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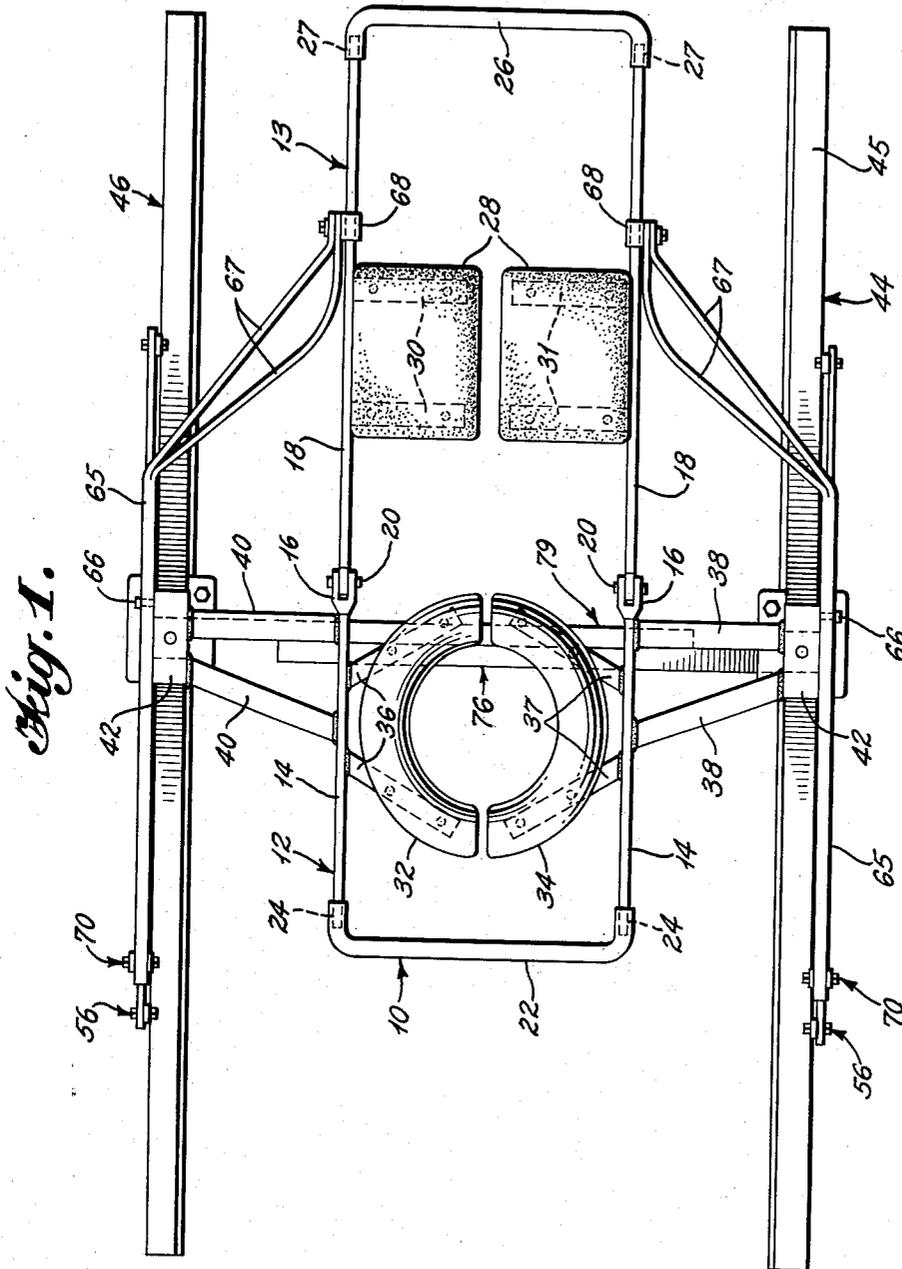
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3,116,492

