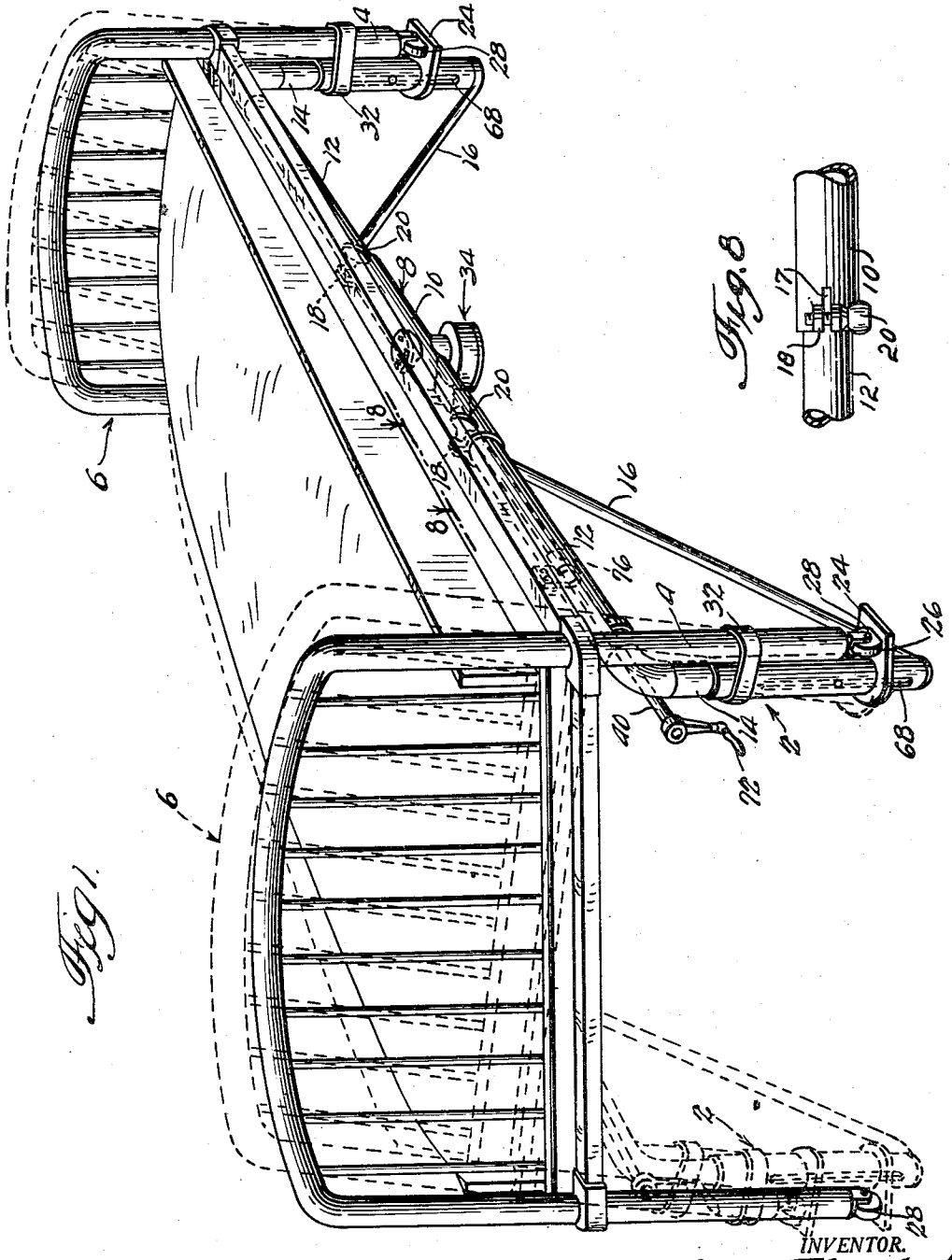
April 15, 1958 L. F. SANDOCK 2,830,303

BED ELEVATING DEVICE

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Fig. 2.

