W. WILLS.

ADJUSTABLE CHAIR.

APPLICATION FILED AUG. 30, 1915.

1,237,850.

Patented Aug. 21, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

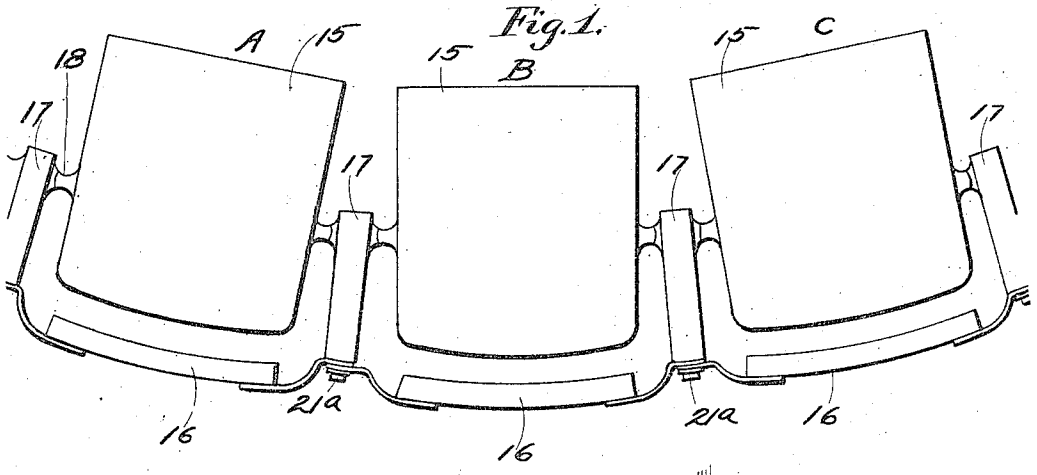
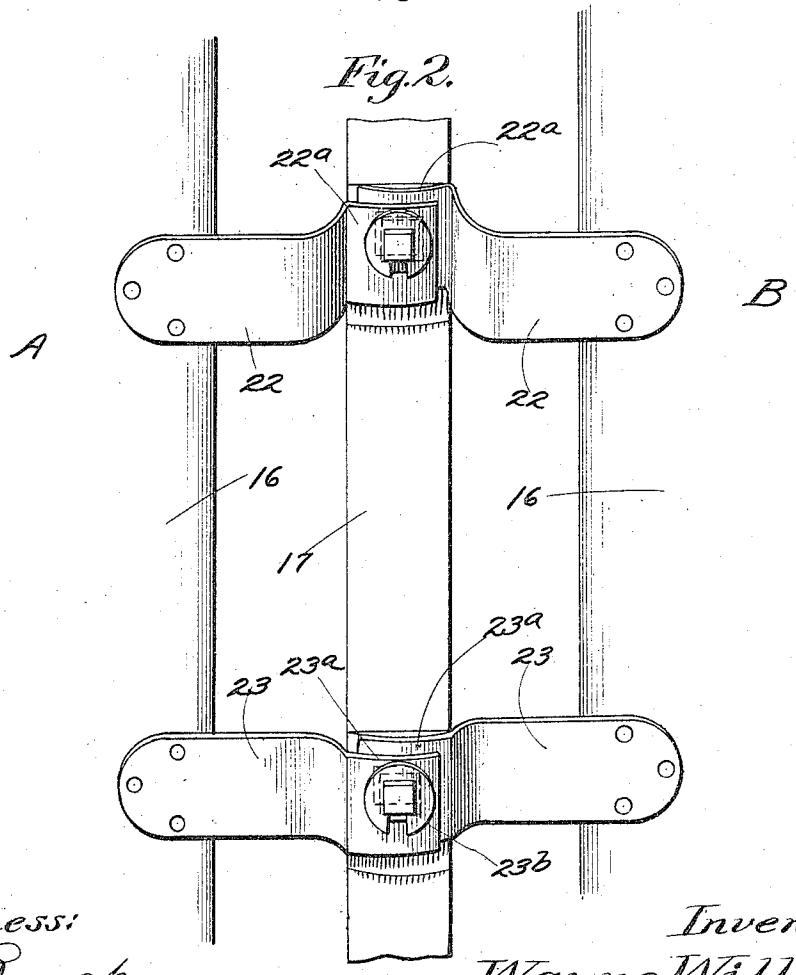


Fig. 2.



