Nov. 4, 1969 I. B. RACHMAN 3,476,404

WHEELCHAIR LIFT

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Fig. 6.

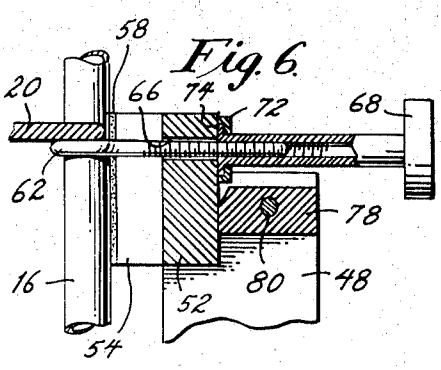


Fig. 3.

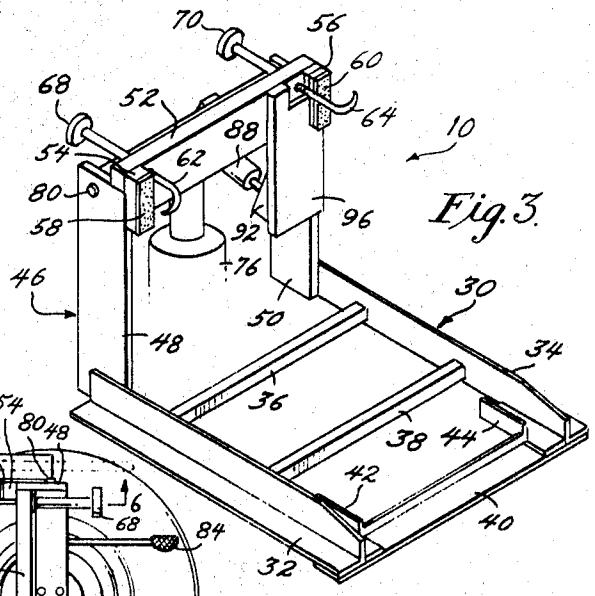


Fig. 2.

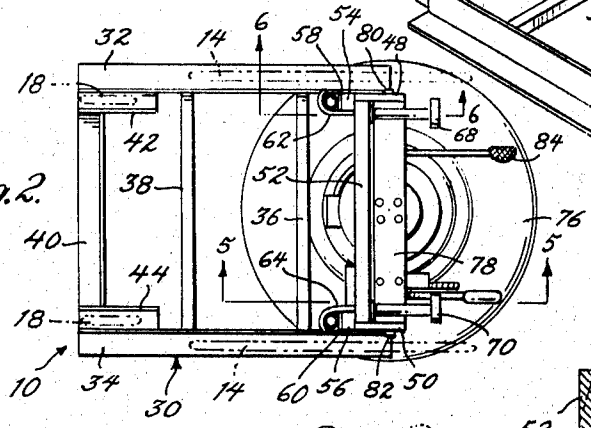


Fig. 5.

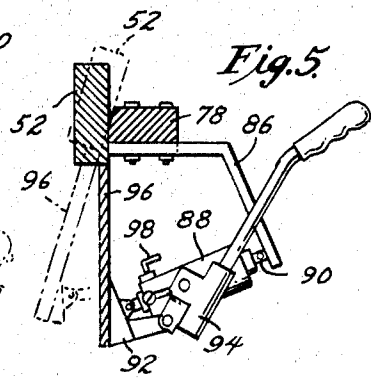


Fig. 1.

