Sept. 26, 1967 R. D. GRANT 3,343,181

DEVICE FOR LIFTING AND SUPPORTING BED PATIENTS

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Fig. 1

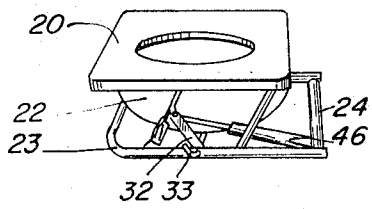


Fig. 2

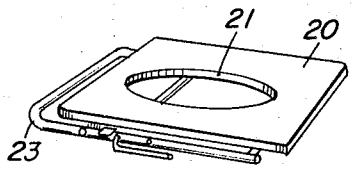


Fig. 14

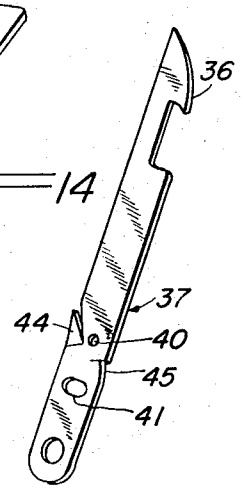


Fig. 3

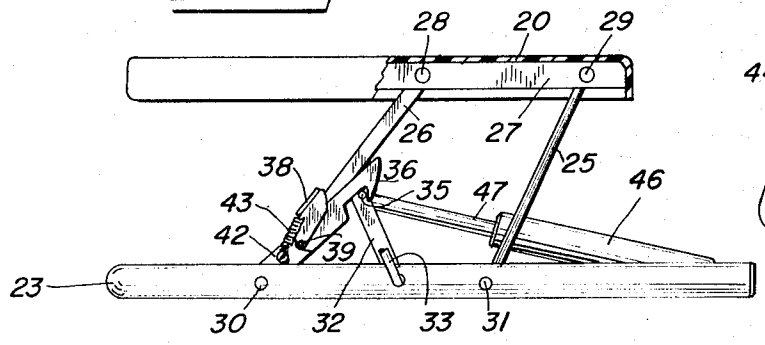


Fig. 4

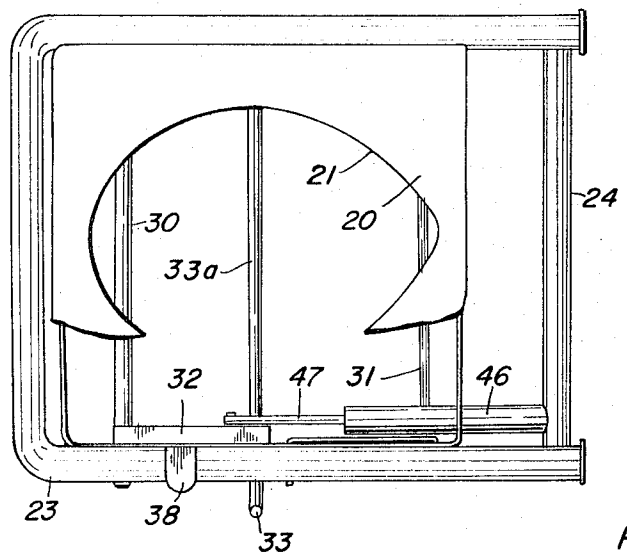
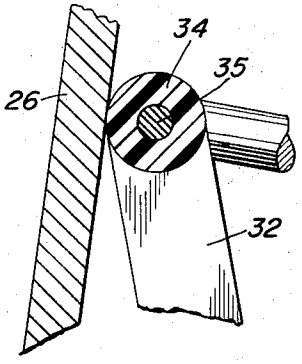


