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3,224,016

DEVICE FOR LIFTING BED PATIENTS

Filed Aug. 31, 1962

3 Sheets-Sheet 1

Fig. 1.

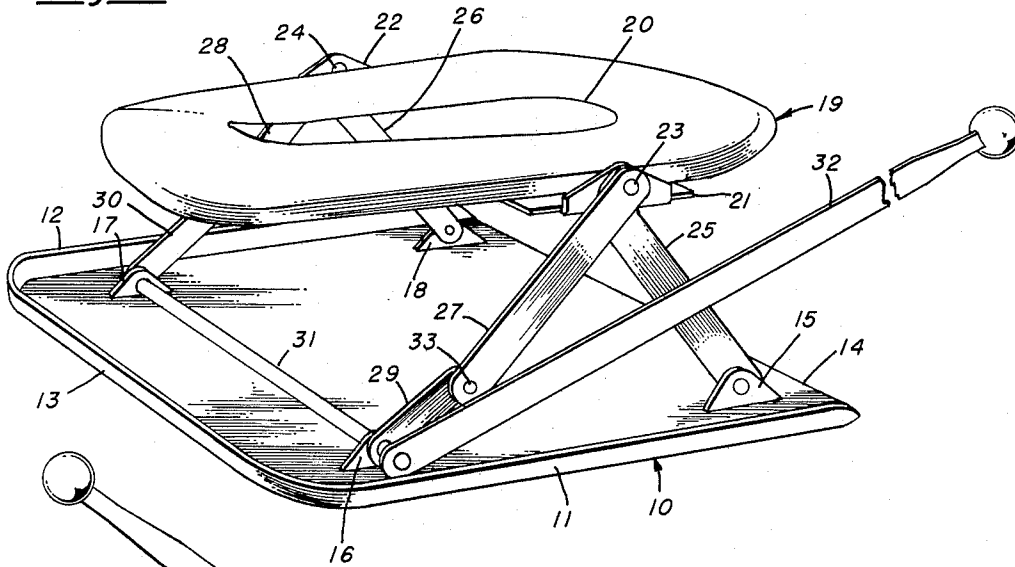


Fig. 2.

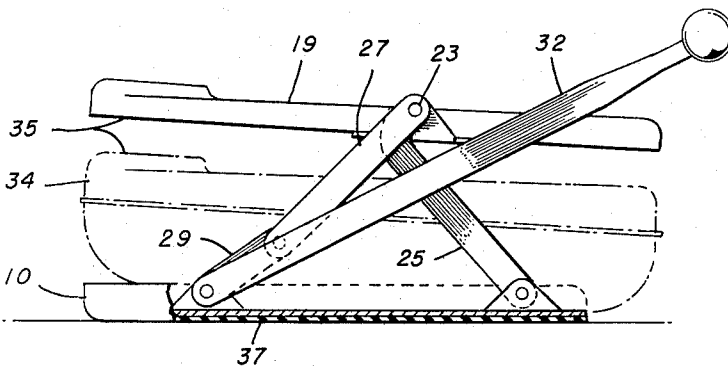
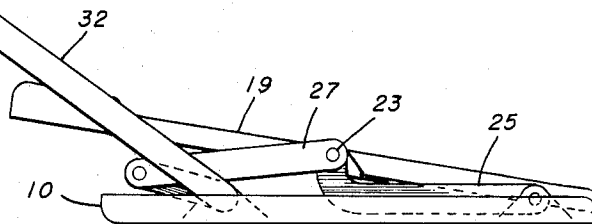


Fig. 3.

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Fig. 4.

