May 29, 1962 J. J. WETZLER 3,036,314

ADJUSTABLE BED

Filed June 27, 1957 4 Sheets-Sheet 1

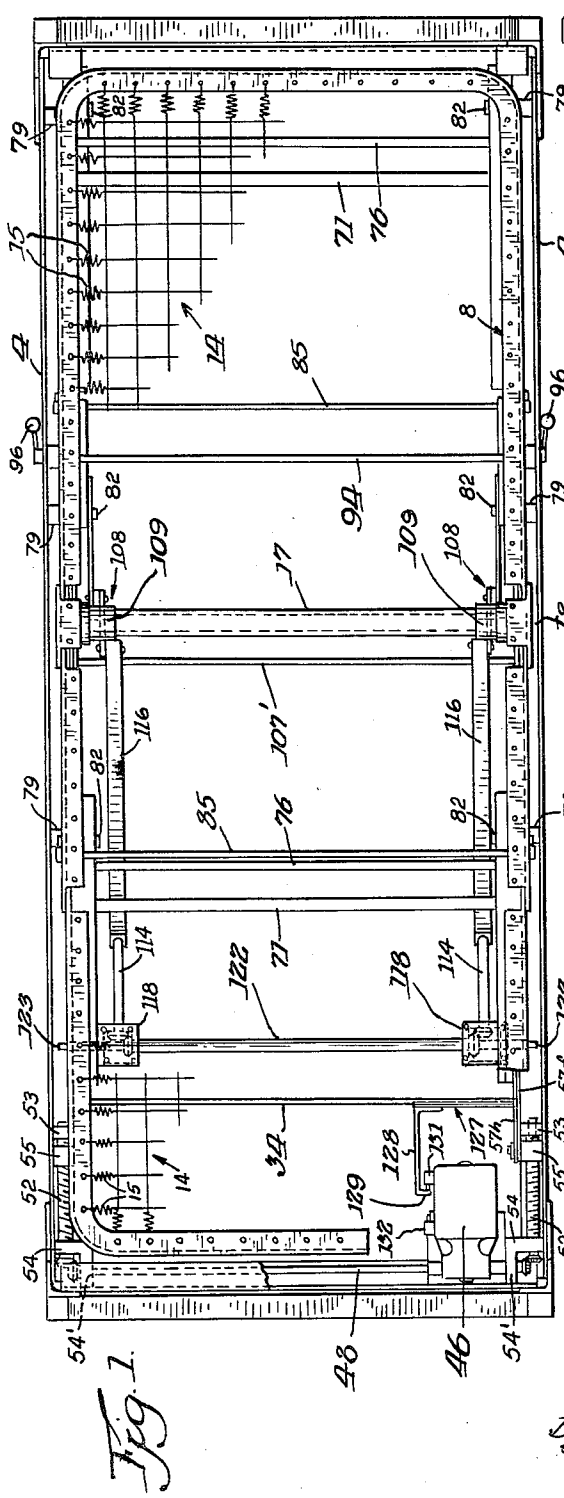

Fig. 1.

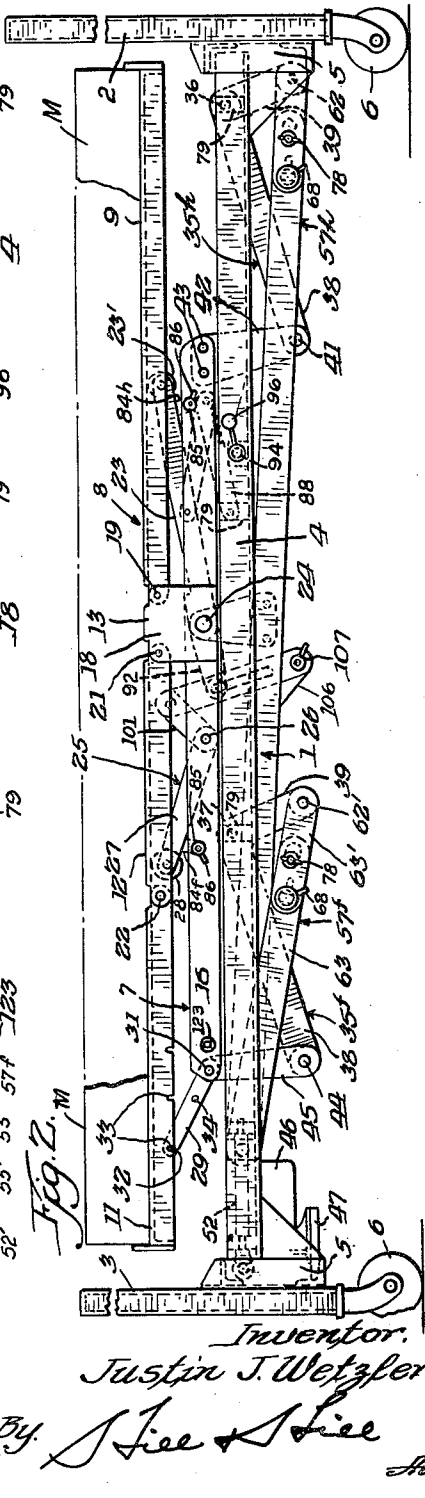

Fig. 2.

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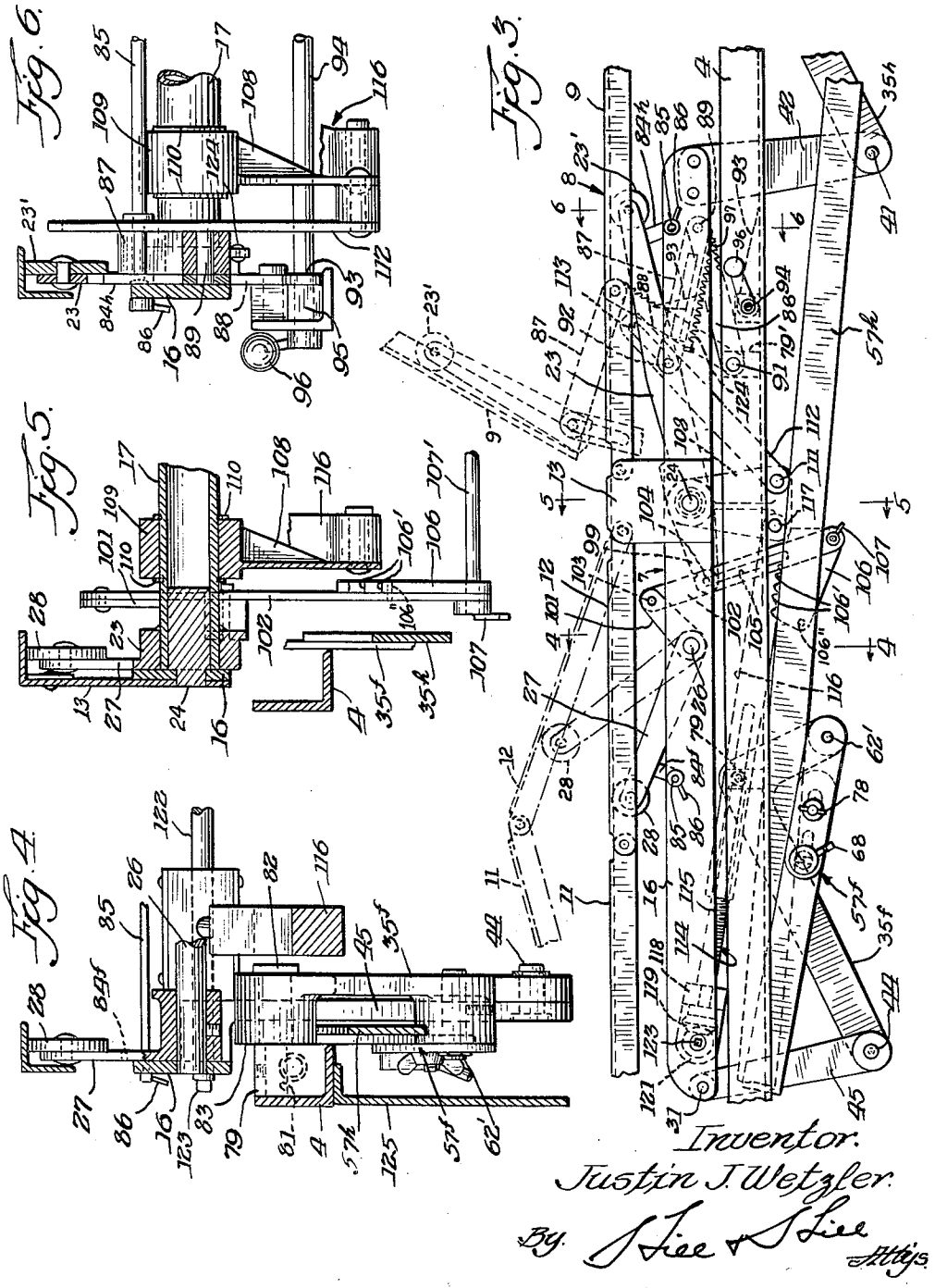

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Fig. 7.

