Sept. 16, 1930. W. J. DUVALL 1,775,672

FOLDING DAVENPORT

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Fig. 1.

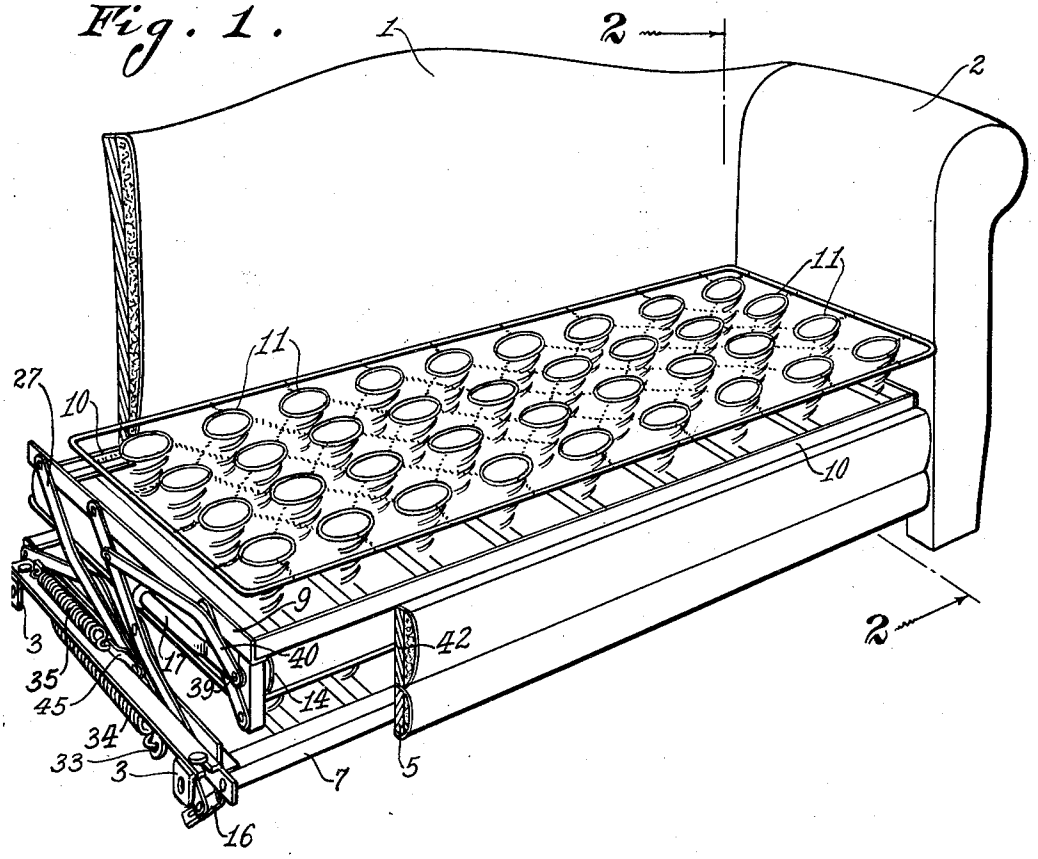
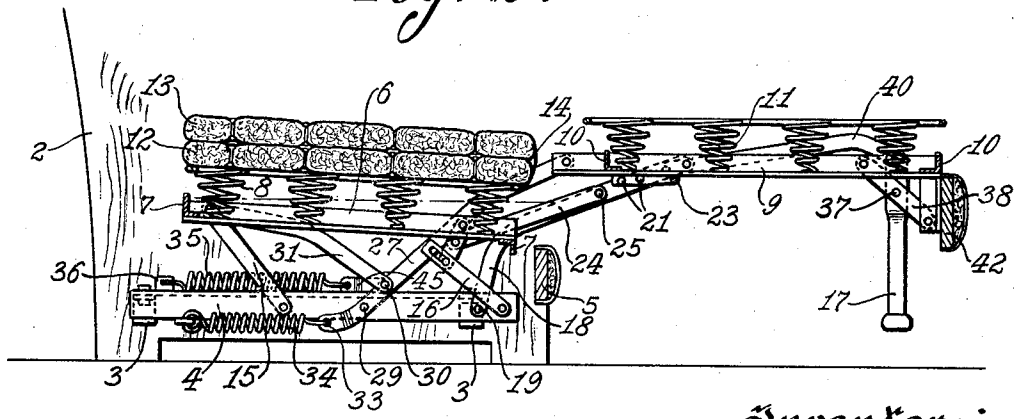


Fig. 2.



