

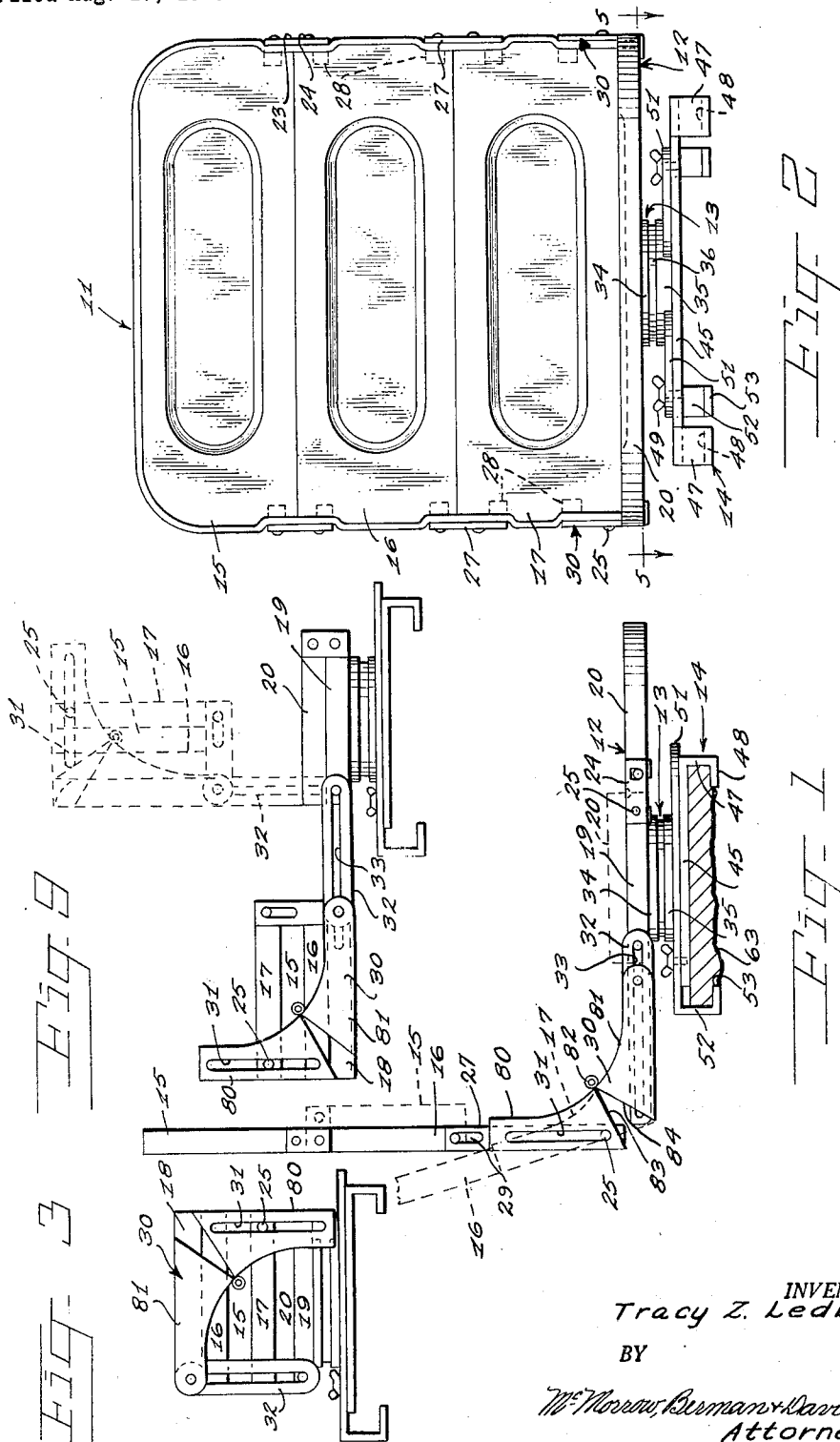
May 16, 1950

T. Z. LEDBETTER
FOLDABLE SEAT

2,507,639

Filed Aug. 17, 1948

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

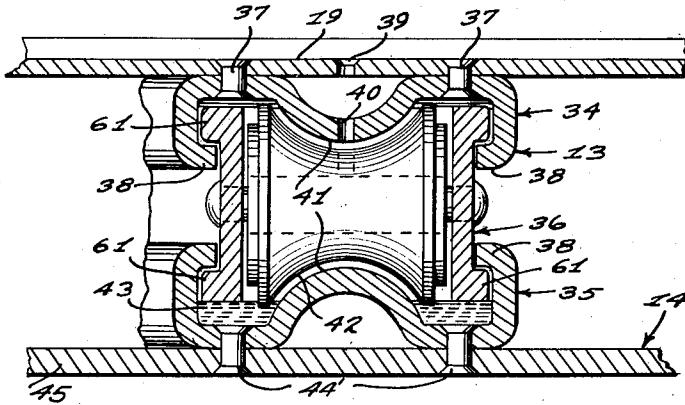


Fig. 4

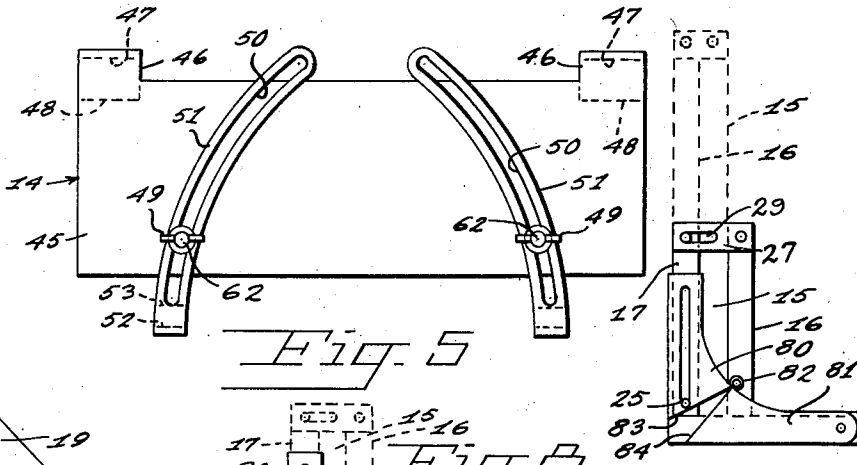


Fig. 5

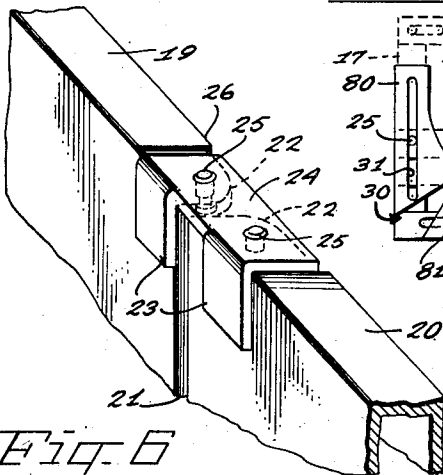


Fig. 6

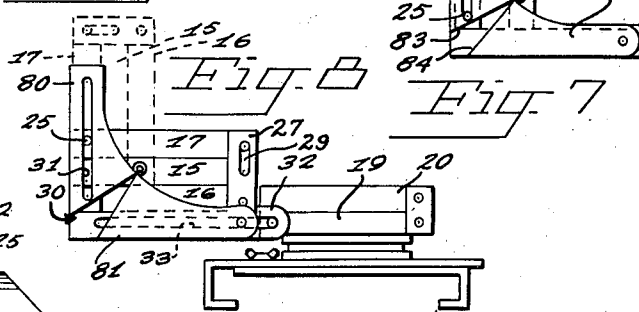


Fig. 7

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FOLDABLE SEAT

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8 Claims. (Cl. 155—133)

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My invention relates to foldable seats, and more particularly to such seats as comprise a backrest section and a seat section together with means carried by said seat section for swively connecting the same to a horizontal support. Seats like that defined by the invention are widely used to provide backrest-providing seats for row boats, temporary bleachers and any other horizontally-disposed support lacking a backrest.

With the foregoing in view, it is an object of the invention to provide an improved foldable seat of the class described.

A further object is to provide an improved foldable seat of the class described which includes means for detachably connecting the same to a horizontal support and a swivel means interposed between the connecting means and the seat portion of the seat.

A further object is to provide an improved foldable seat such as that last described which includes a backrest section and a seat section, each of said sub-sections being formed of at least two sub-sections, and means hingedly connecting all of said sub-sections together for folding movement to a folded position comprising a single stack of sub-sections.

A further object is to provide in a swivel-mounted foldable seat of the class described novel anti-friction means providing a swivel for the seat.

