

Jan. 5, 1965

C. H. HAGE ETAL

3,164,357

CHAIR SEAT ADJUSTING DEVICE

Filed Aug. 27, 1962

2 Sheets-Sheet 1

FIG. 2.

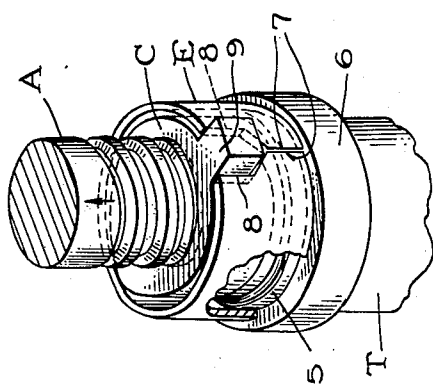


FIG. 1.

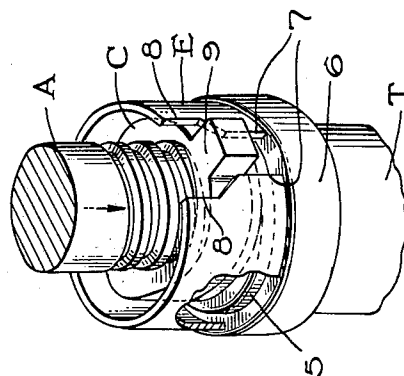


FIG. 4.

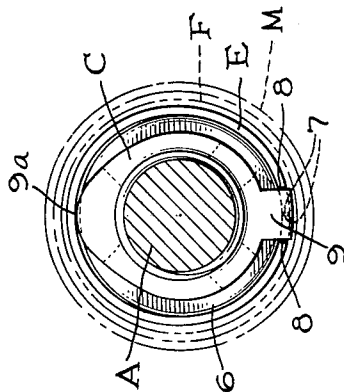
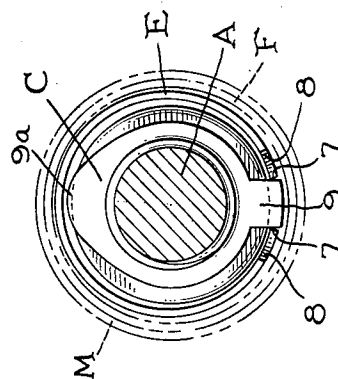


FIG. 3.



