which will now readily suggest themselves to those skilled in the art may be made in the material, form, details of construction, and arrangement of the elements without departing from the spirit of the invention.

Inasmuch as the foregoing and many other changes may be made while still employing various features of the invention, it is to be understood that the specification herein is illustrative only and that reference is to be had to the appended claims for a definition of the limits of the invention.

The invention claimed is:

1. In an adjustable chair comprising a pair of relatively movable seat members, namely, a support member and a tiltable back member, the improvement which comprises: an adjustable position lock for holding said back member set in a predetermined tilt position, said adjustable position lock comprising a pair of mutually spaced parallel rod members connected as a unit with one of said seat members, said unit having a transverse compressibility large compared with its longitudinal compressibility, and canting means connected with the other of said seat members, said canting means having opposite

walls frictionally engageable with the surfaces of the respective rod members, said rod members being movable lengthwise relative to said canting means, resilient means applying a force to said canting means to urge said walls against said surfaces whereby longitudinal movement of said rod members relative to said canting means is resisted, and means for reducing the force of said resilient means to release the grip of said canting means on said rod members.

2. In an adjustable chair comprising a pair of relatively movable seat members, namely, a support member and a tiltable back member, the improvement which comprises: an adjustable position lock for holding said back member set in a predetermined tilt position, said adjustable position lock comprising a split rod member connected with one of said seat members, said split rod member having a transverse compressibility large compared with its longitudinal compressibility, and a canting member connected with the other of said seat members, said canting member having an aperture therein, said split rod member being movable lengthwise through said aperture, the walls of said aperture being frictionally engageable with opposite surfaces of said rod member, resilient means applying a force to said canting member to urge said aperture walls inwardly against said surfaces of said rod member whereby longitudinal movement of said rod member through said aperture is resisted, and means for reducing the force of said resilient means to release the grip of said canting member on said rod member.

3. In an adjustable chair comprising a pair of relatively movable seat members, namely, a support member and a tiltable back member, the improvement which comprises: an adjustable position lock for holding said back member set in a predetermined tilt position, said adjustable position lock comprising a rod structure connected with one of said seat members and canting means connected with the other of said seat members, said rod structure having a transverse compressibility large compared with its longitudinal compressibility, said canting means having an aperture therein, at least part of said rod structure being movable lengthwise through said aperture, the walls of said aperture being frictionally engageable with surfaces on the opposite sides of said part of said rod structure, resilient means applying a force to said canting means to urge said walls inwardly against said surfaces of said rod structure whereby longitudinal movement of said rod structure through said aperture is resisted, and means for reducing the force of said resilient means to release the grip of said canting means on said rod member.

4. In an adjustable chair comprising a pair of relatively movable seat members, namely, a support member and tiltable back member, the improvement which comprises: an adjustable position lock for holding said back member set in a predetermined tilt position, said adjustable position lock comprising a shaft member connected with one of said seat members and a split sleeve member connected with the other of said seat members, said sleeve member telescopically engaging said shaft member, canting means pivotally supported on said shaft member, said canting means having an aperture therein, said sleeve member being movable lengthwise through said aperture, the walls of said aperture being frictionally engageable with opposite external surfaces of said sleeve member, resilient means for urging said aperture walls inwardly against said surfaces of said sleeve member whereby longitudinal movement of said sleeve member through said aperture is resisted, and means for reducing the force of said resilient means to release the grip of said canting means on said sleeve member.

5. The combination described in claim 4 wherein said shaft member is a hollow tubular member.

6. An adjustable position lock for holding a pair of members set in predetermined relative positions comprising: a pair of mutually spaced parallel rod elements adapted for connection as a unit with one of said members, said unit having a transverse compressibility large compared with its longitudinal compressibility, and canting means adapted for connection with the other of said members, said canting means having opposite walls frictionally engageable with the surfaces of the respective rod elements, said rod elements being movable lengthwise relative to said canting means, and means for urging said walls against said surfaces whereby longitudinal movement of said rod elements relative to said canting means is resisted.

7. An adjustable position lock for holding a pair of members set in predetermined relative positions comprising: a rod structure adapted for connection with one of said members and canting means adapted for connection with the other of said members, said rod structure having a transverse compressibility large compared with its longitudinal compressibility, said canting means having an aperture therein, a part of said rod structure being movable lengthwise through said aperture, the walls of said aperture being frictionally engageable with surfaces on the opposite sides of said part of said rod structure, and means for urging said walls inwardly against said surfaces of said rod structure whereby longitudinal movement of said rod structure through said aperture is resisted.

8. An adjustable position lock for holding a pair of main members set in a predetermined relative position comprising: a shaft member adapted for connection with one of said main members, a split sleeve member adapted for connection with the other of said main members, said sleeve member telescopically engaging said shaft member, canting means pivotally connected to said shaft member, said canting means having an aperture therein, said sleeve member being movable lengthwise through said aperture while the walls of said aperture are frictionally engaged with opposite external surfaces of said sleeve member, and means for urging said aperture walls inwardly against said surfaces of said sleeve member whereby longitudinal movement of said sleeve member through said aperture is resisted.

9. A position lock as defined in claim 8 wherein said shaft member has a transverse compressibility large compared with its longitudinal compressibility.

10. In an adjustable position lock for holding a pair of main members set in predetermined relative positions, a shaft member adapted at one end for connection with one of said main members, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member having a slot extending lengthwise thereof, a pivot arm extending outwardly from said shaft member at a position aligned with said slot, and canting means pivotally supported at the outer end of said pivot arm, said

canting means having a pair of walls disposed respectively on opposite sides of said shaft member and said sleeve member, said walls being adapted to engage the outer surface of said sleeve member, said sleeve member being movable lengthwise between said walls.

