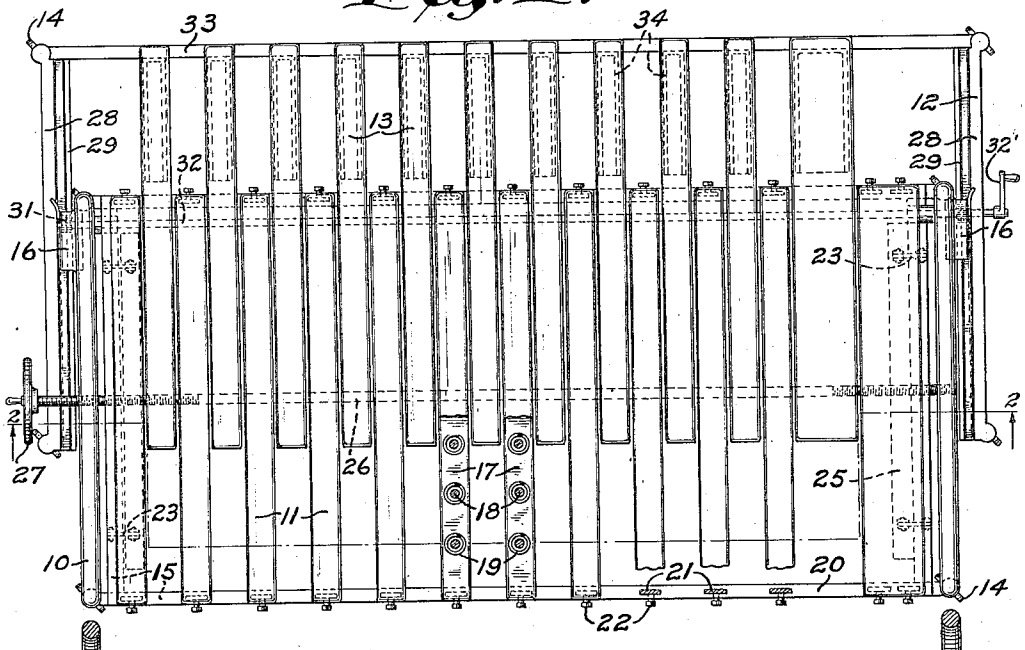
March 29, 1938. W. F. LOIBL 2,112,702

BED

Filed May 10, 1937 2 Sheets-Sheet 1

Fig. 1.



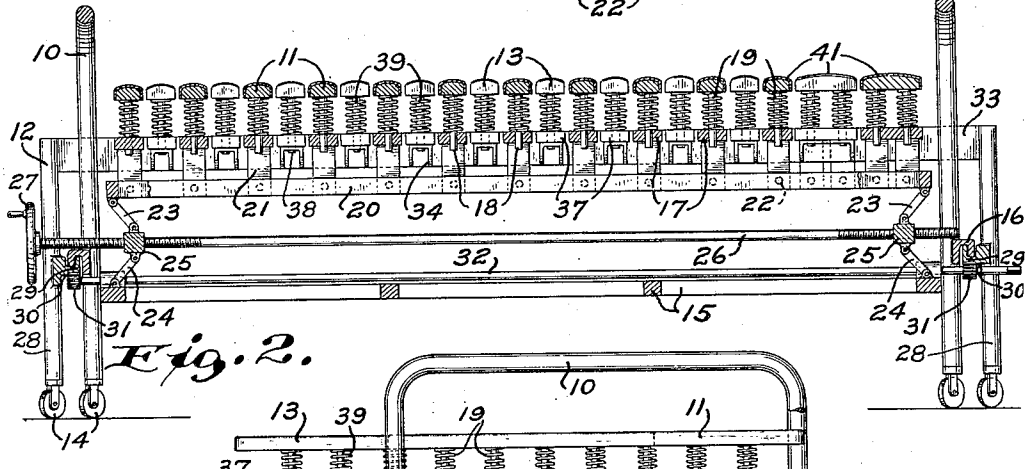


Fig. 2.