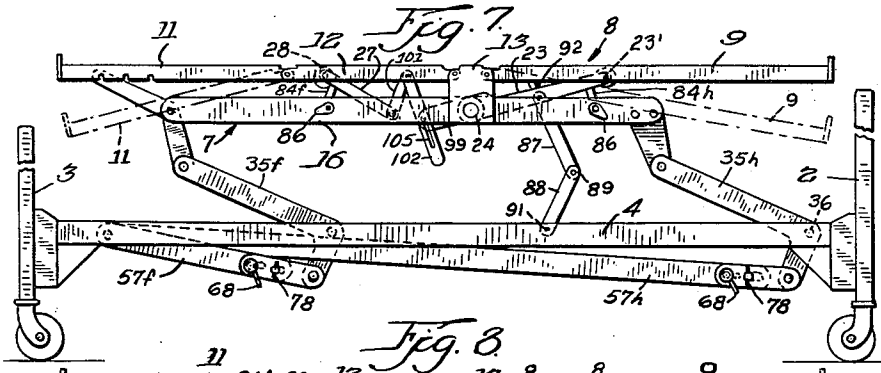


Fig. 8.

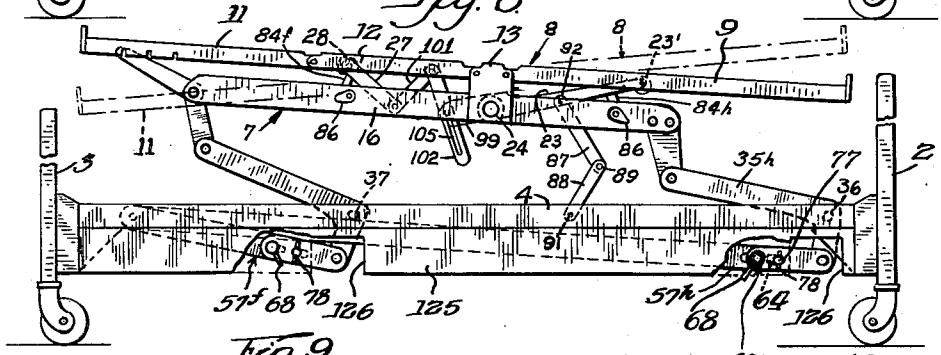


Fig. 9.

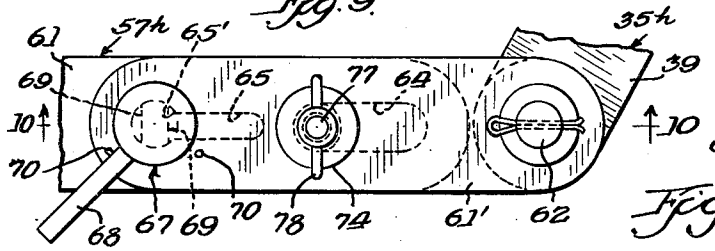


Fig. 10

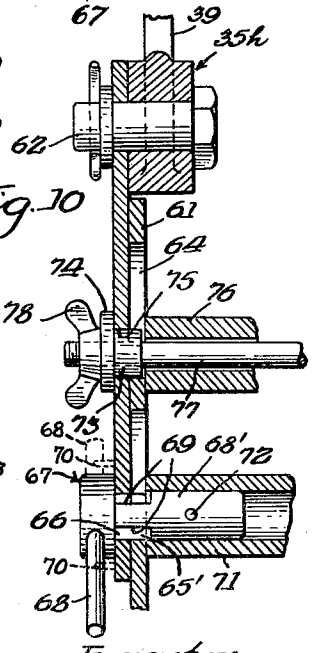
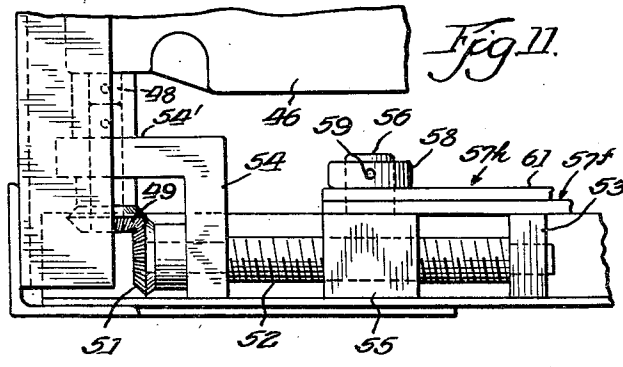


Fig. 11.



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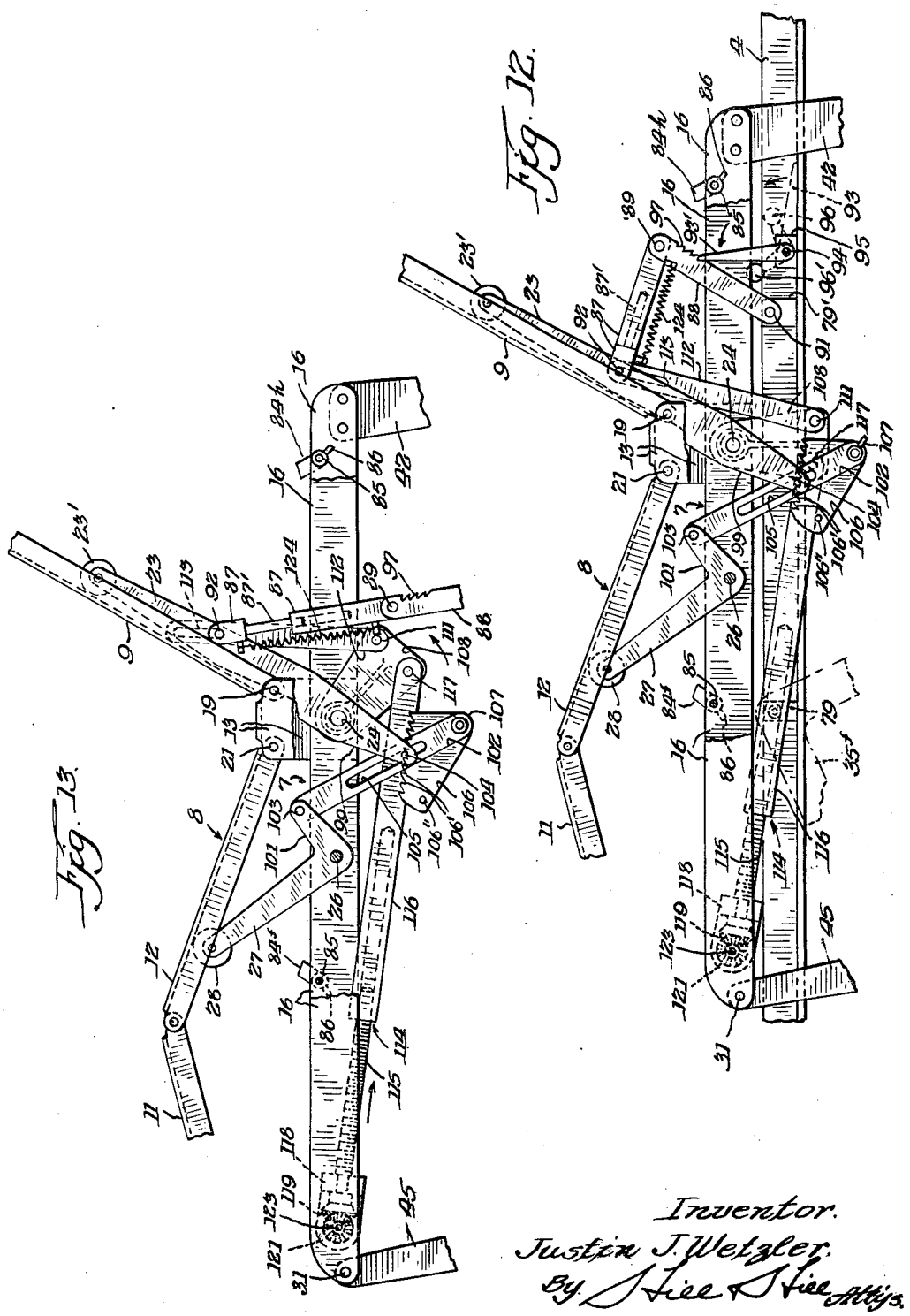

Fig. 12.

Fig. 13.

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United States Patent Office 3,036,314 Patented May 29, 1962

3,036,314

ADJUSTABLE BED

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Filed June 27, 1957, Ser. No. 669,407
15 Claims. (Cl. 5—63)

The invention relates generally to bed structures and the like, and more particularly to an adjustable bed in which portions of the mattress supporting structure may be moved into angular relation when desired.

