No. 622,861. Patented Apr. 11, 1899.

L. D. PETRE.

BALL BEARING FOR OPERA OR OTHER CHAIRS.

(Application filed Dec. 24, 1897. Renewed Oct. 19, 1898.)

(No Model.)

Fig. 1.

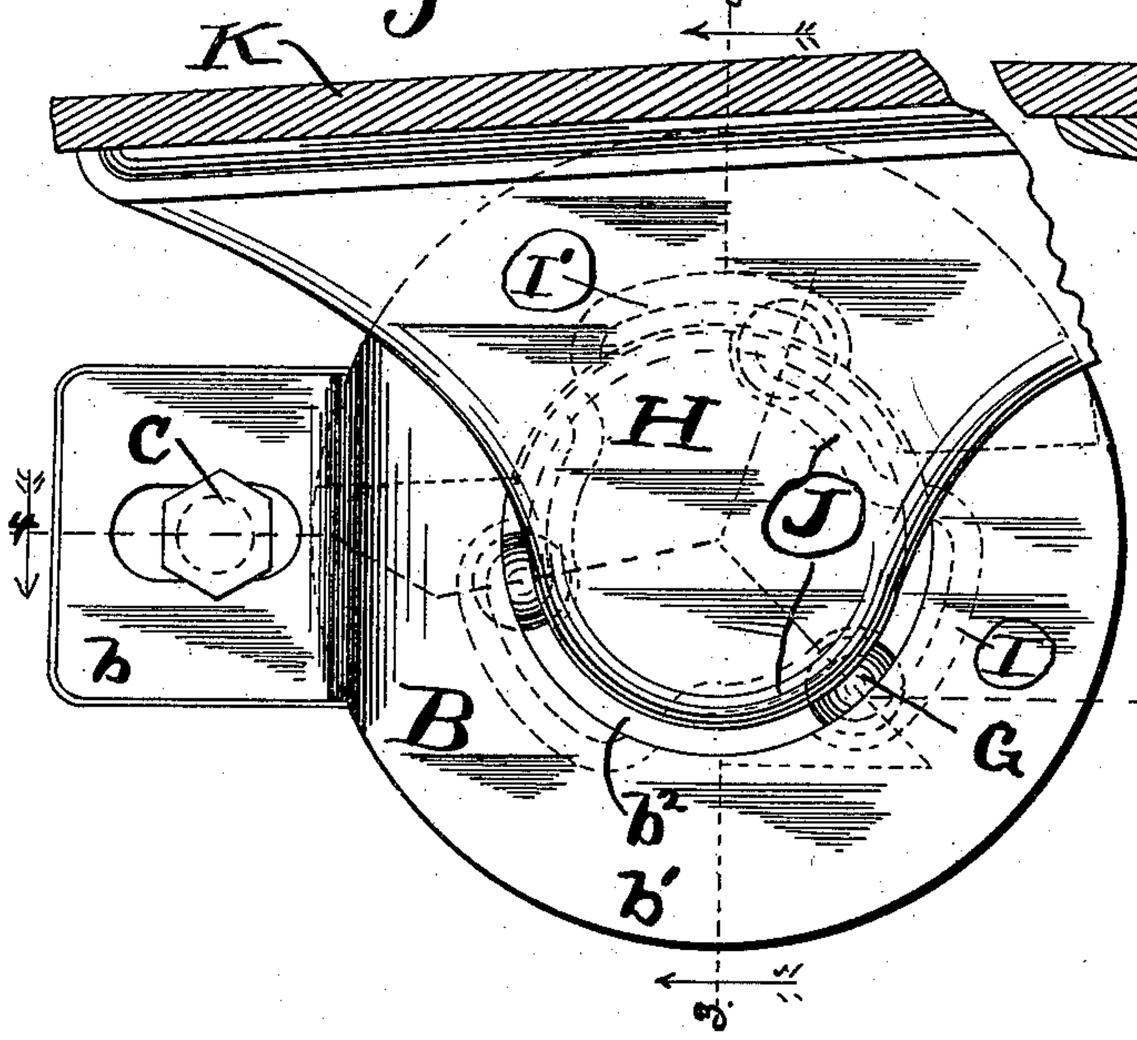


Fig. 3.

