

July 1, 1952

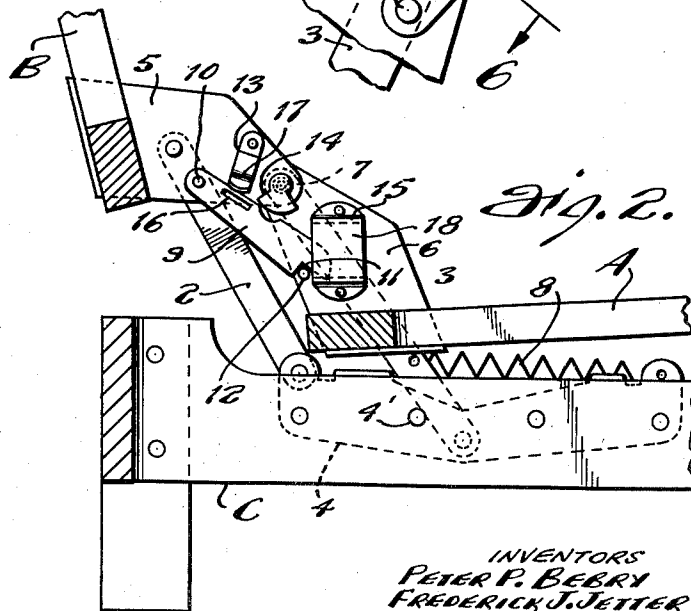
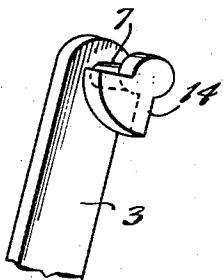
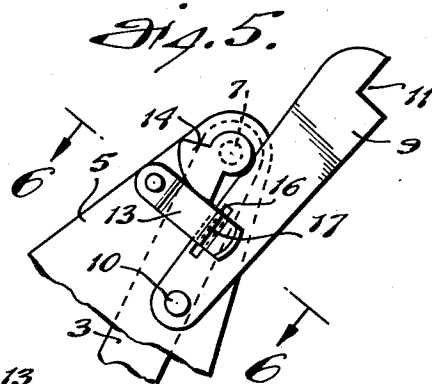
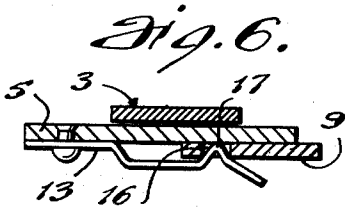
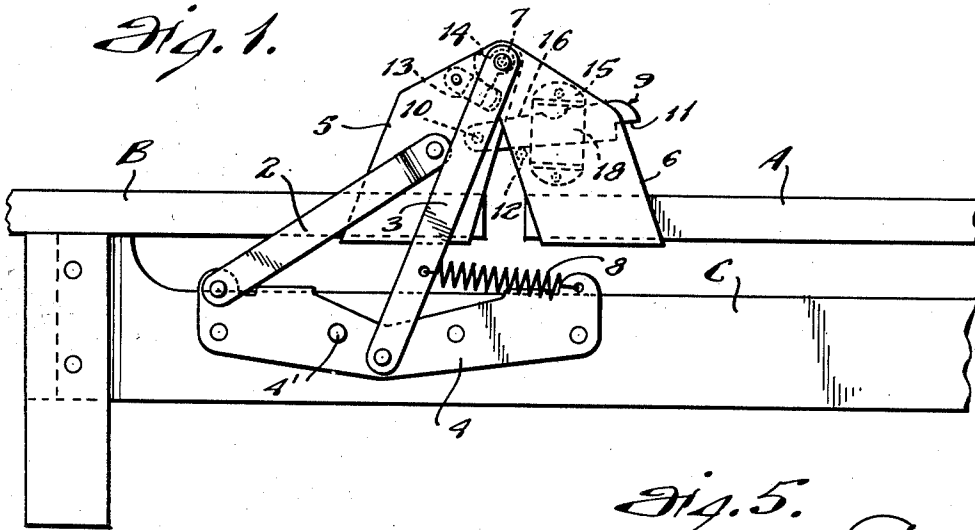
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2,601,683