Witness:
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Inventor:
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By Sheridan, Wilkinson & Scott, Attys

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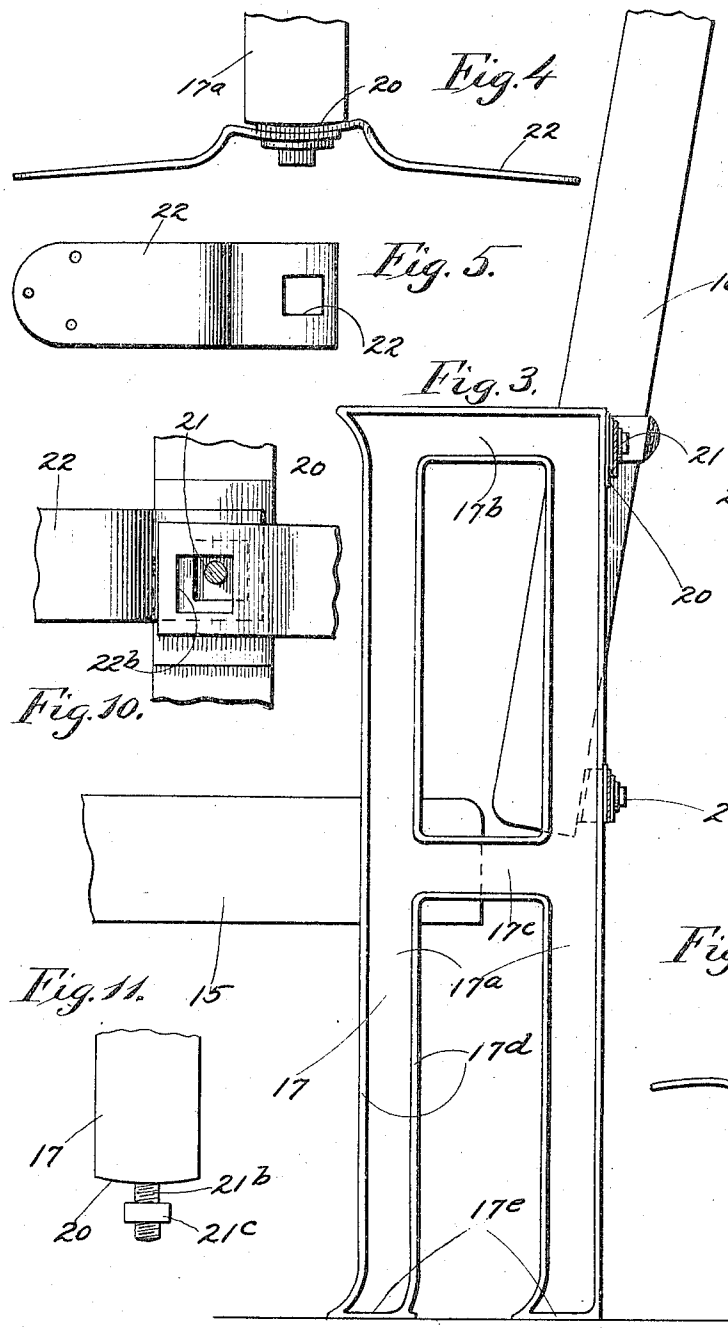

Fig. 4.

Fig. 5.

Fig. 3.

Fig. 10.

Fig. 11.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Witness:

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UNITED STATES PATENT OFFICE.

WAYNE WILLS, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN SEATING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

ADJUSTABLE CHAIR.

1,237,850. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed August 30, 1915. Serial No. 48,110.

To all whom it may concern:

Be it known that I, WAYNE WILLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Adjustable Chairs, of which the following is a specification.

This invention relates to chair construction, and in particular to an improved adjustable chair adapted for use in theaters, auditoriums, or other places where large numbers of seats are arranged in series, and where the symmetry and convenience of the arrangement require that the supporting members of the chairs be adjustable with respect to their supports or frames, and with respect to each other.