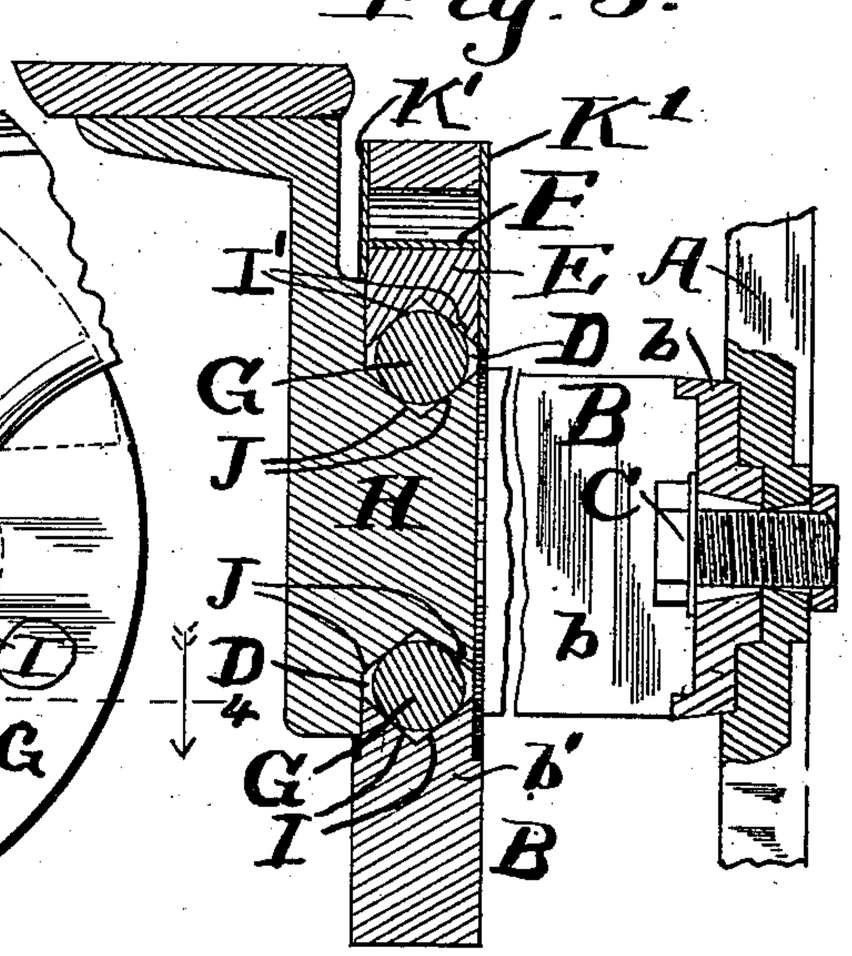


Fig. 2.

