

May 18, 1937.

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2,080,474

DAVENPORT BED

Original Filed Feb. 7, 1934

2 Sheets-Sheet 1

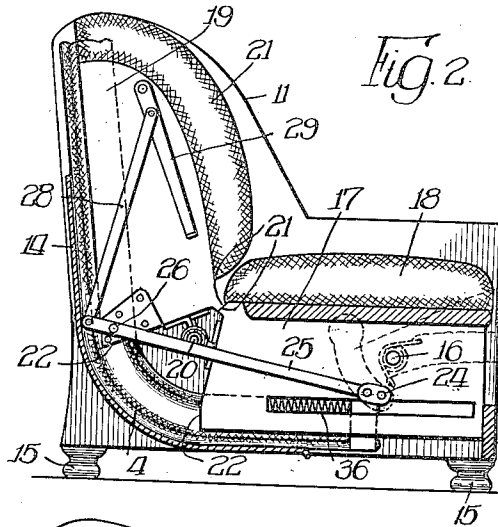


Fig. 2.

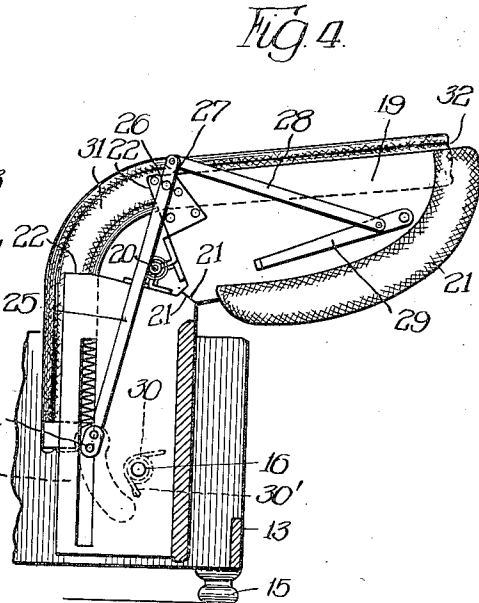


Fig. 4.

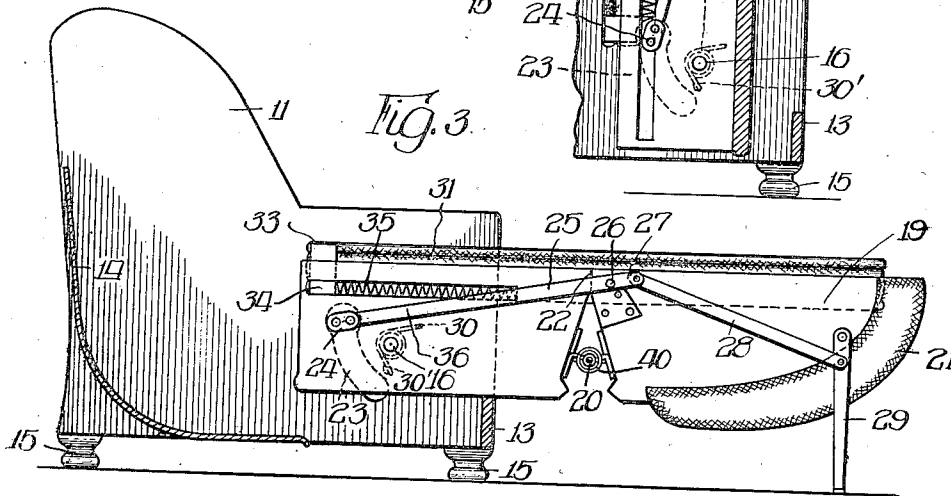


Fig. 3.