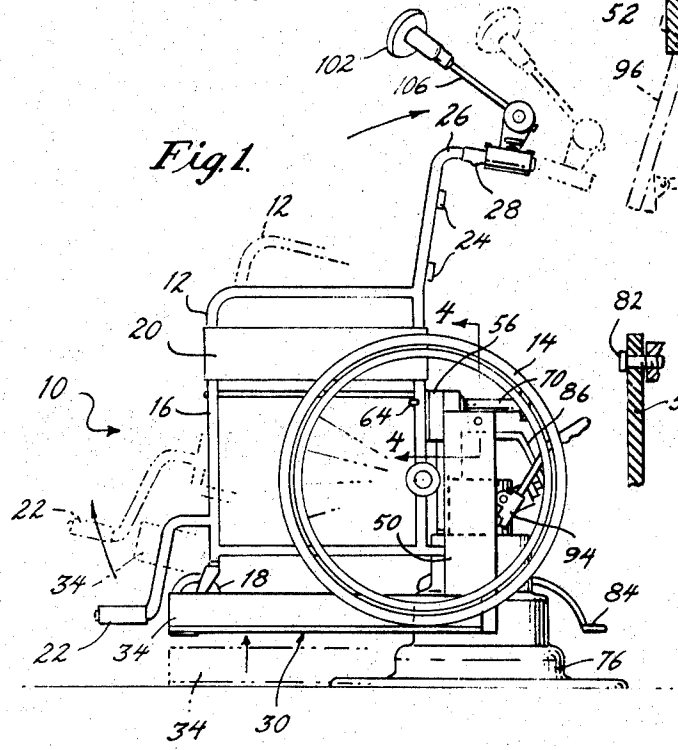
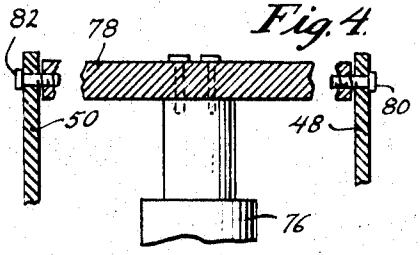


Fig. 4.



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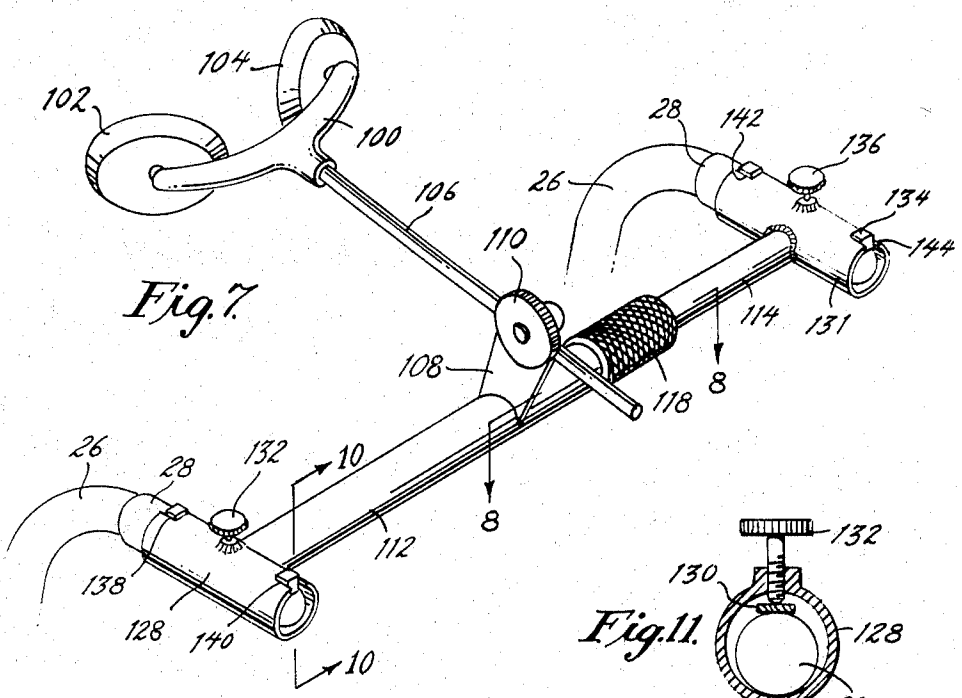


Fig. 7.

Fig. 11.

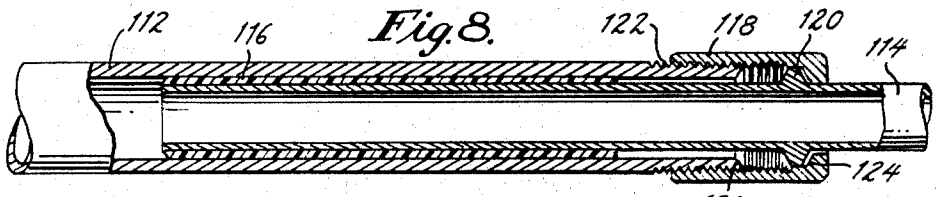


Fig. 8.