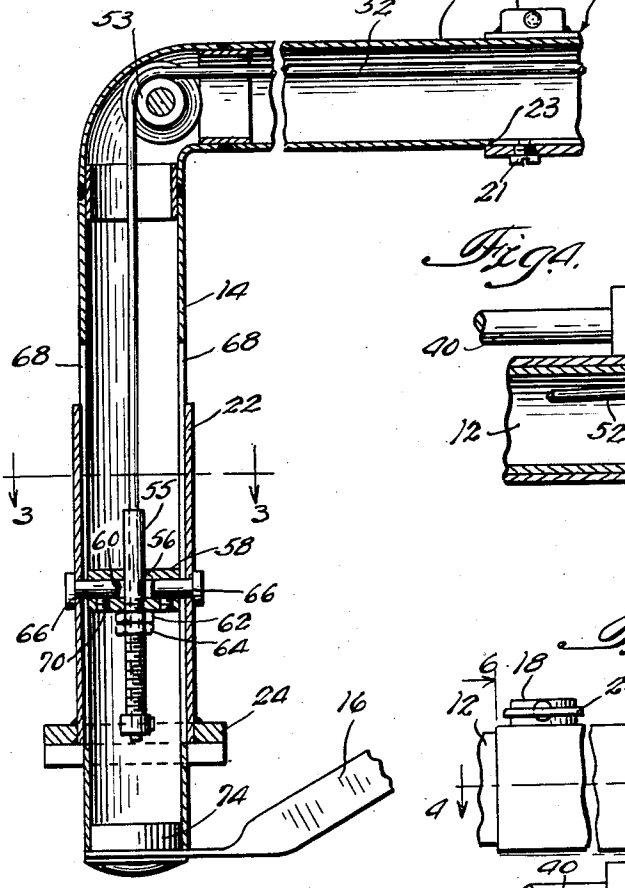



Fig. 3.

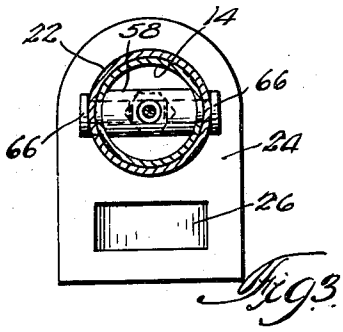



Fig. 4.

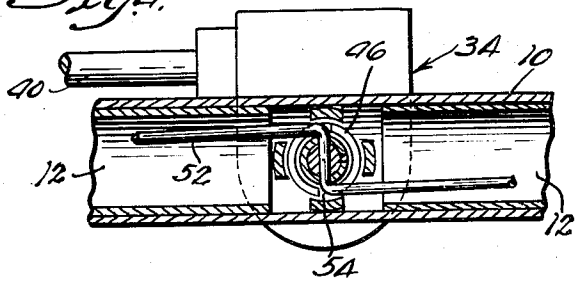



Fig. 5.

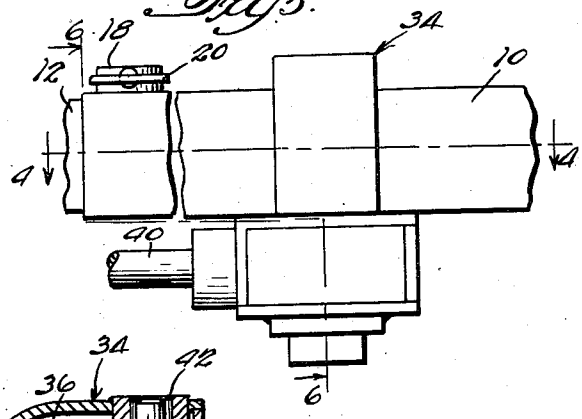



Fig. 6.

