Sept. 29, 1942. A. LAUKHUFF 2,297,105

HOSPITAL BED

Filed Aug. 3, 1940 6 Sheets-Sheet 1

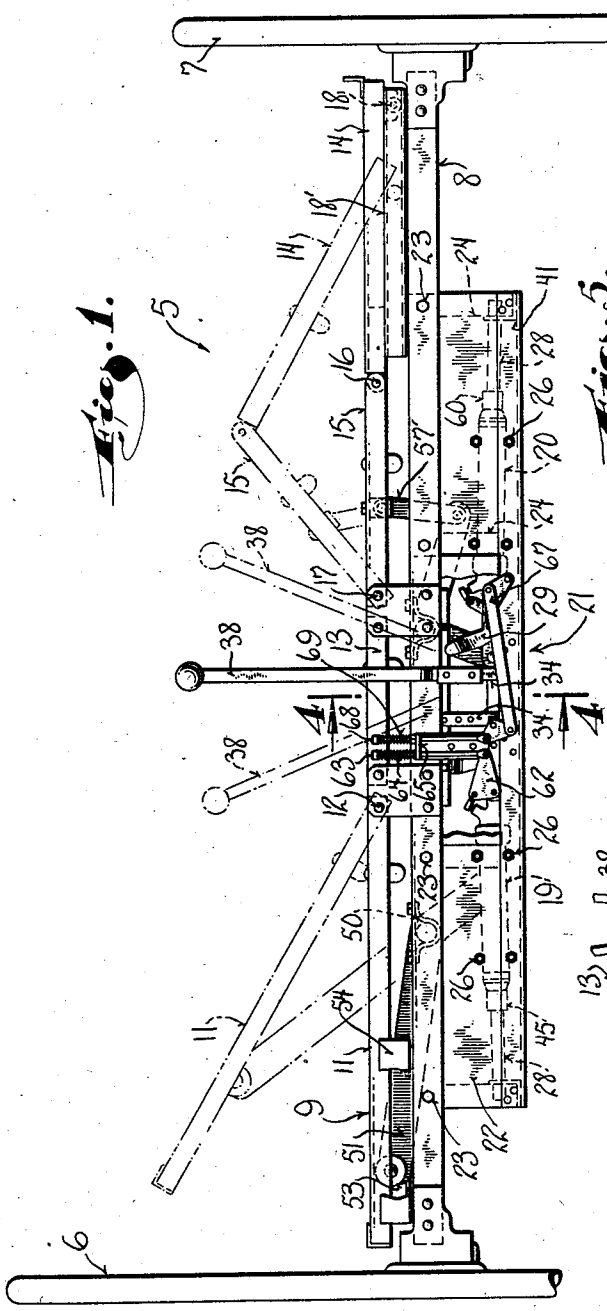

Fig. 1.

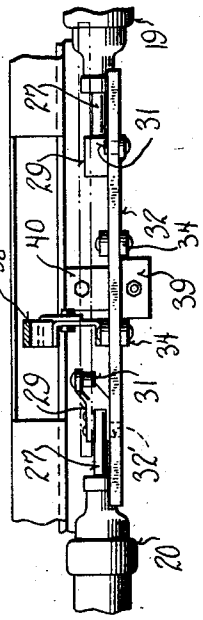

Fig. 3.

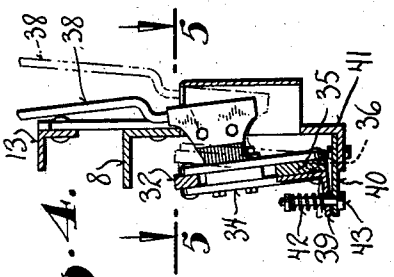

Fig. 4.

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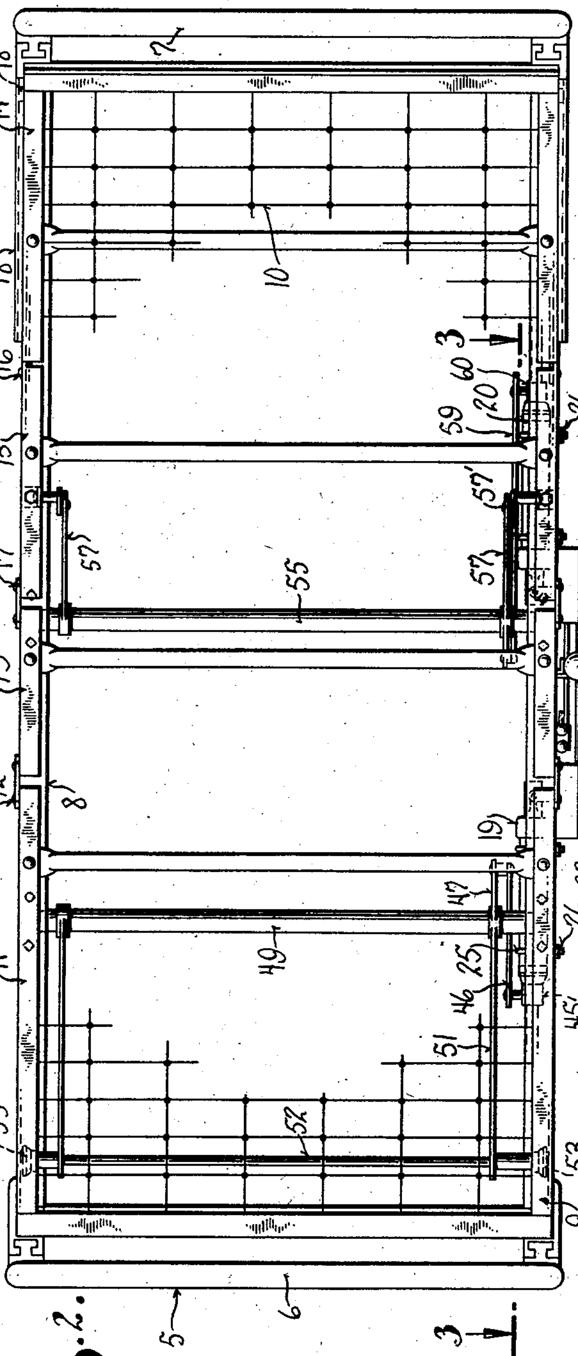

Fig. 2.

