July 15, 1941. J. D. BELL 2,249,266

COMBINED CHAIR AND BED

Filed April 16, 1938

Fig. 3.

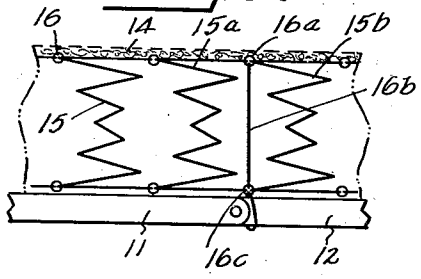


Fig. 5.

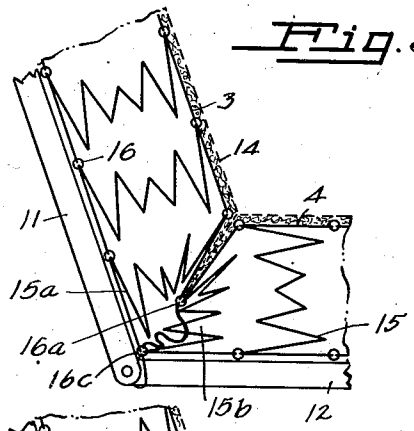
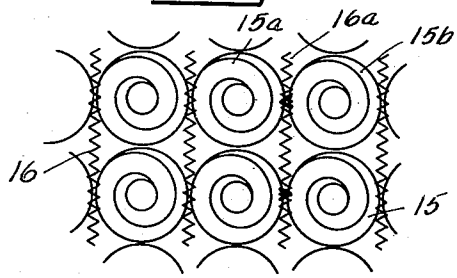


Fig. 4.



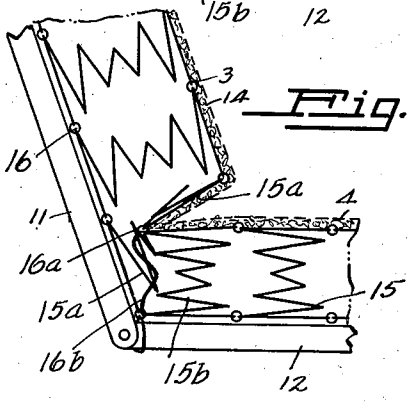


Fig. 6.

Fig. 1.

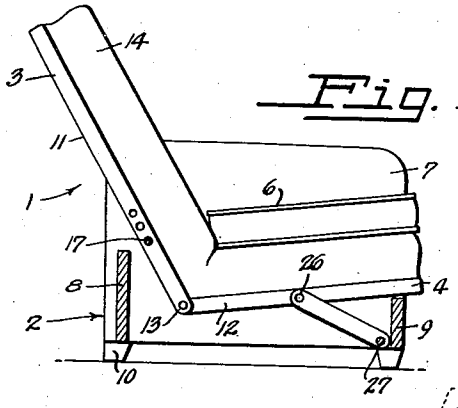
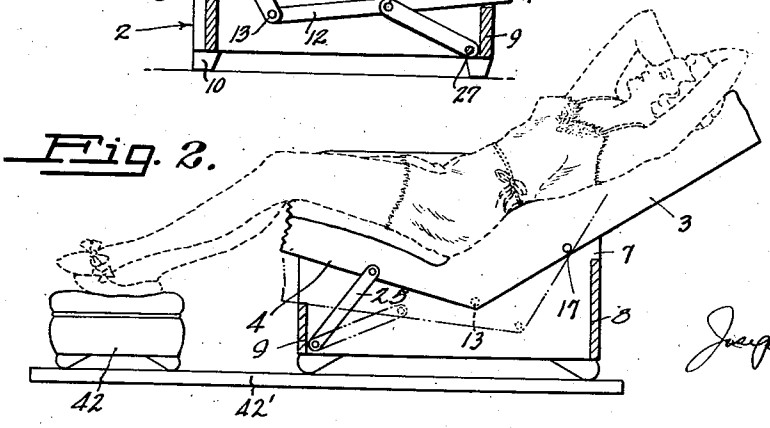


Fig. 2.



INVENTOR.

Joseph D. Bell

Patented July 15, 1941 2,249,266

UNITED STATES PATENT OFFICE

2,249,266

COMBINED CHAIR AND BED

Joseph D. Bell, San Francisco, Calif.

Application April 16, 1938, Serial No. 202,480

4 Claims. (Cl. 5—37)

The present invention relates to improvements in a combined chair and bed, and has particular reference to an article of furniture, which may be readily converted into either a chair or a bed. This application is a continuation in part of my application, Serial Number 124,050, filed February 4, 1937.

