No. 632,775. Patented Sept. 12, 1899.

H. W. BOLENS.

CHAIR.

(Application filed Dec. 24, 1898.)

(No Model.)

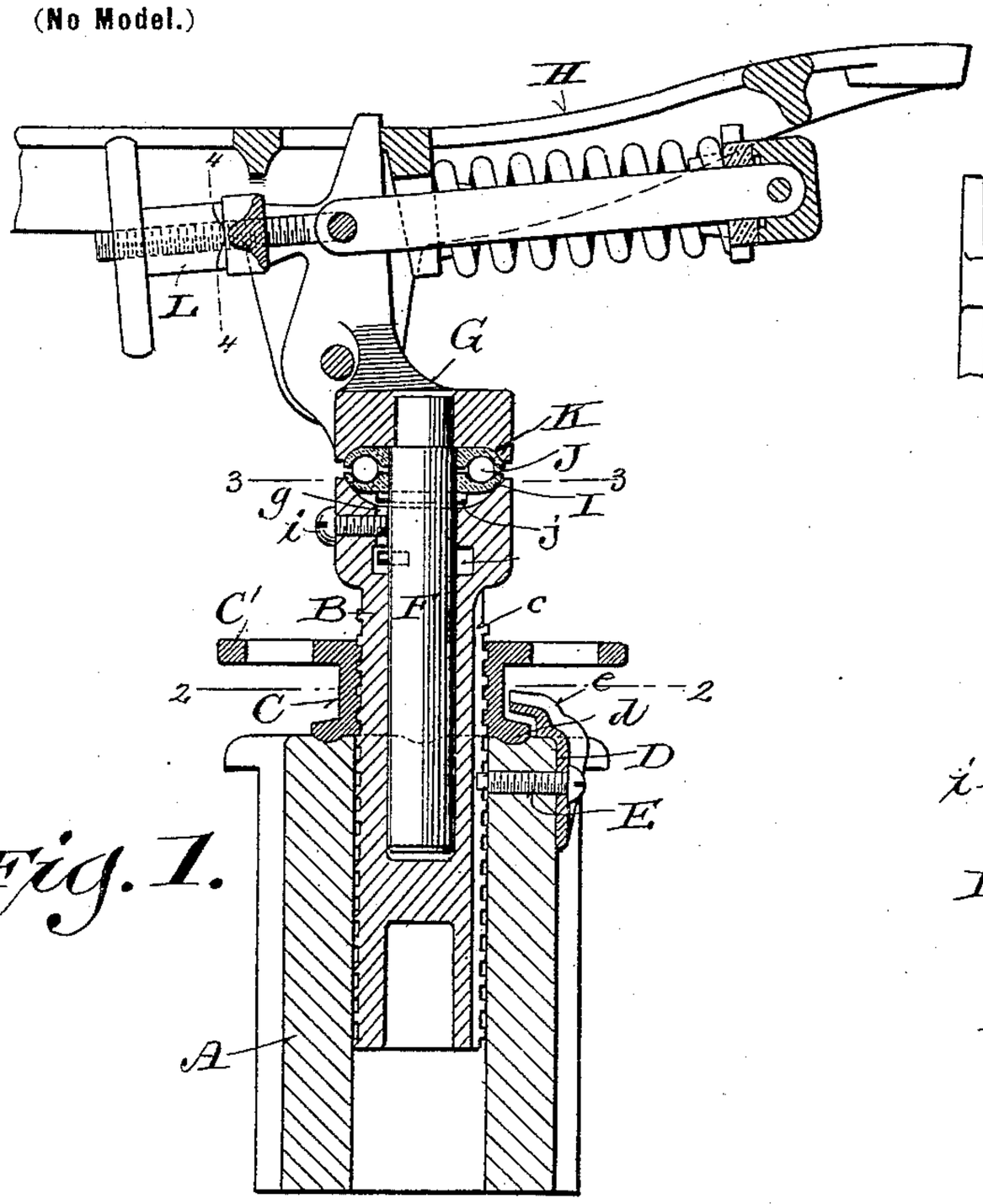


Fig. 1.

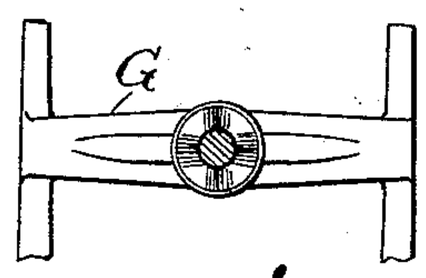


Fig. 4.

