

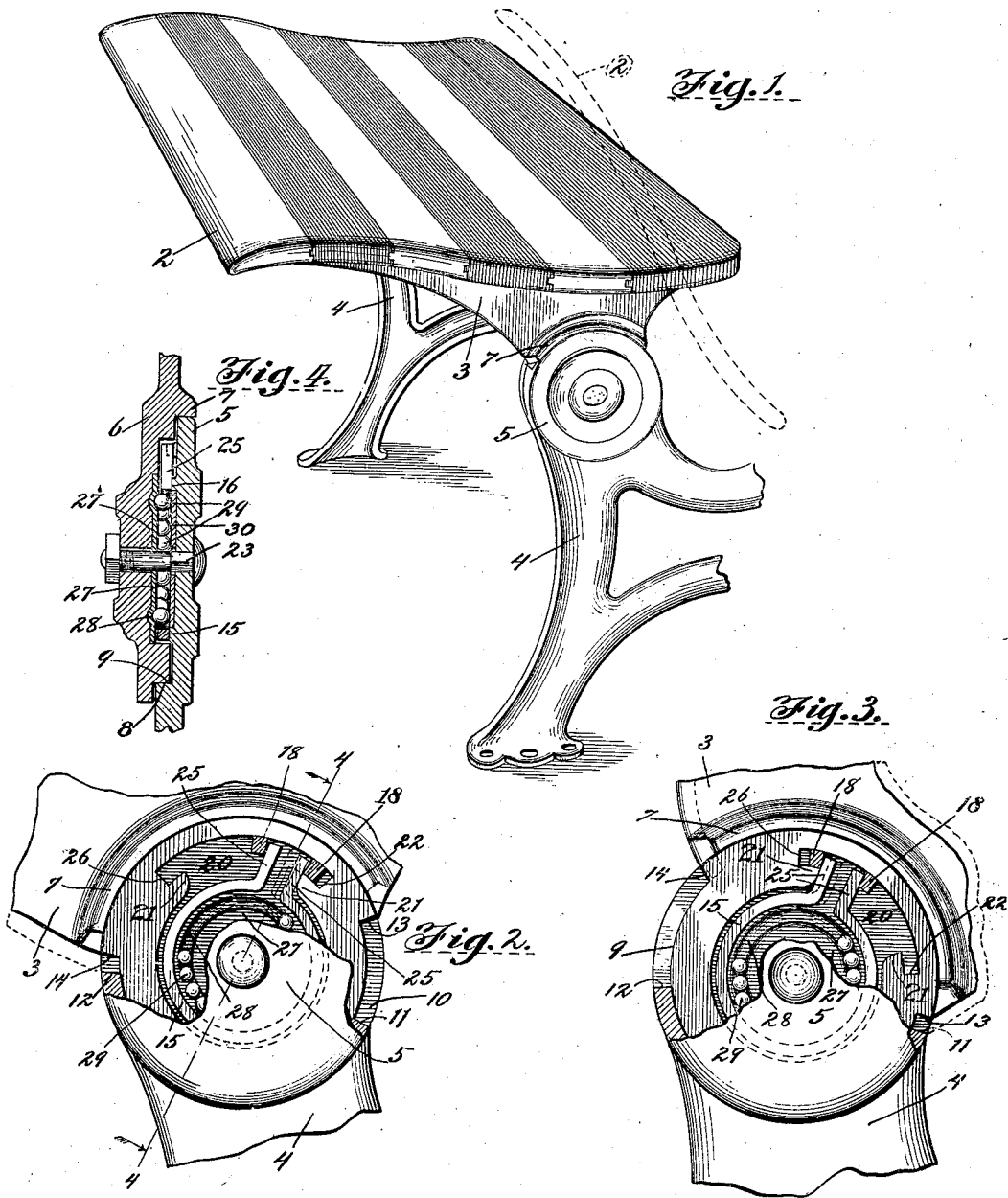
No. 827,950.

PATENTED AUG. 7, 1906.

J. ZIMMER.
HINGE FOR SCHOOL DESK SEATS.

APPLICATION FILED MAY 16, 1902.

