July 1, 1941. J. L. W. MURRAY 2,247,516

SECTIONAL MATTRESS

Filed July 27, 1938 2 Sheets-Sheet 1

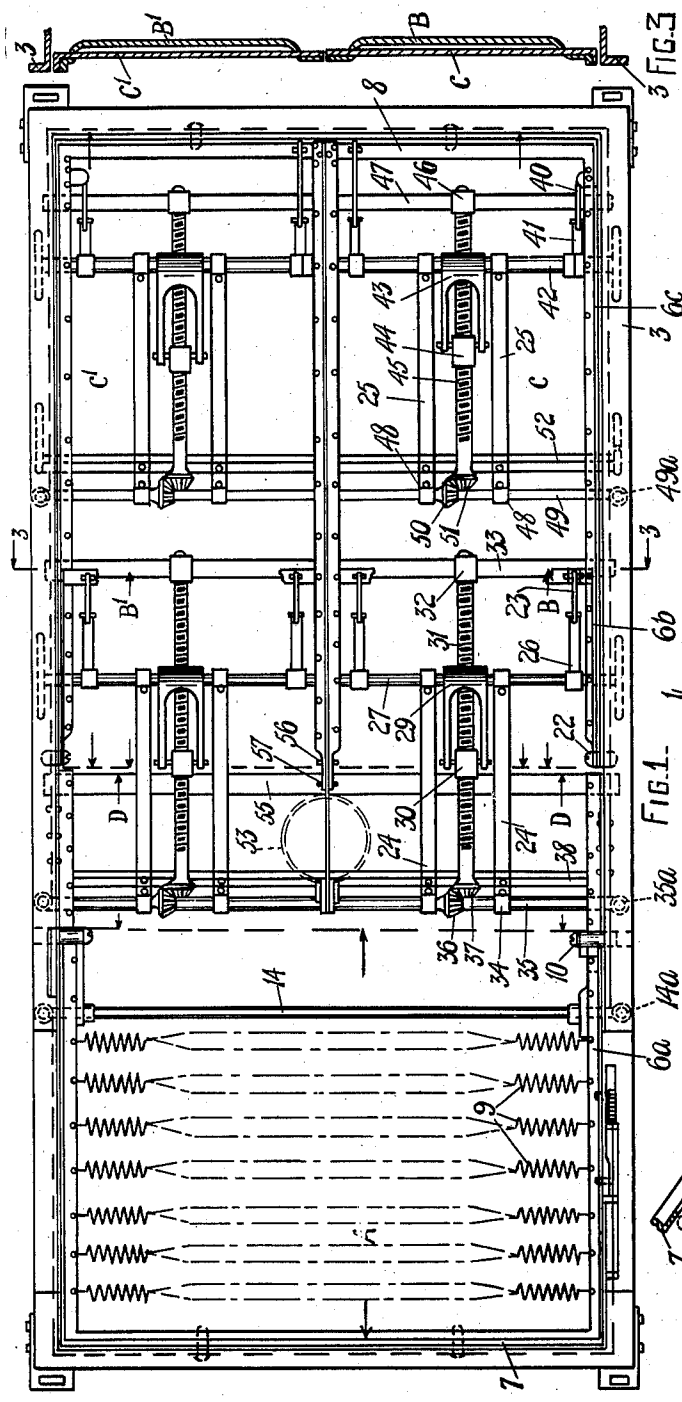


FIG. 1