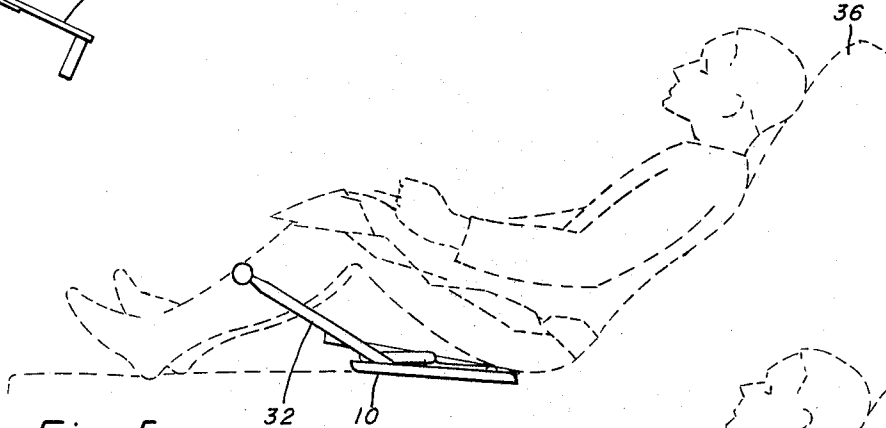
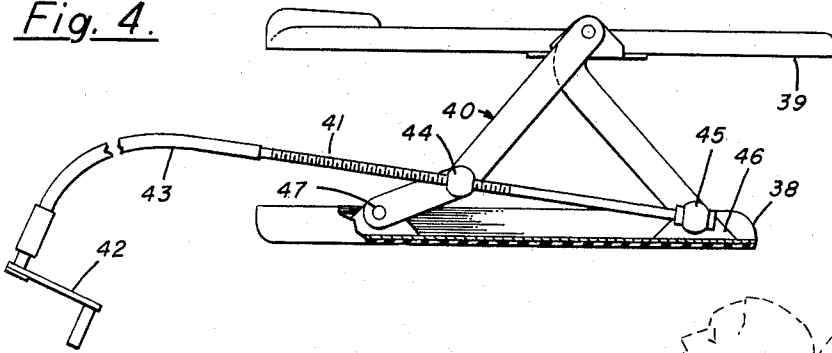


Fig. 5.

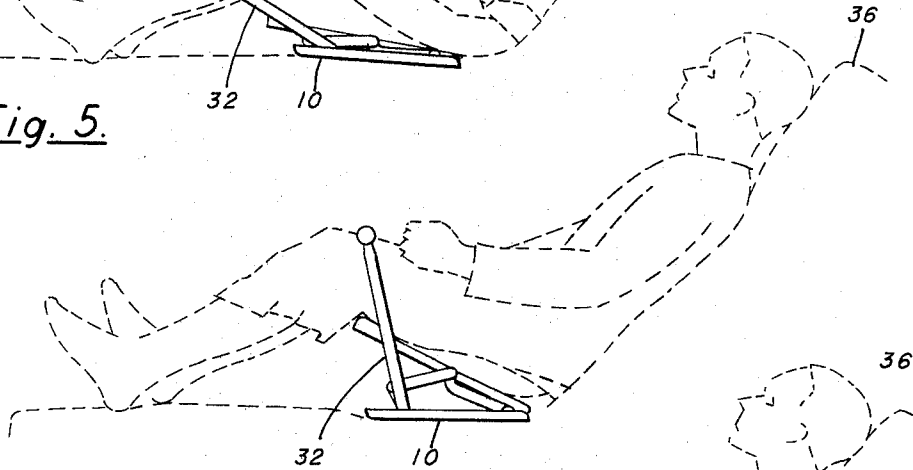


Fig. 6.

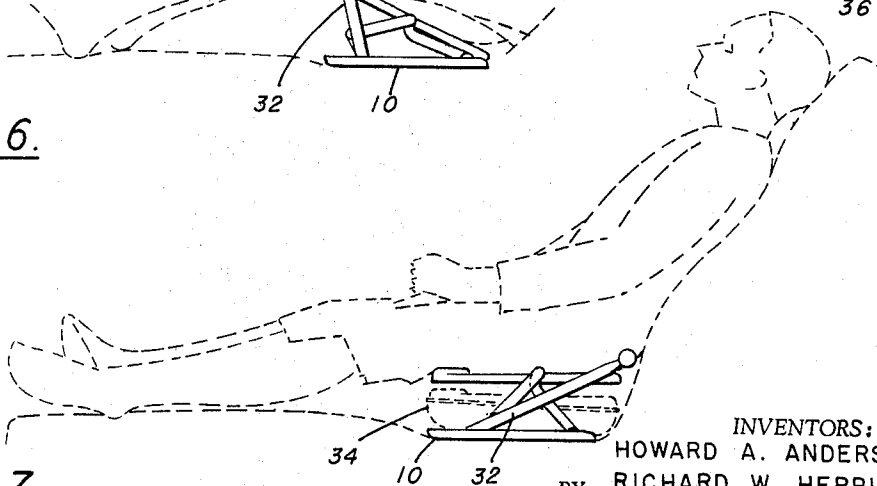


Fig. 7.

