

Feb. 10, 1959

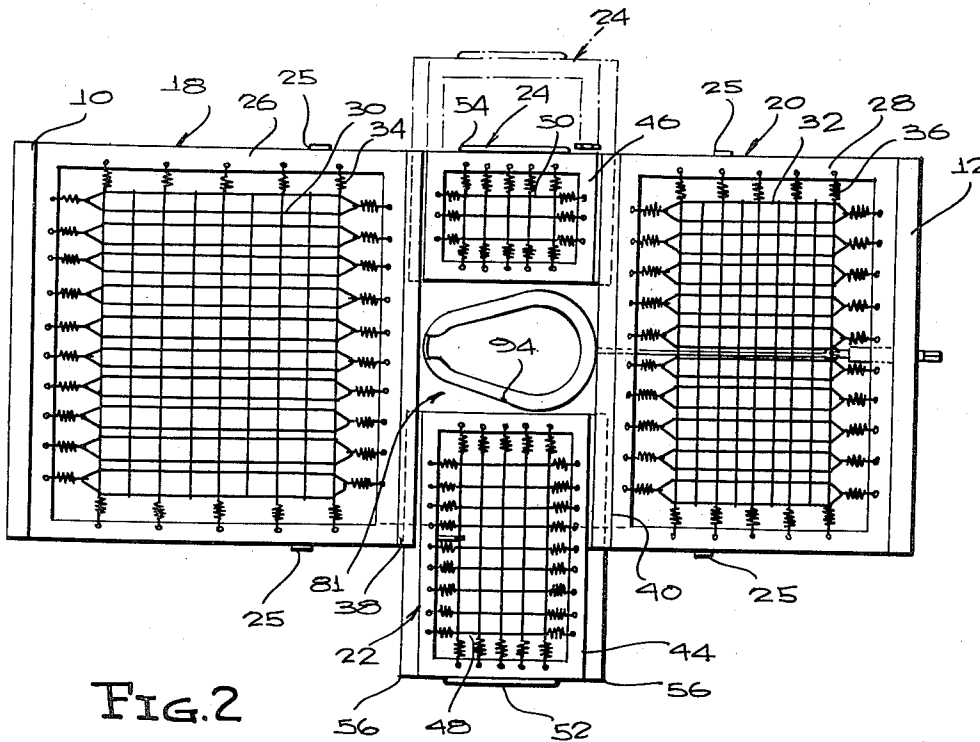
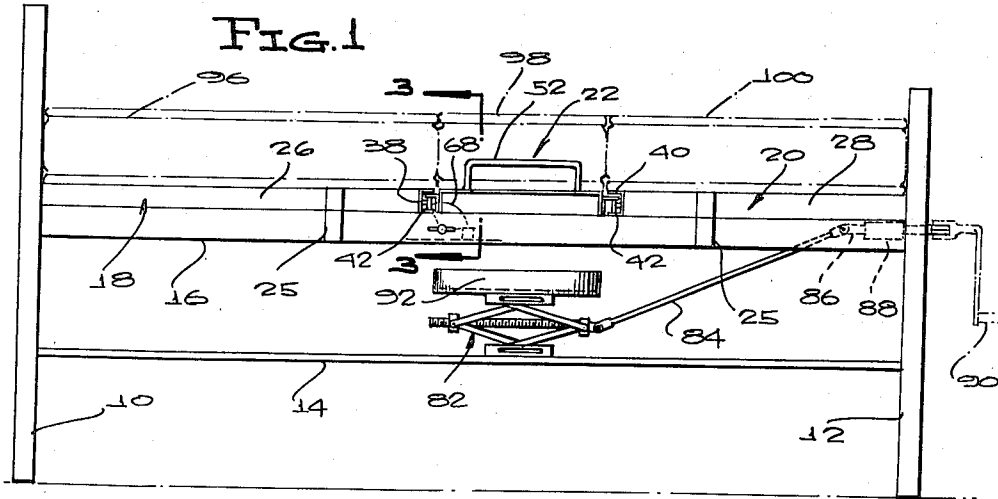
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HOSPITAL BED HAVING Laterally Adjustable Spring Sections