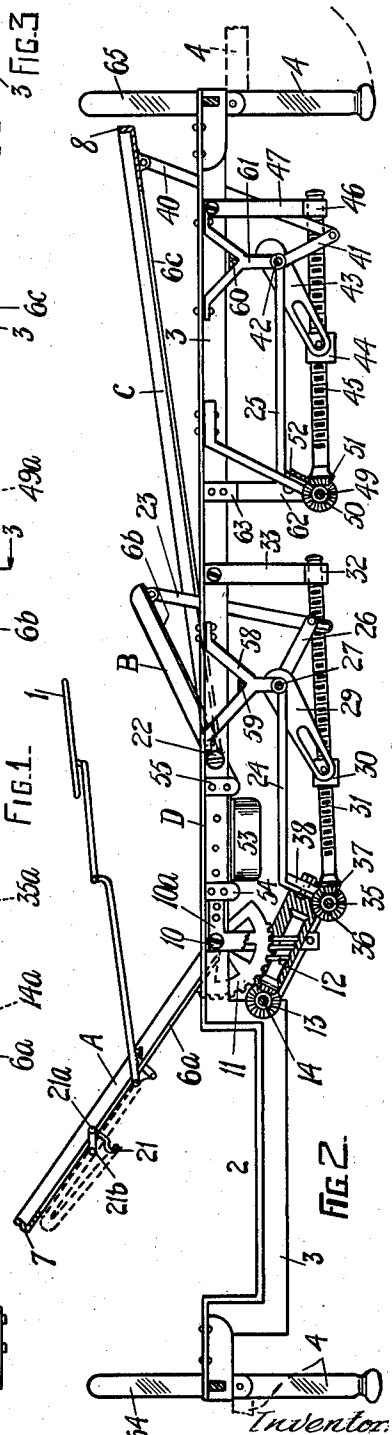


FIG. 2

FIG. 3

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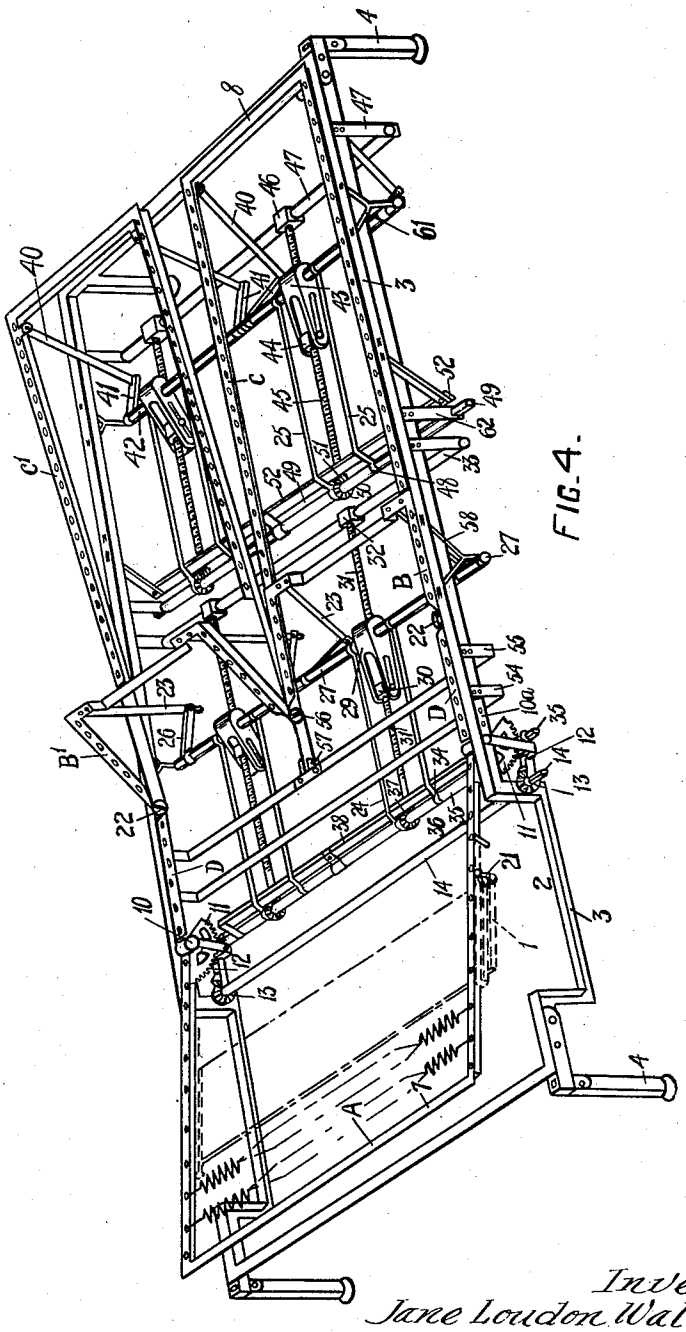


FIG. 4.