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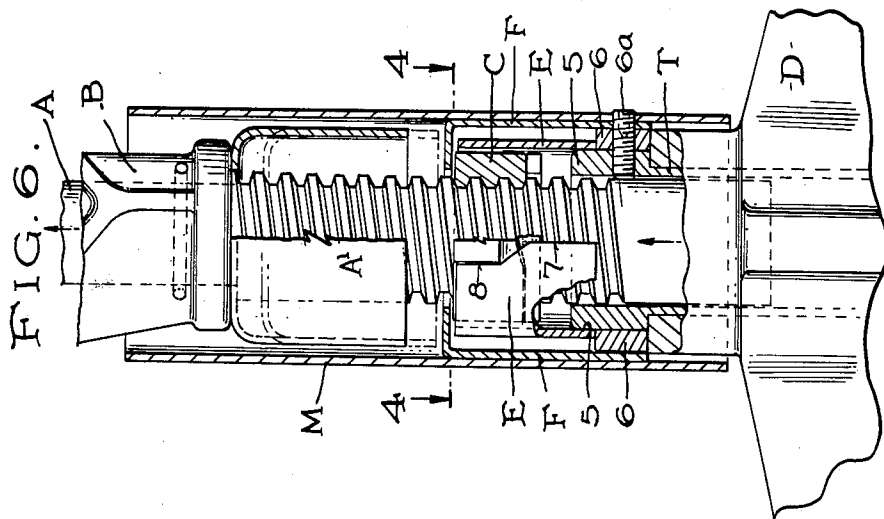
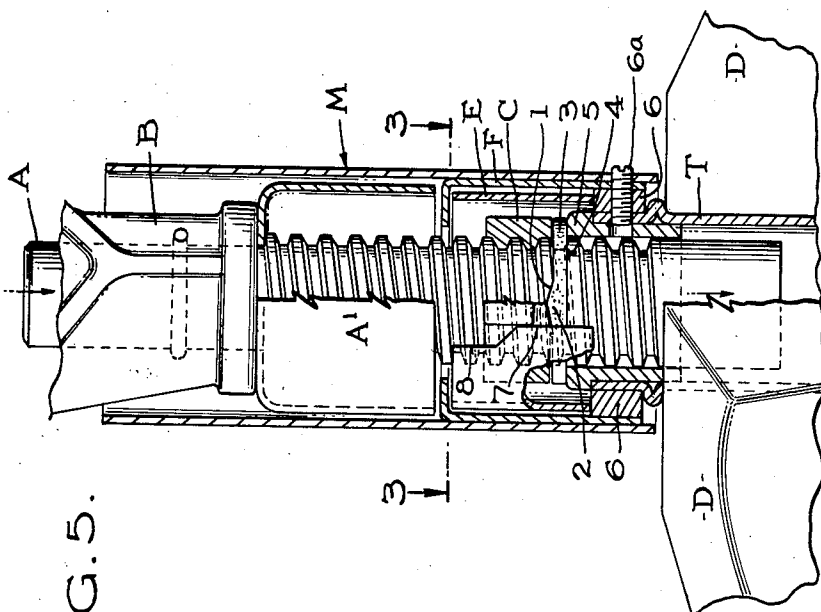
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CHAIR SEAT ADJUSTING DEVICE

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2 Sheets-Sheet 2



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3,164,357

CHAIR SEAT ADJUSTING DEVICE

Carl H. Hage, Poland, and Harris E. Hanser, Youngstown, Ohio, assignors to The General Fireproofing Company, Youngstown, Ohio, a corporation of Ohio
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9 Claims. (Cl. 248—406)

This invention relates to a chair seat adjusting device for chairs of the swivel type wherein a chair iron, carried by the underside of the seat, is mounted on a screw post.

One of the objects of the invention is to provide means for readily adjusting the height of the seat in a simple and expeditious manner without the necessity of manually turning or rotating a seat height adjusting nut, usually mounted in a location difficult to reach. For example, the present improvements are directed to a screw post operating in conjunction with a nut cooperating with a spring clutch which, when the chair seat is loaded, as by the weight of the user, the clutch is "out" or free so that the nut rotates with the post, thereby enabling the seat and post to turn or swivel without changing the level of the seat above the chair base. On the other hand, when it is desired to effect adjustment of the seat when it is unoccupied, it is only necessary to lift the seat upwardly which causes the clutch to be engaged" and hold the nut stationary, or fixed relative to the base, so that the post may be rotated the desired number of revolutions to elevate or lower the seat.

A further object of the invention is to provide simple and practical clutch means operated by axial movement of the screw post and wherein, a divided spring clutch collar having the tendency inherently to contract is provided with a vertical slit and a communicating recess which alternately receives a radial lug on the nut. That is to say, when the post and nut are rotated together during swivelling movement, the radial lug spreads the slit and expends the spring clutch collar disengaging it from the base to permit free wheeling of the seat. Yet, when the chair body is lifted vertically because the nut is threaded on the post, the lug will move into the recess, and, as the seat and post turn together, the nut will be held stationary by the clutch collar engaging it and the base simultaneously so that the post will move up or down to the desired position relative to the position of the base on the floor.

A preferred and practical embodiment of the present invention is shown in the accompanying drawings, in which:

FIGURE 1 is a perspective view showing the normal position of a portion of the screw post for supporting the chair seat and wherein the clutch collar surrounding the nut is expanded because the lug of the nut spreads the slit and the collar is disengaged from the related fixed brake surface of the chair base.