Other objects and advantages reside in the particular structure of the invention, the construction of the elements forming the several parts of the invention, combination and arrangement of the several parts, and will be readily understood by those skilled in the art upon reference to the attached drawing in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawings:

Figure 1 is an elevation of the seat according to the invention, the same being shown in the unfolded position;

Figure 2 is a front view thereof;

Figure 3 is a view like Figure 1, but showing the parts in the completely folded position;

Figure 4 is an enlarged vertical section through a portion of the swivel for the seat;

Figure 5 is a plan view of the means for mounting the seat on a horizontal support apart from the rest of the structure;

Figure 6 is a fragmentary perspective view on an enlarged scale showing one means for connecting adjacent sub-sections of the seat together;

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Figure 7 is a fragmentary elevation like Figure 1, but showing the parts in a preliminary folded position;

Figure 8 is a like view, but showing a further folded position of the parts;

Figure 9 is a similar view, but showing a further position of the parts prior to the final folding operation.

Referring specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, the seat according to the invention comprises a backrest-providing section 11, a seat-providing section 12, a swivel 13, and means generally indicated by 14 for clamping the seat to a horizontal support.

The backrest-providing section 11 and the seat-providing section 12 comprise a plurality of substantially identical sub-sections 15, 16, 17, 18, 19 and 20, respectively, with the sub-sections 15, 16 and 17 comprising the backrest-providing section and the sub-sections 18, 19 and 20 providing the seat section 12. As clearly shown in Figure 6, each sub-section comprises a hollow panel which is preferably formed of any suitable metallic material, but preferably one which combines lightness with strength. The adjacent sub-sections are slightly spaced apart when in the extended position, as at 21, Figure 6, to permit free relative pivotal movement to and from the folded position and the abutting corners of adjacent sub-sections are rounded, as at 22, Figure 6. Adjacent sub-sections are connected together by links about to be described.

Each side edge of the adjacent sub-sections 15 and 16 are hingedly connected together by a plate-like link 24 which is pivoted at each end to the adjacent sub-sections by suitable headed pins 25. In this connection, although the links differ in the connection between certain of the sub-sections, all links are pivoted by headed pins 25 and all of the links are provided with limit stops 23 which overlie adjacent rear surfaces of adjacent sub-sections to limit the hinging movement in one direction, whereby to limit the unfolding movement of the sub-sections to proper angular relation with the adjacent sub-sections. The ends of sections 19 and 20 of the seat sub-sections 12 are likewise connected together by links 24 which are identical to the links connecting the sub-sections 15 and 16 together. However, these links are the only links in the assembly which are identical.

The intermediate backrest-providing sub-section 16 is hingedly connected to the inner sub-

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section 17 by a pair of oppositely-disposed hinge plates 27 by means of headed pins 25. However, the hinge pin 25 for the lower section 17 rides in a bayonet slot 29 formed in the plate 27, whereby to permit a sliding pivotal connection for a reason to be apparent later. The lower end of the backrest-providing sub-section 17 has a sliding and pivoting connection with a vertical leg 80 of an L-shaped bracket member 30 by virtue of a head pin 25 which rides in a bayonet slot 31 formed in the vertical leg 80 of such bracket 30. The vertical leg 80 is hingedly connected to a horizontal leg 81 by any suitable hinge means 82. Each bracket leg 80 includes a diagonal lower end edge 83 which is adapted to abut a complementary diagonal end edge 84 of the horizontal leg 81, whereby to provide a limit stop when the bracket is in the seat-providing position, indicated in broken lines in Figure 1. When the seat is being folded, the edges 83 and 84 are normally spread apart so as to permit the sub-sections to be folded into a neat rectangular stack.

The horizontal leg 81 of the bracket 30 is slidably and pivotally connected to the inner seat-providing sub-section 18 by means of a head pin 25 which also passes through a slot 33 in an elongated hinge link 32, the outer end of which is pivotally connected by a headed pin 25 to the intermediate seat-providing sub-section 19. The purpose of this structure will be apparent later.

