Feb. 18, 1958 S. M. FISHER ET AL 2,823,391

FOLDING BED

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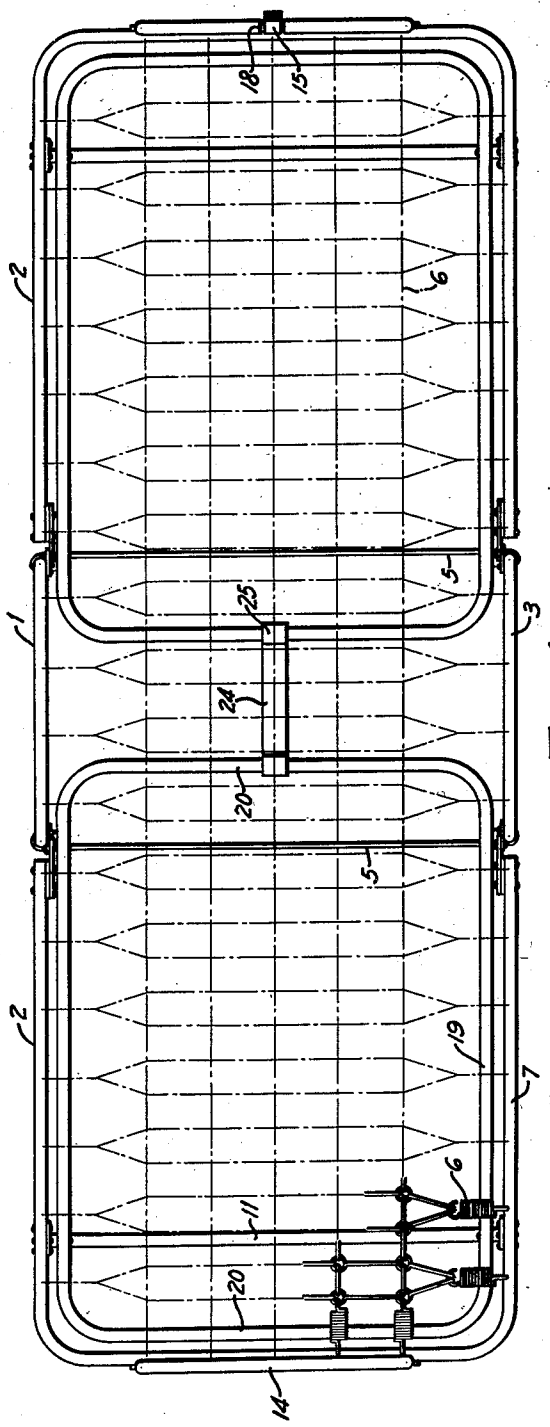