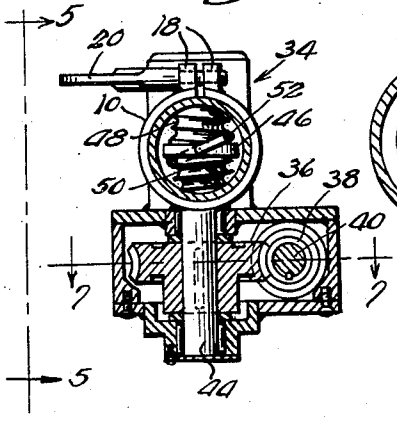
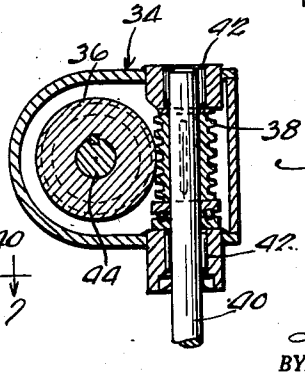



Fig. 7.




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# BED ELEVATING DEVICE

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Application December 1, 1955, Serial No. 550,287

4 Claims. (Cl. 5—63)

This invention relates to a bed elevating device and more particularly to novel means for elevating and tilting beds, such as hospital beds or conventional beds, for the comfort and convenience of patients.

Although most hospital beds comprise means for raising and lowering various sections thereof on horizontal axes extending transversely of the bed in order to facilitate reading and eating by the patient and to ease the patient's legs or elevate them relative to the patient's body, such beds are not tiltable on a horizontal axis extending longitudinally of the bed. This is frequently necessary as, for example, in the case of a patient with internal injuries and one arm in traction and where it is required to turn a patient from one side to the other. In such cases resort has been had to various expediencies, such as inserting blocks and the like between the floor and the legs at one side of the bed or, as is more often the case, propping the patient by means of pillows. However, desired positive adjustment has not been possible and the use of such blocks and pillows has not been either convenient or satisfactory.

Accordingly, a primary object of the present invention is to provide a readily portable device which may be quickly and easily attached to and removed from any hospital bed or conventional bed to tilt the bed on a horizontal or diagonal axis extending longitudinally of the bed.

A further object of the invention is to provide a device such as above described which is economical in construction, is fabricated of a minimum number of parts, and is rugged in construction to ensure long life in service.

Another object of the invention is to accommodate adjustment of the device to beds having various spacing between the legs thereof.

Still another object of the invention is to permit rotation of the bed leg supports so that the device may be applied to either side of a bed with the operating handle of the device at the foot end of the bed, as is usually desirable because the head end of the bed is ordinarily against a wall.

Yet another object of the invention is to provide independent vertical adjustment of the bed leg supports and to actuate both supports by a mechanism which raises or lowers them in unison and in equal increments.

A more specific object of the invention is to provide a casing which is generally in the form of an inverted U and contains a flexible element operatively connected to bed leg supports on the depending legs of said casing which support it from the floor, said flexible element being operatively associated with a capstan for winding and unwinding said element, to raise and lower the leg supports in unison.

Yet another object of the invention is to form said casing with a plurality of separable tubes releaseably clamped in adjusted position to properly space the bed leg supports which are sleeved on the tubes defining the



legs of the device and are operatively connected to the ends of the flexible element within the casing.

The foregoing and other objects and advantages of the invention will become apparent from a consideration of the following specification and the accompanying drawings, wherein:

Figure 1 is a perspective view of a bed having the novel device applied to the legs thereof;

Figure 2 is an enlarged fragmentary view, partly in central vertical section, showing one end of the novel device;

Figure 3 is a sectional view on line 3—3 of Figure 2;

Figure 4 is a fragmentary top plan view, partly in section along the horizontal plane indicated by line 4—4 of Figure 5, showing the capstan and its connection to the flexible element which raises and lowers the supports for the bed legs;

Figure 5 is a side elevational view taken on line 5—5 of Figure 6;

Figure 6 is a vertical sectional view on line 6—6 of Figure 5, showing the capstan and its actuating mechanism;

Figure 7 is a sectional view on line 7—7 of Figure 6; and

Figure 8 is an action view taken on line 8—8 of Figure 1.

Describing the invention in detail and referring first to Figure 1, the novel bed elevating and tipping device is generally designated 2 and is illustrated as applied to legs 4 on one side of a bed 6, although if desired the device may be constructed for application to the legs on one end of the bed as will be readily apparent to one skilled in the art.