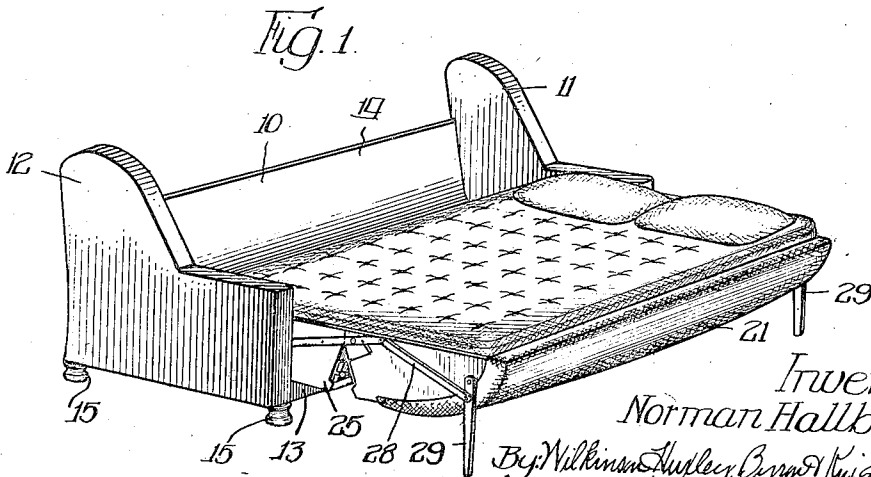


Fig. 1.

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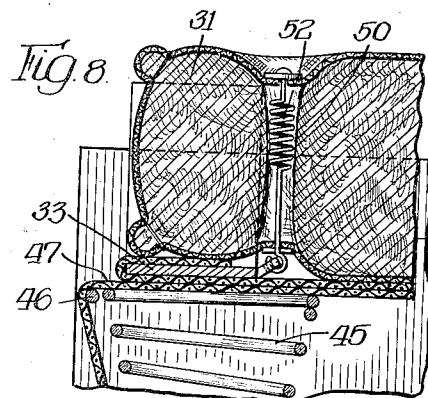
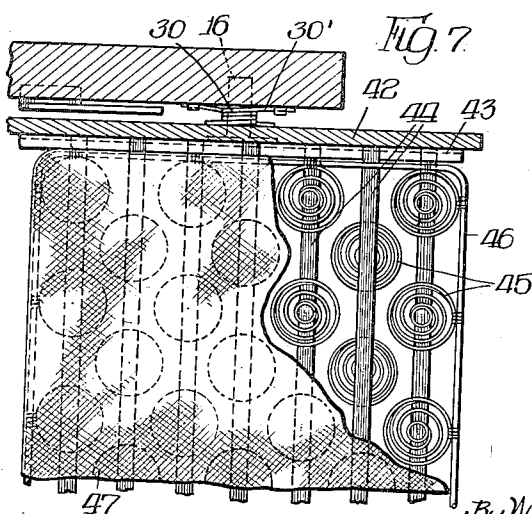
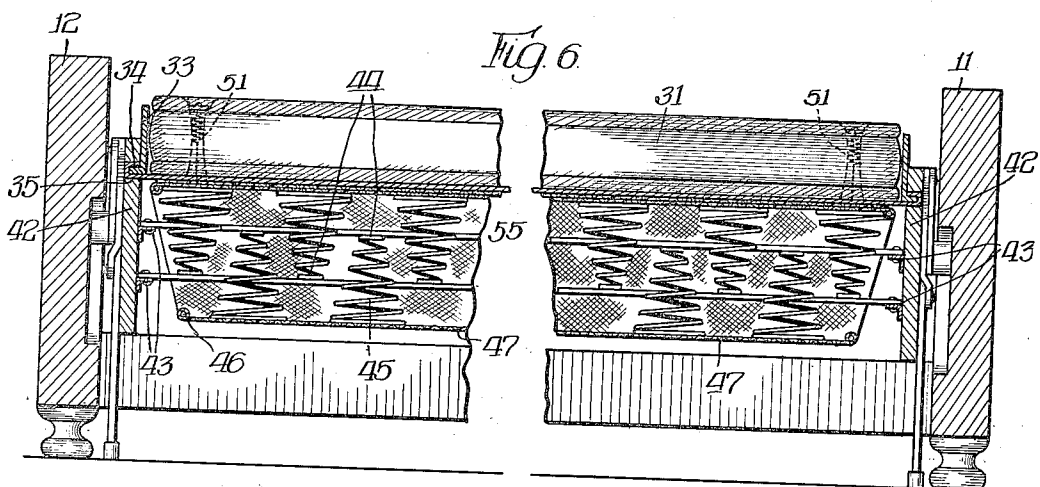
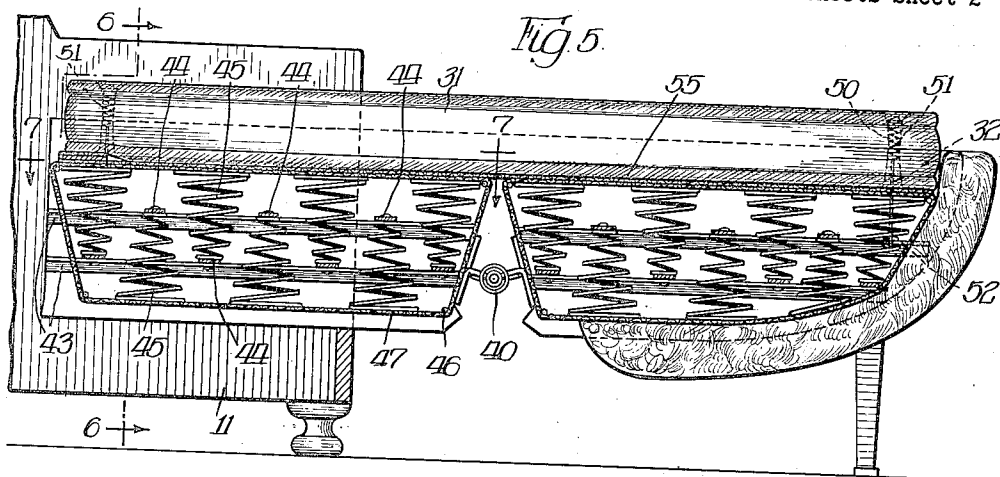
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2,080,474