SOFA BED HINGE

Filed Feb. 28, 1950

2 SHEETS—SHEET 1



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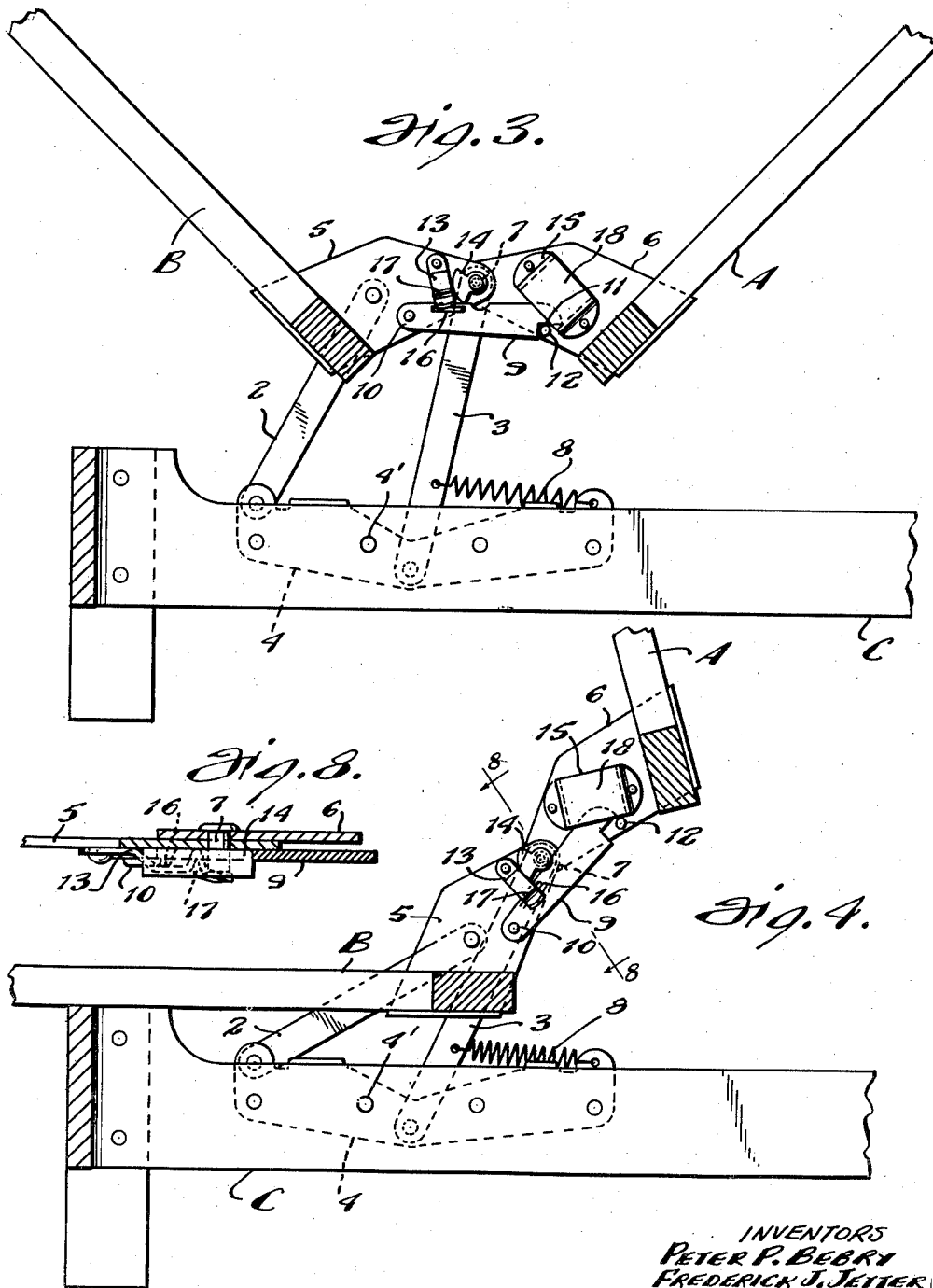
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SOFA BED HINGE

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2 SHEETS—SHEET 2



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2,601,683

SOFA BED HINGE

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Application February 28, 1950, Serial No. 146,848

5 Claims. (Cl. 5—57)

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This invention relates to convertible furniture of that type commonly designated as sofa beds, couches or divans and it more particularly relates to an improved hinge for connecting the seat and back of such structures, which hinge is simple in construction, easily manipulated, inexpensive to manufacture and "foolproof" in use.

Hinges comprising a pair of pivoted plates, one connected to the back, the other to the seat of a sofa bed, and embodying means for controlling the positioning or locking thereof have been used but in the best of them on the market, the controlling elements are complicated, frequently depending upon gravity for operation of the pivoted parts, which materially interfere with their efficiency and, therefore, it is the object of the present invention to provide an improved hinge for structures of the class described which will always be positive in action and prevent manipulation of the bed and seat sections except in the intended manner, while at the same time, permitting operation of those parts expeditiously and simply without possibility of the back falling down when the structure is converted from a sofa to a bed or vice versa. Therefore, in the present structure, the locking latch bar connecting the hinge plates of the back and seat is held in position by a simple spring during certain positions of the structure, which spring, in turn, operates to lift the locking latch bar to permit conversion of the structure into a bed and with which spring and locking latch bar, a rotating cam cooperates to prevent unlatching of the lever until the seat is expressly manipulated for that purpose.