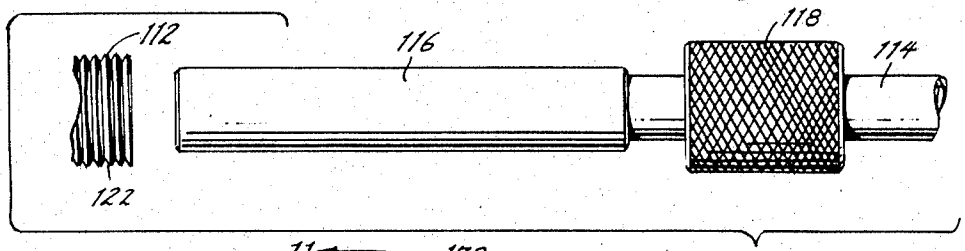


Fig. 9.

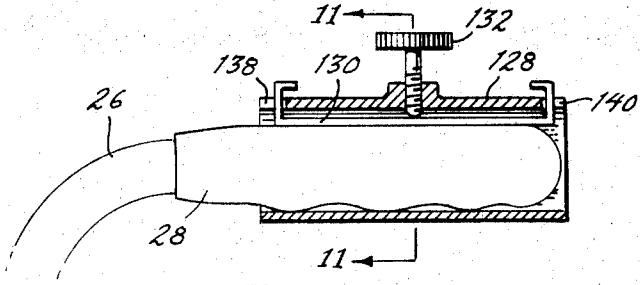


Fig. 10.

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WHEELCHAIR LIFT

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Fig. 13.

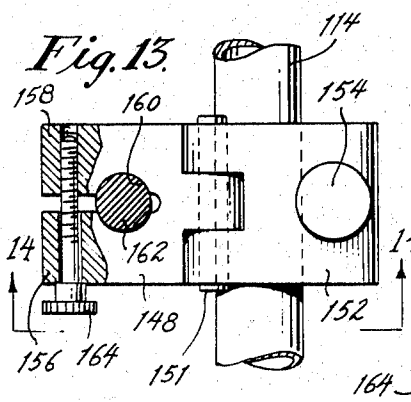


Fig. 12.

Fig. 14.

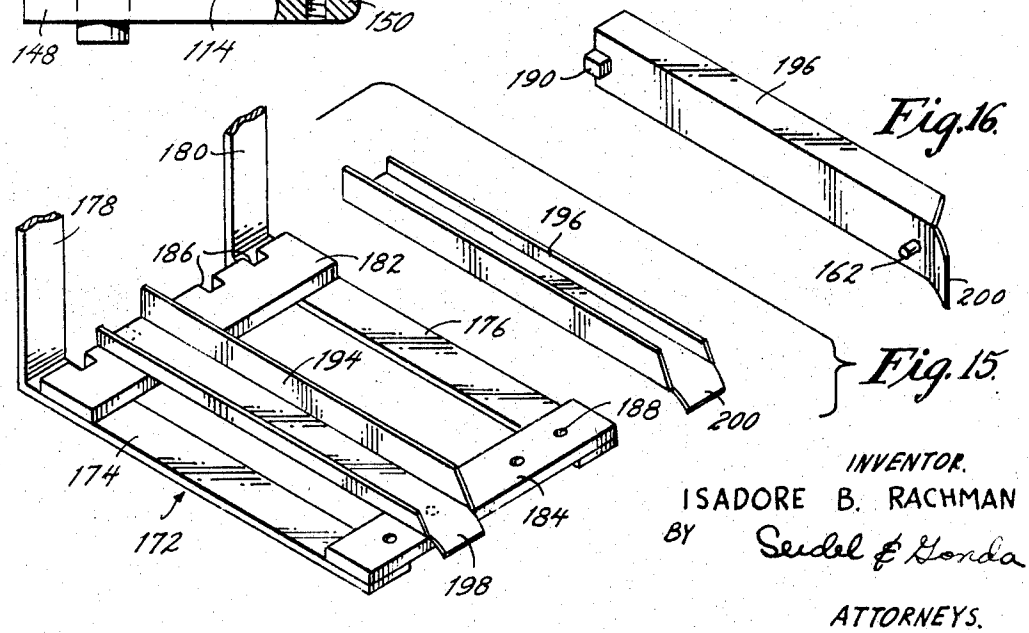


Fig. 16.

Fig. 15.

