No. 881,071. PATENTED MAR. 3, 1908.

E. S. HALL.

BED.

APPLICATION FILED NOV. 10, 1906.

3 SHEETS—SHEET 1.

FIG. 1.

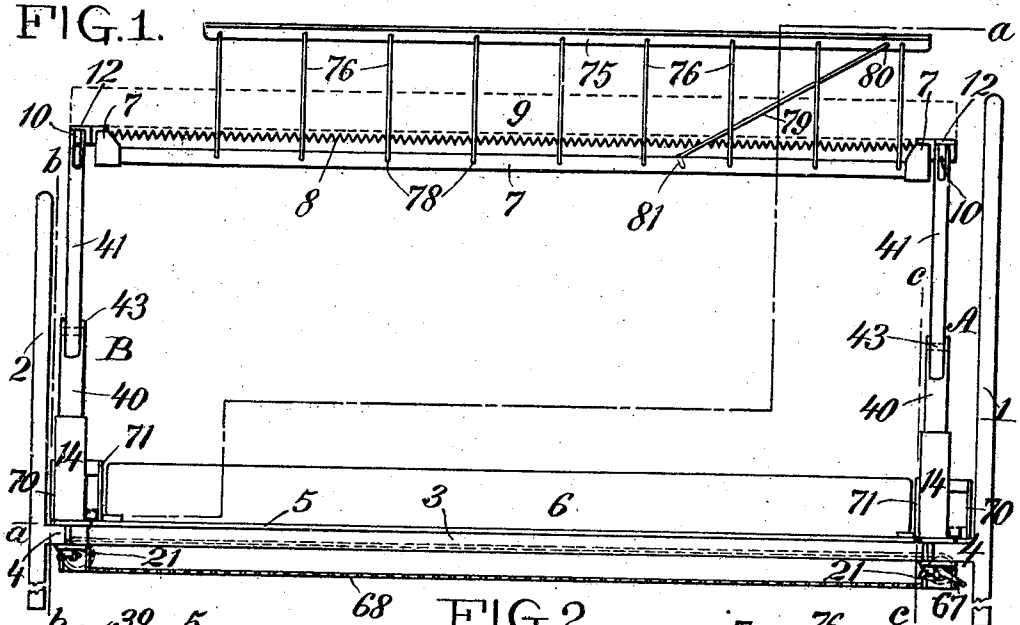


FIG. 2.

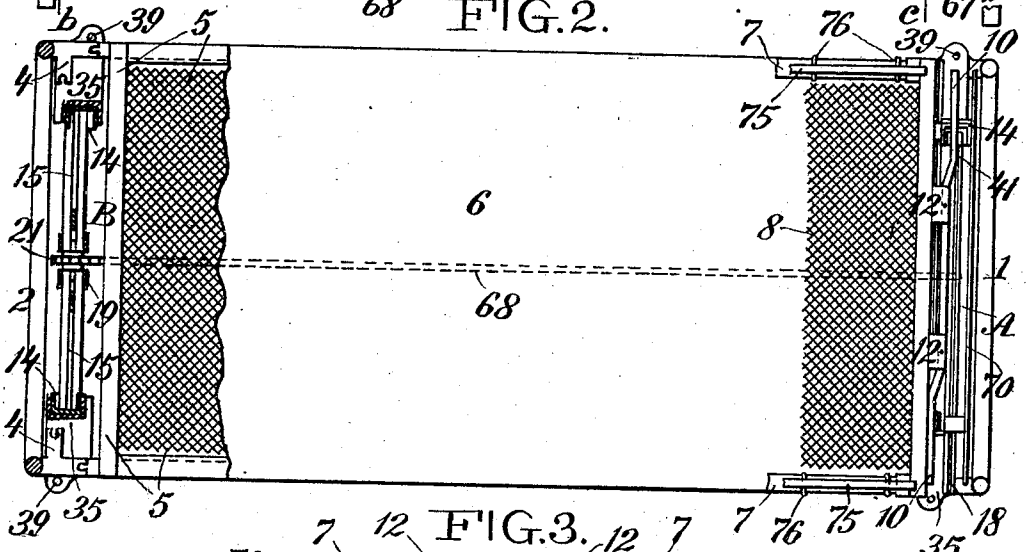


FIG. 3.

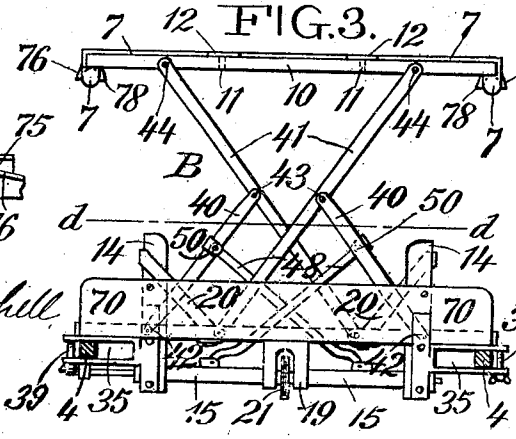


FIG. 4.

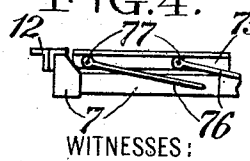
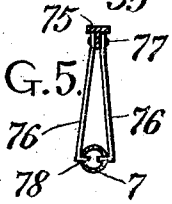


FIG. 5.



WITNESSES:

Donny Twitchell

Stuyvesant Hall

INVENTOR

Edward S. Hall,

BY Alvin K. Goodwin.

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

FIG. 6.

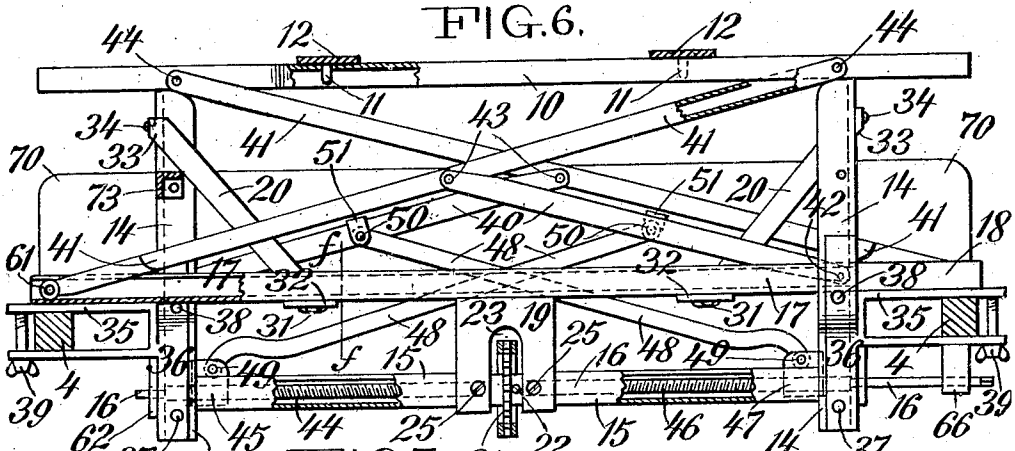


FIG. 7.