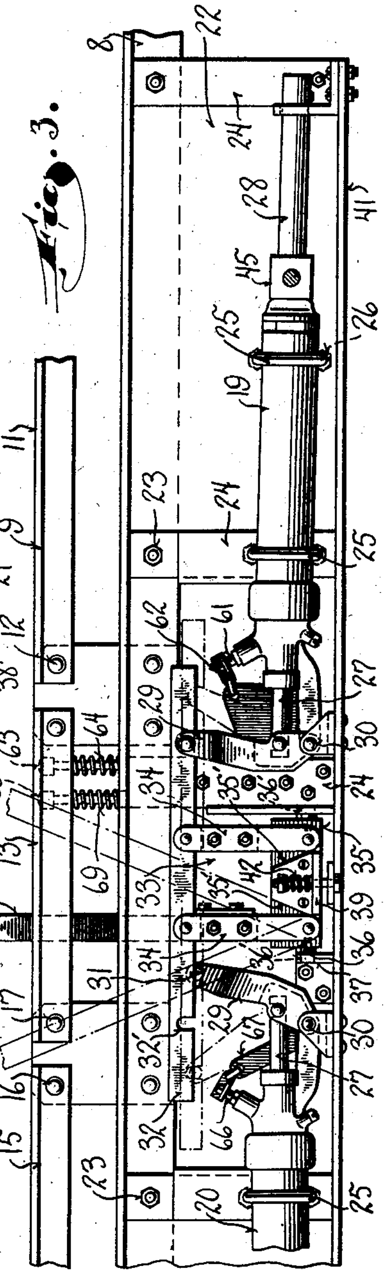

Fig. 3.

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Fig. 6.

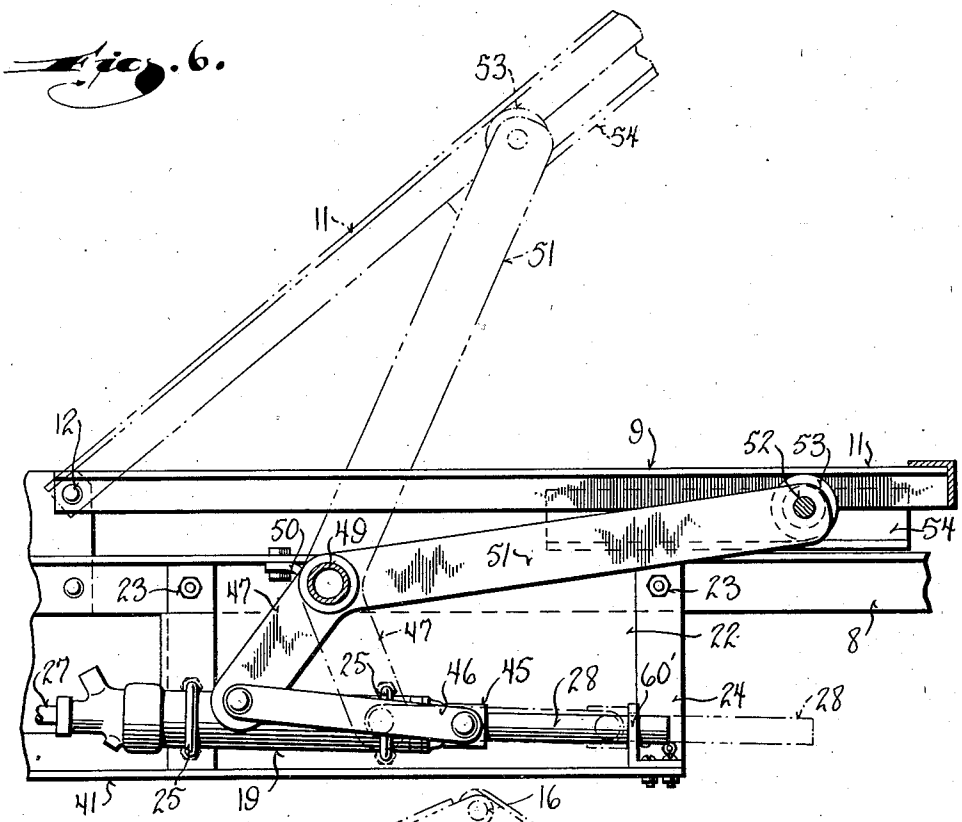
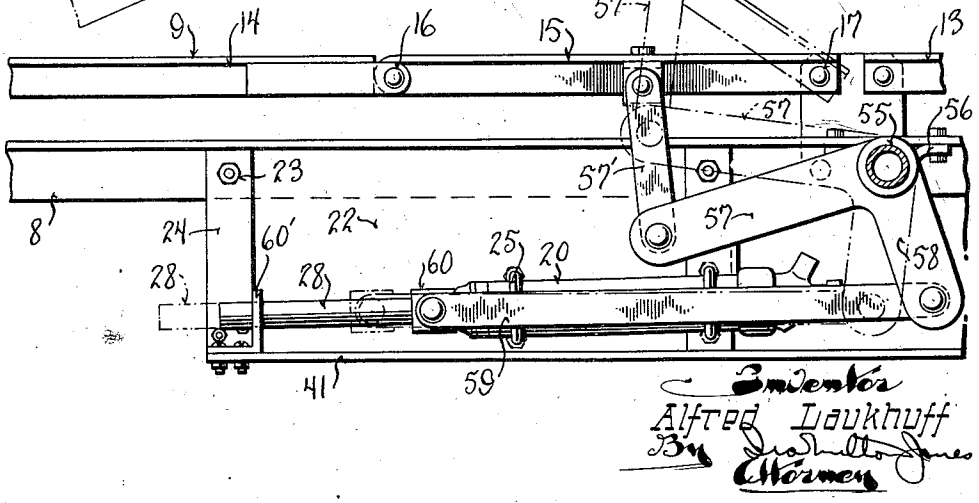


Fig. 7.



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HOSPITAL BED

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Fig. 8.

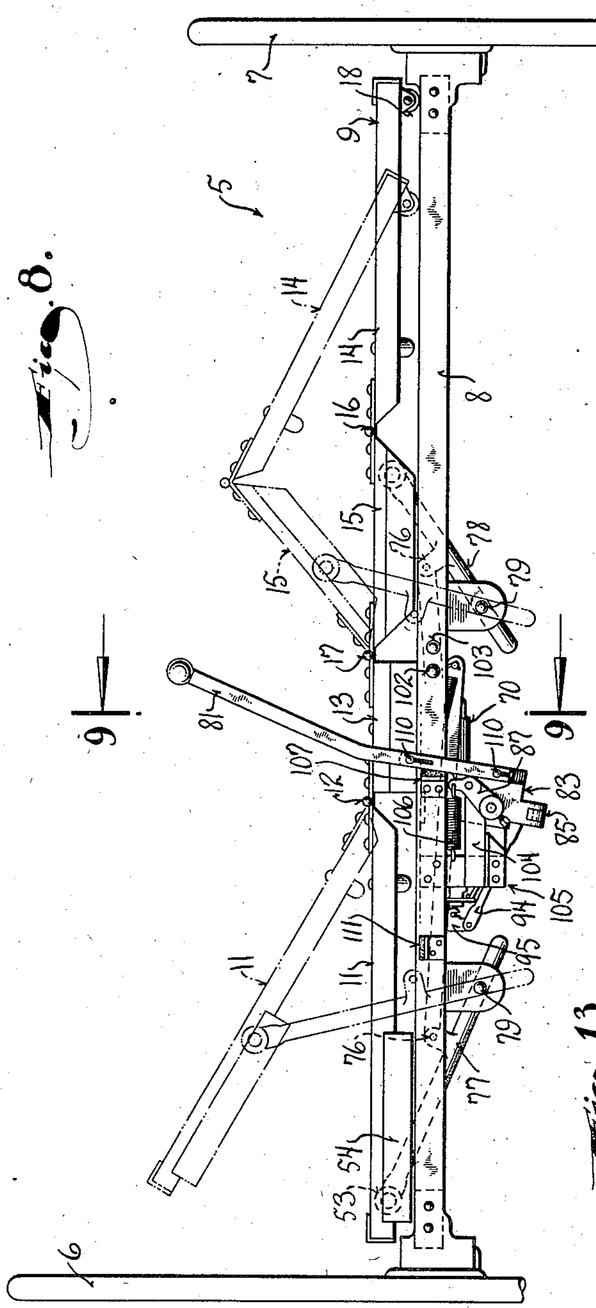


Fig. 14.