The present invention is an improvement on the bed structure illustrated in my co-pending application Ser. No. 616,418, filed October 17, 1956, entitled Adjustable Bed, and has among its objects the production of a bed structure having the advantages of that illustrated in the above referred to co-pending application, which retains a simple construction, and at the same time provides greater flexibility of operation.

More particularly the invention has among its objects the production of an adjustable bed structure which may be power actuated to raise the mattress supporting structure to any desired elevated position, and in which the power mechanism may be utilized to provide means for adjusting respective sections of the mattress supporting structure into inclined positions, the last mentioned mechanism being designed to provide ranges of adjustment for varying the height of the sections in their adjusted positions. Thus the present invention provides a simple mechanism whereby the degree of elevation of the structure is relatively independent of the inclination of the head and foot sections of the structure as distinguished from the construction illustrated in my co-pending application, wherein the elevation of the structure determined the degree of inclination of the head and foot sections.

Another object of the invention is the production of such a bed structure wherever different degrees of adjustment of the foot sections relative to the head sections may be effected.

Another object of the invention is the production of such a bed structure in which the entire mattress supporting structure may be tilted in a single plane either from foot to head or vice versa, at the same time permitting elevation of the structure as desired, while the mattress supporting structure is in such tilted position.

A further object of the invention is the production of an adjustable bed structure in which the adjusting mechanism for tilting the entire bed structure, may be actuated only when the mattress supporting structure is in a lowered position.

A further object of the invention is the production of such a bed structure wherein means may be provided, in addition to the power actuated means, for inclining the head or foot section of the mattress supporting structure. Manual means is provided for effecting such an adjustment, either independently of the power actuated mechanism, or if desired, in some cases supplementing such mechanism, as for example, if it is desired to provide maximum inclination of the head section while the entire bed structure is at its fully elevated position.

Many other objects and advantages of the construction herein shown and described will be obivous to those skilled in the art from the disclosure herein given.

In the drawings, wherein like reference characters indicate like or corresponding parts:

FIG. 1 is a top plan view of a bed structure embodying the invention;

FIG. 2 is a side elevational view of the bed structure illustrated in FIG. 1;

FIG. 3 is a side elevational view similar to FIG. 2 of the elevating and adjusting structure;

FIG. 4 is a sectional view taken approximately on the line 4—4 of FIG. 3;

FIG. 5 is a section view taken approximately on the line 5—5 of FIG. 3;

FIG. 6 is a sectional view taken approximately on the line 6—6 of FIG. 3;

FIG. 7 is a side elevational view of a bed structure such as that illustrated in FIG. 2, with certain of the linkages (not shown) for the elevating and adjusting structure of FIG. 2 and FIG. 3, illustrating the same in elevated position and the mattress supporting structure in its horizontal position in its maximum elevated position and in the dashed lines with the head and foot sections in another adjusted position;

FIG. 8 is a side elevational view similar to FIG. 7, with certain of the linkages for the elevating and adjusting structure of FIG. 2 and FIG 3, illustrating the mattress supporting structure in tilted and/or Trendelenburg position in solid lines and in reverse Trendelenburg position in the dashed lines;

FIG. 9 is an enlarged side elevational view of one of the adjustable structures employed for achieving the adjustment illustrated in FIG. 8;

FIG. 10 is a sectional view taken approximately on the line 10—10 of FIG. 9;

FIG. 11 is a top plan view of one of the elevating actuator mechanisms;

FIG. 12 is a side elevational view similar to FIG. 3, taken in part along a section longitudinally of the portion of the bed structure of FIG. 1 with portions of the elevating structure removed and illustrating the adjusting structure for the mattress-supporting structure including the foot section and head section corresponding to the dotted position of FIG. 3; and

FIG. 13 is a side elevational view similar to that of FIG. 12, partly broken away and illustrating the adjusting mechanism for manually adjusting the mattress-supporting structure including the head and foot sections similarly adjusted as shown in the dotted line of FIG. 3 and the solid lines of FIG. 12, and wherein the manual adjusting means is adapted for manually adjusting the mattress-supporting structure in the lowermost position of the movable frame structure as shown in FIG. 2, FIG. 3 and FIG. 12 and also in the maximum raised position of the movable frame structure as shown in FIG. 7, and equally adapted for adjustment in the intermediate positions therebetween and also equally adapted for intermediate adjustments of the mattress-supporting structure within the range of adjustment of the manual actuating mechanism.

The present invention contemplates the use of a mattress supporting structure which may be in the form of a plurality of adjustable sections, similar to that illustrated in my patent application heretofore referred to, and, for the purposes of illustration, is shown herein in conjunction with a relatively movable frame structure adapted to be elevated and lowered with respect to a relatively stationary structure in a manner similar to that described in my co-pending application.

Referring to the drawings, and more particularly to FIGS. 1 and 2, the reference numeral 1 indicates generally a stationary bed structure having head and foot end boards or frames 2 and 3, which may be of more or less common construction, respectively, operatively connected by longitudinally extending side rails 4, having end fittings 5 adapted to detachably engage the end boards or frames 2 and 3, forming a rigid and relatively fixed frame structure or the stationary bed structure 1 supported on the floor or other surface by suitable cast caster wheels 6 or the like adapted to facilitate movement of the bed when desired.

Suitably mounted on the relatively fixed frame structure 1 and vertically movable relatively thereto is a movable frame structure indicated generally by the numeral 7, which in turn is adapted to support a mattress support-

ing structure indicated generally by the numeral 8 and comprising a head section 9, an end foot section 11, an intermediate foot section 12 and a relatively fixed central and/or stationary section 13.

These sections cooperate to generally define an annular frame structure which is adapted to support a suitable mattress supporting fabric or the like, as for example, wire mesh fabric, indicated generally by the numeral 14, only a portion of which is illustrated in FIG. 1, such fabric being suitably connected to the frame structure, as for example, by small helical springs 15 or the like, thereby providing a resilient support for a mattress M.

In the embodiment illustrated, the movable frame structure 7 is shown as comprising a pair of longitudinally extending side members or side rails 16, each extending adjacent and normally parallel to one of the side rails 4 (only one each of the rails 4 and 16 being illustrated in FIGS. 2 and 3), and are adapted to be operatively connected by suitable means, as for example, one or more cross members or tubular members 17, which also may be utilized for other purposes, as will hereinafter be described.

The side members or side rails 16 are adapted to carry upwardly extending members 18 which form the relatively fixed central and/or stationary section 13 of the mattress supporting structure 8, and the adjacent ends of the sections 9 and 12 are pivoted at 19 and 21 respectively to the members 18, the intermediate foot section 12 being in turn pivoted at its free end to the adjacent end of the section 11, as indicated at 22, whereby the sections 9, 11, and 12 may be adjusted about their respective pivots to positions such as that indicated in broken lines in FIG. 3. and FIG. 7.

In the particular embodiment of the invention illustrated, the head section 9 of the mattress supporting structure 8 is adapted to be supported in any of its adjusted positions by an arm or lever 23 pivoted at 24 to the relatively fixed central and/or stationary section 13 of the mattress supporting structure 8 and provided with means such as a roller 23' at its free end engageable with the section 9, whereby movement of the lever 23 about its pivot will be operative to adjust the section 9 accordingly. In like manner, the intermediate foot section 12 is illustrated as being supported by a more or less L-shaped arm or lever 25 pivoted to the movable frame structure 7 as indicated at 26 and having one leg portion 27 thereof terminating at its free end in suitable means such as a roller 28, engageable with the section 12, whereby adjustment of the lever 25 about its pivotal connection to the movable frame structure 7 will effect adjustment of the section 12 about its pivotal connection 21 with the members 18, thus also effecting adjustment of the foot section 11. The free end of the other is adapted to be supported by suitable members 29 positioned adjacent each member 16 and pivoted thereto, as indicated at 31, with the members being provided at their free ends with suitable means, such as projections 32, engageable in cooperable notches or slots 33 in the foot section 11, whereby the latter may be supported in any one of several adjusted positions, as will be apparent from a reference to FIG. 2, the members 29 preferably being rigidly connected by suitable means such as a rod 34, whereby the two members may be moved in unison from either side of the bed.

The movable frame structure 7 may be supported adjacent its longitudinal ends by pairs of pivotal arms or L-shaped levers, one pair 35*h* being disposed adjacent the head end of the bed, and another pair 35*f* being disposed adjacent the foot end of the bed, the arms 35*h* and 35*f* at each side of the bed being pivoted to the side rails 4 as respectively indicated at 36 and 37. Each of the arms 35*h* and 35*f* may be generally L-shaped, having a relatively long leg 38 and a relatively short leg 39, each of the long legs 38 of the arms 35*h* in turn being pivotally connected adjacent their free ends as indicated at 41 to a link 42 illustrated as being rigidly connected to the head end of the side members or side rails 16 by suitable means such as rivets 43 or the like. In a similar manner, the free ends of the legs 38 of the arms 35*f* may be pivotally connected as indicated at 44 to a link 45 which in turn is pivoted to the adjacent foot ends of the side members or side rails 16, the construction illustrated utilizing the pivot 31 for pivotally supporting both the links 45 and the members 29 from the movable frame structure.