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Fig. 8.

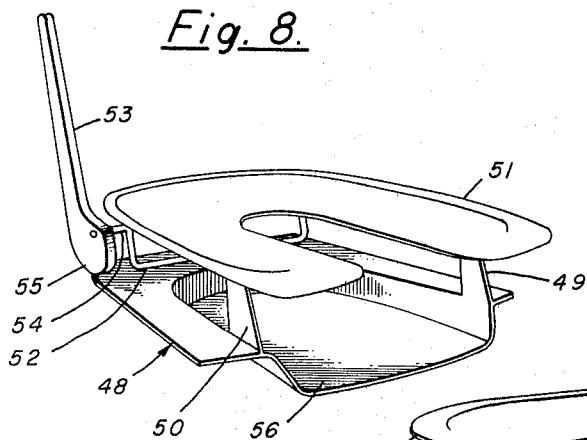


Fig. 9.

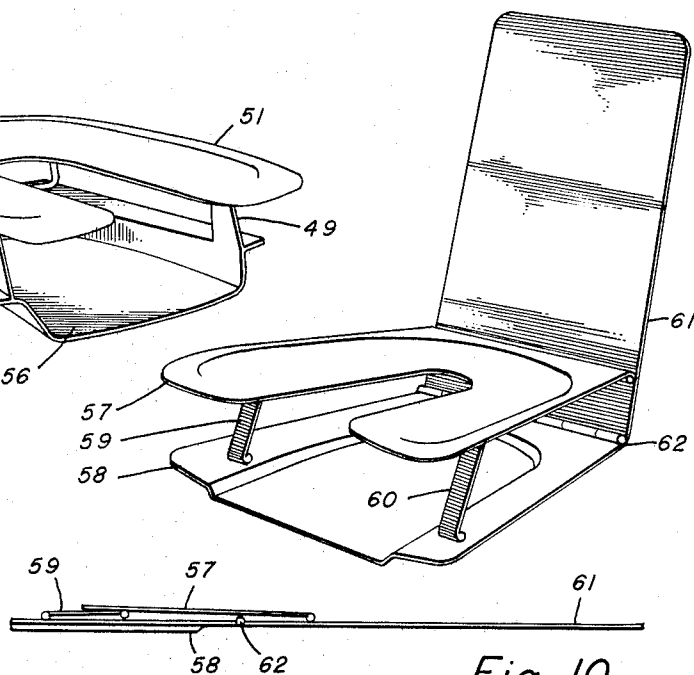


Fig. 10.

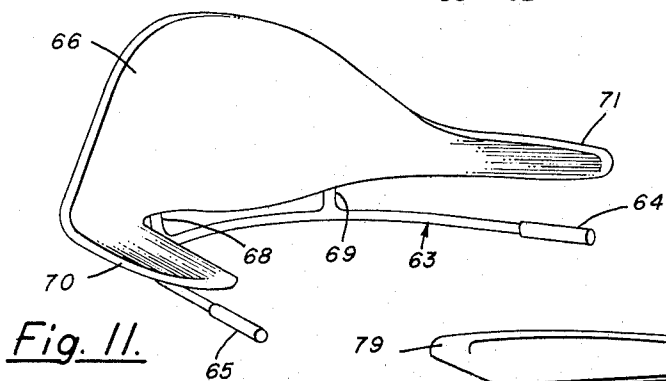


Fig. 11.

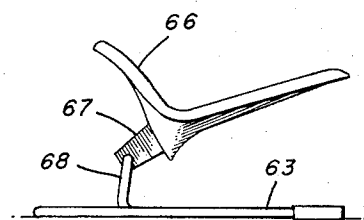


Fig. 12.

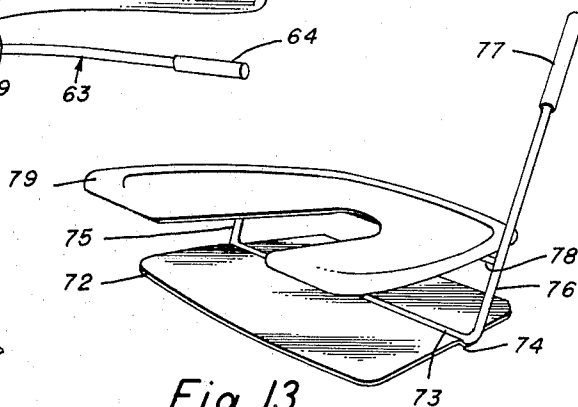


Fig. 13.

