

March 17, 1936.

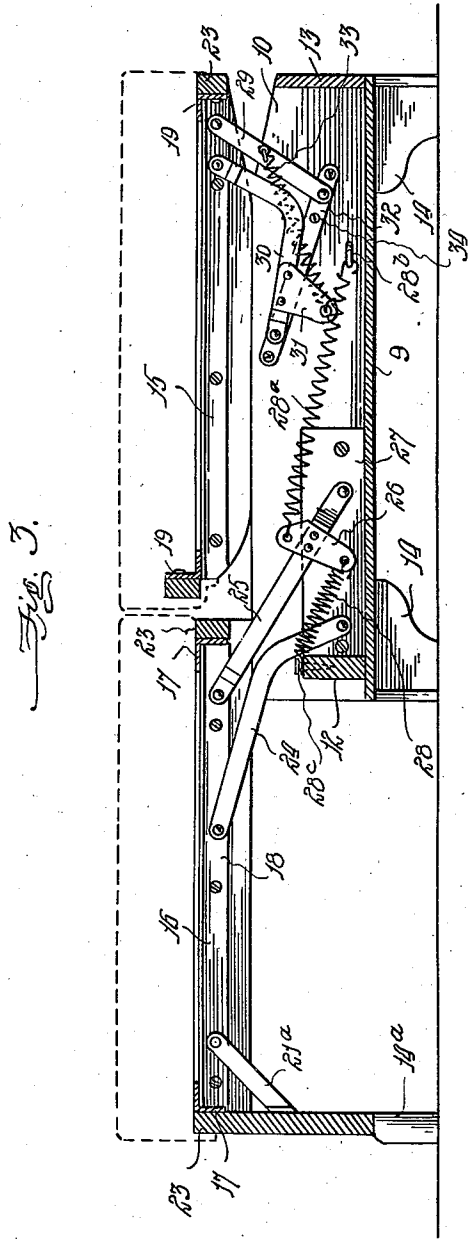
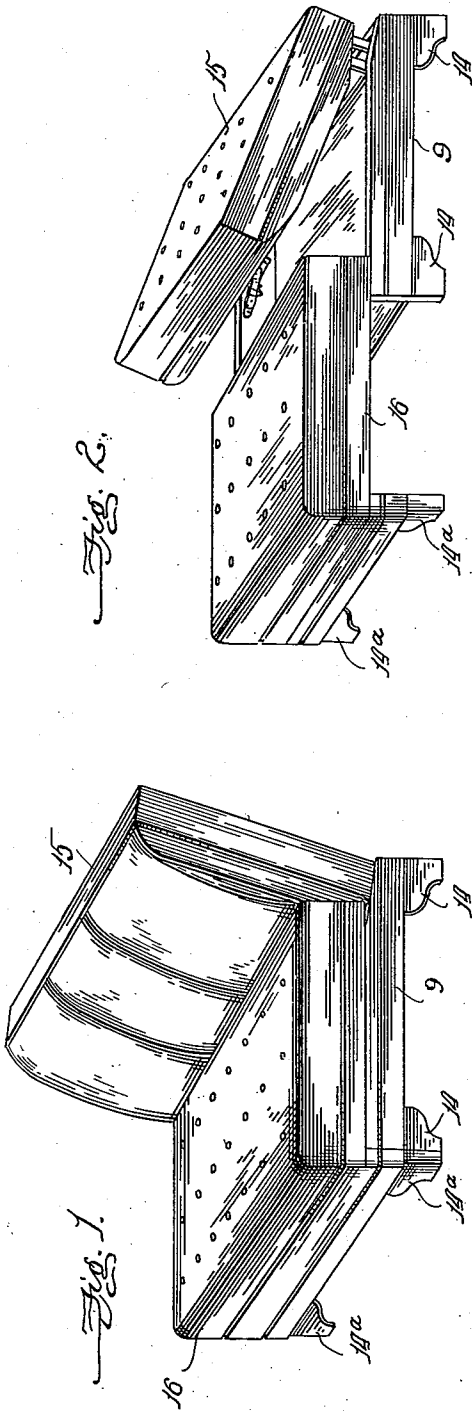
M. FOX

2,034,465

CONVERTIBLE STUDIO SOFA AND BED

Filed Dec. 17, 1934

3 Sheets—Sheet 1



Inventor

Martin Fox.

