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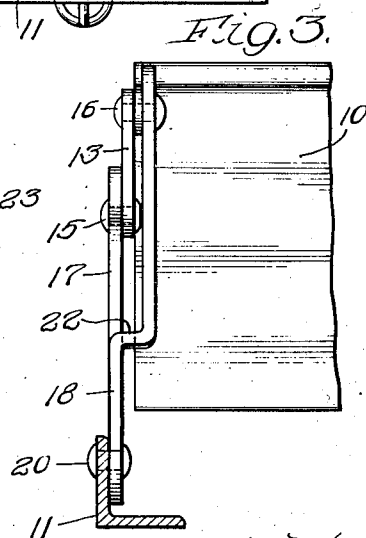
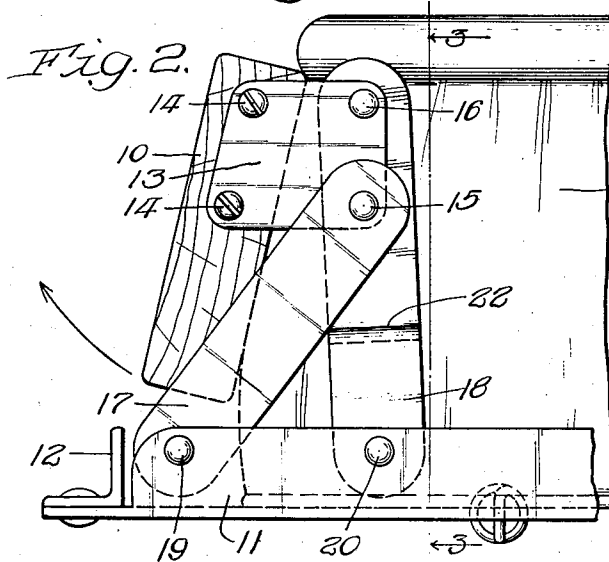
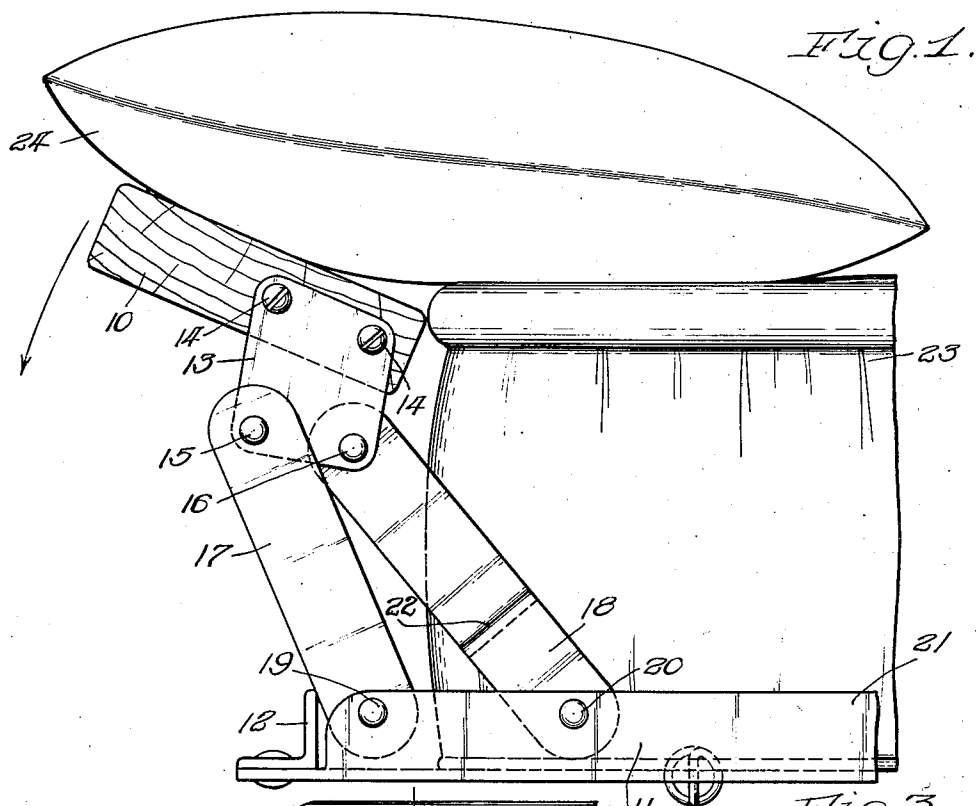
J. R. THOMAS