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DEVICE FOR LIFTING BED PATIENTS

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4 Claims. (Cl. 5—327)

This invention provides an appliance intended to reduce the effort involved in administering to the needs of persons confined to bed. The familiar bedpan, necessary as it is, is often a discomfort to the patient and a burden to attending personnel. A nurse cannot be expected to lift an incapacitated two hundred and fifty pound person enough to administer a bedpan, and it has become common practice to employ male orderlies of strong physique to assist the nurses in this work. Where the services of an orderly are not available, necessity has forced nurses to devise ingenious techniques for rolling patients on and off bedpans. These procedures, however, cannot be used on all patients. At best, considerable skill and strength is required. Reaching out over a bed to handle the weight of a patient is the poorest lifting position imaginable, and back trouble is practically an occupational hazard of nursing.

This invention provides a device that simplifies the lifting of the patient to such a degree that the problem no longer represents a feat of skill and strength. In addition to this, the patient is supported in such a manner that his comfort is vastly greater than has been customary. It is significant that the lifting device is itself supported on the bedding adjacent the patient so that the downward deflection of the bedding as the lifting force is applied supplements the actual lifting to produce the necessary clearance for the insertion of the bedpan. The patient remains supported by the device during the use of the bedpan, and the removal of it is as simple as the insertion.

The several features of the invention will be analyzed in detail through a discussion of the particular embodiments illustrated in the accompanying drawings. In the drawings:

FIGURE 1 presents a perspective view of one modification of the invention in the elevated position.

FIGURE 2 presents a side elevation of the same device shown in FIGURE 1, in the initial position.

FIGURE 3 presents a fragmentary sectional elevation of the device shown in FIGURES 1 and 2, showing the position of the bedpan in dotted lines, with the device in the elevated position.

FIGURE 4 presents a side elevation, partially in section, of a modified form of the invention.

FIGURES 5, 6, and 7 show successive steps in the insertion and operation of the device shown in FIGURE 1.

FIGURE 8 is a perspective view showing a modified form of the invention.

FIGURE 9 is a perspective view of a further modification of the invention, shown in the elevated position.

FIGURE 10 shows the initial position of the device shown in FIGURE 9.

FIGURE 11 is a perspective view of a further modification of the invention.

FIGURE 12 is a side elevation of the device shown in FIGURE 11, in an intermediate position.

FIGURE 13 illustrates a further modification of the invention.

The device illustrated in FIGURES 1, 2, 3, 5, 6 and 7 includes a base 10 preferably in the form of a sheet metal panel having the side flanges 11 and 12, and the front flange 13. The rounded surface provided by the presence of the side flanges 11 and 12 facilitates the lateral insertion of the device under the patient, as it

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tends to minimize the tendency to engage folds in the bedclothes. The frontal flange 13 adds considerably to the strength of the base 10, but the rear edge 14 is left unflanged to minimize the height in this area and thus facilitate the insertion of the device under the patient in the position shown in FIGURE 5.

The base 10 is provided with a group of four brackets 15-18 which form pivot connections for the lifting mechanism. The seat 19 has a central opening 20 in the general pattern of a conventional toilet seat, and is provided with side brackets 21 and 22 which engage the fulcrum pins 23 and 24 providing pivotal connections for the rear links 25-26 and the upper toggle links 27-28. In the elevated position shown in FIGURES 1, 3, and 7, the seat 19 is pivotally supported upon the axis of the pins 22-23.