In the drawings accompanying and forming a part of this specification:

Fig. 1 is a view of one end of this improved sofa bed and its hinge in bed position.

Fig. 2 is a cross-sectional view of the structure in sofa position.

Fig. 3 is likewise a cross-sectional view of the structure illustrating the unitary movement thereof either from a sofa position to a bed position or vice versa.

Fig. 4 is a cross-sectional view of the structure with the back in horizontal position in readiness to have the seat lowered into bed position as shown in Fig. 1.

Fig. 5 is a detail view of the spring and locking cam cooperating with the locking latch bar.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is a detail perspective view of the rotating cam cooperating with the latch bar.

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Fig. 8 is a cross-sectional view taken on line 8—8 of Fig. 4.

In the embodiment of the structure shown, the seat A and back B may be formed in any desired manner and are usually provided with suitable springs and upholstery and supported by a suitable base structure C. To this base structure, the back and seat are connected by a pair of links 2 and 3, the lower ends of which are pivoted to a supporting plate 4 connected to the base while the upper ends are pivotally connected to a pair of hinge plates 5 and 6, one of which, as 5, is secured to the back and the other, as 6, to the seat. These plates 5 and 6 are pivotally connected as at 7 to the upper end of the link 3 and one of these links, as 3 is suitably connected by a spring 8 with the plate 4 to facilitate manipulation of the bed structure. The plate 4 is provided with a stop 4' which limits rearward tilting movement of the parts when in the form of a sofa, and also relieves strain thereon.

To maintain the back in its sofa position, a locking latch bar 9 is provided, being pivoted as at 10 to the hinge plate 5 and having a notched end 11 in position to engage a locking pin 12 carried by the companion plate 6. To maintain this locking latch bar with its notch in engagement with the pin 12, a spring, such as a flat plate spring 13, is secured to the plate 5 in position to have its lower bent end engage the top of the locking latch bar and hold it in engagement with its locking pin 12.

Cooperating with the locking latch bar is a cam 14 having a segmental portion located just above the locking latch bar to prevent raising of the latch bar until the seat is manipulated for that purpose, thereby preventing accidental dropping of the back when converting from a sofa position to a bed.

This cam 14, in the present embodiment is secured to the pivot or rivet that connects the two plates 5 and 6 with the link 3 so that the link 3 and cam will swing as a unit, see Fig. 7. The notched end of the bar rides in a keeper plate 15 secured to the hinge plate 6, which plate, at the proper time, acts to disconnect the latch bar 9 from the spring 13 in the manner about to be described.

The latch bar is provided with a slot 16 cooperating with a bent or projecting portion 17 of the spring 13 so that, at the proper time, the bent portion 17 will engage in the slot 16 to hold the latch bar away from its locking pin until the seat is expressly manipulated to release the parts when the part 18 of the keeper plate 15 engages

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the latch bar and releases the slot from the spring.

In manipulating this improved sofa bed, it will be seen that when the structure is in sofa position, see Fig. 2, the free end of the spring 13 engages the top of the latch bar and holds it in engagement with the pin 12 and so holds the seat and back against independent swinging movement while the cam 14 will prevent the latch bar from being shifted away from its locking pin 12, preventing accidental dropping of the back while changing from sofa position to bed position.

To transform the structure from a sofa as shown in Fig. 2 to a bed as shown in Fig. 1, it is, therefore, merely necessary to swing the seat and back as a unitary structure as shown in Fig. 3, utilizing the links 2 and 3 for this purpose in a manner well known in this art until the back B is lowered sufficiently to rest upon the framework or base as shown in Fig. 4, the latch bar 9 being held during all of this unitary movement in engagement with its locking pin 12 by the lower end of the spring 13, and supplemented also during a considerable part of this unitary movement by the cam 14. When the back B rests upon the base, it is then merely necessary to swing the seat A slightly forward in the direction of the arrow, as in Fig. 4, which causes the pin 12 to raise the notched end of the latch bar 9 until the slot 16 of the latch bar 9 engages the inwardly bent portion 17 of the spring 13, see Figs. 5 and 6. This interlocking of the parts hold the latch bar up and away from its locking pin 12, whereupon the seat can be readily lowered into the position shown in Fig. 1 during which the keeper plate 15 acts to release the spring 13 from the latch bar slot 16, but not until the end of the latch bar has projected sufficiently far into the keeper plate 15 to prevent re-engagement with the locking pin 12.

To transform the structure from a bed to a sofa, it is merely necessary to raise the seat section A until the latch bar is forced by the end of the spring 13 into engagement with the locking pin 12, whereupon both seat and back can be swung as a unitary structure by the links 2 and 3 to a sofa position, at which time, the cam together with the spring 13, will prevent any manipulation of the back independently of the seat.