FIGURE 2 is a view similar to FIGURE 1, wherein the post is lifted to cause the clutch collar to engage the related brake surface on the chair base so that the lug is disposed in the recess, the slit is closed, and turning of the post in the relatively fixed nut will alter seat level.

FIGURE 3 is a horizontal cross sectional view of the parts as shown in FIGURE 1 and taken on the line 3—3 of FIGURE 5.

FIGURE 4 is a horizontal cross sectional view of the parts as shown in FIGURE 2 and taken on the line 4—4 of FIGURE 6.

FIGURE 5 is a detail vertical sectional view of the clutch and its cooperating parts with the clutch collar in expanded position to permit free wheeling of the seat, as when the post is loaded in the direction of the arrows.

FIGURE 6 is a view similar to FIGURE 5 showing the clutch ring contracted to engage the brake ring for

purposes of adjustment, and with the post lifted in the direction of the arrows.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

The present construction is another form of the invention shown in Patents 2,702,075 dated February 15, 1955, and 2,704,113 dated March 15, 1955. The chair iron is conventional and supports the usual seat, not shown. The screw post assembly and its mask are supported on a base of the type, for example, shown in Pat. No. 2,913,208 dated November 17, 1959.

Referring to the drawings, it will be seen that the screw post A is connected with a casting which is a part of the standard chair iron B carried by the underside of the chair seat. In accordance with customary practice, an inverted cup or telescoping bell A' is clamped between A and B at the time post A is inserted into the casting.

As will appear more specifically from FIGS. 5 and 6, the post A has threaded engagement with the nut C whose lower face is provided with a recess 1 for receiving the upstanding rib 2 on a washer 3, preferably made of lubricious plastic material such as nylon. The said nut is normally adapted to rest on the upper surface 4 of the brake member 5 which may, as shown in FIG. 5, be a separate ring resting on and secured to the upper end of a tube T fixed in base D by a press fit or a set screw, or the tube itself may have the ring formed integrally therewith, as shown in FIGURE 6. In both cases, the brake member 5 projects above the upper surface of a concentric annulus 6 which serves as a support for the spring clutch collar E enclosed in a lower inverted cuplike member F, often called the clutch cup, and whose function will presently appear.

The annulus 6 serves one additional important purpose. When the device is assembled at the factory, the clutch collar is inserted into the clutch cup around the nut and the concentric washer is press fit into the clutch cup to keep all of the parts together in shipping, final assembly, etc. This allows the device-equipped chair iron to be handled as an integral assembly. Also this collar is used as well to provide the thread support for the set-screw to assemble the chair top to the base.

The nut C is surrounded by the aforesaid spring clutch collar E which, as will be observed more especially from FIGURES 1—4, is in the form of a band of steel slit as at 7, in its lower portion, and which communicates at its upper end with a relatively laterally wide recess 8. The slit and the recess cooperate with a radial lug 9 on the nut C.

When the edges of the slit 7 are spread apart as shown in FIGS. 1 and 3, the clutch collar E is disengaged with the related outer surface of brake ring 5. On the other hand, when the post A is lifted in the direction of the arrows, the lug 9 moves into the recess 8 as shown in FIGS. 2 and 4.

The clutch collar is enclosed within a lower inverted cup-like member F, often called the clutch cup, which serves two important purposes; first, it forces disengagement of the nut lug 9 and clutch collar from moving up with the nut when the post is lifted; second, since it is joined to the base through the set screw 6a, it keeps the base and chair top together when the chair is lifted, since the nut cannot pass through its opening.

The nut C is of substantially oval shape horizontally with its greatest point of projection 9a opposite the lug 9. The oval shape of the nut is desirable to keep the clutch collar E from creeping forward at the rear when it is expanded, and causing friction at that point. The expanded position is, of course, the free-wheeling position and no friction action or noise is desired.

Accordingly, the oval tip of the nut extends slightly beyond the vertical braking surface of brake member 5

so that the clutch collar never touches the brake area at that point.