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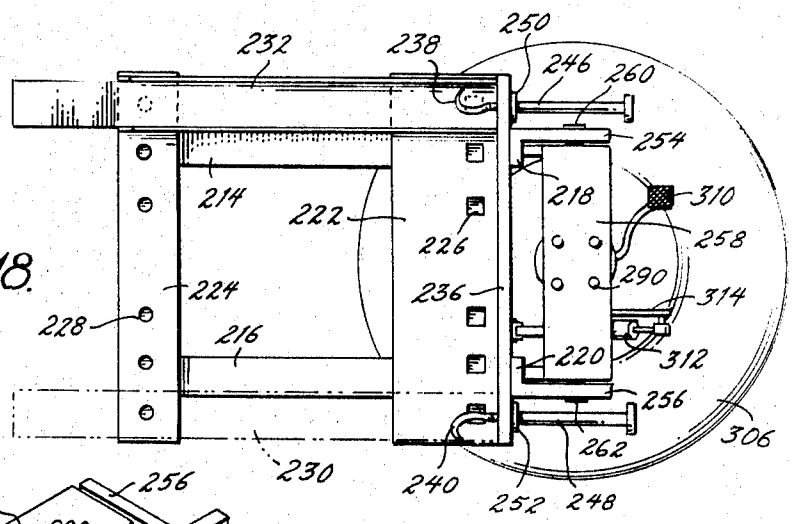


Fig. 18.

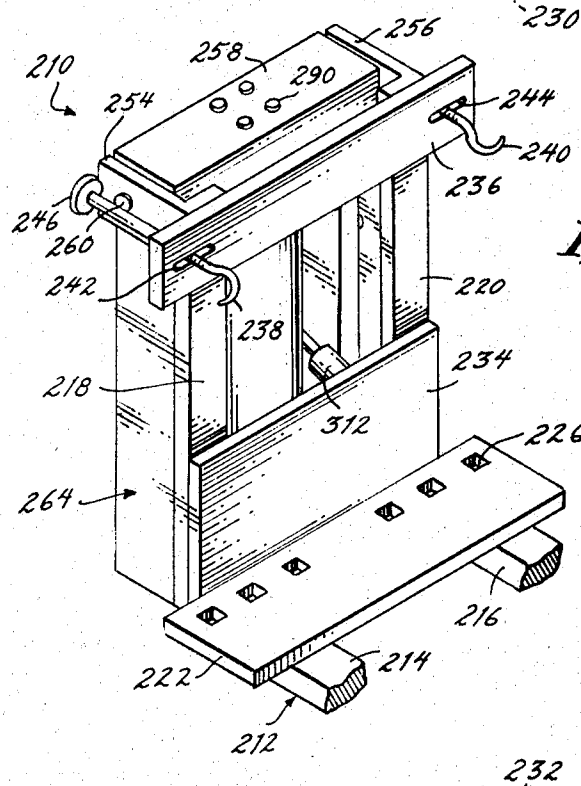


Fig. 19.

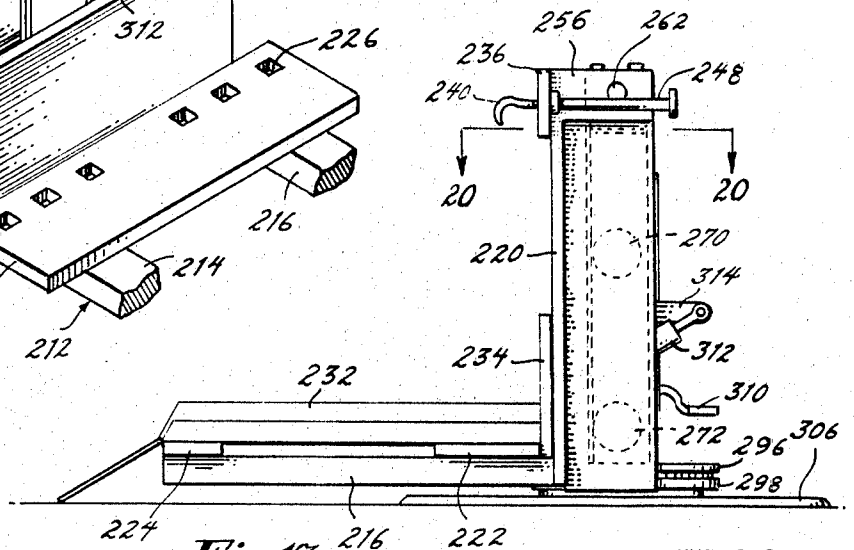


Fig. 17.