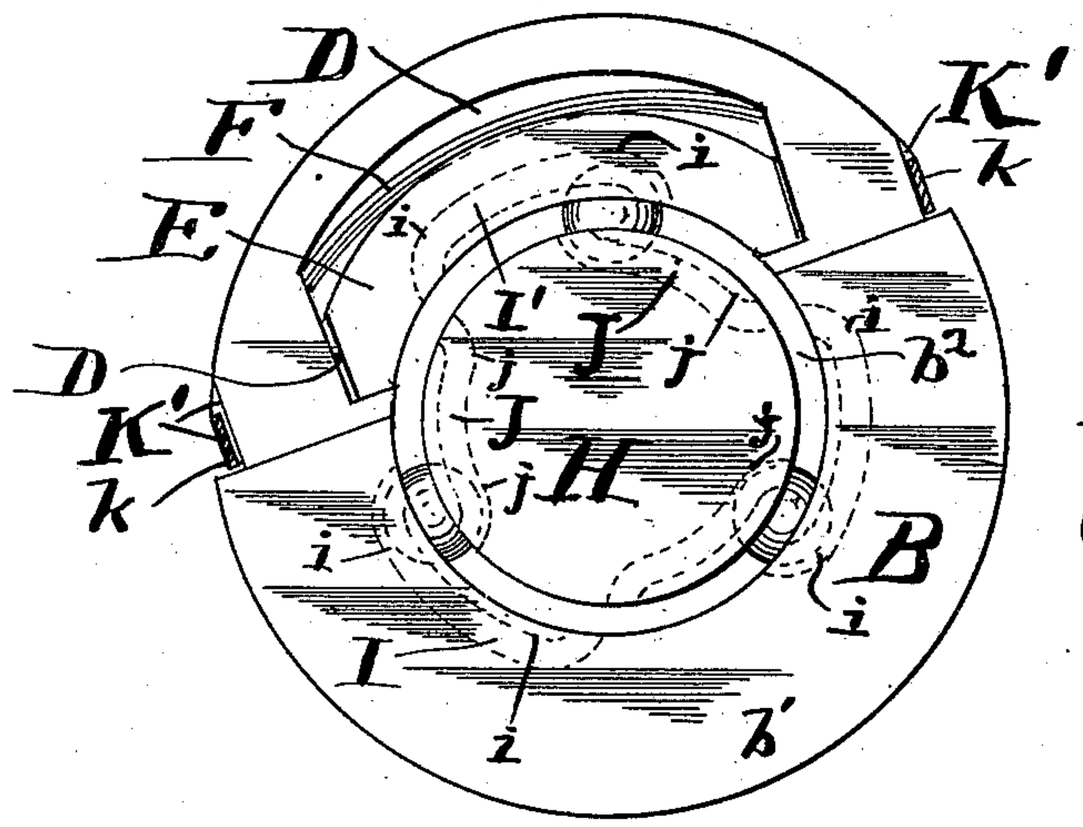
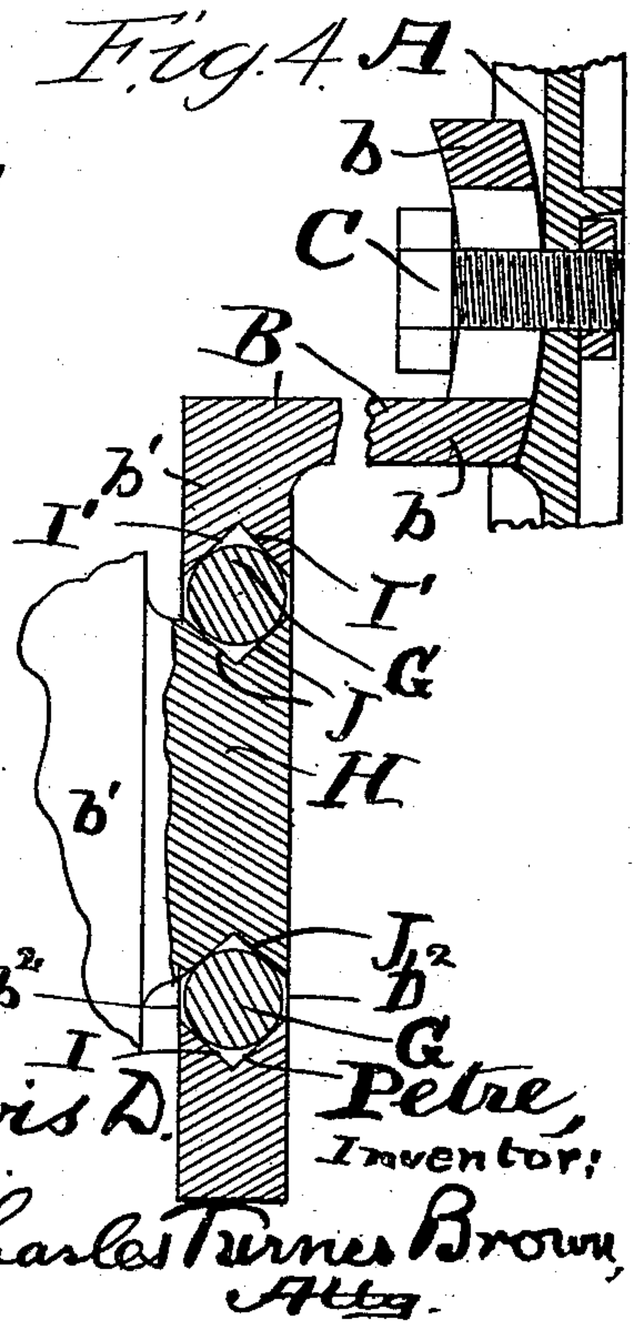