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2 Sheets-Sheet 1



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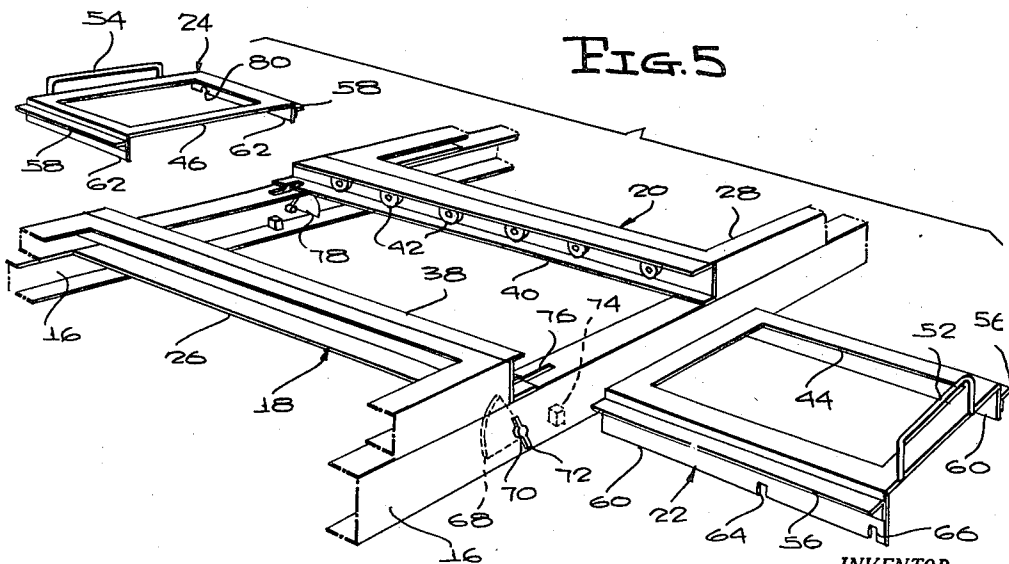
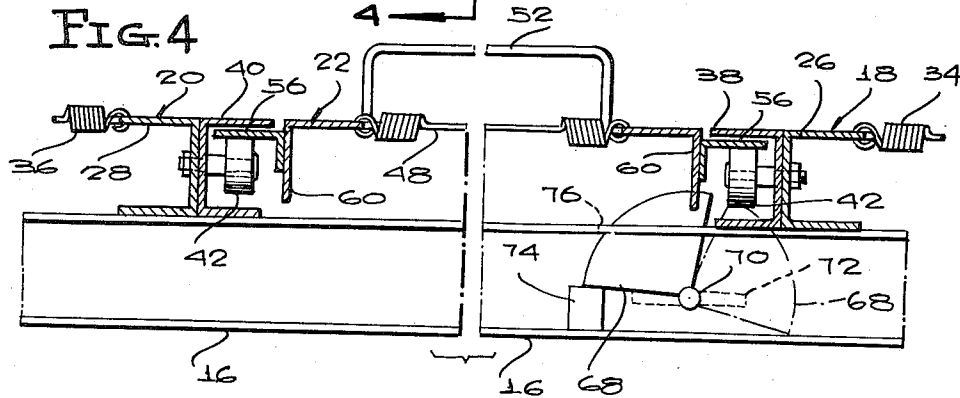
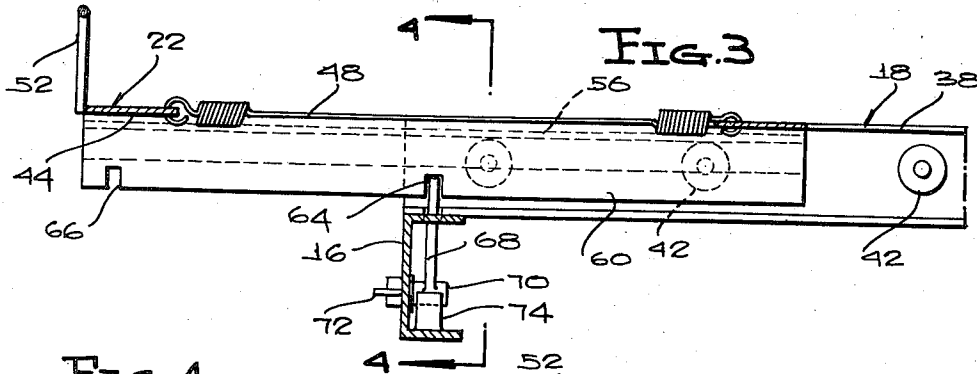
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HOSPITAL BED HAVING Laterally Adjustable Spring Sections

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1 Claim. (Cl. 5—90)

This invention relates to hospital beds, and more particularly has reference to a bed particularly designed to accommodate patients who are completely bedridden, such as paralytics and persons of extreme age and infirmities.