The device 2 comprises a frame or casing 8, preferably tubular in cross section and defined by a central tube or cylinder 10 within which are sleeved a pair of tubes 12. The frame also comprises downwardly extending tubular legs on the ends of respective tubes 12, the lower end of each leg is connected to its tube 12 by a diagonal strut or brace 16.

The ends of the tube 10 are split or slotted at the upper side thereof, as at 17 (Figs. 2 and 8) and a pair of lugs or ears 18 are formed on or attached to the tube at opposite sides of each slot to accommodate a clamping member 20 such as a hand screw having shouldered engagement with one ear 18 and threaded engagement with the other to clamp the tubes 10 and 12 in any desired adjusted position as may be desired in adapting the novel device to beds of various length and to beds having various spacing between the legs thereof.

Preferably, the tube 10 is provided with guide means engageable with each tube 12 to prevent relative rotation therebetween, as best seen in Figure 2, wherein such guide means are illustrated in the form of a stud 21 threaded in the tube 10 at the underside thereof and slideable within a slot or groove 23 of one tube 12. It will be understood that a corresponding stud 21 (not shown) and slot 23 in the other tube 12 are preferably provided, so that all of the tubes 10 and 12 are interlocked against relative rotation but are capable of relative movement lengthwise thereof when the clamp screws 20 are manually released.

Each leg 14 is provided with a sleeve 22 slideably fitted thereon and vertically moveable therealong for a purpose hereinafter described. Each sleeve 22 comprises a bed leg support, preferably in the form of a horizontal flange or web 24 slotted as at 26 to position a caster 28 (Figure 1) on the lower end of a bed leg 4.

The sleeve 22 is removably secured to the related bed leg as by a strap 32 or other suitable means, and the

slot 26 interlocks the caster 28 with the flange 24 of the sleeve.

Means are provided for raising and lowering the sleeves 22 in unison and in equal increments, said means comprising a housing or casing 34 secured to the tube 10 in any desired manner as by welding. The housing 34 contains a worm wheel 36 operatively meshed with a worm gear 38 keyed on an actuating shaft 40 journalled in bearings 42 of the housing 34. The worm wheel 36 is keyed to an actuator shaft 44 of a capstan 46 having reversely arranged helical guide grooves 48 and 50 for a flexible element 52, such as a cable, cord, or filament which extends through an opening 54 (Fig. 4) of the capstan. The flexible element 52 is supported at the top of each leg 14 by a roller 53 therein.

Each end of the element 52 is connected to a stem 55 within one of the sleeves 22, as best seen in Figure 2 wherein one end of the element 52 and the related stem 55 are shown. The stem extends through an opening 56 of a sleeve or tube 58 interrupting a bore 60 thereof. The tube 58 is seated at its underside against an adjustor nut 62 threaded on the stem 55 and held in any desired adjusted position by a lock nut 64.

A pair of pins 66 are received within opposite ends of the bore 60 and are snugly fitted in holes of the sleeve 22, said holes being complementary in form to the cross-section of the pins 66 to interlock the sleeve 22 therewith for vertical movement with the tube 58. The pins 66 during such vertical movement are guided by guide slots 68 of the leg 14, so that the sleeve 22 is restrained against rotational movement relative to leg 14 about their longitudinal axes. The pins 66 are held in position by setscrews 70 which may be removed to permit removal of the pins as for example when it is desired to rotate the sleeve 180 degrees relative to the leg 14 so that the device may be applied to the legs 4 of the bed 6 at either side thereof.

It will be understood that the sleeves 22 are preferably adjusted by the nuts 62 to the same distance above the bottom of the legs 14 when the flexible element 52 is completely unwound from the capstan 46, with the latter in the position shown in Figure 4. Thereafter when the shaft 40 is rotated by a handle 72 thereon, the sleeves 22 and their webs 24 move upwardly in unison and in equal increments of travel, so that both bed legs 4 may be raised or lowered an equal amount in response to rotation of the handle 40. This causes desired tilting of the bed 6 equally at the head and foot ends thereof, although adjustment of the nuts 62 can effect unequalized tilting if desired.

