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J. H. BRADLEY

1,973,699

BED

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2 Sheets-Sheet 2

Fig. 2.

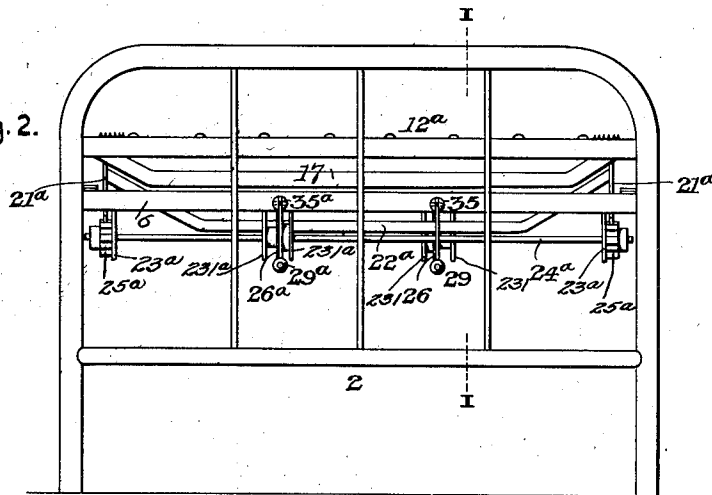


Fig. 4.

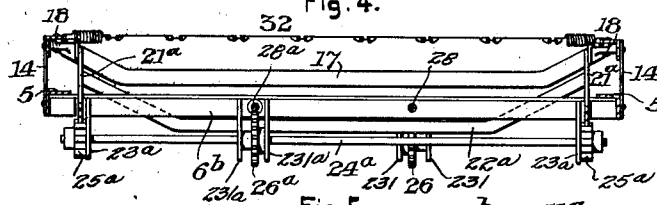


Fig. 5.

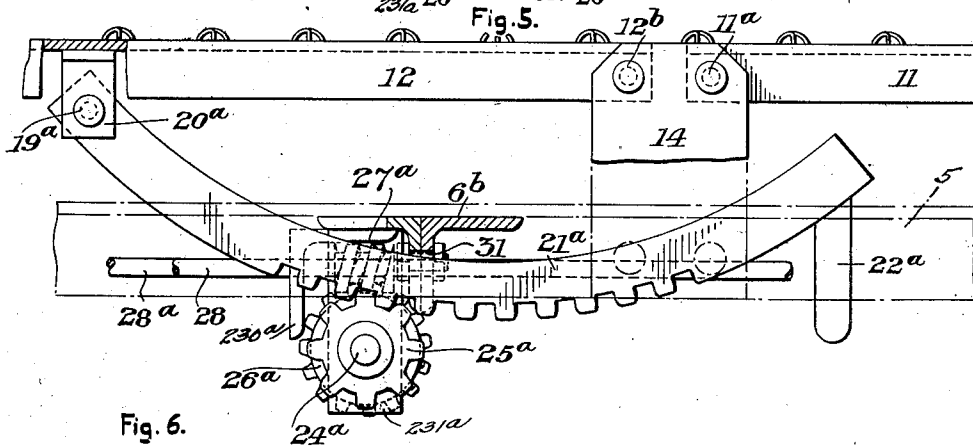
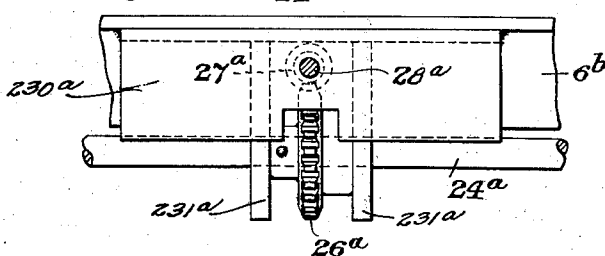


Fig. 6.



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UNITED STATES PATENT OFFICE

1,973,699

BED

John H. Bradley, Philadelphia, Pa.

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1 Claim. (Cl. 5—69)

My invention relates to beds and comprises certain improvements in that type of bed, largely employed for hospital use, which is provided with a sectional mattress support which may be given various angular positions with respect to the normal horizontal position of the bed frame so that a person occupying such bed may be given back support by raising one section, and another form of support for the legs by imparting angular movement to another section so that the tedium of lying in one position, flat on the back for instance, may be relieved by so disposing the sections of the mattress support that, without effort upon the part of the occupant, the mattress support may be given the desired angular positions that will accommodate the body in a substantially sitting posture or position and/or various intermediate positions.

My present improvements relate to the means for raising and lowering the respective sections of the mattress support; each section being positively moved in both directions, and such operation being effected by an attendant through mechanism preferably carried at the foot of the bed.

A particular object of my invention is to provide a bed having a sectional mattress supporting frame with means for adjusting the respective sections independently of each other and positively in each direction so as to support an invalid in any desired position.

