

May 16, 1944.

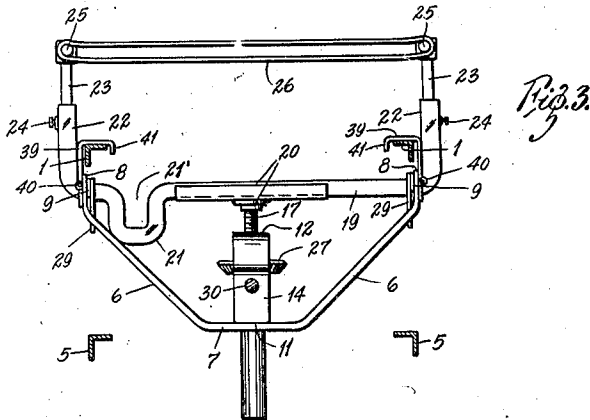
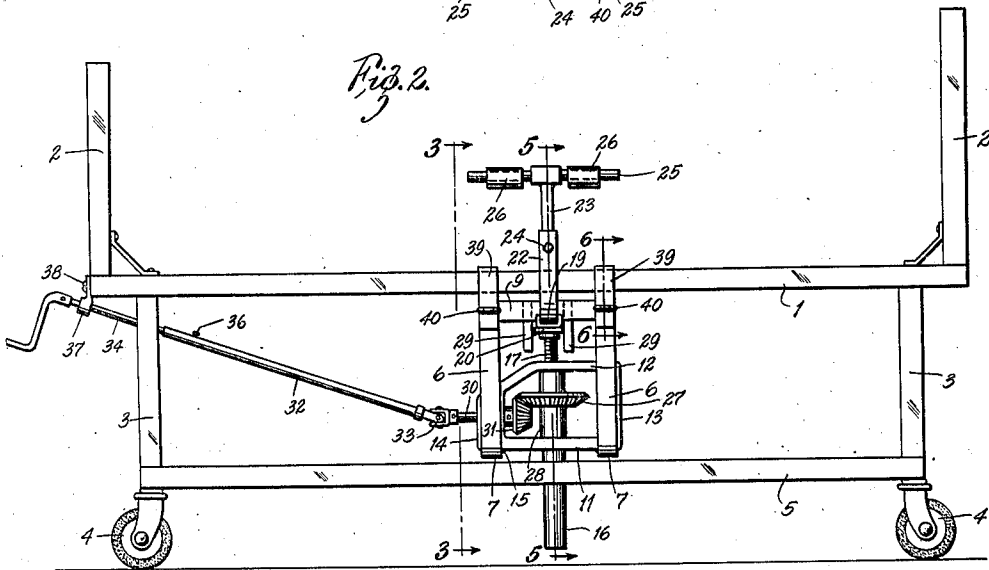
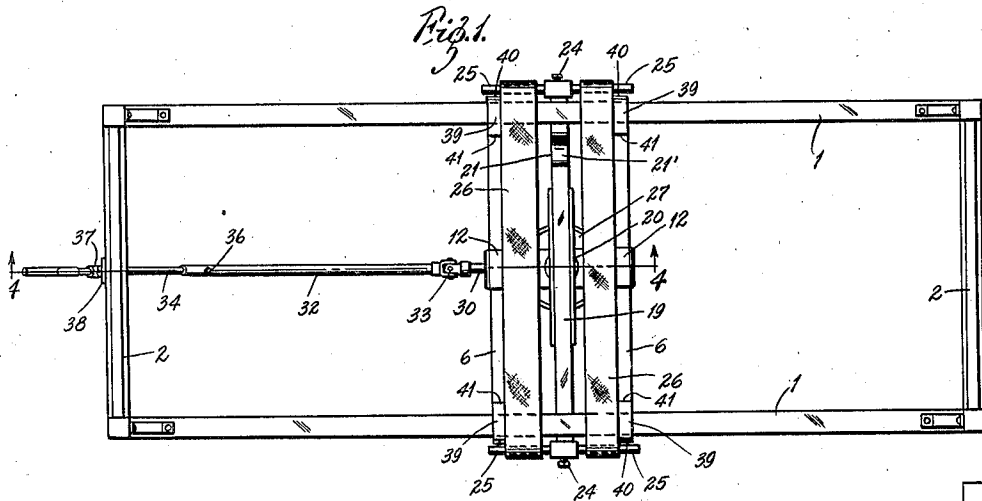
M. BLACK

2,348,778

PATIENT'S LIFT ATTACHMENT FOR BEDS

Filed Feb. 10, 1943

2 Sheets-Sheet 1



Inventor:
Mike Black,
By John D. Rippy
his Attorney.