INVALID LIFT

Filed Nov. 8, 1961

4 Sheets-Sheet 1



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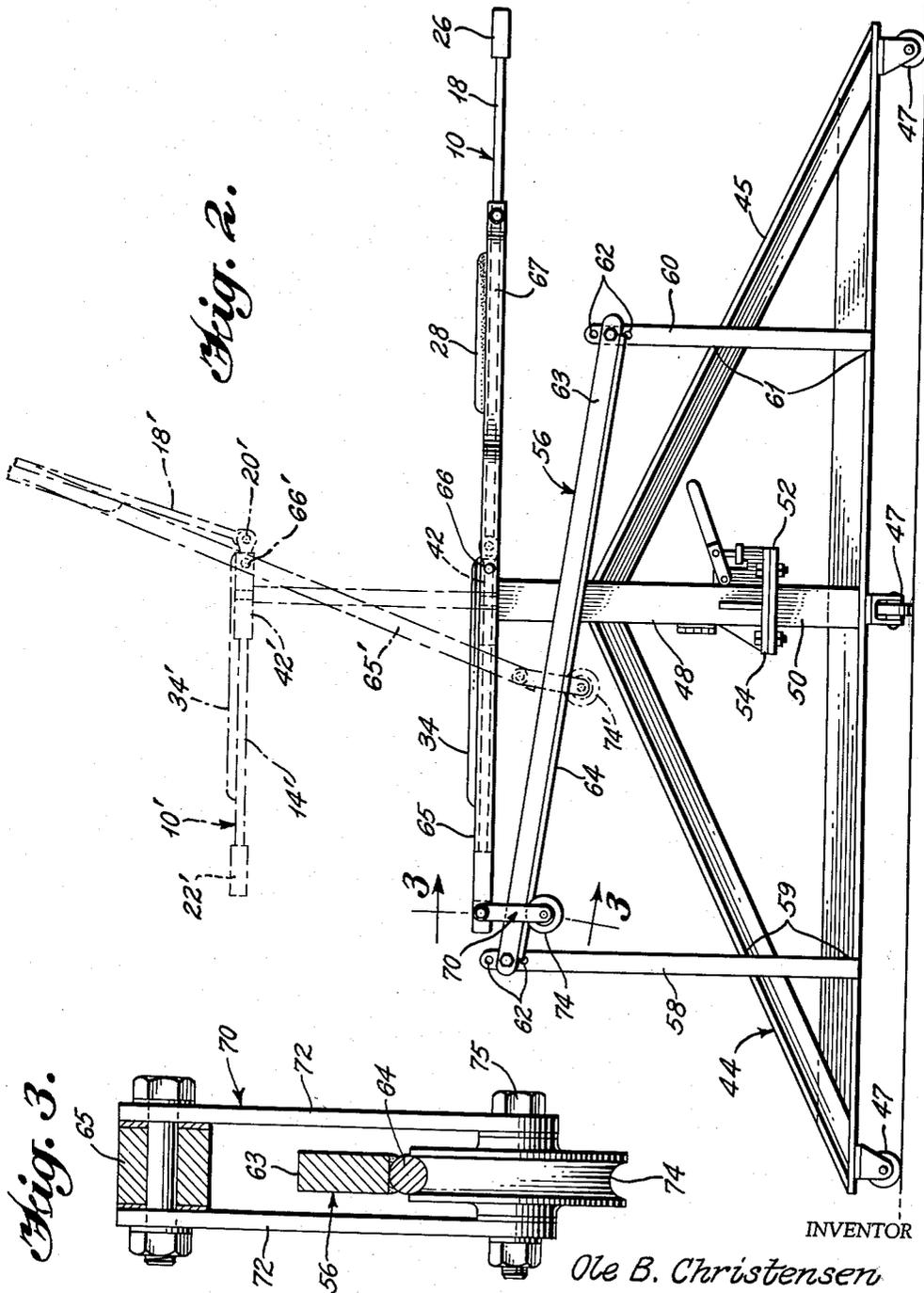
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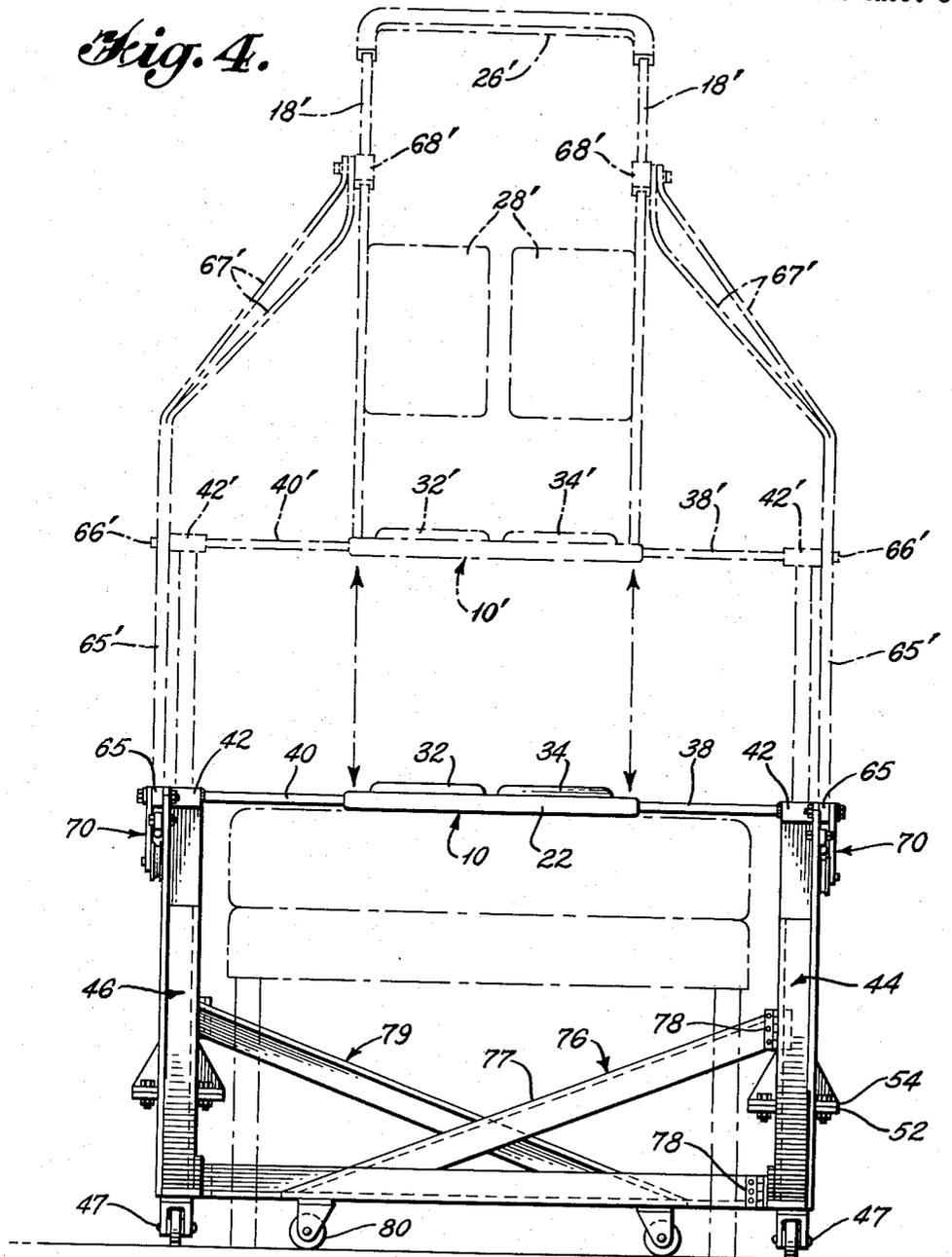
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*Fig. 4.*



