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INVALID BED.

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1,061,168.

Patented May 6, 1913.

3 SHEETS—SHEET 1.

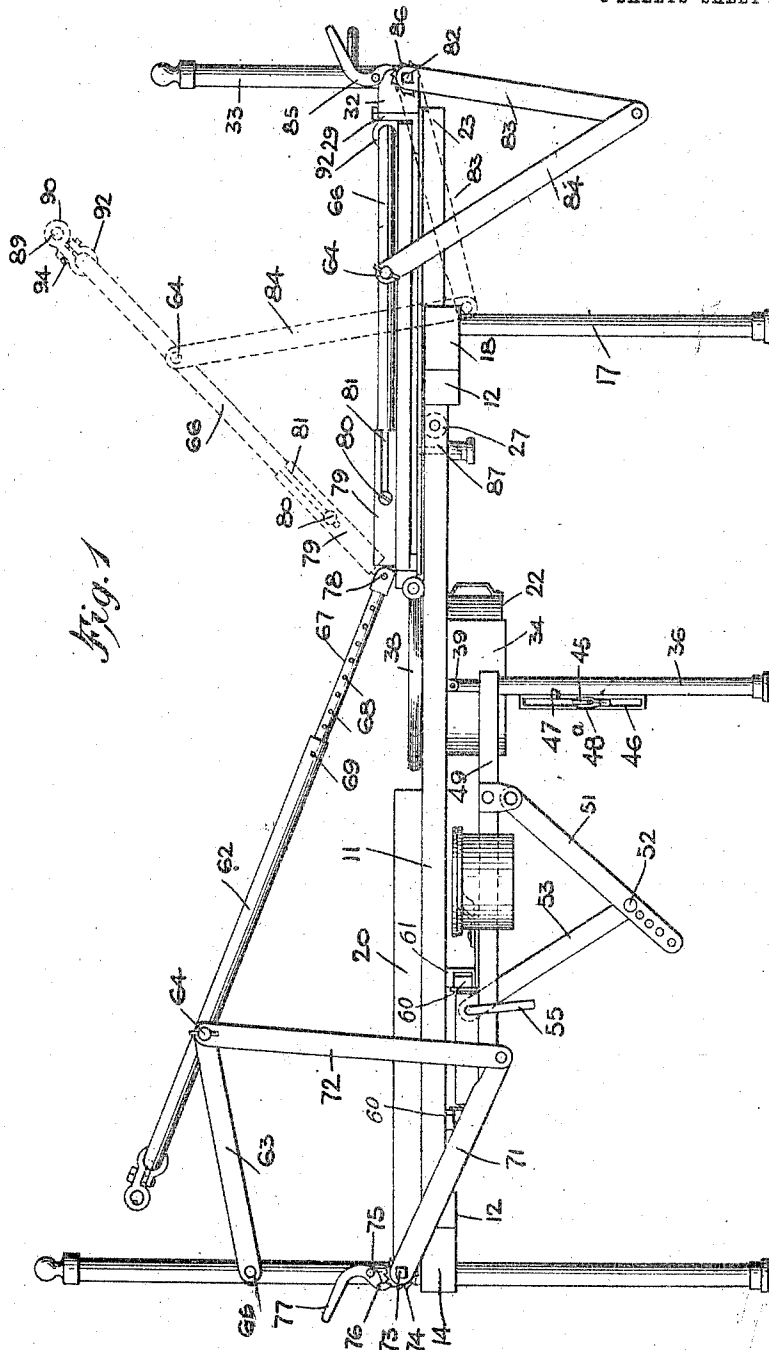