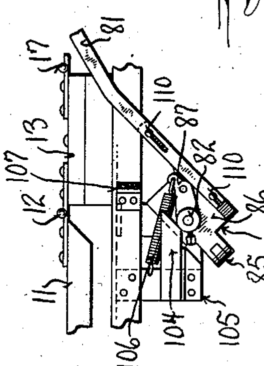
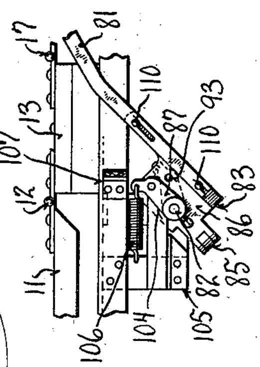


Fig. 13.



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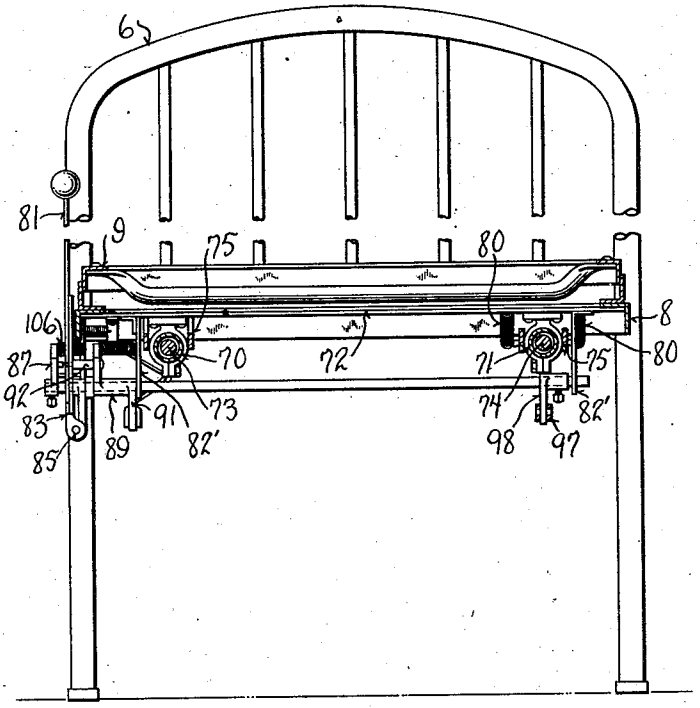

Fig. 9.

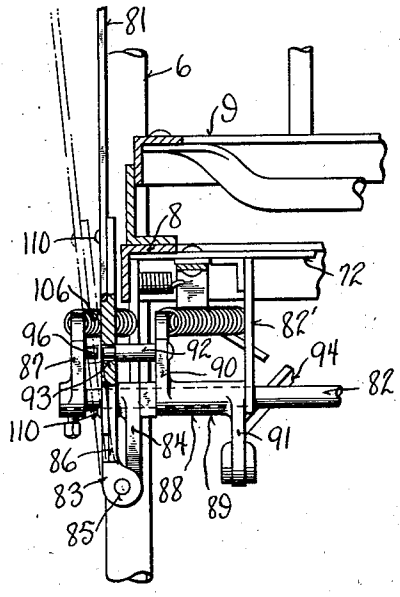

Fig. 10.

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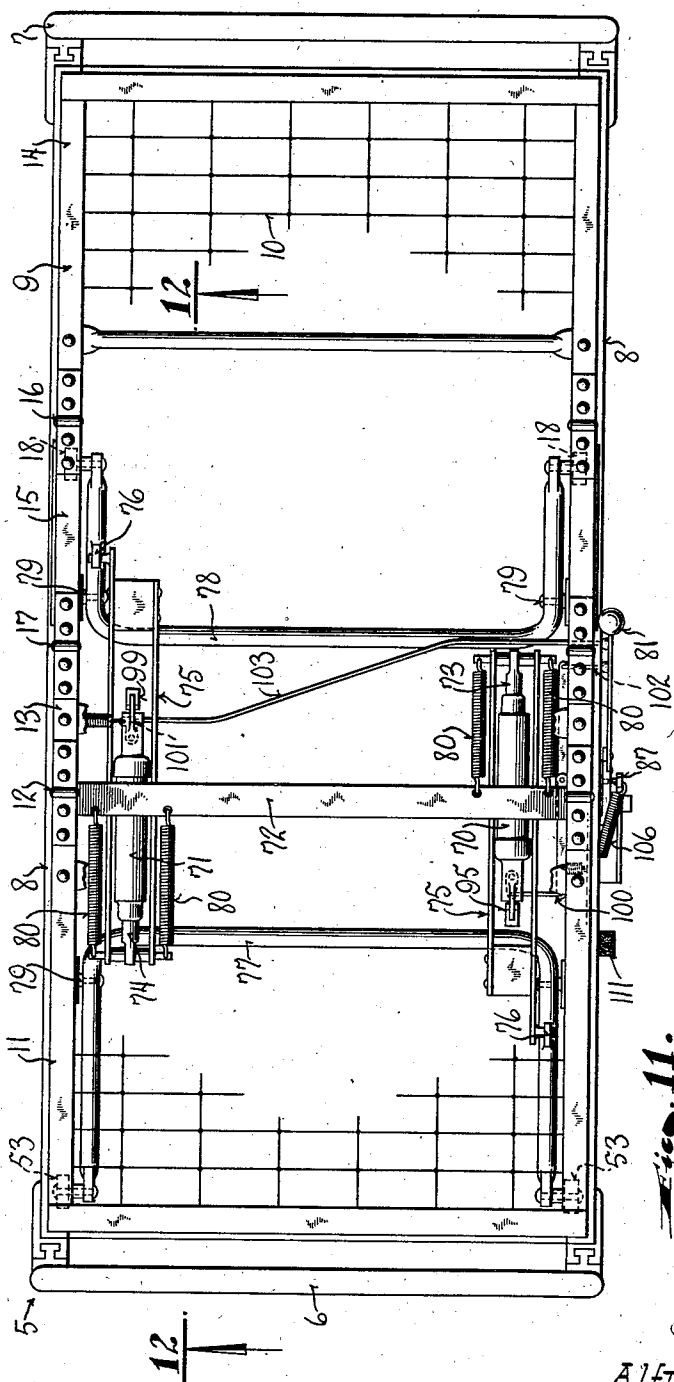

Fig. 11.