2 SHEETS—SHEET 1.



Witnesses:

Wm. D. Perry
Robert Lewis Ames

Inventor:

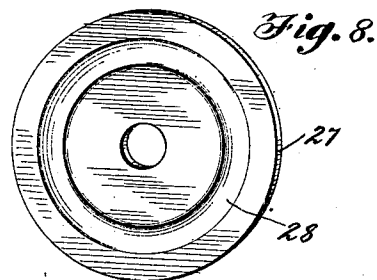
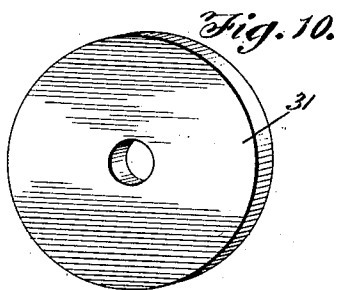
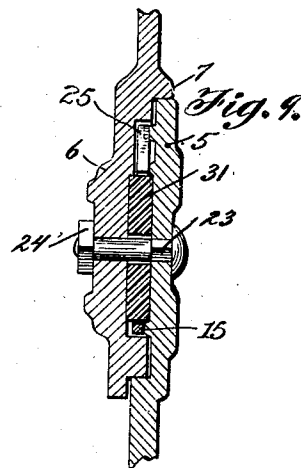
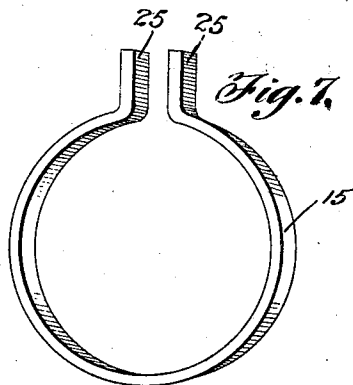
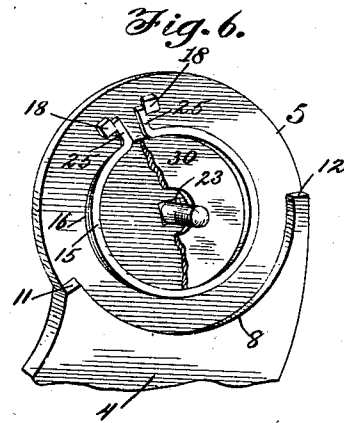
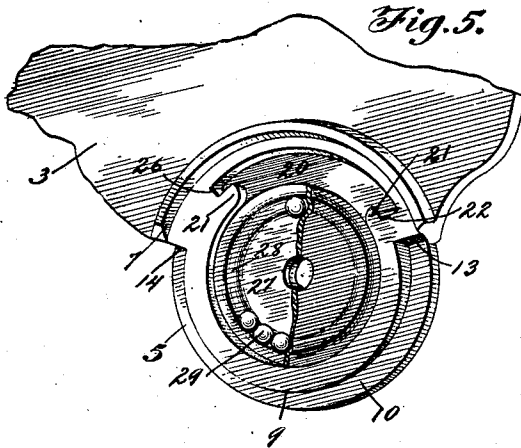
John Zimmer
by Jones & Addington
Attys.

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HINGE FOR SCHOOL DESK SEATS.
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2 SHEETS—SHEET 2.



Witnesses:

John D. Barry
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UNITED STATES PATENT OFFICE.

JOHN ZIMMER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CAXTON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

HINGE FOR SCHOOL-DESK SEATS.

No. 827,950.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed May 16, 1902. Serial No. 107,685.

To all whom it may concern:

Be it known that I, JOHN ZIMMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Hinges for School-Desk Seats, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in a seat-hinge, my object being to provide means for cushioning the seat at either or both limits of its movement, whereby the shock and noise incident to raising and lowering the seat are reduced to a minimum.

A further object is to provide such a hinge with an antifriction-bearing, whereby the same works easily and smoothly and all noise is prevented.

Still further objects are to provide a device of the kind described that is simple and durable, that is efficient in operation, and one that is convenient and comparatively inexpensive to manufacture.

To the accomplishment of these objects and such others as may hereinafter appear the invention comprises the novel parts and combinations of parts hereinafter described, and particularly pointed out in the appended claims.

In the accompanying drawings, in which the same reference characters are used to designate like parts throughout the several views, Figure 1 is a perspective view of a seat embodying my improved form of hinge. Fig. 2 is a detailed view of the hinge, showing the parts broken away and with the seat down. Fig. 3 is a like view showing the position of the parts when the seat is raised. Fig. 4 is a sectional view on line 4 4 of Fig. 2. Fig. 5 is a detail perspective view of the hinging member on the seat-bracket. Fig. 6 is a similar view of the hinging member carried by the standard of the seat. Fig. 7 is a detail perspective view of the spring. Fig. 8 is a detail of the stamping containing the raceway for the balls of the ball-bearing. Fig. 9 is a sectional view of a modification, and Fig. 10 is a detail view of the antifriction-washer employed in Fig. 9.

