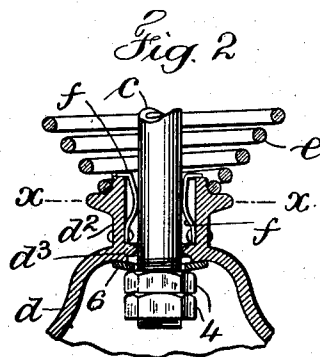
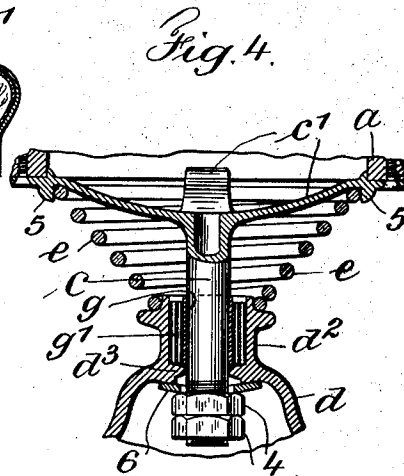
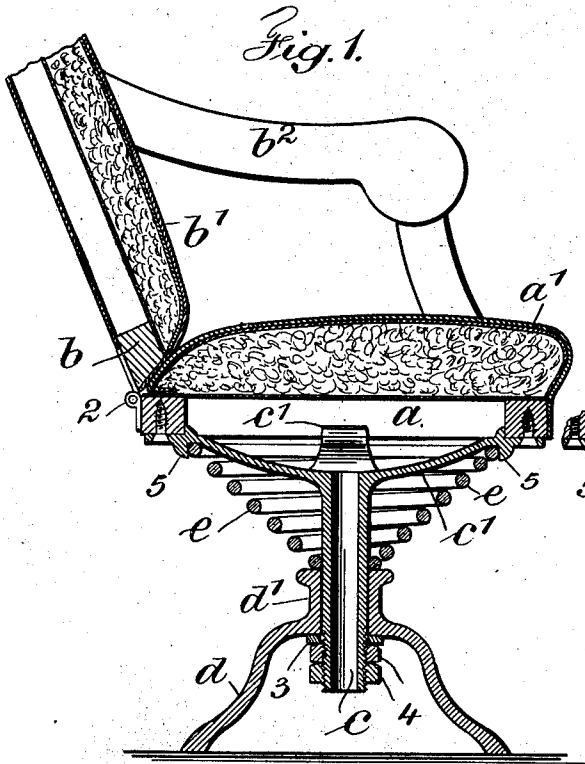


H. A. BATES & H. SERRELL.
NON-VIBRATION CHAIR.
APPLICATION FILED APR. 19, 1911.

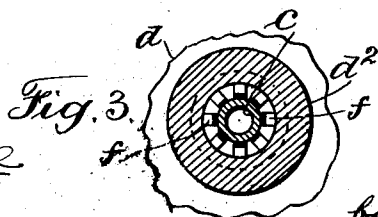
1,058,655.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 1.