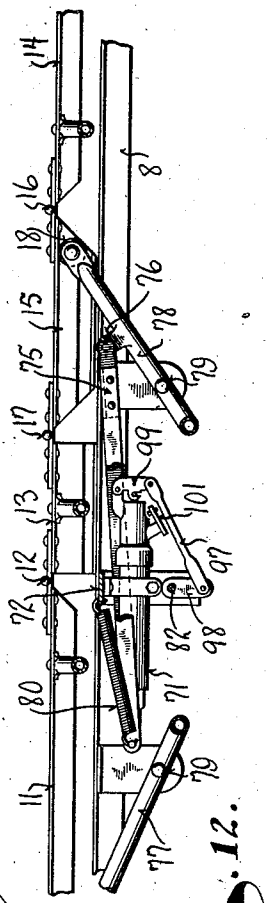

Fig. 12.

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Patented Sept. 29, 1942 2,297,105

UNITED STATES PATENT OFFICE

2,297,105

HOSPITAL BED

Alfred Laukhuff, Milwaukee, Wis., assignor to Will Ross, Inc., Milwaukee, Wis., a corporation of Wisconsin

Application August 3, 1940, Serial No. 350,253

12 Claims. (Cl. 5—69)

This invention relates to improvements in beds and refers particularly to hospital beds.

A late design of hospital bed employs articulated mattress supporting spring sections which permit adjustment of the bed bottom to a reclining chair-like shape supporting the back of a patient at an inclination, and holding the legs of the patient elevated by supporting the same under the knees.

In the past, elevation of the spring sections to their inclined positions was effected either by an attendant manually lifting the sections, or through actuation of a screw directly driven by means of a manually operated crank or its equivalent. In either event the services of an attendant was required.

The present invention seeks to eliminate the necessity for the services of an attendant when the patient desires that the spring sections of the bed be raised to their elevated positions.

It is, therefore, an object of this invention to provide a hospital bed of the character described with mechanism for elevating the spring sections, which is so designed that it may be easily and efficiently operated by the patient himself.

Inasmuch as any actuating mechanism which is designed for operation by the patient himself must be easily operated and effect elevation and descent of the spring sections with a smooth and gradual motion, with especial attention given to the elimination of objectionable vibrations, it is another object of this invention to provide fluid pressure responsive means for raising and lowering the spring sections of the bed which may be operated by a light pressure, capable of application by even a very weak patient.

In this respect, it is another object of this invention to provide separate hydraulic lifting means for each section of the bed which are easily and selectively operated by a single operating lever accessible to a patient on the bed.

Still another object of this invention is to provide hydraulic control mechanism for elevating the hinged spring sections of a hospital bed which is of unitary construction and which is readily attached to any bed having hinged spring sections.

A further object of this invention is to provide hydraulic control mechanism for elevating the spring sections of a bed of the character described, which is compact in design so as to occupy a minimum of space on the bed.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate two complete examples of the physical embodiment of the invention constructed in accordance with the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side view of a bed constructed in accordance with the preferred form of this invention;

Figure 2 is a top plan view of the bed shown in Figure 1;

Figure 3 is an enlarged detail view of the operating mechanism for the bed taken through Figure 2 on the plane of the line 3—3;

Figure 4 is a cross-sectional view taken through Figure 1 on the plane of the line 4—4;

Figure 5 is a detail sectional view taken through Figure 4 on the plane of the line 5—5;

Figure 6 is a detail view illustrating the connection between one of the hydraulic jacks and the back rest spring section of the bed;

Figure 7 is a view similar to Figure 6 illustrating the manner in which the leg rest section is connected to the other of the hydraulic jacks;

Figure 8 is a view similar to Figure 1 illustrating a modified form of the invention;

Figure 9 is a cross-sectional view taken through Figure 8 on the plane of the line 9—9;

Figure 10 is an enlarged sectional view of the operating mechanism illustrated in Figure 9;

Figure 11 is a top plan view of the bed illustrated in Figure 8;

Figure 12 is a view taken through Figure 11 on the plane of the line 12—12; and

Figures 13 and 14 are fragmentary views illustrating details of mechanism shown in Figure 8.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts, the numeral 5 designates a bed having a rigid frame or bedstead including upright head and foot sections 6 and 7, respectively and side rails 8 rigidly connecting the head and foot sections.

On the rigid frame structure of the bed and resting on the side rails 8 is an articulated mattress-supporting spring indicated generally by the numeral 9. As is usual, the mattress-supporting spring comprises the conventional webbing 10 stretched between and anchored to a

boundary frame with which the spring is provided.

The spring is divided into a plurality of transversely hingedly-connected sections providing a back supporting section 11 at the head end of the bed, hingedly connected as at 12 to opposite short stationary medial sections 13 rigidly secured to the opposite side rails 8, and two leg-supporting sections 14 and 15 at the foot end of the bed, hingedly connected to each other as at 16. The end of the leg supporting section 15 opposite its hinge connection to the section 14 is hingedly connected as at 17 to the medial or stationary sections 13 of the mattress support.

The under side of the free end of the leg section 14 is provided with rollers 18 which are guided for travel in channel-shaped members 18' secured to the opposite side rails 8 at the foot end of the bed. The free end of the leg section is thus supported and guided during elevation and descent of the same.

Heretofore, each of the spring sections had to be raised to their elevated positions illustrated in construction lines in Figure 1 by an attendant, and so held by setting a suitable support between the sections and the side rails of the bed. Screw propelled mechanisms were sometimes provided to raise the sections, and in such constructions the friction in the screw actuating mechanism served to retain the sections in their elevated positions. In either event, however, the services of an attendant were required to effect elevation and descent of the sections.

The present invention, through the use of easily and separately operated hydraulic jacks 19 and 20 for the back rest and leg rest sections respectively overcomes the objections to the use of such past constructions by enabling the patient to effect raising and lowering of the sections whenever he so desires.

The hydraulic jacks 19 and 20 form a part of the control mechanism indicated generally as at 21 and which is capable of being attached to the supporting structure such as the side rails of the bed as a compact unit. For this purpose, all the control mechanism including the hydraulic jacks is carried by a single elongated mounting or supporting member 22 adapted to be suspended from one of the rigid side rails by means of bolts 23 passing through rigid uprights 24 on the mounting member and the vertical flange of the side rail.

The hydraulic jacks are positioned at the inside of the mounting member and secured thereto by means of U bolts 25 embracing the outer shells of the jacks and tightened to the mounting member by means of nuts 26 threaded on their free ends which project through the mounting member. The U bolts preferably hold the hydraulic jacks in a substantially horizontal position and in end to end and spaced-apart relationship so that the plunger ends of the jacks are adjacent to each other. It will be apparent, therefore, that a minimum amount of space beneath the bed is required by mounting the jacks in this manner.

The jacks have reciprocable plungers 27 at their adjacent ends and rams 28 projecting from their remote ends to be movable outwardly of the jack housings upon reciprocation of their respective plungers. Each of the plungers 27 has an actuating lever 29 connected thereto which is pivotally supported at its lower end from the mounting member as at 30 and has its free upper end portion provided with a horizontally extending stud 31.