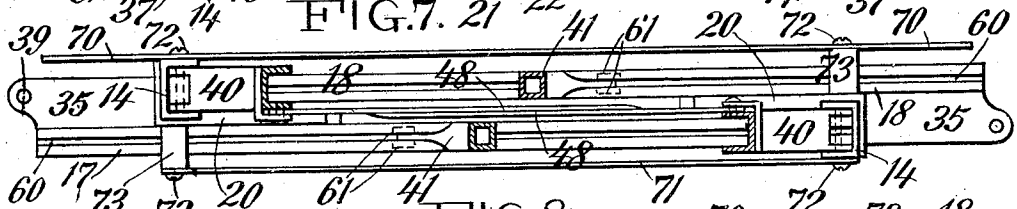


FIG. 8.

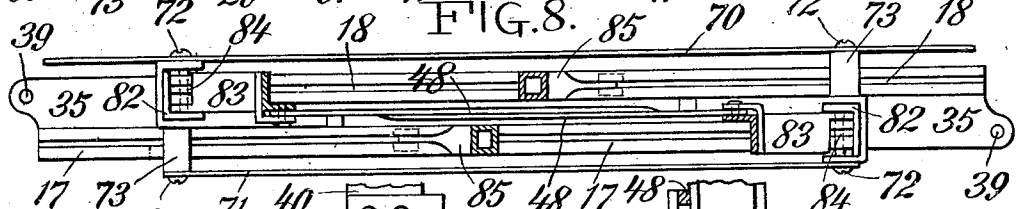


FIG. 9.

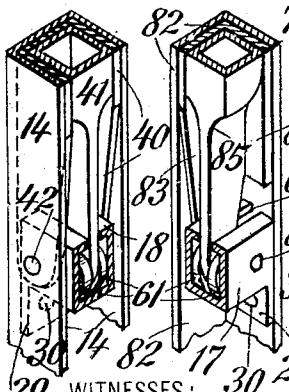


FIG. 10.

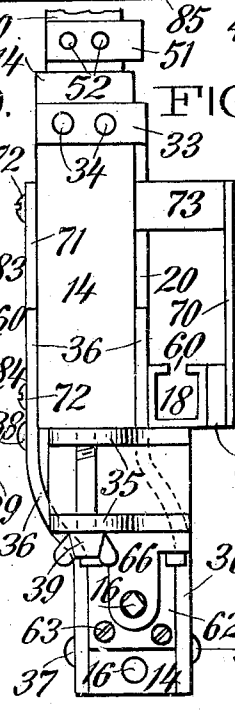


FIG. 11.

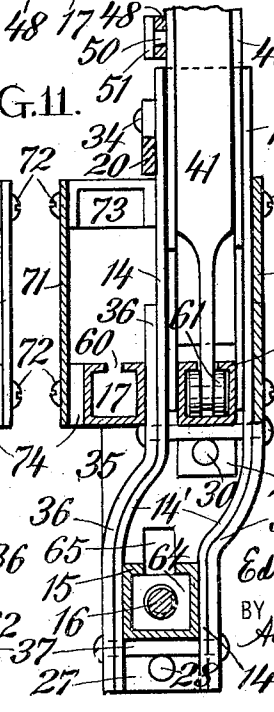


FIG. 12.

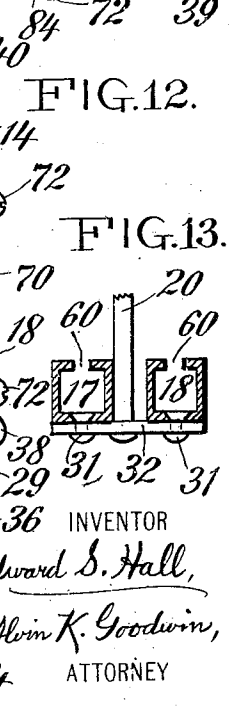


FIG. 13.

WITNESSES:

Donn Twitchell

Mildred Hall

INVENTOR

Edward S. Hall,

BY Alvin K. Goodwin,

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

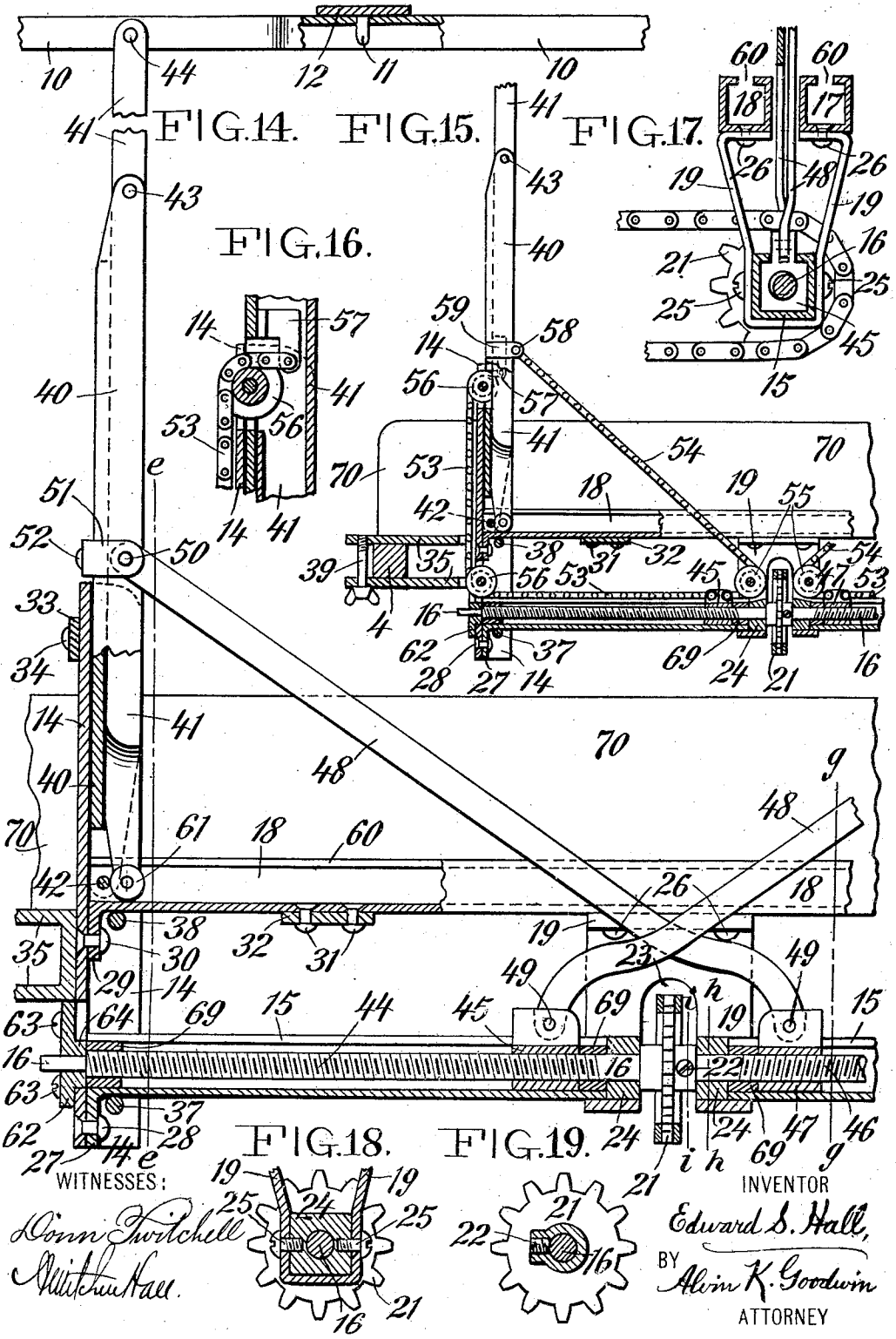
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3 SHEETS—SHEET 3.



WITNESSES:

Conn Switchell

Alvin K. Goodwin

INVENTOR

Edward S. Hall,

BY Alvin K. Goodwin

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

EDWARD SPENCER HALL, OF WATER WITCH, NEW JERSEY.

BED.

No. 881,071. Specification of Letters Patent. Patented March 3, 1908.

Application filed November 10, 1906. Serial No. 342,800.

To all whom it may concern:

Be it known that I, EDWARD SPENCER HALL, a citizen of the United States of America, residing at Water Witch, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Beds, of which the following is a specification.

This invention relates to expansible beds, and more particularly an upper auxiliary bed adapted to form with a main lower bed which sustains it a duplex bed always ready for use by one or more persons sleeping on the lowered auxiliary bed, or adapted by raising said auxiliary bed, to form two separate beds for use by one or more persons sleeping in each bed under the best sanitary conditions.

This invention provides a structure having the size and general appearance of an ordinary single or double bed which may be easily and quickly transformed into two separate beds of substantially like area and useful permanently in family or hospital service, or for comfortable and satisfactory accommodation of unexpected visitors, while the whole duplex bed structure at no time occupies more than the floor space of one bed, thus permitting its convenient use as one bed or as two separate beds in a comparatively small room.

The invention will first be described and then will be particularly defined in claims hereinafter set forth.

Reference is made to the accompanying drawings forming part of this specification, and in which

Figure 1 is a side view of an ordinary single bedstead with parts broken away and with the improved supports sustaining a raised auxiliary bed. Fig. 2 is a plan view thereof with parts broken away and parts in section on the irregular line *a*—*a* in Fig. 1. Fig. 3 is an outside end view of the applied foot mechanism shown partly lowered and with parts of the main bed frame in vertical section on the line *b*—*b* in Fig. 1. Fig. 4 is a detail side view showing one end portion of one of the auxiliary bed side guards folded down as when out of use. Fig. 5 is a transverse detail vertical sectional view showing said guard raised as when in use. Fig. 6 is an enlarged partly broken and sectonal inside end view of the fully collapsed head mechanism of the auxiliary bed supports as applied to the main bed frame which is in vertical section on the line *c*—*c* in Fig. 1. Fig. 7 is a plan view of the mechanism shown in Fig. 6, but drawn as when the upper bed is almost fully raised and with parts in horizontal section on the line *d*—*d* in Fig. 3. Fig. 8 is a sectional plan view of a modification having the two folding and collapsing posts formed mainly of angle-iron. Fig. 9 is an enlarged detail perspective view illustrating the nesting of lower parts of the preferred sectional posts shown in Figs. 6 and 7. Fig. 10 is a detail perspective view of lower parts of one of the modified posts shown in Fig. 8. Fig. 11 is an outside enlarged view of lower parts of the right hand post of the mechanism shown in Figs. 6 and 7, but with the post erected. Fig. 12 is a detail vertical sectional view taken on the line *e*—*e* in Fig. 14, showing the inner face of the opposing left hand post when fully erected. Fig. 13 is a detail cross-sectional view taken on the line *f*—*f* in Fig. 6. Fig. 14 is an enlarged vertical sectional view of the left hand post and adjacent portions of the preferred operating mechanism with parts broken away. Fig. 15 is a reduced scale view illustrating chain connections operating the pivoted post parts from the screw. Fig. 16 is an enlarged detail vertical sectional view showing the interior chain connection to a pivoted post part. Fig. 17 is a detail vertical sectional view taken on the line *g*—*g* in Fig. 14. Fig. 18 is a detail vertical cross-section taken on the line *h*—*h* in Fig. 14; and Fig. 19 is a detail cross-section on the line *i*—*i* in Fig. 14.

In the preferred development of this invention the auxiliary bed supports are made in two opposed and correlated mechanical units or mechanisms herein shown and described as head and foot mechanisms because they are specially adapted for attachment respectively to the head and foot of an ordinary main lower bed frame.