Witnesses
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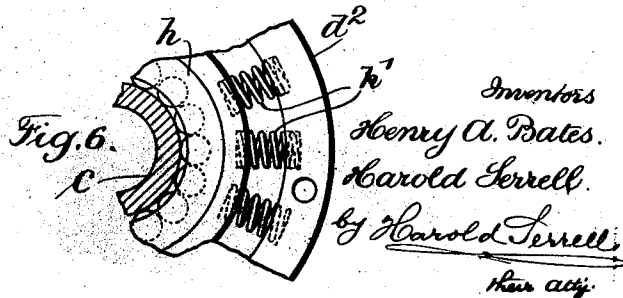
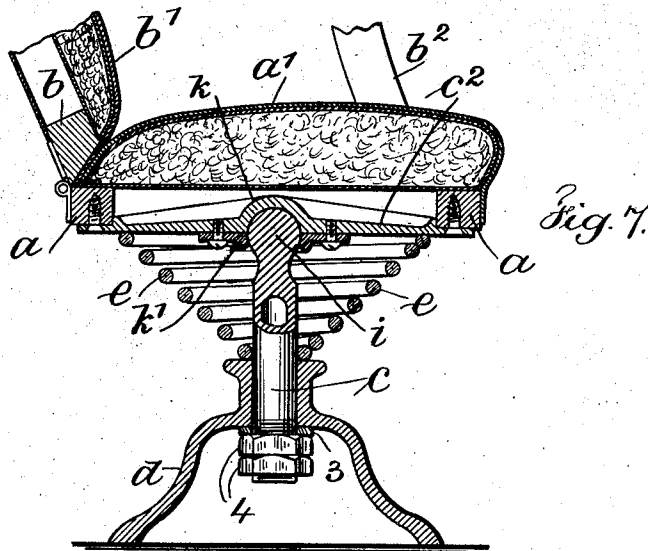
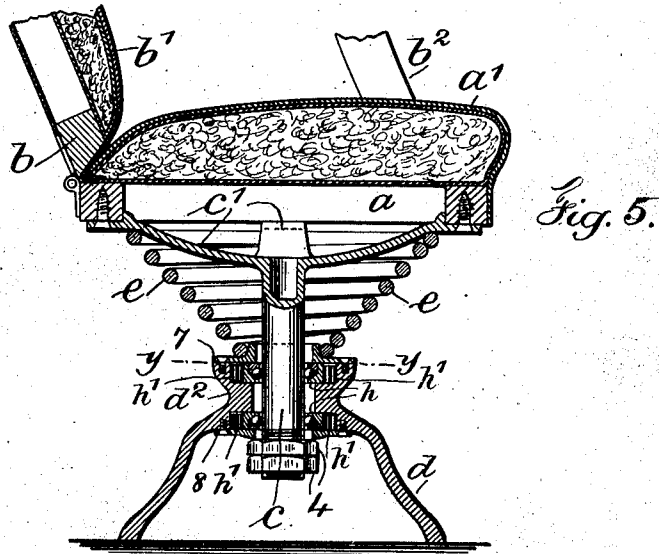


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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NON-VIBRATION CHAIR.

1,058,655.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed April 19, 1911. Serial No. 621,968.

To all whom it may concern:

Be it known that we, HENRY A. BATES, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, and HAROLD SERRELL, a citizen of the United States, residing at Plainfield, in the county of Somerset and State of New Jersey, have invented an Improvement in Non-Vibration Chairs, of which the following is a specification.

Our invention has special reference to such separate chairs or seats as are employed in parlor and other similar special railway cars of the Pullman and Wagner types, with the object of greatly lessening and possibly entirely overcoming the unpleasant and disagreeable vibration communicated through the seat and its support to the occupant and passenger.

Our invention has special application to the fixed or movable single passenger chair or seat and to the fixed revoluble seat.

Our invention comprises means for taking up or compensating vibration regardless of vertical, side or end motion, or whether the passenger is sitting centrally and true on the seat, or is sitting over the edge or reclining in any attitude.

In carrying out our invention and in combination with a suitable support or base and the chair frame, we employ a volute or similar spring and a central vertically disposed pivot-shaft between the support and seat-frame, and means providing for compensating for the tendency of the parts swaying or being diverted in any direction and so to bind. Usually the central pivot shaft will be connected at its upper end to an X-frame or spider of metal and this at its ends be secured to the seat-frame and said shaft passed down through the upper part of the base or pedestal which rests upon or is secured to the floor of the car.

We prefer to employ a volute spring as the smaller part bears on the upper surface of the pedestal and the larger part bears against the under surface of the X-frame or spider. The lower end of the shaft is preferably exteriorly threaded for one or more nuts preferably employed for applying an appreciable pressure and tension upon the spring and means at the upper tubular part of the pedestal or base or upper end of the shaft to compensate for any tendency of the parts to move with the shaft out of a verti-

cal position, or cause a binding thereof from any cause, all of which is hereinafter more particularly described.