Fig. 1

WITNESSES

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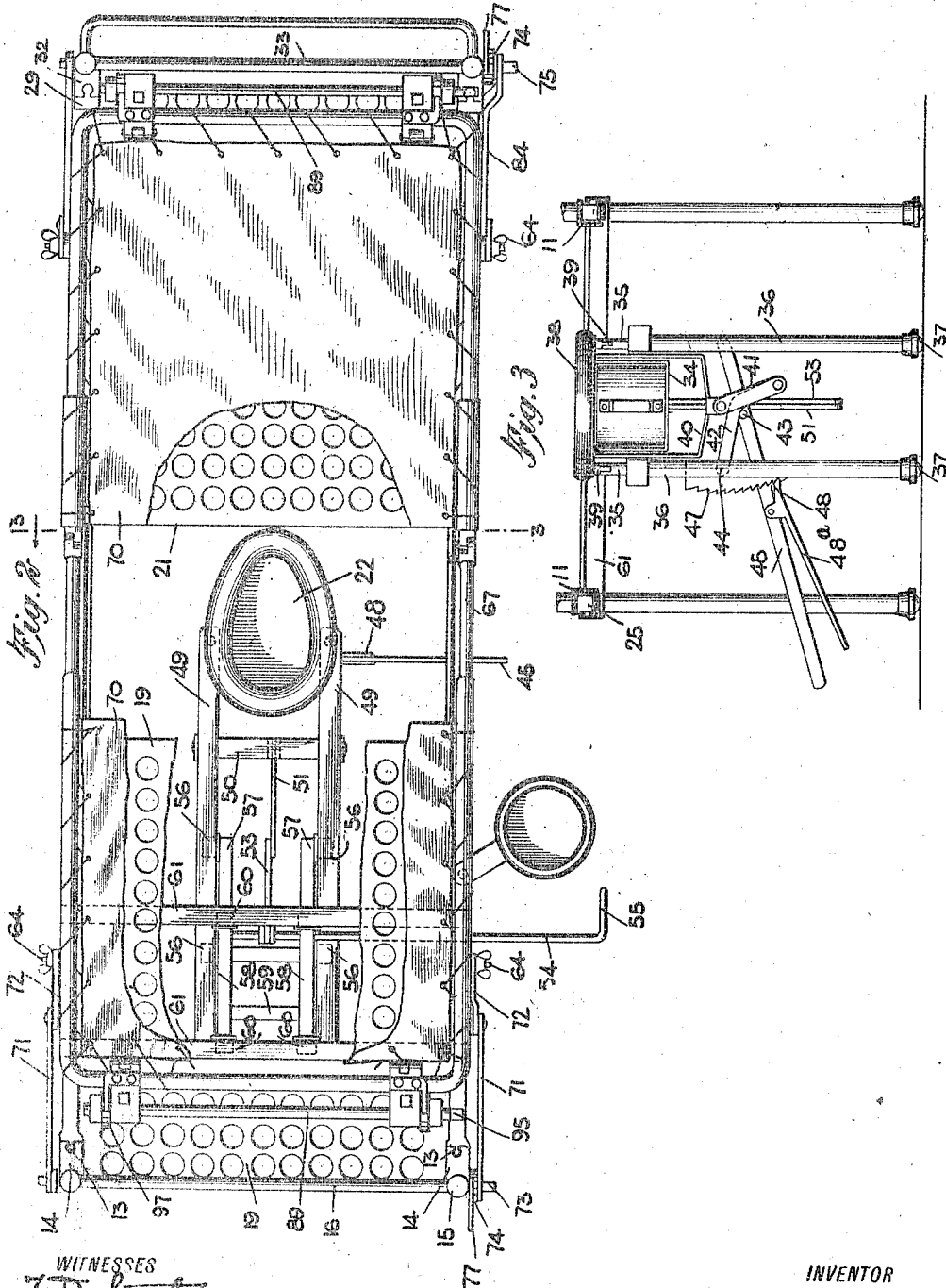
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3 SHEETS-SHEET 2.