From the foregoing, it will be seen that premature falling down of the back during the movement of the seat and back from one position to another is positively prevented and that all that is necessary to transform the structure into a bed after the parts have been shifted as a unitary structure to have the back B rest upon the base, is merely to shift the seat A forward slightly until the spring 13 comes into engagement with the slot 16 of the latch bar 9 which will thereupon hold the latch bar away from the pin 12 and permit the seat to be lowered, since the keeper plate 15 causes the latch bar slot 16 to be released from its spring 12.

Thus, a very simple, inexpensive and efficient sofa bed hinge is provided which can be made and sold as a complete and separate article for attachment by bed manufacturers to various forms of ornamental sofa and couch beds and which improved hinge consists of but few parts, a supporting plate 4, a pair of links 2 and 3, a pair of hinge plates 5 and 6, a latch bar 9 and its keeper 15 and locking pin 12 controlled entirely by a simple spring 13 operating to hold the latch bar in engagement with the locking pin at one

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time and to hold it from this pin at another time, together with a rotating cam 14 which positively prevents any movement of the back independently of the seat when the structure is in the form of a sofa, thus doing away with all complicated and frequently non-operating parts such as gravity pawls and detents, by utilizing a simple spring to hold the latch bar in engagement with its locking pin at one time and to raise the latch bar from its pin at another.

What is claimed is:

1. A convertible sofa bed hinge comprising a pair of pivotally connected plates, one attachable to the seat and the other to the back of a sofa, means for locking said hinge plates in a predetermined position comprising a locking latch bar pivoted to one plate and cooperating with a pin carried by the other plate, a spring carried by said first mentioned plate for holding said latch bar in its locking position and said spring having a projecting part and said latch bar having a slot cooperating with said projecting part for holding said latch bar away from its locking position, and a rotating cam mounted on the pivotal connection of said plates and in position to engage said latch bar to prevent shifting of the latch bar at a predetermined time.

2. A convertible sofa bed hinge comprising a pair of pivotally connected plates, one attachable to the seat and the other to the back of a sofa, means for locking said hinge plates in a predetermined position comprising a locking latch bar pivoted to one plate and cooperating with a pin carried by the other plate, a spring carried by said first mentioned plate for holding said latch bar in its locking position and said spring having a projecting part and said latch bar having a slot cooperating with said projecting part for holding said latch bar away from its locking position, and a rotating cam carried by the pivotal connection of the plates and in position to engage said latch bar to prevent shifting of the latch bar when in locking position against said pin.

3. A convertible sofa bed hinge comprising a pair of pivotally connected plates, one attachable to the seat and the other to the back of a sofa, means for locking said hinge plates in a predetermined position comprising a locking latch bar pivoted to one plate and cooperating with a pin carried by the other plate, a spring carried by said first mentioned plate for holding said latch bar in its locking position and said spring having a projecting part and said latch bar having a slot cooperating with said projecting part for holding said latch bar away from its locking position, a link pivotally connected to the hinge plates at the pivotal connection of said plates, and a cam fixed to said link and shiftable therewith for disposing the same in position to engage said latch bar to prevent unintentional shifting of the latch bar when engaged against said pin.

4. A convertible sofa bed hinge comprising a pair of pivotally connected plates, one attachable to the seat and the other to the back of a sofa, means for locking said hinge plates in a predetermined position comprising a locking latch bar pivoted to one plate and cooperating with a pin carried by the other plate, a spring carried by said first mentioned plate for holding said latch bar in its locking position and said spring having a projecting part and said latch bar having a slot cooperating with said projecting part for holding said latch bar away from

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its locking position, a pair of links pivotally connected, one to one of the plates and the other to the hinge connection of said plates, and a cam carried by said latter link and movable therewith for disposing the same in position to engage said latch bar to prevent unintentional shifting of the latch bar when engaged against said pin.

5. A convertible sofa bed hinge comprising a pair of pivotally connected plates, one attachable to the seat and the other to the back of a sofa, means for locking said hinge plates in a predetermined position comprising a locking latch bar pivoted to one plate and cooperating with a pin carried by the other plate, a spring carried by said first mentioned plate for holding said latch bar in its locking position and said spring having a projecting part and said latch bar having a slot cooperating with said projecting part for holding said latch bar away from its locking position, a supporting plate, a pair of links pivotally connected thereto, one of said

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links being pivotally connected to one of said hinge plates and the other having a pivot forming the pivotal connection of the hinge plates, and a cam fixed to the pivotal connection of said last mentioned link and in position to engage said latch bar to prevent unintentional shifting of the latch bar when engaged against said pin.

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