DAVENPORT BED

Original Filed Feb. 7, 1934

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,080,474

DAVENPORT BED

Norman Hallberg, Chicago, Ill.

Application February 7, 1934, Serial No. 710,048
Renewed March 23, 1937

13 Claims. (Cl. 5—24)

This invention relates to a new and improved davenport bed which is convertible so that when the parts are in one position they constitute a davenport and when in a second position they constitute a bed.

It is an object of this invention to provide a relatively simple construction which will be highly practical and efficient in service and will be subject to conversion to form either a davenport or a bed by relatively simple and easy operation and by a new and improved mechanical movement.

It is a further object of this invention to provide two box spring sections hinged together, which in one position form the seat and back cushions for a davenport and in the converted position, present their reverse sides as spring supports for a bed mattress.

It is a further object of this invention to provide a separate and independent bed mattress which automatically presents itself in proper relationship on the box spring sections when the parts are converted to form a bed and which is automatically folded out of sight into the interior spaces of the davenport when the bed is so converted.

It is a further object of this invention to provide a new and improved mechanical movement for the box spring sections and new and improved link and operating mechanism therefor.

It is a further object of this invention to provide a davenport of the above described type, the two box spring sections of which are connected for positive joint movement whereby the bed forming position is assumed automatically upon moving either one of the parts in the proper direction. As an incident to the last stated object it is a further object to so construct the parts that in converting to the bed position, gravity will assist in the setting up movement and yet the automatic movement of the outer box spring section will act to counterbalance the force of gravity.

Stated differently, it is an object of this invention to provide the parts of such construction and arrangement that the movement thereof in converting the davenport to a bed and vice versa is positive and automatic in the sense that all of the parts are forced to move together in the desired manner and in addition, are partially balanced so that the converting movement is accomplished with the least amount of force.

It is a further object of this invention to provide a novel means for mounting the bed mattress whereby the mattress is always held tightly and automatically presents itself coextensive with the

box spring sections when the parts are moved to bed position.

A further object is to provide a convertible davenport bed having parts for cooperation with the mattress and bed clothes by which the bed clothes are held and maintained in proper position in a neat, tucked-in condition during the conversion of the parts to a davenport and vice versa and while being used as a davenport.

A further object of this invention is to provide in conjunction with the other elements constituting this invention, a new and improved type of box spring, whereby the sections thereof will present cushion surfaces on their opposite sides and with an improved and more efficient arrangement of springs mounted therein providing a maximum spring support for the interior spaces of the box spring.

