Dec. 31, 1935. B. M. BOUMAN 2,026,298

REVOLVING CHAIR

Filed March 23, 1934

FIG. 4

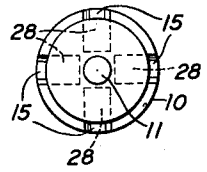

FIG. 3

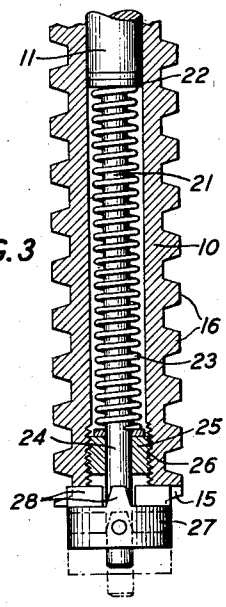

FIG. 1

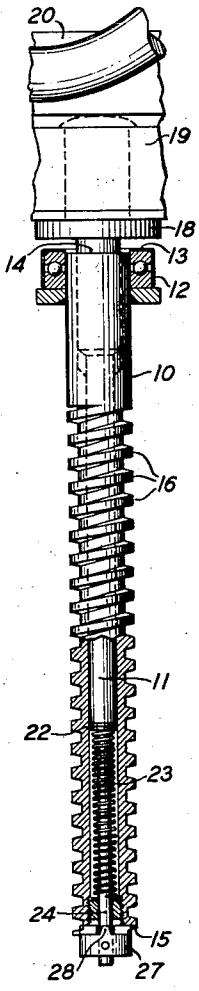

FIG. 2

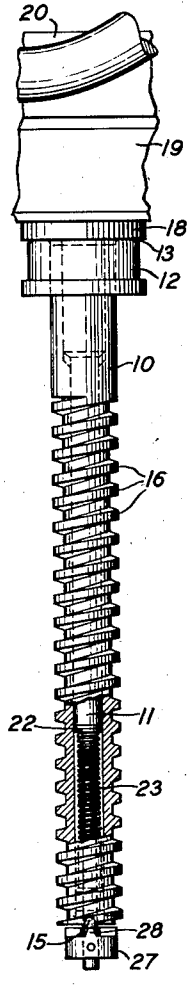

FIG. 5

FIG. 6

INVENTOR
B. M. BOUMAN
BY J. MacDonald
ATTORNEY

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REVOLVING CHAIR

Bernhard M. Bouman, Great Neck, N. Y., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

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2 Claims. (Cl. 155—95)

This invention relates to revolving chairs, and more particularly to a novel type of spindle, which permits the easy rotation of the seat and also provides means for raising or lowering the seat.

The object of the present invention is to provide a spindle for revolving chairs and the like, which when the seat is occupied will permit the seat to be rotated without varying the height of said seat.

Another object of the present invention is the provision whereby when the seat is unoccupied the height of said seat may be readily changed by the rotation of the seat.

A further object of this invention is to reduce the wear on the threaded portion of the spindle. This result is accomplished by providing a two-piece spindle, one inside the other, wherein the weight of the person occupying the chair causes a collar on the inner spindle to engage a thrust bearing on the outer spindle located between the upper ends of the spindle members, thereby reducing the wear on the threaded portion of the outer spindle by causing the chair seat to revolve on its inner spindle, the collar of which engages the thrust bearing on the outer spindle.

A still further object of this invention is the provision of a simple and efficient mechanism which will be cheap to manufacture and which will be sturdy in construction.

It is common practice in chairs having revolving seats, to provide some means whereby the height of the seat may be adjusted to suit the occupant. The earliest type of revolving chairs embodied a construction which permitted, upon the revolving of the seat, the raising and lowering of said seat due to the use of a threaded spindle on the seat journaled in a hub member attached to the legs of the chair and having an internal thread therein.

