

No. 708,163.

Patented Sept. 2, 1902.

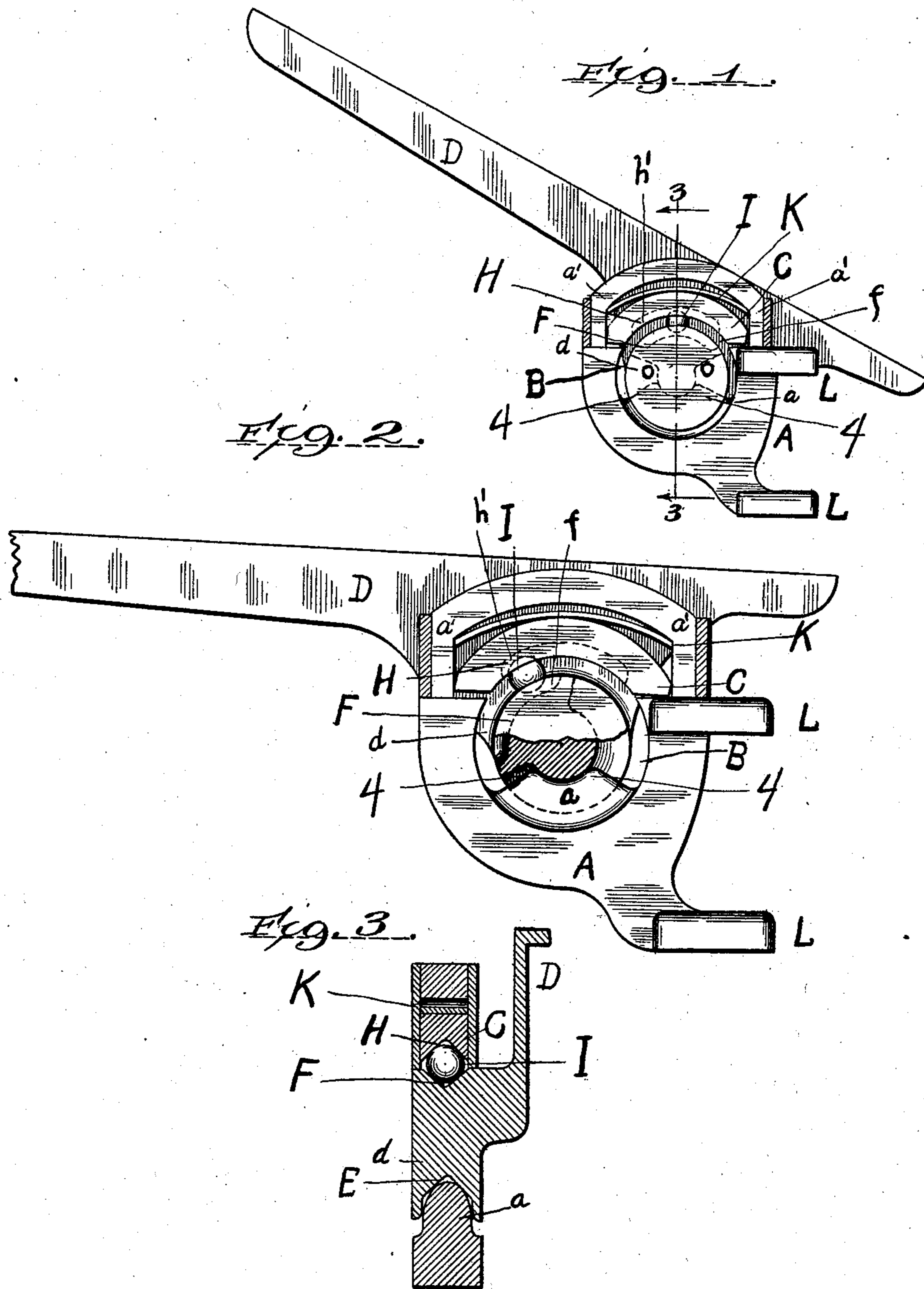
L. D. PETRE.