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UNITED STATES PATENT OFFICE

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SECTIONAL MATTRESS

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In Great Britain August 23, 1937

2 Claims. (Cl. 5—69)

The present invention relates to sectional mattresses for invalids and contemplates constructing either the leg-rest section or the thigh-rest section of the mattress, or each of them, in the form of a pair of independently adjustable sections with winding mechanism operable from the side of the mattress for individually raising each of said sections above the horizontal position; alternatively, the adjustable leg-rest or thigh-rest section, or each of them, may incorporate a pair of smaller independently adjustable sections. The pair of independently adjustable sections are adapted to be adjusted by the provision of any suitable winding mechanism.

The pivotal axes of the thigh-rest section and leg-rest section are coincident, the thigh-rest section overlapping a portion of the leg-rest section. It is preferred to provide a fixed horizontal seat section for supporting the buttocks between the trunk section and the adjustable thigh-rest section.

The provision according to the present invention of winding mechanism operable from the side of the mattress for raising each independent section of the mattress, enables each section to be individually raised and held in its adjusted position even when the bed is occupied.

The accompanying drawings illustrate an adjustable sectional mattress incorporating my improvements, the mattress being shown incorporated in a bedstead which can be used as a stretcher. Fig. 1 is a plan view showing only a part of the spring surface. Fig. 2 is a side sectional view showing the movable mattress sections raised. Fig. 3 is a sectional view on the line 3—3 of Fig. 1. Fig. 4 is a perspective view of the mattress of my invention.

The mattress shown comprises a rectangular outer frame 3 supported on legs 4. The frame 3 supports an adjustable head-and-shoulders support or trunk section A, a fixed horizontal seat section D, twin adjustable thigh rest sections B and B^1, and twin adjustable leg-rest sections C and C^1, each consisting of metal or other side bars between which is stretched the spring surface which may consist of connected helical springs 9 or any other convenient form of spring surface suitable for a mattress of this type. The side bars 6*a* of trunk section A are connected by an end bar 7. The side bars 6*c* of the leg-rest sections C and C^1 are connected by end bars 8. The trunk section A is pivoted or hinged at 10 to the frame 3 and is adjustable by the provision of a pair of toothed quadrants 11 which are pivoted at 10 and fixed to the side bars 6*a* and which mesh with a pair of worm pinions 12 actuated by bevel gearing 13 from a cross-shaft 14 fitted at its ends with fixed or removable operating handles 14*a*, which may be either hand wheels or hand cranks. The mechanism for adjusting the trunk section A is supported by brackets 10*a* suspended from the frame 3. The trunk section A may carry a table and/or book-rest 1. Catches 21 for holding the book-rest in folded position behind the trunk section A may be fixed upon a cross-rod 21*a* so that they move together, the cross-rod 21*a* being fitted at either or both ends with a handle 21*b*. The frame 3 has a recessed portion 2 for the reception of the folded table when the trunk section is in a lowered position.

The fixed seat section D adjoins the trunk section A and when the latter is horizontal the seat section D forms a continuation of it. The seat section D may be provided with a bed pan 53 supported between two cross rods 54, 55 which are secured to the frame 3.

The twin thigh-rest sections B, B^1 and twin leg-rest sections C, C^1 have the same pivotal axis 22 which is located just in rear of the fixed seat section D. Each thigh rest section comprises a pair of parallel side bars 6*b* pivoted at 22 to the outer frame 3, the parallel side bars resting when horizontal upon the parallel side bars 6*c* of the leg-rest sections C and C^1. The adjoining sides of the twin thigh-rest sections B, B^1 and the adjoining sides of the twin leg-rest sections C, C^1, are hinged at 56 to a supporting arm 57 fixed to the cross-rod 55.

The side bars 6*b* of each thigh-rest section have depending arms 23 which are articulated to arms or levers 26 fixed to a cross-shaft 27, there being two cross-shafts 27, one for each thigh-rest section. The shafts 27 are supported at their outer ends in brackets 58 fixed to the outer frame 3 and are revolubly mounted at their inner ends in an arm suspended from a cross rod 59 fixed to the brackets 58, said shafts 27 being so mounted that they can rotate independently. Fixed to each shaft 27 is a slotted fork arm 29, the slots in which are engaged by projections on a nut 30 which works on a screw 31 supported at one end in a thrust block 32 on a fixed cross-rod 33 and at its other end by a yoke 34 and bracing arms 24 engaging a cross shaft 35 projecting at one end through the outer frame 3. The inner ends of the two cross-shafts 35 are supported in a bearing bracket from a cross-bar 38 extending across the outer frame 3. The outer ends of the shafts 35 are fitted with

fixed or detachable handles 35a whereby the shafts 35 through bevel gearing 36, 37 may be caused to rotate the screws 31 to cause the travel of the nuts 30 to rock the slotted forks 29 and shafts 27 to raise or lower the rods 23 and thigh-rest sections B and B1, each of which can be independently adjusted.

