M. L. MacRAE.

ADJUSTABLE SUPPORT FOR CHAIRS, STOOLS, &c.

APPLICATION FILED JULY 5, 1913.

1,114,896. Patented Oct. 27, 1914.

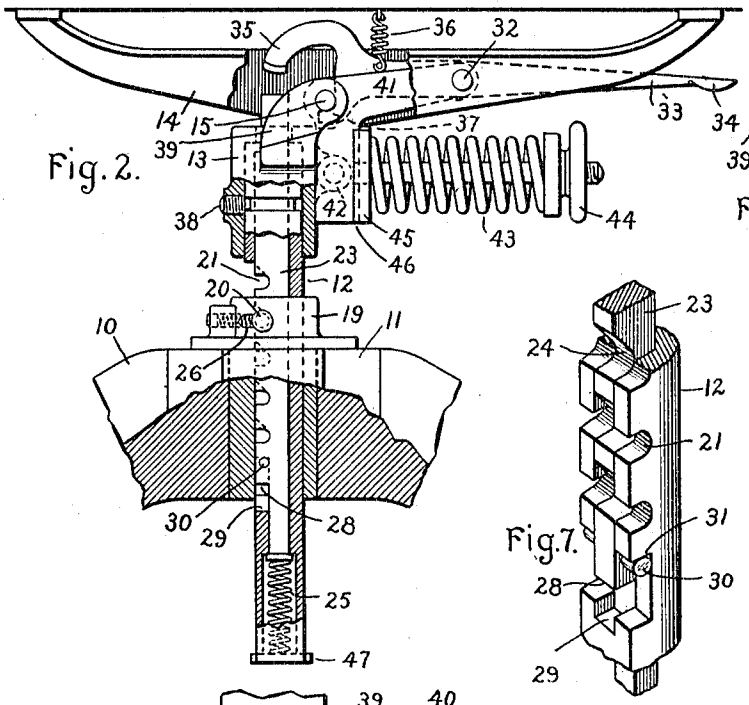


Fig. 2.

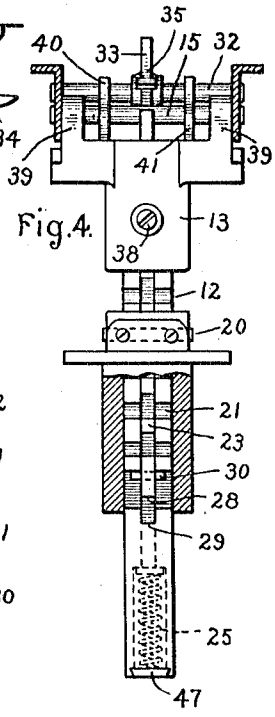


Fig. 4.

Fig. 7.

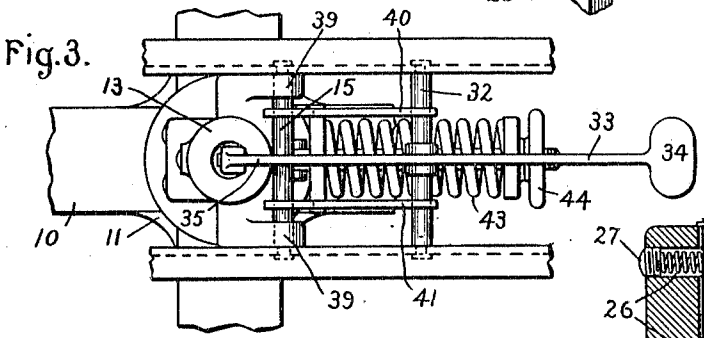


Fig. 3.

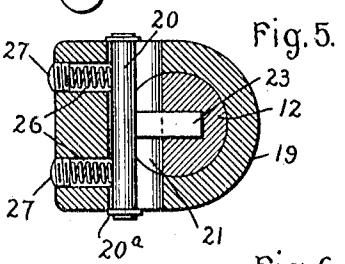


Fig. 5.

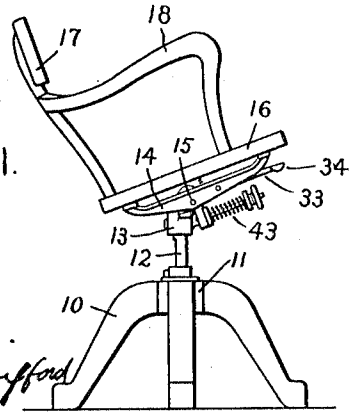


Fig. 1.

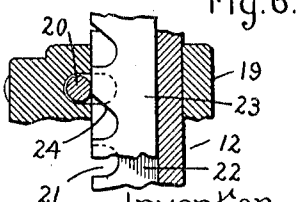


Fig. 6.

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UNITED STATES PATENT OFFICE.

MUNGO L. MacRAE, OF SCHENECTADY, NEW YORK, ASSIGNOR OF ONE-THIRD TO GEORGE C. REILLEY AND ONE-THIRD TO LOUIS G. BANKER, OF SCHENECTADY, NEW YORK.

ADJUSTABLE SUPPORT FOR CHAIRS, STOOLS, &c.

