May 23, 1950 O. E. HILL 2,508,607

FOLDING CHAIR

Filed April 10, 1946 3 Sheets-Sheet 1

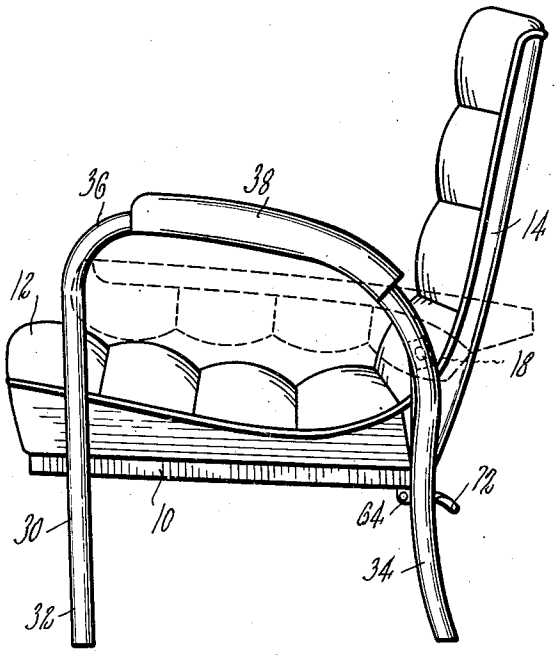


Fig. 1

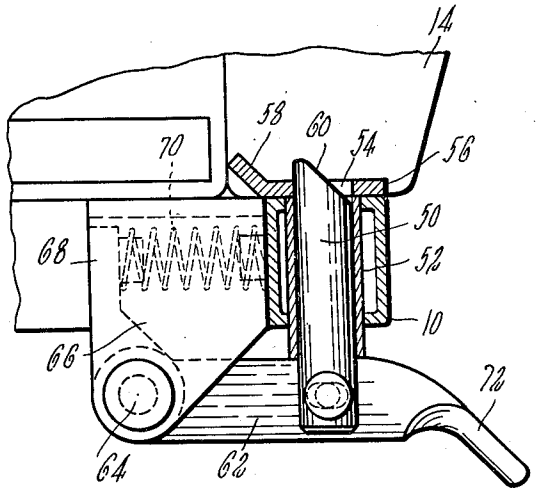


Fig. 2

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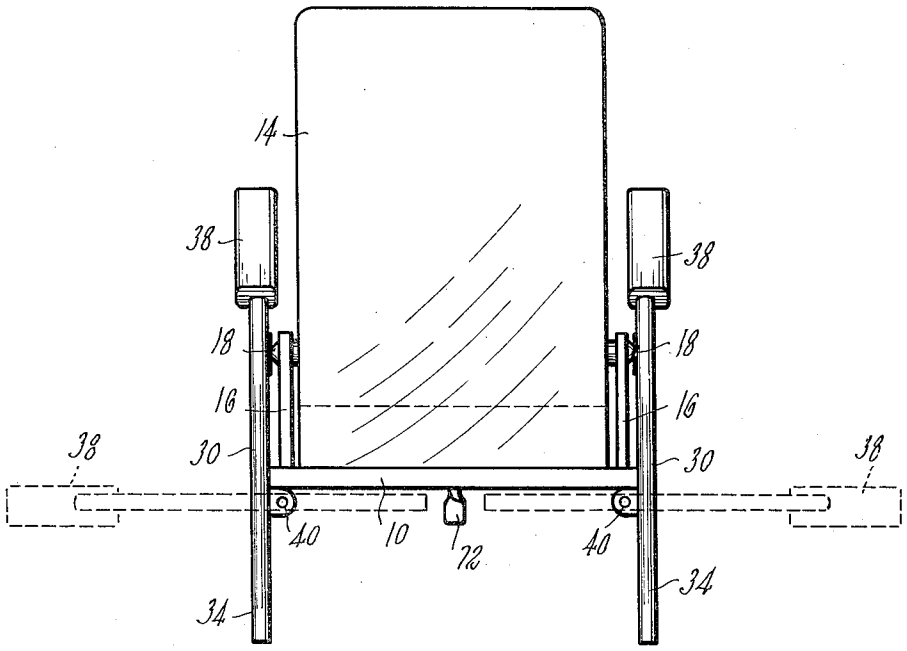


