

(No Model.)

A. D. LINN.
SEAT HINGE.

No. 576,204.

Patented Feb. 2, 1897.

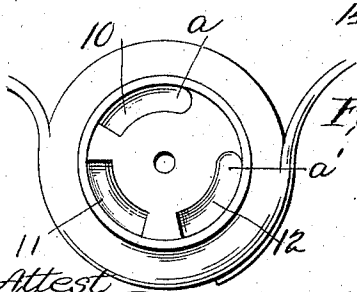
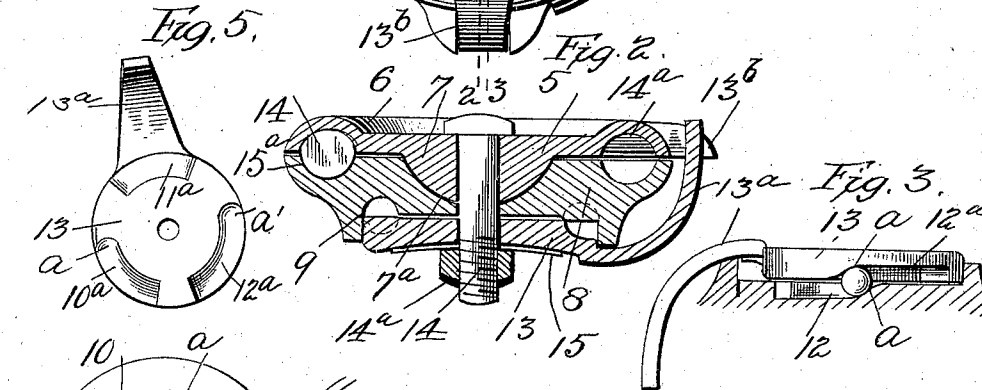
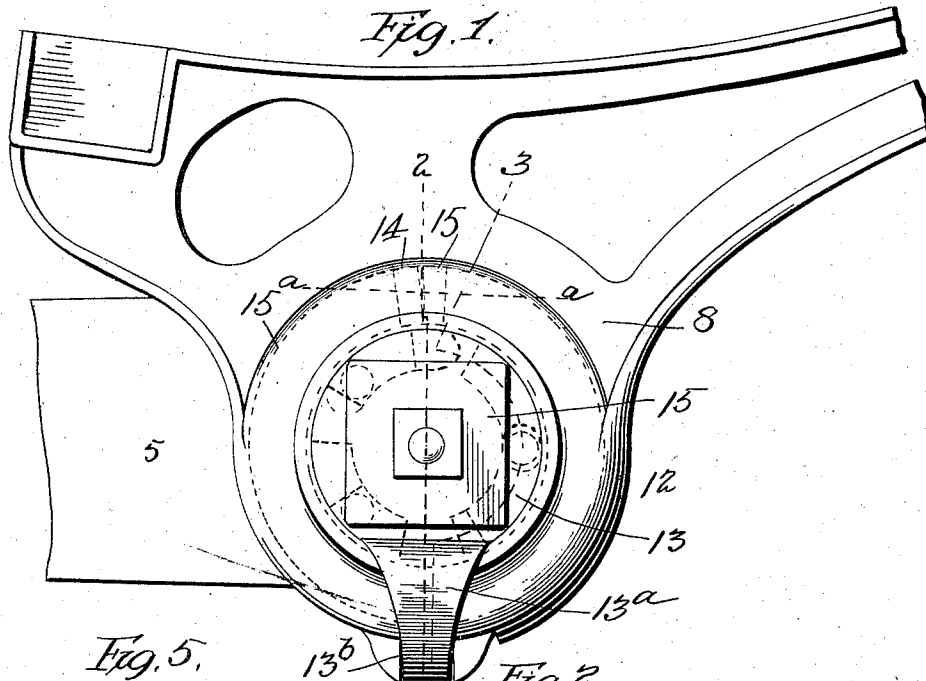


Fig. 4.

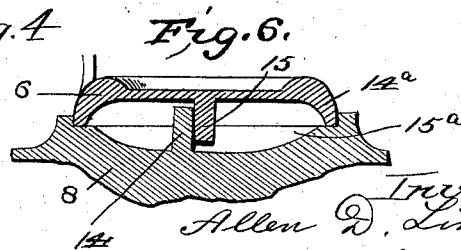


Fig. 6.

Attest
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ALLEN D. LINN, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO THE GRAND RAPIDS SCHOOL FURNITURE COMPANY, OF SAME PLACE.

SEAT-HINGE.

SPECIFICATION forming part of Letters Patent No. 576,204, dated February 2, 1897.

Application filed March 24, 1896. Serial No. 584,684. (No model.)

To all whom it may concern:

Be it known that I, ALLEN D. LINN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Seat-Hinges, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in the form of hinge used in opera-chairs and school-seats and similar articles of furniture having a hinged seat; and the object of the invention is to provide a construction in which the friction is reduced to the least possible amount, while at the same time the movement of the seat is gradually checked in the extremity of its movement in either direction, thus preventing the slamming of the seat as it is raised or lowered, and, further, to provide fixed stops to take the strain off the yielding stops while the seat is occupied. I have aimed to embody the details of construction by which these objects are accomplished in an extremely simple hinge in which all the stops are concealed and in no way detract from the ornamental appearance of the parts.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a seat-standard with the seat mounted thereon as in sitting position, parts being indicated in dotted lines. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a vertical section on line 3 3 through one of the channels. Fig. 4 is an elevation of the channeled portion of the seat-support. Fig. 5 is an elevation of the supplemental plate, and Fig. 6 is a detail sectional view on the line *a a* of Fig. 1.