May 16, 1944.

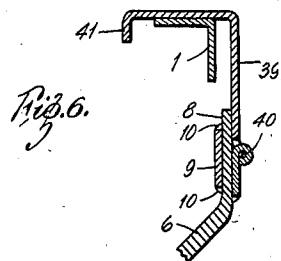
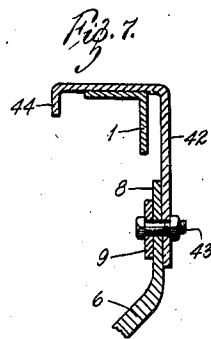
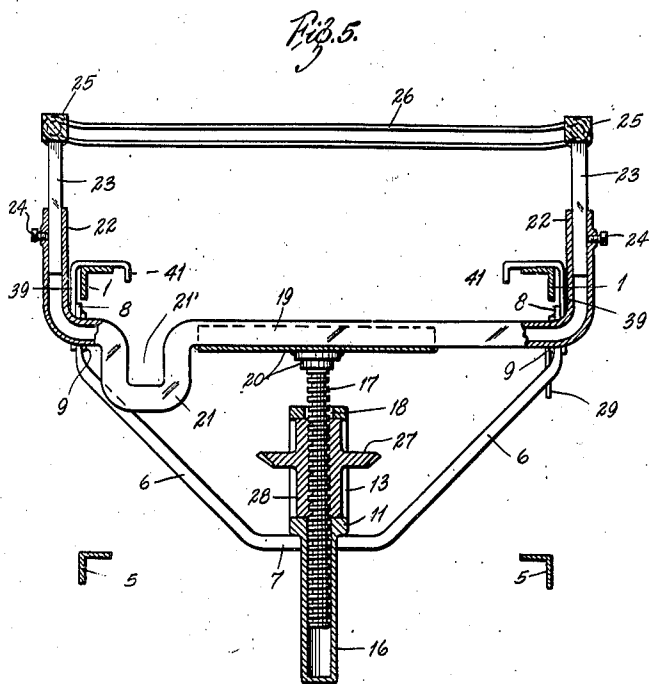
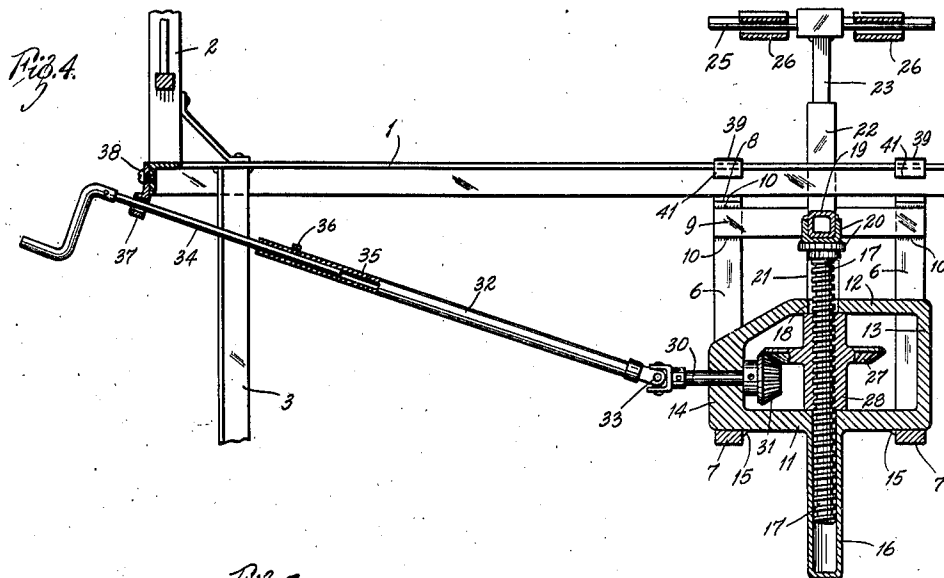
M. BLACK

2,348,778

PATIENT'S LIFT ATTACHMENT FOR BEDS

Filed Feb. 10, 1943

2 Sheets-Sheet 2



Inventor:
Mike Black,
By John D. Rippey
his Attorney.