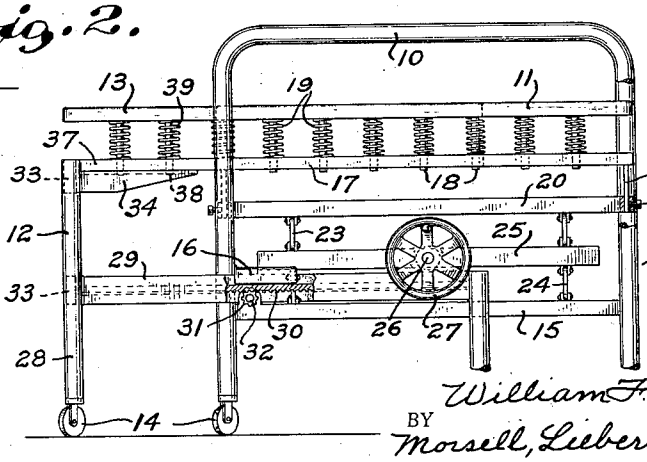


Fig. 3.

INVENTOR.
William F. Loibl
BY
Morsell, Lieber & Morsell
ATTORNEYS.

March 29, 1938. W. F. LOIBL 2,112,702

BED

Filed May 10, 1937 2 Sheets-Sheet 2

Fig. 6.

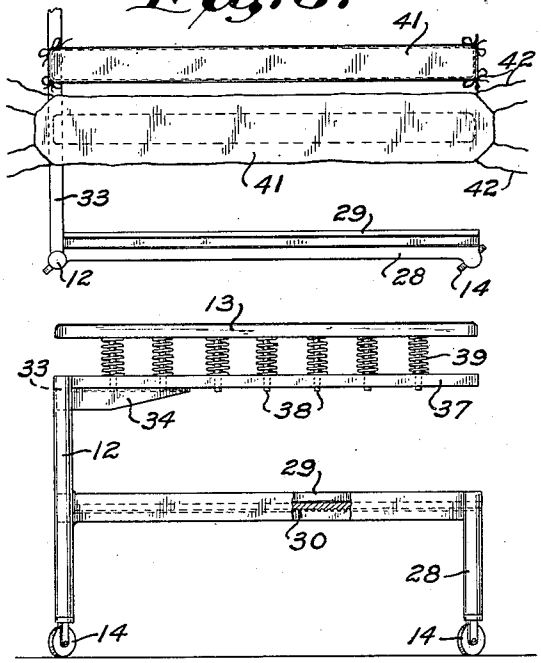


Fig. 4.

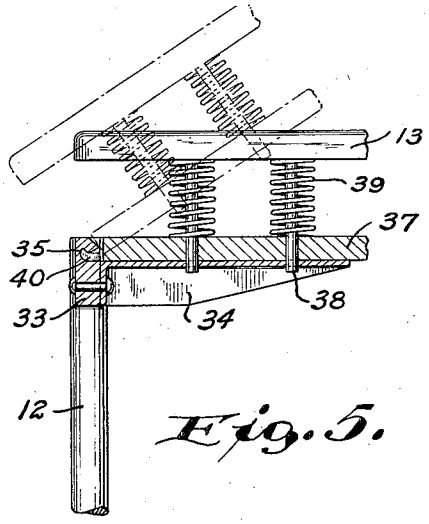


Fig. 5.

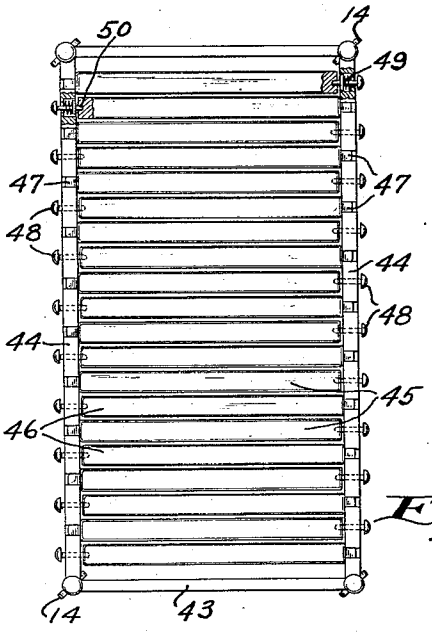


Fig. 8.

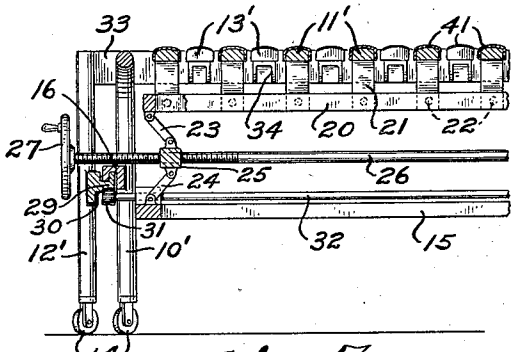


Fig. 7.