SEAT HINGE.

(Application filed May 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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By

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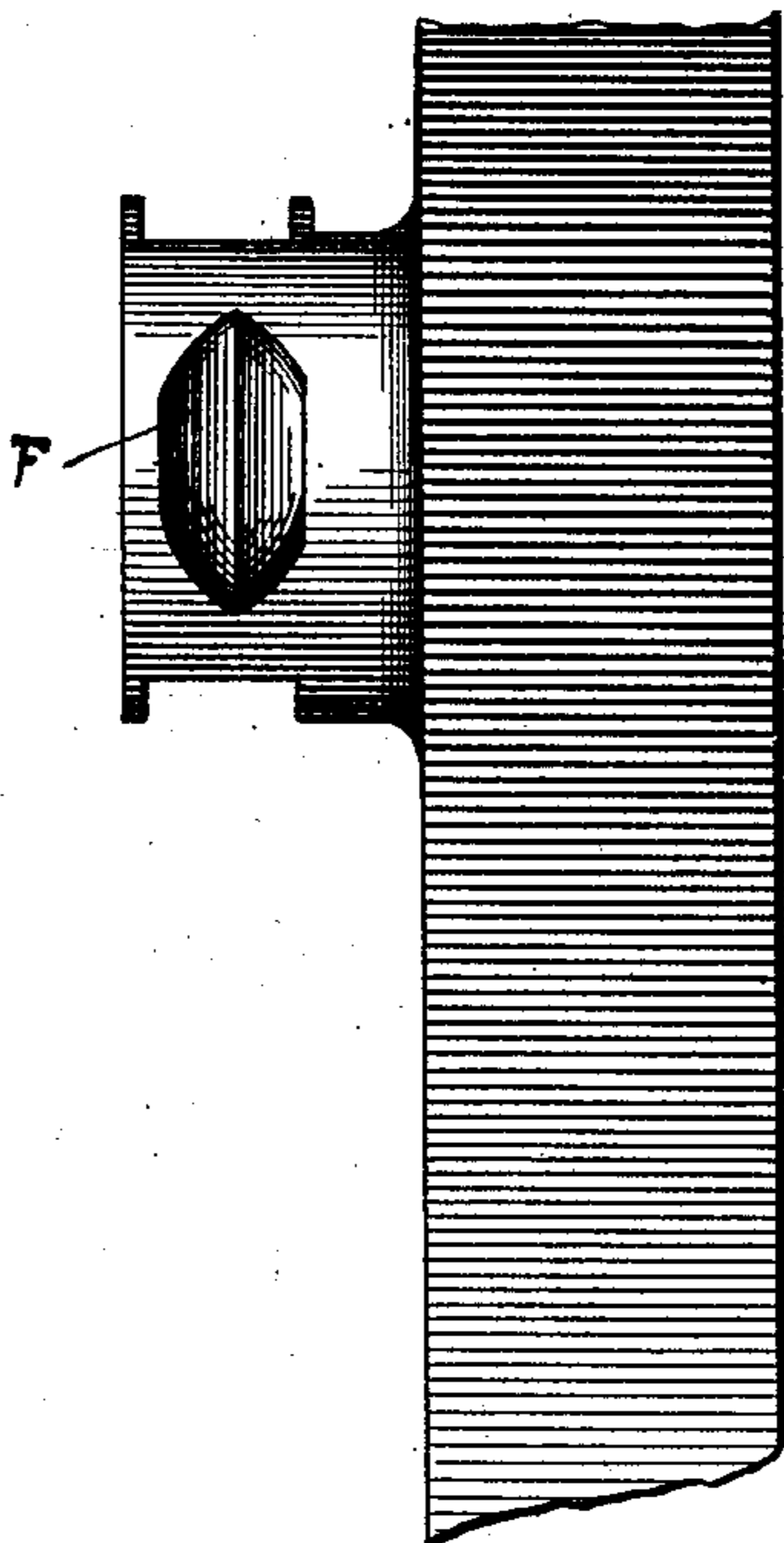
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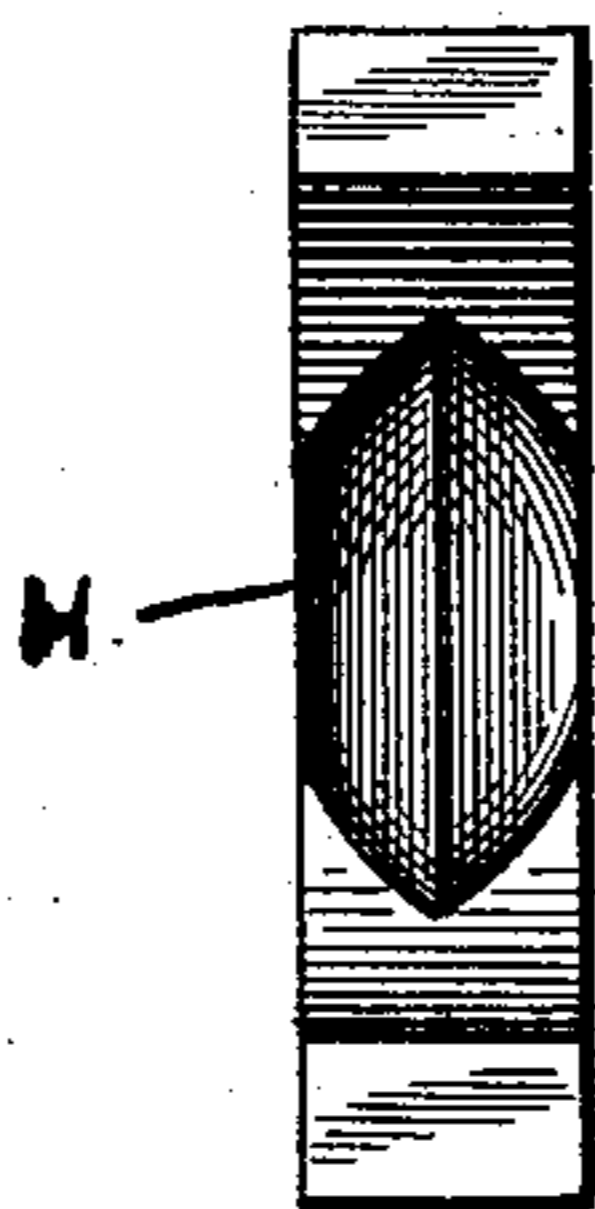
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2 Sheets—Sheet 2.