Each leg-rest section C, C1 is provided with depending links 40 jointed to the ends of arms or levers 41 fixed to cross-shafts 42, there being a shaft 42 for each leg-rest section. Each shaft 42 has fixed thereon a slotted fork 43 engaged by a nut 44 on a screw 45 supported on a thrust block 46 on a fixed cross-rod 47. The screws 45 are operable by means of bevel-gearing 50, 51 and aligned shafts 49 supported at their inner ends in a bearing bracket 62 on a cross bar 63 and fitted at their outer ends with actuating handles 49a. Yokes 48 and bracing arms 25 support the driven ends of the screws 45 from the shafts 49 and a cross bar 52. The leg-rest sections C and C1 are thus independently adjustable. The shafts 42 are supported at their outer ends in brackets 61 fixed to the outer frame 3 and are revolubly mounted at their inner ends in an arm carried by a cross rod 60 fixed to the brackets 61.

The two sets of bevel pinion shafts 35 and 49 may be provided with clutch mechanism or other means to connect each set together at their meeting ends for use when it is desired to raise the sections B, B1 simultaneously and the sections C, C1 simultaneously.

Ends 64, 65 may be provided at the four corners of the frame 3 and the legs 4 may be provided with a rule-joint or hinge to enable the legs to be used as carrying arms when it is desired to use the bedstead as a stretcher, and for hospital use the bedstead may be fitted to a wheeled carriage.

Instead of the mechanism described and illustrated for adjusting the position of the mattress sections, I may employ any suitable mechanism and, if desired, I may support the sections in any inclined position by suitable adjustable struts or the like.

If desired, motor-driven mechanism provided with a hand control may be provided to enable the patient to raise and lower the various sections.

I claim:

1. An invalid's sectional mattress structure comprising an outer rectangular frame, a mattress made in sections adapted to rest horizontally in and to fill said frame, said mattress sections including a trunk section hinged at one end to said frame intermediate the length thereof so as to occupy a portion of said frame, twin leg-rest sections disposed side by side and each independently hinged at one end to said frame to occupy another portion of said frame, the hinge of each leg-rest section being at the end of said section nearer the trunk section, independently adjustable winding mechanisms operable from the sides of the mattress for individually raising each of said sections into a position inclined to and above the outer frame, thereby to raise the leg-sections independently of one another and independently of the trunk section to an angle of less than 180 degrees to the latter, twin thigh-rest sections each overlapping and adapted to rest upon a portion of one of the leg-rest sections at the end thereof nearer the trunk section, each thigh rest section being hinged at its end nearer the trunk section and having its pivotal axis coincident with the pivotal axis of the underlying leg-rest section, and independently adjustable winding mechanism operable to raise each of said thigh-rest sections individually into an acutely inclined position relatively to its underlying thigh-rest section.

2. A convertible stretcher and mattress structure comprising a stretcher frame, members hinged to the corners of said frame and movable from a position in which they serve as supporting legs at right angles to the frame into a position in line with the frame thereby to serve as stretcher carrying handles, a stretcher mattress made in sections adapted to rest horizontally in and to fill said frame, some of said sections being mounted on horizontal axes in said frame and being adapted to be raised into inclined positions, and said sections including twin leg-rest sections disposed side by side and each independently hinged at one end to said stretcher frame intermediate the length thereof, independently adjustable winding mechanism for individually raising each of said leg-rest sections independently of the other, twin thigh-rest sections each overlapping and adapted to rest upon a portion of one of the leg-rest sections, each thigh-rest section being hinged on a pivotal axis coincident with the pivotal axis of the underlying leg-rest section, and independently adjustable winding mechanism operable to raise each of said thigh-rest sections individually into an acute-inclined position relatively to its underlying thigh-rest section.

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