The entire assembly as shown in FIGURES 5 and 6 is surrounded by any suitable form of mask which may be in the form of the tube M substantially spanning the distance between the lower portion of the chair iron B and the chair base D. It will of course be understood that this mask may be in any suitable shape or profile, as, for example, where in some instances chairs of this type have utilized a mask having the general characteristics of a downwardly flaring bell. The mask M, the brake ring 5, and washer 6 are held in fixed assembled relation as for example by a set screw 6a.

From the foregoing, it will now be seen that when the chair seat is occupied, the clutch collar E is expanded because the lug 9 has moved into the zone of the slit 7 from the recess 8 to expand the collar, and the nut C with its washer 3 may freely turn, because the collar is out of contact with the related gripping face of the brake ring 5.

If it is desired to raise or lower the seat, the reverse cycle is initiated by lifting the chair and the post relative to the collar E. In this situation, the nut is lifted with the post until the lug 9 rests in recess 8, and since the nut C is held stationary relative to the post A, the turning of the seat will cause the post to axially move up and down relative to the nut.

Some means, such as stacking the post threads, must be provided for, so that when the post moves down, the telescoping bell A' does not hit the top of the clutch cup below. If this is not prevented, the whole system jams up and can even be self-destructive. The staking of the post thread, on the other hand, forces only the nut to move, and with the nut, the clutch collar, which drags around the braking area, but does no harm.

Either by pressing downwardly on the seat with the hand or the user occupying the seat, the post will move downwardly and the lug 9 will enter the slit 7 again and expand the clutch collar E so that the seat will remain in a fixed position until it is desired to make a different adjustment.

We claim:

1. In a swivel chair, the combination including,

a base

a seat supporting screw post mounted in the base,

a stationary brake member carried by the base and an expansible and contractible clutch element surrounding the post and a member of the screw post cooperating with the axial movement thereof, whereby,

when the post is loaded, the brake and clutch elements disengage to permit the post to rotate freely without axial movement and when the post is lifted the post will move up or down in the direction of its axis when rotated.

2. In a swivel chair, the combination including,

a base,

a screw post supported in the base,

a seat carried by the upper end of the post,

a nut threaded on the post,

and cooperating clutch elements including a stationary brake carried by the base and an expansible and contractible collar controlled by the nut,

whereby, when the post is loaded, the clutch elements are disengaged so that the post and nut move together to prevent axial movement of the post, and when said elements are engaged, the nut will be held stationary relative to the post and rotation of the post in the nut will cause the post to move axially up and down to change the elevation of the seat.

3. In a swivel chair, the combination including,

a base,

a screw post supported on the base,

a seat carried by the upper end of the post,

brake means connected with the base,

a nut threaded on the post,

a spring clutch element slit at one side and surrounding the post and brake means,

clutch element actuating means on the nut cooperating with said slit to cause said element to engage and disengage said brake means, whereby,

when the post is loaded, the clutch element disengages said brake means and when the post is lifted, said actuating means on the nut causes contraction of the clutch element to engage said brake means and also grip the nut.

4. In a swivel chair, the combination including, a base,

a screw post supported in the base,

a seat carried by the upper end of the post,

brake means connected with the base,

a nut threaded on the post and having a radial lug, said nut being of substantially oval shape horizontally and having its greatest projection opposite the lug,

and clutch means in the form of a collar having a communicating slit and recess cooperating with said radial lug to alternately engage and disengage said brake means, whereby,

when the post is loaded, the clutch means disengages said brake means and when the post is lifted, said radial lug causes contraction of the clutch means to engage said brake means and also grip the nut.