Fig. 4.



Figs.



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UNITED STATES PATENT OFFICE.

LEWIS D. PETRE, OF CHICAGO, ILLINOIS.

SEAT-HINGE.

SPECIFICATION forming part of Letters Patent No. 708,163, dated September 2, 1902.

Application filed May 22, 1901. Serial No. 61,440. (No model.)

To all whom it may concern:

Be it known that I, LEWIS D. PETRE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Seat-Hinges, of which the following, when taken in connection with the drawings and reference characters thereon and forming a part hereof, is a full and complete description.

10 The invention relates to seat-hinges for opera-chairs, school-desks, and other articles of furniture having a hinged seat.

The object of my invention is to obtain a simply-constructed hinge whereby the seat may be easily and noiselessly raised and lowered and to produce a hinge without the necessity of a bolt in its construction, thereby reducing to a minimum all liability of its becoming inoperative, and at the same time to produce a hinge the principal parts of which may be molded as parts of the standard and seat-arm of an opera-chair, thereby greatly reducing the cost of its manufacture.

Figure 1 of the drawings hereby made part of this specification is a side elevation of the seat-hinge embodying the invention with a portion of the immovable part removed to expose to view a movable abutment and spring placed therein. The ball-tracks, groove, and obscure parts are shown by dotted lines. Fig. 2 is a side elevation of hinge embodying the invention with seat-arm lowered to position when seat is in use, showing the relative position of the different parts of hinge, also showing the position of the ball in regard to the tracks. A portion of the projection of seat-arm is broken away to show a stud upon which the movable part rests. Fig. 3 is a vertical sectional view on line 3 3 viewed in the direction indicated by the arrows in Fig. 1. Fig. 4 shows the lenticular track placed in the circumferential face of a projection of seat-arm, a portion of the seat-arm being broken away. Fig. 5 shows the lenticular-shaped track in the movable abutment of seat-hinge.

Throughout the specification like parts are indicated by like characters.

50 A, Figs. 1 and 2, is the immovable part of hinge, having a central opening B, into which stud *a* projects, also having a recess opposite

to such stud, in which movable abutment C is placed.

D is a seat-arm of an opera-chair, to which a seat may be attached. Said seat-arm D is provided with a projection *d*, which rests upon stud *a*, as shown in Figs. 1 and 2. 55

E is a groove placed in the circumferential face of projection *d*, as shown by dotted line *o o* in Fig. 1 and at E in cross-sectional view, Fig. 3, so that when seat-arm D is in position indicated in Fig. 1 said groove E is concentric throughout the greater part to the concave top surface of stud *a*. 60

F is a track in the opposite circumferential face of the projection *d*. Such track is lenticular in form, the sides thereof converging at either end at an acute angle. 65

C is a movable abutment placed in a recess in the immovable part of hinge, as clearly shown in Figs. 1 and 2, said abutment having a track H therein, which is lenticular, the sides thereof converging at either end at an acute angle and so placed that when seat-arm is in position indicated in Fig. 1 such track will be opposite to and facing track F. 70 75

I is a ball interposed between projection *d* of seat-arm D and movable abutment C within tracks F and H in each respectively.

K is a spring placed in recess in immovable part of hinge between the movable abutment C and side *a'* of immovable part A, yieldingly holding the hinge in a working position. 80

L L are means whereby the immovable part of hinge may be fastened to a standard. If desired, the immovable part of hinge can be molded as part of a seat-standard, thereby doing away with the necessity of such means to attach said immovable part to a seat-standard. 85 90

The projection *d* of seat-arm D is placed within the central opening B of immovable part A, so that it will rest and turn upon the concave top of stud *a*. The flanges produced by groove E on the peripheral edge of projection *d* extend over the side of stud *a* and hold the seat-arm in a working position and, in conjunction with movable abutment C and spring K, prevent lateral motion of hinge. During the operation of lowering and raising the seat-arm projection *d* partially turns upon stud *a*. The tracks F and H being lenticular, 95 100

the ball I travels from the position indicated in Fig. 1 in a constantly-narrowing track, which forces the ball upward. When the seat-arm D is lowered, projection *d* is turned upon stud *a*. Track F in said projection is also turned, while track H in movable abutment C remains stationary, except as said track H is forced upward in the upward movement of abutment C by reason of ball I traveling in a constantly-narrowing track until the ball is pinched between ends *f* and *h'* of said tracks F and H, respectively, as clearly shown in Fig. 2. Movable abutment C is thereby forced upward, partially overcoming the tension of spring K, until said abutment is forced up against the side *a'* of immovable part A. The forward motion of seat-arm D is thereby stopped, and the seat is held in its proper position for use as a seat. I find that if a spring K is used having a weak tension movable abutment C will force said spring against the top edge *a'* of immovable part A; but this is due to the difference in the tensions of springs.

I prefer to have the groove E of such shape that a cross-sectional view thereof will show a V-shaped track, as indicated in Fig. 3, and the top surface of stud *a* convex in cross-sectional view, as also shown in Fig. 3, so that the lines of contact between said seat-arm D and stud *a* are arcs of circles within groove E and upon stud *a*, respectively. By this means I reduce the friction of the hinge to a minimum. This will be clearly seen by referring to Fig. 3. I also prefer to have the concave top 44 of said stud *a* of as short an arc as possible, but of sufficient length to prevent the seat-arm D from becoming an eccentric upon its reaching its extreme limit when the seat is either raised or lowered. I also prefer to have the tracks F and H V-shaped in cross-sectional view, as shown in Fig. 3.