It is particularly proposed to provide a chair having a back and a main seat adapted to be moved into alignment with each other to form a bed, and I make use of novel means for retaining the back and main seat in rigid relationship relative to one another upon being aligned. The parts may be readily returned to a chair-forming position to provide a comfortable easy chair, preferably of the overstuffed variety.

It is further proposed to provide a chair of the character described in which the back and the seat are supported in such a manner and are so well balanced that they may be readily swung, by a person resting thereon, from one extreme position to the other extreme position and through all the intermediate positions and may be held by the occupant in any position of repose he may elect.

In this connection it is particularly proposed to provide operating or guide means for the back and the seat which cause the front edge of the seat to rise as the back begins to recline, so as to cause the back and the seat, when passing through or held in intermediate positions of repose, to conform to the outlines of the human body in a state of complete relaxation, with knees raised to a slight angle and the hip portion of the body accommodated in a reverse angle, the angles of the body conforming to substantially the same angles which the average person assumes when sleeping on his side in bed.

A still further object resides in the provision of one continuous mattress for the back and the main seat, which is composed of rows of coil springs that are fastened together in such a way as to prevent any crack, hard place or depression in the mattress where the back and seat are connected together and facilitate the unfolding.

Another object of my invention is to provide a combined chair and bed, which is simple in construction, durable and efficient for the purposes intended.

For a better understanding of my invention, reference should be had to the accompanying drawing, forming part of this application, in which

Figure 1 shows a transverse sectional view of my combined chair and bed in chair position;

Figure 2, a similar view showing the chair in partly reclined position, with a human body thereon;

Figure 3 a fragmentary view of the back and seat in aligned relation and illustrating the coiled springs therein;

Figure 4 a plan view illustrating the spring arrangement of Figure 3;

Figure 5 a similar view showing the spring arrangement when the device is used as a chair; and

Figure 6 a similar view showing the spring arrangement in partly reclined position.

While I have shown only the preferred forms of my invention, I wish to have it understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

In carrying out my invention in the form shown in Figures 1 and 2, I provide a combined chair and bed indicated generally at 1, and including in its structural features a supporting frame 2, a back 3 having a main seat 4 secured thereto, and a removable cushion 6.

It will be noted that the supporting frame 2 is fashioned with two side arms 7 that are held in spaced and parallel relation with respect to each other by means of a rear rail 8 and a relatively lower front rail 9, the ends of the rails being secured to the side arms. Feet 10 may be provided at the bottom of the arms for resting on the supporting surface.

The back 3 and the main seat 4 are provided with frame sections 11 and 12, respectively, which are hingedly fastened together as at 13. A mattress 14 is mounted on these frame sections, and the mattress is coextensive with the length and width of the back and of the main seat, the mattress being formed as one continuous unit.

In Figures 3 to 6, I disclose the mattress as being filled with coil springs 15, which are arranged in rows upon the frame sections 11 and 12. The tops and bottoms of adjacent rows of springs have cross-ties 16 attached thereto, the cross-ties being confined to extending from one side of the mattress to the other in parallel relation to the hinge connection 13.

This construction permits the frame sections to be moved into angular relation with respect to each other, and during this movement the cross-tie 16*a* is moved inwardly of the mattress, while the adjacent rows of springs 15*a* and 15*b* are deformed in the manner shown in Figures 5 and 6. To counteract a possible initial tendency of the

cross-tie 16a to bulge outwardly, instead of inwardly, when the mattress is collapsed, I prevent outward motion by means of a flexible connection 16b between the upper cross-tie 16a and its bottom counterpart 16c.

Upon moving the frame sections 11 and 12 into alignment the tie member 16a is again moved upwardly of the mattress and the springs 15a and 15b straighten out. Tie members are not provided at right angles to the ties as in the case of conventional mattresses.

The padding of the mattress (Figures 1, 3, 4 and 5) is forced into the space betwen the rows of springs 15a and 15b so as to be compressed thereby when the frame sections are moved into the position shown in Figure 5. Upon returning the mattress to the state shown in Figure 4, the compressed padding assists in moving the mattress sections into alignment with respect to each other.

The springs 15a and 15b, which are on the opposite sides of and immediately adjacent to the hinge, and which collapse during the folding operations, may be considered a unit serving a special function as compared with the other springs, while the next adjacent row of springs, which are secured to the rows of this unit by means of the cross ties 16, exert pressure on the rows of the unit, so as to cause them to collapse, the flexible connection 16b preventing outward bulging of the springs of the unit.

Referring to the chair construction as a whole, it will be noted that the compressed springs of the unit have a tendency to urge the seat back into a position of horizontal alinement with the back of the chair. This tendency is normally opposed by the link 25, which causes the seat to rise during the aligning operation. If, however, the mattress is straightened out by the occupant bearing down on the upper end of the back, the expansive power of the springs of the unit is utilized in aiding the occupant in the unfolding of the mattress.