By *Conrad Hall*  
Attorney

March 17, 1936.

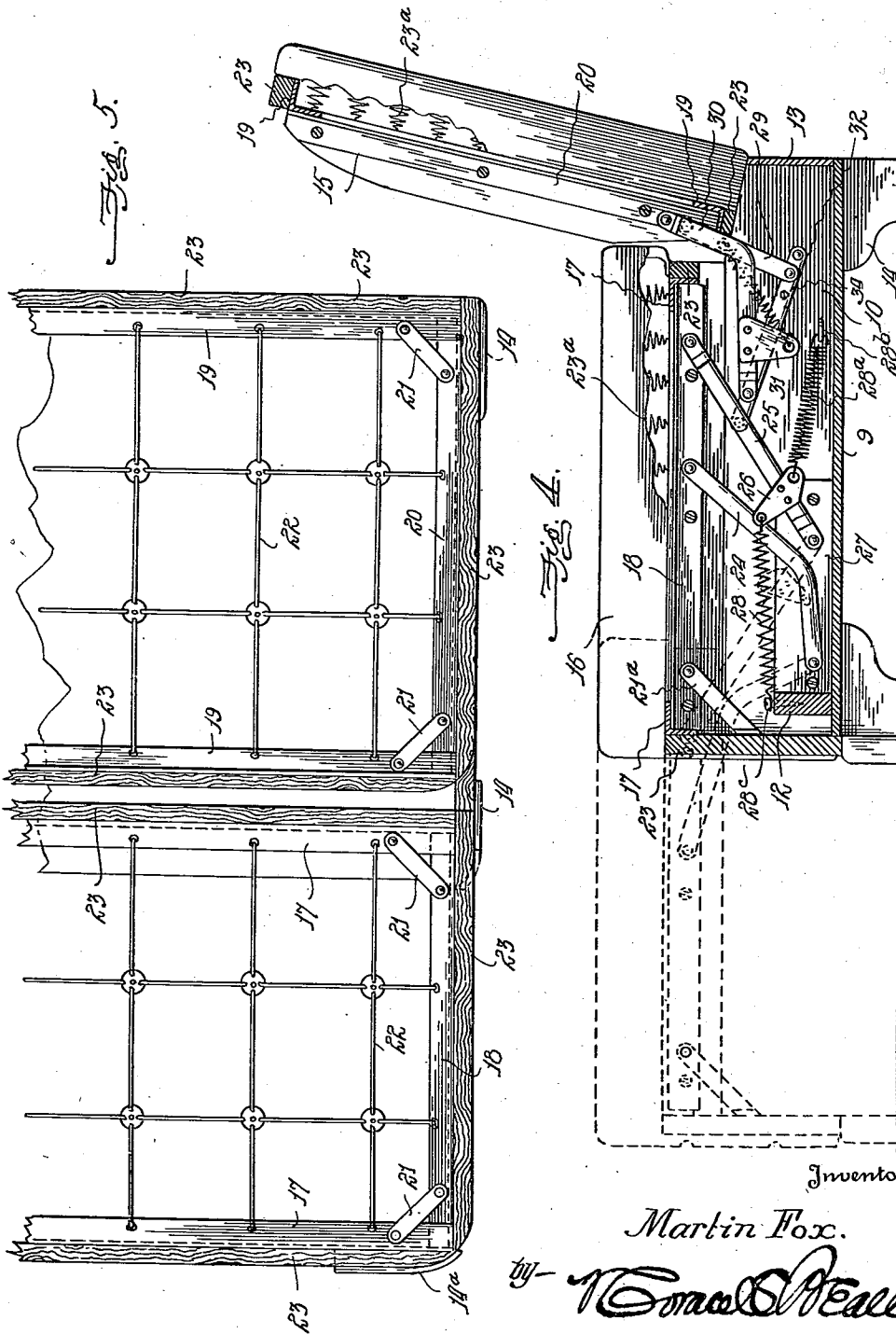
M. FOX

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3 Sheets-Sheet 2



Inventor:

Martin Fox.

by *Thomas A. Hall*

Attorney

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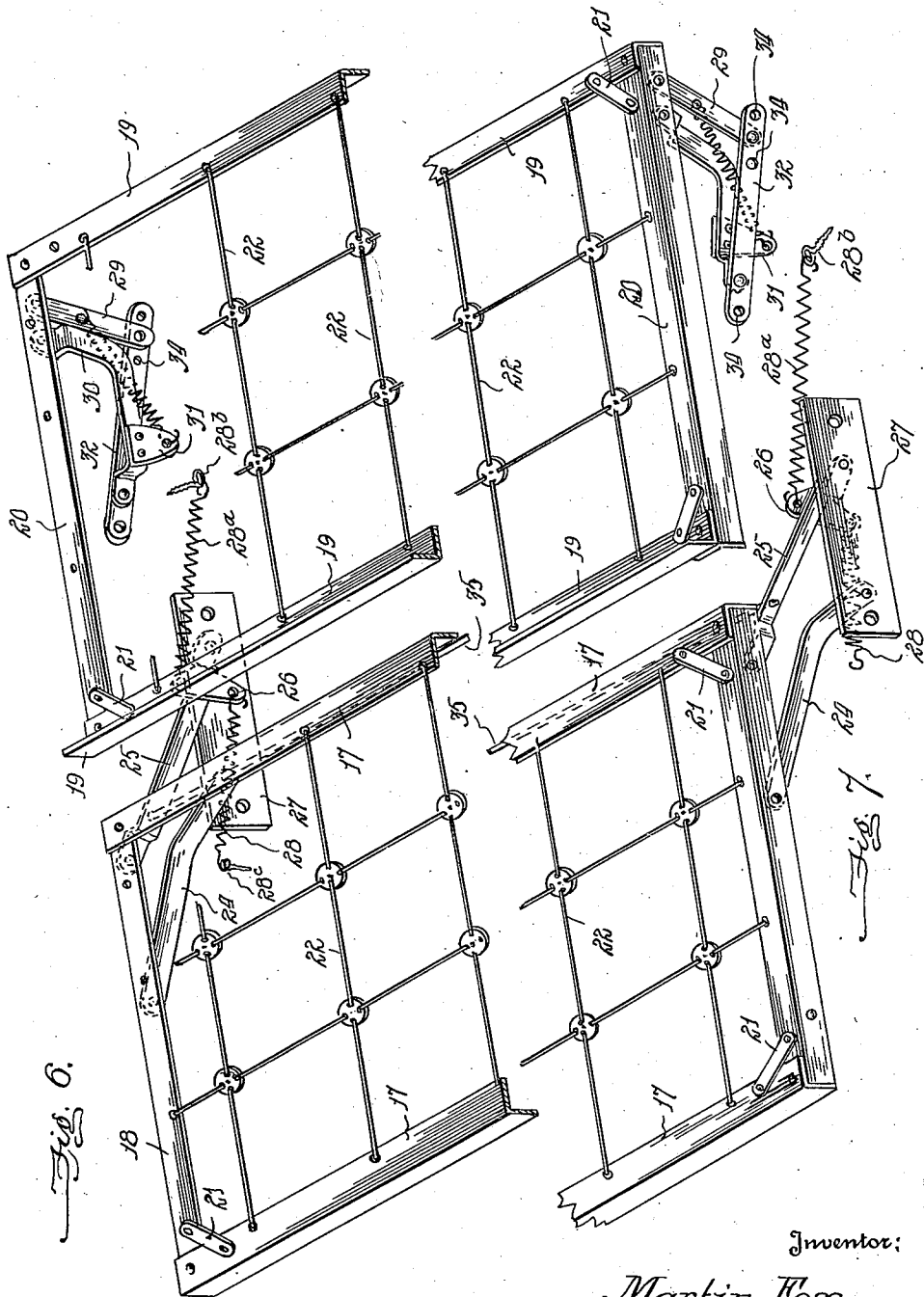
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CONVERTIBLE STUDIO SOFA AND BED

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3 Sheets-Sheet 3



Inventor:

Martin Fox.

By

*T. Donald Heall*

Attorney.