In many buildings, particularly in theaters, it is found that floors are inclined, or have present therein elevations, depressions, or other variations in level, which cause a corresponding variation in the level of the adjacent seat frames. Furthermore, where the chairs are arranged in arcs of circles, the frames of the chairs must be relatively inclined so as to be directed toward the center of the arc. These conditions require that the seats proper be adjustable with respect to the frames, and also that the back supports of the chairs be adjustable laterally and vertically with respect to the frames, in order that the seats proper may be directed radially toward a common center at the proper level, and that the back supports may be inclined properly and arranged in a symmetrical arc.

The principal object of this invention is to provide improved adjustable means for connecting a supporting member of a chair to the frame thereof. By means of my invention the back support of the chair is attached to adjacent frame members in such manner as to be adjustable laterally and vertically within the required limits to permit the desired adjustment and alinement of the adjacent chairs. Another object of the invention is to provide means whereby the supporting members, such as the backs of adjacent chairs, may be placed in position and supported by the frames, after which said members may be adjusted laterally and vertically as desired, and secured in fixed position.

These and other objects and features of the invention will be set forth more particularly in the following specification, taken in connection with the accompanying drawings, in which one embodiment of the invention is illustrated.

In the drawings,—

Figure 1 shows a somewhat diagrammatic top plan view of a series of chairs embodying my invention;

Fig. 2 is a rear elevation of a seat frame and the adjacent seat backs, showing a perspective view of my improved adjustable means for attaching the seat backs to the frame members;

Fig. 3 shows a side elevation of a chair embodying my invention;

Fig. 4 shows a top plan view of the upper connecting members by means of which the back supports are secured to the frames;

Fig. 5 shows a side elevation of one of the upper arms or plates;

Fig. 6 shows a top plan view of one of the chair frames, showing the stud or bolt by means of which the connecting arms or plates are attached to the frames;

Fig. 7 shows the rear elevation of the structure illustrated in Fig. 6;

Fig. 8 shows a plan view of the clip or washer which engages the stud or bolt carried by the frame;

Fig. 9 shows a top plan view of the lower connecting arms or plates secured to the chair frame;

Fig. 10 shows a rear elevation of the chair frame with the connecting plates in position, and the clip and head of the bolt removed; and

Fig. 11 is a top plan view of a portion of a chair frame, showing the stud engaged by a nut.

In Fig. 1 of the drawings I have shown three chairs, A, B, and C, which are arranged in the arc of a circle, according to the usual plan in theaters and the like. Each chair comprises a seat support 15 and a back support 16, which are mounted between the frame members 17, as shown in Fig. 3. In Fig. 1 the frame members 17 are directed toward the center of the arc, and the seat supports 15 are mounted between the frames so as to be directed toward the common center. The seat supports are mounted upon the frames by means of adjustable pivots or hinges 18, which enable the seats to be adjusted so as to be directed toward the common center and arranged

in level position. Many forms of adjustable joints or hinges 18 are known, and this feature is therefore not described in detail.

It will be seen that each chair frame comprises the parallel vertically-extending members 17^a, which are formed integrally with the transversely-extending members 17^b and 17^c. Flanges 17^d extend around the lateral edges of the frame members, and the lower ends of the members 17^a terminate in the base flanges 17^e, which are secured to the floor by screws, or other suitable means.

My improved device comprises means for attaching a supporting member of the chair, such as the chair back 16, to the frame members 17, whereby the chair backs 16, (see Fig. 1), may be arranged in proper alinement so as to form a symmetrical arc, and so as to properly aline with the seats 15. For this purpose I preferably provide each of the rear members 17^a of the chair frames with an arcuate surface 20, curved in a substantially horizontal plane, and engaging the chair frame normally to the arcuate surface 20 are the studs 21 having the enlarged heads 21^a. As shown in Figs. 1 and 2, one of the studs 21 engages the chair frame adjacent the top thereof, and another stud is located at a lower intermediate point. The chair back 16 is mounted between a pair of chair frames 17, and has secured thereto, at each side thereof, two connecting arms, or plates, 22 and 23. Each of the upper oppositely-disposed plates 22 is offset inwardly and twisted slightly, terminating in an arcuate portion 22^a, preferably of slightly different curvature than the arcuate surface 20. The portion 22^a of each of the upper plates is provided with an aperture 22^b, which is somewhat larger than the head 21^a of the adjacent stud 21, so that the head 21^a may be passed through the aperture 22^b, when the arm 22 will be supported in position resting upon the stud 21.