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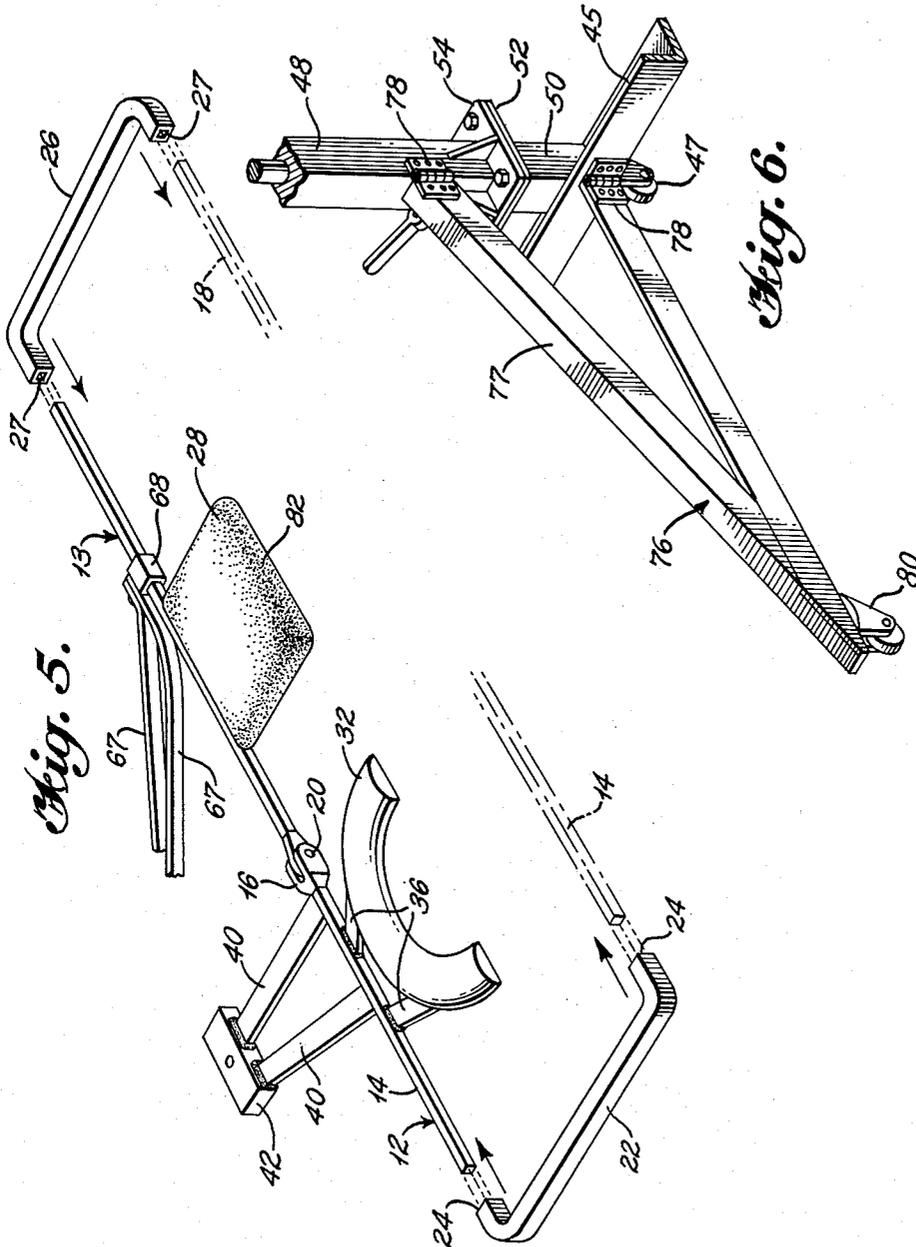