1,114,896. Specification of Letters Patent. Patented Oct. 27, 1914.

Application filed July 5, 1913. Serial No. 777,507.

To all whom it may concern:

Be it known that I, MUNGO L. MACRAE, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Adjustable Supports for Chairs, Stools, &c., of which the following is a specification.

The present invention relates to adjustable supports for the seats of chairs, stools, and like objects, and has for its purpose to improve and simplify the construction of such devices whereby their initial cost may be reduced and the liability of their getting out of order while in use decreased to a minimum.

For a consideration of what I believe to be novel and my invention, attention is directed to the accompanying description and claims appended thereto.

In the accompanying drawing which illustrates one of the embodiments of my invention, Figure 1 is a view in side elevation of an arm chair in a tilted position; Fig. 2 is an enlarged view partly in section and partly in elevation of the spindle and parts associated therewith; Fig. 3 is a plan view of the same; Fig. 4 is view taken at right angles to that of Fig. 2; Figs. 5 and 6 are sectional detail views of the locking pawl and coöperating parts; and Fig. 7 is a perspective view of the spindle and pawl releasing actuator.

Referring to Fig. 1 I have shown what is commonly termed a swivel office chair. It comprises a base having four legs 10 and a standard or holder 11 to which the legs are secured. The standard is provided with a central opening to receive the spindle 12 which is adjustable vertically therein but is held against rotary movement as will appear later. On the top of the spindle is a socket 13 to which a frame 14 is attached by the horizontal pivot 15. The frame is secured to the under side of the chair bottom or seat 16 by screws or other means. The seat or bottom may be of any suitable or well known construction. It is provided with the usual back 17 and arms 18. My invention is not, however, limited to the particular style of chair shown since it is of general application.

Referring to Fig. 2, the standard is provided with a central opening for the spindle 12; four equally spaced recesses to receive the legs 10 and a top plate 19 containing a horizontally disposed pawl 20 that serves to hold the spindle 12 in any desired vertical position. On the under side of the plate 19 and formed integral therewith is a cylindrical member containing a vertical opening corresponding in shape and size to the spindle 12. The spindle is made round with a flattened face to prevent it from turning within the cylindrical member and has notches 21 in said face. These notches may be of any suitable shape and size but I prefer to make them relatively large with round bottoms so that they can be found in the spindle when the latter is cast. The number of notches is not material. They should be close enough together to afford reasonable vertical adjustment of the chair but should be far enough apart to leave plenty of metal between them. If desired the spindle can be made out of cold rolled stock and the notches cut therein by a machine operation. The spindle has a longitudinal slot or groove 22 therein to receive the pawl releasing actuator 23, the latter having a plurality of teeth 24 forming cams whose pitch distance is the same as the notches in the spindle. There should be one tooth or cam 24 for each pawl receiving notch in the spindle, and at least one face of each cam should be capable of forcing the pawl 20 out of the notches 21, as by a wedging action. The actuator or toothed rod is movable in a vertical direction and is guided on both sides and in the rear by the walls of the groove or slot in the spindle which serve to prevent bending thereof. It is normally held in the raised position as shown in the various figures by the coiled compression spring 25 so that the slots between its teeth or cam faces 24 will register with the notches in the spindle thereby permitting the pawl 20 to be seated and hold the parts in position. The pawl may be made in a variety of ways but I prefer to make it of round stock and press it into the notches in the spindle by one or more, usually two, coiled compression springs 26 contained in holes in the top plate 19 and held under stress by the screws 27. It is held against longitudinal movement by collars 20^a at its ends. The lower end of the actuator has a shoulder 28 that strikes a stop 29 on the spindle to limit its

downward movement. It is also provided with a pin 30 which strikes a shoulder 31 on the spindle to limit its upward movement due to the action of spring 25. Normally the pin and shoulder are in contact.

The means for moving the actuator will now be described: Attached to the bottom of the chair or stool are substantially parallel frame pieces 14 made out of fairly heavy sheet stock bent to the proper shape. Connecting the frame pieces is a horizontal pin 32 forming a fulcrum for the lever 33, the latter having a handle 34 which projects toward the front edge of the chair where it can easily be grasped by the chair user and moved upwardly when it is desired to raise or lower the seat. The inner end of the lever is provided with a projection or finger 35 which when depressed strikes the top of the actuator 23 and moves it downward until the shoulder 28 strikes the stop 29 on the spindle. This causes the particular tooth or cam 24 adjacent the pawl 20 to force it out of its then registering notch in the spindle as shown in Fig. 6. The same movement also causes all of the other teeth or high parts on the actuator 23 to move to positions registering with the other notches in the spindle. To state the matter in another way, the high parts on the actuator have been moved into alinement with the low parts in the spindle, and as a net result the spindle, actuator and chair seat can be moved freely up or down as a unit so long as the user continues to apply upward pressure to the handle 34, the pawl 20 being prevented from entering any of the notches. When the user has adjusted the seat to the desired height he releases the handle 34 and the spring 25 moves the slots in the actuator into register with the notches in the spindle and the pawl is then free to enter the first notch presented. It will be noted that the natural act of grasping the seat to move it up or down is the same act that is required to move the handle 34. This simplifies the matter of adjustment and makes for simplicity.