Similar letters or numerals of reference refer to similar parts.

In the drawing, Figures 1, 5 and 7 are vertical sections and partial elevations representing forms of our invention. Fig. 2 is a vertical central section and partial elevation and Fig. 3 a sectional plan at the dotted line x, x , of Fig. 2 representing a form of our invention. Fig. 4 is also a vertical central section and partial elevation representing still another form of our invention, while Fig. 6 is a plan at about the dotted line y, y , of Fig. 5 and in larger size illustrating the form of our invention shown in Fig. 5, or a slight modification thereof.

a represents a chair-frame and a^1 the seat thereof. b represents the back-frame and b^1 the upholstered back, b^2 , the arms,—2 representing a hinge for connecting the back-frame to the seat-frame. These parts may be of any well-known or desired construction without in any sense departing from the spirit of our invention.

c is a tubular shaft or pivot-shaft vertically disposed and at its upper end provided with a frame c^1 or spider of several arms which reach out to the seat-frame a and are connected thereto preferably by screws as shown. d is a pedestal or base and d^1 the tubular upper end thereof. This part is usually made circular to rest upon the floor of the car and may be secured thereto by screws. This, however, is not at all material for our invention.

In the figures of the drawing we have illustrated the lower end of the shaft c as screw-threaded and in most instances as provided with a washer and with two nuts 4.

In Figs. 1 and 7, 3 represents a washer. One of these nuts is adapted to apply a tension to the volute spring e while the other nut is only a lock-nut.

The volute spring e rests upon the upper surface of the tubular part d^1 of the pedestal by its smallest convolution and at its upper end and by its largest convolution which comes beneath the frame or spider c^1 the chair of the car is supported. These volute springs should be made to carry a weight of at least two hundred and fifty or three hundred pounds more or less and it is advantageous to apply by tension of the nuts 4

an initial pressure of about fifty pounds upon the spring so as to prevent unnecessary looseness and to steady the seat,—particularly when the car is running. It is therefore quite apparent that the weight of the occupant of a chair in excess of fifty pounds will cause a depression of the chair and increase the tension on the spring and a lowering through the pedestal of the tubular shaft c , and we prefer to form with the frame or spider c^1 lugs 5 coming outside of the larger convolution of the spring to limit its expansive movement.

Fig. 1 shows the simpler form of our invention, in which the chair as a unit with the tubular shaft c and frame or spider c^1 is simply provided with a vertical movement to compensate the weight of the passenger, and where the passenger sits true and easy upon the seat this may be all that is required to take up the vibration. However, should the passenger sit on the edge of the seat or recline therein in such a position as to disturb the center of weight there would likely be a binding action of the tubular shaft c in the tubular upper end d^1 of the pedestal, and to provide for that we have devised several substantially equivalent devices, as follows:—In Figs. 2 and 3, the upper tubular end d^2 of the pedestal is increased in diameter and recessed; the lower portion however, at d^3 being maintained on the contracted area to snugly surround the tubular shaft c , and in the recess formed in the tubular part d^2 there is placed a series of blade springs f advantageously spaced apart, connected at their lower ends to the tubular upper end d^2 , coming with force in contact with the tubular shaft c and at their upper ends overlying the upper end of this tubular member d^2 so as to provide for an oscillation of the tubular shaft so that it may readily assume a position not exactly vertical according to the position of the occupant of the chair, and in this connection we have provided a curved washer 6 so that the center of motion may be about at the curved washer or at the part d^2 of the upper end of the pedestal as a fulcrum.

In Fig. 4 a modification of this form of our invention is illustrated in which the other parts being the same, we have provided a sleeve g around the tubular shaft c and between the same and the interior of the tubular recessed upper end of the pedestal d^2 one or more springs g^1 , which it will be readily seen, performs the same function.