The lower toggle links 29-30 are mounted on a common shaft 31, and are fixed with respect thereto. The handle lever 32 is also fixed with respect to the shaft 31, and rotation of the handle lever 32 from the position shown in FIGURE 2 to that of FIGURE 1 produces the movement of the device from the initial to the elevated position. The natural characteristics of the toggles formed by the links 27 and 29, and 28 and 30, result in a very large mechanical advantage as the connecting pivots 33 move across the line of centers between the fulcrums 23 and 24 and the shaft 31. This condition corresponds to the point where the maximum lifting force is necessary as the patient is elevated and the bed clothing depressed into the position shown in FIGURE 7. The position of the handle 32 is such that downward forces are applied at this point rather than lifting, and the efforts of the nurse at the bedside are most easily applied in this manner. The device is also self-locking in this position, as the pivot points 33 will always have a tendency to move away from the "on center" position. The final supported position shown in FIGURE 7 may be determined either by auxiliary stops (not shown), or the handle 32 may be permitted to rest in a horizontal position against the base 10. In either case, the final position must provide sufficient clearance to permit the insertion of the bedpan indicated at 34 in FIGURES 3 and 7. Substantial clearance above the bedpan should also be provided, as indicated at 35, to accommodate a degree of rocking freedom of the seat 19 about the fulcrum pivots 22-23 so that the seat may adjust itself to the natural position of the patient. The device should be constructed of components made of aluminum, magnesium, or some other light and relatively non-allergenic material.

It is often desirable to incorporate a covering layer on the underside of the base 10 as indicated at 37 in FIGURE 3 to increase the frictional reaction with bedclothing. The movement of the device from the FIGURE 2 to the FIGURE 1 position involves a considerable horizontal displacement of the seat 19 with respect to the base 10, and the reason for this is evident from an examination of FIGURES 5, 6, and 7. Unless the patient is very severely incapacitated, the conventional hospital bed 36 is preferably elevated to the FIGURE 5 position as the first step in administering the bedpan. The patient's knees are then lifted slightly as shown, and the device inserted by placing it under the patient's legs and shoving it gently under the patient as far as it will go. The handle 32 is then actuated, resulting in a movement of the patient upward and to the right, as shown in the drawings, accompanied by some degree of deflection of the bedding under him. In this type of operation, there is considerable lateral force applied to the device by the weight of the patient tending to move it to the left, as shown in the drawings, and the presence of the friction

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layer 37 will tend to maintain the relative position of the device on the bedding. Completion of the movement of the handle 32 over to the position shown in FIGURE 7 will permit the insertion of the bedpan 34. The pivotal mounting of the seat 19 with respect to the bedding will permit the patient to supplement the lifting effect of the mechanism by a slight straightening of his legs from the FIGURE 6 to the FIGURE 7 position. He will also be able to place himself in the position of maximum comfort. The particular position of the elevated end of the bed 36 is not critical in the operation of the device, and the unit will function equally well if the patient is in the fully reclined position. In the latter case, the patient's knees are preferably lifted to about the height shown in FIGURE 5. The device may then be actuated, and the pivotal mounting of the seat 19 would permit the patient's body to assume an arcuate position that will produce a minimum of disturbance.

The modification of the device shown in FIGURE 4 includes a base 38 and a seat 39 that are similar to the corresponding components shown in FIGURE 1. Similar support linkage generally indicated at 40 is also used. The actuation of the linkage 40 is accomplished by the rotation of the screw-threaded rod 41 by the crank 42 through the flexible shaft 43. The nut 44 is connected to a pivot pin corresponding to the toggle pivots 33 of FIGURE 1, and the rod 41 is rotatable (but axially fixed) with respect to the terminal 45. This terminal is rotatably mounted on the bracket 46 of the base 38, preferably on the same pin that provides a pivot connection for the linkage. A common shaft 47 corresponds to the shaft 31 of FIGURE 1, and associates the linkage 40 with its opposite component so that rotation of the crank 42 will actuate the toggles from the initial to the elevated position. This arrangement will have the advantage of minimizing the interference with the bedclothing, as the flexible shaft may be led out to a position where full clearance is available.

The device shown in FIGURE 8 includes a base 48 having the front pedestals 49 and 50. The seat 51 is pivotally mounted on these pedestals at the forward portion of the seat as shown, and the shaft 52 is preferably rotatably mounted on the base 50. The position of the axis of rotation of the shaft 52 is fixed with respect to the base, and the handle lever 53 is rotatably mounted on the offset end 54 of the shaft. A similar offset is provided at the opposite end of the shaft 52, and both of these offsets bear on the underside of the seat 51, and move across it to some degree during the elevating operation. The elevation is accomplished by the rotation of the handle lever 53 in a direction toward the front of the device, which results in the engagement of the cam surface 55 of the handle lever with the top of the base 48, thus swinging the offset ends 54 upwardly against the underside of the seat 51. In the elevated position shown in FIGURE 8, the bedpan may be placed in the central portion 56 of the base 48.