In order to keep the hand lever 33 out of engagement with the actuator a spring 36 is provided, and to limit the upward movement of the lever a stop 37 thereon is arranged to engage some fixed part, such as the main fulcrum pin 15 on which the chair seat may be tilted.

The means for permitting the chair to swivel and also be tilted without interfering with the vertical adjusting means will now be described: On the top of the spindle is a socket 13 mounted to turn freely thereon, a screw 38 entering a groove in the spindle and preventing longitudinal separation. The socket has ears 39 supporting the fulcrum 15. Situated on opposite sides of the vertical axis of the socket are two L shaped plates or punchings 40 and 41. The right hand ends of these plates are perforated to receive the pin 32 which in addition to acting as a fulcrum for the lever 33 acts as an attaching means for said plates. The plates are also perforated to receive the main fulcrum 15. On the socket is found an ear to receive the inner end of an eye bolt 42, the outer end of which is surrounded by a heavy coiled compression spring 43 and has a spring adjusting nut 44. The inner end of the spring rests on a movable abutment 45, the rear face of which has two parallel grooves 46 to receive the downwardly extending parts of the plates 40 and 41. By making the plates L shaped and arranging them as described a structure of great strength and rigidity is provided and one that is simple and cheap.

In order to form a fixed abutment for the actuator lifting spring 25, Fig. 2, a transverse dovetail slot is cut in the spindle and filled with a short piece 47. This also acts as a stop to prevent the spindle from being accidentally pulled out of the standard 11.

When the user desires to adjust the chair seat up or down, he grasps the seat and handle 34 and moves them toward each other, at the same time relieving the seat of his weight. This depresses the actuator 23 and a cam face 24 moves the pawl 20 out of its coöperating notch and the seat may then be elevated or depressed as desired. When the desired height is reached the user releases the handle 34 and the actuator 23 is pressed upward by the spring 25 to release the pawl 20 and the latter enters the first notch in the spindle presented to it.

My improved arrangement possesses the advantage of simplicity, strength and low first cost. The parts are so designed that very little machine work of any character is required. Further in so far as it is possible I utilize commercial shapes or bars thereby cutting down the cost of material. The parts are of such character that if desired they can readily be cast, and when so made can be assembled practically without finish or machine operation.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a device of the character described, the combination of a suitably supported standard, a spindle that extends vertically through the standard and is provided with a longitudinal slot and transverse notches,

a sliding pawl-releasing device located in the slot and guided on both sides and in the rear, said device having teeth of the same pitch distance as the notches, a pawl carried by the standard and arranged to normally occupy the notches and the slots between said teeth, a seat mounted on the spindle, and means for moving the pawl-releasing device longitudinally to cause its teeth to force the pawl out of the notches and at the same time to register with the notches to prevent the pawl from entering until said device is released by said means.

2. In a device of the character described, the combination of a suitably supported standard, a plate mounted thereon and containing an opening, a spindle that enters the opening and is provided with notches, a pawl carried by the plate and arranged to enter any one of the notches in the spindle, a sliding actuator located in the spindle and guided thereby, said actuator having teeth whose pitch distance is the same as the notches, one side of each tooth being beveled to form a cam, a socket on the spindle, a seat carried thereby, and a lever pivotally supported on the socket and so arranged when moved as to strike the top of the actuator and move it longitudinally to cause one of its teeth to force the pawl out of its cooperating notch and hold it while the spindle and seat are moved bodily up or down.

3. In a device of the character described, the combination of a standard, a seat supporting spindle provided with notches, an actuator with cam-shaped teeth, a pawl on the standard adapted to enter the spindle notches to support and lock the spindle and actuator in a supporting position, and means for moving the teeth of the actuator into register with the notches of the spindle to release the pawl and allow for the adjustment of both the spindle and actuator as a unit.

4. In a device of the character described, the combination of a standard, a seat supporting spindle provided with notches, an actuator with cam-shaped teeth, a slidable and spring controlled pawl on the standard adapted to enter the spindle notches to support and lock the spindle and actuator in a supporting position, means for limiting the movement of the actuator with respect to the spindle, and manual means for moving the teeth of the actuator into register with the notches of the spindle to release the pawl and allow for the adjustment of both the spindle and actuator as a unit.

5. In a device of the character described, the combination of a standard, a seat supporting spindle provided with notches, an actuator with cam-shaped teeth, a spring controlled pawl on the standard adapted to enter the spindle notches to support and lock the spindle and actuator in a supporting position, means for limiting the movement of the actuator with respect to the spindle, means for moving the teeth of the actuator into register with the notches of the spindle to release the pawl and allow for the adjustment of both the spindle and actuator as a unit, a seat support mounted to turn but secured to the spindle, and a spring mounted in the spindle in engagement with the actuator for returning it to a locking position upon the release of the actuator moving means.

In witness whereof, I have hereunto set my hand this 21st day of April, 1913.

MUNGO L. MacRAE.

Witnesses:
HELEN ORFORD,
RICHARD G. POVEY,
MARTHA REXFORD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."