

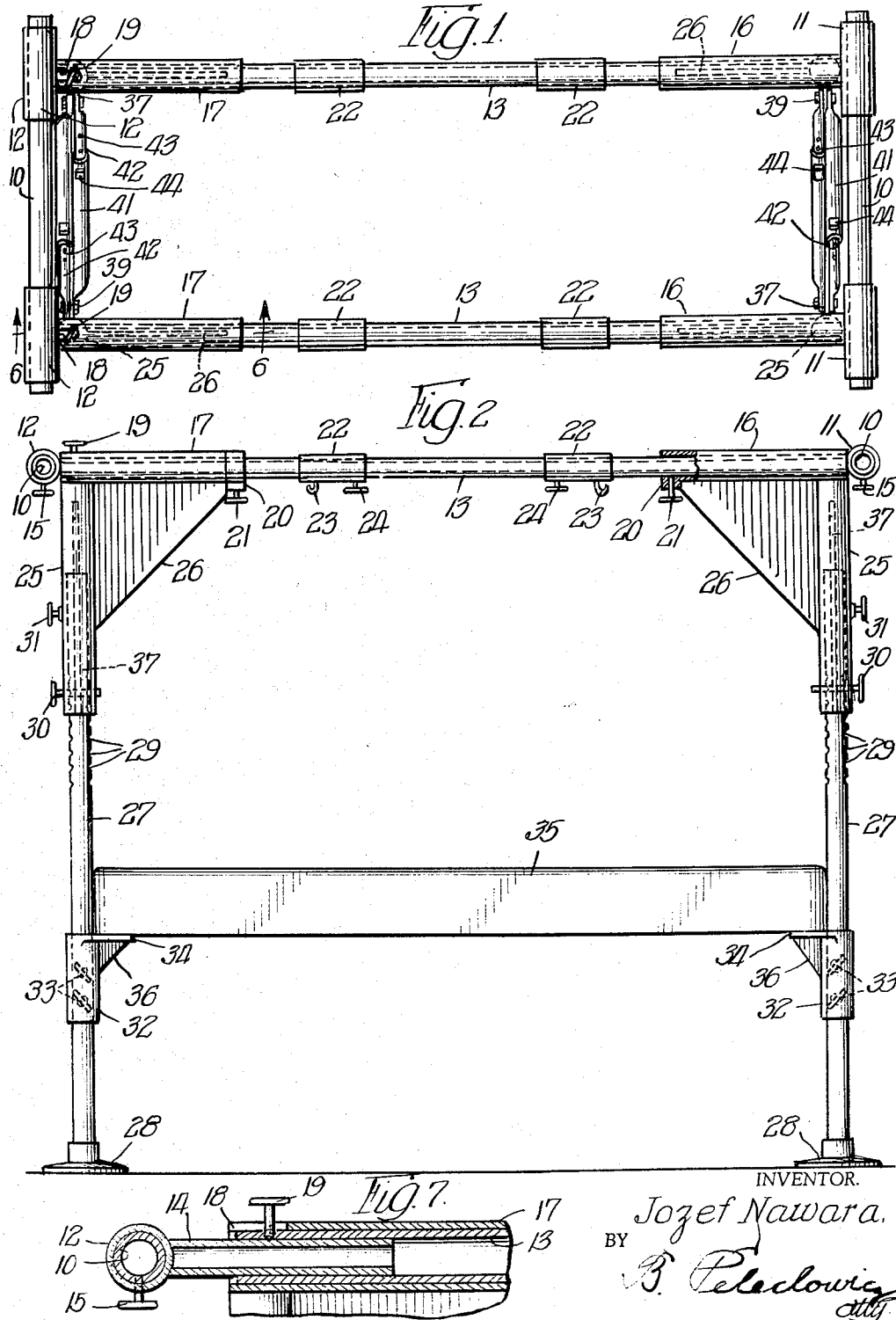
Nov. 22, 1960

J. NAWARA
EXTENSIBLE AND ADJUSTABLE FRAME AND SUPPORTS
FOR THERAPEUTIC APPARATUS

2,960,701

Filed July 21, 1958

2 Sheets-Sheet 1



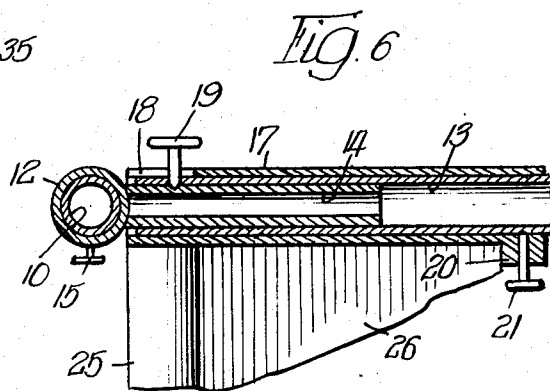
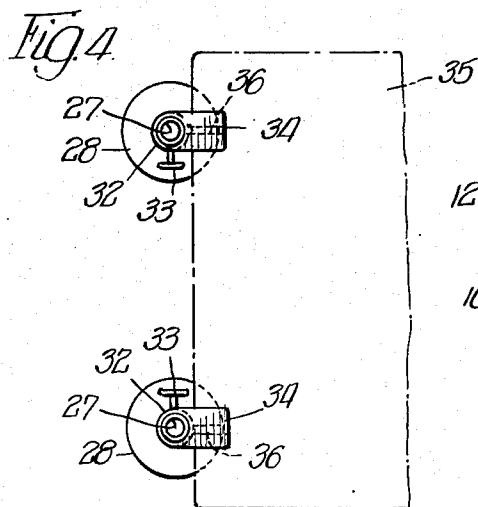
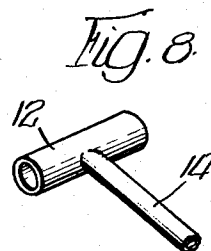
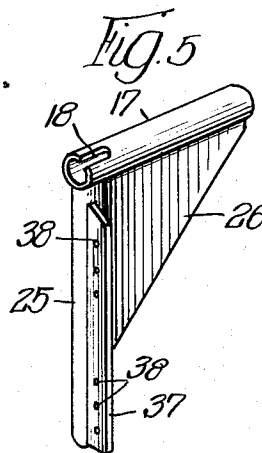