The actuating levers are of such shape as to hold their respective studs 31 at opposite sides of and facing a substantially-vertical plane parallel to the side rail of the bed as is clearly seen in Figure 5. Disposition of the studs in this manner enables selective reciprocation of the plungers of the jacks in a manner now about to be described.

For the purpose of selectively imparting pivotal motion to the plunger actuating levers and consequent reciprocation of the plungers connected thereto, a connector bar 32 is provided having a length sufficient to span the space between the jacks. The connector bar is mounted in a substantially horizontal position above the jack plungers for movement in an endwise direction parallel to the axes of the jacks by means of a parallelogram linkage 33 of which the connector bar forms a part. The medial portion of the connector bar has one end of each of the upright parallel links 34 pivotally connected thereto, which links form the sides of the parallelogram and which have their opposite ends pivotally connected to a pivot block 35 opposite the connector bar and forming the fourth side of the parallelogram.

The pivot block 35 thus freely supports the connector bar for substantially horizontal endwise movement above the plunger ends of the jacks and lengthwise of the bed. The pivot block is held against endwise movement with the connector bar by the engagement of its edges with enlarged shoulders 36 formed on the medial portions of trunnions 36' carried by one of the rigid supports 24 and a clip angle 37 on the mounting member.

The adjacent reduced ends of these trunnions are received in suitable bores in the edges of the pivot block, however, to support the same for tilting or sidewise motion in a direction transverse to the axes of the hydraulic jacks toward and from the side of the bed at which the mechanism is attached.

The trunnions thus permit side-wise motion of the connector bar to and from potentially operative driving positions with respect to the studs 31 of the actuating levers as is seen in Figure 5. Each of the plungers 27 is drivingly connected with the connector bar upon sidewise movement of the parallelogram linkage in the proper direction by the engagement of the stud 31 of its respective actuating lever in one of a pair of slots 32' opening to the under side of the connector near its ends.

An operating lever 38 is connected to one of the parallel upright links 34 in any suitable manner and projects above the spring sections at the outside of the bed to be readily accessible to a patient on the bed. The plunger of either jack may, therefore, be reciprocated through oscillation of the operating lever in a direction lengthwise of the bed. Such reciprocation of either plunger effects raising of one of the spring sections of the bed in a manner to be shortly described.

While it is obvious that the entire parallelogram linkage may be freely moved sidewise to a position engaging one or the other of the studs of the actuating levers, it is preferable to maintain the parallelogram linkage including the operating lever in a position swung toward the bed where the connector bar may be drivingly connected with the plunger of the jack 19 for the back rest section.

For this purpose the inside of the pivot block

35 is provided with a horizontal flange 39 substantially parallel to and overlying a horizontal flange 40 on the mounting member and which may form a part thereof or may be provided by a separate plate fixed to the bottom flange 41 of the mounting member.

A compression spring 42 encircling the outer end of a bolt 43 between a nut at the end of the bolt and the flange 39 maintains the pivot block and the entire parallelogram linkage including the operating lever tilted to one extreme position close to the side of the bed. The different tilted positions of the operating lever are defined by the engagement of the opposite faces of the connector bar with the actuating levers.

Shoulders 35' adjacent to each of the upright links 34 are engaged thereby during endwise movement of the parallelogram linkage to limit the stroke of the operating lever. Thus the plunger of either jack is directly drivingly connected with the operating lever if sidewise shifting motion thereof is always effected at one extreme of oscillation.

As is apparent, reciprocation of either plunger of the jacks causes the ram thereof to be projected outwardly of the jack housing. This motion of the ram is utilized to effect raising of one spring section.

In Figure 6 the leverage for connecting the hydraulic jack 19 with the back rest section 11 is illustrated.

As here seen, the ram 28 has secured thereto a collar 45 to which one end of a link 46 is pivotally connected. The link 46 extends toward the plunger end of the jack and has its opposite end connected to the free end of an arm 47 adjacent to the hydraulic jack 19 at the inside of the bed. The arm 47 is secured to a rotatable shaft 49 extending transversely across the bed at the under side of the stationary side rails thereof and which has its ends received in bearings 50 fixed to each side rail.

The opposite ends of the shaft 49, which for the sake of lightness may be tubular, has rigid elongated arms 51 secured thereto with their free ends disposed at a level beneath the top flange of the boundary frame of the back rest section. The free ends of the arms 51 provide a support for a transverse shaft 52 which has its opposite ends projecting beyond the arms 51 to mount rollers 53 thereon for engagement with the under side of the boundary frame of the back rest.

If desired, the portion of the boundary frame adjacent to the rollers may be provided with an angle-like member 54 having a flange disposed under the opposite side of the rollers 53 and cooperating with the top flange of the boundary frame to provide a substantially channel-shaped guide track for the rollers.

Thus, upon reciprocation of the plunger of the jack 19 an upward force will be exerted on the free portion of the back rest through the linkage connecting it with the ram of the jack 19.

Elevation of the leg rest sections is effected in a similar manner and in this instance a rotatable tubular shaft 55 is also provided extending transversely across the bed to have its ends received in bearings 56 secured to the under side of the side rails of the bed.

Near the opposite ends of the shaft 55 and inside the side rails the shaft 55 has secured thereto a pair of arms 57 which have their outer free ends connected through a link 57' with the opposite sides of the boundary frame of the leg rest section 15.

Thus, upon rotation of the shaft 55 in a clockwise direction as viewed in Figure 7, an upward force is exerted on the leg rest section 15 to cause the same to pivot upwardly on its connection 17 and to also elevate the leg rest section 14.

The shaft 55 is rotated to effect such elevation of the leg rest section by means of an arm 58 on the shaft, and which may be formed by an angular extension of the arm 57 adjacent to the jack 20 connected through a link 59 with a collar 60 secured to the ram 28 of the jack 20.

The free end of each ram is journalled for reciprocation in the upright flange of a clip angle 60' secured to the mounting member, which cooperates with the jack housing to support both ends of each ram.

Each of the jacks is provided with the conventional release means, not shown, which upon actuation permits descent of an elevated section. The release means for the back rest jack 19 has a stem 61 rotatable to control the release, and projecting from the plunger end of the jack. The stem 61 is rotated by connection thereof through a linkage system 62 with a push rod 63 yieldingly held in an upwardly projected position at which the releasing means is inoperative by means of a compression spring 64 confined between a thumb piece at the free end of the push rod and a flange 65 fixed to the mounting member and through which the push rod passes to be guided for vertical movement thereby.

Consequently, if the patient desires to lower the back rest section after it has been elevated, the push rod 63 is depressed to operate the jack release means and thereby allow the back rest to descend.

The hydraulic jack 20 is similarly provided with release means having a rotatable stem 66 connected through linkage 67 with another push rod 68 adjacent to the push rod 63 and similarly provided with a compression spring 69, confined between a thumb piece on the push rod and the flange 65 through which the rod passes, to hold the same in an upwardly projected position at which the release means is inoperative.