Considerable difficulties arise in the care of bedridden patients. The placement and removal of bed pans, for example, is quite difficult, and in addition may prove very uncomfortable so far as the patient is concerned. Most usually, the practice is to lift the patient in the region of the buttocks. Alternatively, one may roll the patient to one side and then, after placing the bed pan, roll the patient back onto the bed pan while utilizing, at the same time, a lifting action.

It will be readily appreciated that not only is this a time-consuming and difficult task, that may prove very uncomfortable to the patient, but in addition the bed pan is quite uncomfortable to the patient, since its rests directly on the mattress with the patient also supported upon the mattress. Further, the difficulties and inconveniences attendant upon this operation are compounded many times, in large hospital wards, etc., as a result of which many patients cannot be attended with sufficient frequency or in emergency situations. This results in soiling of the bed, requiring immediate replacement of the soiled bed clothing.

The main object of the present invention is to provide a generally improved hospital bed in which none of the inconveniences, difficulties, and annoyances noted above will be present. To this end, the hospital bed according to the present invention includes a bed springs which comprises a plurality of sections, said sections being normally positioned so as to cooperate in defining a rectangular bed springs of conventional form and appearance. In accordance with the invention, a pair of side-by-side center sections are adapted for lateral, outward adjustment from the center of the bed. A tray that is adapted to support a bed pan, mounted on an elevatable mechanism below the bed springs, may then be raised in the center opening defined by the outward adjustment of the center spring sections, to receive a bed pan that will be located at or below the level of the top surface of the mattress.

It has been previously proposed to provide hospital beds designed to effect the provision of a center opening, in which the bed pan may be received. However, the object of the present invention is to provide a generally improved hospital bed of the type described, characterized by a novel arrangement such that the several sections will be firmly locked against relative movement in their normal position.

It is another object to so design a locking mechanism for the center sections as to permit said sections to be adjusted outwardly with the locking mechanisms being operated to releasing positions with maximum ease despite their adaptability to normally remain firmly locked.

Still another object is to provide, in at least one center section, means cooperating with the associated locking mechanism in such a way that this section will be capable

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of being securely locked both in its inwardly and outwardly adjusted positions.

Another object is to so design the locking mechanism that it can be manufactured at relatively low cost, and installed with minimum expense in a hospital bed of the character described.

Another object is to design the locking mechanism in a manner such that when it is in either its locking or unlocking position, it will be held in the selected position by gravity, eliminating completely the use of springs and other elements subject to wear and breakage.

Another object is to form the locking mechanism in a manner such that it will not interfere with making of the bed, handling of the patient, or other normal routines, with the locking mechanism being substantially completely concealed at all times.

Still another object is to so form and relate the several locations of the bed springs as to not only permit the formation of the bed-pan-receiving center opening with maximum speed and ease, but also permit the patient to be moved to a position facilitating the outward adjustment of the selected section of the springs, with minimum discomfort so far as the patient is concerned.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a side elevational view of a hospital bed formed according to the present invention, a plurality of mattress sections being shown in dotted lines;

Figure 2 is a top plan view of the bed with the mattress sections removed, one of the center sections being extended outwardly and being shown in full lines, the other center section being shown in full and dotted lines in its inner and outer positions, respectively;

Figure 3 is an enlarged, detail, transverse sectional view on line 3—3 of Figure 1;

Figure 4 is a fragmentary, enlarged longitudinal sectional view, on the same scale as Figure 3, taken on line 4—4 of Figure 3 with portions being broken away, the locking mechanism being shown in full and dotted lines in its locking and unlocking positions respectively; and

Figure 5 is an enlarged perspective, fragmentary view, partially exploded, of the hospital bed.

Referring to the drawings in detail, the hospital bed constituting the present invention includes a stationary bed frame including a head board 10, a foot board 12, longitudinal brace bars 14, and side rails 16 formed, as shown in Figure 5, as confronting channel members.

The bed frame can, of course, be so formed as to include other bracing means, and in addition the bed frame may and usually would be so designed as to permit separation of the head and foot boards from the associated, remaining components of the bed frame.

In accordance with the present invention, a bed springs, supported removably upon the frame, comprises four spring sections generally designated 18, 20, 22, and 24 (Figures 2 and 5). The sections 18, 20 comprise end sections, and though removably supported upon the side rails, will remain stationary during the normal use of the hospital bed. Section 18 is larger than section 20 as shown in Figure 2, and may itself include a hinged portion designed to permit elevation of the upper part of the patient's body so that the patient may be adjusted between prone, semi-sitting, and full sitting positions respectively. This is believed sufficiently obvious as not to require special illustration herein. The illustration of this type of arrangement, which is well known in hospital beds, has been dispensed with so as to devote the drawing and the pertinent description of the invention to the features constituting the invention.