In the revolving chairs in use today, the raising and lowering of the seat is accomplished by means of a revolving hub which is journaled in a bearing in the lower portion of the chair, this hub being provided on its interior with a threaded portion which engages the threaded spindle attached to the chair seat. The threaded hub is free to rotate in its housing, thereby permitting the chair seat to rotate without varying the height thereof. However, in order to vary the height of the seat it is necessary to securely hold the hub against rotation. This allows the threaded spindle to travel either upward or downward in the hub, thereby raising or lowering the seat which is attached to the spindle. Various means have been provided for securing the hub against rotation, all of which, however, require the manual operation of a dog or latch which engages a slot or hole in the hub bearing.

The operation of various latching means before the height of the seat may be changed often requires the use of tools and in the majority of instances requires the assistance of a mechanic. This in itself is undesirable as such chairs are often occupied by girls and women who in the majority of instances are not mechanically inclined.

The applicant, being acquainted with these facts and knowing the need for a revolving chair which could be adjusted readily without the use of tools, has provided a chair which due to the novel construction of the spindle, no manual operation other than the rotation of the seat is required to raise or lower the seat.

Applicant has provided a novel type of spindle whereby when the seat of the chair is unoccupied the seat may be raised or lowered by simply rotating the seat and when the chair is occupied the rotation of the seat does not in any way affect the height of the seat. Furthermore, applicant has provided a means for reducing the wear on the threaded portion of the spindle by providing a ball bearing thrust washer on the top of the threaded member which will engage a collar on the inner spindle member, secured to the chair seat, which when weight is applied thereto, causes the seat member to swivel upon the ball bearing thrust washer with the inner spindle as an axis, the outer spindle or the threaded member remaining stationary.

Applicant's device comprises two main parts, namely, an inner and an outer spindle. The outer spindle is essentially a steel tube threaded to fit the hub of a standard revolving chair. On the upper end a steel ring is welded to the tube to support a suitable ball-bearing thrust washer. The inner spindle is arranged to fasten to the chair seat and to fit into the central bore of the outer spindle. The lower end of the inner spindle is equipped with a shoulder which engages a helical spring, which is held on the lower end of the inner spindle by means of a threaded member. A special nut with four prongs is fitted to the extreme lower end of the inner spindle and is arranged to engage a plurality of notches on the bottom of the outer spindle.

When the chair is not occupied, the spring will lift the inner spindle and will cause the prongs of the nut to engage the slots in the lower end of the outer spindle. This provides a means for engaging the inner spindle with the outer spin-

dle, thereby causing the outer spindle to be rotated when the inner spindle is rotated. When the chair is occupied, the spring is compressed, thereby throwing the nut with its four prongs out of engagement with the slots in the outer spindle, which frees the inner spindle and allows it to be rotated without rotating the outer threaded spindle which is journaled in the hub of the chair.

Referring now to the drawing:

Fig. 1 is a fragmentary view partially in section of applicant's spindle with the helical spring expanded and the lower portion of the inner spindle engaging the bottom of the outer spindle;

Fig. 2 is a view similar to Fig. 1, except that the spring has been compressed and the lower portion of the inner spindle has been disengaged from the outer spindle;

Fig. 3 is an enlarged fragmentary view of the lower portion of the spindle, as shown in Fig. 1, with the lower portion of the inner spindle shown in full in its engaged position and dotted in its disengaged position;

Fig. 4 is a bottom view of Fig. 3;

Fig. 5 is a side elevation of a chair equipped with applicant's novel type of spindle; and

Fig. 6 is a fragmentary view similar to Fig. 5 except that the spindle is located in the center of the seat.

With reference to Figs. 1, 2 and 3, applicant's improved chair spindle comprises an outer spindle 10 and an inner spindle 11, the outer spindle having a central bore throughout its entire length of sufficient diameter to allow the spindle 11 to revolve freely therein. The outer spindle 10 has secured to its upper end a ball-bearing thrust washer 12, the upper surface 13 of which projects slightly above the end 14 of the outer spindle 10. This provides a bearing surface at the upper end of the outer spindle 10. Located on the lower end of the outer spindle 10 and cut into the wall thereof are a plurality of notches 15. These notches are preferably square in shape and extend up a short distance into the outer spindle. The outer spindle 10 is provided on its exterior with the threads 16 which engage the threaded hub member 17 in the well known manner as shown in Fig. 5.