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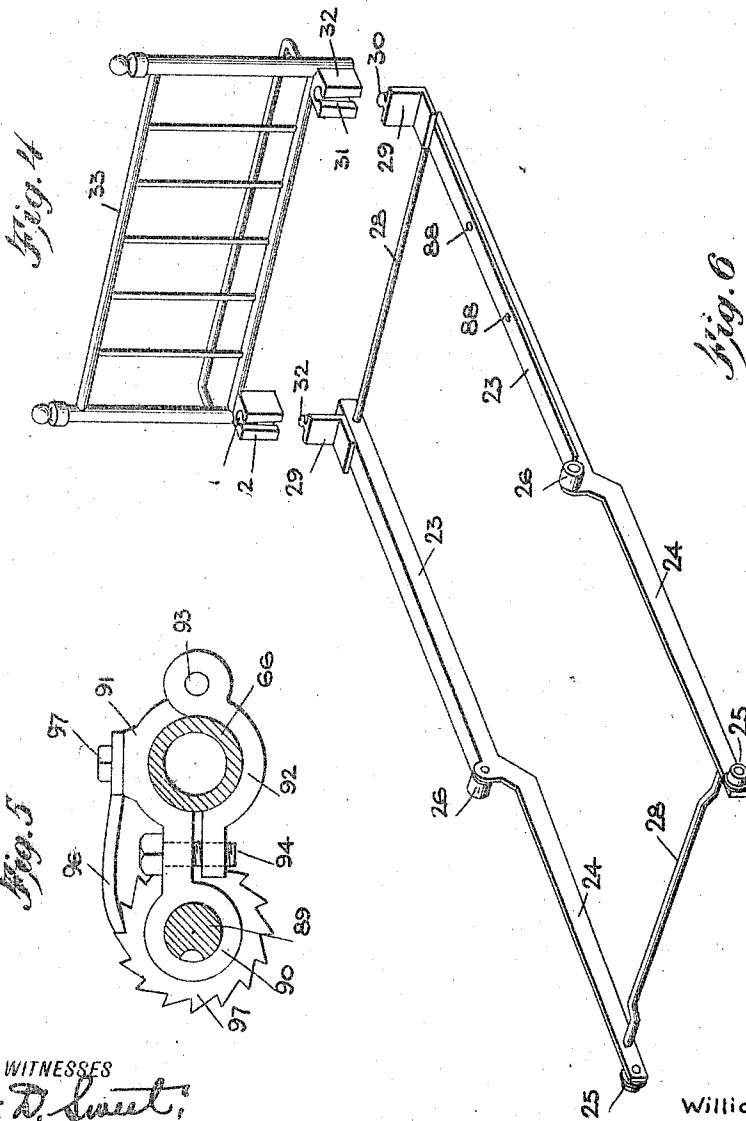
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INVALID-BED.

1,061,168.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM C. FEELY, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Invalid-Bed, of which the following is a full, clear, and exact description.

The present invention relates more particularly to improvements in a structure of like character for which Letters Patent of the United States were granted to me, to which Letters Patent cross reference is here made, said patents bearing numbers 15 and dates as follows: 713,416, November 11, 1902; 730,010, June 2, 1903; 787,162, April 11, 1905; and 892,817, July 7, 1908.

Among the principal objects which the present invention has in view are; to provide 20 a bed structure of the character mentioned, which may be disassembled or knocked down for storage or handling; to provide a more simple and economical construction; to provide means for elevating 25 the body of a patient, or parts thereof, to vary the position of the patient; to provide means for suspending the patient above the bed proper, to facilitate the changing of the bed furnishings; and to provide an improved commode-supporting means for operating the same.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a side view of a bed and auxiliary supporting frame therefor, constructed and arranged in conformity with the 40 present invention, the dotted lines being employed to show a modified position of the auxiliary supporting frame; Fig. 2 is a plan view of a bedstead and auxiliary supporting frame therefor, both constructed and arranged in accordance with the present invention; Fig. 3 is a cross section of the bedstead taken on the line 3—3 in Fig. 2, showing the traveling commode-support employed in connection with the bed; Fig. 4 50 is a detail view in perspective, showing the extension frame of the bedstead and detachable foot-board therefor; Fig. 5 is a detail view, on an enlarged scale, showing a ratchet employed to hold in adjusted position the suspension frame; and Fig. 6 is a

detail view, on an enlarged scale, showing means for connecting and uniting the side bars of the suspension frame.

The nature and purpose of beds constructed in accordance with the various patents 60 above-mentioned, and in accordance with the present disclosure, are subsequently set forth in said patents.

