Jan. 15, 1952 W. E. NORDMARK 2,582,600

SEAT MOUNTING FOR THEATER CHAIRS OR THE LIKE

Filed Jan. 5, 1949 2 SHEETS—SHEET 1

Fig. 1

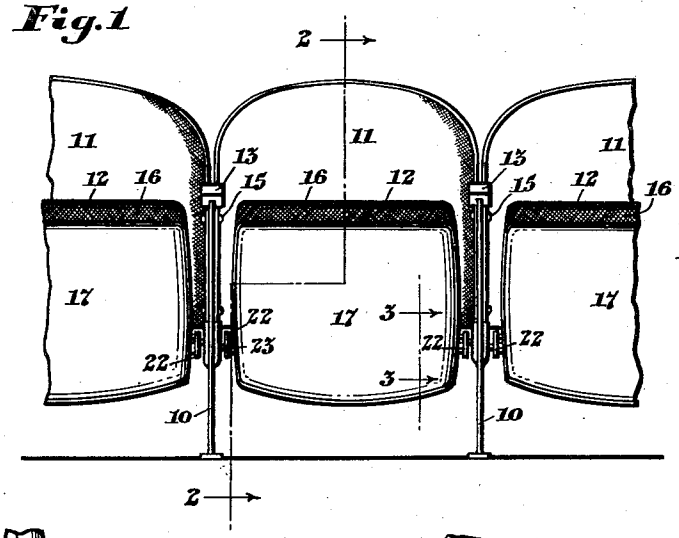
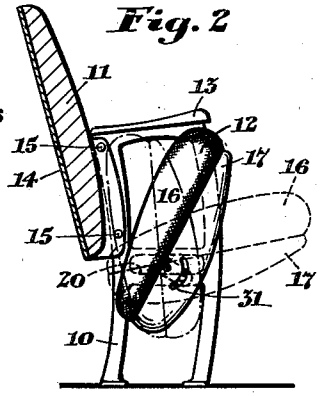