Depression of the push rod 68 when the leg rest section is in an elevated position actuates the release means of the jack 20 and thereby permits the leg rest section to descend to its normal position above the side rail 8.

In the modified embodiment of the invention illustrated in Figures 8 to 14 inclusive the back rest section 11 and leg rest sections 14 and 15 are provided with hydraulic jacks 70 and 71 respectively, as in the previous embodiment. These jacks are also carried by a single mounting member 72 extending transversely across the bed and secured at its opposite ends to the opposite side rails 8 of the bed adjacent to the stationary medial section 13 of the mattress support.

As in the previous embodiment, the jacks are secured to the mounting member 72 in a substantially flat horizontal position with their longitudinal axes extending lengthwise of the bed, but with one jack adjacent to the inside of each side rail. The rams 73 and 74 of the jacks 70 and 71 respectively are projectible outwardly of the jack housing toward the leg rest and back rest sections respectively upon reciprocation of their respective plungers.

Each of the rams has its outer end joined with one end of a tension member 75 comprising

spaced-apart parallel bars connected to each other at their opposite ends and extending alongside the ram and the jack housings past the plunger end of the jack to be pivotally connected as at 76 with one of the legs of transverse U-shaped frames 77 and 78. The frames 77 and 78 are pivotally mounted from the side rails as at 79, and act as levers inasmuch as their free ends, which may have rollers mounted thereon, engage with the undersides of the boundary frames of the back rest and leg rest sections of the bed respectively to impart an upward elevating force thereon.

Thus outward projection of the ram of each jack in a direction away from its associated hinged section imparts a pull on its tension member to effect elevation of its associated spring section.

If desired, tension springs 80 may be connected between the rams of the jacks and the mounting bar 72 to insure retraction of a projected ram and descent of its elevated section.

The plunger of either jack is reciprocated selectively and individually through oscillation of an operating lever 81 in a manner now about to be described.

For the purpose of translating oscillation of the operating lever into reciprocation of one or the other of the jack plungers, the mounting member has suspended therefrom a cross supporting shaft 82 by means of hangars 82' fixed to the underside of the bar 72 adjacent to its ends at the inside of the stationary frame of the bed.

The shaft 82 is rotatably supported by the hangars and projects outwardly of the bed at one side thereof adjacent to the hydraulic back rest jack 70. The other end of the shaft 82 terminates substantially under the hydraulic leg rest jack 71.

The end of the shaft which projects to the outside of the bed mounts a hinge plate 83 for oscillation thereon by one leg 84 of the hinge plate. The hinge 85 of the hinge plate has its axis beneath the axis of the shaft 82 and substantially perpendicular thereto.

The other leg 86 of the hinge plate extends upwardly from the hinge 85 to overlie the outer face of the leg 84 and projects to a point above the shaft 82. To enable free sidewise swinging motion of the leg 86, a slot (not shown) is provided therein through which the shaft projects.

The end of the shaft adjacent to the hinge plate is provided with a pair of levers 87 and 88, one at each side of the leg 86 of the hinge plate.

The lever 88 is provided with an elongated hub 89 loosely journalled on the shaft and confined between the leg 84 of the hinge plate and the adjacent hangar 82', and has an upwardly extending arm 90 at its end adjacent to the hinge plate, and a downwardly projecting arm 91 at its opposite end.

The arm 90 of the lever 88 has secured thereto a stud 92 projecting outwardly toward the leg 86 of the hinge plate 83, to have its end portion received in an aperture 93 in the leg 86 when the latter is in one extreme of sidewise motion defined by its engagement with the leg 84 of the hinge plate. This position of the leg 86 is shown in Figure 10.

Oscillation of the hinge plate by means of the operating lever 81 about the axis of the shaft 82 when the parts are thus positioned effects oscillation of the lever 88, and reciprocation of the plunger of jack 70 through a link 94 connected between the outer end of the arm 91 of the lever 88 and the free end of a plunger actuating lever 95 on the jack. In this manner, the back rest is easily elevated to any desired height by continued oscillation of the operating lever in a direction lengthwise of the bed.

The lever 87 at the opposite side of the hinge plate and at the extreme end of the shaft 82 is fixed with respect to the shaft, and has a stud 96 projecting toward the leg 86 of the hinge plate and spaced outwardly of the end of the stud 92. Consequently, the operating lever 81 may be drivingly connected with the shaft 82 to oscillate the same upon alignment of the aperture 93 of the leg 86 with the stud 96 and subsequent sidewise rocking motion of the leg 86 about the hinge 85 to engage the stud 96 in the aperture.

Oscillation of the shaft 82 by means of the operating lever in this manner is translated into reciprocation of the plunger of the jack 71 by means of a link 97 having one end pivotally connected with the outer end of a lever 98 fixed to the shaft beneath the jack 71, and its other end pivotally connected with the free end of a plunger actuating lever 99 on the jack 71.

Thus oscillation of the operating lever in a direction lengthwise of the bed in its outward limit of sidewise movement defined by engagement of the leg 86 of the hinge plate 83 with the lever 87 and while drivingly connected thereto effects elevation of the leg rest section of the bed.

As in the previous embodiment described, each of the jacks 70 and 71 is provided with release means not shown having rotatable stems for controlling the releasing action. The stems of the release means for the jacks 70 and 71 are connected through linkage systems 100 and 101 respectively with pull rods 102 and 103 respectively which are led through the side rail 8 at the side of the bed adjacent to the operating lever and are supported by said side rail.

Each of the pull rods is provided with a grip at its free end to facilitate grasping thereof by a patient on the bed, and permit selective actuation of either of the release means of the hydraulic jacks.

For the purpose of facilitating engagement of the studs 92 and 96 with the aperture 93 of the leg 86, the lever 87 is yieldingly maintained in a definite position when disengaged from the operating lever against a stationary stop 104 forming part of a framework 105 which may be secured to the side rail of the bed 8 adjacent to the operating lever or which may be directly carried by the cross bar or mounting member 72.

To maintain the lever 87 engaged with the stop 104, a tension spring 106 is secured between the free end of the lever and an upright portion of the framework. Cooperating with the stop 104 is a stop 107 which limits rearward lengthwise oscillation of the operating lever toward the head end of the bed and which serves to accurately locate the hole 93 of the hinge plate leg 86 with respect to the stud 96 of the lever 87.

Thus the stud of either lever 87 and 88 is automatically aligned with the aperture 93 if sidewise shifting motion of the operating lever is always effected at the rearward limit of oscillation of the operating lever; it being understood that the plunger of jack 70 holds the lever 88 in its position at which disengagement between its stud and the operating lever is effected.

Inasmuch as it is desirable to provide for disposition of the operating lever to an out-of-the-way position when the control mechanism is not

in use, special mounting means has been provided between the lever and the hinge plate leg 86.

As clearly illustrated in Figure 8, it is seen that the operating lever 81 is mounted on the leg 86 of the hinge plate by means of a pair of spaced rivets 110, one at the extreme lower end of the operating lever and the other at a medial point on the lever and both of which are carried by the hinge plate.