The device shown in FIGURES 9 and 10 involves a parallelogram-type linkage connecting the seat 57 with the base 58. The frontal links 59 and 60 are pivotally connected respectively to the seat and base, and the rear portion of the seat is pivotally connected to the back 61, the latter being hinged to the base as shown at 62. This arrangement has an advantage in cases where the patient may be rolled on his side in a fully reclined position sufficiently for the device to be placed under him. If this can be done, the conventional hospital bed may be raised to the position shown in FIGURES 5, 6, and 7, which will automatically result in the actuation of the lifting device from the FIGURE 10 to the FIGURE 9 position.

The device shown in FIGURES 11 and 12 includes a base formed by the tubing 63, with the end-pieces 64 and 65 preferably added to function not only as handles but as enlarged areas to prevent punching holes in the bed-

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ding. The back member 66 is provided with brackets as shown at 67 engaging the vertical posts 68 and 69 of the base to provide a pivotal mounting for rotation on a lateral axis. If the patient can sit up without support, the device may be placed against him with the back member bearing against the small of his back. If he then leans back, he will move the device through the intermediate position shown in FIGURE 12 to a position in which the back portion 66 is generally horizontal, resulting in supporting his body at a sufficient height above the bedding to permit the insertion of the bedpan. The position of the axis of rotation of the back 66 should be under the central area of his back, and the base 63 should extend far enough on both sides of the posts 68 and 69 to prevent any tendency for the device to tip over. The presence of the arms 70 and 71 on opposite sides of the back 66 provides leverage for the patient to manipulate the device, and also assures the confinement of the patient on the unit in the elevated position.

The device shown in FIGURE 13 includes a base 72 on which the shaft 73 is rotatably mounted in any convenient manner. For utmost simplicity, the base 72 may merely have a slight recess as shown at 74 for locating the shaft to provide for removal of the base. The shaft 73 has the vertical extensions 75 and 76, the latter terminating in an actuating handle 77. The horizontal fulcrum rod 78 is rotatable with respect to the seat in conventional bearing fittings (not shown), and secured to the vertical extensions 75 and 76, resulting in a pivotal mounting of the seat 79. The device shown in FIGURE 13 may be actuated enough to permit the insertion of a bedpan, and then lowered so that the seat 79 is supported on the pan rather than on the device. The simplicity of the actuating system permits movement of the lever from either direction, although the mechanical advantage of this type of actuation is limited.

The particular embodiments of the present invention which have been illustrated and discussed herein are for illustrative purposes only and are not to be considered as a limitation upon the scope of the appended claims. In these claims, it is our intent to claim the entire invention disclosed herein, except as we are limited by the prior art.

We claim:

1. A device for elevating a bed patient, said device comprising:

- a base;
- a seat provided with a central opening, said seat being movable with respect to said base; and
- elevating means for raising said seat from a position adjacent said base and freely pivotally supporting the same on a lateral axis, and for simultaneously rearwardly displacing said seat with respect to said base, said elevating means including
 - links on opposite sides of said seat member pivotally connected to said seat and said base, respectively,
 - toggle means on opposite sides of said seat and connecting links and said base, and
 - actuating means for positioning said toggle means, said actuating means including
- a shaft connecting corresponding members of said opposite toggle means, and a handle for positioning said shaft.

2. A device for elevating a bed patient, said device comprising:

- a base;
- a seat provided with a central opening, said seat being movable with respect to said base; and
- elevating means for raising said seat from a position adjacent said base and freely pivotally supporting the same on a lateral axis, said elevating means including
 - links on opposite sides of said seat member pivotally connected to said seat and said base, respectively,

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toggle means on opposite sides of said seat and connecting said links and said base, and actuating means for positioning said toggle means.

3. A device for elevating a bed patient, said device comprising: 5
- a base;
 - a seat provided with a central opening, said seat being movable with respect to said base; and
 - elevating means for raising said seat from a position adjacent said base and pivotally supporting said seat 10 adjacent an intermediate portion thereof for freedom to rock about a single lateral axis and for simultaneously rearwardly displacing said seat with respect to said base.
4. A device for elevating a bed patient, said device 15 comprising:
- a base;
 - a seat provided with a central opening, said seat being movable with respect to said base; and

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elevating means for raising said seat from a position adjacent said base and pivotally supporting said seat adjacent an intermediate portion thereof for freedom to rock about a single lateral axis.

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