UNITED STATES PATENT OFFICE

2,348,778

PATIENT'S LIFT ATTACHMENT FOR BEDS

Mike Black, Cincinnati, Ohio, assignor to H. H. Nieberding, Cincinnati, Ohio

Application February 10, 1943, Serial No. 475,325

9 Claims. (Cl. 5—83)

This invention relates to a patient's lift attachment for beds; and has special reference to devices for use in connection with horizontal beds, or other beds having invalids or patients thereon, for raising portions of the patient's body above the bed mattress, as may be required for treatment or for any other purpose.

Objects of the invention are to provide a frame adapted to be mounted below the bed frame and below the mattress thereon for supporting one or more flexible bands or sheets extended transversely between the body of the patient and the bed mattress for sustaining the superposed and adjacent portions of the patient's body spaced above the mattress for treatment or for any needed purpose; to provide operative mechanism in said frame for raising and lowering said band or sheet, or a plurality of such bands or sheets, relative to the mattress in order to raise and lower the superposed and adjacent portions of the patient's body from and toward the mattress; to provide means for preventing displacement of said frame relative to the bed during use of the invention and during operation of said mechanism; and to provide means whereby a band or sheet, or a number of such bands or sheets, may be conveniently attached to the frame in positions in which said bands or sheets extend transversely across the upper side of the bed mattress and below the patient.

Another object of the invention is to provide a rigid and removable portable frame adapted to be attached to a bed frame below the mattress and including a vertically movable member supporting a band or sheet, or a plurality of bands or sheets, extending transversely across the upper side of the mattress of the bed and below the patient, and manually operative gearing for raising and lowering said member and thereby said band or sheet, or a plurality of sheets or bands as desired, to raise and lower the superposed and adjacent portions of the patient's body relative to the mattress for treatment, or for any other purpose that may be required or indicated.

Various other objects and advantages of the invention will be apparent from the following description, reference being made to the annexed drawings, in which—

Fig. 1 is a plan view of my improved patient's lift attachment for beds mounted on a bed frame of conventional construction and design.

Fig. 2 is a side elevation of my improved patient's lift attachment mounted on a bed frame as in Fig. 1.

Fig. 3 is a vertical sectional view of the bed

frame on the line 3—3 of Fig. 2, showing many of the details of the invention.

Fig. 4 is an enlarged vertical sectional view approximately on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged cross-sectional view on the line 5—5 of Fig. 2.

Fig. 6 is an enlarged sectional view on the line 6—6 of Fig. 2, showing one of the hinged releasable brackets for securing my improved patient's lift attachment to the bed frame.

Fig. 7 is a sectional view similar to Fig. 6, showing a modification of the bracket device.

My improved patient's lift attachment is shown mounted on a hospital bed frame of conventional construction and design, all portions of the bed frame being omitted from the drawings excepting so much of the bed structure as is deemed necessary to show the connection of the invention therewith.

As shown, the bed frame includes two parallel and substantially rigid and inflexible longitudinal side members 1 rigidly connected at their ends by head and foot frames 2, thereby forming a rigid top frame for supporting the bed mattress (not shown). The rigid top frame is secured to and sustained by supporting legs 3 carried by rollers 4 having well known swivel connection with the lower ends of said legs. The lower end portions of the legs 3 may be connected and secured in rigid relationship by substantially rigid and inflexible frame members 5, as is well known. The mattress and the spring structure for supporting and cushioning the mattress are omitted because illustration thereof is unnecessary for an understanding of the present invention.