Fig. 2



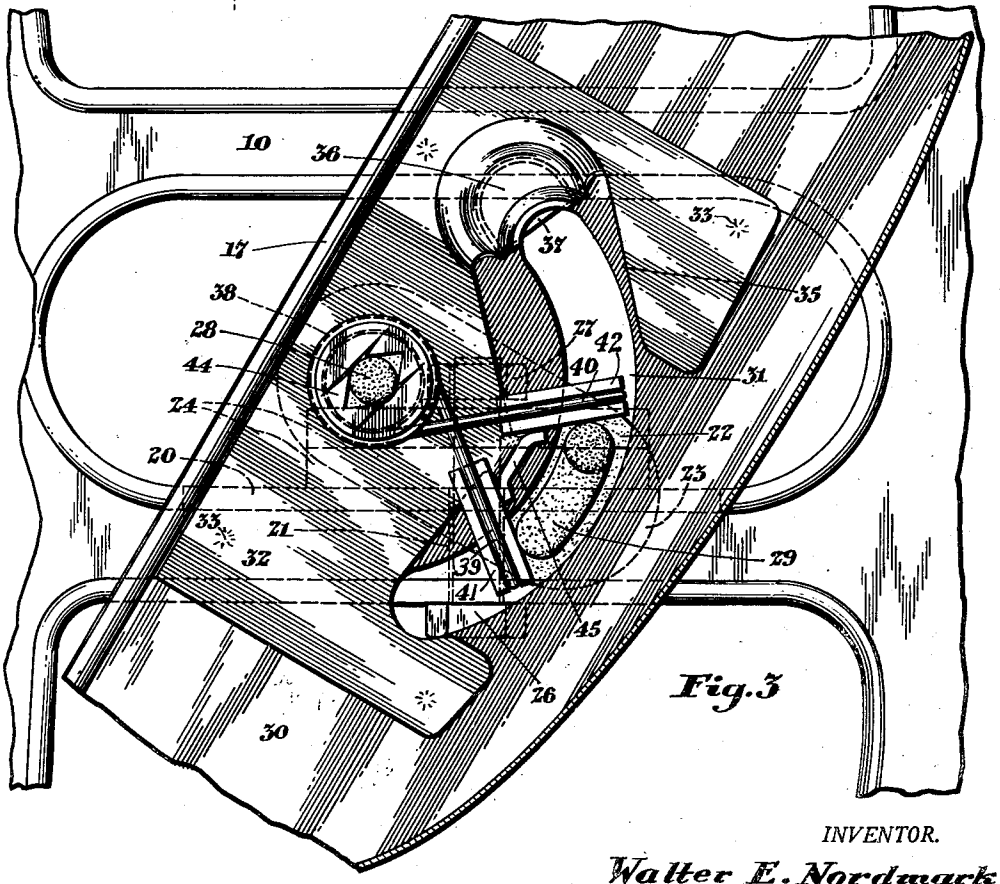


Fig. 3

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Fig. 4

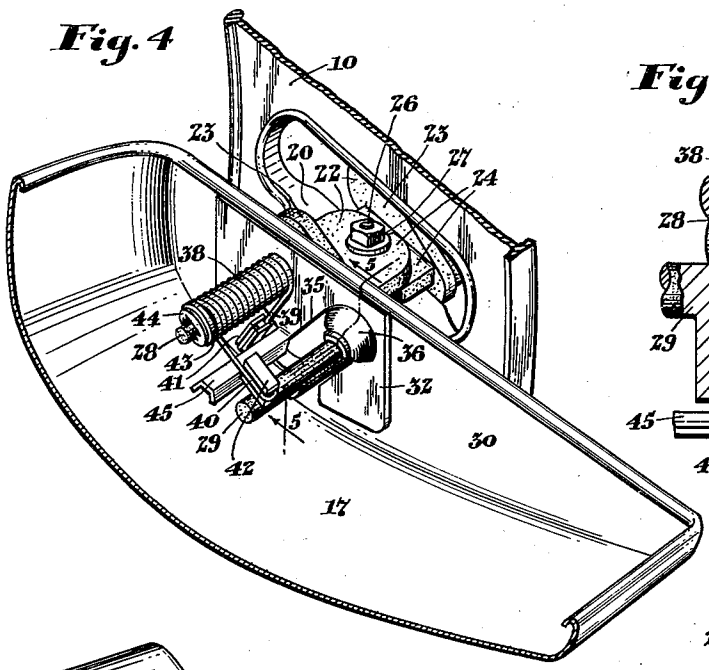
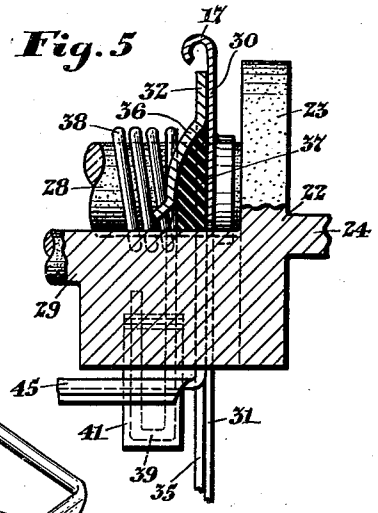


Fig. 5



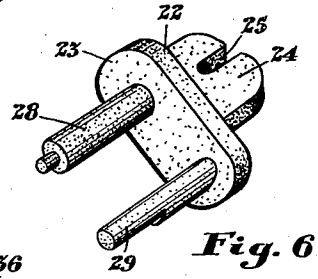


Fig. 6

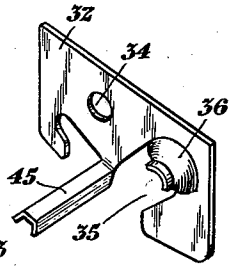


Fig. 7

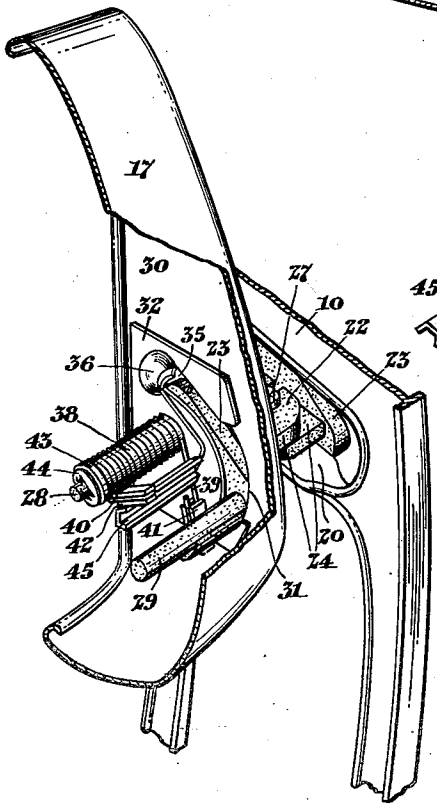


Fig. 8

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UNITED STATES PATENT OFFICE

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SEAT MOUNTING FOR THEATER CHAIRS OR THE LIKE

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Application January 5, 1949, Serial No. 69,396

1 Claim. (Cl. 155—85)

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The present invention relates to seat mountings and more particularly to mountings for the seats of chairs adapted for installation in rows in theatres, auditoriums and the like. This application is a continuation-in-part of my copending application Serial No. 766,500, filed August 6, 1947.