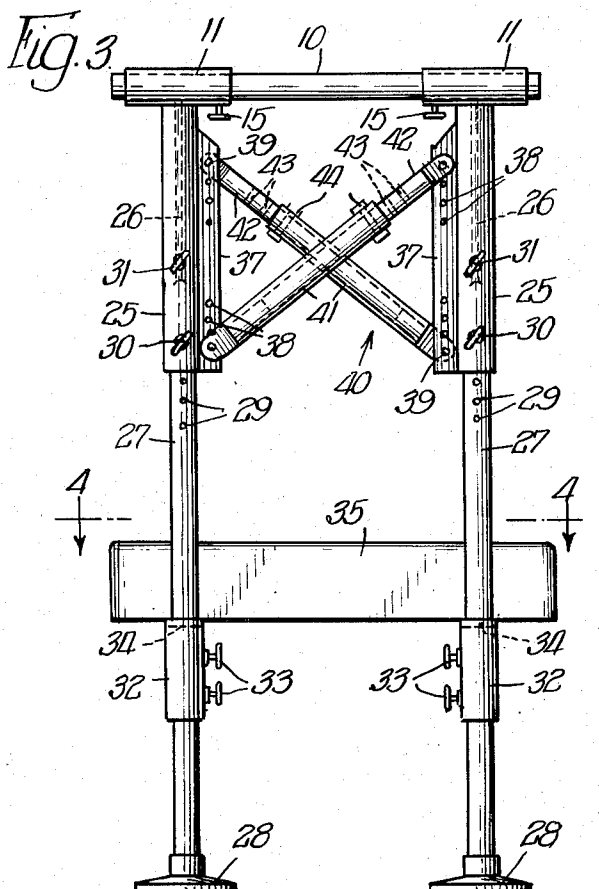
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EXTENSIBLE AND ADJUSTABLE FRAME AND SUPPORTS FOR THERAPEUTIC APPARATUS

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3 Claims. (Cl. 5—181)

The present invention relates to the extensible superstructure frames for supporting various exercising devices in therapeutic apparatus.