To fold the seat to the folded position, the end sub-sections 15 and 20 of the backrest-providing and seat-providing sections, respectively, are folded to the broken line positions, Figure 1. Reference is now had to Figures 7, 8 and 9. In the next step, Figure 7, the upper and intermediate sub-sections 15 and 16 are now folded inwardly atop the lowermost backrest-providing sub-section 17, the slot 29 in the link 27 permitting this movement from the broken line position to the full line position, Figure 7. Referring now to Figure 8, the three backrest-providing sub-sections are now swung forwardly atop the innermost seat-providing sub-section 18, which action is permitted by the slot 31 in the vertical leg of the bracket 30. In this connection, it is noted that the vertical leg is slightly longer than the folded thickness of the three sections, whereby to permit them being raised to the broken line point 40 before they are pivoted forwardly in a clockwise direction atop the sub-section 18. Referring now to Figure 9, the sub-sections 15, 16, 17 and 18 are now moved to the left to the limit permitted by the slot 33 in the link 32. Thereafter, the assembly is swung in a clockwise direction to the broken line position, Figure 9, at which point the assembled sub-sections are swung further in a clockwise direction relative to the link 32 in the direction of the arrow, which positions the sub-section 16 atop the previously folded seat-providing sub-section 20. The parts are now in the position illustrated in Figure 3, wherein the folded seat comprises a single stack of sub-sections atop the intermediate seat-providing sub-section 19.

Referring now to Figure 4 in connection with Figures 1, 2 and 3, the swivel 13 comprises a pair of fixed bearing races 34 and 35 and a bearing cage 36. Each race 34 and 35 comprises an annular member of channeled configuration with the free end edges 38 of the legs of the channels inwardly directed to provide keepers for outwardly-directed flanges 61 of the cage 36. The upper race 34 is rigidly secured to the under sur-

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face of the intermediate seat-providing sub-section 19 by any suitable fastening means, such as the rivets 37. Likewise, the seat-providing sub-section 19 is formed with a hole 39 there-through which registers with a like hole 40 in the web of the channel 34, whereby to provide a convenient means for supplying oil to the bearings. In this connection, it should be noted that the webs of each of the bearings are inwardly directed to provide channels of humped configuration in cross-section, which are complementary to the grooved peripheries of the anti-friction bearings 42 which are pivotally mounted in the side members defining cage 36. Outwardly of the humped portion 41 of the lower cage 35, channels are provided to receive a body 43 of any suitable lubricant for lubricating the bearings. The web of the lower bearing race 35 is rigidly secured by any suitable means, indicated as the rivets 44 and 44' to a plate 45 comprising the main element of the mounting clamp 14.

The mounting clamp 14, as aforesaid, comprises a plate-like element 45 having means 46 at one edge thereof formed to provide rigid clamps, which clamps include depending webs 47 and inwardly-turned clamp fingers 48, as best seen in Figures 1, 2 and 3. Adjustable clamps 51 are adjustably secured on the upper surface of the plate 45. The adjustable clamps 51 are two in number and are preferably of arcuate configuration with the arcs lying in intersecting horizontal disposition. Each clamp 51 is formed with a longitudinally-extending arcuate groove 50 which receive bolts 62 fixed to the upper surface of the plate 45. Wing nuts 49 are threaded on the bolt 62 to clampingly secure the adjustable clamps 51 in adjusted positions. One end of each clamp 51 is formed to provide a depending web 52 and an inwardly-directed clamp finger 53, as best seen in Figures 1, 2 and 3. As indicated in Figure 1, at 63, clamps for the seat are adapted to overlie opposite edges of the boat seat 63, whereby to clampingly secure the seat atop the horizontal support. In like manner, the swivel 13 provides free pivotal movement in a horizontal plane for the occupant of the seat.

As is readily seen in Figure 3, when the parts are folded together, they occupy relatively little space and all of the folded sub-sections are atop the swivel 13 and the clamp plate 45. Thus, the folded seat occupies very little space and may be conveniently carried anywhere in an automobile or like means of transportation to and from the place of use. Likewise, by forming the seat of light weight metallic sheets, the weight of the seat is reduced, whereby to enable it to be readily carried by anyone.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. A foldable seat adapted to be detachably mounted on a horizontal support, comprising a seat section and a backrest section, each section comprising at least two sub-sections, means pivotally connecting each of said sub-sections to an adjacent sub-section for folding movement to a folded formation comprising a single stack of sub-sections atop a sub-section of said seat section, said last-named sub-section including an under surface, swivel means depending from said under

surface, and a support engaging means depending from said swivel means whereby to swivel said seat section to said support.