These and other objects not specifically enumerated are contemplated for this invention as will readily appear to one skilled in the art as the following description proceeds. The detailed description may be more clearly understood if read in connection with the accompanying drawings in which—

Figure 1 is a perspective view of the apparatus of this invention showing the parts in bed forming relationship;

Figure 2 is a transverse view partly in cross section, showing the parts in davenport position;

Figure 3 is a view similar to Figure 2, showing the parts in bed forming position;

Figure 4 is a view similar to Figures 2 and 3 showing the parts in an intermediate position as when the davenport is being converted to a bed or vice versa;

Figure 5 is an enlarged elevational view partly in cross section, of the box spring sections and mattress when in bed-forming position;

Figure 6 is a transverse view partly in cross section taken on the line 6—6 of Figure 5 and looking in the direction of the arrows;

Figure 7 is a plan view partly in cross section taken on the line 7—7 of Figure 5 and looking in the direction of the arrows, and,

Figure 8 is an enlarged elevational view in cross section, showing one corner of the mattress and associated box spring section together with means by which the mattress is slidably held for proper positioning of the mattress during use as a davenport and a bed.

By referring to the drawings, it will be noted that the present invention is illustrated as embodied in an article of furniture comprising a frame part 10, composed of end portions 11 and 12

connected by means of a front brace 13, and the metal back 14. It is to be understood that the metal back 14 may be formed of any suitable material and although it is shown as a smooth surfaced plate in the drawings, this invention contemplates that it may be formed with a corrugated contour in order to provide air passages for ventilation of the bed clothing when the parts are in davenport position.

The end members 11 and 12 are made of relatively stout material and may be of any desired construction but are here shown as comprising side arms for the davenport and having feet 15, on which the davenport bed rests. These end members may be upholstered or not, according to the particular type of davenport desired. On the inside of the two end portions in substantially the position shown in Figures 2 and 4 inclusive, is a pivot 16. Mounted on pivot 16 is a box spring section 17 which is provided on one side with an upholstered cushion 18 serving as a seat for the davenport. A second box spring section 19 is pivoted to section 17 by means of a pivot 20 whereby the two box spring parts may jointly serve, in the position shown in Figure 2, as the seat and back of a davenport. Pivots 20 are mounted on the edge of the frame parts 42 of the box spring sections. Section 17 is likewise upholstered as at 21 to form a cushion back for the davenport.

It is preferable, but not necessary for the upholstered seat 18 to be removable as shown in Figures 3 and 4 because section 18 is inverted when the davenport is converted to form a bed. Box spring sections 17 and 19 have abutting portions 21 as shown in Figures 2 and 4 which determines their angular relationship when in position to form a davenport and also have abutting portions 22 which meet as shown in Figure 3 to fix them in straight line position when converted to form a bed.

The box spring elements may be of any suitable construction but as an additional part of this invention it is proposed that they be constructed in the manner clearly illustrated in Figures 5 to 8 inclusive.

From an inspection of these drawings it will be noted that each section comprises a pair of side supports 42, which serve as side frame parts and on which are mounted a pair of oppositely disposed angle brackets 43. These brackets serve as supports for cross bars 44 which are secured to the angle brackets by rivets, bolts or similar attaching means, and may be of metal or any other suitable material. Bars 44 serve as supports and mountings for coil springs 45, which according to this improvement, are arranged in a manner shown in Figures 5 to 7 inclusive. From an inspection of these drawings, it will be noted that each cushion surface of the spring sections is provided with its own supporting springs. It will be noted that the springs are arranged in staggered relationship and are preferably of conical formation whereby a maximum number of springs can be mounted in the space provided.

The supporting bars 44 are likewise staggered so as to properly serve as supports for the staggered springs. The outer ends of the individual springs are located at approximately the position to represent the outer contour of the box spring sections and each is provided with a margin wire 46, which is properly tied to its supporting coil springs. Each section so made up may be placed under slight compression and encased by a suitable cloth covering 47 in a manner now common

in the formation of box springs. It will be noted that each box spring thereby presents cushion surfaces on both sides. The two hinged box spring sections are caused to move together in a prescribed manner by means of a mechanical link mechanism connected to control their movement.