The invention generally relates to the superstructure frames of the type shown in the co-pending application, Serial Number 714,565, filed February 11, 1958, now Patent No. 2,921,790, and has for its main object the provision of a superstructure frame, for the purpose hereinabove indicated, which may be capable of extension and adjustment, both longitudinally and transversely, to conform to the length and the width of a platform or a bed, capable of supporting a patient during the employment of the various exercising devices supported upon said frame.

Another object of the present invention is the provision of leg members supportable upon said superstructure frame, which leg members may be capable of shifting adjustment with relation to the platform or the bed disposed below the superstructure frame, both in a longitudinal and transverse relation with the bed.

A further object of the present invention is the provision of means permitting adjustment of the leg members with relation to the superstructure frame and of further means whereby the leg members, when adjusted with relation to the bed disposed below the superstructure, may be rigidly engaged with the bed for thereby preventing relative shifting of the leg members and the bed, which otherwise would ensue due to the vibration as the exercising devices supported by and upon the superstructure frame are employed by the patient while reposing upon the bed.

A still further object of the present invention is the provision of means whereby the superstructure frame and the leg members supported thereby may be mutually adjusted and disengageably interconnected for maintaining them in an adjusted relation to the length and width of the bed disposed below the superstructure frame.

A still further object of the present invention is the provision of means for disengageably interconnecting the leg members with the superstructure frame whereby the leg members may be completely disconnected from the superstructure frame, and whereby the superstructure frame may be dismantled, thereby facilitating packing of the leg member and the superstructure frame for the purpose of transporting the same.

A further object of the present invention is the general improvement of the therapeutic devices of the character hereinabove mentioned.

With the above general objects in view and others that will appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings forming a part of this application, and in which like designating characters refer to corresponding parts throughout the several views:

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Fig. 1 is a top elevational view of the superstructure frame;

Fig. 2 is a side elevational view of the superstructure frame, partly in section, with a pair of leg members disposed therebelow, and with a bed disposed below the frame, with means carried by the leg members for engaging and supporting the bed in an adjusted relation below the superstructure frame;

Fig. 3 is the end elevational view, illustrating a pair of end leg members, with brace connecting means therebetween, with bed supported by said legs below the superstructure frame;

Fig. 4 is a cross section through a pair of end legs, taken on line 4—4 of Fig. 3, with a fragmentary elevational view of the bed supported by said leg members;

Fig. 5 is a perspective view of the upper portion of one leg member, illustrating its connection with the superstructure frame;

Fig. 6 is a cross sectional view, taken on line 6—6 of Fig. 1;

Fig. 7 is a similar view, illustrating the extensibility of the superstructure frame, and the adjustability of a leg member with relation thereto; and

Fig. 8 is a perspective view of a transverse and longitudinal frame connection.

Referring to the present drawings in detail, particularly to the mechanism whereby the superstructure frame may be longitudinally and transversely extended and adjusted, there is shown therein a pair of tubular end rails 10. Mounted upon one of said end rails 10 for shifting movement thereon is a pair of sleeves 11. Mounted upon the opposite end rail 10 for shifting movement, is a pair of sleeves 12.

Rigidly connected by its end with each of said sleeves 11, by welding or other suitable means, is a tubular side rail 13, the two of said side rails 13 extending substantially lengthwise of the frame.

Rigidly connected by its end to each of the opposite sleeves 12, by welding or otherwise is a comparatively short tubular stub 14, which in diameter substantially corresponds to the inner diameter of said side rails 13. Said tubular stubs 14 enter the opposite ends of said side rails 13, in a telescopic relation, as is seen in Figs. 6 and 7, by virtue of which arrangement said side rails 13 and said tubular stubs 14 are capable of a longitudinal mutual adjustment.

The parts already described essentially define a rectangular superstructure frame capable of extension for the purpose of adjusting the length as well as the width of the frame. As is clearly indicated in Fig. 1, when the respective pairs of sleeves 11 and 12 are shifted towards or away from each other the side rails 13 will simultaneously shift towards or away from each other, thereby adjusting the superstructure frame transversely. The end rails 10 guide the said transverse adjustment of the frame. By virtue of the telescopic arrangement of the side rails 13 with tubular stubs 14, the frame is capable of extensible adjustment in a longitudinal direction, that is lengthwise of said rails 13. Obviously, when said longitudinal adjustment of the frame takes place in either direction, the two end rails 10 with the pairs of sleeves 11 and 12 are capable of shifting either towards or away from each other, depending upon the direction of the mutual shifting movement of said rails 13 and tubular stubs 14.