In the present invention, the main bed frame is provided with side bars 11, which, 65 as seen best in Fig. 3 of the drawings, are constructed of angle-iron, and the vertical flange whereof is disposed outwardly from the center of the bedstead. The side bars 11 are provided with socket blocks 12, having 70 each vertically-arranged key heads 13, which fit in sockets furnished in the blocks 14 rigidly secured to uprights 15 of a head 16, and legs 17 forming the foot of the fixed bed structure, and having socket blocks 18, 75 as seen best in Fig. 1 of the drawings. The fixed frame may be separated or knocked down by removing the bars 11, lifting for that purpose the blocks 12 from the socket blocks 14 and 18, much in the same manner as is employed in the knocking down of 80 the ordinary bedstead. When assembled, the fixed structure is provided with a resilient spring plate 19, perforated as shown in Fig. 2 of the drawings, to air the mattress 20 when disposed thereon, and to augment the resiliency of the plate. The plate 19 is constructed to measure just one-half the length of the fixed bed structure, and is 85 arranged to register with a second plate 21, which is mounted upon a traveling or extension frame supported by what may be styled the "foot" end of the fixed bedstead. 90

A mattress section the duplicate of that 95 designated in Fig. 1 by the numeral 20, is provided for the plate 21, to form with the said mattress 20 a complete mattress for the bed. In furnishing a bed of the character herein described, each of the mattresses 20 is separately dressed to permit the 100 plates 19 and 21 and mattresses supported thereon to be separated, to permit access to the commode 22.

The traveling frame on which is supported 105 the plate 21 is shown best in Fig. 4 of the drawings, where, as shown, angle-iron sections 23 are provided with straight bar extensions 24, parallel with the vertical extension of the angle-iron forming the sec- 110

tions 23, and adapted to rest beneath the horizontal extension of the angle-iron forming the side bars 11.

At the forward end of the extensions 24 are pivotally mounted rollers 25, which rest beneath the horizontal flange of the side bars 11. The rollers 25, in conjunction with rollers 26, form the principal support for the extension frame. The rollers 26 are pivotally mounted adjacent the juncture of the sections 23 and the extensions 24 of the extension frame, and are arranged to rest over and bear upon the horizontal flange of the side bars 11. To assist in supporting the extension frame, the side bars 11 are provided, adjacent the foot of the fixed frame, with rollers 27. The side bars of the extension frame are rigidly united by tie rods 28, resulting in a rectangular frame, as seen best in Fig. 4 of the drawings. At what may be styled the "foot" end of the extension frame, the same is provided with brackets 29, on the vertical face whereof key heads 30 are formed. The key heads 30 are designed to seat in the sockets 31 formed in socket blocks 32, with which the foot-board 33 of the extension frame is provided. When the extension frame is thus constructed, it is obvious that the foot-board 33 and the rectangular frame may be separated by lifting the foot-board from the said rectangular frame and the key heads 30 thereof.

Thus far, it will be seen that the bed structure is constructed from the six separable portions; namely, the head 16, the two side bars 11, the foot having the legs 17, the rectangular frame of the extension frame, and the foot-board 33 of the extension frame. By means of this arrangement, whenever the bed is not in use, it may be separated and stowed away within small compass. Further, if, when in service, any separate part of the bed becomes damaged or broken, and requires repair or replacement, this may be readily accomplished when employing a structure such as indicated, wherein I use the separable independent structural features.

Two auxiliary structures are employed in conjunction with a bedstead such as described, the first of which is the commode-supporting frame and operative parts therefor; and the second of which is a suspension frame. The commode-supporting frame is provided primarily with a cabinet 34, said cabinet being provided with two guide posts 35, which telescope within tubular legs 36. The legs 36 are furnished with casters 37, on which the frame is supported when traveling over the floor beneath the bed. A seat 38 is pivotally connected at 39 with the posts 35. The cabinet 34 and seat connected therewith are suspended between the side bars of a hoisting frame 40, which frame is connected by means of a link with a second link