Referring first more particularly to Figs. 1, 2 and 3 of the drawings, the numerals 1, 2, 3 respectively indicate the head and foot and side rail parts of an ordinary metal bed frame. To said side rails 3, or to the connected corner blocks 4, are attached the frame portions of the improved head and foot mechanisms generally marked A and B in these smaller scale views. In adjusting the head and foot mechanisms to the main bed frame the cross-bar usually fitted to the opposite corner blocks 4, 4, is removed, as shown at the left hand end of Fig. 2. The main bed frame sustains a lower framed woven wire

support 5 for its mattress 6. Folding parts of the head and foot mechanisms A, B, may be directly pivoted to end cross-bars of a frame 7 sustaining the upper woven wire support 8 for the auxiliary bed mattress 9, which is indicated only by dotted lines in Fig. 1 of the drawings. It is preferred to pivotally connect the tops of two pivoted folding parts of each mechanism A and B, by a cross-bar 10 having holes receiving dowel pins 11 fixed to brackets 12 fastened to the opposite end cross-bars of the mattress frame 7, whereby said parts 7, 8, 9 are directly sustained by the head and foot cross-bars 10, 10 of both mechanisms. The head and foot mechanisms A and B are substantially alike and one of them will be described in detail as follows.

In the preferred construction of each mechanism its lower non-folding or substantially rigid portions constitute a metal frame comprising lower fixed parts 14, 14, of the two opposed sectional auxiliary bed supporting posts, a preferably hollow bottom cross-bar which is shown made in two alined parts 15, 15 and houses and protects the post operating screw 16, two similar and preferably hollow lateral bars 17, 18 forming guides on which move pivoted parts of the two posts, a central yoke 19 rigidly connecting the parts 15, 15, 17, 18, and angularly disposed braces 20, 20 connecting upper ends of the two post parts 14, 14 with the guides 17, 18. The lower frame bar is made in two parts 15, 15 in order to accommodate a chain wheel or pulley 21 which is slipped upon the screw 16 and is rigidly held thereto by a set-screw 22 to assure rotation of the wheel 21 when the screw 16 is turned and permitting independent rotation of either the screw or the wheel when the set-screw is loosened or removed, and for purposes hereinafter explained. The yoke 19 is cut away at its lower part at 23, to accommodate the wheel 21, and in the two lower strap-like portions of the yoke are placed bearings 24, 24 for the screw 16, and fastening screws 25 are passed through the yoke into the bearings. Said yoke 19 is cut away centrally at its top to form a lateral opening corresponding in width with a space provided between the two guide bars 17, 18, to accommodate the rods or chains which extend upward from two nuts on the screw to pivoted parts of the two posts for operating them as hereinafter more fully described. Rivets or screws 26 fasten the two separated top portions of the yoke 19 to the respective guide bars 17, 18.

The post parts 14, 14, are preferably made of three-sided or channel-iron placed with their open inner sides facing each other, and the outer ends of the two tubular screw-housing frame portions 15, 15 are placed within the post parts 14, 14 and have downbent flanges 27 which are fastened by rivets or screws 28 to the outer walls of said post parts 14. The space between the two guide bars 17, 18 is directly over the center of the screw 16, and to accommodate this relative arrangement the lower end of each post part 14 is offset at 14′, as shown in Figs. 11 and 12 of the drawings.

One end of the guide bar 17 is inserted within the right-hand post part 14 above its offset 14′, and has a downbent end flange 29 which is fastened by rivets or screws 30 to the outer wall of said part 14, and the other end of this guide bar 17 is rigidly fastened by rivets or screws 31 to the underlying horizontal flange 32 of the adjacent brace 20, the upper end of which has a bent flange 33 which is fastened by rivets or screws 34 to the outer wall of the upper part of said rigid post part 14. In substantially like manner one end of the other lateral guide bar and brace 18 is inserted within the left-hand channel-iron post part 14 and is fixed thereto by its flange 29 and rivets 30, and the other end of said bar 18 is held indirectly to the right-hand post part 14 by the corresponding angle brace 20 having a bottom flange 32 riveted at 31 to the bar 19 and having a top flange 33 riveted at 34 to said right-hand post part 14. The lower screw-housing bar 15—15, thus is rigidly stayed to both lateral guide bars 17, 18 by the yoke 19, and one end of each bar 17, 18 is directly fastened to one of the two opposed post parts 14, while its other end is indirectly fastened to the opposing post part 14 by means of the angular brace 20, and the foot flanges 32 of both the braces 20 underlie and are fastened by rivets 31 to both of the guide bars 17, 18, as shown in Fig. 13 of the drawings. All the parts 14, 14, 15, 15, 17, 18, 19, 20, 20, thus together constitute a strong frame well adapted to sustain one end of the auxiliary bed from upper pivoted parts of the two opposed posts in manner presently explained.

The skilled mechanic will see that the frame for a head or foot mechanism made substantially as above described may be permanently built in or on a main lower bed frame, but it is a special feature of this invention to provide each head and foot mechanism made as an independent structure with means whereby it may be quickly and easily attached by any intelligent housekeeper to metal bedsteads already in use for converting any ordinary single or double bed into two beds of like area. The attaching means may have any approved construction, but consists preferably of two forked brackets 35 having opposed flanges 36, 36 which overlap front and rear faces of the post parts 14, and are rigidly fastened thereto by lower and upper rivets 37, 38, which are respectively passed through directly underneath the frame parts 15, 17, 18 to give them increased power of resistance to vertical strains or pressure arising from lifting the upper auxiliary bed by oper-

ation of the screw 16 and its connections to pivoted parts of the two posts of each mechanism. Each bracket 35 preferably has considerable lateral length to admit between its upper and lower limbs the corner blocks 4 of main lower bed frames varying somewhat in width. The forked brackets 35 may have any devices adapted to hold or clamp them to the lower main bed frame, such as the screws 39 shown in the drawings.

The sectional posts of the head and foot mechanisms may each have one or more pivoted folding parts adapted to sustain the auxiliary bed frame 7, 8, but it is preferred to make each post in three parts comprising the fixed channel-iron part 14, above mentioned, an intermediate movable channel-iron part 40, and a hollow square movable part 41. The post part 40 is adapted to fold within the post part 14, and its lower end is forked to straddle the lateral guide bar 17 or 18, and a pin 42 passing through said parts 14, 40, 17 or 18, pivots the part 40 to the mechanism frame. The longer post part 41 is adapted to fold within the intermediate post part 40, and is pivoted thereto at 43. To the upper end of said part 41 is pivoted at 44 one end of the auxiliary bed supporting cross-bar 10. When the two pivoted parts 40, 41 of both posts are folded or erected, the three parts 14, 40, 41 of each post are nested together in substantial parallelism at which adjustment the two opposed posts sustain one end of the raised auxiliary bed 7, 8, 9, and when the pivoted parts 40, 41 of both posts are collapsed inward the top cross-bar 10 is lowered to correspondingly lower that end of the auxiliary bed.

