Oct. 27, 1953 A. WINIKOFF 2,656,547

FOLDING BED AND SEAT COMBINATION

Filed May 6, 1950 2 Sheets-Sheet 1

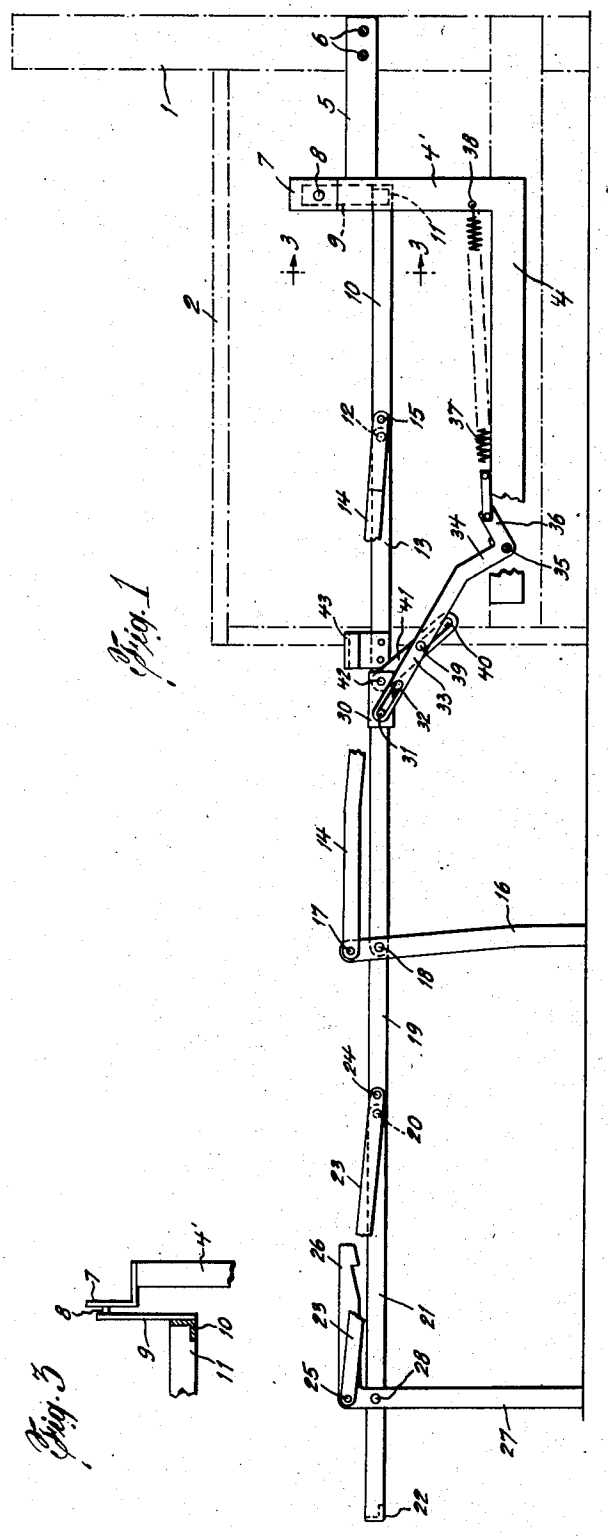


Fig. 1

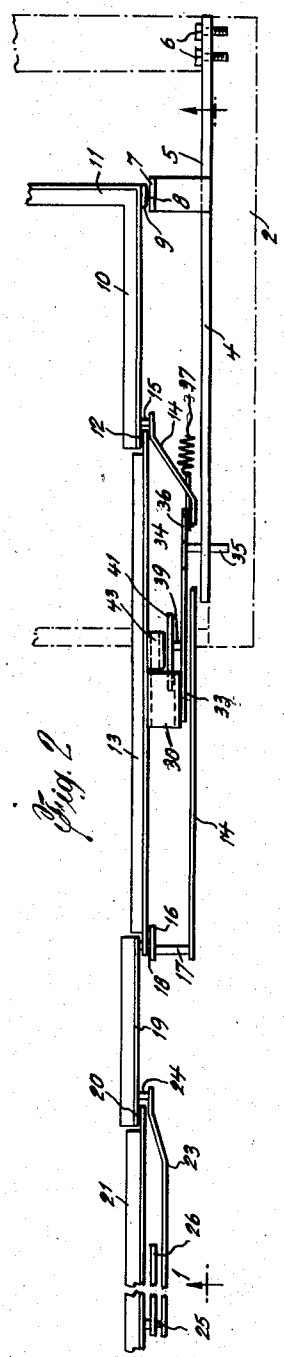


Fig. 2

Fig. 3

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Fig. 4

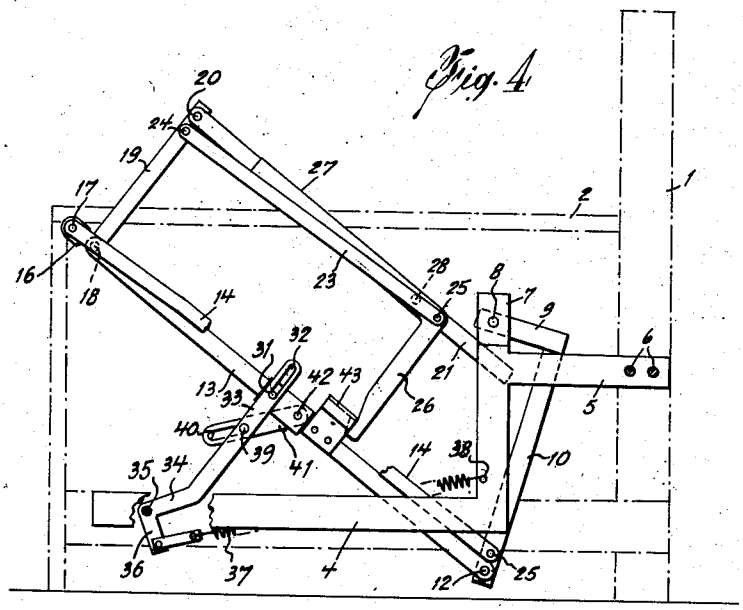
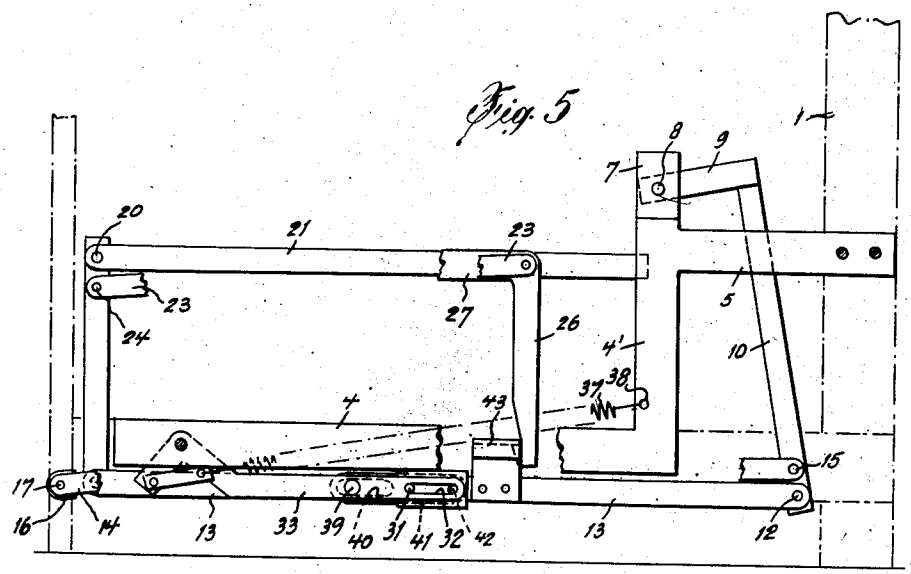


Fig. 5



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FOLDING BED AND SEAT COMBINATION

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7 Claims. (Cl. 5—13)

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The present invention is directed to a combination of a seat and a folding bed which is adapted to be folded into the form of a seat or opened to provide a full length bed.