In each of the end members 11 and 12 adjacent the location of the hinge 16, is a cam slot 23 as shown in Figures 2 to 4, inclusive. It will be noted that this slot is arcuate in shape and terminates at its upper end with a rounded portion of larger diameter than the width of the slot. Positioned in the slot is an oval lug 24 which is fixed to the end of lever 25 mounted on the pivot 26, carried by the box spring section 19. It will readily appear that due to the arcuate shape of the slot the oval cam 24 on the end of the lever 25 will be caused to pass freely therealong when the parts are moved to the position shown in Figure 4. In other words, throughout the first ninety degrees of movement, the box spring elements 17 and 19 move bodily together on the pivot 16 without relative movement therebetween. However, upon reaching the position shown in Figure 4, it will be noted that the lug 24 is caused to pass into the circular top portion of slot 23 which prevents further upward movement.

After the oval lug 24 has passed into the circular top portion of the slot 23 and rotation thereof is effected by the movement of the parts to the bed forming position shown in Figure 3, the oval lug is rotated and is thereby caused to assume a position whereby it cannot be moved into the lower arcuate slot. This is because the greatest dimension of the lug is greater than the width of the slot. The cam therefore acts to confine the movement of pivot 26 in an arc around the upper portion of the slot 23 as a center, wherefore further movement causes the sections 18 and 19 to straighten out and finally assume the position shown in Figure 3. It will be noted that the center of gravity of the two sections 17 and 19 considered as a unit, is to the right hand side of the pivot 16 as shown in Figure 4, and therefore gravity will assist in causing the parts to move to the bed forming position. However, the assumption of this position involves a constant pull on pivot 26 which in a sense lifts the end of section 19 to the straight line position. This action takes considerable force and therefore serves to counterbalance the normal tendencies of gravity in bringing the parts to bed forming position. This produces a balanced action for the movement of the parts.

Lever 25 has its end extending as at 27 beyond the pivot 26 and has pivotally attached thereto, a link 28 which is connected to the leg 29 pivotally mounted on the box spring section 19. The link 28 and leg 29 are so constructed and arranged that the lever 25 in its movement to the position shown in Figure 3, causes the leg 29 to straighten to a vertical position to serve as a support for the outer end of box spring section 19. It is to be understood that this mechanism is duplicated at the other end.

This invention further contemplates the use of torsional coil springs 30 and 30' around pivot 16 which springs are wound in a manner to urge the spring section 17 to the vertical position shown in Figure 4. Hence the action of spring 30 is that of assisting the movement from the davenport position shown in Figure 2 to the intermediate position shown in Figure 4, whereas the action of the spring 30' assists in moving the section 17 from the bed forming position of Fig-

ure 3, to the vertical position shown in Figure 4. This latter movement is also assisted by a torsional spring 40, which is mounted at the pivot 20, for urging the box spring sections to the angular position wherefore through the action of the lever 25, the spring force tending to bring the sections to the angular position, also tends to move the box spring section 17 to the position shown in Figure 4.

A mattress 31 is provided which has one end fixed as at 32, to the upper portion of the box spring section 19, whereas its other end is slidably mounted with respect to section 17 so as to permit the box spring sections to separate at the bed forming surface as shown in Figure 1 and yet permit the mattress to assume a coextensive position in bed forming position as shown in Figure 3. The mattress 31 is therefore provided on one end with a frame part 33 which comprises end plates and a transverse bar adapted to under-ride the end of the mattress. The end plates are provided with lugs 34 slidably mounted in slots 35 in the end portion of the box spring portion 17. The lugs 34 are pressed with coil springs 36 tending to urge them in the left hand direction as shown in Figure 3, or in that direction which will cause the mattress to extend and assume a position coextensive with the box spring element in bed forming position. The movable frame 33 will slide in the slots 35, when the parts are moved to davenport position, by the pull on the mattress caused by the space created at the hinge. This movement causes a compression of the spring 36. When the parts are moved to the bed forming position as shown in Figure 3, it will readily appear that the spring 36 will cause a movement of the frame to automatically bring the mattress to coextensive position on the box spring sections.