42. The link 42 rests above a pin 43, and is mounted by a pivot 44 upon one of the legs 36. The pin 43 is laterally extended from a lifting lever 45, the ends of which extend beyond the side of the bed, as seen best in Figs. 2 and 3 of the drawings. The lever 45 is guidedly mounted in a loop frame 46. The loop frame 46, at one side, is provided with a ratchet toothed detent plate 47, to engage the teeth of a pawl 48 having an elongated handle 49, operable to dislodge the pawl 48 when seeking to lower the cabinet 34. It will be understood that when the commode is adjusted to the position between the mattresses or the plates 19 and 21, the cabinet 34 may be vertically aligned flush with, or above the upper surface of said mattresses, this being accomplished by elevating the end of the lever 45. The pin 43 on the lever 45 lifts, by means of the link 42, the link 41, frame 40 and cabinet 34. When the pawl 48 is released from engagement with the teeth of the plate 47, the cabinet 34 and parts connected therewith may be depressed to below the plates 19 and 21, the extension frame then being moved to close the gap between the plates 19 and 21 and mattresses supported thereon.

The legs 36 are rigidly connected with side bars 49, which side bars are held in mutual parallel relation by a tie-bar 50, to the under side whereof is pivotally secured a link-bar 51. The link-bar 51 is pivotally connected by a pin 52, shown best in Fig. 1 of the drawings, with a crank arm 53. The crank arm 53 is rigidly connected with a crank 54 having a handle 55. By means of this structure, the frame formed by the side bars 49, the tie-bar 50 and the legs 36, is moved to place the cabinet 34 below either of the plates 19 or 21, during the periods when the commode is not in service or beyond the end thereof when in service. In this movement of the cabinet the supporting frame therefor rolls on the casters 37 and rollers 56. To facilitate the movement of the frame, the side bars 49 are constructed of channel-bar metal, the channel whereof opens laterally to the interior of the frame to receive the rollers 56. The rollers 56 are mounted upon stationary sides 57. The sides 57 are supported from the truck sides 58, which in turn are rigidly connected by a brace 59, as shown best in Fig. 2 of the drawings.

At each end of the truck sides 58 are provided rollers 60 to support said frame. The rollers 60 are mounted in the channel of track bars 61, said rollers extending within the open channel of said bars. The track bars 61, as seen in Fig. 2 of the drawings, are disposed transverse the bed-frame.

The supporting and extension frames of the commode may be operated to dispose the commode laterally or longitudinally

relative to the bed structure, and this by manipulating the supporting and extension frames, engaging for that purpose the crank 54. It will be seen that when, by means of the crank 54, the frame resting on the rollers 60 is thrust away from the side of the bed where the said crank protrudes, said frame and parts connected therewith are moved to the opposite side of said bed; and vice versa, when the crank 54 is drawn upon, the frame mounted on the rollers 60 and parts connected therewith, inclusive of the commode, is moved toward the inner side of the bed. When the commode is laterally adjusted, then, by turning the crank 54, employing for that purpose the crank handle 55, the arm 53 and link 51 are disposed to extend or retract the side bars 49 and legs 36 connected therewith, so that the commode is adjusted longitudinally relative to the bed. It has been explained how, when the commode is adjusted in the proper position, the cabinet 34 and parts connected therewith may be lifted through the opening in the bed structure provided by moving the extension frame carrying the plate 21.

The supporting frame above referred to is employed for various purposes. Primarily, the purpose is to exercise the patient by disposing him in various attitudes, and thereby rest the otherwise constrained or tired muscles. Also, it has been found that sanitary results are obtained when a patient is moved in a sick-bed for the purpose of establishing by gravity an induced flow of blood either to the head, feet, or central portion of the body.

The frame is constructed in two sections, one operatively connected with the extension frame above referred to, and the other operatively connected with the fixed frame above referred to. The frame section 62 is pivoted by means of a link 63 and pivot pins 64 and 65 with the head 16. The section 62 is connected with a section 66 by means of sliding bars 67. The bars 67 are each provided with a series of perforations 68, which register with a perforation 69 formed adjacent the lower ends of the frame section 62. Suitable pins are inserted through the perforations 69 and 68, and thereby the extension of the bar 67 is regulated. The bars 67 are of a length sufficient to accommodate any desired separation of the frames 62 and 66 to accommodate or correspond with the separation of the fixed and movable portions of the bed frame. Each of the sections 62 and 66 is covered or connected by a canvas or covering 70. The covering 70 is normally equal in dimensions to the plates 19 and 21 and the mattresses 20 mounted thereon. When the sections 62 and 66 are laid prone, the canvas 70 rests upon the mattress, and if desired, may be dressed as a portion of the bed, prior