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Fig. 3.

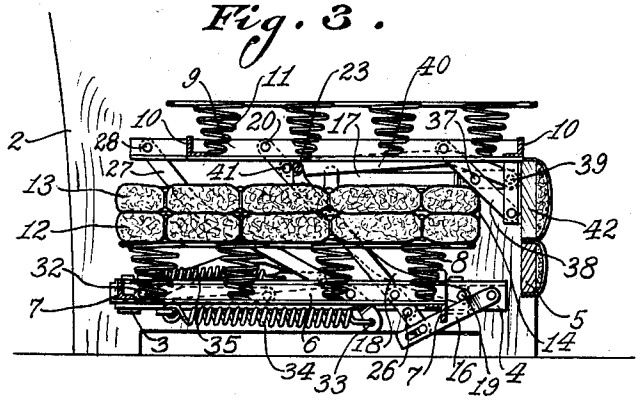


Fig. 4.

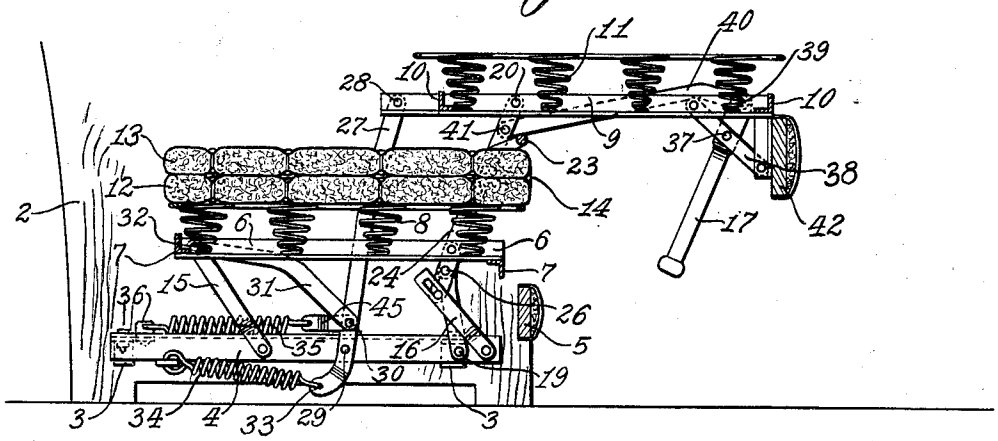
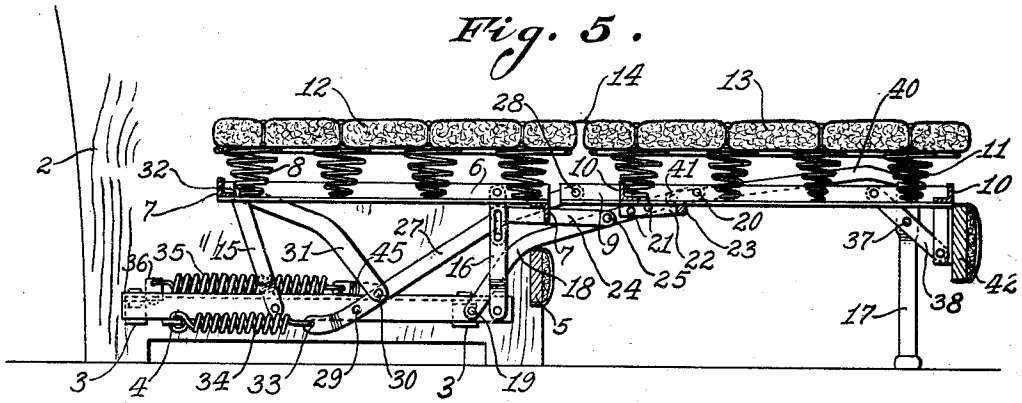


Fig. 5.



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UNITED STATES PATENT OFFICE

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FOLDING DAVENPORT

Application filed March 17, 1926. Serial No. 95,247.

This invention pertains to folding davenport beds, such as may be extended to full size of the ordinary bed or collapsed to approximately half that size to provide a davenport.