Fig. 6.

Fig. 5.

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**INVALID LIFT**

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10 Claims. (Cl. 5-85)

The present invention relates generally to invalid lifts, and more particularly, for lifts for raising and supporting an invalid in sitting position spaced above a bed.

There has been considerable endeavor to provide an invalid lift for lifting an invalid and supporting the invalid above the bed in a hospital or sick room. Many of these devices are designed in such a manner that they are costly to manufacture and awkward to use.

In many instances it is necessary for the device to be moved about in small spaces, for example, in the wards of a hospital wherein many beds are placed in a room with only small spaces between the beds. Most of the existing devices are not capable of being moved about in such small spaces because of their bulky structure. Some invalid lifts have been provided which may be dismantled for improving their maneuverability in small areas; however, most of such devices require two attendants to assemble the lift in its operative position and to operate the lift.

Also, many of the existing devices capable of raising and supporting an invalid in a horizontal position above the bed are not capable of supporting the invalid in a sitting position. It is often desirable to support an invalid in a raised sitting position for assisting the invalid to use a bed chamber or bed pan.

It is an object of this invention to provide an economic invalid lift which may be maneuvered in small spaces and may be operated by one attendant.

It is another object of this invention to provide an invalid lift which will raise and support an invalid in sitting position above a bed.

It is still a further object of this invention to provide an invalid lift which may be separated easily into two sections for facilitating movement of the device into operative position.

These objects may be accomplished, according to one embodiment of the invention, by providing a lift frame having a seat portion and a back rest portion which are pivotally connected together for movement of an invalid from a horizontal position to a sitting position. The lift frame preferably is adapted to be separated into two separate sections.

Each section of the lift frame may be supported on a base member which is provided with casters for maneuverability. Each base member may be provided with a hinged support leg so that each base member can support independently a section of the lift frame on either side of a bed.

Once the base members with their associated sections of the lift frame are positioned on opposite sides of the bed, an invalid may be placed on the lift frame by sliding the sections beneath the invalid while turning the invalid first on one side and then the other. The two sections are then connected together and the invalid is raised to an elevated sitting position by actuating jacks on the base members.

