FOLDING DAVENPORT BEDS

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This invention relates to folding beds adapted, when extended, to form a bed and when collapsed to form a seat in the form of a davenport or a chair. For convenience and brevity, the term "davenport" is used to include a chair, because the distinction between the two is, that a davenport is wider than a chair. Accordingly, the extended bed will have a width corresponding to a davenport or of a chair, although the length will be the same in either case.

Such a davenport bed comprises a frame of wood or metal, having sides connected by a back, which is padded to form a cushion back.

Mounted in the sides of such a frame, is a folding structure, usually of structural steel, comprising a series of articulated sections, including a foot section and adjacent second and third sections terminating in a fourth head section, all provided with a mattress-receiving area usually of link fabric, and moveable with the sections to extended position and foldable to closed position with the mattress between the sections.

When the structure is folded, the foot section should move under the upholstered back. The second and third sections adjacent the foot section, the head section and the sections adjacent thereto are connected by links or levers to the sides of the frame. The connections are usually pivotal ones, so that the whole structure will swing about these pivots, not only towards the back of the frame, but also downwardly in depressed position, so as to provide a seat which is not too high.

Because of the pivotal connections to the sides of the frame, the structure is unstable, particularly at the back of the frame and at the foot section.

One of the objects of this invention therefore is to provide a folding davenport bed structure, which is simple in construction, effective in its action and easy to manipulate in order to open and close the structure.

Another object is to provide a simple and effective mechanism, whereby the head section will be pressed down, when the structure is folded, so as to readily pass underneath the upholstered back.

Another object is to provide a folding structure in which the connections to the frame are braced, so as to render the structure stable.

Further objects will appear from the detailed description, in which will be described a number of embodiments of this invention. It will, however, be understood that this invention is susceptible of various embodiments within the scope of the appended claims.

In the accompanying drawings

Fig. 1 is a side elevation of a folding bed structure embodying this invention;

Figs. 2, 3 and 4 are views similar to Fig. 1, showing the structure in various positions, with Fig. 4 in final folded position; Figs. 3 and 4 showing the frame and the upholsteréd back in construction lines;

Fig. 5 is an enlarged detail of a part of the mechanism in the position shown in Fig. 4, illustrating the operation of the mechanism for pressing and locking the foot section down;

Fig. 6 is a perspective view of one corner of the head section showing the mattress-receiving area, and also the resilient device extending beyond the foot section and its junction with the next adjacent section; and

Fig. 7, view similar to Fig. 5 illustrating another embodiment of this invention.

Referring first to Figs. 1—5, the folding structure comprises a series of articulated sections A, B, C and D. These sections are usually made of angle iron or channel iron, pivoted together, and the sides and ends are connected by a suitable mattress-receiving area, such as a flat spring area of link fabric indicated generally at L. The sides of the frame are usually upholstered, not shown, but the upholstered back is shown at E. Braces R are provided at the ends of section C, and also at the ends of the foot section D.

In each side of the frame is mounted a bracket or plate 1, which is either screwed or bolted to the frame. Since the construction of the links and levers is duplicated on each side of the frame, reference will only be had to one of the sets, as shown in Figs. 1—5. Pivoted at 2 in the bracket, is a bell-crank lever 3, one arm of which is connected by pivot 4 to the head end of the section D, specifically to the brace R. The end of this arm is connected by a pivot to one end of a link 5 connected to a pivot to a lever 6, one end of which is pivoted at 7 to the section D. The other end of the lever 6 is pivoted at 8 to a support in the form of a lever 9, which in turn, is pivoted at 10 to a bracket or plate 29 on the frame. Strong springs 11 connect the bottom of the lever 9 with a bracket 12 on the frame, and a lighter spring 13 connects the upper part of the lever 9 to a plate 14, also on the frame. The upper end of the lever 9 is pivoted to one arm 15 of a bell-crank lever pivoted at 16 to the section C, while the other arm 17 is pivoted to one arm of a lever 18, the other end of which is pivoted to a leg 19 whose upper end is pivoted to the section C. The bell-crank lever arm 17 has a flange 20 providing a stop, as hereinafter described. The lever 18 is extended beyond the leg to form an extension 21, which is offset, and which forms the short arm of a lever 18—21, as hereinafter described. A lever 22 is pivoted at one end to the third section C, and at the other end to a link 23, which is pivoted to the section A. The lever 22 is extended beyond its pivot to the section C, to the right of Fig. 1 to form an arm 24, whose end is offset, so as to form the short end of the lever 22—24, and so as to engage with the short arm 21 of the lever 18—21 for purposes hereinafter described. A link 25 is pivoted at one end to the section B and at its outer end to the short end of the leg 26 pivoted to the section A.

The structure is shown in extended position in Fig. 1, where it forms a bed which is provided with a mattress adapted to fold with the structure. In order to fold the bed, the end of the foot section is simply grasped and moved so as to raise the foot section A. By doing so, the linkage and lever connections operate to move the structure from fully opened to fully closed position through the successive stages, Figs. 1, 2, 3 and 4, enlarged Fig. 5. In so doing, the mattress folds with the sections and the head section D swings under the back still with the mattress thereon. This folding movement is facilitated by the action of the springs 11—13, so that very little effort is required to either open or fold the structure.