In any event, the sections 18, 20 are held against lateral deviation from their assigned positions by means of upwardly projecting abutments or lugs 25 (Figure 1) which are fixedly secured to the respective side rails and project upwardly therefrom a distance sufficient to embrace the spring sections 18, 20.

End sections 18, 20 are formed with rectangular, open-center, channeled frames 26, 28 respectively supporting spring assemblies 30, 32 connected peripherally to the frames by support springs 34, 36.

The inner ends of sections 18, 20 are spaced apart to define a center space extending transversely of the bed through the full width thereof, and secured to the confronting, inner sides of the sections 18, 20 are parallel, confronting, guide channels 38, 40 respectively, on the webs of which are mounted uniformly spaced guide rollers 42 (Figures 4 and 5).

The center sections 22, 24 are also of different size, section 22 being approximately twice as large in respect to the transverse dimension thereof as the section 24, so as to extend, when in its inwardly adjusted position, over approximately two-thirds the full width of the hospital bed.

Sections 22, 24 are also provided with open-center, rectangular, rigidly constituted frames 44, 46 respectively, supporting spring assemblies 48, 50 formed similarly to the spring assemblies of the end sections. The frames 44, 46, however, are not of channel iron construction, as will be readily noted by reference to Figure 5. Rather, the frames of the center sections are formed of flat bar stock, with depending side walls being integrally formed upon the respectively opposite sides of the center section frames in a manner to be discussed in greater detail hereinafter.

Projecting upwardly from the outer sides of the center sections, and rigidly secured to the adjacent edges of the frames thereof, are handles 52, 54 respectively, formed to an inverted U-shape as best shown in Figure 5. These are for the purpose of facilitating adjustment of the center sections to their inner and outer positions.

Also as best shown in Figure 5, fixedly secured to the depending side walls of the center sections are guide rails 56, 56 of section 22, and 58, 58 of section 24. These are extended over the full transverse dimension of the respective center sections, and are secured to the upper portions of the depending side walls 60, 62 of said sections.

As shown in Figure 4, the guide rails are supported upon the rollers 42, so that each center section may be rolled into and out of position. When the sections are moved inwardly to their maximum extent, their inner sides are in abutting relation, so that the center sections, in cooperation with the end sections, define a perfectly rectangular bed springs adapted to support a plurality of mattress sections corresponding in outer configuration to the configuration of the respective spring sections.

It will be noted from Figure 5 that in one of the side walls 60 of the section 22, a pair of downwardly opening notches 64, 66 are formed. Notch 66 is spaced closely from the outer side of the section 22, while notch 64 is spaced transversely of the bed a substantial distance from the notch 66.

Adapted to enter either notch is a locking plate 68 of segmental shape, swingable in a vertical plane, and formed integrally at its smaller end with a laterally, outwardly projecting stub shaft 70, rotatably bearing in an opening formed in the web or side wall of one of the side rails 16. Rigid with the outer end of the stub shaft is a diametrically extending handle 72.

The locking plate 68, when in one position, is supported directly upon the lower wall of the side rail 16, as shown in dotted lines in Figure 4. As will be noted, the entire weight of the plate 68, in these circumstances, is disposed to one side of the pivot axis of the plate. Therefore, the plate will remain in this position, which constitutes an unlocking position, by gravity action. This eliminates en-

tirely the use of springs and similar expedients heretofore employed, which have the tendency of breaking, malfunctioning, etc.

In its opposite extreme position, the plate 68 is supported upon a stop 74 of block-like shape, rigid with and projecting upwardly from the bottom wall of the side rail 16. Again, the greatest part of the weight of the plate 68 is disposed to one side of the pivot axis thereof, so that in this position, which is shown in full lines in Figure 4 and constitutes a locking position, the necessity of springs and similar retaining elements is dispensed with.

In moving between its opposite extreme positions, the arcuate outer portion of the plate 68 travels through a longitudinal slot 76 formed in the top wall or flange of the side rail 16, adjacent the guide rail 38. As a result, the plate 68, when shifted to locking position, moves into the path of slidable adjustment of the section 22. The plate, in the inwardly adjusted position of the section 22, enters the outer notch 66, thus securely locking the section 22 against movement from said inner position thereof.