# UNITED STATES PATENT OFFICE

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## CONVERTIBLE STUDIO SOFA AND BED

Martin Fox, Chicago, Ill., assignor to The Seng Company, Chicago, Ill.

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4 Claims. (Cl. 5-44)

My invention is an improvement in divans or sofas of that particular type in which the seat and back are movable in respect to the main supporting frame for conversion to a bed.

5 In the usual construction of an article of furniture of this general character it is customary to move the seat to a position in front of the main supporting frame and fold the back down upon the latter so that the seat and back will cooperate in converting the divan to a bed. the upper portion of the seat and rear portion of the back being upholstered in the form of mattresses which are brought together in providing a bed of the desired width. In this form of divan or sofa it is a common practice to so construct the movable parts that in the operation of swinging the back to bed position it requires movement of the divan or sofa away from the wall against which the article of furniture is ordinarily placed, and to facilitate this movement the main frame is supported on rollers, while in that type of convertible divan in which the seat section is slidable over the main frame carrying the foldable back said seat section is likewise supported on rollers. It is conceivable therefore that a divan or sofa of such construction possesses disadvantages that detract from its general usefulness, with particular reference to the damage to the floor by the rollers supporting the movable sections, as well as the inconvenience of having to move the entire structure in converting from a divan to a bed and in replacing the article of furniture for day use.

Furthermore, in that type of convertible divan or sofa in which the section having the seat is slidable with respect to the section on which the foldable back is mounted locking means are necessary to prevent accidental movement of the seat section when the article of furniture is being used as a divan or sofa.

In these circumstances it is the main purpose of my invention to provide a special form of link connection between the back and main supporting frame whereby the divan or sofa may retain its position with respect to the wall against or near which it is placed for a slight rearward inclination of the back, in association with a seat section movable to provide the extension forming a part of the bed is not dragged over the floor but is operated in a more desirable manner as well as firmly supported in both positions without the employment of locking means.

A further object of my invention is to provide a convertible divan or sofa of economical construction without sacrificing durability and convenience of operation.

With these principal objects in view my invention consists principally in the form of connection between the foldable back and main supporting frame on which it is mounted, in association with a movable seat section and main supporting frame, including in each instance the employment of counterbalancing springs which assist in the operation of converting the divan or sofa to bed form, and vice versa; all as hereinafter fully described and claimed.

In the drawings:  
Figure 1 is a perspective view showing the structure arranged as a divan or sofa.  
Figure 2 is a similar view with the seat section extended and the back partly folded on to the main supporting frame.  
Figure 3 is a sectional view with the seat and back sections arranged in bed form, the mattress being indicated in dotted lines.  
Figure 4 is a similar view with the seat and back sections in position for use of the article of furniture as a divan.  
Figure 5 is a plan view of the metal frames of the seat and back sections in bed position.  
Figure 6 is a detail perspective view of one end of the seat and back frame to show the link connections adapted for association with the main supporting frame, and including the counterbalancing springs, and  
Figure 7 is a similar view of the fixtures at the other end of the seat and back frames.

In carrying out my invention the main frame 9 of the structure is in the form of a box with the usual side pieces 10, connected by the front and back pieces 12, 13, said box or main frame being provided at its corners with broad feet 14 for firmly supporting the structure in position on the floor, and in the present instance the back, referred to generally by the numeral 15, is connected to the rear end of this main frame by a special arrangement of links and counterbalancing springs, hereinafter described, and for cooperation the seat section 16 is preferably connected to the frame by an arrangement of links and counterbalancing springs, whereby the said seat section may be extended into position in front of the supporting frame and the back lowered thereon in converting the divan or sofa to bed form.

Both the seat and back sections of the convertible divan and bed are made up of longitudinal and transverse angle bars 17, 18 and 19, 55

55 a convertible divan or sofa of economical construction without sacrificing durability and convenience of operation.