In the past there have been a number of structures of this general type which operated effectively to provide a bed when the structure was opened. However, such constructions had a serious disadvantage in that the length of the bed was rather limited because of the necessity of folding the elements thereof into a seat of normal depth. Therefore, such beds were not suitable for tall persons to sleep on them comfortably.

The present invention is intended and adapted to overcome the difficulties and disadvantages inherent in prior structures of the type described, it being among the objects of the present invention to provide a combination of folding bed and seat in which a greater length of bed is obtained without correspondingly increasing the depth of the seat.

It is also among the objects of the present invention to provide a combination of links adapted to operate to allow folding of the several sections of the bed into the desired space.

It is further among the objects of the present invention to provide a construction which is sturdy and in which the folding operation is positive in its action, permitting ready and easy manipulation of the folding bed.

It is still further among the objects of the present invention to provide a latch arrangement of simple construction, which is adapted to hold certain bed sections in locked position when folded.

In practicing the present invention there is provided a seat which may be of any desired width, having attached thereto a series of bed sections pivoted to each other, the innermost or first section being pivoted to a portion of the frame of the seat. There are four sections pivoted together with pivoted links and legs for the second and fourth sections so that when the bed is opened there are supports at the intermediate and end sections thereof to firmly support the open bed. There is also provided a system of linkages between one of the sections, usually the second section, and the frame to provide a suitable movement of the bed when being folded or opened so as to allow a compact arrangement of the folded structure.

The system of linkages consists of a pair of links, one of which is angular and is pivoted at its lower end to the frame. The upper end thereof has a slot and a pin on the second section operates in said slot. A second link is pivoted at one end to the second section at a point spaced from the aforesaid pin and it has a slot at its lower end. The pin on the first link extends through the slot of the second link. When the bed is in extended position, the pins are in the upper ends of the slots and when the bed is folded, the pins are in the opposite ends of the slots.

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In the operation of folding the bed, the fourth section is raised, causing it to assume a position at right angles to the third section, which is then pivoted so that it assumes a position at right angles to the second section. The bed is then raised further so that the second section assumes an angle of about 45° to the horizontal, causing the pin on said section to travel to the opposite end of the slot of the first link. Then the bed is given a downward and inward movement which causes the pin on the first link to travel to the opposite end of the slot of the second link. At the same time, the first section is caused to rotate about its pivot to assume a substantially vertical position.

In the accompanying drawing constituting a part hereof and in which like reference characters indicate like parts,

Fig. 1 is a side elevational view of a combination of folding bed and seat showing the bed in open position, some parts being broken away for clearness;

Fig. 2 is a top plan view thereof, showing only one of the sides of the structure;

Fig. 3 is a fragmentary view taken along line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 1, showing the bed in partially folded position, and

Fig. 5 is a similar view showing the bed in fully closed position.

The seat which may be of any desired width consists of a rear wall 1, a pair of side members 2 and front member 3. Within the seat is an angular support having a horizontal portion 4 and a vertical portion 4'. Horizontal portion 4 is secured to the lower part of sides 2 and vertical portion 4' has an extension 5 which is secured to the frame by screws 6. A similar arrangement is provided at the opposite side of the seat.

On extension 7 is a pivot 8 on which is mounted extension 9 at the inner end of the first section 10 of the bed. Said section has a connecting member 11 going to the opposite side and forming a frame unit which is the first section.

Pivoted at 12 to the outer edge of section 10 is a section 13 which constitutes the second section of the folding bed. Suitable braces are pro-

vided to connect the two side elements to said section. A link 14 pivoted at one end at 15 to the first section has its other end pivoted to leg 16 at its upper point 17. Below the same is a pivot 18 extending from the section.

A relatively short third section 19 is pivoted to the second section at 18 and is further pivoted at 20 to the fourth section 21 having an end member 22 providing a brace for the fourth section. Similarly braces are provided for each of the sections by transverse members going from side to side.

A link 23 is pivoted at one end at 24 to the second section and at 25 to the angle of a right-angled lever. The latter consists of a horizontal element 26 and a vertical element 27 pivoted at 28 to the fourth section. Element 26 is formed with a notch 29 constituting a latch and element 27 constitutes a leg on which the bed rests.