My improved patient's lift attachment for a bed of this or other form comprises a rigidly constructed frame including two duplicate frame members 6 having their end portions diverging upwardly from an intermediate connecting portion 7 and provided with vertically extended ends 8. These frame members 6—7—8 are spaced apart and are connected by metallic bars 9 which may be attached to the ends 8 by welding 10 or otherwise, as desired. The horizontal intermediate connecting portions 7 of these frame members are rigidly attached by a gearing frame or housing comprising a lower wall 11, a top wall 12, and end walls 13 and 14 integrally and rigidly connecting said lower and top walls 11 and 12. The lower wall 11 of the gear frame or housing is rigidly attached to the portions 7 of the two transverse frame members by welding 15, or otherwise. Thus, the gear housing or frame

rigidly connects the intermediate portions of the two transverse frame members and cooperates therewith and with the bars 9 to form a rigid inflexible frame. The lower wall 11 may be formed with an integral downwardly extended tube or sleeve 16 which is of such a length that when the device is attached to a bed for which it is intended, the lower end of said tube or sleeve is supported above and out of contact with the floor or surface on which the rollers 4 are mounted and operate. This leaves the bed freely movable from place to place while the attachment is in connection therewith.

A screwthreaded shaft 17 extends downwardly into the tube or sleeve 16 through the open upper end thereof and through an axially aligned hole 18 in the upper wall 12 of the gear frame or housing. In the specific form of the invention shown, the upper end of the screwthreaded shaft 17 is attached to a vertically movable transverse bar 19 by connections 20 rigidly securing the shaft 17 and the bar 19 together. The bar 19 is formed with a U-shaped portion 21 adapted to receive within the upwardly open space 21' a usual part of the bed structure (not shown) without interfering with the vertical movements of said bar 19.

The bar 19 extends laterally beyond the two side members 1 of the bed for which the lift attachment is intended. Each end of the bar 19 has a vertically extended sleeve 22 which, when the device is mounted on a hospital bed or the like, extends upwardly beyond the outer side of the adjacent side member 1 of the bed. A post 23 is telescoped within each sleeve 22 for relative longitudinal vertical adjustments, and may be rigidly secured in any such relative adjustment by a set screw 24 or other appropriate fastener. It is evident that the adjustable connection of the parts 22 and 23 may be varied as desired. The upper end of each post 23 is rigidly attached to a horizontal rod 25 for supporting one or more flexible bands or sheets 26. As shown, the parts 26 are in the form of endless belts or bands engaged upon the end portions of the rods 25 at opposite sides of the posts 23, and may be easily slipped on or removed from said rods. In the use of the device, it is intended that the bands or sheets 26 be extended across the upper side of the bed mattress and under the patient so that the superposed and adjacent portions of the patient may be raised and lowered by raising and lowering said bands or sheets 26. A single band or sheet 26 may be used, or any needed number of such bands or sheets may be used.

A gear wheel 27 has an elongated hub 28. The gear wheel is mounted within the gear frame or housing with the lower and upper ends of the hub 28 engaging the lower and upper walls 11 and 12 of said frame or housing. The hub 28 is formed with a coaxial threaded hole and is screwed on the shaft 17 for vertical longitudinal movements when said gear wheel is rotated. The shaft 17 may be held from turning with the gear wheel 27 by any appropriate means, as by arms 29 projecting from the rigid frame and receiving the bar 19 between them. This leaves the bar 19 free for vertical movements by the gearing 17-27 while said bar is held from undesired displacement and thereby prevents undesired displacement of the bands or sheets 26. A stud shaft 30 is mounted for rotation in the end wall 14 of the gear frame or housing. A pinion 31 on said stud shaft is in permanent mesh with the gear wheel 27.

A tubular shaft 32 has universal swivel connection 33 with the stud shaft 30. A crank device 34 has detachable telescoping connection 35 with the shaft 32, and may be secured in any longitudinally extended position by a set screw device 36. Thus, the combined length of the shaft 32 and crank device 34 may be varied as desired in order to adapt the invention for attachment to beds of different lengths while the extended portion of the crank device 34 remains available for operation close to one end of the bed. A bearing 37 for the crank shaft 34 may be provided with any suitable detachable device 38 for securing the same to the bed frame.