The mattress is preferably fixed at one end of the box spring as at 32 by means of an opening 50 located through the corner of the mattress in which is positioned a coil spring 51 having an extending end 52 provided with a hook for extending through and engaging with a portion of the box spring frame. This serves to hold the mattress in place and yet permits the same to be yieldingly lifted so as to place thereunder, the necessary bed clothing in making up a bed. The holding spring can be located in any preferred position with respect to the mattress but preferably so as to leave an adequate margin for the proper accommodation of the under folds of the bed clothing. Any number of the springs may be used to effect the desired anchoring of the mattress. The opposite end of the mattress is held by a similar spring 52, as clearly shown in Figure 8, the anchoring end of which however, attaches to the sliding bar of the frame part 33. Here also an upward yielding movement of the mattress is permitted for the accommodation of bed clothing while at the same time this end of the mattress is slidably mounted for the purpose above described.

Although springs are here shown, any suitable yielding attachment is contemplated.

The accommodation of the bed clothing is further assisted by means of a strip or curtain 55, of canvas or like material, which is attached to the spring section at one end and to the sliding bar 33 at its other end. This curtain is preferably coextensive with the mattress and serves to separate the bed clothing from the underlying spring sections whereby to assist in the maintenance of the bed clothing in the proper position during the conversion movement from the davenport to the bed forming positions and vice versa. It will be obvious that the clothing which has been tucked in will occupy the space between the mattress and the curtain and be free from any disturbing frictional contact occasioned by the movement of the parts.

In operation, to convert the davenport into a bed, it is merely necessary to grasp the back section of the davenport at the top end to draw it forward until the parts have assumed the position shown in Figure 4. The movement of the parts through this ninety degrees is assisted by the torsional spring 30. Thereafter the movement is in the nature of a balanced movement so that the two sections can be forced further toward the bed forming position without danger or liability of the relatively heavy parts falling onto the operator. The action of gravity will assist in the movement but a counterbalancing effect is provided in the lifting action effected by lever 25 pulling section 19 into the horizontal position.

Furthermore, the movement from the position of Figure 4 to the position of Figure 5 is resisted somewhat by the torsional springs 30' and 40, both of which tend to hold the parts in the position shown in Figure 4. Beds constructed in accordance with this invention may be either single or double or may be designed for occupancy in the longitudinal direction as shown in Figure 1, or at right angles thereto with the head of the bed toward the metal back 14.

It is to be noted that the box spring sections 17 and 19 jointly provide a continuous box spring for the bed without the disadvantage of intermediate braces at the location of the hinge. In restoring the bed to a davenport it is merely necessary to lift the outer edge until the parts assume the position in Figure 4.

In the reverse direction of movement, the balanced action is also effective whereby the required movement is relatively simple. Thereafter the parts may be safely dropped into the davenport position shown in Figure 2. The mattress is thereby placed in the interior of the davenport entirely out of sight, and is ready to be automatically presented when the bed is set up.

Also the mattress and spring construction provides for the maintenance of the mattress at all times while at the same time, permitting the insertion of the proper bed clothing between the mattress and the underlying curtain. By the upward yielding of the mattress, the bed clothing can be properly placed and it is there maintained by the protecting action of the curtain which removes it from disturbing frictional contact with the spring sections during the conversion of the parts.

I claim:

1. A davenport bed comprising in combination a frame, a reversible box spring section pivoted in said frame, and adapted to present one side as a davenport seat and the opposite side as a bed section, a second box spring section pivotally connected to said first named section, and a link pivoted to said second section having an extended end mounted for operation in a cam slot in said frame.

2. A davenport bed comprising in combination a frame, a reversible box spring section pivoted in said frame, and adapted to present one side as a davenport seat and the opposite side as a bed section, a second box spring section piv-

totally connected to said first named section, and a link pivoted to said second section having an extended end mounted for operation in a cam slot in said frame, said cam slot permitting

5 1. bodily movement of said second section with said first section for approximately ninety degrees but therebeyond causing relative movement between said sections.

3. In a davenport bed the combination of a frame, comprising spaced ends, a seat section 10 pivoted between said ends adapted to present one face as a davenport seat and its reverse face as a bed section, a second box spring section pivoted to said first section and removable there- 15 with but subject to controlled movement, the movement of said second section being controlled by a link having one end pivoted to said section and the other end mounted for operation in a cam slot in said frame.