The lower of the rivets is received in an open slot in the end of the operating lever while the upper of the rivets passes through an elongated closed slot so that pivotal motion of the lever with respect to the hinge plate 83 is permitted upon lifting of the lever to disengage its lower bifurcated end from the lower rivet.

When the operating lever is so disengaged it may be swung rearwardly about the axis of the upper rivet to a substantially horizontal position where its free end may rest on a cushion stop 111 near the head end of the bed.

It will be readily apparent from the descriptions of both forms of the invention that the control mechanism is readily connected to any bed having hinged back and leg rest sections due to the unitary construction of the mechanism.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that this invention provides a simple unitary control mechanism for elevating the back and leg supporting spring sections of a hospital bed and which is especially designed for easy operation so that even a very weak patient may operate the mechanism without the necessity of the services of an attendant.

What I claim as my invention is:

1. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting frame connectible to a stationary part of the bed; a pair of hydraulic jacks secured to said mounting frame to lie in a substantially horizontal position with respect to the bed, each of said jacks having a reciprocal plunger and a ram movable in response to reciprocation of its plunger; driving mechanism connected to each of the jack plungers; an operating lever mounted on the mounting frame for oscillation lengthwise and crosswise of the bed; means for translating oscillation of the lever lengthwise of the bed into reciprocation of one or the other of the jack plungers including means on the lever selectively mechanically connectible with said plunger driving mechanisms, connection of said lever means with the driving mechanism of one plunger entailing oscillation of the lever in one direction crosswise of the bed to disconnect said lever means from the driving mechanism of the other plunger whereby said plungers are individually and selectively reciprocated by the operating lever; and means for connecting the ram of each jack with one of the spring sections whereby reciprocation of the plunger of each jack is translated into elevational movement of one of the spring sections.

2. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism securable to a stationary portion of the bed; a pair of hydraulic jacks carried by the mounting member, each of said jacks having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; means carried by the mounting member for selectively reciprocating said plungers including an operating lever accessible to a patient on the bed and mounted for oscillation in either of two substantially upright planes inclined to each other, plunger actuating means for each jack, and a connector movable with the operating lever and engaged with one of said actuating means when the operating lever is in one of said two angularly disposed planes and engaged with the other of said actuating means when the operating lever is in the other of said planes; and means for connecting the ram of each jack with one of the spring sections of the bed whereby reciprocation of the plunger of each jack is translated into elevational movement of one of the hinged spring sections.

3. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism securable to one of the stationary side rails of the bed; a pair of hydraulic jacks carried by the mounting member in a substantially horizontal position with their longitudinal axes substantially aligned and in spaced-apart relationship, each of said jacks having a plunger at their adjacent ends and a ram projecting from their opposite ends each movable in response to reciprocation of its plunger; means for selectively reciprocating said plungers including a bar spanning the space between the adjacent ends of the jacks, means mounting the bar from the mounting member for motion toward and from the plunger end of each jack and for sidewise motion in a direction transverse to the axes of the jacks, means for connecting the bar with one of the plungers in one of its transverse positions and for connecting the bar with the other of said plungers in the other of its transverse positions, and an operating lever for imparting motion to the bar for reciprocating the plunger connected thereto; and means for connecting the ram of each jack with one of the spring sections of the bed whereby reciprocation of the plunger of each jack is translated into elevational movement of one of the hinged spring sections.

4. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism adapted to be secured to a stationary portion of the bed; spaced-apart hydraulic jacks carried by the mounting member in a substantially horizontal position, each of said jacks having a reciprocable plunger at one end and a ram projecting from its opposite end and projectible in response to reciprocation of its plunger; an operating lever accessible to a patient on the bed; means mounting the operating lever from the mounting member for oscillation in either of two substantially upright planes inclined with respect to each other; an actuating lever for the plunger of each of the jacks, one adjacent to each of said planes; latch means movable with the operating lever and engaged with a part on one of said actuating levers when the operating lever is in one of said planes, and engaged with a part on the other of said actuating levers when the operating lever is in the other of said planes and whereby the plungers are selectively reciprocable by the operating lever; and means on the ram of each jack connectible with one of the spring sections of the bed whereby reciprocation of the plunger of each jack is translated into elevational movement of one of the hinged spring sections.

5. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member connectible

to a stationary portion of the bed; a pair of opposed hydraulic jacks secured to said mounting member with their longitudinal axes lying in a substantially common horizontal plane, each of said jacks having a reciprocable plunger at their adjacent ends and a ram projecting from the opposite end of each jack and movable in response to reciprocation of its plunger; an operating lever for the jacks pivotally carried by the mounting member for oscillation in separate defined substantially-upright planes; means for connecting the operating lever with one of the plungers when the operating lever is in one of said planes and with the other plunger when the operating lever is in the other of said planes, whereby the plungers are individually connectible with the operating lever to be reciprocated thereby, said means including a member driven by the operating lever and constrained to substantially horizontal movement adjacent to the plungers of the jacks and parallel with the axes of the jacks; and means for connecting the ram of each jack and one of the hinged sections of the bed for translating reciprocation of the plunger of each jack into elevational movement of one of the hinged spring sections when the control mechanism is installed on the bed.

6. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member connectible to a stationary portion of the bed; a pair of hydraulic jacks secured to said mounting frame with their longitudinal axes lying in a common horizontal plane, each of said jacks having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; an operating lever for the jacks supported from the mounting member adjacent to the outside of the bed for pivotal motion about a substantially horizontal axis perpendicular to the side rails of the bed and for limited sidewise rocking motion toward and from the bed; means engaged by the operating lever in one of its limits of sidewise motion for drivingly connecting the operating lever with the plunger of one of the jacks and for drivingly connecting the lever with the plunger of the other jack when the operating lever is in the other of its limits of sidewise motion, whereby pivotal motion of the operating lever about its substantially horizontal axis is translated into reciprocation of the plunger of one of said jacks and whereby the jacks are selectively operated by the lever; means for connecting the ram of each jack and one of the hinged sections of the bed for translating motion of the ram of each jack in response to reciprocation of its plunger into elevational movement of one of the hinged spring sections; and release means for each jack selectively operable by a patient on the bed for permitting the descent of an elevated spring section.

7. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism securable to the supporting structure of the bed; a pair of hydraulic jacks carried by the mounting member, each having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; means carried by the mounting member for reciprocating said plungers including an operating lever accessible to a patient on the bed and mounted for oscillation in either of two substantially upright planes inclined to each other, and means for individually drivingly connecting the plungers of the jacks with the operating lever, said means being operable to drivingly connect the plunger of one jack with the operating lever when the operating lever is positioned for oscillation in one of said planes and operable to drivingly connect the plunger of the other of said jacks with the operating lever when the operating lever is positioned for oscillation in the other of said planes; and means for connecting the ram of each jack with one of the spring sections of the bed whereby reciprocation of the plunger of each jack is translated into elevational movement of one of the spring sections.

8. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism connectible between the side rails of the bed; a hydraulic jack for each of the hinged sections fixed to the mounting member so as to lie in a substantially horizontal position with their longitudinal axes lengthwise of the bed, said jacks each having a reciprocable plunger and a ram connected with one of the hinged sections to elevate the same upon motion of the rams in response to reciprocation of their plungers; a shaft rotatably supported from the mounting member so as to lie transversely of the bed and having one end projecting from one side of the bed; a lever fixed to the extremity of said end of the shaft; a lever loose on said end of the shaft spaced inwardly of said fixed lever; a single operating lever for the jacks; means on the shaft between said levers mounting the operating lever for oscillation about the axis of the shaft and for sidewise motion toward and from each of said levers; means for establishing a driving connection between the operating lever and said fixed lever upon sidewise movement of the operating lever toward said fixed lever; means for establishing a driving connection between the operating lever and said loose lever upon sideways movement of the operating lever toward said loose lever and away from the fixed lever, whereby oscillation of the operating lever when drivingly connected with the fixed lever effects oscillation of the shaft; means connecting the shaft with the plunger of one of said jacks so as to effect reciprocation thereof upon oscillation of the shaft; and means connecting the loose lever with the plunger of the other of said jacks whereby oscillation of the operating lever when drivingly connected with said loose lever is translated into reciprocation of said last named plunger.

9. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member for the mechanism connectible between the side rails of the bed; a hydraulic jack for each of the hinged sections fixed to the mounting member so as to lie in a substantially horizontal position with their longitudinal axes lengthwise of the bed, said jacks each having a reciprocable plunger and a ram connected with one of the hinged sections to elevate the same upon motion of the rams in response to reciprocation of their plungers; a shaft rotatably supported from the mounting member so as to lie transversely of the bed and having one end projecting from one side of the bed; a lever fixed to the extremity of said end of the shaft; a lever loose on said end of the shaft spaced inwardly of said fixed lever; a single operating lever for the jacks; means on the shaft between said levers mounting the operating lever for oscillation about the axis of the shaft and for sidewise motion toward and from each of said levers;

means for establishing a driving connection between the operating lever and said fixed lever upon sidewise movement of the operating lever toward said fixed lever; means for establishing a driving connection between the operating lever and said loose lever upon sideways movement of the operating lever toward said loose lever and away from the fixed lever, whereby oscillation of the operating lever when drivingly connected with the fixed lever effects oscillation of the shaft; means connecting the shaft with the plunger of one of said jacks so as to effect reciprocation thereof upon oscillation of the shaft; means connecting the loose lever with the plunger of the other of said jacks whereby oscillation of the operating lever when drivingly connected with said loose lever is translated into reciprocation of said last named plunger; and means rendered operative by a patient on the bed for lowering an elevated spring section.

10. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member extending transversely across the underside of the bed and adapted to be secured to the side rails thereof between the hinged sections; a pair of hydraulic jacks carried flatwise beneath the mounting member with their longitudinal axes extending lengthwise of the bed, one of said jacks being positioned adjacent to each end of the mounting member so as to be alongside one of the side rails of the bed, said jacks each having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; means for connecting the ram of one of the jacks to the back rest section so that the same may be elevated; means connecting the ram of the other jack to the leg rest section whereby the leg rest section may be elevated; a shaft rotatably supported from the mounting member so as to lie transversely of the bed beneath the mounting member and having one end projecting from one side of the bed; means connecting the shaft with the plunger of the leg rest jack so that oscillation of the shaft effects reciprocation of the leg rest jack plunger; a lever spaced from said end of the shaft and loosely mounted thereon; means connecting said loose lever with the plunger of the back rest jack so that oscillation of the loose lever effects reciprocation of the back rest jack plunger; a lever fixed on said end of the shaft in axially spaced relationship with respect to said loose lever; a single operating lever for the jacks; means on the shaft between said levers mounting the operating lever for oscillation about the axis of the shaft and for sidewise motion toward and from each of said levers; means for establishing a driving connection between the operating lever and said fixed lever upon sidewise movement of the operating lever toward said fixed lever whereby oscillation of the operating lever effects reciprocation of the leg rest jack plunger; and means for establishing a driving connection between the operating lever and said loose lever upon sidewise motion of the operating lever toward said loose lever whereby oscillation of the operating lever effects reciprocation of the plunger of the back rest jack.

11. Control mechanism for elevating the hinged back and leg rest spring section of an invalid bed comprising: a mounting member extending transversely across the underside of the bed and adapted to be secured to the side rails thereof between the hinged sections; a pair of hydraulic jacks carried flatwise beneath the mounting member with their longitudinal axes extending lengthwise of the bed, one of said jacks being positioned adjacent to each end of the mounting member so as to be alongside one of the side rails of the bed, said jacks each having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; means for connecting the ram of one of the jacks to the back rest section so that the same may be elevated; means connecting the ram of the other jack to the leg rest section whereby the leg rest section may be elevated; a shaft rotatably supported from the mounting member so as to lie transversely of the bed beneath the mounting member and having one end projecting from one side of the bed; means connecting the shaft with the plunger of the leg rest jack so that oscillation of the shaft effects reciprocation of the leg rest jack plunger; a lever spaced from said end of the shaft and loosely mounted thereon; means connecting said loose lever with the plunger of the back rest jack so that oscillation of the loose lever effects reciprocation of the back rest jack plunger; a lever fixed on said end of the shaft in axially spaced relationship with respect to said loose lever; a single operating lever for the jacks; means on the shaft between said levers mounting the operating lever for oscillation about the axis of the shaft and for sidewise motion toward and from each of said levers; means for establishing a driving connection between the operating lever and said fixed lever upon sidewise movement of the operating lever toward said fixed lever whereby oscillation of the operating lever effects reciprocation of the leg rest jack plunger; means for establishing a driving connection between the operating lever and said loose lever upon sidewise motion of the operating lever toward said loose lever whereby oscillation of the operating lever effects reciprocation of the plunger of the back rest jack; and means rendered operative by a patient on the bed for lowering an elevated section.

12. Control mechanism for elevating the hinged back and leg rest spring sections of an invalid bed comprising: a mounting member connectible to a stationary portion of the bed; a pair of hydraulic jacks secured flatwise to said mounting member with their longitudinal axes extending lengthwise of the bed, each of said jacks having a reciprocable plunger and a ram movable in response to reciprocation of its plunger; an operating lever for the jacks supported from the mounting member adjacent to the outside of the bed for oscillatory motion in a direction lengthwise of the bed and for limited sidewise motion toward and from the side of the bed; means for establishing a driving connection between the operating lever and the plunger of one of said jacks when the operating lever is in one extreme of sidewise motion and for establishing a driving connection between the operating lever and the plunger of the other of said jacks when the operating lever is in its other extreme of sidewise motion, and whereby the plungers are individually reciprocated by the operating lever; and means for connecting the ram of each jack and one of the hinged sections of the bed for translating motion of the ram of each jack in response to reciprocation of its plunger into elevational movement of one of the hinged spring sections.

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