2,370,890

FOLDING BED RAIL

Filed April 27, 1942

2 Sheets-Sheet 1



Inventor:
Joseph R. Thomas,
By Kent W. Wonnell
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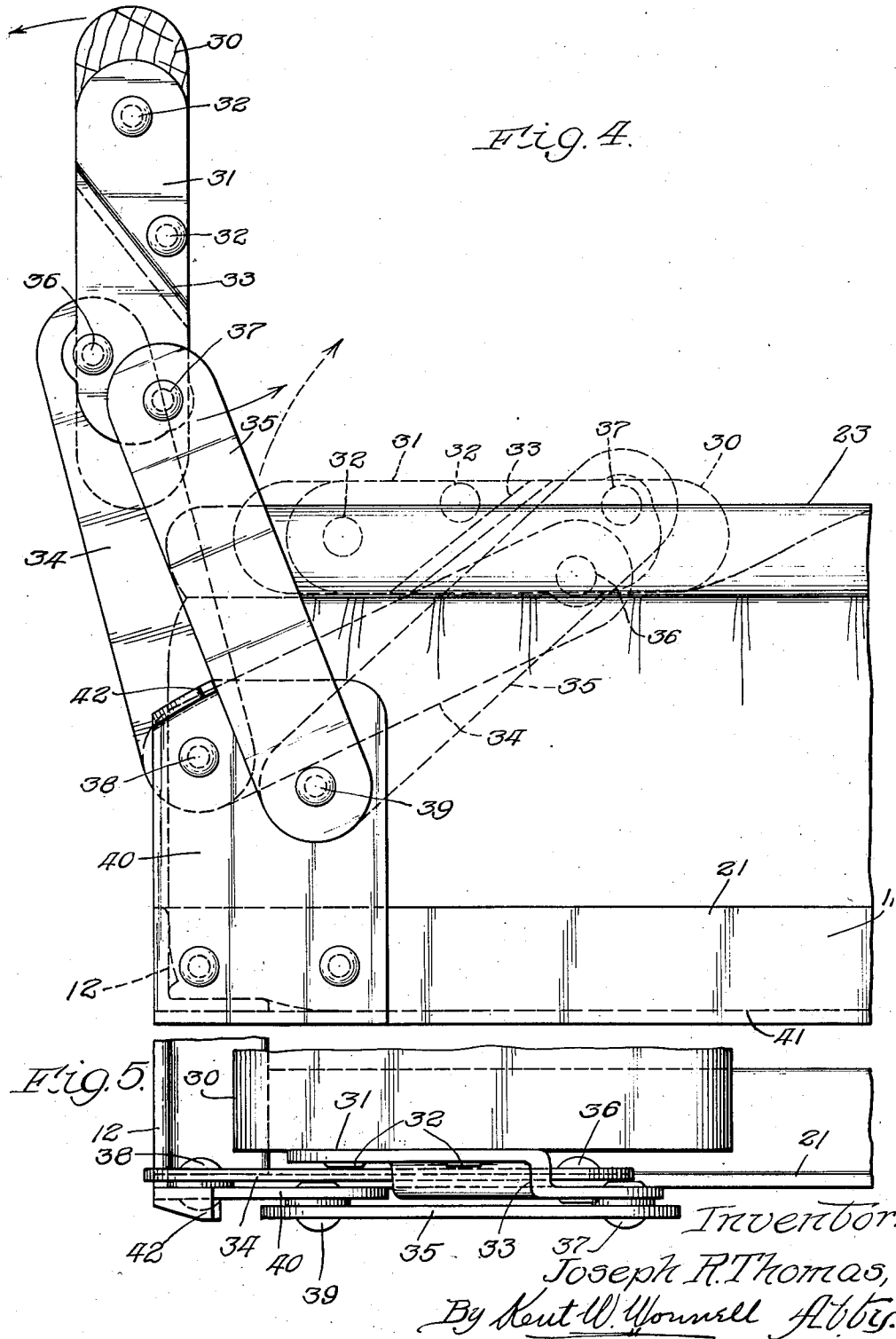
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,370,890

FOLDING BED RAIL

Joseph R. Thomas, Chicago, Ill.

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9 Claims. (Cl. 5—53)

This invention relates in general to an end rail for a folding bed and is more particularly described as a movable rail and support for a folding bed of the convertible davenport type, although it may have a more general use wherever applicable.