to installing the patient. In this position, it will be understood, when the extension frame carrying the plate 21 is moved to separate said plate from the plate 19, the pin being previously withdrawn from the perforations 68 and 69, the frame sections 62 and 66 also separate at the median portion of the bed, the bars 67 sliding in the frame section 62 for that purpose. The patient may now be lifted by elevating the frame section 62 to an approximately upright sitting position. For this purpose, a shaft is extended between the uprights 15 of the head 16, to which shaft is rigidly secured arms 71.

Pivotaly connecting the free ends of the arms 71 with the frame 62 is a link bar 72, best seen in Fig. 1 of the drawings. The shaft above referred to is provided with a square wrench end 73 and a ratchet wheel 74 fixedly mounted thereon. The teeth of the ratchet wheel 74 are engaged by a pawl mounted on a pivot 75 and having a head 76 and a handle 77. It will be seen that when a proper wrench is applied to the end 73, the shaft connected with the arms 71 is rotated to lift the link bars 72 and the frame section 62 connected therewith. The frame section 62, in swinging, moves about the center of the pivot pin 64, being controlled to so move by the links 63. During the movement just above described, it will be seen that the lower ends of the frame section 62 rest upon the bed structure and upon the frame section 66 and a pivot pin 78, by which the two sections are pivotaly connected.

When the suspension frame is employed as an exerciser, the bars 67 are extended within the section 62, and the bed sections are closed. For this purpose, it will be seen that, according to the elevation of either of the sections 62 or 66, the portion of the body of the patient resting thereon is elevated. If both frame sections be elevated, each swinging about the pins 78, both parts of the body of the patient will be raised. By repeating this action more or less slowly, it will be seen that the patient will be exercised in a very gentle manner.

If it be desired to unite rigidly the frame sections 62 and 66, said sections are alined, so that the sliding tube 79 may be moved to inclose both the frame sections 62 and 66, as shown in Fig. 6 of the drawings. In this sliding action of the tube 79, it is controlled by a guide screw 80 and a slot 81 provided in said tube, as seen best in Fig. 1 of the drawings.

The frame sections being now rigidly secured, it will be understood that they may be moved by manipulating the shaft having the end 73, or the shaft having the end 82, to raise or lower either the frame 62 or the frame 66, the combined frames being de-

clined at either end. It will be seen that the patient resting on the canvases 70 on said frames is tilted or inclined, with his head lower or his feet lower as the attendant selects. If the rigidly united sections 62 and 66 be elevated, which is accomplished by moving the arms 71 and 83 and the links 72 and 84 equally, to raise both ends of the combined frame, the patient may be lifted above the mattresses 20, and the bed may be completely changed and refurnished.

The frame section 66 is held in adjusted position by a pawl 85, which engages a ratchet wheel 86 at the foot of the extension frame of the bed. The extension frame is prevented from moving outward from the fixed frame of the bed when the sections 62 and 66 are being manipulated by the spring-actuated bolt 87. The bolt 87 is permanently mounted in one of the side bars 11, and is adapted to register with perforations 88 formed in the horizontal flange of the sections 28.

The frame sections 62 and 66 have each mounted thereon a windlass shaft 89. The shaft 89, as best seen in Fig. 5 of the drawings, is mounted in bearings 90 formed at the end of brackets 91. The brackets 91 are each supplied with a clamping member 92, adapted to encircle the cross bar of each of the frame sections 62 or 66, and is connected to the bracket 91 by means of a pivot pin 93. The juxtaposed ends of the bracket 91 and the clamp member 92 are perforated to receive a bolt 94. As shown in the drawings, the perforation in the bracket 91 is smooth, to pass the shaft of the bolt 94, while the perforation in the end of the clamp member 92 is tapped to register with the screw-thread at the end of the bolt 94. By manipulating the bolt 94, the clamp 92 and body of the bracket 91 are drawn to rigidly engage the head bars of both the frame sections 62 and 66, as seen in Fig. 1 of the drawings. Each shaft 89 is squared at the end, to provide wrench sections 95, to which is applied a wrench when it is desired to rotate the shaft 89. The shafts 89 are held in position by a spring pawl 96, which, as shown in Fig. 5 of the drawings, is rigidly connected with the body of the bracket 91 by the pawl 96. The free ends of the pawls 96 engage each of the teeth of a ratchet wheel 97. The shafts 89 are employed in the operation of stretching or extending the patient or some portion of the patient, as in the treatment of dislocated or fractured limbs or back, or similar surgical operations.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. An invalid bed having, in combination; a fixed bed structure provided with side bars and supporting legs therefor; an extension

