Sept. 14, 1965 J. CAMPER 3,205,512

PATIENT LIFTING DEVICE

Filed Aug. 8, 1963

FIG. 1

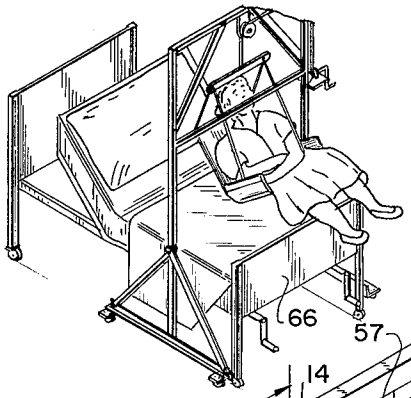
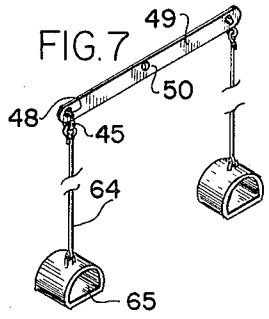


FIG. 7



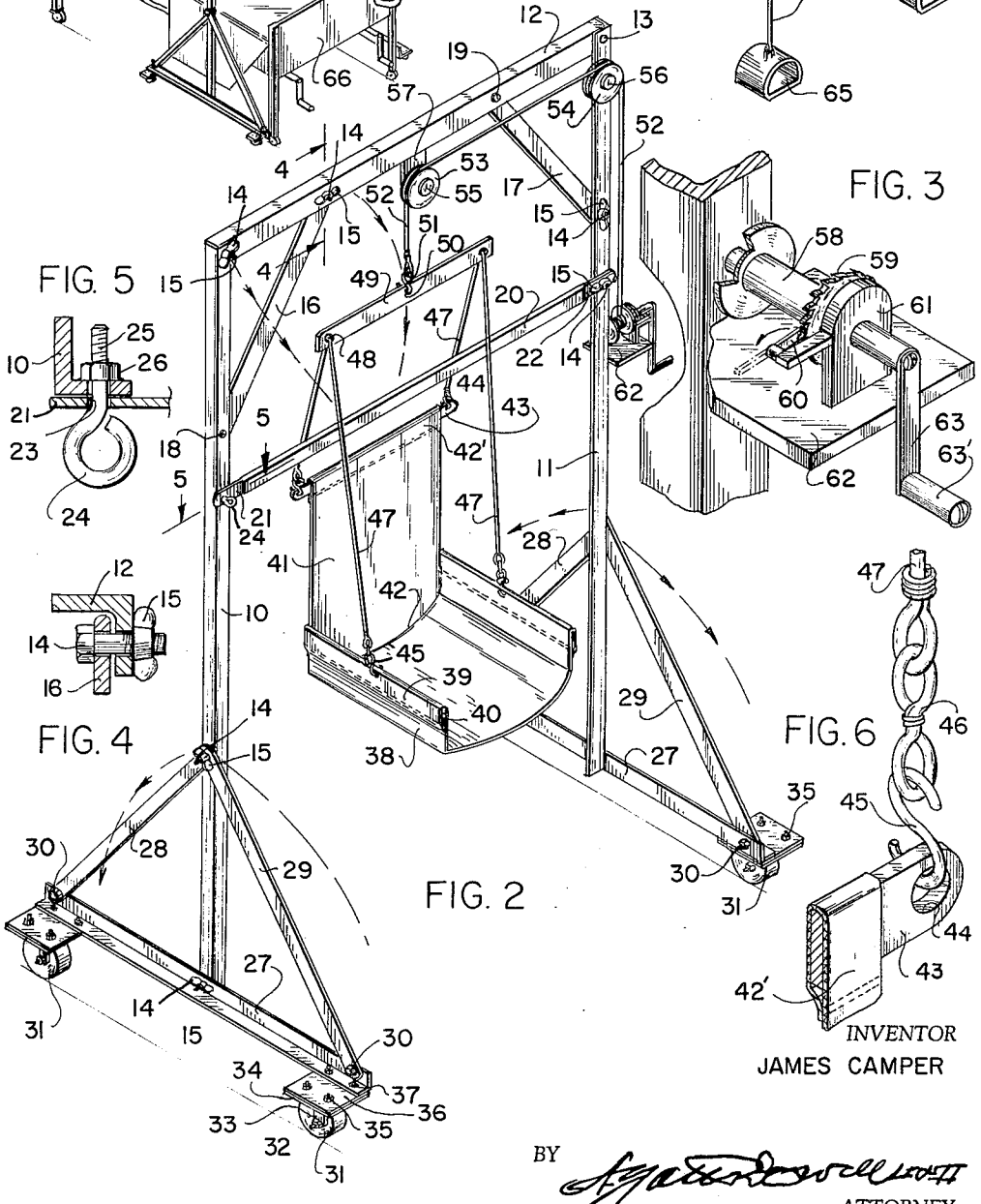




FIG. 3

FIG. 5

FIG. 4

FIG. 2

FIG. 6

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United States Patent Office 3,205,512 Patented Sept. 14, 1965



3,205,512

# PATIENT LIFTING DEVICE

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Filed Aug. 8, 1963, Ser. No. 300,839
2 Claims. (Cl. 5—86)

This invention relates to therapeutic devices including of the character employed in connection with the rehabilitation of persons of reduced physical capacities either through birth, accidents, illnesses, or other causes, and by means of which devices the handling and treatment of persons are facilitated and simplified.

The invention relates particularly to a device by which an individual may be lifted from a prone or other position with minimum effort regardless of the location of the physical deformity of the individual, without danger of injury, and regardless of the weight of the individual.

Lifting devices of various kinds have been produced including those intended for the handling of persons. These have not been satisfactory for various reasons including their cost, the skill and strength required to use them, and they have lacked provision for supporting the feet.

It is an object of the invention to provide a device for lifting or carrying persons in selective positions or attitudes which can be quickly and easily assembled or taken apart without the use of tools, as well as of relatively inexpensive construction by which an individual may be readily supported, raised, lowered, and moved about with maximum facility and minimum effort.

Another object of the invention is to provide a device of the character indicated by means of which the body may not only be seated in various attitudes but also in a standing position for lifting and carrying purposes.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing in which:

FIG. 1 is a perspective illustrating one use of the invention;

FIG. 2, an enlarged perspective of the invention;

FIG. 3, a further enlarged perspective of the windlass and its securing ratchet;

FIG. 4, a section on the line 4—4 of FIG. 2;