An important object of the invention is in the provision of a folding end rail which may be used as a pillow rest, as a mattress support and guard, and as an end rail.

A further object of the invention is to provide a foldable end rail adapted to be retained in either one of two said positions without the use of holding or retaining springs.

A still further object of the invention is in the provision of a folding bed rail adapted to engage and to be engaged by a mattress for holding and guiding the mattress and the pressure of the mattress engaging the rail for holding it in place in one position, additional pressure of the mattress tending to hold the rail more firmly in its position.

Other objects of the invention are: to provide a guard for engaging a mattress end, keeping the mattress from engaging the ends of other folding sections; as a pillow rest to effectively lengthen a bed, support a pillow and prevent a pillow from falling from the end of the bed; as a mattress support to engage the end of a mattress for confining and holding the mattress in place when the bed is folded, to eliminate the necessity of mattress fastening ties at the adjacent end of the bed, and to prevent the mattress from bulging beyond the end of the section thereby insuring proper folding and unfolding of the bed and mattress.

Other objects of the invention will appear in the specification and will be apparent from the accompanying drawings, in which

Fig. 1 is a side elevation of a folding bed rail in accordance with this invention when used as a pillow rest;

Fig. 2 shows the rail of Fig. 1 in its other folded or limiting position;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 illustrates a modification in which the rail may be used as a foot board in one position and as a mattress clamp in its other limiting position; and

Fig. 5 is a partial plan view of the structure shown in Fig. 4 in the mattress clamping position.

In folding beds, and particularly in folding davenport beds, it is desirable not only to con-

fine and hold the end of a mattress foldable with the bed sections so that it will not project beyond the end of its folding section, nor lie loosely upon its supporting section in folding and unfolding. Foot rails have been provided heretofore with a spring at each end mounting to hold the rail in either one of two limiting positions, but in the present invention, no spring is necessary, the rail is manually moved from one limiting position to the other, and the disposition of parts is such that the rail is held naturally or by pressure of the mattress or a pillow in its limiting positions, the mounting of the rail causing it to be held more firmly in position when additional pressure is applied thereto or to the pillow or mattress supported and engaged thereby.

Referring now more particularly to Figs. 1, 2 and 3, an end board 10 is movably mounted at one end of a folding bed section which comprises opposite side rails of which only one rail 11 is shown, connected at the end by an angle cross bar 12. The end board is usually not more than 4 or 5 inches in width and about one inch in thickness and is supported at each end by means of a four-sided plate 13 through which screws 14 or other suitable fastening devices are inserted at adjacent corners of the plate into the end of the board at one side thereof, leaving the other side relatively free and unattached. The opposite side of each plate is pivoted by rivets 15 and 16 with the ends of links 17 and 18 respectively, the other ends of the links being pivoted by rivets 19 and 20 to an upstanding flange 21 of the side rail 11, the rivet 19 being located relatively near to the cross rail 12 so that in one limiting position, the outer edge of the link 17 will engage the rail 12 as shown in Fig. 1, and in the other or opposite limiting position, the opposite edge of the link 17 will engage an offset 22 intermediate the ends of the other link 18 as shown more clearly in Fig. 2.

The length of the links 17 and 18 between their respective end pivots and their connection to the plate 13 is such that the end board 10 is rotated from an upwardly and outwardly inclined position at the top of a mattress 23 supported by the bed section 11 as shown in Fig. 1, to an inwardly and upwardly inclined position at the end of the mattress as shown in Fig. 2. To accomplish this result, the link 17 is somewhat shorter than the link 18, it is pivoted at the outer side of the plate 13 whereas the link 18 is pivoted at the inner side of the plate 13, and the plate for engaging the fastening screws 14 and the pivots 15 and

16 is preferably in the shape of a rhomboid rather than a rectangle.

With this construction, the end board is inclined slightly above the top of the mattress 23 at the end thereof to provide a foot rest or a support for a pillow 24, and downward pressure on the pillow or on the supported side of the board 10 will tend to press it more firmly in the limiting position with the mounting link engaging the stop cross bar 12. Likewise in the other limiting position of the board as shown in Fig. 2, it is located the end of the bed section inclined upwardly and inwardly therefrom, thereby engaging the upper portion of the mattress more than the lower portion thereof so that it tends to hold the mattress upon the bed section near the end thereof, and any pressure of the mattress against the board due to the swinging or folding movement of the bed section will cause the mattress to press more tightly against the lower inclined edge of the board tending to hold it more firmly in the inclined limiting position, and thus to support and retain the mattress more firmly in position upon its supporting bed section for the folding and unfolding movements thereof, making it unnecessary to provide mattress fastening ties at the adjacent end of the mattress.