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20 respectively, riveted together where they meet at the corners and reinforced by metal braces 21, and as these frames are upholstered to provide the mattresses of the bed there are cross wires 22 for the purpose of supporting coil springs 23a, although any other construction of mattress and supporting means therefor may be provided, it being understood that the back section 15 has dual upholstered surfaces, one for a cushioned front when the structure is arranged as a divan and the other providing one of the mattress sections for the bed. On the other hand, the upper portion only of the frame of the seat section is upholstered inasmuch as it is moved horizontally in extending the same from the main frame while the back is folded down which brings the rear mattress surface thereof uppermost. Furthermore, in order to support the forward end of the seat section when it is extended in bed form the front corners are provided with posts terminating in feet 14a adapted to the general design of foot pieces illustrated in Figs. 1 and 2 of the drawings.

For the purpose of upholstering the seat and back sections of the convertible divan and bed the metal frames hereinbefore described are surrounded by wooden strips 23 (see Fig. 5), the one in the front of the seat section being in the form of a wide board to which the posts 14a are attached and braced by metal straps 21a.

The seat section 16 is connected to the main frame for extension in front of the latter by means of two links 24 and 25, and as these links are duplicated at opposite ends of the structure a description of one set will apply also to the other set, like numerals of reference being employed. The link 24 is bent laterally, while the link 25 is bent outwardly intermediate its length and carries a plate 26 riveted thereto and extending at opposite sides thereof for the attachment of counterbalancing springs 28, 28a, and it will be noted by reference to the drawings that these links are pivoted at one end to the end angle bars of the metal seat frame and at the other end to a plate 27 attached to an end wall of the box forming the main frame whereby when said seat frame is moved from its position on said main frame to extended position in forming the bed it is slightly elevated so as to clear the floor. The forward end is then supported by the corner posts 14a while the rear end is supported on the forward end of the side pieces of the main frame, leaving a space between the rear ends of the seat section and main frame to receive the back of the divan or sofa when folded down on the main frame, and in this position the mattresses are in alignment, as indicated by dotted lines in Fig. 3. The counterbalancing springs 28, 28a serve to ease the weight of the seat section in shifting or swinging the same from one position to the other, and for this purpose spiral spring 28 extends forwardly from the lower end of plate 26 and is connected to the upper end of the front wall of the main frame by a screw 28c, while spiral spring 28a extends rearwardly from the upper end of said plate 26 and is connected to a screw eye 28b secured to an end wall of the main frame. As the link connections 24 and 25 are provided at each end of the movable seat section 16 for the operation of said seat section in converting the article of furniture from divan to bed and vice versa, an equalizer bar 35 connects the links 25 so that they will operate in unison in the event said seat section should be raised at any point other than the center.

The back section 15 is also connected to the main frame by a pair of links, 29, 30, pivoted at one end to the metal frame of said back section and at the other end to a plate 32 secured to an end wall of the box forming the main frame. In this instance link 30 is bent at a slight obtuse angle to form a stop in supporting the back at an inclination, for which purpose it engages the lower crosspiece of the metal frame of the back as shown in Fig. 4, and it is also bent outwardly and has riveted thereto a plate 31 for the attachment of a counterbalancing spiral spring 33, which latter extends from the outer end of said plate to an intermediate portion of the link 29, whereby the expansion and contraction of said spring eases the lowering of the back when the divan is converted to a bed and assists in raising the back when the article of furniture is to be used as a divan or sofa. The links are arranged in a particular manner for permitting the folding and unfolding of the back without moving the article of furniture away from the wall against which it may be placed, as well as for supporting said back at a rearward inclination; that is to say, in the operation of the back the lower end is projected only a slight distance beyond the rear end of the main frame, or within the space between said main frame and wall which is left when the article of furniture is placed in position for day use with the top of the back against the wall. For this purpose the upper end of link 29 forms a fulcrum or pivot near the lower end of the back, which changes position only slightly in the operation, while bent link 30 pivoted to the back a little farther away from the end than the pivot point of link 29 limits the rearward swinging movement of said back, as hereinbefore explained, and to this end cooperates with the other link and inclined upper edge at the rear end of the side pieces of the main frame, and there is also a cooperation of these links with the counterbalancing spring. To further provide for this operation of the back section the lower edges of the side pieces thereof are cut away or beveled at their rear ends, as shown in the drawings (Fig. 3), and these beveled edges also accommodate the positioning of the mattress of the seat section against the lower part of the cushioned back for the divan or sofa, (see Fig. 1). In some instances instead of having the cushion or back in the form of upholstering, the front portion of the back may be finished to receive loose pillows, and of course the rear portion of the back may be provided with any desired type or thickness of mattress. As hereinbefore explained the links 29 and 30 are connected at their lower ends to the attaching plate 32, and for securing this attaching plate to the side of the box frame it is provided with screw holes 34. The stationary main frame being in the form of a box it may be used for the purpose of storing pillows, blankets, or other bedding.