Movable abutment C, in connection with spring K, has for its primary object the production of a means whereby the seat-arm D is checked in its turning motion and also to bring it to a full stop. They also provide a means whereby the different parts of the hinge are kept in a constantly-working position, and any slight inaccuracies in the molding of the respective parts become immaterial, owing to the tension of spring K. They also provide a means whereby the seat can be assembled.

In assembling the hinge projection *d* is placed within the central opening B of immovable part A, resting upon stud *a* within groove E. Ball I may then be placed in track F, after which movable abutment C may be placed in the recess of central opening B, resting upon ball I, which ball will thus be interposed between tracks F and H. Spring K may then be inserted.

I claim—

1. In a seat-hinge, an immovable part A having a central opening B and provided with a stud *a*; a seat-arm provided with a projection *d* having groove E and track F in its cir-

cumferential face, such projection of seat-arm resting upon stud *a* of immovable part A within groove E; movable abutment C having a track H therein; a spring K interposed between movable abutment C and side *a'* of immovable part A; a ball I interposed between movable abutment C and projection *d* within tracks H and F in each respectively, substantially as specified.

2. The combination of a seat-arm provided with a projection having track and groove therein, an immovable part having a central opening and a recess therein and also provided with a stud extending into said central opening and upon which stud the projection of seat-arm rests and turns within said groove in the circumferential face of the projection of seat-arm, a movable abutment having a V-shaped track therein for a ball placed in said recess in immovable part, a ball interposed between the circumferential face of projection of seat-arm and movable abutment in tracks in each respectively, a spring yieldingly holding movable abutment in working position, substantially as specified.

3. The combination of a seat-arm having a projection with a groove and track in the circumferential face of such projection, an immovable part provided with a central opening and a recess and a stud having a concave top surface upon which the projection of seat-arm rests and turns, a movable abutment set in said recesses in the opening of said immovable part and provided with a track therein for a ball, a ball interposed between the projection of seat-arm and the movable abutment in said tracks in each respectively, and a spring yieldingly holding movable abutment in a working position and confined in its limit of operation by immovable part, substantially as specified.

4. An immovable part having a central opening and a recess and provided with a stud having a concave top surface; a seat-arm provided with a projection having a groove in its circumferential face and also having a V-shaped track, such track being lenticular in form, the sides thereof converging at either end at an acute angle, and placed on the opposite circumferential face of such projection to said groove; a movable abutment placed in said recess in immovable part and provided with a lenticular V-shaped track the sides of which track converge at either end at an acute angle; a ball interposed between the projection of seat-arm and the movable abutment within said tracks in the circumferential face of such projection and movable abutment respectively, and a spring yieldingly holding the movable abutment in a working position, substantially as specified.

5. An immovable part molded as part of a seat-standard, having a central opening and a recess, also a stud having a concave top; a seat-arm provided with a projection, such projection having a groove within which the stud of the immovable part is placed, and

upon which stud the projection turns, such groove being concentric throughout its greater part to the concave top of such stud, said projection also provided with a V-shaped track placed in the circumferential edge of said projection opposite to such groove, said track being lenticular in shape the sides thereof converging at either end at an acute angle; a movable abutment placed in said recess in immovable part of hinge, said abutment having a track therein which track is lenticular in form, the sides thereof converging at either end at an acute angle, said abut-

ment being so placed in immovable part that the track therein shall be opposite to and facing the track in the projection of seat-arm; a spring yieldingly holding abutment in working position, and a ball interposed between movable abutment and the circumferential face of projection of seat-arm, substantially as specified.

LEWIS D. PETRE.

In presence of—

WILL H. CLARK,
HIRAM I. KECK.