In the form shown by Figs. 4 and 5, an end board 30 is supported at each end by a plate 31 having fastening devices 32 inserted therein through the plate and with an offset 33 in the plate to provide means for pivotally attaching links 34 and 35 at opposite sides of the offset end of the plate by means of pivots 36 and 37 respectively.

The other ends of the links are connected by pivots 38 and 39 at opposite sides of a plate 40 attached to and projecting above a side rail 41 of a bed section upon which a mattress 42 is supported.

At one upstanding corner of the plate 40 is a bent extremity 42 forming a stop for engaging the outer edge of link 35 in a position to hold the board 30 in substantially upright position. Any movement against the lower end of the board below the supporting portion of the plate 31 will tend to press it and its mounting against the stop.

When the board is bodily rotated outwardly from the mattress at the upper end thereof, to swing the links inwardly, the board will then assume a position on top of and depressing the adjacent end of the mattress 42 as shown in broken outline in Fig. 4 and in full lines in Fig. 5 until the offset 33 comes into engagement with the outer and upper edge of the link 34 which determines the limiting position of the board in this direction of rotation.

In this form of the invention, the board may constitute a pillow support, an end rail or a foot board, and in its other limiting position, it restrains and holds the mattress upon the end of its bed section for folding and unfolding movements and any pressure of the mattress upon the free side of the board by the mattress causes a firmer engagement and holding contact with the mattress itself, thus making it unnecessary to provide mattress fastening ties for securing the adjacent end of the mattress to its supporting bed section.

In both of the forms above shown, the mounting links are so connected to the end board that they are held in their limiting positions without the necessity of springs or fastening devices

other than the stops and engaging portions provided for limiting the movements of the supporting links. The boards are manually moved from one inclined position to the other, and in one limiting position of each form, a mattress is engaged and held in place by the board.

In each limiting position, the end board is locked in place by the connections of the links, any ordinary pressure upon the board by a pillow or a mattress tends to hold it and lock the links more securely in place, and manual movement of the board and consequently of the links upon their pivots is necessary to change the board position.

In Fig. 1, pressure of the mattress 23 against the adjacent edge of the board 10, the weight of a pillow or other pressure against the upper face tends to hold the board more firmly in place with the link 17 against the cross rail 12. Only by manually rotating the board, moving the inner end slightly inwardly and upwardly until the pivot 16 crosses the line between the pivot 20 and the fastening 14, can the board be swung downward to the other limiting position.

In its lower position as shown by Fig. 2, the mattress pressing more firmly against the upper edge and inner face of the board tends to tighten it against the mattress. By manually rotating the board upwardly from its lower end, moving the upper end inwardly against the pressure of the mattress until the pivot 15 crosses the line between the pivots 19 and 16, the board may be swung into its upper limiting position.

In the same manner, the board 30 is locked in upper position by the pivot 37 crossing the line between the pivots 36 and 39, and in the lower position by the pivot 36 crossing the line between pivots 38 and 37. Compression of the mattress holds the board locked more firmly in place, and manual rotation of the board in this position causes the inner edge to press into the mattress more firmly in order to unlock the connection and swing the board upwardly.

Instead of being supported by a mounting plate at each end of the foot board, the links 17, 18 or 34, 35 may be pivoted directly to the end of the board. If pivoted at such distances that they would interfere, one of the links may be spaced from the other by washers, or a portion of the end is cut away forming a shoulder out of line with the other portion of the end of the board to which one end of a link (as 18) is pivoted out of line, but parallel with the other link, and a stop, or an offset (as 22) is provided at any desired location, or on either of the links so that they will engage (as in Fig. 2) limiting their movement in one direction. In their other direction of movement, one of the links may engage a stop (as 12 or 42) to limit the movement of the links and a board attached thereto.

By providing a mounting plate (as 13 or 31), an accurate spacing of the links is obtained, the plate forms a natural offset for spacing the links apart making it unnecessary to form the end of the board with an offset or shoulder, and the plate constitutes a suitable connecting means for attaching the mounting means to the end of the board. Even the loosening of one of the fastening screws attached to a plate would not prevent the mounting structure from operating properly as would a pivoting screw inserted through the end of a link.