Threadedly engaging each of said sleeves 11 and 12, at the lowermost point of the periphery of each, and adjustment the inner end of each, is screw 15, which is passed through each of said sleeves 11 and 12 and bears against said end rails 10 for rigidly interconnecting said sleeves 11 and 12 with their respective end rails 10; and thereby for maintaining rigid interconnection of said sleeves 11 and 12 with said rails 10, and thereby for

maintaining in a rigid adjusted relation said side rails 13 on a transverse plane of the frame.

Mounted upon said rails 13, for sliding movement thereon, adjacent said sleeves 11, is a pair of horizontal, tubular leg supporting members 16, while at the opposite ends of said rails 13 a pair of similar horizontal, tubular leg supporting members 17 are mounted. Said horizontal, tubular leg supporting members 16 and 17 are freely slidable upon said rails 13 for the purpose of shifting two pairs of end legs towards each other, as will be later apparent.

Each of said horizontal, tubular leg supporting members 17, adjacent its outer end, and at the upper portion of its periphery, is provided with a longitudinal slot 18, for accommodating therewithin the stem of screw 19. Said screw 19 is threadedly engaged with, and passed through the adjacent end of each of said rails 13, and is capable of engaging and bearing against each of said tubular stubs 14 for interengaging said rails 13 and said tubular stubs 14 and for maintaining the two in their rigid adjusted relation.

From the hereinabove description it will be apparent that rails 13, by their adjacent free ends may be brought as near to said sleeves 12, or as far away therefrom, as the tubular stub members 14 will permit. The shifting of said rails 13 toward said sleeves 12, or shifting of the former away from the latter, will shift the pair of end leg members supported by said horizontal, tubular leg members 16 toward or away from said sleeves 12, and consequently, toward or away from the pair of end legs supported by said horizontal, tubular leg members 17. In brief, by virtue of the telescopic arrangement between said rails 13 and tubular stubs 14, the interengagement therebetween through screws 19, and the shiftability of said horizontal, tubular leg supporting members 16 and 17 upon said side rails 13, the two end pairs of leg members are capable of mutual adjustment toward or away from each other, to conform to the distance of the two pairs of leg members as required by the length of the bed disposed below the said superstructure frame.

Made upon the lowermost peripheral point of each of said horizontal, tubular leg supporting members 16 and 17, and adjacent the inner end of each, is an enlargement 20 for the purpose of supporting thereby and passing therethrough of screw 21, capable of bearing against the side rail 13 for thereby rigidly interconnecting said horizontal, tubular leg supporting members 16 and 17 and maintaining them in their longitudinally adjusted relation with said side rails 13.

Mounted upon each of said side rails 13, intermediately of said horizontal, tubular leg supporting members 16 and 17, is a plurality of sleeves 22, each provided with a downwardly depending hook 23, for supporting various therapeutic exercising devices, described in greater detail in my said co-pending application. A downwardly depending screw 24 passed through each of said sleeves 22 constitutes a rigid interconnecting means between each of said sleeves 22 and side rail 13, whereby the former may be maintained in its rigid adjusted relation with said rail 13.

Rigidly formed with the outer end of each of said horizontal, tubular leg supporting members 16 and 17, and downwardly depending therefrom in a perpendicular relation is tubular leg member 25. Rigidly connecting each of said horizontal, tubular leg supporting members 16 and 17, with its cooperating tubular leg member 25 is a triangular brace plate 26, which acts as a strengthening connection between said horizontal, tubular leg supporting members 16 and 17 and their cooperating tubular leg members 25. In a pair of the opposed leg supporting members 16—17 and 25, on each side of the superstructure frame, a pair of said brace plates 26 is on the same plane, as is seen in Fig. 2. Enlargements 20 remain free and unobstructed by said brace plates 26.