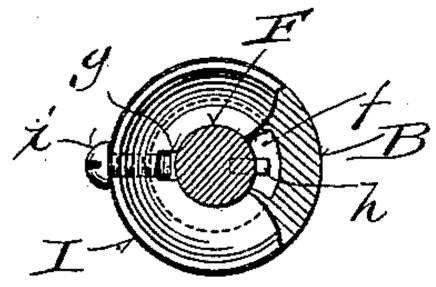
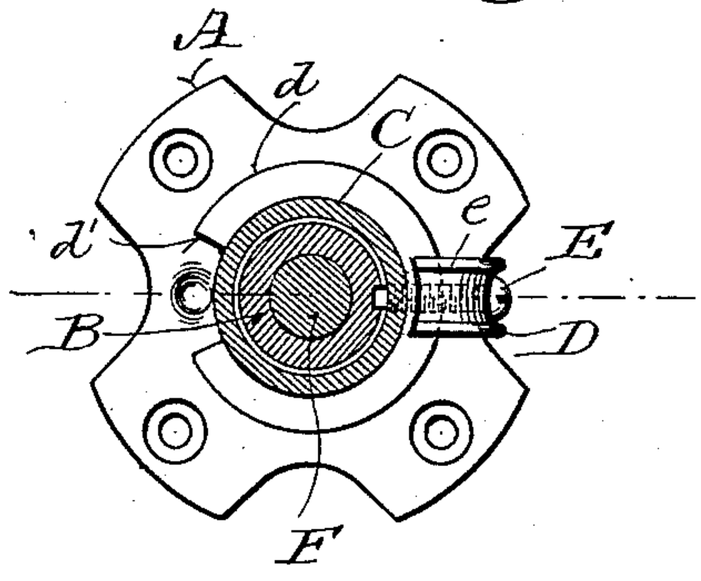


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

HARRY W. BOLENS, OF PORT WASHINGTON, WISCONSIN.

CHAIR.

SPECIFICATION forming part of Letters Patent No. 632,775, dated September 12, 1899.

Application filed December 24, 1898. Serial No. 700,246. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. BOLENS, a citizen of the United States, and a resident of Port Washington, in the county of Ozaukee and State of Wisconsin, have invented certain new and useful Improvements in Chairs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to improve that class of chairs organized to have vertically-adjustable and pivotal spring-controlled tilt seats. Therefore it consists in certain advantageous structural peculiarities of the metal work for such a chair, as is hereinafter particularly set forth with reference to the accompanying drawings, and subsequently claimed.

Figure 1 of the drawings represents a vertical transverse section of an assemblage of parts constituting my improved metal work for a vertically-adjustable and pivotal spring-controlled tilt-seat chair, certain features of the same appearing in elevation; Figs. 2 and 3, plan views, partly in horizontal section, on the planes respectively indicated by lines 2 2 and 3 3 in the first figure; and Fig. 4, a detail elevation, partly in transverse section, on the plane indicated by line 4 4 in said first figure.

Referring by letter to the drawings, A indicates a chair-base casting having a smooth-bore devoid of the spline generally provided for engagement with a longitudinal groove *c* in a screw-threaded spindle B, that has free play in said bore. Like in Patent No. 562,387 of June 23, 1896, a nut C engages the screw-thread of the spindle above the base-casting, and an annular flange *d* of the nut is overlapped by the head *e* of a guard acting to prevent the nut and spindle from being lifted away from the aforesaid base-casting. In the aforesaid patent the guard is shown as an integral part of the base-casting; but practice has demonstrated its liability to fracture, whereby said base-casting is rendered worthless in so far as provision is had to prevent its separation from the spindle when lift is had upon a chair of which it forms a part, and the substitution of a new base-casting requires an expenditure of considerable time and skilled labor. To remedy the defect herein noted, as well as to provide for ready inexpensive substitution of one guard for another in case of fracture, I make the guard as a separate piece and secure it to the base-casting by means of a set-screw E, herein shown as made long enough to have the inner end thereof loosely engage the spindle-groove and serve in place of the spline heretofore made integral with said base-casting in the bore of same, it being preferable to strip the thread from the set-screw where it enters said spindle-groove.

As a matter of detail the detachable guard is shown as a bracket made to fit snug against the top and outer vertical surface of the base-casting between leg-sockets of the same, and while it is preferred to make the connecting set-screw as herein set forth for the purpose specified it is wholly within the scope of my invention to utilize similar guards in connection with smooth-bore base-castings having spindle-groove splines integral therewith, as in the patent aforesaid, and although the nut C is shown above the base-casting it is practical to arrange it below the same, the guard in such a case being correspondingly arranged to keep said nut in working position.