Fig. 4.



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UNITED STATES PATENT OFFICE.

LEWIS D. PETRE, OF CHICAGO, ILLINOIS.

BALL-BEARING FOR OPERA OR OTHER CHAIRS.

SPECIFICATION forming part of Letters Patent No. 622,861, dated April 11, 1899.

Application filed December 24, 1897. Renewed October 19, 1898. Serial No. 694,040. (No model.)

To all whom it may concern:

Be it known that I, LEWIS D. PETRE, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ball-Bearings for Opera or other Chairs, of which the following, when taken in connection with the drawings and reference-letters thereon, forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

This invention relates to bearings for opera and other chairs wherein the seat is designed to be raised into a perpendicular, or nearly so, plane or to be lowered when in use as a seat into a substantially horizontal plane; and the object of this invention is to obtain a ball-bearing which will at all times be operative, not liable to get out of order, which will be noiseless (both in starting and stopping) when operated, and which will be easy of operation, durable, and simple in construction.

In the drawings referred to as forming a part of this specification, Figure 1 is a side elevation of a ball-bearing hinge embodying the invention, showing the rear part of the seat of an opera-chair; Fig. 2, a side elevation of a ball-bearing hinge embodying the invention, with a portion of the immovable part thereof removed to expose to view a movable abutment placed therein and with the several ball-tracks or ball-races indicated by dotted lines; Fig. 3, a vertical sectional view on line 3 3 of Fig. 1, viewed in the direction indicated by the arrows; and Fig. 4, a horizontal sectional view on line 4 4 of Fig. 1, viewed in the direction indicated by the arrows crossing such line.

A reference-letter applied to designate a given part is used to indicate such part throughout the several figures of the drawings wherever the same appears.

A, Figs. 3 and 4, is the standard of an opera-chair.

B is the immovable part of the ball-bearing embodying this invention and comprises part b, (which may be termed the "base" of the immovable part,) secured to standard A by bolt C, and the ball-bearing part b', having opening b^2 therein, which may be termed the "track-carrying" portion thereof.

D is a recess in part b' of immovable part B, and E is a movable abutment in recess D.

F is a spring yieldingly holding movable abutment E forward against the ball G, interposed between it and movable part H of the ball-bearing. Such forward position of the movable abutment E is hereinafter termed the "operative" position thereof.

I I are tracks in the circumferential face of recess b^2. Tracks I I are separated from each other and throughout the main part thereof are concentric to the main part of the tracks J J J on the periphery of the movable part H.

I' is a ball-bearing track on the face of movable abutment E, adjacent to the movable part H. Tracks I I are oppositely placed to two of the tracks J J, and track I' is oppositely placed to the remaining one of the tracks J and so that when the interposed balls G G G are at one end of the tracks J J J such balls are at the other end of the tracks I I I', respectively, as is clearly indicated in Fig. 2. The several tracks I I I' at the ends thereof approach the ends of the tracks J J J, so that as the movable part H is turned in raising or lowering the seat K (see Fig. 1) the pinching of the balls G G G between the several tracks will gradually stop the turning thereof, making the ball-bearing practically noiseless, as well as serving to limit the movement of the movable part in its turning.