The lower end of each of said tubular leg members 25 is open for reception therethrough, in a telescopic relation, of an extensible lower leg member 27, which has mounted upon its lower end foot 28, for supporting the leg members and the superstructure frame upon the floor.

Made in each of said lower leg members 27, adjacent its upper end, is a plurality of diametric apertures 29, for accommodating within one of which, pin 30, extended through the lower end of each of said tubular leg members 25 in a transverse relation, for thereby interconnecting said lower leg members 27 with said tubular leg member 25, when the former are shifted within the latter, for maintaining the superstructure frame in its shifted relation to or away from the bed.

In order to prevent vibration and rattling between said lower leg member 27 and tubular leg member 25, screw 31 is passed through each of said tubular leg members 25, to engage and bear against each of said lower leg members 27 at the uppermost point thereof and above said pin 30.

Mounted for upright shifting movement upon each of said lower leg members 27 is sleeve 32, through which a pair of screws 33 is passed, in a longitudinal relation, for engaging each lower leg member 27 for disengageably interconnecting sleeve 32 with the lower leg member 27 for maintaining said sleeve 32 in its adjusted relation with the lower leg member 27. Preferably, in a pair of the end leg members the two sets of screws 33 are directed towards the plane extended through the longitudinal center of the said superstructure frame, as is seen in Figs. 3 and 4.

Rigidly formed with the upper end with each of said sleeves 32, and extended in a horizontal direction therefrom is rest plate 34 for supporting thereon bed 35. Each pair of said rest plates 34 in the pair of the end leg members is directed toward the plane extended through the transverse center of bed 35 and of the superstructure frame, so that each pair of rest plates 34 in the pair of end supporting legs, supports one end of bed 35, as is seen in Figs. 2 and 4.

To strengthen the structure, brace plate 36 rigidly interconnects each rest plate 34 with its cooperating sleeve 32. With relation to a pair of the opposed supporting leg members 27, on each side of the superstructure frame, the corresponding pair of said brace plates 36 is on the same plane, as is seen in Fig. 2.

As is seen in Figs. 2 and 3, a pair of said rests 34, at the end pair of the leg members, supports each end of bed 35, and bed 35 may be brought nearer to the superstructure, or shifted farther away from it, as may be required for the convenience of any given patient while reposing on bed 35, for reaching and employing various exercising devices which may be supported upon and suspended from hooks 23 carried by said sleeves 22. By means of screws 33 sleeves 32 may be rigidly affixed to the lower leg members 27 at any desired level for supporting bed 35 in its adjusted relation with the said superstructure frame.

As is apparent from the hereinabove description the end pairs of the said leg members, including the tubular leg members 25 and the lower leg members 27, are made shiftable towards or away from each other, in a longitudinal relation with side rails 13, in conformity with the length of the bed, the shifting movement thereof being guided upon said side rails 13 by the said horizontal, tubular leg supporting members 16 and 17. When said leg members have been shifted to any required position in conformity with the length of the bed, they are thereupon locked in their shifted position to said side rails 13 by means of screws 21.

The opposed pair of side leg members may be adjusted to conform with the width of the bed by shifting the respective sleeves 11 and 12 upon the end rails 10, towards or away from each other. Screws 15 engaging

said end rails 10, lock said sleeves 11 and 12 with said end rails 10 for maintaining the side pairs of the leg members in their adjusted shifted position in a transverse direction with relation to bed 35.

When the lower leg members 27 are made to contact the ends of bed 35, when the bed is supported upon said rest plates 34, the interconnection between the leg members and the bed will become quite firm, preventing shifting of the bed when the same remain in its operative position below the superstructure frame.

Means are provided for maintaining the opposed pairs of side leg members in a mutually interconnected relation, in addition to the interconnection of sleeves 11 and 12 with end rails 10 through the medium of screws 15. These additional means include oblong strips 37, laterally extending from, and rigidly formed with, each of said tubular leg members 25. A pair of said strips 37 in a pair of the end leg members is in the same plane in a transverse relation with the superstructure frame or with bed 35, as is seen in Figs. 1 and 3. Adjacent its ends each of said strips 37 is provided with a plurality of apertures 38, through which bolt and nut fastener 39 is passed for connecting, in an adjusted relation, a pair of crossed braces, generally indicated by 40 in Fig. 3. Each end of braces 40 includes tubular section 41 and an extensible bar section 42, telescopically receivable within and longitudinally extensible from, said tubular section 41. The inner end of tubular section 41 is provided with a diametrical aperture, while said bar section 42 is provided with a series of openings 43. One of said openings 43 is adapted to come in register with the aperture made in said tubular section 41 for reception therethrough of a bolt and nut fastener 44, whereby said sections 41 and 42 may be maintained rigid in their adjusted relation.