This embodiment of the invention is illustrated in the accompanying drawings, in which:

FIGURE 1 is a plan view of the invention;

FIGURE 2 is a side view of the invention showing the two positions of the lift, the elevated position being shown in broken lines;

FIGURE 3 is an enlarged sectional view taken on line 3-3 of FIGURE 2;

FIGURE 4 is an end view showing the two positions

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of the lift in position over a bed, the elevated position and the bed being shown in broken lines;

FIGURE 5 is a partial perspective view of the lift frame of the invalid lift; and

FIGURE 6 is a partial perspective view of the pivoted support leg.

Referring to the drawings, the lift frame 10 is comprised of a pair of substantially U-shaped members 12 and 13. The member 12 forms a seat portion and includes a pair of legs 14, each having a yoke 16 at its end. The U-shaped member 13 forms a back rest portion and has a pair of legs 18 pivotally connected to the yokes 16 on the legs 14 by pivot pins 20.

The bight portion of each U-shaped member is removable. The bight portion 22 of the U-shaped member 12 consists of a rod having its ends disposed substantially perpendicular to the longitudinal axis of the rod and having pockets 24 therein to slidably engage the legs 14. The bight portion 26 of the U-shaped member 13 is identical to the bight portion 22, and has pockets 27 therein to receive the legs 18 of the U-shaped member 13. This structure can best be seen in FIGURE 5.

A back rest is provided on the U-shaped member 13 which consists of a pair of flat rectangular plates 28. The plates 28 may be made of wood or other suitable material. The plates 28 are supported on pairs of straps 30 and 31 which are rigidly secured to the legs 18. The plates 28 may be fastened to the straps 30 and 31 by screws or other suitable fastening means.

A seat consisting of two sections 32 and 34 is also provided for supporting the invalid. The two sections 32 and 34 extend inwardly from the legs 14 of the U-shaped member 12. The sections 32 and 34 are supported on pairs of straps 36 and 37 which are rigidly secured to legs 14. Each seat section 32 and 34 is similar to half of a conventional toilet seat and may be secured to the straps 36 and 37 by screws or other suitable fastening means.

The lift frame 10 is supported by a pair of arms 38 extending laterally outwardly from one leg 14 of the U-shaped member 12 and another pair of arms 40 extending laterally outwardly from the other leg 14. The arms 38 and 40 are rigidly secured to the legs 14, for example, by welding. The other ends of the arms 38 and 40 are rigidly secured to plates 42 which are supported by elevating means on each of the base members 44 and 46.

The base member 46 is a mirror image of the base member 44 and it will therefore suffice to discuss only the one member 44.

The base member 44, as best seen in FIGURE 2, is comprised of a triangular frame 45, which is illustrated as constructed of sections of angle iron rigidly secured together by welding or other such suitable means. The base member 44 is provided with casters 47 so that the base member may be moved about on a supporting surface.

Additionally, each base member is provided with elevating means. In the preferred embodiment of the invention, the base member 44 includes a conventional hydraulic jack 48. The jack 48 is supported on the frame 45 by a vertical support member 50 which is rigidly secured to the horizontal portion of the triangular frame 45. The upper end of the vertical support has a plate 52 rigidly secured thereto. The base 54 of the jack may be bolted to the plate 52. The height of the support member 50 depends on the extent of the vertical movement of the jack employed. In some cases this support may not be necessary and the jack may be secured directly to the frame 45.

A cam trackway 56 is adjustably supported on a pair

of vertical legs 58 and 60 which are rigidly secured to the triangular frame 44 at 59 and 61, respectively. The leg 58 is longer than the leg 60 for supporting the cam trackway 56 in an inclined position. The legs 58 and 60 have a plurality of apertures 62 therein for varying the inclination of the trackway 56.

The cam trackway 56, as shown in FIGURE 3, consists of a rectangular bar 63 having a circular rod 64 welded or otherwise rigidly secured to the bottom side thereof. Other suitable ways may be employed for providing a trackway.

The trackway 56 cooperates with means for raising the back rest portion 13 to an upright position while the lift frame 10 is being raised vertically by the jacks 48. This means consists of a pair of levers 65 rotatably supported on pins 66 which are rigidly secured to the plates 42.