The inner spindle 11 which is slidably and rotatably mounted in the longitudinal bore of the outer spindle 10 is provided at its upper end with a shoulder or flange 18 which is secured to the bracket 19, which in turn is secured to the under side of the chair seat 20 in the usual manner.

The lower end of the inner spindle 11 is reduced in diameter as shown at 21 (Fig. 3) to provide a shoulder 22 and a suitable mounting means for the helical spring 23. The end 24 of the inner spindle 11 passes through the bushing or guide member 25, which is secured on the interior of the outer spindle 10 in its lower end by means of the threaded portion 26. The spring 23 is thereby confined on the reduced portion of the inner spindle 11 between the shoulder 22 and the bushing 25.

Fixedly secured to the end 24 of the inner spindle 11 is a collar 27. This collar is provided with four upwardly extending prongs or teeth 28. These prongs or teeth are arranged to mesh with the notches 15 as shown in Fig. 3 and are held in mesh with said notches by means of the spring 23 when it is expanded and out of mesh when the spring is compressed.

As shown in Figs. 1 and 2, the inner spindle 11 is secured to the seat 20 by means of the bracket 19. In Fig. 1, the seat 20, inasmuch as there is no weight thereon, is raised slightly so that the flange or collar 18 is not in contact with the thrust washer 12. Thus, due to the tension of the spring 23, the teeth 28 of the collar 27 mesh with the notches 15 on the lower end of the outer spindle 10 and hold the flange 18 out of engagement with the thrust washer 12.

Due to the collar 27 being secured to the bottom of the inner spindle 11 and held into engagement with the lower end of the outer spindle 10 and said inner spindle being secured to the chair seat 20, the rotation of said chair seat will cause the rotation of the outer spindle 10, and inasmuch as the outer spindle is screw-threaded into the hub 17 this rotation will cause the seat 20 of the chair to raise or lower, depending upon the direction of rotation.

With reference to Fig. 2, in this view sufficient weight has been applied to the chair (for example, by an occupant) to compress the spring 23 and disengage the collar 27 with its teeth 28 from the notches 15 thereby removing the connection between the inner and outer spindle and allowing the chair seat 20 to revolve freely on the thrust washer 12 without affecting the height of the chair.

The spindle for revolving chairs as designed by applicant allows the height of the chair to be adjusted very readily by merely revolving the seat when the chair is unoccupied and allows the chair to be rotated when it is occupied without affecting the height.

What is claimed is:

1. A revolving chair comprising a seat portion and a plurality of supporting legs, an internally threaded hub member secured to said legs, a hollow spindle in threaded engagement with said hub, a seat supporting spindle rotatably mounted in said hollow spindle and projecting a short distance beyond the end thereof, said seat supporting spindle having at its lower end a reduced diameter portion, a helical spring mounted on said reduced portion one end of which engages a shoulder on said seat supporting spindle and the other end engaging a bushing secured to the interior of the hollow spindle, and a member on said seat supporting spindle engaging the lower portion of said hollow spindle, said spring exerting pressure to maintain this engagement.

2. A revolving chair comprising a seat portion and a plurality of supporting legs, an internally threaded hub member secured to said legs, a hollow spindle in threaded engagement with said hub, a seat supporting spindle rotatably mounted in said hollow spindle and projecting a short distance beyond the end thereof, said seat supporting spindle having at its lower end a reduced diameter portion, a helical spring mounted on said reduced portion one end of which engages a shoulder on said seat supporting spindle and the other end engaging a bushing secured to the interior of the hollow spindle, and a member having a plurality of raised portions thereon secured to the lower end of said seat supporting member, said raised portions adapted to engage notches in the hollow spindle when the spring is expanded and to be disengaged when said spring is contracted.

BERNHARD M. BOUMAN.