Another object of my invention is to provide simple and sturdy means for moving the sections of the mattress supporting frame, easily operated and readily accessible to an attendant.

A further object of my invention is to provide a structure wherein the desired adjustments above referred to may be accomplished in a simple and efficient manner; my improved invalid bed being especially neat in construction and design and readily and cheaply manufactured.

These and other features of my invention are more fully set forth hereinafter; reference being had to the accompanying drawings, in which:

Figure 1 is a sectional elevation of my improved bed structure, taken on the line I—I, Fig. 2.

Fig. 2 is an end elevation of the same.

Fig. 3 is a side elevation of the mattress supporting frame shown independently of the head and foot sections and with the sections of such mattress supporting frame in their extreme upper angular positions.

Fig. 4 is a transverse sectional view of the mattress supporting frame, taken on the line IV—IV,

Fig. 1, showing the operating mechanism for raising and lowering the sections of such frame.

Fig. 5 is a fragmentary view on a slightly larger scale showing a detail of the operating mechanism.

Fig. 6 is a view of a further detail, and

Fig. 7 is a fragmentary view of a portion of the leg supporting section with modified operating means; such view illustrating clearly the simplicity of design permitting modifications tending to minimize manufacturing costs.

As shown in the drawings, the frame structure which, with the head and foot sections 1 and 2 make up the bed, may be of any usual construction and may comprise side rails 5, preferably of angle members; end connecting cross members 6, also of angle type, and intermediate cross members 6^a and 6^b of a similar character. The rails 5 may carry at their ends fittings 7 of any usual or standard type for connection with the head and foot sections 1 and 2, respectively.

The sections of the mattress supporting frame are operatively connected to and disposed above the side rails 5, and comprise an adjustable head section 10; a fixed body section 11, and a duplex adjustable and jointed leg section comprising the parts 12 and 12^a. For the purpose of supporting these sections, each of the side rails 5 is provided with a pair of upwardly extending brackets, indicated at 13 and 14, Figs. 1 and 3. The side bars of the head section 10 are pivotally connected at 10^a to the brackets 13; the side bars of the fixed body section 11 are secured to said brackets by rivets or other fastening members indicated at 11^a, and the side bars of the portion 12 of the duplex jointed leg section are pivotally connected at 12^b to the bracket 14.

The portions 12 and 12^a of the duplex leg section of the mattress supporting frame are pivotally connected at 12^c and 12^d, respectively, to connecting members 15, which are of such vertical dimensions that when they are in engagement with the side rails 5, the parts of said duplex jointed section 12, 12^a will lie in substantially the same plane as the fixed body section 11, as shown in Fig. 1.

The side bars of the head section adjacent to their pivotal connection with the bracket 13 may be braced by a connecting bar 17, which may be tubular and of the general shape shown in Fig. 4; the ends of such bar being flattened as indicated and underlying the upper flanges of the side rails of such frame to which they may be secured by rivets or other fastenings 18. The shape of the cross bar 17 permits the usual sagging of

the mattress without affecting the comfort of the person lying on the same. The portion 12^a of the leg supporting section of the mattress supporting frame is also provided with a similar bracing and connecting bar 17^a, similar in all respects to that employed with the head section and connected to said portion 12^a in a similar manner.

In addition to the end rails or cross bars 6^a of the main frame, it is also provided with cross bars 6^a and 6^b intermediate the ends, as shown in Fig. 1.

For the purpose of raising and lowering the head section of the mattress supporting frame, I employ the following means. Pivotally connected at 19 to brackets 20 which may be welded to the side bars of the head section are segmental racks 21; the free ends of which are connected by a cross bar 22, preferably depressed centrally of the same, to accommodate any sagging of the mattress, as more fully shown in Fig. 4. Supported in suitable bearings formed in brackets 23 depending from the cross bar 6^a, is a cross shaft 24 carrying pinions 25 meshing with the teeth of the segmental racks 21. In addition, the shaft 24 carries a worm wheel 26, which is actuated by a worm 27, carried by a shaft 28, journaled in the cross rail 6 at the foot of the bed and brackets 230 and 230^a carried by the cross rails 6^a and 6^b, respectively, such shaft extending to the foot portion 2 of the bed structure where it is provided with a handle 29 whereby it may be turned; such movement of the shaft actuating the shaft 24 through the medium of the worm gearing illustrated. In addition to the brackets 23, the shaft 24 is supported by brackets 231 carried by the cross rail 6^a and disposed adjacent to the worm wheel 26. By the use of this mechanism, the head section may be positively raised and lowered. In order that the head section may occupy a substantially level position when lowered, it is provided with legs or supports indicated at 10^b, preferably rubber shod, which rest upon the upper flanges of the angle side rails 5 when the head section is in the lowered position.