During the latter part of the folding movement from position, Fig. 3 to Fig. 4 (detail Fig. 5), the short arm 21 of the lever 18—21 engages the offset 24 of the short arm of lever 22—24, swinging the right end of 22 down, so as to exert a downward pull on link 23, and therefore on the section A, so as to press it against the mattress in order to facilitate the movement of the foot section A underneath the upholstered back E. This movement is
brought about by the dropping down of the entire sectional structure of the frame, as distinguished from a straight movement of the foot section A toward the back of the frame. Near the end of the movement, the right end of the lever 22, Fig. 5, engages the flange 29, so as to form a stop. In other words, the foot section is not only pressed down, but also against the stop, so that the foot section will be supported in order to provide a firm seat. There may be a slight release of the downward pressure of the right end, Fig. 4 of section A as it moves to final position, but at that time the foot section has already moved under the back E. This not only avoids undue pressure on the mattress, but also insures that the foot section A will be closed to the bottom of the back E. After the structure is folded, Fig. 4, the seat may have placed thereon cushions not shown.

Fig. 7 illustrates another embodiment of this invention. In this embodiment, the end 21 of the lever 18-21 is omitted, and the short end of the lever 9 has a lug in the form of a pin or an offset W, which engages the short arm of the lever 24-22, as the parts move to the position shown in Fig. 4, so as to again move the arm 22 down, operating as before through the link 23 to press the section A down until the right end of the lever engages the stop 20, Fig. 4.

In order to stabilize and brace the structure, each of the bell-crank levers 3 suspending the head section D at the sides thereof, and these arms are connected by a suitable bar 28, which may be in the form of a pipe or channel iron or angle iron, and which bar is forwardly of the head section when extended. It will be seen that because of this brace 28, the head end of the folding structure is firmly supported in the frame, so that it will be stabilized and will not wobble. The bar 28 also serves to stabilize the entire structure, because it will cause the sections A, B and C to follow the movement of section D into the frame.

Referring particularly to Figs. 2 and 6, mounted on the sides of the section B are a pair of brackets 35, which are connected by a crossbar 36, in this case of channel iron fixed to the brackets at the ends, as by bolt over portions 37. Fixed at their bottoms to this crossbar 36 are series of springs 38, in this particular embodiment, coil springs, the upper ends of which are connected to heavy cross wires 39 by clips 40. These cross wires are connected to the brackets 35 by coil springs 41. Wires 42, fixed to the cross wires 39 as by welding or clips, may extend across the section A and attached at their ends to the right cross wire of the flat spring area or to the frame at 43, Fig. 6, as by springs 44.

It will be seen that there is thus provided a resilient device extending beyond the foot section and its junction with the next adjacent section, when the sections are closed, so as to provide a convenient rest for the legs of the occupants sitting on the seat formed by the section A. That provides a support for the legs of the occupant back of the knees. When, however, the structure is opened or extended, so as to form a bed, Fig. 1, the resilient device will be underneath the bed, so as to be out-of-the-way, and will not form an objectionable bulge under the mattress. It will, of course, be understood that the cushions will extend not only over the sections A, but also over the resilient device extending beyond the foot section. The above described resilient device is described and claimed in application Serial No. 95,090, filed May 24, 1949.

It will, therefore, be seen that this invention accomplishes its objects. A compact and convenient folding structure is provided, which is simple in construction, effective in its action and easy to manipulate. The structure will be stabilized particularly at its head end by the crossbar at the head and not only when the bed is extended, but also when it is collapsed; wobbling is therefore prevented. When the structure is folded to provide a davenport or a chair, the front of the seat will be resilient, so as to provide maximum comfort for the occupant.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A folding structure, comprising, a series of articulated sections including a foot section and second and third sections provided with a mattress-receiving area movable with said sections to extended position and foldable to closed position with the mattress between said sections, a lever pivotable to said third section, a link connecting one end of said lever with said foot section, a stop engageable by said lever, and means connecting with the other end of said lever when said sections are being closed to press the foot section down.

2. In a davenport bed, a folding structure, comprising, a series of articulated sections including a foot section and second and third sections provided with a mattress-receiving area movable with said sections to extended position and foldable to closed position with the mattress between said sections, a lever pivotable to said third section, a link connecting one end of said lever with said foot section, and means connecting with the other end of said lever when said sections are being closed to press the foot section down until said lever engages said stop.

3. In a davenport bed, a folding structure, comprising, a series of articulated sections including a foot section and second and third sections provided with a mattress-receiving area movable with said sections to extended position and foldable to closed position with the mattress between said sections, a lever pivotable to said third section, a link connecting one end of said lever with said foot section, a stop engageable by said lever, and means connecting with the other end of said lever when said sections are being closed to press the foot section down until said lever engages said stop.

4. In a davenport bed, a folding structure, comprising, a series of articulated sections including a foot section and second and third sections provided with a mattress-receiving area movable with said sections to extended position and foldable to closed position with the mattress between said sections, a lever pivotable to said third section, a link connecting one end of said lever with said foot section, a second lever mounted on one of said second or third sections adapted to coast with the other end of said first lever, and means connecting with said second lever adapted when said sections are being closed to press the foot section down.

5. In a davenport bed, a folding structure, comprising, a series of articulated sections including a foot section and second and third sections provided with a mattress-receiving area movable with said sections to extended position and foldable to closed position with the mattress between said sections, supports connected to said sections adapted to raise and drop the same when extended and closed respectively, a lever pivotable to said third section, a link connecting one end of said lever with said foot section, a stop engageable by said lever, and means connecting with the other end of said lever when said sections are being dropped and closed to press the foot section down until said lever engages said stop.

6. In a davenport bed, a folding structure, comprising, a series of articulated sections including a head section and adjacent sections foldable to extended and closed positions, linkages for pivotally suspending said head section at the sides thereof in the sides of a frame, and means cross-connecting said linkages forwardly of said head section when extended adapted to stabilize the structure at the head section.

7. In a davenport bed, a folding structure, comprising, a series of articulated sections including a head section and adjacent sections foldable to extended and closed
positions, links pivoted to the sides of the head section and adapted for pivotal connection with the sides of a frame to suspend said head section therefrom, and a bar connecting said links forwardly of said head section when extended.

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