INVENTOR.
William F. Loibl
BY
Morsell, Lieber & Morsell
ATTORNEYS.

Patented Mar. 29, 1938 2,112,702

UNITED STATES PATENT OFFICE

2,112,702

BED

William F. Loibl, Cedarburg, Wis.

Application May 10, 1937, Serial No. 141,604

13 Claims. (Cl. 5—60)

My invention relates in general to improvements in the art of manufacturing supports for elongated objects such as a reclining or reposing human body, and relates more specifically to improvements in the construction and operation of beds, cots, operating tables or the like, and to means for effecting changes in bedding without disturbing a body resting upon the bed.

Generally defined, an object of my present invention is to provide an improved bed or the like which will permit changes in bedding such as sheets or linens, without disturbing or inconveniencing the individual reposing or reclining upon the bed.

It is frequently necessary and often desirable, in hospitals and sick rooms, to be able to change the bedding or operating table coverings, without disturbing or moving the patients resting upon the beds or tables. In many cases, it is also desirable to transfer a person in a reposing position from one bed or cot to another without lifting and transporting the individual bodily from one support to the other, and so far as known to me, no prior simple assemblages have been devised for permitting such changes in bedding or transfer of a body.

My present invention therefore more specifically contemplates provision of an improved bed structure or the like, which will in fact permit either convenient bedding changes or rapid transfer of a patient from one support to another, without undesirably annoying the patient.

Another specific object of my invention is the provision of a relatively simple and durable bed structure wherein the normal body supporting area may be quickly reduced so as to permit access to bed sores or convenient use of a bed pan, and which may be thoroughly ventilated and aired without removing the occupant.

A further specific object of the invention is to provide a new and useful separable section bed or table, the sections of which may be readily separated to provide two independent resting supports, or combined to form a composite support.

Still another specific object of my invention is to provide a bed composed of relatively vertically movable alternate sections which may be conveniently adjusted to change the supporting areas presented to a body reposing upon the bed, without any effort on the part of such person.

An additional specific object of my invention is to provide various improvements in the construction of adjustable beds or the like, whereby the utility of such devices is enhanced to a maximum.

These and other specific objects and advantages will be apparent from the following detailed description.

A clear conception of embodiments of the various features constituting my present invention, and of the mode of constructing and of using several types of beds and tables built in accordance with the improvement, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a somewhat diagrammatic, part sectional top view of a typical bed assemblage embodying my invention, the two bed sections having been partially separated;

Fig. 2 is a similarly diagrammatic longitudinal vertical section through the bed assemblage of Fig. 1, taken along the irregular line 2—2;

Fig. 3 is a part sectional end view of the improved bed assemblage, likewise showing the sections partially separated;

Fig. 4 is a part sectional end view of the normally removable section of the bed assembly of Figs. 1, 2, and 3;

Fig. 5 is an enlarged fragmentary sectional view of the bed section of Fig. 4, showing details of construction thereof;

Fig. 6 is a fragmentary top view of the bed assemblage showing the mode of applying fresh linens;

Fig. 7 is a fragmentary longitudinal section through an operating table assemblage embodying features of my invention; and

Fig. 8 is a part sectional top view of a cot bed embodying removable mattress sections in accordance with the invention.

While I have shown and described my invention herein, by way of illustration, as having been embodied in a specific manner to only three practical types of beds or body supports, it is not the intent to thereby unnecessarily restrict the scope since most of the novel features are more generally applicable to other types of body supports having varied details of construction.

Referring specifically to Figs. 1 to 6 inclusive, the improved hospital bed illustrated more or less diagrammatically therein, comprises in general two relatively movable and inter-cooperating bed sections one of which consists of a roller supported frame 10 having a series of parallel elongated padded body supports 11 vertically adjustably mounted thereon; and the other of which consists of a roller supported frame 12 having a similar series of body supports 13 stationarily but

detachably suspended therefrom. The two frames 10, 12 may be mounted upon casters 14 as shown, and the body supports 11, 13 are formed of such width and are so spaced that when the two bed sections are assembled, the supports 11 will fill the spaces between the supports 13 and will thus provide a substantially continuous padded supporting surface upon which a person may repose. The supporting frame 10 with its padded body supports 11 constitutes the main section of the bed, while the other supporting frame 12 with its padded body supports 13 will be designated as the auxiliary or movable bed section, but it should be understood that either of these bed sections may be moved relative to the other so as to cause relative sliding or telescoping of the padded supports 11, 12.