Fig. 3

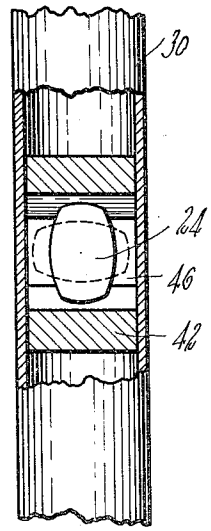


Fig. 4

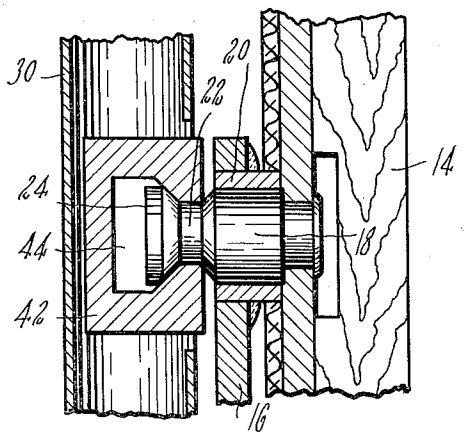


Fig. 5

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FOLDING CHAIR

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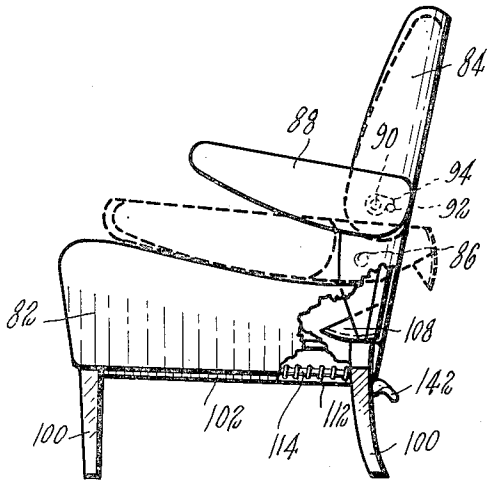


Fig. 6

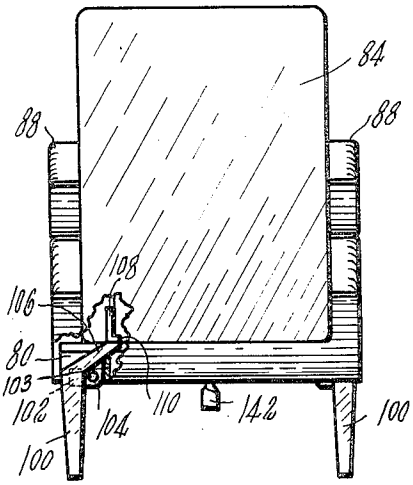


Fig. 7

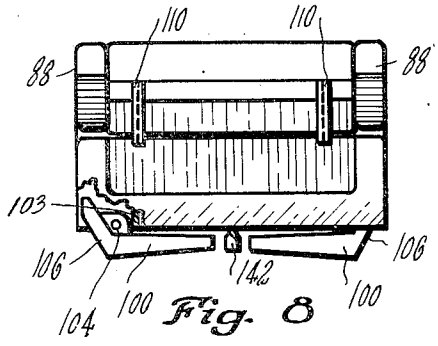


Fig. 8

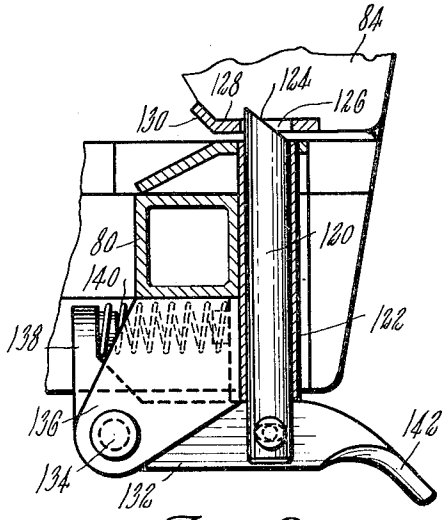


Fig. 9

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UNITED STATES PATENT OFFICE

2,508,607

FOLDING CHAIR

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Application April 10, 1946, Serial No. 661,138

3 Claims. (Cl. 155—148)

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This invention relates to folding chairs which can be set up for use or collapsed to a relatively flat condition in which they can be readily stowed in narrow spaces.