4. A davenport bed of the character described comprising in combination a frame, a spring section pivotally mounted in said frame and adapted 20 to present its opposite surfaces as cushioned supporting surfaces, a second spring section pivotally connected by said first spring section, a cam slot in said frame, and a link pivoted to 25 said second section having an extended end operatively associated with said cam slot, a portion of said cam slot being substantially concentric with the pivot of said first spring section. 30

5. A davenport bed of the character described comprising in combination a frame, a spring section pivotally mounted in said frame and adapted to present its opposite faces as cushioned supporting surfaces, a second spring section 35 pivotally connected by said first spring section, a cam slot in said frame, and a link pivoted to said second section having an extended end operatively associated with said cam slot, a portion 40 of said cam slot being substantially concentric with the pivot of said first spring section, and positioned so that a portion of the movement of said section permits the free sliding of said link in said slot, but a further movement there- 45 of forces a pivotal movement between said sections.

6. A davenport bed of the character described comprising in combination a frame and a pair of pivoted box spring sections mounted in said 50 frame, disposed with an angular space therebetween when in davenport position, a mattress attached to one of said sections at one of its ends and having a sliding connection with the opposite end of the other of said sections where- 55 by said mattress may yield and bend with said sections and bridge said angular space.

7. In a davenport bed of the character described, a frame, a pair of pivoted box spring sections mounted in said frame adapted to present 60 faces on both sides as cushion supports in service, means connecting the outermost section with said frame for controlling its movements relative to said first section to provide a bed, and means operable by said first means for providing 65 a supporting leg for the outer end of said section.

8. A davenport bed of the character described, comprising a frame, a pair of pivoted box spring sections mounted in said frame, constructed to 70 provide an angular space adjacent the mattress supporting surface when said sections are angularly disposed to form a seat and back cushion for a davenport, a bed mattress attached to one of

said sections and having a yielding connection with the opposite of said sections whereby it automatically assumes a position coextensive with said sections when said sections are positioned to form a bed and automatically yields to bridge said 5 space when said parts are positioned to form a davenport.

9. A davenport bed of the character described comprising in combination a frame and a pair of pivoted box spring sections mounted in said 10 frame, a mattress attached to one of said sections at one of its ends and having a sliding connection with the opposite end of the other of said sections, said sliding connection including a spring pressed bar underlying the end of said 15 mattress.

10. A davenport bed of the character described comprising in combination a frame and a pair of pivoted box spring sections mounted in said 20 frame, a mattress attached to one of said sections at one of its ends and having a sliding connection with the opposite end of the other of said sections, said sliding connection including a spring pressed bar underlying the end of said mattress, 25 and a curtain coextensive with said mattress, fixed at one end with respect to one of said box spring sections, and at its other end to said bar.

11. A davenport bed of the character described, comprising a frame, a pair of pivotally connected 30 box spring sections mounted in said frame, said sections being reversible to present one of their surfaces for use as a bed and their opposite surfaces for use as cushions of a davenport, a link pivotally connected to one of said sections and 35 having at its other end a connection with said frame, said last named connection providing lost motion throughout part of the movement of said sections with respect to said frame and a restraining pivotal movement for the balance of 40 the movement of said section with respect to said frame.

12. In a davenport bed of the character described, the combination of a frame, a box spring section pivoted on a substantially central axis 45 in said frame, and a second box spring section pivoted to said first box spring section, said second box spring section being free to move bodily with said first box spring section and relative to 50 said frame when said first box spring section is turned on its pivot from a horizontal to a vertical position, and a link extending between said second box spring section and said frame, having 55 connecting means with said frame for permitting its said bodily movement with said first spring section but causing relative movement between said box spring sections when said first box spring section is moved beyond the vertical position.

13. A davenport bed of the character described, comprising a frame, a pair of pivotally connected 60 box spring sections mounted in said frame, said sections being movable to present one of their surfaces for forming a bed and their opposite surfaces as cushions for a davenport, the outer of said sections having a link pivoted thereto, said 65 link having at its opposite end, a connection providing successively a sliding movement and a controlled pivotal movement between said link and said frame during the conversion of said sections from davenport position to bed position whereby 70 the movement of said sections is positively controlled during conversion.

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