I claim:

1. A movable end board and means mounting it for limited movement on a bed part, said

means comprising a plate secured to each end of the board, a pair of links each separately pivoted at one end to the plate and at the other end to the bed part, a fixed stop carried by the bed part for engaging one of the links to limit the movement of the board in one direction, and interengaging means between a link and the plate at each end of the board for limiting the movement of the board in the other direction.

2. A movable end board and a mattress support for a bed section, a plate secured to each end of the board having a projecting portion thereof free at both sides of the plate, a pair of supporting links each separately pivoted at one end to opposite sides of the plate and pivoted at the other end at spaced distances to the bed section, means carried by the bed section for engaging one of the links to limit the movement of the board at an angle to the mattress, and means engaging the links for holding the board in engagement with the mattress in the other limiting position of the board.

3. A combined mattress support and end board for a folding bed section, comprising a pair of links pivoted at spaced distances apart adjacent the end of a bed section, a plate to which the other ends of the links are connected at a less distance apart the plate having a fixed connection with the end of the board at one side of the center thereof, a fixed stop carried by the bed section for engaging the edge of one of the links and limiting the position of the board in one direction, and an offset projection in one of the parts engaged by one of the links for holding the board in engagement with a mattress in the other limiting position of the board.

4. A folding rest and mattress support for a bed section comprising a pair of links pivoted adjacent the end of a bed section at spaced distances apart, a plate to which the upper ends of the links are separately pivoted at a less distance apart, an end board and means for securing the plate thereto at the end of the board and at one side of the center thereof, means carried by the bed section for engaging the edge of one of the links for holding the board in an inclined position at the top of a mattress, and an offset in one of the links for engaging the other link to position the board in engagement with the mattress at the end of the bed section for holding the mattress in connection with the section for folding and unfolding movement.

5. A movable end board and mattress support for a folding bed section comprising a flat rail and means for mounting it to swing from a position extending from a mattress to a position engaging the end of the mattress, said means comprising a plate secured to each end of the board having a portion extending free from the board, a pair of links separately pivoted at opposite sides of the plate and at spaced distances apart and separately pivoted at greater distances apart to the side of a supporting bed section, a cross rail on the bed section for engaging the edge of one of the links to hold the board inclined to a mattress at the upper surface thereof, and an offset

in one of the links for engaging the other link to limit the movement of the links for positioning the board in an inclined position engaging the end of a mattress supported by the bed section for holding and confining the mattress thereon.

6. A movable end board and mattress support for a folding bed section comprising a flat rail and means for mounting it to swing from a position extending from a mattress to a position engaging the end of the mattress, said means comprising a plate secured to one end of the board having an offset in the plate to space a portion thereof from the board, a pair of links pivoted to the offset portion of the plate on opposite sides thereof, a plate support carried by the bed section to which the other ends of the links are pivoted on opposite sides of the plate, a stop extending from the plate for engaging the edge of one of the links and limiting the movement of the board in one direction free from a mattress, the said offset in the plate engaging one of the links for limiting the movement of the links and the board in the other direction and holding the board compressed against the upper side of a mattress supported by the bed section.

7. A combined mattress support and end rest for a bed section, comprising a pair of links pivoted adjacent the end of the bed section at spaced distances apart, an end board to extend across the bed section, means for pivotally connecting the adjacent ends of the links to the end of the board and out of line with each other so that the links may overlap in swinging the board from one limiting position to another, a stop carried by the bed section for engaging the edge of one of the links for holding the board in a position extended from a mattress, and a stop on said means for engaging one of the links to position the board in engagement with the mattress in the other limiting position.

8. A movable end board and mattress support for a folding bed section, comprising a flat rail, a pair of links separately pivoted to the bed section and having separate pivotal connections with the end of the rail, a cross piece on the bed section for engaging the edge of one of the links to limit movement of the links and rail in one direction, and stop means on one of the links for engaging the other link to limit the movement of the links in a direction away from the cross piece.

9. The combination with a bed section, a mattress supported thereon and a foldable end board, of means for mounting the end board by engagement of the ends thereof to swing from a position free and clear of the mattress to a position engaging the end of the mattress, said means comprising a pair of links each having a pivotal connection at one end with the end of the board and at the other end with the bed section, means supported by the section to engage one of the links for limiting the movement of the board in one direction, and a stop on one of said links for engaging the other link to limit the movement of the board in the other direction.

JOSEPH R. THOMAS.