The invention relates more particularly to a folding or collapsible chair for use on railway vehicles. It is an object of the invention to provide a chair which can be set up for use or stowed in collapsed condition, for example, under a Pullman berth.

It is a further object of the invention to provide a folding or collapsible chair which is sturdily built, is locked in its set-up position for use and which can readily be collapsed or set up as desired.

According to the invention, the chair is provided with a back rest which can be rocked forward when released to a substantially horizontal prone position upon the seat of the chair. The rocking of the back rest to the prone position automatically unlocks side assemblies which include the legs of the chair so that such side assemblies can be rocked from their normally vertical position into a horizontal position, partly or wholly beneath the seat frame.

For a more complete understanding of the invention, reference may be had to the following description of certain embodiments thereof and to the drawings, of which:

Figure 1 is a side elevation of a chair embodying the invention;

Figure 2 is a fragmentary sectional view of the locking latch employed in the chair shown in Figure 1, on a larger scale;

Figure 3 is a rear view of the chair shown in Figure 1;

Figure 4 is a fragmentary view of a portion of a side frame, a portion being broken away to show in section;

Figure 5 is a fragmentary sectional view of one of the locking devices for the side frames;

Figure 6 is a side elevation of a chair embodying a modified form of the invention, a portion being broken away;

Figure 7 is a rear view of the same, a portion being broken away;

Figure 8 is a rear elevational view of the chair shown in Figure 6, in its folded or collapsed condition;

Figure 9 is a fragmentary sectional view of the locking latch.

The chair shown in Figures 1 to 5 comprises a seat frame 10 on which is preferably an upholstered seat cushion 12. A back rest 14 is pivotally mounted on a pair of standards 16 which are a part of the seat frame so as to rock forward

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from the upright position shown in Figure 1 to a prone position upon the seat 12 as indicated in dotted lines. For this purpose, the frame of the back rest 14 is provided with a pair of aligned stub shafts 18 secured to its respective side edges, the shafts 18 being rotatable in bearings 20 which are fixed in the upper portions of the standards 16 as indicated in Figure 5. Each stub shaft 18 has a reduced extension 22 terminating in an oval locking member or button 24 of larger diameter for interlocking with the side assemblies of the chair.

Hinged to the seat frame 10 at the sides thereof are side assemblies 30 which are preferably but not necessarily tubular, these side assemblies including lower portions 32 and 34 which act as legs or supporting members for the chair itself and an upper portion 36 which may be used to support an arm rest 38. The side assemblies 30 are hinged to the seat frame 10 to rock about axes 40 which extend from front to rear and are nearly horizontal. When released, they can be rocked from their upright position as indicated in Figure 3 to their collapsed position which is substantially horizontal and which is indicated in dotted lines.

As shown in Figures 4 and 5 a locking means is provided for each of the side assemblies 30, such locking means comprising a block 42 welded or otherwise secured at a suitable point therein, the block 42 having a central cavity 44 adapted to receive the button 24 on the adjacent side of the back rest. The face of the block 42 which is toward the back rest 14 is provided with an opening 46, the horizontal dimension of which is greater than the vertical dimension. The button 24, as indicated in Figure 4, is elongated so that its length is greater than its width, these dimensions being related to the dimensions of the opening 46 in such a way as to permit the button 24 to pass through the opening 46 into the cavity 44 when the long dimension of the button is parallel to the long dimension of the opening 46 as indicated in dotted lines in Figure 4. When, however, the button 24 is turned to the position shown in full lines in Figure 4, the ends thereof engage the wall of the block 42 above and below the aperture 46 as indicated in Figure 5. When the button 24 is in such position within the cavity 44, the side assembly is locked against any rocking movement toward its collapsed condition. Since the buttons are integral with the rock shafts 18 of the back rest 14, they rotate with the back rest when the latter is swung about the axis of the shafts 18 from its upright position of use to its prone position. The angular relation of the but-

tons to the back rest is such that when the back rest is in its upright position of use, the buttons are in the locking position indicated in full lines in Figure 4. When the back rest is swung forward and down to its prone position, the buttons 24 turn to the position indicated in dotted lines in Figure 4, thus releasing the corresponding side assemblies 30 which can then be swung down from their upright position of use to their collapsed horizontal position. While the back rest is herein shown and described as carrying the buttons 24, and the side assemblies 30 are shown and described as carrying the hollow blocks 46 which interlock with the buttons, it is obvious that these elements can be interchanged so that the buttons are carried by the side assemblies and the blocks by the back rest.