The outer ends of sections 41 and 42 are flattened in such a manner that when the flattened ends of one brace 40 are contacted with one of the faces of a pair of the opposed end strips 37 and the flattened ends of the other brace 40 are contacted with the opposite faces of the same strips 37, the adjacent body portions of a pair of co-acting braces 40 would not remain on the same plane, in order that the co-acting pair of said braces 40 may not mutually interfere in their shifting movement as the pair of the end leg members are shifted towards or away from each other, as is clearly seen in Fig. 1. The flattened ends of said braces 40 are connected to the pair of the opposed end strips 37 by means of said bolt and nut fasteners 39.

By virtue of the telescopic arrangement of sections 41 and 42 of said braces 40, the latter are capable of extensible adjustment for permitting shifting of the pair of the end leg members toward or away from each other, depending upon the width of bed 35.

Apertures 38 made at each end of each strip 37 permit further adjustment of braces 40 by selectively connecting the flattened ends of a pair of braces 40 adjacent said strip 37 at the innermost or outermost apertures 38.

It is further observed that when the end pairs of leg members are shifted in contact with the ends of bed 35 or its frame, the two end pairs of said leg members will act as a clamp for maintaining the bed disposed therebetween in a quite rigid relation with the leg members preventing any shifting upon or displacement of the bed from said rest plates 34.

To dismantle the leg members from the superstructure frame, and to disassemble several parts of the superstructure frame all that is required to be done is to disconnect the several braces 40 from strips 37, and loosen the several screws 15, 19 and 21. This will permit removal of the horizontal, leg supporting members 17 from the side rails 13. Thereupon the horizontal, leg supporting members 16 are removed from said side rails 13. Thereupon end rails 10 are withdrawn from sleeves

11 and 12. The parts thus disassembled may be easily stored or packed without taking too much space.

It is to be understood that braces 40 are not essential parts of the invention under all conditions. These may be of use depending upon the weight of the patient when reposing on bed 35 and upon the force with which exercising devices suspended upon hooks 23 are actuated.

Although the frame in a rectangular form, including a pair of end rails 10 and a pair of side rails 13, as shown in the drawings is preferable in that they add to the sturdiness of the device and therefore eliminate wobbliness and shaking of the parts due to vibration, it is nevertheless to be understood that a frame of a simplified or modified construction may be employed.

Such a simplified or modified frame construction may consist of a frame which would include a pair of opposed stops, equivalent of a pair of opposed sleeves such as 11 or 12, to act as means for limiting the outward shifting movement of a single pair of the horizontal tubular leg supporting members such as 16 or 17. To stop 11 one tubular section of rail such as 13 would be affixed, while to the opposite stop 12 tubular stop member such as 14 would be affixed, said parts 13 and 14 to be telescopically interconnected, in a manner as shown in Figs. 6 and 7. In such a modified frame construction only one pair of the horizontal tubular leg supporting members such as 16 or 17 would be employed, with only a pair of legs, made up by sections 25, and 27, would downwardly depend. To prevent wobbliness of the frame as the exercising devices supported upon a single rail 13 are employed, feet 28 could be made wider, or in the alternative the lower ends of each lower leg section 27 could be made to terminate in a pair of bifurcated arms which by their free ends would rest upon the floor. The bed engaging and supporting sleeve 32 and rest plate 34 could be disposed above the bifurcated lower arms of each leg section 27, or if preferred, said bed engaging and supporting parts could be mounted upon each of the four bifurcated leg arms, a pair of which to be provided at the lower end of each leg sections 27.