In the design of such a folding davenport it is desirable to provide a construction such that a mattress used when extended to bed size may be folded to a position within the structure when the device is collapsed to davenport size, and furthermore, it is important that when extended, the adjacent edges of the collapsible sections will stand close together so that there will be no gap or sag in the middle of the bed.

In designing such a structure, great difficulty has been experienced in providing a movement such that one section may not only be collapsed to a position over the other, but during the collapsed movement the outer section must not only clear the inner section but must clear the folded mattress as well when said mattress is placed upon the inner section.

One of the objects of this invention, therefore, is to provide a folding davenport bed structure in which one section may be collapsed upon the other in such a way as to avoid interference between the sections.

Another object is to provide such a structure in which the movement is such that the edge of the folded mattress is carried out of the way of the collapsing section.

Another object is to provide a construction which will be balanced in all positions so as to be simple and easy to operate and which will be strong and rigid in either extended or collapsed position.

Further objects will appear from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view partly in section of a davenport embodying this invention.

Figure 2 is a section on line 2—2, Figure 1, illustrating the initial movement of the collapsing sections, and

Figures 3, 4 and 5 are views similar to Figure 2 showing the parts in different positions.

Referring now to the accompanying drawing 1 designates the back and 2 the end support of the davenport. Supported on brackets 3, secured to the end supports 2 is a pair of cross bars 4, only one of which is shown in each view. This cross bar may be suitably constructed of angle iron as illustrated in the drawings. A suitable brace 5 joins the end supports 2 along the front of the device while said supports are connected at the rear by the back 1, thus forming a suitable supporting frame.

The bed consists of two sections which will hereinafter be designated respectively the front and the rear sections. The rear section comprises a frame consisting of a pair of end bars 6 joined by longitudinal front and rear bars 7. This frame carries the springs 8 which may be of any suitable construction. The front section comprises a similar frame consisting of end members 9 and longitudinal members 10 carrying the springs 11. A mattress consisting of separate half sections 12 and 13 joined by a flexible web 14, is adapted to fold in the middle when the davenport is to be collapsed as illustrated in Figure 2.

The rear section is supported in extended position as illustrated in Figure 5 by a link 15, pivoted at its lower end to the bar 4 and at its upper end to the cross-bar 6. There are, of course, two such links, one at each end. While the links 15 support the rear of the rear section, the front of the same is supported by a pair of toggles 16. The front section is supported at its front edge by a collapsible foot 17 which will be more fully described later, and at its rear by a pair of links 18 pivoted at 19 to the bar 4 and at 20 to the bar 9. The links 18 each have fixed thereto by rivets 21, a short bracket 22 carrying a supporting rod 23 which extends from end to end of the davenport connecting the brackets 22 at opposite ends and upon which the bars 9 of the folding section rest when in extended position. A pair of links 24 are each pivoted at 25 to the links 18 and at 26 to the upper section of the toggle 16. This link serves to hold said toggle straight when the device is in extended position as illustrated in Figure 5. The joint between the two sections of each toggle 16 is made with a pin-and-slot connection as shown to permit the toggle to

adjust its length to accommodate the other parts. The upper end of the lower section of each toggle is squared off as shown so as to provide a support upon which the bar 6 rests when the bed is extended.

A pair of links 27 are each pivoted at 28 to the end bar 9 of the folding section and at 29 to the bar 4. Each of these links has pivoted thereto at 30 another link 31 extending rearwardly and pivoted at 32 to the rear end of the bar 6. Each link 27 is extended beyond its pivot 29 and has attached to its extended end at 33 a spring 34 whose other end is attached to the bar 4. Also pivoted at 30 to the link 27 is a loose link 45 to which is connected one end of a spring 35 whose other end is also attached to the bar 4 at 36. The springs 34 and 35 exert mutually opposed efforts upon the link 27, one spring being extended when the other is released. These springs are so adjusted as to balance the weight of the front section in all positions thereof. The foot 17 is pivoted at 37 to an angular brace 38 on the folding frame. The foot 17 extends upwardly beyond the pivot 37 and has pivoted thereto at 39 a link 40 whose other end is pivoted at 41 to the link 18 at a point adjacent the pivot 20.