When the chair is set up for use, a suitable latch mechanism is provided to lock the back rest in its upright position, such latch mechanism may be in the form illustrated in Figure 2. As therein shown, a plunger 50 is vertically slidable in a tube 52 which is welded or otherwise secured in or to the rear cross member of the seat frame 10. This plunger projects through a hole 54 in a plate 56 which is mounted in the lower edge of the back rest 14. An inclined flange 58 is provided at the forward end of the plate 56 to engage the bevelled surface 60 at the upper end of the plunger 50 when the back rest 14 is rocked to its upright position. The lower end portion of the plunger 50 is connected to a lever 62 which is pivoted at 64 to a bracket 66 secured to the seat frame 10. The lever 62 may be in the form of a bell crank having a vertical arm 68 which is pressed by a suitable compression spring 70 which yieldingly maintains the plunger 50 in its uppermost position from which it can be readily moved by depressing the lever 62. The extremity of the lever 62 is in the form of a pedal 72 which can be engaged by the foot of the operator to depress the lever. When the back rest is swung up again to its upright position, the lower end thereof, being below the pivot 18, swings to the left in Figure 2. The inclined flange 58 thus engages the bevelled face 60 to cam the plunger 50 downward so as to permit the back rest to reach its upright position in which the hole 54 registers with the bore of the tube 52. The plunger 50 thereupon springs upward through the hole 54 under the influence of the spring 70, locking the back rest in its upright position of use until it is released by depression of the pedal 72.

A modified form of the invention is illustrated in Figures 6 to 9 which show a collapsible chair having a seat frame 80 on which is mounted a suitable seat cushion 82. A back rest 84 is rockably mounted on seat frame 80 so as to be rocked about a hinge axis 86 from the upright position shown in Figure 6 in full lines to the prone position shown in dotted lines in the same figure. Arm rests 88 may be pivotally mounted as at 90 on the side walls of the back rest so that the arm rests can be swung upward from the nearly horizontal position of use illustrated in full lines in Figure 6 to the idle position alongside of the back rest, indicated by dotted lines in Figure 6. A stop pin 92 carried by the arm rest 88 engages a fixed lug 94 carried by the back rest to limit the downward movement of the arm rest from its idle position to its position of use. When the arm rests 88 have been swung up to their idle positions alongside of the back rest 84, the latter can then be rocked down to its prone position upon the seat cushion 82.

The chair is supported by four legs 100, the two legs on each side of the chair being rigidly connected by a bar or frame member 102 which extends from front to rear, the combination of frame member 102 and two legs 100 at each side of the chair constituting a side assembly which is hinged to the seat frame 80 as at 104. Each rear leg 100 is provided with an oblique extension 106, the upper end of which engages under a sector 108 secured at the lower end of the back rest 84. The sector 108 is preferably a suitably shaped plate having an arcuate flange 110 at its lower end to provide a wider bearing surface for the upper end of the arm 106. As indicated in Figure 7, when the back rest 84 is in its upright position of use, the sector 108 bears on the upper extremity of the corresponding arm 106 and thus prevents the side assembly of which this arm is a part from rocking from the position indicated in Figure 7. When the back rest 84 is rocked forward to its prone position, the sector 108 swings clear of the arm 106 so that the corresponding side assembly can then be rocked about its axis 104 to swing the legs 100 into the horizontal position under the seat frame indicated in Figure 8. If desired, a spring may be carried by each side assembly so arranged as to tend to swing the assembly to its upright position of use. In Figure 6 such a spring 112 is indicated, this spring being around a short shaft 114 which is an extension of the pin of the rear hinge 104. The drawing illustrates the foregoing mechanism on the left hand side of the chair, but it is to be understood that such mechanism is duplicated on the right hand side of the chair.