Fig. 1

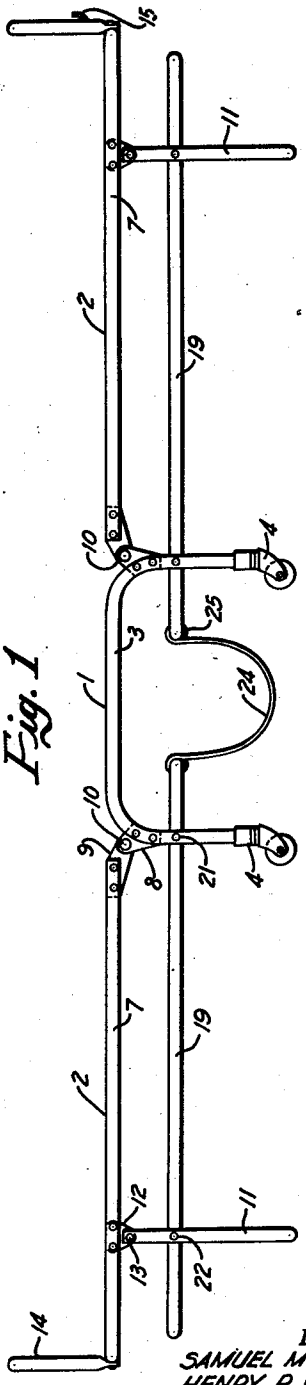


Fig. 2

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Fig. 3

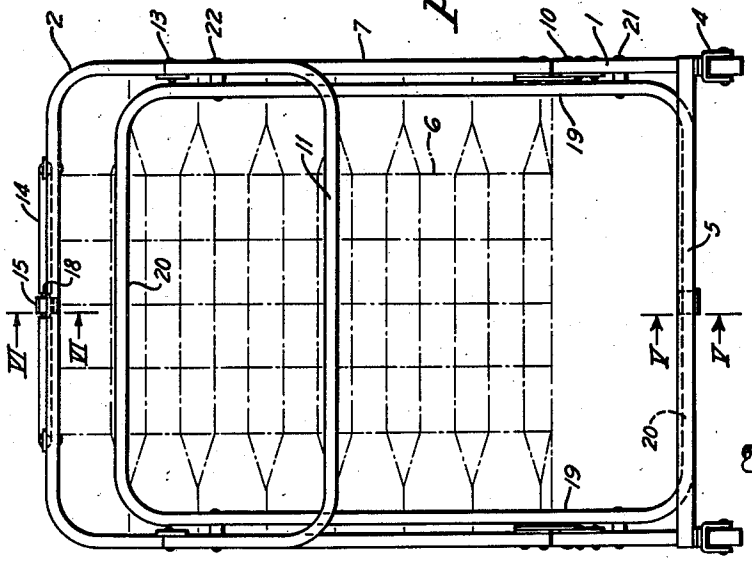


Fig. 6

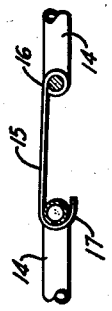


Fig. 5

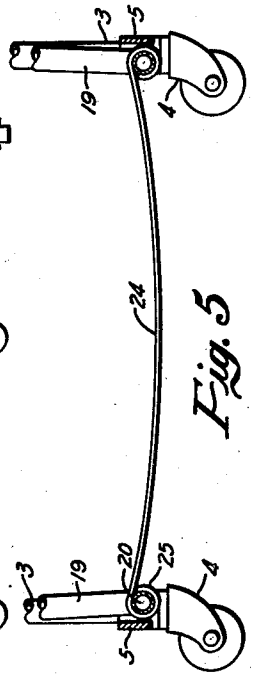
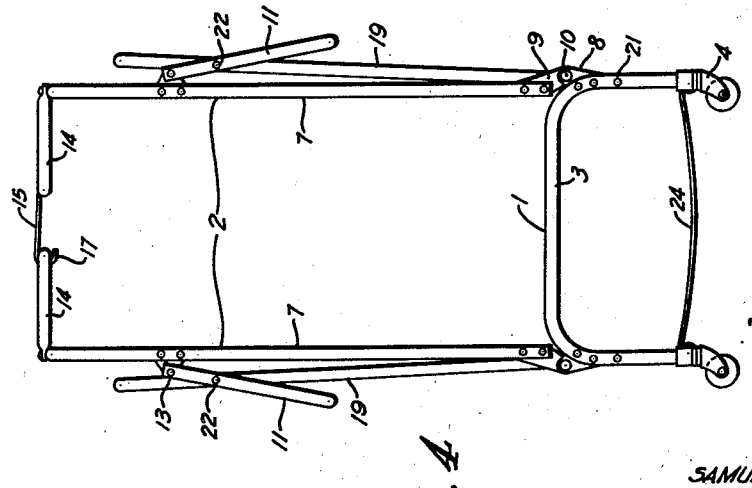


Fig. 4



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FOLDING BED

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3 Claims. (Cl. 5—152)

This invention relates to beds of the folding type wherein the end sections fold about a center section mounted on castors for ease in handling. More specifically the invention is concerned with a new and novel manner of bracing the folding bed providing great rigidity to the sections and automatic positioning of the section supporting members as the bed moves from collapsed to open position.

An object of the invention is to provide a folding bed having a center section and pivotal end sections which are automatically supported in operative position upon opening the bed and the supporting mechanism is automatically retracted as the bed is moved to folded position.

Another object of the invention is to provide a novel form of a continuous O-shaped end and center section brace which also serves as a pivotal support for the end sections.

Another object of the invention is to provide an O-brace of the character described which automatically opens and locks the end section supporting legs in operative position as the bed is opened.

A further object of the invention is to provide a novel counterbalance for the end sections making for smoothness and ease of movement of the sections from open to folded position.