I prefer to have the several tracks V-shaped, it being practical to place the balls G G G in position between the movable part H and immovable part B because of the movable abutment E, (after which the spring F can be inserted,) and such V-shaped tracks being effective to prevent lateral movement of movable part H relative to immovable part B except as spring F is retracted or made to give.

Movable abutment E in addition to permitting the interposing of the balls G G G, as stated, is forced against the ball G, interposed between it and the movable part H, by the spring F, the tension of such spring being sufficient to hold movable abutment E in operative position, and thereby the pressure on the several interposed balls is equalized,

while at the same time any inequality in the tracks does not render any of the parts inoperative, such spring F yielding to permit sufficient backward movement of the movable abutment to overcome the inequality. In practice it is found that by this means a ball-bearing can be constructed and put together, where the several parts B and H are of cast-iron, without having any "machine work," as it is termed, done thereon.

K′ K′ are face-plates connected together by bars *k k*, (see Fig. 2,) which I prefer to use to prevent movable abutment E and spring F from coming out of the recess D, particularly before the opera or other chair having the ball-bearing embodying my invention placed therein is set up; but such face-plates are not essential to the bearing or to the successful working thereof.

In the operation of this ball-bearing as the seat K is turned up or down the balls traverse from one end to the other of the respective tracks, being at all times held under working pressure by the spring F yieldingly holding movable abutment E in operative position, as hereinbefore described, and the several balls being pinched by the approaching of the ends of the tracks together, as at *i i* and *j j*.

To assemble the bearing, the balls G G are placed in tracks I I, (or the tracks J J opposite thereto,) the movable part H inserted in the opening b^2 of immovable part B, and then the ball G interposed between the movable part H and the movable abutment E and such movable abutment placed in recess D, after which the spring F is put in place and (if used) the face-plates K′ K′ are fastened in place on immovable part B.

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

1. The combination of a movable part to which the seat of an opera or other chair is secured, such movable part having peripheral tracks thereon for balls, an immovable part which may be secured to a standard, a movable abutment in such immovable part, a spring yieldingly holding such movable abutment in an operative position, the immovable part and the movable abutment therein having tracks for balls oppositely placed to the peripheral tracks, the several tracks being separated from each other and at the ends thereof the oppositely-placed tracks approaching each other to pinch the balls at each end of the movement of the movable part, with balls interposed between the movable part and the immovable part and a ball interposed between the movable part and the movable abutment; substantially as described.

2. The combination of a movable part to which the seat of an opera or other chair can be secured, such movable part having V-shaped peripheral tracks thereon for balls, an immovable part which may be secured to a standard, a movable abutment in such immovable part, a spring yieldingly holding the movable abutment in an operative position, the immovable part and the movable abutment having, respectively, tracks therein for balls such tracks being V-shaped and oppositely placed to the peripheral tracks, balls interposed between oppositely-placed tracks, such oppositely-placed tracks being concentric in the main part thereof and approaching each other at the ends to limit the turning of the movable part; substantially as described.

3. The combination of a movable part having V-shaped peripheral tracks, separated from each other, means for securing the seat of an opera or other chair to such movable part, an immovable part having a center opening therein of larger diameter than the diameter of the periphery of the movable part, a movable abutment set in a recess in the immovable part, such recess having shoulders against which the movable abutment can, at the ends thereof, be alternately forced, a spring yieldingly holding the movable abutment in an operative position, the immovable part and the movable abutment having, respectively, tracks therein oppositely placed to the peripheral tracks in the cylindrical face of the center opening, such tracks being separated from each other and one of such tracks being on the movable abutment, balls interposed between oppositely-placed tracks, and such oppositely-placed tracks being concentric in the main part thereof and approaching each other at the ends to limit the movement of the movable part; substantially as described.

LEWIS D. PETRE.

In presence of—
CHARLES TURNER BROWN,
ISAAC G. PEETREY.