The primary objects of this invention are to provide improved means for mounting seats of the theatre type between spaced, upright, chair-supporting standards; to provide improved seat mountings for turnably connecting the seat to the standards so that it may be lowered to a nearly horizontal position for occupancy or raised to a nearly vertical position as when the occupant rises to permit others to pass in front of him; to provide such seat mountings whereby the seat is normally caused to assume an intermediate or neutral position between its fully raised and fully lowered positions, so that all of the seats in an unoccupied theatre will normally automatically assume the same angular position and thus present a uniform and attractive appearance; to provide such seat mountings which are adaptable for use in either straight or curved rows of chairs, and which include compensating means for slight errors in the positions of the supporting standards; to provide seat mountings the parts of which are economical to manufacture, to assemble and to install in a theatre or other desired place, and which when assembled in a chair structure are readily accessible for replacement or repair; and in general to provide a chair structure which is sturdy in construction, effective in use and attractive in appearance.

The invention is illustrated in one embodiment thereof by the accompanying drawings, wherein:

Figure 1 is a front elevational view of a chair of the theatre type installed between supporting standards each of which also supports one side of an adjacent chair in a row thereof, the adjacent chairs being shown fragmentarily;

Figure 2 is a sectional view of the same taken on line 2—2 of Figure 1, the seat being shown in its normal, neutral position in full lines, in its lowered position for occupancy in dotted lines, and in its fully raised position in broken lines;

Figure 3 is an enlarged, fragmentary, vertical section view through the seat foundation, taken on line 3—3 of Figure 1, and illustrating the seat in its normal or neutral position intermediate its extreme lowered and raised positions;

Figure 4 is a fragmentary perspective view of the interior of the seat foundation, the adjacent supporting standard, and the seat mountings by

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means of which the seat is mounted on said supporting standard, the seat being indicated in its extreme lowered position for occupancy in this view;

Figure 5 is an enlarged fragmentary, sectional view of parts thereof taken on line 5—5 of Figure 4;

Figure 6 is a perspective view of a seat bracket per se;

Figure 7 is a perspective view of a plate member per se; and

Figure 8 is a fragmentary perspective view, similar to Figure 4 but with the seat indicated in its extreme raised position.

Referring now in detail to these drawings, a row of seating best illustrated in Figure 1 is mounted upon spaced, upright, chair-supporting standards 10 which are preinstalled in a theatre or the like and upon which are subsequently mounted chair backs 11 and chair seats 12. The standards 10 are of the type known as middle standards, each serving as a common support for the adjacent sides of adjoining chairs in a row and each being provided with a conventional arm rest 13. In the present construction, the chair backs 11 are shown mounted on plates 14 which are secured in any conventional manner, as by bolts or rivets 15, to a pair of the standards 10.

Each chair seat 12 comprises a seat cushion 16 removably mounted in conventional manner upon a sheet metal seat foundation or "seat pan" 17, and the essence of the present invention resides in the seat mounting connections between the seat pan 17 and the supporting standards 10, whereby the following results are accomplished:

1. A support is provided for the weight of the seat and the occupant;

2. A pivot is provided about which the seat turns to raised and lowered positions;

3. The seat is normally maintained in a neutral position between its raised and lowered positions;

4. Stops are provided for the seat in its extreme raised and lowered positions;

5. Provision is made for ready installation of the seats on pre-installed standards in either straight or curved rows; and

6. Lateral or horizontal adjustment is made to compensate for slight errors in the spacings between standards.

The standards 10 are usually made of cast metal, and each standard is provided with a horizontal web portion 20 having a vertical opening 21 therein. Seat brackets 22 comprise vertical portions 23 and horizontal portions 24 having horizontally elongated outwardly opening vertical

slots 25 therethrough which extend inwardly from the outer edges of the brackets (see Figure 6). The seat brackets 22 for the adjacent sides of adjoining chairs are secured to their common supporting standard 10 by means of a bolt 26 inserted upwardly as shown through the opening 21 in the standard's web portion 20 and through the openings 25 in the pair of seat brackets 22, a nut 27 being provided on the upper end of bolt 26 for securing the brackets to the standard, and the brackets being secured in required horizontally adjusted position and in required angularly adjusted position about the axis of the bolt 26. It will be seen that the horizontal portions of the left hand seat brackets are at a slightly higher level than, and overlap, the horizontal portions of the right hand seat brackets so that the remainders of the right hand and left hand brackets are at the same level.