To permit adjustment of the section 22 outwardly to the full line position of Figure 2, the plate 68 is swung to its dotted line position of Figure 4, so as to completely clear the notch 66. Section 22 is now free to be pulled outwardly by one grasping the handle 52. When it has been moved outwardly to the extent shown in Figure 2, the notch 64 will be brought into registration with the slot 76, so that plate 68 may now be swung back to its locking position, entering at this time the notch 64. Thus, the section 22 will now be held in its outer position of adjustment.

Section 24 is also equipped with a locking mechanism similar to that described immediately above, including a pivoted plate 78 adapted to enter a single notch 80. This is shown in Figure 5, and as will noted, only one notch is provided in the section 24, rather than two as used in the section 22.

Plate 78 enters notch 80 when the section 24 is in its normal, full line position of Figure 2. In this regard, section 24 need not be adjusted outwardly when it is desired to provide the center space in the hospital bed. However, if it is desired to move the same outwardly for any purpose, as for example for the purpose of facilitating remaking of the bed, changing of draw sheets, or the like, the plate 78 is readily adjusted to its unlocking position, freeing the section 24 for outward movement and, if desired, complete removal from the bed.

When section 22 is adjusted outwardly, there is defined a center space of rectangular formation designated 81. This space is disposed centrally between the opposite sides of the bed, as will be readily seen from Figure 2.

Immediately below the space 81, there is mounted upon the bed frame a scissors jack mechanism generally designated 82. This is per se conventional and hence need not be described in detail herein. Mechanism 82 is operated by a shaft 84 having a universal connection to a stub shaft 86 journaled in a bearing 88 carried at the foot board, with stub shaft 86 having a non-circular projection adapted to receive a hand crank 90.

Mounted upon the mechanism 82 is a shallowly dished tray 92, and a conventional bed pan 94 may be removably supported in the tray. Thus, if it is desired to place the bed pan, it is merely necessary that the patient be rolled on one side, to overlie the section 24, after which the section 22 is pulled outwardly and locked in its outer position. The bed pan may now be placed on the tray 92, and is adjusted upwardly by rotation of the crank 90, to a position in which it is at or just below the level of the top surface of mattress sections 96, 98, 100, supported upon the respective sections. It will be understood that each mattress section will correspond in shape and size to the section supporting the same.

The hospital bed constituting the present invention has

the desirable advantage that the movable center sections are locked, when the bed is in regular use, securely against movement relative to the main bed frame. Further, the section 22, which is the section that is moved outwardly and inwardly, is also lockable in its outer position by the same mechanism employed to normally hold the same in its inner position. The locking mechanism is characterized by its simplicity, wherein the locking plate is maintained both in locking and unlocking positions entirely by gravity action, without requirement of springs, etc. Nevertheless, the plate, though simple and inexpensive in construction, securely locks the center section against movement. This is of importance, since complete insurance against accidental movement of the center sections, which movement might be caused by turning of the patient in bed, is provided.

Still further, the construction facilitates the making of different sections of the bed, to change soiled bed clothing, without requiring remaking of the entire bed. Thus, should the bed clothing on section 22 become soiled, this may be readily changed without disturbing the patient other than to roll the patient onto one side, upon the section 24.

The type of spring assembly used can, of course, be varied as desired, that shown being merely illustrative of one of many that can be employed to advantage.

The sections 22 and 24 may be reversed, i. e. inserted from the sides opposite those shown, depending upon which side a patient is customarily turned upon when utilizing the novel bed in the manner heretofore described. The sections 22 and 24 may have disposed thereon suitable mattresses which are covered by coverings similar to "pillow slips," and the sections 18 and 20 will have thereon suitable mattresses covered by conventional sheets.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles, and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in

construction that may be permitted within the scope of the appended claims.

What is claimed is:

In a hospital bed comprising a support frame including side rails one at least of which is formed with a side wall and with a top flange extending laterally inwardly from said wall, a pair of end spring sections carried by and spaced longitudinally of the frame, bed pan support means mounted on the frame below the space between the end sections, and a pair of center sections mounted on the end sections in the space between the same for relative adjustment transversely of the frame between contacting inner positions and outer positions in which the center sections are spaced apart sufficiently to expose therebetween the bed pan support means, the improvement which comprises: a locking plate pivoted upon the inner side of the side wall, said top flange having a slot through which said plate is pivotally movable between locking and unlocking positions respectively, one center section having notches spaced apart along one side thereof, each of which notches receives the locking plate in a selected position to which said one section is adjusted, said locking plate being pivoted on its axis for movement from one side to the other of said axis, so as to remain in selected positions of pivotal movement by gravity action.

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