Releasable hanger brackets 39 may be connected with the vertically extended portions 8 of the rigid frame by hinges 40 which permit swinging movements of said brackets from and to positions in which said brackets extend inwardly across the bed frame members 1 to support the device for use. As shown, the inner ends of the brackets 39 are preferably formed with downward extensions 41 which prevent any possible disengagement of the brackets from the bed frame members 1 by lateral sliding movements of the lift device. If preferred, brackets 42 may be detachably secured to the vertical extensions 8 of the frame by releasable bolt fasteners 43 and provided with downward extensions 44. The hinged brackets 39 may be provided at one or both ends of the lift attachment frame, as desired. The use of hinged brackets 39 on at least one end of said frame is preferred so that said brackets may be swung outwardly and disengaged from the bed frame to permit easy disengagement of the opposite end of the lift attachment from the bed frame; thereby dispensing with the necessity of detaching or removing the bolted brackets 42 from one end at least of the device. It will be seen that these brackets are arranged in such a relationship that the lower end of the sleeve 16 is supported well above the level of and out of contact with the floor on which the rollers 4 operate (Fig. 2) so that there is no interference with the free movement of the bed about the hospital or the like.

From the foregoing, the attachment of the device to the bed for use is self-evident. The bands or sheets 26 are extended across the mattress of the bed below the patient and connected with the bars 25, preferably while the bands or sheets 26 rest upon the mattress. Then the gearing 31-27 is operated to move the shaft 17 longitudinally in an upward direction, thereby raising the bar 19 and the bands or sheets 26 which had been secured on the bars 25. This upward movement of the bands or sheets 26 raises the superposed and adjacent portions of the body of the patient above the mattress to any desired extent and for any desired purpose. The mechanism is so arranged that downward pressure against the bands or sheets 26 by the weight of the patient supported thereby will not operate said mechanism nor lower the bands or sheets 26. Thus, the superposed and adjacent portions of the body of the patient will be supported above the mattress and at any desired height and for any purpose as long as desired.

The construction, arrangement and operation of the device may be varied within the scope of equivalent limits without departure from the nature and principle thereof.

I claim:

1. A patient's lift attachment for beds comprising a rigid frame, means for detachably se-

curing said frame to the underside of a bed, a bar mounted in said frame and extending across the underside of the bed, vertical posts attached to the ends of said bar beyond the sides of the bed, gearing supported by said frame for raising and lowering said bar and thereby raising and lowering said posts, and a band or sheet attached to said posts and extending transversely above the bed for raising and lowering superposed and adjacent portions of the body of a person on the bed.

2. A patient's lift attachment for a bed that includes a rigid bed frame having rigid and inflexible longitudinal side members, comprising a rigid lift frame extending transversely of said bed frame below said side members, detachable means for supporting said lift frame by said side members, a bar mounted in said lift frame and extending across the underside of the bed frame below said side members, upwardly extended posts attached to said bar adjacent to the sides of the bed frame, a band or sheet supported by said posts above and transversely of said side members of said bed frame for supporting and raising and lowering superposed and adjacent portions of the body of a person on the bed, and mechanism supported by said frame for raising and lowering said bar and said parts and thereby said band or sheet.

3. A patient's lift attachment for a bed having a rigid frame including substantially rigid and inflexible longitudinal side members, comprising a rigid lift frame insertable into and withdrawable from the space below said side members of said bed frame, detachable means for connecting said lift frame to said side members, a vertically movable bar mounted in said lift frame and extending across the underside of the bed frame below said side members, upwardly extended posts attached to said bar adjacent to the sides of said bed frame, a band or sheet supported by said posts above and transversely of said side members of said bed frame for raising and lowering superposed and adjacent portions of the body of a person on the bed, a vertical shaft attached to and extending downwardly from said bar, and gearing supported by said frame for raising and lowering said shaft and thereby said bar and said band or sheet to raise and lower superposed and adjacent portions of the body of a person on the bed.