FIG. 5, a section on the line 5—5 of FIG. 2;

FIG. 6, an enlarged detail of the connection of the cable to the sling of FIG. 2; and,

FIG. 7, a perspective of an attachment which can be used in lieu of the sling of FIG. 2.

Briefly stated the invention is a person lifting device which can be readily assembled and taken apart without the use of any tools and consequently can be disposed in a compact package for shipment and storage. It comprises a pair of spaced supporting posts, a top bar detachably connecting the upper portions of said post with detachable braces in order that the inverted substantially U-shaped rigid frame thus provided can be employed for elevating and supporting a person. Each of the posts is mounted on a removable wheeled support having a horizontal member beneath each end of which is a caster wheel. Braces connect the ends of the horizontal member to the posts and provide a solid connection capable of holding the posts in upright position. In order to provide a carriage for a patient a flexible seat or sling is suspended by a cable from the top bar and a windlass is provided for raising and lowering the sling,



a ratchet device or other means being provided for locking the windlass in a fixed position to hold the seat or sling at the desired elevation. The sling is composed of a seat reinforced at each side and a connected relatively highly extending back supporting portion with a sling-type cable at each side having one end thereof connected to the intermediate portion of a side of the seat and the other end connected to the upper portion of the back which extends above and free of the side portions, such cable at each side being slidably connected to each end of a load connector bar releasably attached to the suspension cable.

The present invention consists of a frame of inverted substantially U-shaped construction including posts **10** and **11** and a substantially horizontally extending top bar or connecting portion **12**. This frame may be relatively strong, for example of angle iron construction, and the connecting portion or top bar **12** may be secured by a pivot **13** to one of the legs and by a bolt **14** and a finger-tightened wing nut **15** to the other leg thus providing a pair of uprights and a top.