Any means or devices may be used to fold, or to fold and collapse, the pivoted parts of the two posts of the head or foot mechanism. Should means be used only to positively fold or erect the sectional posts, the gravity of the raised auxiliary bed may be relied upon to collapse unlatched pivoted parts of the two posts and lower the bed under control of any suitable brake devices. It is much preferred to positively fold and collapse the pivoted parts of the two posts of each mechanism and to do this by providing the above named screw 16 with right-and-left threads 44, 46, on which are placed nuts 45, 47, and providing any suitable connections from the nuts to the intermediate pivoted parts 40, 40 of both posts, said connections being preferably two rods 48, 48, pivoted at 49 to upward projections on the nuts and pivoted at 50 to the two post parts 40. The pivot pin 50 entering a hole in the rod 48, is shown fixed to or formed on a bracket 51 which is riveted at 52 to the post part 40, but any other suitable connection of the parts 40, 48 may be adopted.

Figs. 15 and 16 of the drawings sufficiently show how the pivoted post parts 40, 41, may be folded and collapsed by two flexible chains or wires 53, 54, coupled at one end to upward projections of the respective nuts 45, 47, and respectively running over guide pulleys 55 on the frame yoke 19, and over guide pulleys 56, 56 on the fixed post parts 14. The other end of the chain 53 is coupled to an interior bracket 57 fixed to the post part 40, and the other end of the chain 54 is coupled at 58 to a side bracket 59 fixed to said post part 40, and the post parts 40, 41 are suitably cut away at the chain connections to permit close nesting together of all three post parts 14, 40, 41, as the pivoted post parts are quite fully folded to sustain the raised bed. Either the connecting rods 48 or the chains 54 pass through the space between the two guides 17, 18. The lower flattened ends of the post parts 41 run in and are guided by slots 60 formed along the tops of said guides 17, 18. The post parts 41 may have any suitably formed parts or projections running underneath upper parts of the guides to prevent upward dislodgment of the parts 41 from said guides 17, 18. For this purpose it is preferred to use antifriction rollers 61 journaled to the lower ends of the post parts 41 and running inside of the tubular guides while said parts 41 run in the guide slots 60. The rollers 61 also facilitate easy folding and collapse of pivoted parts of the two posts under the weight of the auxiliary bed.

Whether the rod 48 or the chains 53, 54, be used to connect each nut 45, 47, to the adjacent pivoted post part 40, it is desirable to provide for applying or removing the disconnected nuts to or from the screw 16 without disturbing the rivet or screw fastenings holding together the main parts 14, 15, 17, 18, 19, 20, of the mechanism frame. This is done by journaling outer end parts of the screw in removable metal plates 62 which are held to the post parts 14 by screws 63 and preferably have inner projections 64 entering openings 65 in the parts 14. These openings permit free passage of the nuts through them after the plates 62 are removed. The upward projections of the two nuts run in slots formed in the top walls of the screw housing 15, while the main bodies of the nuts run on the screw 16 within the parts 15, the arrangement being such that lubricating oil possibly dropping from the screw threads and nuts will be caught and held in the housing 15, and will not fall upon and soil floors or carpets upon which the bed structure rests. An outer bearing 66 held to one of the brackets 35, supports one outwardly prolonged end of the screw 16, adapted to receive a crank 67 for rotating the screw. Any suitable chain or other belt 68 connects the two wheels 21, 21, of the head and foot mechanisms.

On the screw 16, and at each end of its

right-and-left threads 44, 46, are placed metal collars 69 which wholly take the end thrust of the two nuts 45, 47, at the limit of their travel in both directions. These collars 69 relieve the post folding and collapsing devices, such as the above named connecting rods or chains, of all injurious strains by positively stopping rotation of the screw immediately either nut jams against one of the collars. The collars thus prevent breakage of the nut and post connections should the screw be forcibly turned to the limit in either direction by a careless maid or operator.

Outer and inner cover and guard plates 70, 71 are held to each head and foot mechanism, the outer plate 70 concealing the operating parts when the auxiliary bed is fully lowered, and the inner plate 71 specially preventing entanglement of the auxiliary bed clothing with moving parts of the mechanism during raising or lowering of said bed and incidentally assisting to conceal said mechanism. The guard plates 70, 71 are held by screws 72 to long and short arms or brackets 73, 74 held to the fixed post parts 14, and to the guides 17, 18 of the pivoted post parts 41. A safety guard is shown for the upper bed which comprises a rail 75, preferably made of T-iron, and a number of pairs of supporting rods 76, 76, each pair held at their upper ends by the same pivot 77 to the stem of the rail 75, and pivoted at 78 at their lower ends to opposite sides of the side rail of the auxiliary bed frame 7. Each pair of connected folding rods 76, 76, thus forms a light but laterally strong truss able to resist considerable side strain. When raised to operative position the entire guard may be securely locked by an angularly disposed rod 79 pivoted at 80 to the rail 75 and having a hook-end 81 locking into an opening in the side rail of the bed frame 7.

It is not essential that three-sided channel-iron post parts 14, 40, be used, as the two outside post parts may be made of two-sided angle-iron, or the post parts may have any cross-sectional form which will enable them, when folded and nested together and while alone vertically sustaining the raised bed, to resist lateral strains in two or more directions. The modified post parts shown sufficiently in Figs. 8 and 10 of the drawings comprise a fixed lower angle-iron part 82 forming a portion of the head or foot mechanism frame, an intermediate angle-iron part 83 pivoted at 84 at its foot to the part 82 and to one end of the guide 17 or 18, and a preferably square inner part 85 which is pivoted to the top of the part 83, and will be pivoted at its upper end to the top cross-bar 10, and also carries guide rollers 61, substantially as above described for the preferred post. When said angle-iron parts 82, 83 are used the laterally nesting parts of the two opposed posts of either the head or foot mechanisms will jointly resist lateral strains sidewise of the raised bed and the two posts of both mechanisms at the same side of the bed will jointly resist lateral strains endwise of the raised bed. The superiority of the preferred posts having the nesting channel-iron post parts 14, 40, and inner part 41, is due to the fact that each post individually or independently resists strains in opposite directions endwise of the raised auxiliary bed by reason of the entrance of the part 41 between the two flanges of the part 40, and the entrance of said part 40 between the two flanges of the fixed part 14, and consequently all four of the auxiliary bed posts coact in resisting lateral strains in both directions endwise of the raised bed, while the two opposed posts of each mechanism resist lateral strains sidewise of the raised bed.