These and other objects of the invention will be made apparent to those skilled in the art from the following description and the drawing forming a part thereof in which Fig. 1 shows a plan view of the bed in open position; Fig. 2 shows a side elevation of the bed in open position; Fig. 3 shows an end elevation of the bed in folded position; Fig. 4 shows a side elevation of the bed in folded position; Fig. 5 shows an enlarged section through the bed illustrating the compression spring between the end sections; and Fig. 6 shows a section on lines VI—VI of Fig. 3.

Referring now in detail to the drawing, the bed comprises a center section 1 and end sections 2. The center section includes the inverted U-shaped tubular members 3 mounted on castors 4 at each side of the bed. Adjacent the castors the arms of the members 3, at opposite sides of the bed, are preferably connected by a tension member 5 which may be a strap as shown or any other suitable shape. The tops of the members 3 are connected by a suitable resilient mattress support such as 6.

Each end section comprises a U-shaped tubular member 7 having the free ends of its arms pivotally connected with the center section tubular members 3 by means of pivot plates 8 secured to the members 3, a pivot plate 9 secured to each arm of the end section member 7 and pivot pins 10 connecting adjacent ends of the pivot plates. Adjacent the outer end of each end section tubular member 7 are supporting legs comprised of a U-shaped tubular member 11 having the free ends of its arms connected with the arms of the end section member 7 by means of a bracket member 12 secured to each arm of the member 7 and a pivotal connection 13 between such bracket

and the adjacent arm of the member 11. At each end of the bed and mounted on the outer end of each end section member 7 is a suitable mattress retaining member which may be an inverted U-shaped tubular member 14 having the free ends of its arms connected with the member 7. The arms of the tubular member 7 are connected by a suitable mattress supporting section such as 6 having provisions for hinging about the similar section mounted on the center bed section 1.

The end sections 2 may be locked in raised position by means of a locking member 15 having one end 16 looped about one of the members 14 and the other end 17 provided with an open ended hook for engaging the adjacent member 14. This member 15 may be retained in operative position upon its respective member 14 by recessing the member 14, as shown in Figs. 1 and 6 to provide shoulders 18 between which the looped end 16 of locking member 15 is mounted.

An O-shaped brace is provided beneath each end section 2 and preferably in the form of a continuous tubular member having spaced arms 19 extending lengthwise of the bed and connecting arms 20 extending crosswise of the bed. Each arm 19 is pivotally connected adjacent one end at 21 to an arm of the center section tubular member 3 and adjacent the other end at 22 to an adjacent arm of the end section supporting leg tubular member 11. The pivotal connection 21 between each O-shaped brace member 19 and the center section 1 is below the pivotal connection between the end section 2 with the center section 1. The pivotal connection 22 of each member 19 to supporting member 11 is below the pivotal connection 13 between the member 11 and the end section 3. This construction provides relative movement between the O-shaped brace and its adjacent end section as the end sections are pivoted about the center section. This movement of the O-shaped brace relative to the adjacent end section automatically extends the member 11 into supporting position as the bed opens, and retracts the member 11 to folded position as the end sections are folded. The arms 20 of the O-shaped brace also provide rigid connections between opposite ends of the arms 19 and thus provide transverse support for the associated end section 2 and associated end of the center section 1. The compression spring 24 extends between the bottom ends of the O-braces, having looped ends 25 engaging the members 20 and a body portion disposed slightly below a horizontal line connecting said members so as to be deflected downwardly, as in Fig. 2 when the bed is in open position. The looped ends 25 of member 24 may be retained in position by an annular depression in the members 20 similar to that shown in Fig. 6.

The bed as shown and described may be folded to the position shown in Fig. 4 for storage and moved from place to place upon the castors 4.

Although not shown in the drawings and forming no part of this invention, the bed is customarily equipped with a suitable mattress disposed between the mattress retaining members 14. When the bed is in folded position the mattress is disposed between the end sections 2 and supported on the center section 1. The members 14 serve to retain the mattress in fixed relation to the bed in both folded and open positions. When the bed is in open position as in Figs. 1 and 2, the mattress and spring sections 6 provide a resilient support for the body.