In the embodiment illustrated, the levers 65 are comprised of a pair of tubular rods which are secured together a substantial portion of their length by welding. This construction provides for great strength without involving the use of heavy material. Other designs for the levers 65 may be employed; however, this is the preferred embodiment. The connected portion of each of the levers 65 extends substantially coplanar with the cam trackway 56. Adjacent one end, the levers 65 have portions 67 which slope inwardly toward the lift frame 10 and are secured to collars 68 which slidably engage the legs 18 of the member 13. The portions 67 of the levers 65 slope inwardly to the collars 68 at various angles to provide greater strength.

The other ends of the levers 65 have a cam roller assembly 70 secured thereto. This arrangement can best be seen in FIGURE 3. A pair of straps 72 are bolted to the end of a lever 65. The straps 72 extend downwardly on each side of the cam trackway 56 and terminate a predetermined distance below the trackway 56. A cam roller 74 is rotatably supported between the depending ends of the straps 72 by a bolt 75 and is in engagement with the track 64 of the trackway 56. In the illustrated embodiment, the cam roller 74 has a concave peripheral surface, similar to the construction of a pulley.

It will now be understood, that when the plates 42 carrying the lift frame 10 are raised vertically by the jacks 48, the pivot pins 66 and the levers 65 will be raised. As the levers 65 are raised, they will pull the cam assembly and move the cam rollers 74 along the tracks 64. Because of the inclination of the trackways 56, the levers 65 will rotate in a counterclockwise direction, as viewed in FIGURE 2. The levers 65 will thus pivot the back rest portion 13 about its pivotal connection 20 to a substantially upright position. The upright position may be varied by varying the inclination of the trackway as provided for by the apertures 62 in the legs 58 and 60. As the back rest portion 13 is pivoted by the levers 65, the collars 68 will slide along the legs 18. With this arrangement, an invalid is raised to a sitting position at an elevated position above the bed.

When it is desired to position the lift adjacent the bed for raising an invalid, the lift frame 10 may be separated into sections by removing the bight portions 22 and 26 from each end of the lift frame 10. Each base is now free to move independently from each other and to support a section of the lift frame 10.

The operator or attendant would first place one base member adjacent one side of the bed and subsequently place the other base member adjacent the other side of the bed.

To prevent the section of the lift from falling over or from falling onto the invalid, a support leg 76 is provided on the base member 44. The support leg 76, as best seen in FIGURE 6, consists of a V-shaped frame 77 which is hingedly secured to the base member 44 by a pair of hinges 78. The free end of the frame 77 is provided with a caster 80. When in its extended position, as

shown in FIGURES 4 and 6, the support leg 76 will maintain the base member 44 of the invalid lift in its upright position. The support leg 76 may be swung flush against the frame 45 of the base member 44 when moving the base member 44 about in small spaces. Once the base member 44 is positioned adjacent the side of the bed, the support leg 76 may be swung beneath the bed to support the base member 44. The base member 46 also has a support leg 79 attached thereto in the same manner.

When the base members 44 and 46 are in proper position, the attendant then rolls the invalid first on one side and inserts a section of the lift frame 10 under the raised portion of the invalid's body. The other section of the lift frame 10 may then be placed beneath the invalid by rolling the invalid onto his other side, and sliding the section of the lift frame 10 in proper position beneath the patient. The two sections are connected by sliding the pockets 24 and 27 of the bight portions 22 and 26 onto the legs 14 and 18 of the members 12 and 13. Having thus securely fastened the two sections of the lift frame 10 together, the jacks 48 may be operated for raising the invalid above the bed and into a sitting position. The jacks 48 have conventional handle means and may be connected together by any conventional means, such as a rod welded therebetween, so that one attendant may operate both jacks simultaneously.

The elevated position of the lift frame is shown in broken lines in FIGURES 2 and 4. The various elements of the lift frame in its elevated position are indicated by the same reference numeral followed by a prime designation.

The plates 28 may be cushioned with sponge rubber 32 or other suitable means to increase the comfort of the invalid.

While the invention has been illustrated and described in a certain embodiment, it is recognized that variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. An invalid lift comprising a pair of base members adapted to be independently moved over a supporting surface and a lift frame adapted to support an invalid, elevating means carried by said base members for raising and lowering said lift frame, said lift frame including a pair of separable side sections connected respectively to said base members and bridging means for connecting said side sections together.

2. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface and a lift frame adapted to support an invalid, elevating means on said base members for raising and lowering said lift frame, said lift frame including a pair of separable sections connected respectively to said base members and means for connecting said sections together, and a support pivotally attached to each base member for supporting each base member independently of the other in an upright position.

3. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface and a lift frame adapted to support an invalid, elevating means on said base members for raising and lowering said lift frame, said lift frame including a pair of separable sections connected respectively to said base members, each of said sections including portions pivotally connected together and adapted to form a seat-like support.

4. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface and a lift frame adapted to support an invalid, said base members having elevating means for raising and lowering said lift frame, said lift frame including a pair of separable sections connected respectively to said base members, each of said sections having portions pivotally connected together, and means for pivoting one of said

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portions of each section into a substantially upright position.

5. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface, elevating means attached to each base member, a sectional lift frame, a section of said lift frame supported by each of said elevating means, removable means adapted to connect the sections of the lift frame together, each section of said lift frame including a back rest portion and a seat portion, said portions being pivotally connected together, and means on each of said base members for pivoting each back rest portion to a substantially upright position when said lift frame sections are raised by said elevating means.

6. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface, elevating means carried by each of said base members, a separable lift frame supported by said elevating means for movement therewith, said lift frame including a back rest portion and a seat portion, said portions being pivotally connected together, and means on each of said base members for pivoting said back rest portion to an upright position in response to the raising of said lift frame by said elevating means.

7. An invalid lift comprising a pair of base members adapted to be moved independently over a supporting surface, elevating means secured on each base member, a separable lift frame including a seat portion and a back rest portion pivotally connected together, means securing the seat portion to said elevating means for enabling said seat portion to be raised by said elevating means, a lever rotatably connected to each of said elevating means and adapted to be raised thereby, guide means on each of said base members, each of said levers having one end slidably engaged with said back rest portion and the other end movably engaged with said guide means whereby the back rest portion is pivoted to a substantially upright position simultaneously with the raising of the seat portion.

8. An invalid lift comprising a pair of base members adapted to be moved over a supporting surface, elevating means secured on each base member, a lift frame including a seat portion and a back rest portion, said seat portion being substantially U-shaped and having a seat secured thereto, said back rest portion being substantially U-shaped and having a padded support thereon, said back rest portion being pivotally connected to said seat portion, said seat portion being secured at each side thereof to said elevating means for vertical movement therewith, a cam trackway supported on each base member, a lever rotatably connected to each elevating means, a cam assembly on one end of each lever, said cam assembly engaging a cam trackway and adapted for movement therealong, and means on the other end of each of said levers for slidably engaging said back rest portion so that said

levers will rotate said back rest portion to a substantially upright position when said lift frame is elevated.

9. An invalid lift comprising a pair of base members adapted to be moved over a supporting surface, elevating means secured on each base member, a lift frame including a seat portion and a back rest portion, said seat portion being substantially U-shaped and having a seat secured thereto, said back rest portion being substantially U-shaped and having a padded support thereon, said back rest portion being pivotally connected to said seat portion, said seat portion being secured at each side thereof to said elevating means for vertical movement therewith, the bight of the U-shaped seat portion and the bight of the back rest portion each being removable so that a section of the lift frame is supported by each of said base members, a cam trackway secured to each base member, a lever rotatably connected to each elevating means, a cam assembly on each lever at one end thereof and in engagement with a cam trackway, means on the other end of each of said levers for slidably engaging said back rest portion, whereby said cam assemblies rotate said levers to pivot said back rest portion to a substantially upright position when said lift frame is elevated.

10. An invalid lift comprising a pair of base members adapted to be moved over a supporting surface, elevating means secured on each base member, a lift frame including a seat portion and a back rest portion, said seat portion being substantially U-shaped and having a seat secured thereto, said back rest portion being substantially U-shaped and having a padded support thereon, said back rest portion being pivotally connected to said seat portion, said seat portion being secured at each side thereof to said elevating means for vertical movement therewith, the bight of the U-shape back rest portion and the bight of the U-shaped seat portion being removable so that a section of the lift frame is supported by each of said base members, a cam trackway supported on each base member, a lever rotatably connected to each elevating means, a cam assembly on one end of each lever and in engagement with a cam trackway, means on the other end of each of said levers for slidably engaging said back rest portion whereby said cam assemblies rotate levers to pivot said back rest portion to a substantially upright position when said lift frame is elevated, and a support leg comprised of a V-shape frame hingedly attached to each base member for supporting said base member when said support leg is swung into a position substantially perpendicular to said base member.

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