It will be apparent that by rocking the arms 35*f* and 35*h* in a clockwise direction, as viewed in FIG. 2, about their respective pivots 36 and 37 the entire movable frame structure 7, and with the sections 9, 11, 12 and 13 may be raised from the position illustrated in FIG. 2 to a position similar to that illustrated in FIG. 7, and by reversing the movement of the arms 35*h* and 35*f* the movable frame structure 7 and associated mattress supporting sections may be returned to their lower position illustrated in FIG. 2.

In the embodiment of the invention illustrated, power means is provided for raising and lowering the movable structure, such means including a suitable power source such as an electric motor 46, which is positioned adjacent the foot end of the bed as clearly illustrated in FIGS. 1 and 2, the motor being supported by a suitable supporting member 47 carried by the stationary bed structure, and is provided with a drive shaft 48 which extends across the width of the bed and is provided at each of its ends, adjacent the side rails 4, with a beveled gear 49 adapted to mesh with a cooperable gear 51, each of which is rigidly carried by a rotatable screw 52 journaled in suitable bearing members 53 and 54, the latter member also having an extension 54' for supporting the adjacent end of the drive shaft 48, as clearly illustrated in FIG. 11.

Movable along the screws 52 are respective nuts 55, each having an inwardly directed stem 56 on which is pivotally supported connecting arms 57*h* and 57*f*, which are retained on the stem 56 by a collar 58 pinned as indicated at 59 or otherwise rigidly connected to the stem 56. As illustrated in detail in FIGS. 9 and 10, the connecting arm 57*h* may be formed in two sections or members and 61' which are adjustably secured together, the free end of the member 61 being pivotally connected to the nut 55 and the free end of the member 61' being pivotally connected to the short leg 39 of the arm 35*h* as indicated at 62, and in like manner the connecting arm 57*f* may be constructed in two sections or members 63 and 63' the former being pivotally connected to the nut 55, and the free end of the section 63' being pivotally connected to the short leg 39 of the arm 35*f* as indicated at 62'. As the connecting arms 57*h* and 57*f* are normally in tension, relatively light material may be employed therefor, even though the connecting arm 57*h* is of considerable length. The construction of the connecting arms 57*h* and 57*f* in two sections as illustrated, provides a simple arrangement whereby the length of the connecting arms 57*h* and 57*f* may be varied to provide an angular adjustment of the mattress supporting structure with respect to the horizontal.

The arms 35*h* and 35*f* and connecting arms 57*h* and 57*f* are adapted to be of a normal length to provide a more or less parallelogram action with respect to the movable frame structure 7 and mattress supporting structure carried thereby so that as the nuts 55 are moved along their respective screws, the mattress supporting structure will move upwardly or downwardly while extending substantially parallel to the horizontal.

Referring to FIG. 8, it will be apparent that by lengthening the connecting arms 57*h* with respect to the connecting arms 57*f*, the arms 35*h* will not rotate through as great an arc as the arms 35*f*, as a result of which the foot end of the structure will be elevated to a greater height than the head end, as shown in FIG. 8. Likewise, if the reverse is effected, making the connecting arms

57*f* longer than their normal length while retaining the length of the connecting arms 57*h* fixed, the head end of the structure will be elevated as indicated in broken lines in FIG. 8. Thus, such an adjustment permits tilting of the entire mattress supporting structure when so desired, at the same time retaining all of mattress supporting sections in a common plane.

FIGURES 9 and 10 shows, in detail, the particular adjustable structure for lengthening the connecting arms 57*h* or 57*f* when desired, at the same time providing adequate means for insuring retention of the members at their normal length to eliminate any danger of undesired lengthening of the arm in operation. The section 61 may be provided with a generally longitudinally extending slot 64 therein, and a second generally keyhole-shaped slot 65 having a generally circular portion 65', and the member 61' may be provided with a circular opening 66 therein of substantially the same diameter as the portion 65' of the slot 65. Extending through the portion 65' and opening 66 is a latch member indicated generally by the numeral 67, the latter having a handle member 68 and a cylindrical portion 68' rigidly connected thereto, the latter being provided with a portion of reduced thickness having parallel faces 69 spaced a distance approximately equal to the width of the narrow portion of the slot 65, so that when the latch member is in the position illustrated in FIG. 9, the parallel faces 69 will be substantially vertical or at right angles to the longitudinal edges of the narrow portion of the slot 65, thereby preventing relative movement between the member 61 and the member 61'. However, if the latch member is rotated into a position bringing the parallel edges 69 into substantially parallel arrangement with respect to the edges of the narrow portion of the slot 65, the latch member may enter the slot 65 permitting relative longitudinal movement of the members 61 and 61'. The amount of movement of the handle 68 and latch member 67 may be limited by respective pins 70 extending from the member 61' and forming stops for the handle 68. To permit actuation of the latch memberes at opposite sides of the bed structure, oppositely disposed latch members 67 may be rigidly connected by suitable means as, for example, a tubular member 71 adapted to receive the cylindrical portion of the latch member 67, those illustrated in FIGS. 9 and 10 being connected together by a pin 72 passing through the associated latch member and adjacent end of the tubular member 71.

If desired, additional means may be utilized for rigidly locking the sections or members 61 and 61', or the sections 63 and 63' together, and such means is illustrated in FIGS. 9 and 10 in conjunction with the slot 64. A sleeve member 73 having an outwardly extending flange 74 thereon adjacent its outer end, may be disposed in an opening 75 in the member 61', the opening 75 having a diameter approximately equal to the width of the slot 64 and diameter of the sleeve 73. Extending between the members 61 at opposite sides of the bed structure is a tubular member 76 having a rod 77 extending therethrough which is threaded at its free ends and provided with wing nuts 78 on the threaded end portions. Thus, by tightening the wing nuts 78, clamping pressures may be exerted through the sleeve members 73 on each pair of members 61 and 61' to rigidly lock the same together in any of their adjusted positions, and as each rod 77 is free to move axially with respect to its cooperable member 76, tightening or loosening of the wing nut 78 on one side of the bed structure will effect a clamping or unclamping action respectively on the members at opposite sides of the bed. Wing nuts 78 and associated structure, in addition to providing supplemental locking or clamping means between the respective pairs of members, also provide means for maintaining each cooperable pair of members in axial alignment throughout their adjusted positions preventing one member from pivoting with respect to the other member.

Adjustment of the connecting arms 57*h* and 57*f* may be readily accomplished when the structure is in its lowermost position, in which case the side rails 16 may be supported in a horizontal position on the side rails 4, side rails 16 being adapted to rest, in their lowermost position (not shown), on the bearing blocks 79 which form the pivot means for the arm 35*h* and arm 88, as will be apparent from a reference to FIGS. 2, 3 and 4. Bearing blocks 79 also form the pivots for arms 35*f*. FIG. 1 and FIG. 2. Referring to FIG. 4, it will be noted that the block 79, which may be suitably secured by welding or other means to the side rails 4, may be provided with a bore 81 therein adapted to receive a pivot pin 82 which passes through the hub portion 83 of the arm 35*f*. Thus, assuming that the movable frame structure 7 is in a lowermost position, one of the handles 68 and corresponding wing nut 78 may be loosened to permit the entire assembly to correspondingly loosen at the opposite side of the bed, and upon elevation of the movable frame structure 7, due to the lengthening of the adjusted arm 35*f* or 35*h*, as the case may be, the corresponding end of the mattress supporting structure will not be elevated as high as the opposite end thereof.

As illustrated in FIGS. 3, 4 and 6, the arms 23 and 27 are adapted to be normally supported on the side rails 16 by suitable means such as stop members 84*h* and 84*f* which are pivotally supported by the side rails 16, each pair of members at opposite sides of the bed being connected by a rod 85 having handle means 86 at its free ends. Thus when the stop members 84 are in the positions illustrated in FIG. 3, the arms 23 and 27 are automatically maintained at positions which will retain the mattress supporting sections in a horizontal plane. However, if it is desired to tilt the foot section, while retaining the head section horizontal, or to tilt the head section downwardly while retaining the foot sections horizontal, the respective handle 86 is rotated to adjust the arm 23 and the arm 27 to a position which will let the associated section or sections tilt downwardly as illustrated in dotted lines in FIG. 7.

The mattress supporting sections 9, 11 and 12, are adapted in the embodiment of the invention illustrated in the drawings to be actuated by either power or manually actuated means.