Fig. 10



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DEVICE FOR LIFTING AND SUPPORTING BED PATIENTS

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FIG. 5

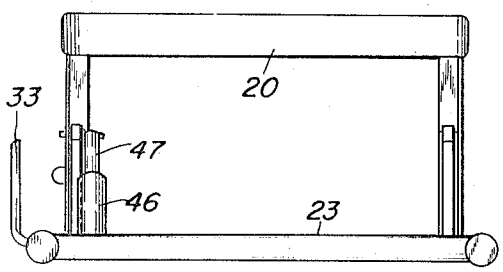


FIG. 6

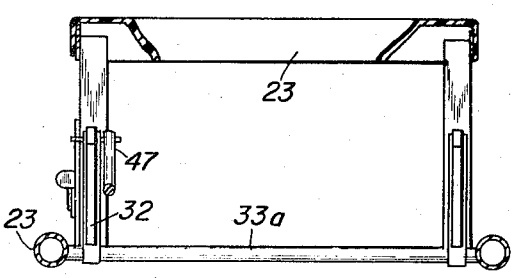


FIG. 7

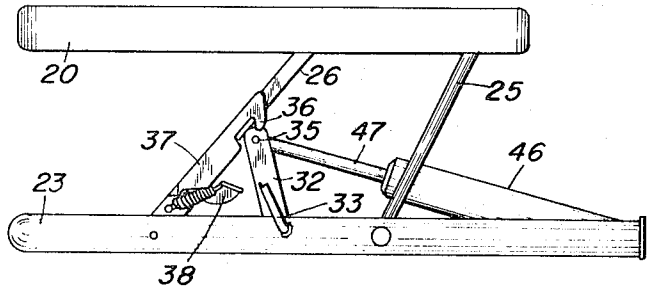


FIG. 8

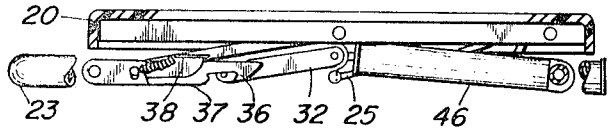


FIG. 11

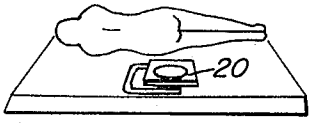


FIG. 12

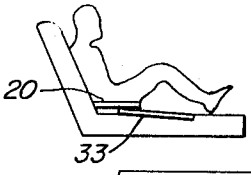


FIG. 13

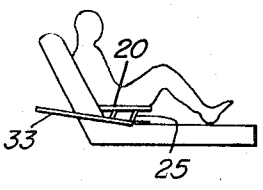
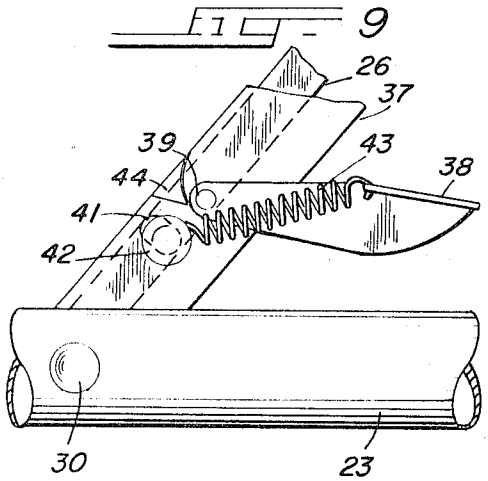


FIG. 9



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DEVICE FOR LIFTING AND SUPPORTING BED PATIENTS

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Filed Nov. 8, 1965, Ser. No. 506,821
7 Claims. (Cl. 5—90)

ABSTRACT OF THE DISCLOSURE

An elevatable device for supporting a patient over a bedpan, the support structure being a system of links extending between a base and a supporting member, with a rotatable actuating arm bearing against one of the links to elevate the device, and having a latch engageable with the arm to fix the angular position of the arm with respect to the base.

This invention provides an improved device for lifting and supporting bed patients, and has been developed primarily to facilitate the use of bedpans. The invention is an improvement on the invention disclosed in the application of Anderson and Herring, Ser. No. 221,007, filed on Aug. 31, 1962. The application referred to discloses a device for lifting the central portion of the body of a bed patient, and supporting it at a height sufficient for a bedpan to be slipped underneath the support structure. The elevating mechanism applies a considerable mechanical advantage to the force contributed by the attending nurse, which relieves her of excessive strain and also relieves the patient of the danger of accident or mishandling. The present invention provides an improved actuation for the lifting mechanism, and a locking mechanism that cooperates with the actuating mechanism to maintain the elevated position without risk. Means are also incorporated for assuring that the lowering of the patient will be done safely, and with little effort on the part of the attendant.

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

FIGURE 1 is a perspective view showing the elevated position of the device, with a bedpan placed under the support panel.

FIGURE 2 shows the collapsed position of the device, which is a condition in which it is first inserted under the patient.

FIGURE 3 is an elevation, partially in section, showing the elevated position of the structure on an enlarged scale over FIGURES 1 and 2.

FIGURE 4 is a plan view of the device shown in FIGURE 3.

FIGURE 5 is a front view of the device in the position shown in FIGURE 3.

FIGURE 6 is a section through the central portion of the device shown in FIGURE 3.

FIGURE 7 is a side elevation showing the unlocked position of the mechanism, preparatory to lowering the patient.

FIGURE 8 is a sectional elevation showing collapsed position of the device, as shown in FIGURE 2.

FIGURE 9 is a fragmentary view on an enlarged scale showing components of the locking mechanism.

FIGURE 10 is a fragmentary section showing the engagement of the actuating arm with a supporting link of the device.

FIGURES 11, 12, and 13 show successive steps in the insertion and use of the device.

FIGURE 14 is a perspective view of the latch member.