The seat 2 is carried upon a bracket 3 in the usual way, which bracket is hinged to the standard 4 of the desk or like article of furni-

ture by means of my improved hinge. The hinging members comprise the parts 5 and 6, carried, respectively, by the standard 4 and bracket 3 and hereinafter referred to as the "outer" and "inner" members. The inner member 6, as seen in Fig. 5, is provided with an annular shoulder or rib 7, into which the upper circular edge of the outer member 5 fits, and the outer member has a similar annular shoulder 8, into which a circular ridge or edge 9, formed on the inner member, fits, a flange 10 on the latter serving to overlap the circular shoulder 8. The outer member of the hinge is formed with a step 11 at its rear edge and with a similar step 12 at its forward edge, with which the cooperating shoulders or steps 13 and 14, formed upon the inner member, cooperate. When the hinging members are placed together, as shown in the several figures, and the seat is down, the shoulders or steps 12 and 14 are in engagement and serve to limit the downward movement of the seat and as resting-points to take the weight off the axle, as later explained, and when the seat is raised the shoulders 11 and 13 engage to limit the movement of the seat in its backward movement.

In order to prevent injury to the parts by quickly raising or lowering the seat, as well as to avoid noise, a spring 15 is carried upon the inner face of the hinging member 5, a raised ring 16 being provided for the same to rest upon, while its outwardly-extending ends 25 press against suitable lugs 18 18, carried upon the face of the member 5, as shown in Fig. 6. This spring is of considerable strength, and when in the position shown in Fig. 6 the two ends press outwardly against the lugs. The opposite member 6 is provided with a central depression, which forms a recess between the parts and receives the circular portion of the spring when the two parts of the hinge are secured together, the said depression or recess having an extension 20 at its upper edge, as indicated in Figs. 2, 3, and 5, into which the lugs 18 and the ends 25 of the spring 15 project. The spring is therefore carried in the recess between the two members, as shown in Figs. 2, 3, and 4, the upper ends 25 of the same projecting into the extension 20 of the recess in the part 6. The operation of this part of the invention is more clearly illustrated in Figs. 2 and 3, Fig. 2 indicating in full lines the position of the

parts when the seat is down, but before any weight is applied to the seat. In this position the adjacent projecting part 21 of the edge of the recess is pressed against one end 5 25 of the spring 15, the other end thereof being held stationary against the lug 18, carried by the outer and stationary part 5 of the hinge. The further downward movement of the seat will therefore be against the tension 10 of the spring 15, which will serve to cushion the same and prevent the shock and noise incident to the ordinary device. When the weight is upon the seat, it takes the position shown in dotted lines, the shoulders 12 and 15 14 are in engagement, and the right-hand lug 18 presses against the edge 22 of the recess 20, so that the weight is entirely taken off from the axle of the hinge. This axle consists of the bolt 23, passing through the central aperture in the hinge members 5 and 6, and is 20 provided with a nut 24 to secure the parts together. The opposite movement of the seat is indicated in Fig. 3, in which the opposite point 21 of the edge of the recess is pressing against the adjacent end 25 of the spring, while the opposite end of the spring is held 25 against the lug 18, as shown. In the further movement of the seat, as shown in dotted lines, the point 21 depresses the end 25 of the spring, the shoulders or steps 11 and 13 are in 30 engagement, and the lug 18 and adjacent edge 26 of the recess 20 are also together, whereby the shock and noise are prevented and the strain is entirely taken off from the 35 axle 23 of the hinge.

In order to reduce friction and provide a smooth and noiseless working hinge-joint, a ball-bearing is provided between the two members of the hinge, said bearing comprising 40 a stamping 27, (shown more clearly in Fig. 8,) placed in the bottom of the depression or recess in the member 6 and having a shallow groove 28, serving as a race for the balls 29 of the bearing. The opposite bearing-surface for the balls consists of a plate or 45 disk 30, carried inside of the raised ring 16 of the member 5, this plate being provided with a plain outer face, upon which the balls are adapted to roll. These stampings are easily 50 made and prevent the balls from rolling upon the rough surface of the casting of the hinging members, as would otherwise be necessary.

In the modification shown in Fig. 9 the 55 balls are replaced by a washer or ring 31, of vulcanized fiber or other antifriction material, this ring being shown more clearly in Fig. 10. When the parts are secured together, as shown in Fig. 9, the washer 21 prevents noise and rattling of the parts, besides 60 reducing the friction between them.

While I have described the devices of my invention with particular reference to the details of construction, it is apparent that various 65 changes may be made without depart-

ing from the spirit thereof, and I therefore do not wish to be limited to the precise disclosure herein made; but,

Having thus described my invention, what I claim is—

1. In a seat-hinge, the combination with 70 coacting hinge members, of lugs arranged in the side of one of said members adapted to engage with the outer ends of a recess in the other member, a spring interposed between 75 said lugs and ends for retarding the movement of said other member before said lugs engage the edge of said recess, and coacting shoulders upon the outer edge of said members, said shoulders being adapted to positively 80 engage each other after said lugs are in firm engagement with the edge of said recess to take the pressure off the axle when weight is applied to the seat.