From the drawings it will be noted that when the sections are arranged for use as a divan or sofa the back inclines rearwardly from the seat at the usual angle (see Fig. 4) and in placing this article of furniture in a room the upper end of back may be against the wall or in the usual position, and that in converting the divan to a bed the lower end of said back section will project only a slight distance beyond the main frame so as to not require movement thereof, notwithstanding the fact that the rear portion of the back is thickly upholstered and consequently if hinged in the usual manner would project to

such an extent as to necessitate movement of the structure away from its original position contiguous to the adjoining wall of the room in which the article of furniture is placed. The construction herein shown and described therefore permits the use of feet for the main frame having a substantial bearing on the floor, an advantage in this instance for the reason that the operation of my improved form of convertible divan and bed obviates the labor of moving the article of furniture in converting it, and also saves the surface of the floor from the scarring which usually occurs in the use of movable furniture. These advantages also accrue in respect to the seat section as the arrangement of links provides for a walk-over movement of said seat section, for when it is swung forwardly the feet 14a come squarely down on the floor and do not drag across as in the case of slidable extension sections.

It will be understood that the arrangement of the connecting links and counterbalancing springs between the main frame and cooperating sections of the convertible divan and bed may be modified within the spirit and scope of my invention and yet accomplish the main purposes in respect to fixed position of the article of furniture, stability of construction, and ease of operation.

I claim:—

1. A convertible divan and bed comprising a main frame, an extensible seat section, means for connecting said seat section to the main frame for the extension thereof in forming the bed, a foldable back section, and means for connecting said back section to the main frame including a pair of companion links pivoted at one end within the main frame in spaced apart relation and at the other end within the back section at a slight distance from the lower end thereof, one of the links forming a fulcrum for the swinging movement of the back and the other link bent at an angle and pivoted to the back section adjoining the pivot point of the first mentioned link for the engagement of the lower end of the back with said links in positioning said back at a rearward inclination.

2. A convertible divan and bed comprising a main frame the upper edges of the sides of which are beveled downwardly at their rear ends, an extensible seat section, means for connecting said

seat section to the main frame for the extension thereof in forming the bed, a foldable back section the lower edges of the sides of which are beveled in the opposite direction from the bevel of the edges of the main frame, and means for connecting said back section to the main frame including a pair of companion links pivoted at one end within the main frame in spaced apart relation and at the other end within the back section at a slight distance from the lower end thereof, one of the links being bent at an obtuse angle and pivoted to the back section adjoining the pivot point of the other link for the engagement of the lower end of the back with said links in supporting said back at a rearward inclination on the beveled edges of the side pieces of the main frame, and a spiral spring connected at its ends to said links for counterbalancing the weight of the back section in the operation thereof.

3. A hinge connection for the movable back of an article of furniture having a box frame, comprising a pair of links pivoted within the box frame in spaced relation and within an end of the movable back in juxtaposition at a slight distance from the lower end of said back, one of the links forming a fulcrum for the swinging movement of the back and the other link bent at an angle, whereby said links are engaged by the lower end of the back and form a stop for the rearward swinging movement of said back to position it at a rearward inclination.

4. In combination with an article of furniture including a box frame and back, the edges of the side pieces of said back and box frame being beveled in opposite directions at their rear ends to dispose the back at a rearward inclination when in open position, of a hinge for connecting the back to the box frame comprising a pair of links pivoted to the sides of the box frame in spaced relation and within the end of the movable back in juxtaposition at a slight distance from the rear end of said back, one of the links forming a fulcrum for the swinging movement of the back and the other link bent at an angle, whereby said links are engaged by the lower end of the back and form a stop for the rearward swinging movement of said back, together with a counterbalancing spring connected to and extending between the links.

MARTIN FOX. 50