The frame 10 of the main bed section has parallel U-shaped end portions which are rigidly connected by lower braces 15, and the opposite ends of this frame 10 are provided with parallel horizontal guide flanges 16 as clearly shown in Figs. 1, 2, and 3. Each of the body supports 11 is resiliently mounted upon a lower bar 17 by means of a series of parallel vertical guide rods 18 and springs 19 surrounding the same, and the opposite ends of the bars 17 are detachably secured to the opposite side rails of a sub-frame 20 by means of vertical plates 21 and clamping screws 22 coacting therewith. The assemblage is such that the mattress sections each comprising a support 11, bar 17, rods 18 and springs 19, are normally fixedly mounted upon and movable with the sub-frame 20, and this entire assemblage is vertically movable relative to the lower braces 15 of the main frame 10. The opposite ends of the sub-frame 20 are connected to the adjacent opposite ends of the lower braces 15 by several sets of toggle links 23, 24, the upper ends of the upper links 23 being pivotally attached to the sub-frame 20, the lower ends of the lower links 24 being likewise pivotally attached to the braces 15, and the adjacent ends of the links 23, 24 being pivotally connected with transverse elongated blocks 25. The blocks 25 have central alined openings which are oppositely threaded for the reception of right and left hand screw threads formed on the opposite ends of a horizontal adjusting shaft 26 extending throughout the bed length and having a crank or actuating wheel 27 at one end thereof. The arrangement and formation of these elements is obviously such that when the wheel 27 is rotated in one direction, the blocks 25 will move toward each other to thereby simultaneously lower all of the padded supports 11, whereas opposite rotation of the wheel 27 will separate the blocks 25 and raise all of the supports 11.

The auxiliary or movable frame 12 is shown in detail in Figs. 4 and 5, and this frame has parallel vertical end portions 28 each of which is provided with a ridge bar 29 adapted to ride within the recess formed by the adjacent main frame flange 16 as indicated in Figs. 1 and 2. The bottom of each ridge bar 29 is provided with a toothed rack 30 which is adapted to coact with an adjacent pinion 31 when the ridge is slid longitudinally beneath the corresponding flange 16, and the pinions are rigidly attached to the opposite ends of a shaft 32 which is journaled in bearings on the braces 15 of the main frame 10. With this assemblage, parallel and simultaneous advancement of both end portions 28 of the auxiliary frame 12 relative to the opposite ends of the main frame 10 will always be assured during assembly or dismantling of the bed sections, and the end portions 28 are rigidly interconnected only at one side of the bed by means of several stiff bars 33. One end of the pinion shaft 32 may be extended outwardly beyond the frames 10, 12 and provided with a crank 32' as shown in Fig. 1, so that by turning this crank, the pinions 31 and racks 30 will cause the two bed sections to move relatively to each other. The upper of the connecting bars 33 has integral brackets 34 projecting laterally therefrom and is provided with a socket 35 adjacent each of these brackets 34 as illustrated in Fig. 5; and the padded supports 13 are again resiliently supported upon transverse bars 37 by means of parallel guide rods 38 and springs 39 to form mattress sections each of which is detachably attachable to one of the sockets 35 by means of a hook 40 secured to the end of its bar 37. When the mattress sections are thus attached to the frame bar 33, the lower bars 37 rest upon and are supported by the brackets 34 as shown in solid lines in Fig. 5, but the mattress sections may be conveniently removed from the auxiliary frame 12 by merely tilting the same as shown in dot-and-dash lines and by subsequently sliding the hooks 40 from within the sockets 35.

The padded body supports 11, 13 are thus readily removable from their normal retaining structure, and while all of these mattress sections may be made of the same width, some of them may be formed of different widths as shown at the right of Figs. 1 and 2. In some cases it may also be desirable to have some of the medial mattress sections wider or narrower, depending upon the purpose for which the bed is to be used, and the number of springs 19, 39 which are provided in each mattress section may also be varied as desired. Each padded support 11, 13 is preferably normally covered and protected by a linen or other cloth covering 41 attached thereto by means of tie-bands 42 in the manner illustrated in Fig. 6.