Suitable latch mechanism, such as is illustrated in Figure 9, is provided to maintain the back rest in its upright position of use. Such mechanism may comprise a vertical plunger 120 slidable in a tube 122 which is welded or otherwise secured to the rear cross member of the seat frame 80. The upper end of the plunger 120 is bevelled as at 124, this bevelled end normally projecting through a hole 126 in a plate 128 mounted in the lower edge of the back rest 84. The plate 128 has an inclined flange 130 at its forward end to engage the bevelled end 124 of the plunger when the back rest 84 is swung into its upright position of use. Such engagement of the plunger by the flange causes the former to be forced down so that the plate 128 can move into the position shown in Figure 9 with the hole 126 directly above the tube 122. The plunger 120 is then sprung upward so that its upper end enters the hole 126 and locks the back rest in its position of use. For this operation the plunger 120 is connected near its lower end to an operating lever 132 pivoted at 134 on a bracket 136 fixed to the seat frame 80. The lever 132 is preferably in the form of a bell crank having a vertical arm 138 extending up from the pivot 134, the arm being pressed by a spring 140 in such a direction as to cause the plunger 120 to move upward. A treadle 142 is formed at the rear extremity of the lever 132 to facilitate depression of the plunger 120 by the foot of the operator to release the back rest 84.

When it is desired to fold or collapse this chair, the treadle 142 is pressed downward until the upper end of the locking plunger 120 is clear of the plate 128. The arm rests 88 are swung up to their idle position and the back rest is then swung down to its prone position on the seat cushion 82. This results in the removal of the sectors 108 from the upper ends of the arms 106, permitting the side assemblies to be rocked

against the torque of the springs 112 to swing the chair legs 100 under the seat frame as shown in Figure 8.

The springs 112 are preferably not strong enough to rock the legs 100 back to their vertical position when the chair is collapsed as shown in Figure 8 and is resting on the floor, the weight of the chair being sufficient to keep the legs in their collapsed position. If the collapsed chair is lifted from the floor, the springs 112, assisted by gravity, will rock the legs back to their vertical position, whereupon the back rest 84 can be swung to its upright position, thus locking the legs in place. In this position the two legs 100 and their connected member 102 engage against one or more stops 103 on the frame which serve to limit outward swinging movement of the legs and cooperate with the sector 108 to support the legs in the open vertical position of Figs. 6 and 7.

I claim:

1. A folding chair comprising a seat frame, side frames hinged to said seat frame to rock from upright positions of use to horizontal positions, a back rest having a frame pivotally mounted on said seat frame and rockable forward from an upright position of use to a prone position above the seat frame, and interlocking means carried by said back rest frame and each said side assembly, said interlocking means comprising a button element and a cooperating element having a cavity adapted to be entered or exited by said button only when the button element and cooperating element are in a predetermined angular relation which is assumed when the back rest is in its prone position, the element carried by said back rest frame being rotatable with the back rest frame in its rocking movements.

2. A folding chair comprising a seat frame, a back rest pivotally mounted on said frame for movement from an upright position of use to a prone position overlying the seat frame, a side assembly at each side of the chair, each side assembly including support means for its side of the chair pivoted to the seat frame for movement from an upright position of use to a collapsed position beneath the seat frame, cooperating locking means carried by the back rest and the side assemblies and operative to lock them together in their said position of use and to release the side assemblies when the back rest is pivoted forward to its prone position, a locking latch carried by the seat frame, a spring normally moving the latch into engagement with the back rest to hold it in said upright position, and a foot pedal for withdrawing the latch.

3. A folding chair comprising a seat frame, a back rest pivotally mounted on said frame to rock forward from an upright position of use to a prone position overlying said frame, side assemblies hinged at the sides of the seat frame, each said assembly including supporting legs for its side of the chair rockable from an upright position of use to a collapsed position under the seat frame, an oblique arm carried rigidly by each side assembly and engageable against a stop surface on the seat frame when the assembly swings to the position of use, and arcuate flanged plates carried by the back rest in position to engage said arms in opposition to the stop surfaces and hold the assemblies in upright position when the back rest is rocked to upright position.

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