Flange *d* of nut C is herein shown provided with a notch *d'* of sufficient dimensions as to clear the head *e* of guard D, and the parts thus far described being in the arrangement shown it is practical by bringing the flange-notch into register with said guard to take away said nut with the spindle and all above the aforesaid nut when a chair embodying my improvements is to be shipped knockdown, this being one of the novel features of my invention, whether the aforesaid guard is integral with the base-casting or detachably connected thereto.

The nut is provided with a hand-wheel C' to facilitate rotation, whereby spindle B is caused to have direct vertical adjustment because of its groove being engaged by a stationary spline, and to prevent said spindle from working down incidental to movement of a person occupying a chair of which it forms a part the opposing ends of said nut and the base-casting are shown made with intermatching irregularities to thereby lock

the aforesaid nut against automatic rotation; but this latter feature is old in the patent aforesaid.

The spindle B herein shown has its upper end provided with a socket for the depending pivot F of the standard G, to which the chair-seat spider H is pivotally connected. The spindle-head is shown provided with an annular chamber *f*, communicating with the aforesaid socket, and intercepting the chamber is a vertical channel *g*, also provided in the spindle-head. The channel serves as a passage for a lateral lug *h* on the standard-pivot F, and said channel is closed by inward adjustment of a screw *i*, arranged transversely in the spindle-head above the aforesaid chamber in which the lug is free to rotate. The screw operates to prevent withdrawal of the standard-pivot from the spindle-head should the pivot-lug *h* be in register with the vertical spindle-channel *g* when the chair is lifted by its seat, and said screw may be run in to lock said spindle against rotation. However, this construction and arrangement of parts is similar to what is disclosed in Patent No. 535,348, of March 12, 1895, and it is to be understood that the same results may be had in various ways.

The upper end of the spindle is counterbored to form a seat for a hard-steel cup I and clearance for a pin *j*, the latter having drive fit in a transverse aperture of the standard-pivot F to form supporting-lugs for the cup. Hard-steel balls J are arranged in the cup I, and in contact with these balls is an inverted hard-steel cup K, set in a counterbore of the standard G, whereby an all-hard-metal bearing is formed intermediate of said standard and the aforesaid spindle. Particular attention is called to the fact that I am aware of patents showing hard-metal balls as part of a bearing in chair-iron construction; but in every instance of which I have knowledge there is contact of cast-iron with said balls. Hence detrimental rapid wear must result, this being an objection I have successfully overcome. Various means other than the pin *j* may be employed to prevent separation of the elements of the bearing, and as neither cup of said bearing is made fast to an adjacent part both are free to slip, notwithstanding that they are ordinarily held fast in their respective seats as a result of superimposed weight.

To insure tension adjustment of the spring or springs pertaining to tilt-seat chairs, the opposing surfaces of the standard G and the tension-nut L are waved, as shown in Fig. 1, or otherwise provided with intermatching irregularities, the elevations of one of these surfaces fitting the depressions in the other of said surfaces to thereby lock said nut against automatic rotation.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A chair-base casting, a longitudinally-grooved screw-spindle loose in the casting, a flanged nut on the spindle in opposition to an end of said casting, a guard made separate from the aforesaid casting but arranged therewith to overlap the nut-flange, and a guard-securing set-screw having its inner end engaging the spindle-groove.

2. A chair-base casting, a longitudinally-grooved screw-spindle splined in the casting, a nut on the spindle in opposition to an end of said casting, a notched flange on the nut, and a guard in detachable connection with the aforesaid casting arranged to overlap the nut-flange, the notch in the latter being of sufficient dimensions to clear the head of the guard.

3. A chair-base casting, a longitudinally-grooved screw-spindle in the casting, a spindle-adjusting nut, a guard operative to insure retention of the nut in working position, and a guard-securing device constituting a spline engagable with the spindle-groove.

4. A pivot provided with lugs, a ball-bearing having its cups loose on the pivot and its lower cup against said lugs, a chair-spindle having a counterbored socket for said pivot and lower cup of the ball-bearing, clearance being had in the counterbore for the pivot-lugs, and a seat-standard in loose fit upon the upper cup of said ball-bearing but rigid with the aforesaid pivot.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

HARRY W. BOLENS.

Witnesses:
N. E. OLIPHANT,
B. C. ROLOFF.