The power actuated means comprises a pair of links 87 and 88 pivoted to one another as indicated at 89 in FIGS. 3 and 6, provide linkage means with the opposite end of the arm 88 being pivoted at 91 to the side rail 4 by means of the block 79' while the opposite end of the link or arm 87 is pivoted at 92 to the member 23. The link or arm 87 may be telescoped to the position as shown in the dotted lines of FIG. 3 and the corresponding position as shown in the solid lines of FIG. 12 and may be extended to the maximum position as shown in FIG. 13 of the extended arm portion 87' and when telescoped the arm portion 87' takes the dotted position of FIG. 12, being spring-biased to this position as will be described later with reference to the operation of the adjusting mechanism for the mattress-supporting structure. Also carried by the side rail 4 is a stop member indicated generally by the numeral 93, the latter being rigidly carried by a rod 94 rotatably carried by the side frames 4 in bearing blocks or members 95 and having handle means 96 on its free ends at each side of the bed. As illustrated in FIG. 3, the stop member 93 may be generally triangular in shape, having a pointed free end which is adapted to engage any one of a plurality of teeth or serrations 97 on the member 88. The handle 96, as illustrated, is provided with a relatively heavy ball at the free end thereof which serves as a weight, the handle being so related with respect to the members 93 that the handle may be swung upwardly in a counterclockwise direction as viewed in FIG. 3 beyond dead center, whereby, due to the action of gravity on the heavy handle, the member 93 will be urged into engagement with the member 88.

Thus assuming that the structure is in the position illustrated in FIG. 3, when it is desired to adjust the head section **9**, the handle **96** may be rotated into a position to bring the stop member **93** in engagement with the arm **88**, and upon actuation of the motor **46** and rotation of the elevating arms **35***h* and **35***f*, the movable frame structure **7** and mattress supporting structure **8** will be elevated. When the mechanism has traveled a sufficient distance, the stop member **93** will engage one of the serrations **97** in the member **88** and upon reversal of the motor **46** and a lowering of the movable frame structure **7**, the stop member **93** in engagement with the preselected serration **97** will prevent return movement of the arms **87** and **88** so that the latter will remain in substantially the same relative positions as they were at the time the structure started to descend. However, as the intermediate structure **13** carrying the pivot **19** moves downwardly the roller **23'** of the lever **23** will cause the head section **9** to rotate about its axis in a counterclockwise direction, elevating the free end of the head section with respect to its connection to the upwardly extending members **18**. Assuming the structure was elevated to a position to permit engagement of the stop member **93** in the lowermost notch or serration on the member **88**, FIG. 3 and FIG. 12 and the movable frame structure then lowered to bring the head section into maximum elevation, the latter will assume the approximate position illustrated in broken lines in FIG. 3 and in the position as shown in FIG. 12.

When it is desired to lower the head section **9**, the movable frame structure **7** is elevated sufficiently to disengage the stop member **93** from the serrations **97** on the member **88**, following which the handle **96** may be rotated, as shown in FIG. 12 with the stop member **93** in its dotted position, to render the stop member inoperative.

The same action of the stop member **93** may also be utilized to actuate the foot sections **11** and **12**, such connecting mechanism comprising an arm or lever **99**, FIG. 3, providing an extension integrally connected to the lever **23** and operatively connected to a leg portion **101**, rigidly carried by the arm **27**, by a link member **102**, the latter being pivotally connected to the leg portion **101** as indicated at **103** and to the lever **99** by a connecting pin as indicated at **104**. The link member **102**, however, may be provided with a longitudinally extending slot **105** therein through which the connecting pin **104** of the arm **99** extends to form a sliding connection or lost-motion means between the same. Pivotally carried by the link member **102** adjacent the lower free end thereof is an abutment or stop member **106** which is adapted to be rotated relative to the link member **102** by a handle **107**, the stop member **106** being provided with a series of stops **106'** thereon, any one of which may be positioned in the path of the pin **104**, so that by utilizing different stops **106'**, free travel of the pin **104** and arm **99** may be varied to determine the degree of adjustment of the foot sections. It will be appreciated that if the member **106** is rotated in engaging position, as the arm **23** is rotated in a counterclockwise direction the arm **99** associated therewith will rotate downwardly until it engages the member **106**, at which point it will thereafter move the link member **102** downwardly with it, rocking the leg portion or arm **101** and with it the arm **27** in a clockwise direction to elevate the outer end of the section **12** and inner end of the section **11** of the foot sections of the mattress supporting structure as indicated in FIG. 3 in broken lines. A stop pin **106''** FIGS. 3, 5, 12 and 13, affixed to the member **106** limits the clockwise movement thereof in the setting of the stop **106'** in its engagement with the pin **104** by abutting the edge of the leg member **102**. In this position of the pin **106''** the length of the slot **105** is reduced for the minimum length of travel of the pin **104**, the maximum length of travel of the pin **104** is with the stops **106'** set at the bottom of the slot **105**, the stop member **106**, FIG. 12 and FIG. 13, being substantially at the intermediate setting thereof. Obviously as the amount of travel in the slot **105** of the link member **102** is reduced, the greater the adjustment of the foot sections.

Referring to FIG. 3 and FIG. 12 there is illustrated the adjustment of the head section **9** and the foot sections **11** and **12** with the projections of the member **29** engaging the slot **33** in the foot section **11** as illustrated in FIG. 2. In the position of the head section and foot section as shown in FIG. 12, the movable frame structure **7** has been actuated from the lowermost position thereof as shown in FIG. 2 to the elevated position such as shown in FIG. 7 upon actuation of the motor **46** and rotation of the elevating arms **35***h* and **35***f*, and with the stop member **93** rotated from its dotted position FIG. 12 counterclockwise to its solid position **93'** and also the stop member **106** set as shown in FIG. 12 so that as the motor **46** is reversed and the movable frame structure **7** lowered to the position as shown in FIG. 12, the head section **9** and the foot sections **11** and **12** will take the position as shown with the arm **27** and link member **102** taking their respective position for the adjustment of the head section **12**, and the arms **87** and **88** and connecting links **112** taking their respective positions with the lever **23** and the arm **99** thereof also in the position as shown in FIG. 12. When it is desired to return the movable frame structure **7** and its associated mattress-supporting structure **8** to the position as shown in FIG. 2, the motor **46** is again actuated raising the movable frame structure **7** so that the stop member **93** may be disengaged from its respective serration **97** and rotated to the dotted position clockwise as shown in FIG. 12 and upon lowering the movable frame structure **7** upon actuation of the motor **46**, the head section **9** and foot sections **11** and **12** will return to their position as shown in FIG. 2 and in the solid lines of FIG. 3 with the arms **27** and **23** engaging the stop members **84***f* and **84***h*. It is also evident that by adjusting the members **29** so that the projections **32** are in engagement with the other slots as shown in FIG. 2 that the foot sections **11** may be further adjusted in other positions from that as shown in FIG. 3 and FIG. 12 for any adjusted position of the leg portions **27** as determined by the setting of the stop member **106** for adjusting the length of the slot **105** of the link member **102** upon actuation of the levers **23** as determined by the setting of the stop members **93** when in engagement with the preselected serrations **97** of the members **88** when the adjusting mechanism is set as described above and the actuating mechanism is operated through the motor **46** for the adjustment of the head section **9** and the foot sections **11** and **12**.

In some cases it may be desirable to effect an adjustment of the mattress supporting sections independently of the elevating mechanism, as for example, in the event of a power failure or the like, which might prevent power actuation of the elevating mechanism. Also, in the particular embodiment of the invention illustrated, the provision of independently actuated means may be utilized for effecting an adjustment of the mattress supporting sections, when desired, either independently of or in conjunction with the section adjusting mechanism, so that any desired amount of adjustment of the mattress supporting sections may be effected at any elevation of the entire mattress supporting structure.

Such independent adjusting means is adapted to mechanically adjust the arm **23** to vary the angularity of the head section **9**, and through the link member **102** and related linkage, leg portion **101** and leg portion or arm **27**, effect an adjustment of the foot sections **11** and **12**, the relative amount of adjustment of the foot sections being dependent upon the setting of the member **106**, as heretofore described.