When the bed is in folded position as in Fig. 4, the operator may stand facing the folded bed of Fig. 4 and after applying a slight pressure against the end sections 2 to free hook 17 of member 15 from the left hand member 14, rotate the member 15 to the right. The end bed sections 2 may then be moved outwardly and downwardly about their pivotal connections 10 with center

section 3. The O-braces associated with each end section will also pivot about their connections 21 with center section 3 and will move outwardly relative to the associated end section to rotate supporting leg member 11 of the end to supporting position. The bed is now in the position as shown in Figs. 1 and 2. During this movement of the bed from folded to open position, spring member 24 is compressed as the adjacent ends 20 of the O-braces approach each other. The member 24 being of spring steel resists movement from flat to arcuate position and thus exerts a counterbalancing action against the pivotal movement of the O-braces and end sections. It will be noted that each O-brace, when the bed is in open position, locks its associated end section supporting member 11 in operative position.

When it is desired to move the bed from open to folded position, the operator standing at the side of the center section 1 may simultaneously raise both end sections to vertical position. When this is done the O-braces retract the members 11 from the position shown in Fig. 2 to that shown in Fig. 4. If desired, the operator may alternately raise each end section to folded position. With either method of folding the bed, the energy stored in member 24 is released so as to assist the folding movement of the end sections. After the end sections reach vertical position, the member 15 is rotated to engage hook 17 thereof with the adjacent member 14 and by slightly compressing the end sections together the hook 17 moves over the member 14 to lock the bed in folded position. By reason of the shoulders 18 of the member 14 upon which member 15 is pivotally mounted, the member 15 is retained at the midportion of the member 14 in readily accessible position for its locking or unlocking movements.

The O-brace associated with each end section and adjacent end of the center section acts as a brace to prevent the legs of the inverted U-shaped member 3 at each side of the end section from being deflected towards or away from their normal plane. These O-braces provide a like transverse support for the arms of the U-shaped end section members 7. It is therefore apparent that the O-braces will retain the shape of the end and center bed sections under any expected loading conditions. This will be so, whether the bed is occupied by one or several persons and regardless of the weight of such persons. The members 5 connecting the center section members 3 at opposite sides of the be also serve to provide transverse support for the members 3. It will likewise be apparent that when the open bed is under load, the O-braces beneath each end section serve to brace the members 3 of the center section against spreading in a direction longitudinally of the bed.

The bed section members 3, 7 and 11 have been shown and described as being tubular members since this is the preferred embodiment of the invention. It will be readily apparent to those skilled in the art that the bed will operate in the same manner when the members 3, 7 and 11 are made from any other suitable cross section. The O-braces are preferably made continuous in order to obtain all the bracing effects herein described and shown. If the members 20 of the O-braces are not continuous

so as to connect the opposite members 19 of the O-brace the full function of the O-brace will not be obtained. The bed will, however, open and close in the manner described. It will also be apparent to those skilled in the art that the cross section of metal forming the O-brace may be of other than the preferred tubular form.

It is to be understood that the exact details of construction shown and described are for purposes of illustration and not limitation, except as made necessary by the scope of the appended claims.

We claim:

1. In a folding bed construction, in combination, a center section formed of inverted spaced U-shaped members disposed at opposite sides of the bed, a U-shaped end section at each side of the center section, the arms of said end sections forming the sides of the bed with the free end of each arm pivotally connected with the adjacent arm of the center section in substantial horizontal alignment therewith when in horizontal position, resilient mattress supporting members connecting the opposite arms of each end section and the top of the center section members, transversely disposed U-shaped leg members adjacent the outer ends of each end section with the free ends of the arms of each said leg members being pivotally connected to the arms of the U-shaped end members, a continuous substantially rectangular shaped brace member disposed beneath each end section when in horizontal position and extending in overlapping relation between the arms of the adjacent leg member and center section, and pivotal connections between each brace member and the adjacent arms of the leg members and center section members intermediate the vertical ends thereof at each side of the bed restraining lateral movement of said arms under vertical load applied to the said center and end sections, said brace members cooperating with said leg members and center section members to provide a continuous rigid lateral and longitudinal support for each end section of the bed in open and closed positions.

2. The folding bed as defined in claim 1 wherein the adjacent depending legs of the opposite U-shaped center section members are connected by transverse tension members disposed beneath each said rectangular shaped brace member providing balanced bracing of the opened bed end section at the leg member and at the center section.

3. The folding bed as defined in claim 1 wherein the adjacent overlapping ends of the rectangular brace members beneath the center section are connected by a compression spring counter-balancing the weight of the end sections when moving to and from closed position of the bed.

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