At an intermediate point on the second section is secured a plate 30. Near the outer edge thereof is a pin 31 extending into slot 32 of angular link 33. The lower angular portion thereof is pivoted at 35 to support 4. An extension 36 thereon holds one end of a coil spring 37, the other end of which is attached at 38 to vertical member 4'. Means may be provided in connection with spring 37 for adjusting the tension thereof.

A pin 39 at an intermediate point of link 33 operates in slot 40 at one end of second link 41. The other end thereof is pivoted at 42 near the inner edge of plate 30. A keeper 43 is provided on the second section inwardly of plate 30.

In the operation of the bed, assuming that it is in the open position as shown in Fig. 1, end 22 of the fourth section is lifted until said section is in a vertical position. This movement, because of the presence of link 23, causes a folding of leg 27 so that it is in alinement with member 21. The bed is further lifted, causing the third section to assume a vertical position, being pivoted around point 18. By reason of this movement, latch 29 engages in keeper 43 and firmly locks the second, third and fourth sections in their final position.

The bed is lifted further so that it assumes a position at about 60° to the horizontal with link 33 vertical and pins 31 and 39 in the upper ends of slots 32 and 40, respectively, the bed pivoting about pivot 35. Then as shown in Fig. 4, the bed is further lifted so that it assumes a position at about 30° to the horizontal, whereby pin 31 travels to the bottom of slot 32 and pin 39 is at the right of the vertical line passing through pivot 35 and remains in the upper end of slot 40. Then the bed is given a downward and inward movement, throwing link 33 inwardly from the vertical and causing pin 39 to travel to the outer end of slot 40 in link 41, the bed pivoting about pin 31. The bed then assumes the position shown in Fig. 5, with the first section in a vertical position and the first and second links in superposed relation. To open the bed, the reverse movements are caused to take place.

Because of the presence of the slotted links, the "throw" of the outer sections of the bed is increased to the extent of the slots. This causes the outer sections to assume a position further forward from the back of the seat frame enabling one to have a longer bed. The length of the bed may be still further increased by lengthening the inner section and/or placing it further forward. In folding the bed, the effective length of the slotted links is shortened allowing the sections to be folded in the area of a seat of usual dimensions. A partial result is obtainable by using a single slotted link, but the combination of two interconnected slotted links is preferable.

I claim:

1. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through the slot in said second link.

2. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through the slot in said second link, the length of said slots being sufficient so that said pins contact one end of said slots when said bed is extended and contact the opposite end thereof when said bed is folded.

3. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through the slot in said second link, a leg pivoted to said fourth section and linked so as to fold against the same when folded, an angular extension on said leg, a latch on said extension, and a keeper on said second section adapted to retain said latch when said sections are folded.

4. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through

the slot in said second link, and a spring attached to said first link and to said frame.

5. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through the slot in said second link, a support having a horizontal member attached to said frame and a vertical member extending upwardly at the inner end of said support, a spring attached to said first link and to said vertical member, said first section being pivoted thereto.

6. In a folding bed structure having a frame, a first bed section pivoted to said frame, a second section pivoted to said first section, a third section pivoted to said second section and a fourth section pivoted to said third section, a linkage system having one end pivoted to said frame and the other end pivoted to said second section, the improvement in which said linkage comprises a pair of links, one link being pivoted at one end to said frame, a pin on said second section, said first link having a slot at the other end through

which said pin extends, the second link being pivoted at one end to said second section and having a slot at the other end thereof, and a pin on said first link extending through the slot in said second link, a support having a horizontal member attached to said frame and a vertical member extending upwardly at the inner end of said support, a spring attached to said first link and to said vertical member, said first section having an upward extension at its inner end, said extension being pivoted to said vertical member.

7. In a folding bed structure having a frame and a plurality of pivoted sections including a first section pivoted to said frame and a second section pivoted to said first section, the improvement which comprises a link having a longitudinal slot therein, said link being pivoted to said frame, and a pin on said second section passing into said slot, a second link having a longitudinal slot pivoted on said second section, and a pin on said first link passing into the slot of said second link.

ABRAHAM WINIKOFF.

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