2. In a seat-hinge, the combination with 85 coöperating hinge members, one of said members having a limited movement about the other, of a single metal spring arranged in a recess between said members, said spring remaining inoperative during the greater movement 90 of said members and lugs adapted to engage the end of said spring to cushion said members at both limits of their movement, substantially as described.

3. In a seat-hinge, the combination with 95 coöperating hinge members, one of said members having limited movement about the other, of a circular spring having its free ends interposed between lugs formed on said 100 members arranged in a recess formed between the said opposed faces of said members, and an antifriction-bearing arranged within said recess and within the boundary of said spring, substantially as described.

4. In a seat-hinge, the combination with 105 opposed hinge members, of a recess between said members, a spring mounted within said recess, and lugs formed upon the opposed hinged members coöperating with the ends of 110 said spring at both limits of the movement of the hinge to cause the spring to cushion the seat at both limits of its movement, substantially as described.

5. In a seat-hinge, the combination with 115 coöperating hinge members, of lugs carried by one of said members and arranged in a passage in the other member, abutments arranged at each end of said passage for engaging 120 said lugs to limit the movement of said members about each other, a spring disposed between said members and having its ends extended into said passage, and a projection 125 fixed at each end of said passage for engaging said spring to cushion the seat at both limits of its movement, substantially as described.

6. In a seat-hinge, a fixed member secured to and coöperating with a movable member, a circular spring fixed in the face of 130 the fixed member and having its free ends

in parallel fixed between and bearing against lugs in a recess in the face of the fixed member; on the adjacent face of the movable member, integral projecting lugs facing a recessed portion and adapted to impinge against the spring in the fixed member when the former nears the end of its range of movement to check said movement; abutments at the ends of the recessed portion adapted to engage the aforesaid lugs on the face of the movable member and limit the movement of the same, and coacting shoulders on said members adapted to engage to support any load carried by the movable member.

7. In a seat-hinge, the combination with opposed members adapted to rotate in face-to-face contact, a recess being formed in one of said members, of a spring within the recess and having laterally-extending ends adapted to engage lugs or projections carried upon both said members to cushion the hinge members at each limit of movement thereof, and an antifriction-bearing between said members and located within the spring, substantially as described.

8. In a hinge-joint, a member having a limited range of movement secured to a fixed member to cooperate with the same, raised portions on the working face of each of the members and depressions on the face of the cooperating member to permit movement of said raised portions in the same, a spring fixed in the face of the fixed member, projecting lugs in the working face of the movable member adapted to coact with the spring in the face of the fixed member when the movable member nears the limit of its range of movement, to check said movement, abutments on the face of the movable member and projecting lugs on the face of the fixed member to engage aforesaid abutments to limit the movement of the movable member, and coacting shoulders on said members adapted to positively engage to support any load carried by the movable member.

9. In a hinge, in combination, a member provided with a stop and a shoulder immediately in front of said stop, another member provided with a lug to coact with said stop,

and a spring for said members arranged to engage with said shoulder before said lug coacts with said stop.

10. In a seat-hinge, the combination with cooperating hinge members, one of said members having a limited movement about the other, of a spring consisting of a single loop of spring metal having its free ends pressed and held between lugs on the immovable member and arranged in a recess formed between the opposed faces of said members, and adapted to coact with a projection on the face of the movable member to cushion said movable member at the limit of its movement.

11. In a hinge, the combination with a movable member having stops arranged thereon and shoulders in front of said stops, of a fixed member connected thereto, a pair of lugs carried by said fixed member arranged to engage said stops, a spring having the ends thereof interposed between said lugs and arranged to engage said shoulders prior to the engagement of said stops by said lugs.

12. In a hinge, the combination with a movable member having oppositely-disposed stops formed thereon and oppositely-disposed shoulders, of a fixed member, a pair of lugs formed on said fixed member, one of said lugs being arranged to engage one of said stops when the hinge is at either limit of movement thereof, and a spring arranged to be placed in tension between one of said shoulders and the lug opposite to that engaging the stop.

13. In a hinge, in combination, a member provided with a stop and a shoulder immediately in front of said stop, another member provided with a lug to coact with said stop, a spring for said members arranged to engage with said shoulder before said lug coacts with said stop, and an antifriction ball-bearing between said members.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

JOHN ZIMMER.

Witnesses:

ROBERT LEWIS AMES,
M. R. ROCHFORD.