The operation of this device is as follows: With the device in extended position as illustrated in Fig. 5, when it is desired to collapse the same the mattress 12 and 13 is first folded at the hinge 14 to the position illustrated in Figures 2, 3 and 4 upon the rear section. The front section is then simply lifted. When the front section is lifted, the rear end thereof will rise upon a radius determined by the link 27 moving about the pivot 29. As the front section rises the link 18 pivots about its lowermost pivot 19. This movement of the link 18 causes the link 24 to move to the left, Fig. 5. This movement of the link 24 operates to break the toggle 16 which immediately collapses so as to lower the front edge of the rear section. At the same time, the movement of the link 27 will cause the link 31 to move the rear section bodily to the rear. This combined movement is illustrated in Figure 2, in which the initial stage of the collapsing movement is illustrated. The upper section of the toggle 16 is made considerably shorter than the lower section thereof and the pivot 26 at which the link 24 is attached to said upper section, is placed close to the upper pivot of said section to the bar 6. Accordingly, the toggle 16 will be collapsed very rapidly upon movement of the link 24. Accordingly, the front edge of the rear section will be immediately and rapidly dropped as the front section starts to rise. This movement, together with the bodily rearward movement of the rear section causes a wide clearance between the two sections to be established immediately after the movement begins so that the rear edge of the front section will easily clear the rear section with the mattress thereon.

As the movement continues, the breaking of the toggle 16 lowers the front edge of the rear section while the rear edge of the same is lowered by the swinging of the link 15. Meanwhile, the front section swings rearwardly upon the links 27 and 18 as shown in Figure 4, until it finally comes to rest over the rear section in the position shown in Figure 3. In this position the cross bar 42 carried on the front of the front section is brought to rest upon the brace 5 while the bar 23 has turned over to the position shown in Figure 3 in which the bar 9 again rests thereon to support the front section in collapsed position.

The foot 17 is collapsed during the above described movement by the operation of the link 40 which moves the upper end of the foot 17 forwardly as illustrated in Figure 4 causing the same to pivot at 37 and finally fold into a horizontal position as shown in Figure 3. The springs 34 and 35 serve to balance the weight of the moving parts, the spring 35 being extended when the device is in extended position and the spring 34 when collapsed.

It will be seen, therefore, that in accordance with this invention a movement is provided which not only serves to swing the front section out or in with a simple movement but also provides an effective movement of the rear section such as to prevent interference between the two sections during their movement. The quick drop of the forward edge of the rear section together with the immediate rearward movement of that section are effective in establishing ample clearance between the two. Accordingly, this davenport can be swung out for use as a bed with a simple movement and can again be swung inwardly without the awkwardness of fouling the mattress. The weight of the moving section is balanced in all positions during the collapsing or extending movements.

It is obvious that various changes may be made in details of construction without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. In a folding davenport bed having end supports and bed sections movable thereon to extended position with one beside the other and to folded position with one above the other; a collapsible supporting device for the sections at each end thereof, comprising; a pair of arms pivoted to the front section and to the support upon which that section may swing from extended to folded position, hinged supporting means for the rear of the rear section movable rearwardly and down-

wardly to folded position, and a toggle supporting the front of the rear section and connected for operation by one of said arms so as to break the toggle before the rear section moves downwardly.

2. In a folding davenport bed having end supports and bed sections movable thereon to extended position with one beside the other and to folded position with one above the other; a collapsible supporting device for the sections at each end thereof, comprising; a pair of arms pivoted to the front section and to the support upon which that section may swing from extended to folded position, a link pivoted to the support and to the rear section movable rearwardly and downwardly to folded position, and a toggle supporting the front of the rear section and connected for operation by one of said arms so as to break the toggle before the rear section moves downwardly.

3. In a folding davenport bed having end supports and bed sections movable thereon to extended position with one beside the other and to folded position with one above the other; a collapsible supporting device for the sections at each end thereof, comprising; a pair of arms pivoted to the front section and to the support upon which that section may swing from extended to folded position, hinged supporting means for the rear of the rear section movable rearwardly and downwardly to folded position, a toggle supporting the front of the rear section and connected for operation by one of said arms so as to break the toggle before the rear section moves downwardly, and mutually opposed springs connected to one of said arms adapted to counteract the weight of the front section on all positions during the folding operation.

In testimony whereof I affix my signature this 8th day of March, 1926.

WILLIAM J. DUVALL.