5. Chair seat height adjusting means for positioning the seat at a selected elevation relative to the chair base, comprising,

a screw post having the seat fixed to its upper end,

a supporting washer secured to said base,

a brake ring adjacent the washer and having an exposed brake service,

an expandable and contractible slit spring clutch collar surrounding the post and resting on said washer, said collar having a recess opening at its upper portion and communicating with the slit at its lower edge,

a nut of substantially ovoid shape horizontally threaded on the post,

a radial lug on the nut movable from said recess to said slit to expand the collar to be out of contact with said surface of the brake ring so that the post and nut will rotate together without effecting said adjustment,

and a clutch cup fixed against rotation relative to the post and surrounding the clutch collar whereby, when the chair seat is manually lifted to effect height adjustment relative to the chair base, the post will carry the nut with it and the clutch cup will restrain the clutch collar, and the radial lug will move into the recess as the clutch collar contracts to engage said brake ring and the rotation of the seat and post will cause the latter to turn in the nut to effect seat positioning adjustment,

and when the seat is depressed, the lug will re-enter the slit and expand in the clutch collar, its ovoid shape preventing creeping of the clutch collar forward at the rear when it is expanded to permit turning of the post without changing seat height adjustment.

6. Chair seat height adjusting means for positioning the seat at a selected elevation relative to the chair base, comprising,

a screw post having the seat fixed to its upper end,

a supporting washer secured to said base,

a brake ring concentric with the washer and having an exposed brake surface,

an expandable and contractible circular slit spring clutch collar surrounding the post and resting on said washer, said collar having a recess opening at its upper portion and communicating with the slit at its lower edge,

a nut of substantially ovoid external shape on the post,
 a radial lug on the nut movable from said recess to
 said slit to expand the collar to be out of contact
 with said surface of the brake ring so that the post
 and nut will rotate together without effecting said
 adjustment, the greatest point of the said ovoid shape
 of the nut being opposite the lug, 5
 and a clutch cup fixed against rotation relative to the
 post and surrounding the clutch collar whereby,
 when the chair seat is manually lifted to effect height
 adjustment relative to the chair base, the post will
 carry the nut with it and the clutch cup will restrain
 the clutch collar, and the radial lug will move into
 the recess as the clutch collar contracts to engage
 said brake ring and the rotation of the seat and
 post will cause the latter to turn in the nut to effect
 seat positioning adjustment, 10
 and when the seat is depressed, the lug will reenter
 the slit and expand in the clutch collar, its ovoid
 shape preventing creeping of the clutch collar for-
 ward at the rear when it is expanded to permit
 turning of the post without changing seat height ad-
 justment. 20
 7. In a swivel chair, the combination including,
 a base,
 a seat supporting screw post mounted in the base,
 a stationary brake member carried by the base,
 an annular expandible and contractible collar sur-
 rounding said brake member and also surrounding
 the portion of the post over a portion of its length
 adjacent the brake, said collar being normally ex-
 panded to disengage the brake to permit free rota-
 tion of the post whether loaded or unloaded, 30
 a nut on the post within said collar,
 and cooperating means on the nut and collar,
 whereby, when the post is unloaded and manually
 lifted the collar will contract to hold the nut rela-

tively stationary to the post so that the chair may be
 turned to effect the desired height adjustment, and,
 when the chair is again occupied, the collar and brake
 become disengaged to permit free-wheeling of the
 seat at the new selected height.
 8. In a swivel chair, the combination including,
 a base,
 a seat supporting screw post mounted in the base,
 a stationary brake member carried by the base,
 an annular expandible and contractible collar sur-
 rounding the post and said brake member, said collar
 having a vertical slit on its side extending over a
 portion of its depth and communicating at its upper
 end with a recess,
 a nut on the screw post, 15
 and means projecting from the nut toward and co-
 operating with the slit and recess to expand and con-
 tract the collar, whereby, when the post is loaded,
 the brake and clutch elements are disengaged to per-
 mit the post to rotate freely without axial movement,
 and when the post is moved in the direction of its
 axis into the recess, the nut will be held relatively
 stationary to the post to effect chair height adjust-
 ment.
 9. A swivel chair according to claim 8, wherein, a
 washer of lubricious material is disposed between the
 nut and the brake member. 25

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