The back 3 may be swung toward and into horizontal position as shown in Figure 1 and for permitting this movement I provide trunnions 17 on the back, which are pivoted in confronting faces 19 of the side arms. The back rests on the top of the rear rail 8 when moved into horizontal or bed-forming position.

As the back 3 is lowered into a reclining position, the seat 4 is raised above its normal level by means of links 25, which are pivoted to the seat as at 26 and to the side arms as at 27. When the seat is fully raised, it is brought into horizontal alignment with the reclined back 3, and the links 25 bear against the front rail 9.

It will be noticed that the back 3 freely teeters about the fixed point 17 and may be teetered about the pivot by movements of the human body. When pressure is exerted by the shoulders the upper end of the back moves downward and when pressure is exerted by the hip portion the lower end of the back moves downward.

The seat 4 freely floats on the link 25 and the latter link is disposed in such a manner that it rises from an acute angle to a substantially vertical position while the back teeters backward, with the result that the front edge of the seat rises while the upper end of the back descends. This rising movement of the front of the seat gives a bracing support to the thighs of the occupant as clearly shown in Figure 2 and gives complete control to the occupant over the movements of the chair and holds the body in the chair against downward slipping motion.

Figure 2 also shows a stool 42 disposed on the floor 42' in approximate relation to the front edge of the chair. This stool serves as a foot rest and a foot brace for the occupant and facilitates the operation of the chair by body movements.

It will be noted that the seat 4 is substantially balanced on its supporting links and that the latter are arranged to cause a distinct initial upward movement of the front edge of the seat as the back is tilted backward so as to maintain a bracing angularity between the back and the seat in intermediate positions of repose as illustrated in Figure 2.

I claim:

1. In combination, a base, two rigid sections, one a seat section and the other a back, having a hinged connection between the same, means for supporting the two sections on the base with freedom of movement between positions of horizontal alinement and of chair angularity, a unit of transverse rows of coil springs mounted on the sections, means for connecting together the adjacent top edges of two of the rows of springs with freedom of flexing inward and outward when unrestrained, the said means being centered substantially vertically over the pivot of the hinges of the two sections, a check cord, means for fastening the cord with respect to the connecting means for the said top edges of the springs and the hinge connection for holding the said edges from bulging outwardly at the commencement of the folding operation of the sections, the said cord being slackened and released from the holding strain with the continuation of the folding by the inward flexing of said adjacent top edges toward the hinge connection.

2. In combination, a base, two rigid sections, one a seat and the other a back, having a hinge connection between the same, means for supporting the two sections on the base with freedom of movement between positions of horizontal alinement and of chair angularity, a unit of transverse rows of springs mounted on the sections, one row on each side of the hinge, means for connecting said rows along their upper edges, transverse rows of springs mounted on the sections in continuous succession with the two unit rows to form a supporting surface, means for connecting adjacent rows of springs to the unit rows for pushing inwardly against the said unit rows as the sections are folded, a cover stretched over the said surface so as to rest thereon and being secured to the edges of the frame sections, cord means anchoring the connecting means for the unit rows of springs with respect to the hinge whereby the latter connecting means is substantially centered over the hinge and is prevented from bulging outwardly when the unit rows are pressed inwardly by the adjacent rows of springs as the two sections are moved into a position of angularity.

3. A folding mattress of the character described, comprising front and rear frame sections having hinged connection for movement between positions of angularity and of relative alinement, uniform upholstery for the two frame sections extending throughout the lengths thereof and including rows of springs mounted on opposite sides of the hinged connection and an overlying cover secured to the free front and rear edges of the frame sections respectively, the hinged connection being arranged below the plane of the

upholstery whereby a considerable amount of excess cover material is provided between the sections when arranged in angular relation, and means for independently anchoring intermediate sections of the cover to the frame section adjacent the hinged connection and with a pulling effect toward the latter to prevent the excess material from bulging outward during bending operations.

4. A mattress comprising two frame sections, hinges connecting the sections together, springs arranged in rows on opposite sides of the hinges, means securing the springs to the sections, the latter being swingable into angular and alined relation with respect to each other, and a padded cover for the springs to provide a sleeping surface, the adjacent rows of springs contacting on opposite sides of the hinges and being interconnected at their upper ends and free to flex inwardly of the mattress when the frame sections are swung into angular relation, and a flexible connection between the hinged region of the frame sections and that portion of the cover overlying the same, the said connection being arranged to prevent outward flexing of the springs so as to leave inward flexing as the only alternative.

JOSEPH D. BELL.