The lower plates 23, carried by each chair back, are twisted and offset outwardly from the plane of the chair back, as clearly shown in Fig. 9, and terminate in arcuate plates 23^a, which are preferably of slightly different curvature than the surface 20. These portions 23^a of the plates 23 are similarly provided with apertures 23^b slightly larger than the heads 21^a of the studs, which apertures are adapted to be engaged by said heads when the arms are being passed into engagement with the studs. The upper plates 22 are offset inwardly and the lower plates 23 are offset outwardly for the purpose of giving to the chair backs the proper upward and rearward inclination, since it will be observed that the rear surfaces 20 of the chair frames are substantially vertical. Where the rear surfaces 20 of the chair frames are inclined upwardly and rearwardly at the desired angle, it may be unnecessary to offset the plates 22 and 23 in the manner above described, in order to secure the proper inclination of the chair backs.

After passing the plates 22 and 23 of adjacent chair backs into engagement with the studs 21, carried by the intermediate chair frame, curved clips or washers 24, having transverse slots 24^a formed therein, are passed over the studs 21 between the heads 21^a thereof and the adjacent plates 22 and 23. The slots 24^a are of such size that the walls thereof closely engage the stems of the studs 21 and the clips 24 are of such dimensions as to overlap the boundaries of the apertures 22^b and 23^b, which are formed in the corresponding connecting plates. It will be seen that after the clips 24 are placed in position, the plates 22 and 23 will be secured against displacement from the studs 21. The enlarged apertures 22^b and 23^b will, however, permit a considerable lateral and vertical adjustment of the plates 22 and 23 with respect to the chair frame 17, and as this adjustment takes place the portions 22^a and 23^a of the plates will slide upon the arcuate surfaces 20. After the plates 22 and 23 have been adjusted with respect to the studs 21, so that the chair backs 16 are in the desired alinement with each other, and with the seats 15, the studs 21 may be passed into tighter engagement with the chair frames 17, so as to tightly clamp the clips 24 against the plates 22 and 23, and thereby secure the latter in fixed position.

It will be observed that by varying the radii of the various coacting arcuate surfaces, a spring-like resistance is set up against the tightened studs, resulting in the effect of locking the studs against turning or loosening because of vibration or the like.

Instead of tapping the studs 21 into the chair frames, as illustrated in Fig. 6, or into the oppositely-disposed nuts, the studs may be fixed in the frames and threadedly engaged by nuts, as shown in Fig. 11, in which the threaded stud 21^b is engaged by a nut 21^c. With this construction the plates 22 and 23 may be passed over the nuts, or if the apertures 22^b and 23^b are not large enough for that purpose, the nuts may be removed until after the plates are in place on the studs, after which the nuts are replaced. Then after adjusting the plates on the studs transversely to the axes thereof, the nuts may be tightened to clamp the parts in position. In the interpretation of the appended claims, it will be understood that a nut is the equivalent of the head of a stud and that the usual bolt may be used if desired.

In Fig. 2 of the drawings, it will be seen that the plates 22, carried by the right-hand

chair back, have a more elevated position with respect to the studs 21 than the corresponding plates carried by the left-hand chair, which may be necessary, for instance, when the chair frame at the other side of the right-hand chair is at a higher level than the one shown in Fig. 2. In Fig. 10 the head of the stud of the clip is removed so as to show the limits of this adjustment more clearly. It will be understood that the apertures 22^b and 23^b are of such size as to permit a considerable lateral adjustment of the plates 22 and 23, toward or away from corresponding plates carried by adjacent chairs, so as to compensate for varying relative inclinations of the adjacent chair frames 17. The limits of adjustability may be varied by varying the sizes of the apertures 22^b and 23^b.