The portion 12 of the leg section of the mattress supporting frame may be equipped with positive operating means substantially identical with that employed for lifting the head section. This mechanism includes a cross shaft 24^a journaled in brackets 23^a depending from the cross bar 6^b; such shaft carrying pinions 25^a meshing with the teeth of segmental racks 21^a pivotally connected at 19^a to brackets 20^a which may be welded to the side bars of the portion 12 of the leg section of the mattress supporting frame. As with the racks connected to the head section, the free ends of the racks 21^a are connected by a cross bar 22^a, of the same character as 22, centrally depressed to accommodate any sag of the mattress that may occur when occupied by an invalid. As in the operating means for the head section of the mattress supporting frame, the shaft 24^a carries a worm wheel 26^a, which is actuated by worm 27^a carried by a shaft 28^a journaled in the cross-bar 6 at the foot of the bed and the bracket 230^a carried by the cross-rail 6^b; such shaft extending to the foot portion 2 of the bed structure where it is provided with a handle 29^a whereby it may be turned; such movement of the shaft 28^a actuating the shaft 24^a through the medium of the worm gearing illustrated. In addition to the brackets 23^a, the shaft 24^a is supported by brackets 231^a carried by the cross-rail 6^b and disposed adjacent to the worm wheel 26^a. By the

use of this mechanism the portion 12 of the leg section may be positively raised and lowered. The side bars of the portion 12^a of the duplex leg section are pivotally connected at 12^d to the members 15 to which the side bars of the portions 12 of such duplex leg section are also pivotally connected at 12^c so that when the portion 12 is raised, the portion 12^a follows. This latter portion is provided with legs 30 carrying caster rollers 30^a which ride on the upper flanges of the side rails 5 when the duplex leg section is elevated, as clearly shown in Fig. 3. When this duplex leg section is in the lowered position, as indicated in Fig. 1, the legs and rollers support the portions 12 and 12^a of the same in horizontal position in the same plane as the sections 10 and 11.

The portion 12^a of the duplex leg section of the mattress supporting frame is provided with a cross brace 17^a of the same character as that shown at 17, connected at 18^a to the side bars of such portion of the leg section and being centrally depressed to accommodate any sagging of the mattress.

While I have shown the segmental racks 21^a which provide the supporting and adjusting means for the leg section of the mattress supporting frame as extending toward the segmental racks 21 for adjustably supporting the head section 10, it is obvious that this relation may be altered without departing from my invention, and in Fig. 7 I have shown a modified arrangement wherein such racks, indicated at 21^b, extend toward the foot section of the bed. They are connected at the same point to the side bars of the portion 12 of the leg and they are operated in a manner precisely similar to the operation of the racks 21^a with the advantage that the operating shaft 28^b need not be quite so long.

To prevent the racks 21, 21^a or 21^b, moving away from the respective pinions 25, 25^a or 25^b, their operative position is related to the cross bars 6^a and 6^b, as clearly shown in Fig. 5; such cross bars being cut away as indicated at 31 to accommodate such racks.

It will be understood, of course, that the several sections of the mattress supporting frame will be provided with some form of bed-bottoming, usually a relatively elastic or resilient support of woven wire, wire links or the like, which may have spring connections with the frame making up such bed-bottoming being indicated in Figs. 1 and 4; such bed-bottoming being indicated at 32, in Fig. 4.

The handles 29 and 29^a are pivotally connected to slotted blocks 35 and 35^a secured to said shafts at their ends which terminate at the foot section of the bed. The operative position is indicated by full lines, Figs. 1 and 7, and by dotted lines Fig. 3. The full line position of the handle 29, shown in Fig. 3 represents the position it may occupy, out of the way, when not in use.

All parts of my improved structure which are not bolted or riveted together are welded; the structural parts of my improved bed being particularly susceptible of permanent engagement by a welding operation.

I claim:

In a bed of the character described, the combination with a main frame including side rails, a plurality of cross rails and head and foot members, of a sectional mattress-supporting frame operatively supported by and disposed above the main frame; said mattress-supporting frame including a body section; supports carried by the side rails of the main frame to which said body section

is pivotally connected, a pair of segmental racks pivotally connected to intermediate portions of said body section and arranged therebelow, a cross shaft operatively supported from the main frame by means including one of said cross rails intermediate the head and foot, a pair of pinions fixed to said cross shaft and in engagement with said segmental racks; said last-mentioned cross rail serving as means for maintaining said racks and pinions in operative engagement, a worm wheel carried by said cross shaft, a shaft extending longitudinally of the main frame and journaled in a plurality of said cross rails including the one at the foot of said main frame, and a crank arm at the foot end of the bed for imparting movement to said longitudinally arranged shaft whereby the pinions may be actuated to adjust the segmental racks and with them the body section of the mattress-supporting frame.

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15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150