Referring to FIGS. 3, 5 and 6, carried by the cross member or tubular member **17** and freely rotatable there-

on is a member 108, the latter having a tubular hub 109 through which the tubular member 17 extends, axial movement of the member 108 along the tubular member 17 being restricted by a pair of spring locking rings 110, the member 108 depending downwardly from the tubular member 17 as clearly apparent from a reference to FIGS. 3, 5 and 6. Pivotally mounted at its lower end, as indicated at 111, is a connecting link 112 which is operatively connected adjacent its upper end to the arm 23 at the pivot pin 92, the link 112, however, being provided with a longitudinally extending slot 113 therein in which the pivot 92 is positioned, to permit a predetermined amount of movement between the link 112 and the member 23. The length of the link 112 and that of the slot 113 is so proportioned with respect to the effective length of the member 108 that by rotating the latter in a counterclockwise direction as viewed in FIG. 3, the link 112 will operatively engage the pivot 92 to move the arm 23 and thus either the head section or both the head and foot sections into any desired adjusted position, such adjustment depending upon the amount of rotation of the member 108. Since the arms 23 on both sides of the frame are affixed to the opposite ends of the tubular member 17 by welding, FIG. 5, and as the links 112 are operatively connected to the respective members 108 which are adapted for relative movement about the tubular member 17, the members 112 being operatively connected by their respective pivot pins 92 of the arms 23, the movement of the links 112 may therefore be accomplished by the adjustment of the respective arms 23 connected through the tubular member 17 to which they are affixed. The setting for the position of the links 112 is done by the handle 96 from either side of the bed and its associated linkage as described above.

Various types of actuating means may be employed to effect rotation of the member 108, when desired, the embodiment of the invention illustrated utilizing a rotatable screw mechanism 114, FIG. 3, which may be manually actuated by a crank or other suitable means. The actuating mechanism 114 comprises a rotatable screw 115 which is extensible from and retractable into an elongated internally threaded nut or threaded extension member 116 which is pivotally connected at its free end as indicated at 117 to the member 108. The opposite end of the screw 115 may be supported in a bearing housing 118 and may be provided at its free end with a suitable bevel gear 119 adapted to mesh with a similar driving gear 121 rigidly mounted on a drive shaft 122 extending transversely across the bed frame and supported in the side rails 16, the free ends 123 being square or otherwise suitably formed for engagement with manual actuating means such as a crank, whereby rotation of the drive shaft 122 will be transmitted through the gears 121 and 119 to the screw 115, and assuming that the rotation of the latter is in a direction to extend the same from the elongated internally threaded nut 116, such extension will rotate the member 108 in a counterclockwise direction as viewed in FIG. 3, resulting in actuation of the head section 9 to any desired adjusted position. Upon reversal of the screw, the section may be lowered to its original position.

Referring to FIG. 3 and FIG. 13, there is illustrated the mattress-supporting structure 8 in its adjusted position as adjusted manually in the similar adjusted position as shown in FIG. 12 wherein the adjustment is accomplished through the motor 46 and its associated mechanism. In the showing of FIG. 13, the actuating mechanism 114 has been adjusted from the position as shown in FIG. 3 to that of FIG. 13, the stop member 106 being set in the same position as in FIG. 12 when the mattress-supporting sections are adjusted to the position shown upon actuation of the motor 46 and its associated mechanism. Upon actuating the drive shaft 122 through the free ends of 123 when engaged with the manual actuating means such as a crank and the screw 115 is rotated to adjust it from the position as shown in FIG. 3 with the mattress-supporting structure 8 and its corresponding sections in the lowered position as shown in solid lines of FIG. 3, the head section 9 and foot sections 11 and 12 will be adjusted to the position shown in FIG. 13. When actuated as illustrated in FIG. 13, the threaded extension member 116 is adjusted and rotates the member 108 counterclockwise to the position shown which in turn actuates the link 112 to move the arm 23 adjusting the head section 9. The movement of the arm 23 to which the arm 99 is integrally affixed rotates the arm 99 in a counterclockwise direction and the pin 104 moving in the slot 105 of the link member 102 engages the preselected stop 106' in the position of the stop member 106 as shown in FIG. 13 rotating the arm 27 in a clockwise position adjusting the foot sections 11 and 12 as shown in FIG. 13. the foot section 11 having the projections 32 of the member 29 in engagement with the slot 33 as shown. It is to be understood that with the member 29 positioned in any of the other slots 33 that the relative positions of the foot sections 11 and 12 would be different for such adjustment. With the manual adjustment of the mattress-supporting structure as shown in FIG. 13, the arm 87 is extensible to the position shown with the extensible portion 87' providing a lost motion connection. The spring 124 normally biases the extensible member 87' in its closed position, for example, as shown in FIG. 12 and in the dotted position of FIG. 3. In these positions the stop member 93 is disengaged from the serrations 97 and is preferably returned to the dotted position 93, for example, as shown in FIG. 3 and in FIG. 12.

In order to return the foot sections 11 and 12 and the head section 9 of the mattress-supporting structure 8, the screw 115 is returned to the position as shown in FIG. 3 and FIG. 12 returning the threaded extension member 116 also to the position as shown in FIG. 3 and FIG. 12 rotating the member 108 in a clockwise position so that the arms 27 and the levers 23 engage the stop members 84*f* and 84*h* in the position as shown in FIG. 2, FIG. 12 and FIG. 13 so that the mattress-supporting structure 8 is returned to its horizontal position.

It is to be understood that with the manual adjustment, the head section and foot section of the mattress-supporting structure 8 may be manually adjusted in positions corresponding to the adjustment of the foot section as permitted by the engagement of the projections 32 of the members 29 in the sets of slots 33 as illustrated in FIG. 2 and the foot section 12 may also be adjusted upon movement of the arm 23 in any of its adjusted positions corresponding to the setting of the stop member 106 to permit the preselected stop 106' to engage the pin 104 of the arm 29 as the pin 104 moves within the slot 105 when the length thereof is adjusted by the stop member 106 and the foot sections 11 and 12 will take positions corresponding to the adjustments thereof as preselected.

It is to be understood that the manual adjustment of the head section and foot section of the mattress-supporting structure 8 although shown, for example, in FIG. 13 in the maximum raised position of the movable frame structure 7 is equally adapted for similar adjustments in the lowermost position of the movable frame structure 7, for example, as shown in FIG. 2, FIG. 3 and FIG. 12 and also in any intermediate positions of the movable frame structure 7 between the lowermost and uppermost range of movement thereof.

It is also to be understood that it is within the scope of the invention that upon power failure as briefly described above, the screw mechanism 114 through a crank providing the manual actuating means connected to one of the free ends 123 of the drive shaft 122, when for example the mattress-supporting structure is in position as shown in FIG. 12 when actuated by the motor 46 may be lowered to the position shown in FIG. 2 by the actuation of the threaded extension member 116 to the adjusted position as shown in FIG. 13 so that the lower end of the slot 113 engages the pivot 92 and the members 87 and 88 may be sufficiently changed from their positions, for

example, as shown in FIG. 12 to permit the stop member **93** to be disengaged from its solid position **93'** from the serrations **97** and then returned to its dotted position **93**, FIG. 12, after which the rotation of the screw **115** to change the position of the threaded extension member **116** from the position of FIG. 13 to that of FIG. 2 and FIG. 3, the members **87** and **88** taking the position as shown in FIG. 3 and with the arm **27** and the arm **23** engaging the stop **84***f* and stop **84***h* respectively with the mattress-supporting structure **8** returned to the horizontal position of FIG. 2.

It will be noted that the slot **113** is preferably of a sufficient length to permit normal movement of the arm **23** about its pivot under adjusting movements resulting from the vertical movement of the movable frame structure, as previously described, and at the same time provide adjustment of the head section when desired. Obviously adjustment of the foot sections **11** and **12** may be readily effected when adjustment is being accomplished manually, in the same manner as heretofore described under the power adjustments.

To enable the adjustment of the foot sections from either side of the bed the stop members **106** and handles **107** at opposite sides of the bed may be operatively connected by a suitable member such as the rod **107'** rigidly secured adjacent its ends to the respective members **106**, so that operation of either handle **107** will adjust both members **106**.

To prevent possible damage to the elevating mechanism by overrunning the mechanism at the upper and lower limits of travel of the movable frame, limit switches or the like may be provided. Referring to FIG. 1, a suitable bracket arm **127** may be mounted on one of the movable members, as for example, on the connecting arm **57***h*, the bracket having an extension **128** which terminates in a projection **129** adapted to engage a limit switch **131** when the structure is in a lowered position, and engage a similar switch **132** at the extreme elevated position. The switches may be so arranged in the electrical circuit to the motor **46** that the one switch will shut off the motor at the lower position and permit the motor to run only in a reverse direction for elevating the structure and the other switch will perform a corresponding function at the opposite end of the travel. In some cases it may be desired to manually adjust the head section to its maximum angular adjustment, while the movable frame structure **7** is at maximum elevation, in which case the members **87** and **88** may tend to restrict maximum adjustment. Such maximum adjustment without interference of the members **87** and **88** may be readily achieved by making the member **87** extensible as illustrated in dotted lines in FIG. 3 and particularly in the showing of FIG. 13, corresponding to its adjustment when the mattress-supporting structure **8** is manually adjusted as shown and with the movable frame structure **7** adjusted to its maximum elevation, FIG. 7, from its lowermost position, FIG. 2, FIG. 3 and FIG. 12, in which case the pivot **89** is on one section and pivot **92** is on the other section, with the two sections being telescoped one within the other and normally held in retracted position by suitable means, as for example, a tension spring **124** having its opposite end secured to the respective sections. It will be appreciated that the member **87** during power or automatic operation is under compression forces and will therefore function satisfactorily when the two sections of the member are in their retracted positions, enabling full compression stresses to be placed on the member. However, when the mattress supporting sections are manually adjusted by the screw mechanism **114**, in the event the manual adjustment exceeds that which would normally take place under power operation, the sections of the member **87** are free to extend in opposition to the relatively light forces exerted by the spring **124** and when the sections are returned to their original positions the spring **124** will retract the two sections to their original positions.