A frame of a simplified or modified form hereinabove suggested, need not be further illustrated in the drawings, because the showing in Fig. 2 may be deemed as illustrating, for all practical or essential purposes, the frame of the suggested simplification or modification.

While there are described herein preferred embodiments of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What I claim as new is:

1. In a therapeutic device including a bed, a dismountable frame structure capable of adjustment to the varying lengths and widths of a bed, comprising a pair of end rails, a pair of sleeves mounted upon each of said end rails for a shifting movement to or away from each other, a pair of tubular side rails rigidly affixed by one of their ends to a pair of sleeves in a perpendicular relation therewith, a pair of tubular stubs rigidly affixed by one of their ends to the remaining pair of said sleeves in a perpendicular relation therewith, the free ends of said tubular stubs being receivable within the free ends of said side rails in a telescopic relation for a longitudinal shifting movement in either direction for thereby selectively shifting said end rails to or away from each other, said end rails, tubular side rails and tubular stubs defining a substantially rectangular frame capable of assuming a superimposed relation with the bed disposed therebelow, said side rails and their cooperating tubular stubs defining a pair of side bars in said rectangular frame, in the operative position of said rectangular frame with relation to the bed said end rails being in a transverse relation therewith and said side bars being in a

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longitudinal relation therewith, a pair of horizontal tubular members mounted upon each of said side bars for a shifting movement to or away from each other in a longitudinal relation with each of said side bars, a pair of said horizontal tubular members mounted upon the two of said side bars being proximate to one of said end rails and the remaining pair of said horizontal tubular members being proximate to the other of said end rails, a vertical tubular member depending in a downward relation from each of said horizontal tubular members, a supporting leg receivable within each of said vertical tubular members, as each of said horizontal tubular members which is proximate to each of said end rails is shifted towards each other the pairs of said supporting legs depending from the corresponding pairs of said vertical tubular members being adapted for shifting movement towards each other for bringing the opposed pairs of said supporting legs in an intimate clamping contact with the opposed end edges of the bed, means for rigidly interconnecting the respective pairs of said sleeves upon each of said end rails for maintaining said side bars in an adjusted transverse relation with the bed, means for rigidly interconnecting said tubular stubs with their respective tubular side rails for maintaining said end rails in a mutually adjusted relation longitudinally with respect to the bed, means for rigidly interconnecting said horizontal tubular members with said side bars for maintaining the opposed pairs of said supporting legs in a clamping relation with the bed, and vertically adjustable means carried by each of said supporting legs for supporting the bed in an adjusted spaced relation with said rectangular frame, said last named means becoming operable upon bringing the opposed pairs of said supporting legs in a clamping relation with the opposed end edges of the bed.

2. The structure defined in claim 1, wherein the said vertically adjustable means including sleeves adjustably shiftable upon said vertical supporting legs to or away from said rectangular frame, and horizontal rest plates integrally formed with and laterally extending from said sleeves for engaging the underface of the bed.

3. In a therapeutic device including a bed, a dismountable frame structure capable of adjustment to the varying lengths and widths of a bed, comprising a pair of

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end rails, a pair of sleeves mounted upon each of said end rails for a shifting movement to or away from each other, a pair of tubular side rails rigidly affixed by one of their ends to a pair of said sleeves in a perpendicular relation therewith, a pair of tubular stubs rigidly affixed by one of their ends to the remaining pair of said sleeves in a perpendicular relation therewith, the free ends of said tubular stubs and the free ends of said side rails being telescopically interconnected for permitting longitudinal shifting movement of said tubular stubs and said side rails in either direction for thereby permitting selective shifting of said end rails to or away from each other, said end rails, tubular side rails and tubular stubs defining a substantially rectangular frame capable of assuming a superimposed relation with the bed disposed therebelow, said side rails and their cooperating tubular stubs defining a pair of side bars in said rectangular frame, in the operative position of said rectangular frame with relation to the bed said end rails being in a transverse relation therewith and said side bars being in a longitudinal relation therewith, a pair of legs downwardly depending from the ends of said side bars which are in a proximate relation with one of said end rails, a pair of legs downwardly depending from the ends of said side bars which are in a proximate relation with the other of said end rails, means associated with said side bars for shifting the opposed pairs of said legs to or away from each other, and bed supporting means carried by said legs.

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