In this connection it may be noted that access to the nuts 62 and 64 may be afforded through the bottom of leg 14 which is provided with a removable plug 74 (Figure 2) affording an anchor for one end of the beforementioned brace 16.

It will be understood that after the rod 40 has been rotated by its handle 72 to effect a desired elevation or tilting of the bed 6, the handle or rod may be releaseably locked against rotation as for example by a support and lock bracket 76 (Figure 1) on one tube 12.

Ordinarily only one device 2 is required inasmuch as the common use thereof is to tilt one side of the bed 6, as shown by phantom lines in Figure 1, and for this reason the webs 24 which support the bed legs 4 are preferably adjustable, as above described, so that the device 2 may be conveniently applied to the legs at either side of the bed, with the handle 72 at the foot end of the bed.

However, if a permanent installation is desired, a pair of the devices 2 may be applied to the bed 6, as shown in Figure 1. Such an arrangement is particularly advantageous where it is desired to tilt the bed in either direction or to elevate both sides of the bed equally as for example to convert a conventional bed into one of the height ordinarily used in hospitals.



Thus it will be understood that I have devised a readily portable apparatus which may be quickly and easily attached to and removed from the legs of a bed for the purpose of elevating said legs in unison and in equal increments of travel by a single operating handle. The invention also comprehends the simple economical construction of the novel device and the manner in which the bed leg supports may be conveniently adjusted to their proper height and may be rotated 180 degrees to adapt the device for use on the legs at either side of a bed. Another noteworthy feature of the invention is the manner in which the housing parts are releaseably locked against relative rotation to accommodate convenient handling of the device and are relatively moveable to permit adjustment to various spacing between bed legs.

While the present invention has been explained and described with reference to specific embodiments of structure, it will be understood, nevertheless, that numerous modifications and variations are susceptible of being incorporated without departure from the essential spirit or scope thereof. Accordingly, it is not intended for an understanding of this invention to be limited by the foregoing description nor by the illustrations in the annexed drawings, except as indicated in the hereinafter appended claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is as follows:

1. In a bed elevating device, the combination of a tube, a pair of tubes slideably sleeved in opposite ends of the first-mentioned tube, means for releaseably clamping said tubes together, a hollow leg depending from each tube of said pair to support the device on a floor, sleeves on respective legs moveably upwardly and downwardly relative thereto, means on said sleeves for supporting associated bed legs, a capstan carried by the first-mentioned tube, flexible means extending through the tubes and legs connecting the sleeves to the capstan, and means for rotating the capstan to wind said flexible means thereon.

2. A portable bed elevating and tipping device comprising a tubular casing which is in the form of an inverted U as seen in side elevation, the legs of said U being adapted to support said casing on a floor; clamps on said legs for releaseable attachment to the legs of an associated bed; means on said casing for adjusting the distance between said legs and for locking said legs against movement toward and away from each other; supports carried by said legs for vertical movement relative thereto and means in said casing for raising and lowering said supports, said means comprising a flexible element extending through the casing attached to said supports and a capstan engaged with said element.

3. A portable bed elevating and tipping device comprising in combination a tubular casing in the form of an inverted U as seen in side elevation, the legs of said casing being adapted to support said casing on a floor, clamps on said legs for releaseable attachment to the legs of an associated bed, means on said casing for adjusting the distance between said legs and for locking said legs against movement toward and away from each other, supports carried by the respective legs for vertical movement relative thereto and means for raising and lowering said supports, said means comprising a capstan journalled in said casing at approximately the center thereof, said capstan having a hole therethrough and having reversibly arranged helical guide grooves extending upwardly and downwardly respectively from said hole and a flexible element extending through said holes and connected to said supports; an operating handle connected with said capstan, said handle being adapted to be releaseably locked against rotation whereby, by operation of said handle, the said supports may be made to move upwardly or downwardly in unison and in equal increments of travel and be locked in any desired position.

4. A device according to claim 3 wherein each of said

legs is provided with a slotted flange on the lower ends to position a caster on the lower end of an associated bed leg.

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