Each seat bracket 22 is provided with an annular trunnion 28 and a stud 29 both of which are integrally cast with the bracket and both of which extend inwardly from the vertical portion 23 of the bracket (see Figure 6). The seat pan 17 is turnably journalled on the mutually inwardly extending trunnions 28 of the brackets 22 on a pair of adjacent standards 10. The side walls 30 of the seat pan 17 are provided with arcuate openings or slots 31 concentric with the trunnions 28, through which slots pass the mutually inwardly extending studs 29. Reinforcing plates 32 (see Figure 7) are secured as by welding 33 to the inner surfaces of the seat pan's side walls 30 and are provided with bearing openings 34 through which extend the trunnions 28, and with other openings 35 which coincide with the arcuate slots 31 in the seat pan's side walls 30. These reinforcing plates 32 have inwardly pressed pockets 36 at the upper ends of the slots 31, into which pockets are inserted rubber cushion bumpers 37. It will be seen that when the seat is in its lowered position for occupancy the rubber cushion bumpers 37 rest on the studs 29, said studs thus serving as stops for the lowering movement of the chair seat and as supports for the seat when occupied. The studs 29 also engage the opposite ends of the slots 31 to limit the upward swinging movement of the seat from its neutral position shown in Figure 3 to its extreme raised position shown in Figure 8.

A cylindrically coiled spring 38 surrounds each trunnion 28. The inner end portion 39 of this spring 38 projects tangentially and in the neutral position of the seat shown in Figure 3 bears against the underside of the adjacent stud 29. The outer end portion 40 of the spring 38 also projects tangentially and in the neutral position of the seat bears against the upperside of the stud 29. The projecting end portions 39 and 40 of the spring 38 are desirably provided with rubber sheaths 41, 42 respectively to insure quietness in the operation of the chair seat. The spring 38 is retained on the trunnion 28 by means of a washer 43 and a push-on speed nut 44.

As best seen in Figures 4, 7 and 8, each plate 32 has an integrally formed, cross-sectionally U-shaped arm 45 which extends inwardly between the tangentially projecting ends 39, 40 of the coil spring 38, said arm being so dimensioned as to exactly fit the space between said spring's ends 39, 40 when the seat is in its neutral position shown in Figure 3. Thus when the seat is in said neutral position the spring's ends 39, 40 contact both the arm 45 and the stud 29. The arm 45 being thus confined between the spring's ends 39 and 40 and being rigidly connected to the seat pan 17, the seat is normally maintained at the predetermined angle illustrated in Figure 3, and all of the seats in a row are thus maintained at a uniform angle of inclination when unoccupied, notwithstanding differences in the amounts of compression on the coil springs 38.

When the seat is occupied and thus turned by the weight of the occupant from its position illustrated in Figure 3 to its position illustrated in Figure 4, the arm 45 carries the spring's inner end portion 40 downwardly out of engagement with the stud 29. Thereafter when the occupant rises from the seat, the spring's unwinding force exerted through its end 40 on the arm 45 returns the seat to its normal, neutral position. Similarly, when the occupant rises and presses the seat from its neutral position illustrated in Figure 3 to its extreme raised position illustrated in Figure 8, in order to permit other theatre patrons to pass in front of him, the arm 45 carries the spring's outer end portion 41 upwardly out of engagement with the stud 29 and thereafter when the occupant releases the seat the spring's unwinding force exerted through its end 41 on the arm 45 returns the seat to its normal, neutral position.

In the manufacture of the chairs the seat mountings including the brackets 22 are preferably assembled to the seats at the factory. The bolts 26 and nuts 27 are also assembled, loosely, to the standards 10 at the factory. The installation comprises pre-installing the standards 10 in a theatre, and thereafter mounting the backs on the standards as shown, and mounting the seats on the standards in properly adjusted positions by inserting the horizontal portions 24 of the brackets between the nuts 27 and the standards' horizontal webs 20 so that the bolts 26 are received in the outwardly opening slots 25 of the brackets, and tightening the nuts 27 on the bolts 26.

It will thus be seen that the invention provides a seat mounting means comprising a minimum number of parts for performing the desired functions hereinbefore described, and while but one specific embodiment of the invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of the invention as the same is defined by the following claim.

I claim:

In a chair structure: a pair of standards; a seat bracket mounted on each standard; trunnions on said brackets extending mutually inwardly; a seat having its opposite side walls journalled on said trunnions and one of said side walls having an arcuate slot therethrough concentric with the adjacent trunnion; a stud on the adjacent bracket extending inwardly through said slot and adapted to engage the ends of the slot for limiting swinging movements of the seat on the trunnions to positions wherein the seat is lowered for occupancy or raised for non-occupancy; a cylindrical coil spring surrounding said trunnion and having its opposite end portions projecting tangentially to normally press against opposite sides of said stud; a plate secured to said side wall of the seat and having a bearing opening through which passes said trunnion and another opening coinciding with the arcuate slot in said side wall, said plate having a portion thereof flanged laterally to form an arm on the seat extending inwardly between the projecting end portions of said coil spring and normally confined therebetween for maintaining the seat in a neutral position intermediate its

lowered and raised positions, said spring's end portions being respectively yieldable to move with said arm during the respective manual raising and lowering movements of the seat and being respectively adapted to press against said arm on opposite sides thereof for returning the arm and the seat to their neutral positions.

WALTER E. NORDMARK.

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