frame having mounted thereon laterally-extending members to engage said side bars above and below the same; and a foot-board removably mounted on said extension frame.

2. An invalid bed, having, in combination; a fixed frame provided with side bars; a plurality of supporting legs for said frame, removably secured thereto; an extension frame slidably mounted on said side bars, said extension frame having laterally-projecting members to rest above and below said side bars, and said extension frame being removably adapted for disengagement from said fixed frame; and a foot-board removably mounted upon said extension frame.

3. An invalid bed, having, in combination; a fixed frame provided with side bars, a head-board and supporting legs; an extensible frame slidably mounted thereon, provided with side bars having lateral extensions to rest above and below the side-bars of said fixed frame, removably connected therewith; a foot-board removably mounted upon said extension frame; a plurality of spring mattress-supporting plates, the combined length of which equals the normal length of the bed, said plates being adapted to separate at the median section of said bed, one of said plates being attached to the fixed frame, and the other to the extension frame; a commode-supporting frame movably attached to said fixed frame, in supported relation thereto; and means for elevating a part of said commode-supporting frame to above the normal level of said plates and mattresses supported thereon.

4. An invalid bed having, in combination; a fixed frame provided with side bars, a head-board and supporting legs; an extension frame slidably mounted thereon, provided with side bars having lateral extensions to rest above and below the side bars of said fixed frame, removably connected therewith; a foot-board removably mounted upon said extension frame; a plurality of spring mattress-supporting plates, the combined length of which equals the normal length of the bed, said plates being adapted to separate at the median section of said bed, one of said plates being attached to the fixed frame and the other to the extension frame; a movable commode-supporting frame movably attached to said fixed frame, in supported relation thereto; means for elevating a part of said commode-supporting frame to above the normal level of said plates and mattresses supported thereon; and means extending beyond the side of said bed for moving said supporting frame lengthwise said bed, to register the commode with the open section of said fixed and extension frames, when parted.

5. In a bed such as described, having a fixed frame and an extensible frame adapted

to be separated intermediate the ends thereof; a commode-supporting frame, comprising a plurality of track members mounted on, and extending transverse, said fixed
 5 frame; a truck, having rollers mounted on said track members and supporting one end of said frame; a plurality of legs supporting the opposite ends of said frame; an extension mechanism having pivotally connected
 10 link members, one definitely mounted upon the supporting frame and the other mounted upon said truck frame; and a crank extensible beyond the side of the bed and rigidly connected to one of said link members
 15 swing the same about the center of said crank when said crank is rotated to move said supporting frame lengthwise said bed, said crank being adapted to shift said supporting frame and supporting truck thereof
 20 transversely of said bed.

6. In a bed such as described; an auxiliary supporting frame, comprising a plurality of telescopically-united pivotally-connected frame sections; means for adjusting said

frame sections in extended relation; and a 25 plurality of coverings for said frame, the combined coverings equaling the extreme length of said frame.

7. In a bed such as described; an auxiliary supporting frame, comprising a plurality 30 of telescopically-united pivotally-connected frame sections; means for adjusting said frame sections in extended relation; a plurality of coverings for said frame, the combined coverings equaling the extreme length 35 of said frame; means uniting said frame sections when aligned to form a unit-supporting frame; and elevating means operatively connected with said frame sections to independently elevate the same. 40

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM CLARK FEELY.

Witnesses:

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JOHN P. DAVIS.