July 22, 1958 B. BJORKLUND 2,843,858

LIFT STRAP AND EXERCISER FOR RECUMBENT PERSONS

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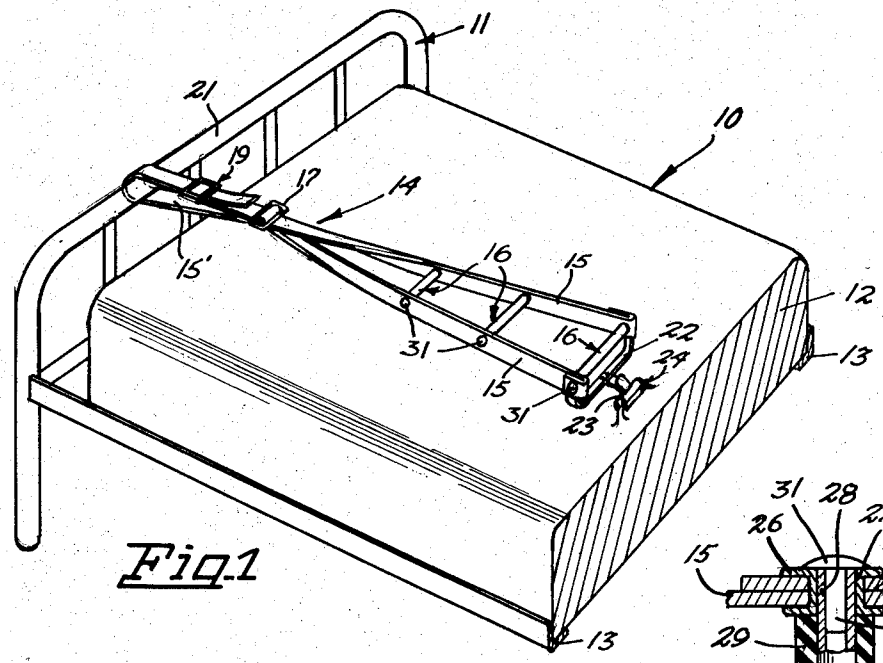


Fig. 1

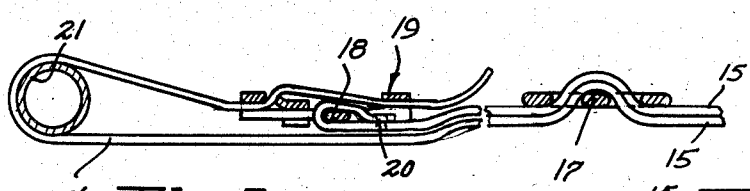


Fig. 2

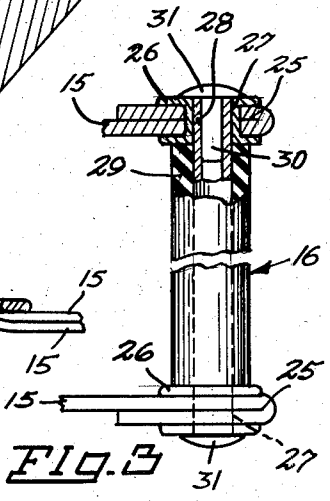


Fig. 3

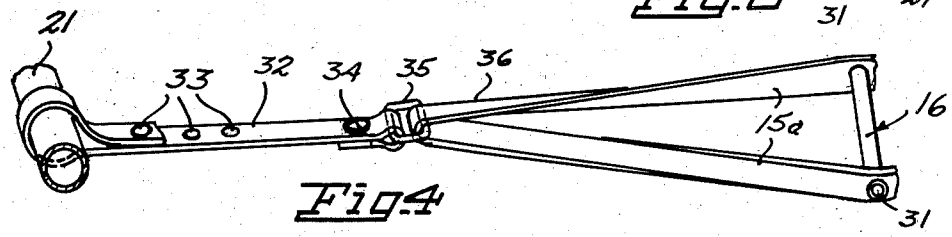


Fig. 4

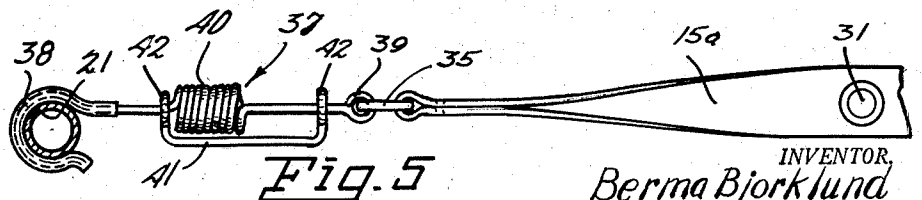


Fig. 5

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LIFT STRAP AND EXERCISER FOR RECUMBENT PERSONS

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8 Claims. (Cl. 5—317)

This invention relates to a device for aiding recumbent persons.