Referring to FIGS. 12 and 13, the member **87** includes a telescopic portion **87'** wherein both parts are in compression under the bias of the spring **124**, FIG. 12, but in the manually adjusted position of the head section as shown in FIG. 13 the telescoping portion **87'** of the member **87** adjusts to the position shown in opposition to the relatively light force exerted by the spring **124**. Upon the actuation of the adjusting screw **115** to return the mattress-supporting structure **8** from its adjusted position in FIG. 13 to its horizontal position of FIG. 2, FIG. 3, the spring **124** biases the telescoping portion **87'** of the member **87** to the dotted position of FIG. 3. When the elevating mechanism is utilized as described with reference to FIG. 12, the member **87** is always in compression in any of the adjusted positions of the member **88** with the stop member **93** engaging any one of the serrations **97** and with the spring **124** also biasing the telescoping portions **87'** within the member **87**.

In some cases it may be desired that adjustment of the handle **68** and wing nuts **78**, for controlling tilting of the mattress supporting structure with respect to the horizontal as illustrated in FIG. 8 be limited to the lowermost position of the movable frame and mattress supporting structure to eliminate any possibility of tampering therewith when the mattress supporting structure is in an elevated position. Referring to FIG. 8, the side rails **4** may each be provided with a skirt or shield **125** which depends below the side rail as will be apparent from a reference to FIG. 3, and may be suitably formed and attached to the rail by any convenient means. Each shield **125** may be provided with a suitable opening or notch **126** opposite the handles **68** and wing nuts **78** when the movable frame and mattress supporting structures are in fully lowered position. However, upon the application of power in a direction to elevate the bed structure, the connecting arms **57***f* and **57***h* will move behind the shield **125**, preventing actuation of the handles **68** and wing nuts **78**, other than when the structure is in its fully lowered position.

It will be appreciated from the above description that while I have illustrated the adjustment of the sections taking place when the bed is being lowered from an elevated position, if desired the adjustment could be designed to take place while the bed is being elevated, as for example, by restraining the arm **99** adjacent the pivot **104** with respect to a stationary part of the bed structure, which would result in rotation of the arm **23** in a counterclockwise direction as the movable frame structure is elevated, causing adjustment of the head section, and if desired, the foot sections. Likewise in connection with the latter, instead of the stop member **106** in compression and forming the stop for the pin **104**, the arm **102** may be provided with suitable means such as hook-like projections, providing an adjustable connection between the arm and the pin **104**.

It will also be appreciated that the linkages utilized in adjusting the various sections may be so proportioned that adjustment may take place at any desired point along the vertical movement of the movable frame structure. Thus, for example, in the construction illustrated, the linkage could be so designed that the adjusting movement of the sections takes place during the lower half of the vertical movement of the movable frame structure, or during some other portion of such vertical movement.

Likewise while I have illustrated the use of two screws **52**, one at each side of the bed, it might be desirable in some cases to employ only a single screw and a yoke arrangement operatively connecting the single screw with the corresponding ends of the connecting arms **57***h* and **57***f*. Similarly, it may be desired to make the manual adjusting structure with only a single screw **114** and a suitable yoke to operatively connect the single screw with both members **108**. Also in some cases it may be desired

to actuate the manual mechanism by power, as for example, a separate motor or suitable clutch mechanisms wth the motor 46, whereby the angular adjustment of the mattress supporting structure may be independent of the elevating structure.

It will be noted from the above description that I have provided a comparatively simple adjustable bed structure which provided both power elevation of the mattress supporting structure and power adjustment of the head and foot sections, at the same time providing means for effecting additional or equivalent adjustment of the head and foot sections by manual operation. The present invention also enables various adjustments of the foot sections with respect to the head section and provides means for tilting the entire mattress supporting structure either forwardly or rearwardly while the mattress supporting sections lie in a comomn plane. It will further be noted that the invention provides means for effecting such tilting adjustment only when the mattress supporting structure is in its fully lowered position, eliminating the possibility of undesired actuation of the structure when it is in an elevated position.

Having thus described my invention, it will be obvious to those skilled in the art from the disclosure herein given that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

I claim:

1. An adjustable bed comprising a relatively fixed frame structure, a movable frame structure, a mattress-supporting structure operatively associated with said movable frame structure and vertically movable relative to said fixed frame structure, means including levers pivotally connected to the movable frame structure and operatively connected to said mattress-supporting structure and pivotal arms contiguous to the head and foot ends of the bed and operatively connected to the fixed frame structure at the head and foot ends of the movable frame structure and operatively related to said fixed frame structure and movable frame structure for effecting vertical movement of the mattress-supporting structure relative to said fixed frame structure, linkage means including adjustable means operatively related to said first-mentioned means for varying the elevation of one end of the mattress-supporting structure relative to the other end thereof, and shield means associated with said fixed frame structure for restricting actuation of said adjustable means of said linkage means when the mattress-supporting structure is in an elevated position.

2. An adjustable bed including a relatively fixed frame structure having floor engaging elements, and including spaced stationary side rails, comprising a normally horizontal mattress-supporting structure including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a movable frame structure having spaced longitudinally extending side members, said mattress supporting structure being operatively supported by said movable frame structure, a plurality of levers, each similarly pivoted to said fixed frame structure adjacent a respective corner of the bed, a corresponding end of each lever being operatively connected to the movable frame structure whereby simultaneous movement of said levers through a similarly disposed arc is operative to raise or lower the latter, motor driven screw means, connecting arms including means for adjusting the length thereof operatively connecting said motor driven screw means with each lever, and stop means operatively related to said head section and one of said foot sections, whereby the head section and one of said foot sections may be adjusted into angular positions relative to the horizontal.

3. An adjustable bed comprising a normally horizontal mattress-supporting structure including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress-supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a relative fixed frame structure having floor engaging elements, and including spaced stationary side rails, a movable frame structure having spaced longitudinally extending side members, said mattress-supporting structure being operatively supported by said movable frame structure, a plurality of L-shaped levers, each similarly pivoted adjacent its apex to said fixed frame structure adjacent a respective corner of the bed, a corresponding arm of each lever extending in the same direction relative to its pivot and operatively connected to the movable frame structure whereby movement of said levers is operative to raise or lower the latter, a motor driven screw positioned at each side of the bed, a traveling nut on each screw and connecting arms including adjustable members and means for locking said adjustable members upon adjustment operatively connecting the other arm of the levers at each side of the bed with the nut thereat.

4. An adjustable bed including a relatively fixed frame structure having floor-engaging elements and spaced stationary side rails, comprising normally horizontal mattress-supporting structure operatively related to said fixed frame structure and including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress-supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a movable frame structure including spaced longitudinally extending side members and operatively mounted on said fixed frame structure, said mattress-supporting structure being operatively supported by said movable frame structure, power operated means operatively mounted on said fixed frame structure and operatively connected to said movable frame structure for raising or lowering the movable frame structure, an arm adjacent each side of and pivotally carried by the movable frame structure for adjusting said movable head section, one end of each of said arms being operatively related to the head section whereby movement of the arms is transmitted to the head section for adjusting the latter, means for actuating said arms during movement in a vertical plane of said movable frame structure and operative to effect movement of said arms and adjustment of said movable head section, a rotatable adjusting screw carried by said movable frame structure, a threaded extension member carried by and movable along said screw, a downwardly depending member pivotally carried by said movable frame structure and operatively connected to the threaded extension member whereby rotation of said adjusting screw is operative to pivotally move said downwardly extending member, and means operatively connecting downwardly extending member to one of said arms for effecting movement of said arm for adjusting said section operatively connected to said arm.