In the form of our invention shown in Figs. 5 and 6, the tubular recessed upper end d^2 of the pedestal is still further enlarged and provided with upper and lower grooves and with top and bottom plates 7 8 which are secured to the top and bottom surfaces of the upper end of the pedestal.

In the grooves thus provided we place an-

nular ball-bearing collars between the outer surface of which and the inner surface of the grooves at the upper end of the tubular portion d^2 are springs h^1 . These springs may be of any desired character, either volute, as shown in Fig. 5, or radially disposed helices, as shown in Fig. 6, either one performing the function of maintaining the annular ball-bearing collars h in the vertical axial center of the chair and causing the tubular shaft thereof to maintain such position. In this connection it is quite apparent that any tendency to divert the tubular shaft c from a true vertical axis is at once taken up by the shifting of the annular ball-bearing collars, one moving in one direction and the other in the opposite direction. It is also apparent that this movement or yielding of the members does not in any way interfere with the resilient action of the volute spring e nor hamper the movements thereof by its yielding function to take up the vibration of the car.

Another form of our invention is shown in Fig. 7, in which the movement of the springs is as shown in Figs. 2, 3 and 4, and the spring-controlled ball-bearing collars as shown in Figs. 5 and 6, where we employ a ball and socket joint,—that is to say, the ballhead i is provided at the upper part of the tubular shaft c and a socket k is provided in the center of the flat frame or spider c^2 ; a plate or half-plate k^1 being provided around the lower portion of the ballhead i and secured to the under surface of the flat frame or spider c^2 for the purpose of holding the spider or frame to the tubular shaft and preventing accidental disengagement. According to this form of our invention,—Fig. 7,—it will be quite apparent, first, that with a nominal pressure of about fifty pounds applied to the volute spring e , the same will be sufficient to at all times maintain the chair in a horizontal plane and will, we believe, be sufficient to prevent any tendency of the extra weight of the back or arms to disturb this position of equilibrium. Second, that any weight of the passenger disposed unequally upon the seat will tend to swing the seat upon the ball and socket joint slightly out in a horizontal plane and this tendency will be in proportion to the weight of the passenger and the compressive force thereof applied to the volute spring e . This tendency, however, is not sufficient to cause any deflection from the vertical axis of the tubular shaft c so that the same, with the weight, will freely pass up and down through the tubular upper end d^1 of the pedestal.

The several forms of our invention herein illustrated and described, we believe to be fully capable of compensating for the direct weight of the passenger and occupant of the seat, as well as for any undue side or

torsional strain that may be applied by the position of the passenger being out of direct center, and that the compensating devices provided therefor will not in any sense interfere with the direct action of the volute spring *e* in preventing the vibration of the car being communicated to the passenger occupying the seat.

We do not limit our invention to the employment of a volute spring,—although we prefer the same,—because any spring interposed between the car seat and the base or pedestal, or arrangement of springs adapted to perform the same resilient function will come within the scope of our invention.

We claim as our invention:

1. The combination with a revoluble car seat, a vertically disposed shaft therefor, and a base or pedestal having a tubular upper end or neck, of a spring interposed between the car seat and the base or pedestal to take up vibration, and means comprising at least in part suitable spring devices located within the upper end or neck of the

base or pedestal and providing or compensating for the tendency of the parts to sway or be diverted in any direction and so binding.

2. The combination with a car seat, of a vertically disposed shaft having a flaring upper part or frame for attachment to the seat, and a base or pedestal having a tubular upper part or neck appreciably larger than the said shaft, and the shaft passing through the neck of the pedestal, a spring interposed between the car seat and the pedestal to take up vibration, and yielding devices in the tubular upper end or neck of the pedestal making a bearing between the same and said shaft, and providing or compensating for a tendency of the parts to sway or be diverted out of a vertical line.

Signed by us this seventh day of April, 1911.

HENRY A. BATES.
HAROLD SERRELL.

Witnesses:

GEO. T. PICKNEY,
E. ZACHARIASEN.