In the drawings, 5 represents the seat support or standard, which carries at its outer end a plate 6, having an integral trunnion 7. The seat-bracket is shown at 8 and is provided with a recess 7^a, adapted to receive and turn upon the trunnion 7. The opposite face of bracket 8 is provided with a recessed portion 9, having arc-shaped grooves or channels 10, 11, and 12, for the purpose hereinafter to be described. A circular plate 13 fits within the opening or recess 9 and is provided with

arc-shaped grooves on the outer edge of its inner face, as shown at 10^a, 11^a, and 12^a, these grooves or channels corresponding with the channels in the seat-bracket. The three parts thus described are held together by a bolt 14, passing through openings therein and provided with a nut 14^a, bearing against a spring-washer 15, by which a yielding clamping effect is secured. The plate 13 has an arm 13^a, which is curved downwardly over the edge of the seat-bracket and rests in a notch formed in the edge of the seat-standard, as shown at 13^b, by which means the plate is connected with the seat-standard and is held against turning during the movement of the seat.

In order to cause the seat-bracket to turn easily on its bearings and at the same time to provide a friction-stop whereby the seat is gradually brought to a stop at each extremity of its movement, I locate a ball in each of the spaces formed between the channels of the seat-bracket and plate 13 before described. The channels 10 and 10^a are provided, respectively, at opposite ends with an inclined face *a*, and it will be seen that as the seat is raised and approaches the limit of its upward movement these inclines will approach each other, and by reason of their riding upon the interposed ball the plate and bracket will be forced apart, thus placing tension upon the spring-washer and bringing the seat to a gradual stop without slamming. The ball coacting with the channels 12 and 12^a operates just the reverse of the one above described, and by reason of the inclines *a'* being located reversely to the inclines *a* causes a tension to be placed upon the parts as the seat nears the limit of its downward movement, thus likewise preventing jarring of the parts and the consequent noise. The ends of the channels opposite the inclines are formed abruptly, so that each ball acts as a yielding stop only at one end of the movement of the parts. The intermediate ball, traveling in the channels 11 and 11^a, acts only as an idler, the recess being long enough to admit of a full travel without the incline terminals, and thus a better support is provided for the parts and they move more easily.

In order to prevent straining of the parts when the seat is occupied, I provide fixed

stops, which are concealed from view in order that they may not mar the general appearance of the parts. These stops are formed on the adjoining faces of the standard and seat-bracket, as shown at 14 and 15, and travel in corresponding grooves or channels 14^a and 15^a, and they are so arranged that when the seat has reached the limit of its downward movement the two stops contact with each other and take further strain, caused by the weight of the occupant of the seat, from the friction-stop.

In order that the spring-washer may not be injured by reason of unskilled workmen turning the nut too tight in setting up the parts, I form the recess in the face of the plate 13 concaved and only of sufficient depth to get the required spring action, and by reason of this concave shape if the nut is turned too tight the spring-washer will simply bottom upon the concaved face, and when released it has not been injured in the least.

It should be especially noted that by the action of the balls, as above described, the seat moves with perfect ease through the greater portion of its travel and yet is brought gradually to a stop at each extremity of its movement without noise or jarring. Further, by reason of the balls forming the gradual stops the parts do not bind or stick, but are released immediately without noise or jarring, the balls working easily on the inclines.

Having thus described my invention, what I claim is—

1. In combination with the standard the seat-bracket and plate yieldingly connected, the two sets of arc-shaped channels arranged with reversely-located inclines, and the balls located in said channels, one of said balls serving as a gradual stop to limit the move-

ment of the seat in one direction, and the other serving to limit gradually the movement of the seat in the other direction, substantially as described.

2. In combination with the standard and plate, the interposed seat-bracket, a bolt connecting said three parts and forming a hinge upon which the bracket pivots, a fixed stop located between the standard and bracket and traveling in a groove in the adjacent part, arc-shaped channels in the adjacent faces of the seat-bracket and plate, said channels having inclined ends, balls located in said channels, and a spring-washer surrounding the bolt and exerting a yielding pressure upon the plate, substantially as described.

3. In combination the standard and seat-bracket having annular channels in their adjoining faces, a stop projecting from each part into the channel of the adjoining part, a plate located upon the opposite side of the seat-bracket with means for holding it against turning, channels in the adjoining faces of the bracket and plate, said channels having inclined ends, a bolt and spring-washer for holding said parts yieldingly together, and a plurality of balls located in the channels between said plate and bracket, one of said balls serving as a rolling stop to limit the upward movement of the seat, another as a rolling stop to gradually limit the downward movement, and another acting as an idler, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALLEN D. LINN.

Witnesses:

JNO. DUFFY,

W. R. FOX.