During normal use of the improved bed assemblage shown in Figs. 1 to 6 inclusive, the padded supports 11, 13 are properly covered with linen or other cloth coverings 41, and the two sections of the bed are normally assembled with the supports 13 located between and in substantial horizontal alinement with the supports 11 so as to present a suitable upper padded and substantially continuous surface for the support of a body. The person occupying the bed will then be received upon a resilient substantially continuous mattress and all of the supports 11, 13 would normally be in position upon their frames 10, 12. If it becomes desirable to change the coverings 41, the hand wheel 27 may be rotated to elevate the supports 11 above the intervening supports 13, thus causing the occupant of the bed to be raised away from these intervening supports 13. When this has been accomplished, the auxiliary frame 12 may be withdrawn together with the intervening supports 13 from the main frame 10 and its supports 11, and the occupant will be left lying upon the mattress supports 11 alone. When the auxiliary bed section has thus been withdrawn, the coverings 41 on the supports 13 may be replaced, whereupon the auxiliary section may again be slid into position within the main section of the bed. The hand wheel 27 may thereafter be rotated to lower the supports 11 and the patient resting thereon, until the patient assumes a position upon the recovered supports 13. The lower-

ing of the supports 11 should then be continued until they are withdrawn from contact with the body resting upon the supports 13, whereupon the auxiliary section with the occupant of the bed lying thereon, may again be withdrawn from the main section so that the coverings 41 on the supports 11 may be renewed without obstruction. When these coverings have been thus renewed, the two sections of the bed may again be brought together and the supports 11 may be elevated so as to return them to a position of alinement with the auxiliary supports 13, thereby completing the bedding renewal.

It will thus be noted that the bedding may be conveniently changed without materially inconveniencing or disturbing the occupant of the bed, and it will be apparent that while gaps are left between the successive supports 11, 13, when either set of these is removed from the other, the occupant of the bed still has at least one-half of the total supporting area to rest upon at all times. This supporting area is well distributed so that the removal of either set of supports will not materially inconvenience or annoy the occupant.

It should also be noted that the occupant of such a bed may also be conveyed from one location to another without material annoyance, either on one section alone or while resting upon both sections. It may be desirable at times to ventilate the bed by permiting the occupant to lie upon one section alone for a period of time, and the removability of supports 11, 13 will permit exposing relatively large areas for treatment of bed sores, or for use of accessories. It should be observed that any one or more of the supports 11, 13 may be conveniently removed, the supports 11 being removable by virtue of the clamping screws 22, and the supports 13 being removable by virtue of the hooks 40 coacting with the sockets 35. It should also be observed that the racks 30 coacting with the pinions 31 will insure proper alinement and sliding of the two bed sections relative to each other, so that the assembly and dismantling of the bed sections may be accomplished without inconvenience.

In the modified operating table assemblage of Fig. 7, the table is constructed in a manner quite similar to that of the bed shown in Figs. 1 to 3 inclusive. This operating assemblage comprises a main frame 10' and an auxiliary frame 12', the former having padded supports 11' associated therewith, while the latter has similar padded supports 13' supported thereby. The only difference between this operating table assemblage and the bed assemblage previously described, is that the bars 17, rods 18, and springs 19 have been omitted from the supports 11', and these have been mounted directly upon the plate 21; and the bars 37, rods 38 and springs 39 have been omitted from the supports 13' and these have been mounted directly upon the brackets 34. This assemblage therefore omits the resiliency provided by the springs 19, 39, and produces a body supporting surface which is padded but not adapted to give the same as the mattress construction will. The mode of utilizing the operating table is precisely the same as that described in connection with the bed assemblage, and the supports 11' and 13' may be removed from this modified operating table assemblage in the same manner as in the bed assemblage.

In the modified cot bed structure of Fig. 8, the main frame 43 has parallel side beams 44, and two series of alternately arranged parallel elongated mattress sections 45, 46 are removably attached to the side beams 44. Each of the mattress sections 45, 46 has an end projection 47 coacting with a recess in one of the side beams 44, and the opposite ends of each mattress section are provided with a retaining pin 48 which is spring pressed by means of a spring 49 to normally hold the same within a hole 50 in the end of the lower bar of the mattress section. By withdrawing the pin 48 of any section 45, 46, the adjacent end of this section may be lowered to a position beneath the adjacent side bar 44, and the projection 47 of that section may subsequently be withdrawn from its normal retaining recess. By alternating the mattress sections 45, 46, the manipulator of the mattress sections may remove and replace linen on alternate sections from one side of the bed and from intervening sections at the other side of the bed. Obviously, this modified cot bed assemblage will likewise permit changing of bedding without disturbing an occupant of the cot, and mattress sections may also be removed for purposes of ventilation, treatment of bed sores, and for convenient use of accessories.