It will be seen that by means of my improved adjustable connection, all of the necessary adjustments may be made by the person who assembles the chairs on the floor of the theater, or other building, so as to secure the proper alinement of the chair backs and of the chair frames without the necessity of altering any of the fixed connections, such as the connections of the plates 22 and 23 to the chair backs. After the chair frames have been secured to the floor, which is usually of cement construction, the chair backs may be hung on the studs 21, the clips 24 placed in position, and the plates 22 and 23 then adjusted on the studs so as to secure the proper alinement and adjustment of the chair backs to compensate for irregularities or variations in the level of the floor, and for curvatures and other irregularities in the rows of chairs. After this has been done, the studs 21, or the nuts thereon, are tightened and the chair backs are securely fixed in position.

Although I have shown and described a particular embodiment of the invention and have explained its operation in a particular manner for purposes of illustration, it will be understood that the invention may be embodied in various other forms without departing from the scope thereof, as defined in the appended claims.

What I claim is:—

1. In a device of the class described, a frame, a chair back on each side of said frame, arms attached to each of said chair backs, said arms being apertured, and a bolt engaging both of said arms and said frame, said apertures being of larger size than the stem of said bolt.

2. In a device of the class described, a frame, a pair of supporting members located on opposite sides of said frame, a stud engaging said frame, arms attached to each of said supporting members, the overlapping ends of said arms being apertured to pass over the head of said stud and to permit adjustment transversely to the axis of said stud, and a clip engaging said stud to prevent displacement of said arms.

3. In a device of the class described, a frame having a vertically-extending surface curved substantially in a horizontal plane, a stud engaging said frame normally to said surface, a chair back, a plate secured to said chair back and having a curved extremity adapted to coact with the curved surface of said frame, the extremity of said plate being apertured to receive the enlarged head of said stud, whereby said plate may be passed into engagement therewith, and a clip adapted to fit over said stud and prevent displacement of said plate.

4. In a device of the class described, a pair of chair backs, a chair frame between said chair backs, a stud projecting from said frame, an arm attached to each of said chair backs, said arms being apertured to be engaged by said stud, and a clip engaging said stud.

5. In a device of the class described, a pair of chair backs, a chair frame between said chair backs, a stud projecting from said frame, an arm attached to each of said chair backs, and a slotted clip engaging said stud and overlapping said apertures.

6. In a device of the class described, a pair of chair backs, a chair frame between said chair backs, a pair of studs projecting from said frame, and arms secured to each of said chair backs, said arms being oppositely disposed in pairs, the arms of each pair being adapted to overlap and being apertured to engage one of said studs, said apertures being of larger size than the stems of said studs.

7. In a device of the class described, a pair of chair backs, a chair frame between said chair backs, a pair of studs projecting from said frame, and arms secured to each of said chair backs, said arms being oppositely disposed in pairs, the arms of each pair being adapted to overlap and being apertured to engage one of said studs, and slotted clips engaging said studs outwardly of said arms.

8. In a device of the class described, a chair frame having an upward-extending surface curved substantially in a horizontal plane, a chair back on each side of said frame, a stud projecting from the curved surface of said frame, plates secured to said chair backs and having curved extremities of different curvatures than the curved surface of said frame with which they are adapted to coact, and a clip engaging said stud, whereby when said stud is tightened said plates will be clamped between said clip and said curved surface of the frame.

9. In a device of the class described, a chair frame having an upwardly extending surface on the rear side thereof, a chair back

on each side of said frame, a stud projecting from said surface of said frame, plates secured to said chair backs and having curved extremities adapted to coact with said surface of said frame, and a clip engaging said stud, whereby the tightening of said stud will clamp said plates on said surface of the frame.

10. In a device of the class described, a series of chair frames, lugs projecting from the rear walls of said chair frames, chair backs between said chair frames, arms connected to said chair backs and having slots of larger size than said lugs to receive said lugs and permit adjustment of said chair backs vertically and horizontally, and means for securing said arms on said lugs.

11. In a device of the class described, a frame having a vertically extending surface curved substantially in a horizontal plane, a pair of chair backs located on opposite sides of said frame, arms attached to said chair backs and having curved extremities overlapping on said curved surface, and clamping means for securing said arms to said frame and permitting adjustment thereof on said curved surface.

In testimony whereof, I have subscribed my name.

WAYNE WILLS.

Witnesses:
C. B. STILLWELL,
G. H. LEUTHSTROM.