5. An adjustable bed including a relatively fixed frame structure having floor engaging elements and spaced stationary side rails, comprising a normally horizontal mattress-supporting structure operatively related to said fixed frame structure and including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress-supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a movable frame structure including spaced longitudinally extending side members and operatively mounted on said fixed frame

structure, said mattress-supporting structure being operatively supported by said movable frame structure, a plurality of L-shaped levers, each similarly pivoted adjacent its apex to said fixed frame structure adjacent a respective corner of the bed, a corresponding long leg of each L-shaped lever being operatively connected to the movable frame structure whereby movement of said L-shaped levers is operative to raise or lower the latter, motor driven screw means, links operatively connecting said screw means with the other short leg of each L-shaped lever, an arm adjacent each side of and pivotally carried by the movable frame structure, one end of each of said last-mentioned arms being operatively related to the head section whereby movement of said arms is transmitted to the head section for adjusting the head section, linkage mean operatively connecting each of said last-mentioned arms and the fixed frame structure, and operator-operated stop means operatively mounted on said fixed frame structure and operatively associated with said linkage means for operatively restricting normal movement of said linkage means during movement in a vertical plane of said movable frame structure, operative to effect movement of said arms and adjustment of said head section.

6. An adjustable bed as defined in claim 5, including pivoted arms operatively related to said foot sections, and connecting means for adjustably connecting said last-mentioned pivoted arms to said first-mentioned arms adjacent each side of and pivotally carried by the movable frame structure, whereby said head and foot sections may be simultaneously adjusted.

7. An adjustable bed as defined in claim 6, wherein the pivoted arms related to the foot sections are L-shaped, one leg portion of each such L-shaped pivoted arm being engageable with one of the foot sections and the other leg portion thereof being operatively connected by a link member to an extension carried by its respective arm for the head section and adjacent each side of and pivotally carried by the movable frame section, whereby movement of the arms is transmitted to said L-shaped pivoted arms operative to provide simultaneous adjustment of both head and foot sections, said last-mentioned link member complementally formed with a sliding connection to the aforesaid extension for adjustment to vary the length of travel of the L-shaped pivoted arms and the adjustment of the foot sections, for a predetermined adjustment of the head section.

8. An adjustable bed including a relatively fixed frame structure having floor engaging elements and spaced stationary side rails, comprising a normally horizontally mattress-supporting structure including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress-supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a movable frame structure including spaced longitudinally extending side members and operatively mounted on said fixed frame structure, said mattress-supporting structure being operatively supported by said movable frame structure, power means operatively mounted on said fixed frame structure and operatively connected to said movable frame structure for raising or lowering the movable frame structure, an arm adjacent each side of and pivotally carried by the movable frame structure for adjusting said movable head section, one end of each of said arms being operatively related to the head section whereby movement of the arms is transmitted to the head section for adjusting the latter, linkage means operatively connecting each of said last-mentioned arms and the fixed frame structure, and operator-operated stop means operatively mounted on said fixed frame structure and operatively associated with said linkage means for effecting an adjusting movement of said linkage during movement in a vertical plane of said movable frame structure, operative to effect movement of said arm and adjustment of said head section.

9. An adjustable bed comprising a mattress-supporting structure divided into a plurality of sections, at least one of which is relatively movable into an angular position with respect to the horizontal, including movable head and foot sections and an intermediate section, a relatively fixed frame structure, a movable frame structure vertically movable relative to said fixed frame structure, said intermediate section being supported by and movable with said movable frame structure, said head and foot sections being arranged for pivotal movement relative to said movable frame structure, means for effecting movement of said head and foot sections relative to said movable frame structure upon relative movement between said fixed and movable frame structure, said means for effecting movement of said head and foot sections comprising connecting linkage including levers pivotally connected to the movable frame structure and operatively connected to said mattress-supporting structure and pivotal arms contiguous to the head and foot ends of the bed and operatively connected to the fixed frame structure at the head and foot ends of the movable frame structure and operatively associated with said levers, operator-operated stop means operatively mounted on said fixed frame structure and operatively associated with said levers for effecting adjustment of one of said foot sections and head sections upon relative movement between said fixed and movable frame structures, means for effecting movement of said sections when said movable frame structure is stationary, and said means for effecting movement of said head and foot sections relative to said movable frame structure and said means for effecting movement of said sections when said movable frame structure is stationary, operatively connected together permitting movement of said head and foot sections relative to said movable frame section.

10. An adjustable bed comprising a normally horizontal mattress-supporting structure divided into a plurality of sections, at least one of which is relatively movable into an angular position with respect to the horizontal, including movable head and foot sections and an intermediate section, a relatively fixed frame structure having spaced longitudinally extending side members, a movable frame structure, said mattress-supporting structure being operatively supported by said movable frame structure, a plurality of movable members operatively related to the stationary and movable frame structures and including levers pivotally connected to the movable frame structure and operatively connected to said mattress-supporting structure and pivotal arms contiguous to the head and foot of the bed operatively connected to the fixed frame structure at the head and foot ends of the bed and operatively connected to the head and foot ends of the movable frame structure, movement of said members being operative to raise and lower the movable frame structure and mattress-supporting structure, power means, linkage means operatively connecting said power means and said movable members, elements of said linkage being selectively adjustable to vary the effective travel thereof and thus vary the elevation of one end of the movable frame structure with respect to the other end thereof, and operator-operated stop means operatively mounted on said fixed frame structure and operatively associated with said levers for effecting adjustment of one of said foot sections and head section upon relative movement between said fixed and movable frame structure.

11. An adjustable bed comprising a normally horizontal mattress-supporting structure divided into a plurality of sections, at least one of which is relatively movable into an angular position with respect to the horizontal, a relatively fixed frame structure having spaced longitudinally extending side members, a movable frame structure, said mattress-supporting structure being operatively supported by said movable frame structure, simultanously actuated means comprising connecting linkage including levers piv-

otally connected to the movable frame structure and operatively connected to said mattress-supporting structure and pivotal arms contiguous to the head and foot ends of the bed and operatively connected to the fixed frame structure at the head and foot ends of the movable frame structure for vertically moving said mattress-supporting structure with said sections lying in a common plane, and adjusting means operatively related to the aforesaid simultaneously actuated means for varying the action of the latter, whereby one end of said mattress-supporting structure will move vertically a greater distance than the other end thereof to tilt the plane of said mattress-supporting structure with respect to the horizontal.

12. An adjustable bed as defined in claim 11, wherein said simultaneously actuated means for vertically moving the mattress-supporting structure includes power means, said power means including said adjusting means comprising adjustable sections and said connecting linkage operatively related to the mattress-supporting structure and to the power means, said adjustable sections operatively related to said connecting linkage and being adjustable to vary the travel of one end of the mattress-supporting structure relative to the other, and releasable means including a latch member and complementally formed means for locking said adjustable sections of said operatively related connecting linkage in their adjusted positions.

13. An adjustable bed including a relatively fixed frame structure having floor engaging elements and spaced stationary side rails, comprising a normally horizontal mattress-supporting structure including a movable head section and a pair of foot sections, said sections being movable relative to one another into angular positions relative to the horizontal, each of the sections of said mattress-supporting structure being pivoted to adjacent sections on horizontally extending parallel axes, a movable frame structure including spaced longitudinally extending side members and operatively mounted on said fixed frame structure, said mattress-supporting structure being operatively supported by said movable frame structure, power means operatively mounted on said fixed frame structure and operatively connected to said movable frame structure for raising or lowering the movable frame structure, an arm adjacent each side of and pivotally carried by the movable frame structure for adjusting said movable head section, one end of each of said arms being operatively related to the head section whereby movement of the arms is transmitted to the head section for adjusting the latter, linkage means operatively connecting each of said last-mentioned arms and the fixed frame structure, and operator-operated stop means operatively mounted on said fixed frame structure and operatively associated with said linkage means for effecting an adjusting movement of said linkage during movement in a vertical plane of said movable frame structure, operative to effect movement of said arm and adjustment of said head section, pivoted arms operatively related to said foot sections, and connecting means for adjustably connecting said last-mentioned pivoted arms to said first-mentioned adjusting arms adjacent each side of and pivotally carried by the movable frame structure, whereby said head and foot sections may be simultaneously adjusted.

14. An adjustable bed as defined in claim 13, wherein the pivoted arms related to the foot sections are L-shaped, one leg portion of each L-shaped pivoted arm being engageable with one of the foot sections and the connecting means therefor including the other leg portion of such L-shaped arms, said last-mentioned leg portions being operatively connected by a link member to an extension carried by its respective arm adjacent each side of and pivotally carried by the movable frame structure, whereby movement of the arms is transmitted to said L-shaped pivoted arms operative to provide simultaneous adjustment of both head and foot sections, said last-mentioned link member including lost-motion means operatively connected to said extension for adjustment to vary the length of travel of the L-shaped pivoted arms, and the adjustment of the foot sections, for a predetermined adjustment of the head section.

15. An adjustable bed as defined in claim 14, wherein said lost-motion means comprises a pin operatively mounted on said extension, and operator-operated stop means including a series of stops operatively connected to said link member and power means, whereby any one of said stops may be positioned in the path of the aforesaid pin, so that by utilizing different stops, free travel of the pin and extension may be varied to determine the degree of adjustment of the foot sections.

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