In order to provide rigidity and stability to the upper portion of the frame diagonal braces **16** and **17** are provided, the brace **16** being secured by a pivot **18** to the post **10**, and the brace **17** being secured by a pivot **19** to the top bar **12**. The opposite ends of the diagonal braces **16** and **17** are adapted to be fastened to the top bar **12** and to the post **11** respectively also by means of bolts and finger-tightened wing nuts **14** and **15**, respectively.

Positioned below the diagonal braces **16** and **17** and in substantial parallelism to the top bar **12** is a frame rigidifying cross bar and stabilizer device **20** of circular or other cross-section with flattened end portions **21** and **22** having a slot **23** in order that such end portion may fit about a hand-tightened eye screw **24** having an end **25** threaded through a nut **26** welded or otherwise maintained against rotation. The flattened end **22** of the crossbar or rod **20** may be attached in a similar manner or may be secured by the bolt **14** and wing nut **15**. The crossbar or rod **20**, in connection with the braces **16** and **17**, posts **10** and **11** and the connecting portion or top bar **12**, provide a rigid frame structure. Its stabilizing function will be later explained.

In order to maintain the frame and associated parts in upright position each lower free end of the U-shaped frame is provided with a supporting carriage including an angular bar **27** secured to the lower portion of each post **10** to support the post by means of a bolt **14** and finger-tightened wing nut **15** and the opposite extremities of the bar **27** are connected to braces **28** and **29** each connected to the bar **27** by a bolt **30** with the upper ends of said braces **28** and **29** fastened to the post **10** by a similar bolt **14** and a wing nut **15**, thus each post will be provided with a triangular base. The base is mounted on caster wheels or rollers **31** in plates **33** attached to mounting plate **34** and secured by bolts **35** to horizontal plates **36** secured by bolts **37** to the bar **27**.

Lifting and supporting mechanism for a patient or other person is provided in the form of a flexible sling or seat member **38** of nylon, canvas or other suitable material having the tops of its side edge portions reinforced in any desired manner, as for example by a hem **39**, in which may be received a stiffening element **40**. The seat member **38** is provided with a back supporting portion **41**

extending a considerable distance above the seat side portions with a stiffening joint **42** at its lower end making it possible therefore to make the back either integral with or separate from the seat member **38**. The upper edge portion of the back supporting portion **41** of the seat member is provided with a hem **42'** in which is received a load distributing and support bar **43**, such bar having an opening **44** at each end or side of the seat for receiving an S-hook connector **45** which may engage a swivel **46** by which it can be connected to one end of a sling cable **47**. The opposite end of the sling cable **47** is secured by an S-type connector **45** to an intermediate or mid-portion of the upper side of the hem **39** in the seat member **38**. The intermediate portion of each sling cable **47** slidably extends through an opening **48** in each end of a transversely extending balanced load connector bar **49** by means of which the seat member is supported, the bar **49** in turn having an opening **50** at its center in which is received an S-type connector **51** on the end of a hoisting cable **52**. The hoisting cable passes over a pair of pulleys **53** and **54** rotatably mounted on pivot bolts **55** and **56**, the bolt **55** being carried by a bracket **57** riveted or otherwise secured to the frame top bar **12** at substantially its mid-point and the other bolt **56** being fastened to the frame post **11**. The opposite end of the hoisting cable **52** extends around a winch drum or windlass **58** having a ratchet wheel **59** engaged by a pawl **60**. The winch drum **58** is mounted in a pair of uprights **61** on a bracket **62** fixed to the post **11** and the winch drum **58** is provided with a crank arm **63** and a handle **63'** by means of which it may be rotated to wind and unwind the cable **52** to respectively raise and lower the member **38**.

With reference to FIG. 1 it will be noted that the stabilizer or cross-bar **20** extends transversely of the seat member and between the two reaches of each sling cable **47** and at such a location as to not interfere with the body of the occupant when supported in the seat member **38**. The seat occupant can thus grasp and hold onto the cross-bar to adjust himself into any of a relatively wide range of comfortable seating positions or postures and maintain or stabilize himself in a selected position. This is made possible due to the connection of the forward reaches of the sling cables **47** to the intermediate portions of the seat side hem portions **39**, the connection of the rearward reaches of the cables **47** to the back supporting portion **41** at a location above the seat member and the slidable connections of the cables with the load connector bar **49**. Thus, by holding onto the cross-bar **20** the seat occupant can selectively exert pressure with his back and legs against the upper portion **42'** of the seat back **41** and the forward edge portion of the seat member **38**, respectively, to effect and maintain a desired seating attitude.