From the foregoing specific description it will be apparent that my present invention provides an improved bed structure especially adapted for use by invalids and sick persons, which will permit convenient change of bedding without inconveniencing the occupant of the bed. The improved assemblage will also permit convenient treatment of bed sores, and use of accessories, and any of the mattress sections may be replaced as a unit when unfit for further use. The assemblages when completely assembled, function no different than an ordinary bed or operating table or cot, and the body supporting mattress sections may be formed of any desired number and width without departing from the present invention.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

I claim:—

1. In combination, a series of rigidly and permanently interconnected parallel body supports, another series of similar rigidly and permanently interconnected parallel body supports interposed between the supports of said first mentioned series, means for effecting simultaneous vertical displacement, and means for effecting subsequent simultaneous endwise removal of the supports of one of said series so as to cause a body originally resting upon both series to be supported by the remaining series alone.

2. In combination, two independent series of alternate rigidly and permanently interconnected parallel body supports having independent carrier frames, means for effecting simultaneous vertical displacement of one of said series relative to the other, and means for effecting separation of said frames to simultaneously remove the supports of one series from between those of the other.

3. In combination, two alternate series of body supports, means for effecting simultaneous vertical adjustment of all of the supports of one series either above or below those of the other series, and means for effecting subsequent endwise removal of the supports of the lowest series.

4. In combination, two alternate series of body supports, means for effecting simultaneous vertical adjustment of all of the supports of one series either above or below those of the other

series, and means for effecting simultaneous endwise removal of all of the supports of one series from between those of the other series.

5. In combination, a pair of independently supported telescopic frames, a series of body supports carried by each frame and being adapted for sliding of the supports of one series and complete removal thereof from between those of the other, and means for insuring parallel motion of one of said frames relative to the other during relative displacement and removal thereof.

6. In combination, a pair of independently supported telescopic frames, a series of body supports carried by each frame and being adapted for sliding of the supports of one series and complete removal thereof from between those of the other, and means for effecting simultaneous disposition of the supports of one of said series above and below those of the other series.

7. In combination, two independently supported series of rigidly and permanently interconnected body supports cooperable to form a substantially continuous reposing area, the supports of one series being normally disposed between those of the other, means for effecting simultaneous adjustment of all of the supports of a series above or below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

8. In combination, two independently supported series of rigidly and permanently interconnected body supports cooperable to form a substantially continuous reposing area, the supports of one series being normally disposed between those of the other and each of said supports having an independently replaceable covering, means for effecting simultaneous adjustment of all of the supports of a series above or below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

9. In combination, two independently supported series of rigidly and permanently interconnected body supports cooperable to form a substantially continuous reposing area, the supports of one series being normally disposed between those of the other and each of said supports being independently resiliently mounted, means for effecting simultaneous adjustment of all of the supports of a series above or below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

10. In combination, two series of body supports, the successive supports of one series being normally disposed between the successive supports of the other to provide a substantially continuous reposing area, means for effecting simultaneous adjustment of all of the supports of a series above and below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

11. In combination, two series of body supports, the successive supports of one series being normally disposed between the successive supports of the other to provide a substantially continuous reposing area and each of said supports having an independently replaceable covering, means for effecting simultaneous adjustment of all of the supports of a series above and below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

12. In combination, two series of body supports, the successive supports of one series being normally disposed between the successive supports of the other to provide a substantially continuous reposing area and each of said supports being independently resiliently mounted, means for effecting simultaneous adjustment of all of the supports of a series above and below said area, and means for effecting simultaneous removal of all of the supports of a series from between those of the other series.

13. In combination, two series of body supports, the successive supports of one series being normally disposed between the successive supports of the other to provide a substantially continuous reposing area, means for effecting simultaneous adjustment of all of the supports of a series above and below said area, means for effecting simultaneous removal of all of the supports of a series from between those of the other series, and means for insuring parallel motion of the supports of one series relative to those of the other during said removal.

WILLIAM F. LOIBL.