In applying the head and foot mechanisms to an ordinary bed frame, either mechanism may be interchangeably used at either end of the bed. Usually the lower end frame bars coupling the main bed frame corner blocks 4, 4, will be removed, and each mechanism with its bracket screws 39 removed will while askew be lowered within the main bed frame until its opposite brackets 35 are at the level of the blocks 4, 4, which enter the brackets as the mechanism is turned to final transverse position, and the screws 39 then are applied to the brackets and tightened to fasten the two mechanisms at the head and foot of the main bed frame. The chain belt 68 now may be conveniently applied to the wheels 21, 21 of both mechanisms. The lower main bed mattresses now are replaced and the upper auxiliary bed frame bracket pins 11 are entered into the holes in the top cross-bars 10 of both mechanisms and the mattresses and bedding are then arranged on the upper auxiliary bed and all is now ready for use of the lowered auxiliary bed. The entire auxiliary bed when built as an attachment may thus be quickly and easily applied to the main lower bed frame without the use of tools, and the auxiliary bed may at any time be as easily removed from the main bed.

With the auxiliary bed 7, 8, 9, fully lowered the parts of the head and foot mechanisms have relative positions shown in Figs. 6 and 7 of the drawings below the level of the upper bed, and the spread or coverlet of the auxiliary bed completely conceals both mechanisms and there is no visible indication that the whole bed structure is anything more than an ordinary bed having a box spring mattress. This invisibility of the supports of the lowered auxiliary bed is a striking and pleasing and important feature of the invention because the whole bed structure so adjusted does not in the least detract from or mar the appearance of any other furnishings

in the room. At this lowered adjustment, and while the mechanism cross-bars 10 rest solidly upon the tops of the fixed post parts 14, the auxiliary bed may alone be used. When occasion arises for use of the two beds, the crank 67 is applied to the screw 16 of either the head or foot mechanism and is turned naturally to the right hand. This rotates the screws and causes the two nuts 45, 47 thereon to approach each other and compels the rods 48, or the chains 53, to swing the two post parts 40 of both mechanisms upward on their pivots 42, and the parts 40 carry the upper ends of the post parts 41 upward while their roller carrying lower ends run in the two guides 17, 18. This operation lifts the top cross-bars 10 of both mechanisms and raises the auxiliary bed 7, 8, 9, and about as this bed is fully raised the parts 41, 40, 14 of each of the four posts nest together laterally to sustain the raised bed. As the post parts thus nest together the nuts 45, 47 strike the outer stop collars 69 on the screw and the crank 67 cannot be further and forcibly turned forward thereby preventing overstraining of and injury to the post operating mechanism. The side guards 75, 76 now will be swung upward into operative positions and will be locked by entering their hooks 79 into the openings of the auxiliary bed frame side rails, as shown in Fig. 1 of the drawings. Reverse operation is effected in obvious manner.

A special advantage of the arrangement of the auxiliary bed head and foot mechanisms for operation independently of each other is that during illness in the home or at the hospital one end of the bed may easily be adjusted higher than its other end by simply removing the set screw 22 holding the wheel 21 to the screw 16 of either or both mechanisms and then operating the mechanism at either end of the bed by turning its screw 16 by the crank 67, as required to elevate the head or feet of the patient as any special injury or illness may make desirable.

Should the two opposed correlated posts of each mechanism be arranged at the sides of the main bed instead of at its ends, each mechanism would have but one long guide for the roller-carrying feet of the post parts 41, and pivoted parts of both posts would not then cross each other in operation. There are special advantages as regards increased stiffness and strength of the two opposed mechanisms and the avoidance of injurious contact with metal parts by persons entering and leaving the bed, which make most desirable the arrangement of the two mechanisms at the head and foot of the main bed. With such arrangement the pivoted post parts of each mechanism necessarily cross each other when applied to a main bed of any ordinary width and require two guides 17, 18 for the feet of the two folding parts 41 of the posts of each mechanism.

As regards some hereinafter claimed features of this invention, the preferred fixed post parts 14 may be dispensed with and the post parts 40 be directly pivoted to the mechanism frame or to the main bed frame. It also is obvious that there may be but one pivoted part to each of the two posts of each mechanism, such as the part 40, which then would be lengthened upward sufficiently to suitably connect with and sustain the auxiliary bed frame. The two opposed posts of each mechanism thus may have various forms provided they be arranged to sustain the raised auxiliary bed, or that they do this without the aid of extraneous supports while offering necessary resistance against lateral strains in two or more directions.

Another distinctive feature of each auxiliary bed supporting head or foot mechanism is that the devices operating the pivoted part or parts of its two correlated posts are arranged below said pivoted parts and in the general plane of their folding and collapse, thereby assuring compactness of each mechanism to promote its easy attachment to a main lower bed frame, and also facilitating storage and transportation.

Various other modifications of parts of this invention may be made by the skilled mechanic within the scope of one or more of the appended claims.

I claim as my invention:—

1. In a device of the kind described, having a lower main bed-frame adapted to support a mattress and an upper frame overlying the same, head and foot mechanisms comprising each a base adapted to be secured to said lower frame in the space between the mattress thereon and the adjacent head or foot section thereof, and provided with folding posts adapted to fold inwardly and when folded to occupy the afore-mentioned space, said posts being connected with said upper frame to support the same above the lower frame a sufficient distance to permit occupancy of the latter, in combination with means for simultaneously operating both said head and foot mechanisms.

2. An expansible bed comprising two vertically superposed beds of which, when collapsed, the upper bed is unobstructed for access and use, in combination with elevating mechanism mounted on the lower bed for raising said upper bed a sufficient distance to expose and permit occupancy also of the lower bed, said elevating means constituting the supporting means of said upper bed when elevated and adapted to collapse below the level of the upper surface of said upper bed when the latter is depressed, and means for operating said mechanism to raise and lower said upper bed.

3. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having one or more pivoted folding and collapsing parts, and all the posts coacting when erected to sustain the raised bed independently of extraneous supports, means operating the pivoted parts of either pair of posts independently of the operation of the pivoted parts of the other pair of posts, and devices coupling the operating means of both pairs of posts and simultaneously folding the pivoted parts of all four posts for raising and sustaining the bed.

4. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having one or more pivoted folding and collapsing parts, and all the posts coacting when erected to sustain the raised bed independently of extraneous supports, means operating the pivoted parts of either pair of posts independently of the operation of the pivoted parts of the other pair of posts, and devices coupling and uncoupling said operating means of both pairs of posts and adapted when coupled to simultaneously fold the pivoted parts of all four posts for raising and sustaining the level bed, and adapted when uncoupled to assure operation of but one pair of posts for adjusting one end of the bed higher than its other end.

5. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having one or more pivoted folding and collapsing parts, and all the posts coacting when erected to sustain the raised bed independently of extraneous supports, means positively folding and collapsing the pivoted parts of each pair of posts and disposed below said pivoted post parts and in the general plane of their folding and collapse, and devices coupling the pivoted post part operating means of both pairs of posts and simultaneously folding or collapsing the pivoted parts of all four posts for raising or lowering the bed.

6. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having a fixed part and one or more pivoted folding and collapsing parts, and all the posts coacting when erected to sustain the raised bed independently of extraneous supports, and means operating the pivoted parts of either pair of posts independently of the operation of the pivoted parts of the other pair of posts.

7. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having a fixed part and one or more pivoted folding and collapsing parts, and all the posts coacting when erected to sustain the raised bed independently of extraneous supports, and means folding and collapsing the pivoted parts of each pair of posts and disposed below said pivoted post parts and in the general plane of their folding and collapse.

8. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having parts adapted to nest laterally and including one or more pivoted folding and collapsing parts, and all the posts coacting when erected to vertically and laterally sustain the raised bed independently of extraneous supports, and means operating the pivoted parts of the posts.

9. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including one or more pivoted folding and collapsing parts, and all the posts coacting when erected to vertically and laterally sustain the raised bed independently of extraneous supports, means folding and collapsing the pivoted parts of each pair of posts, and devices coupling the pivoted post part operating means of both pairs of posts and simultaneously folding or collapsing the pivoted parts of all four posts for raising or lowering the bed.

10. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including a fixed part and one or more pivoted folding and collapsing parts, and all the posts coacting when erected to vertically and laterally sustain the raised bed independently of extraneous supports, and means operating the pivoted parts of the posts.

11. Supports for vertically adjustable beds, comprising two correlated pairs of posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including a fixed part and one or more pivoted folding and collapsing parts, and all the posts coacting when erected to vertically and laterally sustain the raised bed independently of extraneous supports, means folding and collapsing the pivoted parts of each pair of posts, and devices coupling the pivoted post part operating means of both pairs of posts and simultaneously folding or collapsing the pivoted parts of all four posts for raising or lowering the bed.

12. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, and means held to the frame and operating said pivoted post parts and disposed below them and in the general plane of their folding and collapse.

13. In supports for vertically adjustable beds, a head and foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, guides held to the frame, said pivoted post parts running on the guides and having parts underlying portions of said guides, and means operating the pivoted post parts.

14. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, guides held to the frame, said pivoted post parts having antifriction rollers running on and underlying portions of said guides, and means operating the pivoted post parts.

15. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, two guides held to the frame and on which move pivoted parts of the two posts which during operation cross each other, and means held to the frame and operating said pivoted post parts.

16. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, and means held to the frame and operating said pivoted post parts and disposed below them and in the general plane of their folding and collapse.

17. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, two guides held to the frame and on which move pivoted parts of the two posts which during operation cross each other, and means held to the frame and operating said pivoted post parts.

18. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, means held to the frame and operating said pivoted post parts, and braces connecting the fixed post parts and the guides and standing closely between pivoted parts of the two posts and mutually staying them at right angles to the general plane of their folding and collapse.

19. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including one or more pivoted folding and collapsing parts, and means held to the frame and operating said pivoted post parts.

20. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including a fixed part and one or more pivoted folding and collapsing parts, and means held to the frame and operating said pivoted post parts.

21. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, and means held to the frame and operating said pivoted post parts.

22. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including a fixed part and one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, and means held to the frame and operating said pivoted post parts.

23. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, connections from said nuts to pivoted parts of the two posts for operating them, and a power-transmitting device on the screw adapted to couple with it or uncouple from it to render the mechanism operative or inoperative relatively to a like foot or head mechanism.

24. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, and connections from said nuts to pivoted parts of the two posts for operating them, said operating means being disposed below the pivoted post parts and in the general plane of their folding and collapse.

25. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post

having one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, and connections from said nuts to pivoted parts of the two posts for operating them, said operating means being disposed below the pivoted post parts and in the general plane of their folding and collapse.

26. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having a fixed part and one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, and connections from said nuts to pivoted parts of the two posts for operating them, said operating means being disposed below the pivoted post parts and in the general plane of their folding and collapse.

27. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, two guides held to the frame and on which move pivoted parts of the two posts which during operation cross each other, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, and connections from said nuts to pivoted parts of the two posts for operating them.

28. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having parts adapted to nest laterally and having such cross-section that when nested they resist lateral strains in two or more directions and including one or more pivoted folding and collapsing parts, guides held to the frame and on which move pivoted parts of the two posts, a screw journaled in the frame and having right-and-left threads, two nuts on said respective threads, and connections from said nuts to pivoted parts of the two posts for operating them.

29. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts, each post having one or more pivoted folding and collapsing parts, a top cross-bar coupled to pivoted parts of both posts and adapted to directly sustain the bed, and means held to the frame and operating said pivoted post parts to raise and lower the bed and disposed in the general plane of folding and collapse of said post parts.

30. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts each having a fixed part and one or more pivoted folding and collapsing parts, means held to the frame and operating said pivoted post parts to raise and lower the bed and disposed in the general plane of folding and collapse of the pivoted post parts, and a top cross-bar held to pivoted parts of the two posts and adapted to directly sustain the raised bed and also adapted by resting on the fixed parts of the two posts to relieve the pivoted post parts and their operating means of the weight of the lowered bed.