One object of the invention is to provide a device for attachment to the foot of a bed which can be used by a recumbent person to raise himself to a sitting position.

Another object of the invention lies in the provision of a device for attachment to the foot of a bed which will enable a recumbent person to exercise his arms and upper torso.

Another object of the invention is to provide a device of this kind having securing means releasably fastened at its free end and adapted to secure the device against accidental removal from within the reach of the recumbent person.

With the above and other objects in view my invention consists in the arrangement, combination and details of construction disclosed in the accompanying drawings wherein a preferred form of the invention is shown accompanied by modifications and then more particularly pointed out in the appended claims.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts;

Figure 1 is a fragmentary perspective view of a bed having my improved lift strap and exerciser associated therewith;

Figure 2 is a fragmentary longitudinal elevation partially in cross section of the device disclosed in Figure 1;

Figure 3 is a view partially in plan and partially in cross section disclosing one rung and its means of securing;

Figure 4 is a fragmentary perspective of a modified lift strap; and

Figure 5 is a fragmentary side elevation of a still further modified lift strap.

Referring now more particularly to the drawings a conventional bed is indicated in general by the numeral **10** and is provided with the usual foot **11** and has the conventional spring and mattress indicated by the numeral **12** supported on bed rails **13** extending between the foot **11** and the head (not shown). In many cases invalids having lost the use of their body below the waist find it very difficult if not impossible to raise themselves in a bed to a sitting position and in other cases this effort without assistance results in considerable pain to the patient.

The lift strap indicated in its entirety by the numeral **14** has been found to be very effective in assisting to raise themselves to a sitting position as well as to assist themselves in changing positions in the bed and also provides means for exercising those parts of the body which are well in the case of an invalid.

Inspection of Figure 1 will show that the lift strap is provided with a pair of laterally spaced strap elements **15—15** which are provided with laterally extending longitudinally spaced parallel rungs **16—16** having their ends anchored in the strap elements and extending therebetween. At the forward or inner end one strap element **15** extends through a securing buckle **17** and at its free end encircles the intermediate transverse bar **18** of a strap buckle **19** and is stitched upon itself at **20** thus securing the buckle **19**. The other strap element **15** extends through the securing buckle **17** and beyond the buckle **19** where it constitutes an integral securing strap **15'** and encircles an element or rod **21** of the foot of the bed **11** and thence is adjustably and releasably secured in the buckle **19** providing for longitudinal adjustment of the length of the lift strap **14**. The securing buckle **17** is provided to eliminate angular movements of the rungs **16** by relative opposed movements of the strap elements **15**. The free end portion of the lift strap including the strap elements **15** and the rungs **16** form a hand ladder by means of which an invalid may raise himself to the sitting position by successively grasping the rungs **16** hand over hand and drawing himself up.

When a patient is sleeping normal movements of the hands and body may cause the lift strap **14** to fall from the side of the bed **10** or be moved downwardly out of reach and therefore I have provided a cross strap **22** which is stitched or otherwise secured to the spaced strap elements **15** and supports a resilient clamp or clip **23** secured thereto. This clamp is provided for clamping to the bed clothes as at **24** thus securing the free end of the ladder portion against accidental removal from within the reach of the recumbent person.

The rungs **16** are especially of important construction as the pressures applied thereon would normally tend to tear them from the strap elements **15**. Observation of Figure 3 will disclose that I have provided at the free end of strap elements **15** folded portions **25** in which are formed metallic eyelets **26** defining central apertures **27** which are axially aligned and receive the end portions of tubular rods **28**. Encircling the tubular rods are tubular hand grips **29** shown to be of rubber but which may be synthetic resin, cork or other materials if found desirable and the hand grips are of a length adapting them to maintain the strap elements **15** in spaced relation and yet permit the eyelets **26** to encircle the end portions of the tubular rod **28**. To maintain the eyelets against removal from the ends of the rods **28** I provide rivets **30** which under extreme pressures are pressed into the hollow center of the rods **28**. The rivets **30** are provided with heads **31** sufficiently large to prevent the eyelets **26** from passing thereover. The greatest pulling pressure is applied on the end rung **16** and therefore the material is folded at **25** to provide added strength. If desired the intermediate rungs **16** may be provided with patches of strap material at the points where the eyelets **26** are inserted to give body to the fastening means or the strap elements may be folded in serpentine fashion and thus provide three layers of strap to secure the eyelets **26**.