Instead of the member **38** being attached to the bar **49** the openings **48** may each engage S-hook **45** to which cable **64** may be attached and used for supporting stirrups or foot slings **65**. With this arrangement the occupant can, by holding onto the cross-bar **20**, stabilize himself while being supported in the foot stirrups **65**.

As illustrated in FIG. 1 the device may be used for lifting a person, as for example a patient from a hospital bed **66**, or from other object or support and for maneuvering and handling such person and transporting him, the relatively adjustable seat and back facilitating application of the device. The device of the present invention is of such character that it can be erected or collapsed in the matter of a very few moments without the use of wrenches or other tools. Collapsing can be accomplished by counter rotation of the retaining eye bolt at the left end of the cross bar **20** and the unscrewing of the wing nut at the right end of the bar. The cross bar thus can be removed permitting the sling or seat structure **38** to be removed, the hoisting cable supporting the same being liftable from the pulleys on which it



is supported. The sling or seat can be disconnected by unhooking the S-type seat and cable hook connections **45** and **51** after which the hoisting cable can be unwound from the windlass to which it is attached. The caster wheeled carriage for the lower end of each of the posts of the upright frame can then be removed by removing the upper and lower wing nuts by which the wheel carriage is attached to the posts. Thereafter the generally U-shaped frame can be laid upon the floor, the eye bolt at the left end of the stabilizer bar and the wing nut at the right end of the stabilizer bar can be loosed so that the stabilizer bar may be released. The wing nuts securing the ends of the corner braces in place next should be unscrewed and the corner braces swung to a position parallel to the members to which they are attached. Then the wing nut in the upper left corner of the frame can be loosened so that the horizontal top member can be swung parallel to the post to which it is pivotally attached. The parts then can be placed in a compact package. Reassembling can be accomplished by a reverse operation.

It will be obvious to one skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is illustrated in the drawing and described in the specification, but only as indicated in the accompanying claims.

What is claimed is:

**1.** A castered collapsible device for application to and for the elevation and supporting of a person for therapeutic treatment, for transportation, or for other purpose, said device comprising an inverted U-shaped frame including spaced supporting posts, a top bar detachably connecting the upper end portions of said posts in fixed spaced relation, releasable bracing means between said top bar and posts, a cross-bar releasably connected between said pair of spaced supporting posts in substantially spaced and parallel relation to said top bar, a detachable caster wheeled support for the lower end of each of said posts, said caster wheeled supports being parallelly spaced apart affording unobstructed access therebetween from both directions, said wheeled supports including a horizontal member of substantially length with caster roller means supporting each end portion thereof, braces detachably connected to each of said posts from a location spaced above said horizontal member and extending angularly downward and connected to each outer end portion of said horizontal member, pulley means mounted on the upper portion of said U-shaped frame, a load supporting cable having an end depending from said pulley means at substantially the center of said U-shaped frame, a balanced support bar secured to the said depending cable end, windlass means on said U-shaped frame connected to the opposite end of said load supporting cable, a pair of sling cables each slidably connected intermediate their length to each end of said balanced support bar, adjustable seat means including a relatively high back portion and relatively low side portions, the corresponding ends of said pair of sling cables being connected at opposite sides of said seat means to the top portions of said seat back and side portions at the side of the seat adjacent thereto whereby two cable reaches thereby formed in each of said seat sling cables are disposed in relative angular depending relation to each other, said frame cross-bar extending across said frame and between each pair of said reaches in each of said seat sling cables whereby said cross-bar may be grasped by a seat occupant to effect attitude adjustments between the portions of the adjustable seat means and for stabilizing his position therein when supported in said seat means.

**2.** The construction set forth in claim **1** in which said adjustable seat means comprises a flexible seat of sheet material, said side portions each being formed integral therewith and having a hem formed along the upper edge

thereof, means reinforcing said hem, the connection of each of said sling cables to each of said seat side portions being at a point intermediate the length of said hem and engaging said reinforcing means, said relatively high seat back portion extending free of said seat side portions, said balanced support bar having aperture means in each end thereof, each cable of said pair of sling cables slidably extending through one of said aperture means at opposite ends of said support bar thereby forming said slidable connection therewith.



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