4. A patient's lift attachment for a bed having a rigid bed frame that includes two longitudinal rigid and inflexible side members, comprising a rigid lift frame extending transversely below said side members, brackets connected with the ends of said lift frame for engaging said side members and thereby supporting said lift frame, a rotary gear wheel mounted in said lift frame having an internally screwthreaded hub, a vertical shaft screwed through said hub for vertical movements thereby when said gear is rotated, a bar attached to the upper end of said shaft and supported thereby transversely below said side members of said bed frame, posts attached to the ends of said bar beyond the outer sides of said side members, a band or sheet extending transversely above the bed frame, means for supporting said band or sheet by said posts, and manual mechanism for rotating said gear wheel and thereby moving said shaft vertically as required to move said band or sheet vertically to raise and lower superposed and adjacent portions of the body of a person on the bed.

5. A patient's lift attachment for a rigid bed

frame having two parallel side members, comprising a rigid lift frame insertable into and withdrawable from a space below said bed frame, detachable means for connecting said lift frame to both of said side members of said bed frame for preventing lateral displacement of said lift frame relative to said bed frame, a bar mounted in said lift frame and extending transversely below said bed frame, posts extending upwardly from the ends of said bar, a flexible element extending transversely above the bed frame and connected with said posts beyond the sides of said bed frame, and mechanism mounted in said lift frame for raising and lowering said bar and said posts to raise and lower said flexible element and thereby raise and lower superposed and adjacent portions of the body of a person on said flexible element.

6. A patient's lift attachment for a rigid bed frame, comprising a rigid lift frame extending transversely below said bed frame, brackets hinged to the ends of said lift frame for engaging said bed frame and preventing relative lateral displacement of said two frames, a bar mounted in said lift frame and extending transversely below said bed frame, rods supported by the ends of said bar, a flexible element supported by said rods transversely above the bed frame, gear mechanism connected with said bar for raising and lowering the same and thereby raising and lowering said flexible element relative to the bed frame, and mechanism for operating said gearing.

7. A patient's lift attachment for a bed that has a rigid bed frame, comprising a lift frame extending transversely below the upper portion of said bed frame, brackets hinged to the ends of said lift frame for engaging said bed frame to support said lift frame and prevent displacement thereof relative to said bed frame, a bar mounted in said lift frame and extending transversely of the upper portion of said bed frame, upwardly extended posts attached to said bar adjacent to the sides of said bed frame a flexible band or sheet supported by said posts and extending transversely above the bed frame, means for guiding said bar in vertical movements, gearing mounted in said lift frame for moving said bar and said posts and thereby said band or sheet vertically as required to raise and lower superposed and adjacent portions of the body of a person lying across said band or sheet, and mechanism for operating said gearing.

8. A patient's lift attachment for a rigid bed frame that has two approximately parallel side members, comprising a rigid lift frame extending transversely of said bed frame below said side members, elements in connection with said lift frame for detachably engaging said respective side members of said bed frame and supporting said lift frame below said side members, an approximately horizontal bar mounted for upward and downward movements in said lift frame below and toward and from said side members of said bed frame, upwardly extended posts supported by the ends of said bar adjacent to said side members of said bed frame, approximately horizontal rods supported by the upper ends of said posts, bands or sheets connected with said rods and extending transversely between the bed and the body of a person on the bed, and gearing supported by said frame for raising and lowering said bar and said posts and thereby raising and lowering said bands or sheets to raise and lower superposed and adjacent portions of

the body of a person on the bed and on said bands or sheets.

9. A patient's lift attachment for a bed having a bed frame adapted to support a mattress, comprising a rigid portable frame, means for detachably supporting said portable frame by and below said bed frame, upwardly extended posts mounted in said portable frame for upward and downward movements at the opposite sides of said bed frame, a band or sheet connected with said posts and extending transversely between the bed and the body of the person on the bed, a vertically movable shaft mounted in said portable frame for moving said posts upwardly and

downwardly as aforesaid, and mechanism operatively supported by said portable frame for moving said shaft upwardly to move said posts upwardly and downwardly and thereby raise and lower said band or sheet and the superposed and adjacent portions of the person's body from and toward the bed.

his
MIKE X BLACK.
mark

10

Witnesses to mark signature of Mike Black:
JOHN D. RIPPEY,
MARCY V. QUAIN.