31. In supports for vertically adjustable beds, the sectional folding and collapsing posts each comprising a fixed part and one or more pivoted parts adapted when the pivoted parts are folded to nest together laterally and having such cross-section that when the pivoted post parts are folded and the posts sustain the raised bed independently of extraneous supports the nested fixed and pivoted post parts resist lateral strains endwise and sidewise of the bed.

32. In supports for vertically adjustable beds, the sectional folding and collapsing posts each having pivotally connected parts, the outer part or parts having angular cross-section and the inner part having substantially square cross-section, said post parts adapted to nest together and then present to view a light, strong post structure having substantially square or rectangular form and resisting lateral strains endwise and sidewise of the raised bed while the posts sustain the bed independently of extraneous supports.

33. In supports for vertically adjustable beds, the sectional folding and collapsing posts each comprising a fixed part and one or more pivoted parts, the outer post part or parts having angular cross-section and the inner post part having substantially square cross-section, said fixed and pivoted post parts nesting together when the pivoted parts are folded and then presenting to view a light, strong post structure having square or rectangular form and resisting lateral strains endwise and sidewise of the raised bed.

34. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts each having one or more pivoted folding and collapsing parts adapted to sustain the bed, means operating the pivoted part or parts of both posts, and devices on the mechanism frame adapted to hold said mechanism to an ordinary bed frame.

35. In supports for vertically adjustable beds, the combination with sectional posts each having a relatively fixed lower part and one or more movable upper parts adapted to sustain the bed, and devices adapted to collapse the parts of the posts, of devices held to the fixed post parts and adapted to embrace a lower main bed frame.

36. In supports for vertically adjustable beds, the combination with posts each having one or more pivoted folding and collapsing parts adapted to sustain the bed, of forked brackets or parts on the posts adapted to receive parts of a main lower bed frame, and means adapted to secure the brackets and posts to said main bed frame.

37. In supports for vertically adjustable beds, the combination with posts each having one or more pivoted folding and collapsing parts adapted to sustain the bed, of horizontally forked brackets or parts on the posts adapted to receive parts of a lower main bed frame, and screws fitted to the brackets and adapted to secure the posts to said main bed frame.

38. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts each having one or more pivoted folding and collapsing parts adapted to sustain the bed, means operating the pivoted parts of both posts, and an outside plate held to the frame and concealing said operating means.

39. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts each having one or more pivoted folding and collapsing parts adapted to sustain the bed, means operating the pivoted parts of both posts, and an inside plate held to the frame and concealing the operating means and preventing entanglement of the bed clothing with said operating means.

40. In supports for vertically adjustable beds, the combination with the adjustable bed frame, of folding side guards each comprising a rail, supports for said rail including pairs of rods in truss form pivotally connecting the rail with a side bar of the bed frame, and means adapted to lock the unfolded guards in raised operative position.

41. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts having pivoted folding and collapsing parts adapted to sustain the bed, a tubular housing held to the frame, a screw journaled to the frame and arranged within the housing, nuts on the screw, connections from said nuts to pivoted parts of the two posts for operating them, two guides held to the frame and on which run pivoted parts of the two posts, and a saddle arranged between the two posts and having bearings for the screw and fixed to and mutually bracing the screw housing and the guides.

42. In supports for vertically adjustable beds, a head or foot mechanism comprising a frame including two opposed posts having pivoted folding and collapsing parts adapted to sustain the bed, a tubular housing held to the frame, a seerw journaled to the frame and arranged within the housing, nuts on the screw, connections from said nuts to pivoted parts of the two posts for operating them, two guides held to the frame and on which run pivoted parts of the two posts, a saddle arranged between the two posts and having bearings for the screw and fixed to and mutually bracing the screw housing and the guides, said saddle having a central opening, and a power transmitting wheel held to the screw at the saddle opening.

43. In supports for vertically adjustable beds, the combination with a frame comprising two opposed posts each having a fixed lower part 14 offset at its lower end and one or more pivoted folding and collapsing parts, a housing 15 connecting the offset lower ends of both posts, a screw within the housing, nuts on the screw, two guides for pivoted post parts held to the fixed post parts above the housing and screw, and connections between the screw nuts and pivoted parts of the two posts passing between the two guides.

44. In supports for vertically adjustable beds, the combination with a frame comprising two opposed lower fixed post parts 14, 14, a tubular housing 15, two slotted tubular guides 17, 18, and braces 20 connecting the parts 14, 17, 18, of two post parts 40 pivoted at 42 to the parts 14, and two post parts 41 pivoted at 43 to the parts 40 and running on the guides 17, 18, a screw 16 in the housing 15, nuts 45, 47 on said screw, and connections from the nuts to pivoted parts 40 of the posts for operating them.

45. In supports for vertically adjustable beds, the combination with a frame comprising two opposed lower fixed post parts 14, 14, a tubular housing 15, two slotted tubular guides 17, 18, and braces 20, connecting the parts 14, 17, 18, of two post parts 40 pivoted at 42 to the parts 14, and two post parts 41 pivoted at 43 to the parts 40 and running on the guides 17, 18, a screw 16 in the housing 15, nuts 45, 47 on said screw, connections from the nuts to the pivoted post parts 40, and a saddle 19 fixed to the parts 15, 17, 18 and carrying intermediate bearings 24 for the operating screw.

46. In supports for vertically adjustable beds, the combination with a frame comprising two opposed lower fixed post parts 14, 14, a tubular housing 15, two slotted tubular guides 17, 18, and braces 20 connecting the parts 14, 17, 18, of two post parts 40 pivoted at 42 to the parts 14, and two post parts 41 pivoted at 43 to the parts 40 and running on the guides 17, 18, a screw 16 in the housing 15, nuts 45, 47 on said screw, connections from the nuts to the pivoted post parts 40, a saddle 19 fixed to the parts 15, 17, 18 and having an opening 23,

bearings 24 for the screw 16 within the saddle, and a power transmitting wheel 21 on the screw at the saddle opening.

47. In supports for vertically adjustable beds, the side guards for the raised bed, comprising a rail 75, pairs of supports 76, 76 pivoted to the rail and to the bed frame, and a latch rod 79 pivoted to the rail 75 and adapted to engage a recess in the bed frame for locking the guard in raised operative position.

EDWARD SPENCER HALL.

Witnesses:
A. MITCHELL HALL,
H. M. ORVILLE.