11. In an adjustable position lock for holding a pair of main members set in a predetermined relative position, a tubular member adapted at one end for connection with one of said main members, a sleeve member telescopically engaging said tubular member externally thereof and adapted at one end for connection with the other of said main members, said sleeve member having a slot extending lengthwise thereof, a pivot arm extending outwardly from said tubular member at a position aligned with said slot, and canting means pivotally supported at the outer end of said pivot arm, said canting means having a pair of walls disposed respectively on opposite sides of said tubular member and said sleeve member, said walls being adapted to engage the outer surface of said sleeve member, said sleeve member being movable lengthwise between said walls.

12. In an adjustable position lock for holding a pair of main members set in a predetermined relative position, a shaft member adapted at one end for connection with one of said main members, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member comprising a pair of sleeve elements separated by slots extending lengthwise thereof on opposite sides thereof, a pivot arm extending outwardly from said shaft member at a position aligned with one of said slots, canting means pivotally supported at the outer end of said pivot arm, said canting means having an aperture therein encircling said shaft member and said sleeve member, said sleeve member being movable lengthwise through said aperture, and a locking lever pivotally connected to said canting means on the opposite side of said sleeve member from said pivot arm, the inner end of said locking lever being pivotally connected with said shaft member at a position aligned with said other slot.

13. In an adjustable position lock for holding a pair of main members set in a predetermined relative position, a shaft member adapted at one end for connection with one of said main members, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member having a slot extending lengthwise thereof on opposite sides thereof, a pivot arm extending outwardly from said shaft member at a position aligned with said slot, canting means pivotally supported at the outer end of said pivot arm, said canting means having an aperture therein encircling said shaft member and said sleeve member, said sleeve member being movable lengthwise through said aperture, means including a spring applying a force to said canting means for urging the walls of said aperture against the outer surface of said sleeve member whereby longitudinal movement of said sleeve relative to said canting means is resisted, and means for reducing the force applied by said spring to release the grip of said canting means on said sleeve member.

14. An adjustable position lock for holding a pair of main members set in predetermined relative positions comprising: a shaft member adapted at one end for connection with one of said main members, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member comprising a pair of sleeve elements separated by slots extending lengthwise thereof on opposite sides thereof, a pivot arm extending outwardly from said shaft member at a position aligned with one of said slots, canting means pivotally supported at the outer end of said pivot arm, said canting means having an aperture therein encircling said shaft member and said sleeve member, said sleeve member being movable lengthwise through said aperture, a locking lever pivotally connected to said canting means on the opposite side of said sleeve member from said pivot arm, the inner end of said locking lever being pivotally connected with said shaft member at a position aligned with said other slot, resilient means acting on said locking lever for urging the walls of said aperture inwardly against the surfaces of said sleeve member whereby longitudinal movement of said sleeve member through said aperture is resisted, a rotatable shaft extending through said shaft member, and a linkage interconnecting said locking lever with said rotatable shaft for moving said locking lever in opposition to the force exerted thereon by said resilient means to release the grip of said canting means on said sleeve member.

15. An adjustable position lock for holding a pair of main members set in predetermined relative positions comprising: a shaft member adapted at one end for connection with one of said main members, said shaft member being divided lengthwise throughout a substantial portion of its length by a shaft slot extending transversely therethrough, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member comprising a pair of sleeve elements separated by a pair of sleeve slots extending lengthwise thereof on opposite sides thereof, a cross member extending through said shaft slot and securing the free ends of said sleeve elements together, the ends of said shaft slot acting as stops to limit the range of relative longitudinal movement of said shaft member and said sleeve member, a compression spring enclosed by said sleeve member for urging said shaft member and said sleeve member apart into an extended position, a pivot arm extending outwardly from said shaft member at a position aligned with one of said sleeve slots, canting means pivotally supported at the outer end of said pivot arm, said canting means having an aperture therein encircling said shaft member and said sleeve member, said sleeve member being movable lengthwise through said aperture, and a locking lever pivotally connected to said canting means on the opposite side of said sleeve member from said pivot arm, the inner end of said locking lever being pivotally connected with said shaft member at a position aligned with the other sleeve slot.

16. An adjustable position lock for holding a pair of main members set in a predetermined relative position comprising: a shaft member adapted at one end for connection with one of said main members, said shaft member being divided lengthwise throughout a substantial portion of its length by a shaft slot extending transversely therethrough, a sleeve member telescopically engaging said shaft member and adapted at one end for connection with the other of said main members, said sleeve member comprising a pair of sleeve elements separated by

sleeve slots extending lengthwise thereof on opposite sides thereof, a pivot arm extending outwardly from said shaft member at a position aligned with one of said sleeve slots, a cross member extending through said shaft slot and securing the free ends of said sleeve elements together, the ends of said shaft slot acting as stops to limit the range of relative longitudinal movement of said shaft member and said sleeve member, a compression spring enclosed by said sleeve member for urging said shaft member and said sleeve member apart into an extended position, canting means pivotally supported at the outer end of said pivot arm, said canting means having an aperture therein encircling said shaft member and said sleeve member, said sleeve member being movable lengthwise through said aperture, a locking lever pivotally connected to said canting means on the opposite side of said sleeve member from said pivot arm, the inner end of said locking lever being pivotally connected with said shaft member at a position aligned with the other sleeve slot, a tension spring connected between the outer end of said locking lever and the outer end of said shaft member for urging

the walls of said aperture inwardly against the surfaces of said sleeve member whereby longitudinal movement of said sleeve member through said aperture is resisted, a rotatable shaft extending transversely through said shaft member at the outer end thereof and having a crank on one end thereof, and a link interconnecting said locking lever with said crank for moving said locking lever in opposition to the force exerted thereon by said spring to release the grip of said canting means on said sleeve member.

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