In Figure 4 I have shown a modified form of the invention wherein the securing strap corresponding with the portion **15'** comprises a strap **32** having a plurality of snap fasteners **33** at one end thus providing for longitudinal adjustments thereof and having snap fastener **34** spaced from its opposed end which is looped through a square **35** and also secures the fold **36** of the spaced strap elements **15a** formed by folding an elongated strap midway its length and looping it through the square **35**.

A further modified form is disclosed in Figure 5 and instead of the usual securing strap section **32** I provide a resilient means indicated in general by the numeral **37** and which comprises a hook **38** adapted to be releasably secured to an element of the bed foot **11** and at its opposed end having an eye **39** associated with the square **35**. Intermediate its length the resilient means **37** is provided with a tension spring **40** permitting the lift strap to be flexed if desired. To limit the amount of flexing

of spring 40 I provide a rigid U-shaped bridge 41 having eyes 42 at opposed ends and encircling the ends of the resilient portion 37, thus limiting the stretch or flexing of the spring 40 to permit a person to raise himself if desired.

Having thus described my invention I claim:

1. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a securing strap adapted to be releasably secured about a fixed element at the foot of a bed; spaced strap elements anchored at one end by said securing strap; metal eyes defining apertures in said last named strap elements and disposed in axially aligned opposed pairs; tubular rods extending one through each said pair of aligned apertures; a tubular hand grip encircling each said rod and maintaining said spaced strap elements in spaced relation; rivets pressed into the hollow centers of said rods and having heads confining said eyes against removal from the rods; and means for releasably securing the free end of the ladder portion against accidental removal from within reach of the recumbent person.

2. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a pair of spaced strap elements; a plurality of laterally extending rungs extending between and spaced along the length of said strap elements and having their ends anchored thereto whereby to constitute a hand ladder; means for securing the strap elements at the foot of a bed; and means for releasably securing the free end of the ladder with relation to the bed and within reach of a recumbent person in the bed.

3. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a hand ladder having a pair of spaced strap elements carrying a plurality of laterally extending rungs spaced along the length of said strap elements; means for securing one end of the ladder at the foot of a bed; and a spring biased clamp carried at the free end of said ladder for releasably clamping to the bed clothes of said bed and securing the free end of the ladder against accidental removal from within the reach of a recumbent person.

4. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a hand ladder having a pair of laterally spaced strap elements provided with longitudinally spaced laterally extending rungs having their ends secured in said strap elements, one said strap element having a buckle secured on its end opposed to said rungs and extending through a securing buckle; the other said strap element extending through said securing buckle and about an element of the foot of a bed and thence being adjustably secured in said first named buckle, whereby means are provided for adjusting the length of said lift strap.

5. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a pair of laterally spaced strap elements having means at one end secured at the foot of said bed; rungs having their ends secured in said strap elements and comprising metal eyelets defining apertures in said straps and disposed in axially aligned pairs; tubular rods extending one through each said pair of aligned apertures; a tubular hand grip encircling each said rod and spacing said straps; and rivets pressed into the hollow centers of said rods and having heads confining said eyes against removal off of the ends of said rods.

6. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with an elongated strap folded midway its length and forming a pair of spaced strap elements; laterally extending rungs having their ends secured in the strap elements and forming a hand ladder; and a securing means connecting one end of said hand ladder to an element fixed relative to said bed.

7. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with an elongated strap folded midway its length and forming a pair of spaced strap elements; rungs having their ends secured in said strap elements laterally thereof; resilient means secured at one end to the fold of said strap and at the other end to an element of the foot of a bed; and rigid means bridging said resilient means and limiting the stretching movement thereof.

8. In a self-help invalid implement of the class wherein an otherwise helpless invalid having the use of his arms only may raise himself from a reclining position to a sitting position in bed; the combination with a pair of spaced strap elements; a plurality of laterally extending rungs extending between and spaced along the length of said strap elements and having their ends anchored thereto; and means for securing one end of the strap elements at the foot of a bed.

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