2. A foldable seat adapted to be detachably mounted on a horizontal support, comprising a seat section and a backrest section, each section comprising at least two sub-sections, means pivotally connecting each of said sub-sections to an adjacent sub-section for folding movement to a folded formation comprising a single stack of sub-sections atop a sub-section of said seat section, said last-named sub-section including an under surface, swivel means depending from said under surface, at least a pair of opposed clamp members depending from said swivel means, and said clamp members being relatively adjustable toward and away from each other to clamp a horizontal support therebetween.

3. A foldable seat adapted to be detachably mounted on a horizontal support, comprising a seat section and a backrest section, each section comprising at least two sub-sections, means pivotally connecting each of said sub-sections to an adjacent sub-section for folding movement to a folded formation comprising a single stack of sub-sections atop a sub-section of said seat section, said last-named sub-section including an under surface, swivel means depending from said under surface, a support-engaging means depending from said swivel means whereby to swivel said seat section to said support, said swivel means comprising a pair of opposed bearing races, one of said races being fixed to said last-named sub-section, the other race being fixed to said support-engaging means, and a bearing cage including anti-friction bearings interposed between said races and swivelly connected thereto.

4. A foldable seat adapted to be detachably mounted on a horizontal support, comprising a seat section and a backrest section, each section comprising at least two sub-sections, means pivotally connecting each of said sub-sections to an adjacent sub-section for folding movement to a folded formation comprising a single stack of sub-sections atop a sub-section of said seat section, said last-named sub-section including an under surface, swivel means depending from said under surface, a support-engaging means depending from said swivel means whereby to swivel said seat section to said support, said swivel means comprising a pair of opposed bearing races, one of said races being fixed to said last-named sub-section, the other race being fixed to said support-engaging means, said last-named race being formed to provide a lubricant reservoir, and a bearing cage including anti-friction bearings interposed between said races and swivelly connected thereto.

5. A foldable seat adapted to be detachably mounted on a horizontal support comprising a bracket, a seat section disposed adjacent one end of said bracket and mounted therein for horizontal sliding movement and rotational movement about a horizontal axis, and a back section disposed adjacent the other end of said bracket and mounted therein for vertical sliding movement and rotational movement about a horizontal axis, each of said sections comprising at least two sub-sections pivotally connected together for movement to a folded formation comprising a single stack of sub-sections.

6. A foldable seat adapted to be detachably mounted on a horizontal supporting surface comprising a bracket, a seat section disposed adjacent one end of said bracket and mounted therein

for horizontal sliding movement and rotational movement about a horizontal axis, and a back section disposed adjacent the other end of said bracket and mounted therein for vertical sliding movement and rotational movement about a horizontal axis, said back section comprising three sub-sections arranged in end to end confronting relation with respect to each other, means pivotally connecting the confronting ends of the outermost back providing sub-section and the intermediate back providing sub-section, bracket means slidably and pivotally connecting the confronting ends of said intermediate back providing sub-section and said innermost back providing sub-section, and said seat section comprising three sub-sections arranged in end to end confronting relation with respect to each other, means pivotally connecting the confronting ends of the outermost seat providing sub-section and the intermediate seat providing sub-section, bracket means slidably and pivotally connecting the confronting ends of said intermediate seat providing sub-section and said innermost seat providing sub-section, said sub-sections being movable to a folded formation comprising a single stack of back and seat providing sub-sections resting upon said intermediate sub-section of said seat section.

7. A foldable seat adapted to be detachably mounted on a horizontal support comprising a bracket, a seat section disposed adjacent one end of said bracket and mounted therein for horizontal sliding movement and rotational movement about a horizontal axis, a back section disposed adjacent the other end of said bracket and mounted therein for vertical sliding movement and rotational movement about a horizontal axis, swivel means disposed adjacent the under surface of said seat section and dependently supported therefrom, and support engaging means operatively connected to said swivel means and engageable with said horizontal support whereby to swivel said seat section to said horizontal support.

8. A foldable seat adapted to be detachably mounted on a horizontal support comprising a bracket, a seat section disposed adjacent one end of said bracket and mounted therein for horizontal sliding movement and rotational movement about a horizontal axis, a back section disposed adjacent the other end of said bracket and mounted therein for vertical sliding movement and rotational movement about a horizontal axis, each of said sections comprising at least two sub-sections pivotally connected together for movement to a folded formation comprising a single stack of sub-sections, swivel means disposed adjacent the under surface of said seat section and dependently supported therefrom, and support engaging means operatively connected to said swivel means and engageable with said horizontal support whereby to swivel said seat section to said horizontal support.

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