Referring to the drawings, the lifting device includes the supporting panel **20** provided with the central opening **21**, under which a bedpan may be inserted as shown at **22** in FIGURE 1. The base frame is formed by the U-shaped tubular member **23** and a crosstube **24**. At the opposite sides of the device, pairs of links as shown at **25** and **26** are pivotally connected with the reinforcement structure **27** associated with the panel **20**, and also pivotally connected to the base frame **23**. The upper pivotal connections are designated at **28** and **29**, and the lower pivotal connections at the cross rods **30** and **31**.

Raising of the unit from the FIGURE 2 position to that shown in FIGURE 3 is accomplished by rotation of the radius arms **32** by manipulation of the handle **33** controlling the shaft **33***a*. This handle is usually supplemented by inserting a tube (not shown) over the handle to provide the effect of a greater leverage. The upper extremity of the radius arms **32** is provided with a roller **34** which bears against the links **26** as the elevation proceeds.

When the predetermined height shown in FIGURE 3 has been reached, an extension of the pin **35** is engaged by the hook portion **36** of the latch member **37**, which prevents clockwise rotation of the radius arm **32**. The latch member **37** is coaxially connected to the lower pivot of the link **26**, and is free to rotate (within a limited range) with respect to the link **26**.

A biasing action is applied to the latch member **37** by a toggle system which includes the positioning lever **38** pivotally connected at **39** to the latch member **37**. The pivot pin **39** is mounted in the hole **40**, and an elongated hole **41** receives the spring anchor pin **42** securing the lower end of the spring **43**. The pin **42** is mounted on the link **26**, and angular movement of the pin **42** within the slot **41**. The upper end of the spring **43** is secured to the positioning member **38**, and the positioning member is free to move the respect to the latch member **37** through an arc sufficient to bring the spring "over-center" with respect to the pivot pin **39**. If the positioning member **38** is moved clockwise from the position shown in FIGURE 3 to the position shown in FIGURE 8, the result would be an application of force (derived from the spring **43**) through the pivot pin **39** to the latch member **37** inducing a counter-clockwise rotation which will disengage the hook **36** from the pin **35**. The lanced portions **44** and **45** on the latch member **37** provide limit stops to determine the range of freedom of movement of the positioning member **38** with respect to the latch member **37**. Normally, the handle **33** will be actuated in a counter-clockwise direction a sufficient amount to free the hook **36** from the pin **35**, and the movement of the positioning member **38** to the FIGURE 8 position will then result in disengaging the latch member. If the handle **33** is then released, the weight of the patient will cause a downward movement of the panel **20**, accompanied by clockwise rotation of the links **25** and **26**. The rate of this rotation is controlled by the hydraulic cylinder **46**, the piston rod **47** of which is pivotally connected to the pin **35** on the radius arm **32**. The hydraulic cylinder **46** must be pivotally connected to the frame **23**, and this may be accomplished by providing that the tube **24** is rotatable with respect to the U-shaped portion **23**, and by securing the end of the cylinder **46** to this tube, as shown in FIGURE 8. The elevating and latch mechanism and also the cylinder **46**, may be mounted on one or both sides of the device, depending on the stiffness of the panel **20** and the resistance of the links **25** and **26** against assuming a skewed relationship.

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 my intent to claim the entire invention disclosed herein, except as I am limited by the prior art.

I claim:

1. In combination with a lifting mechanism including a base member, a supporting member, and link means at opposite sides of said mechanism interconnecting said base member and supporting member, a mechanism for actuating said lifting mechanism and maintaining an elevated position of said supporting member comprising:

an actuating arm pivotally mounted on said base member on a fixed axis of rotation at a position spaced from said link means and adapted to bear on an intermediate point on said link means to rotate said link means to elevate said supporting member, and,

a latch member pivotally mounted on said mechanism at a position spaced from the axis of rotation of said lifting arm and having a hook adapted to engage a portion of said actuating arm spaced from said axis at a particular angular position of said arm.

2. A combination as defined in claim 1, also including a hydraulic piston-cylinder assembly pivotally mounted at its opposite ends to said actuating arm and said base, respectively.

3. A combination as defined in claim 1 wherein said link means includes spaced links, on at least one side of said mechanism.

4. A combination as defined in claim 3, wherein said latch member is connected to said base coaxially with one of said spaced links.

5. A combination as defined in claim 3, also including biasing means for maintaining said latch member in position to engage said actuating arm.

6. A combination as defined in claim 5, also including disengaging means for moving said latch member to a position disengaged from said actuating arm.

7. A combination as defined in claim 6, wherein said disengaging means includes a control member pivotally mounted on said latch member, and also including a post mounted on said one link and a spring connected at its opposite ends to said post and to said control member, respectively, and stop means defining a sector of rotation of said control member wherein said spring moves laterally across the axis of pivotal mounting of said control member.

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