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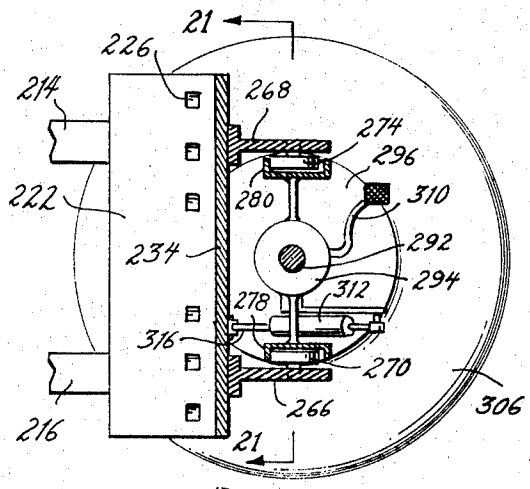


Fig. 20.

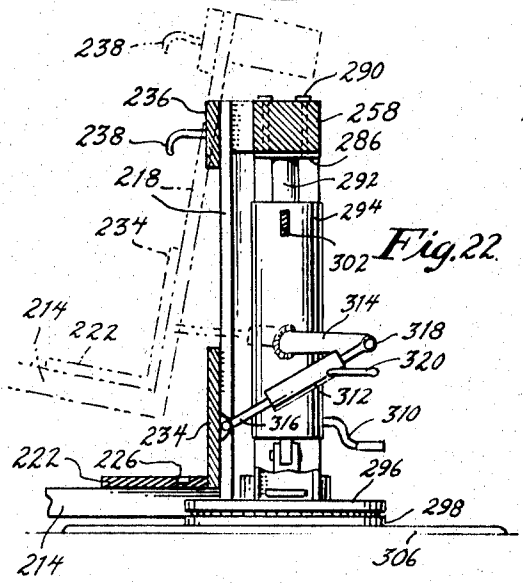
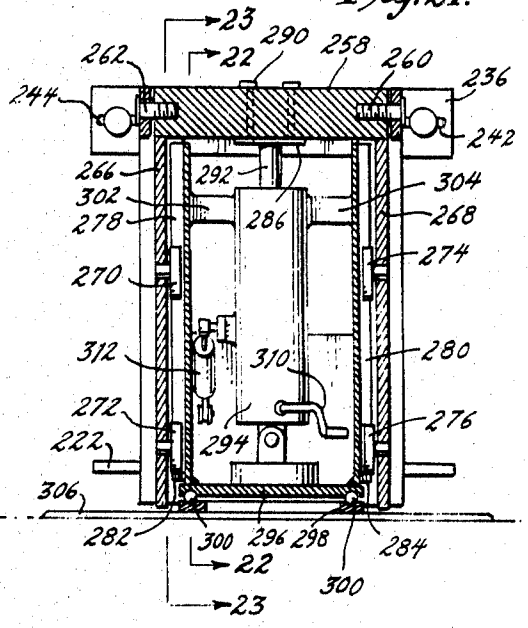


Fig. 22.

Fig. 21.



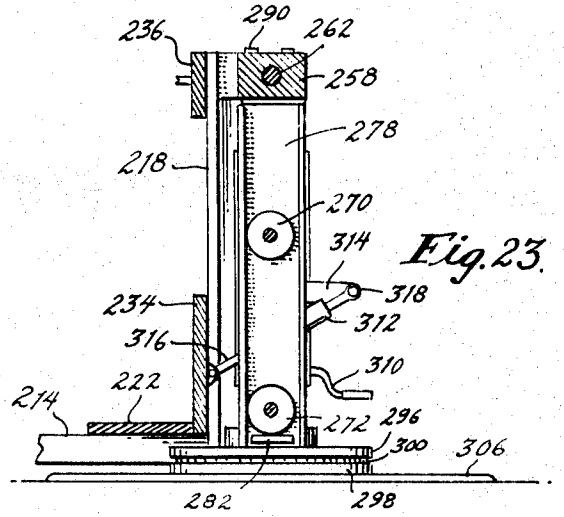


Fig. 23.

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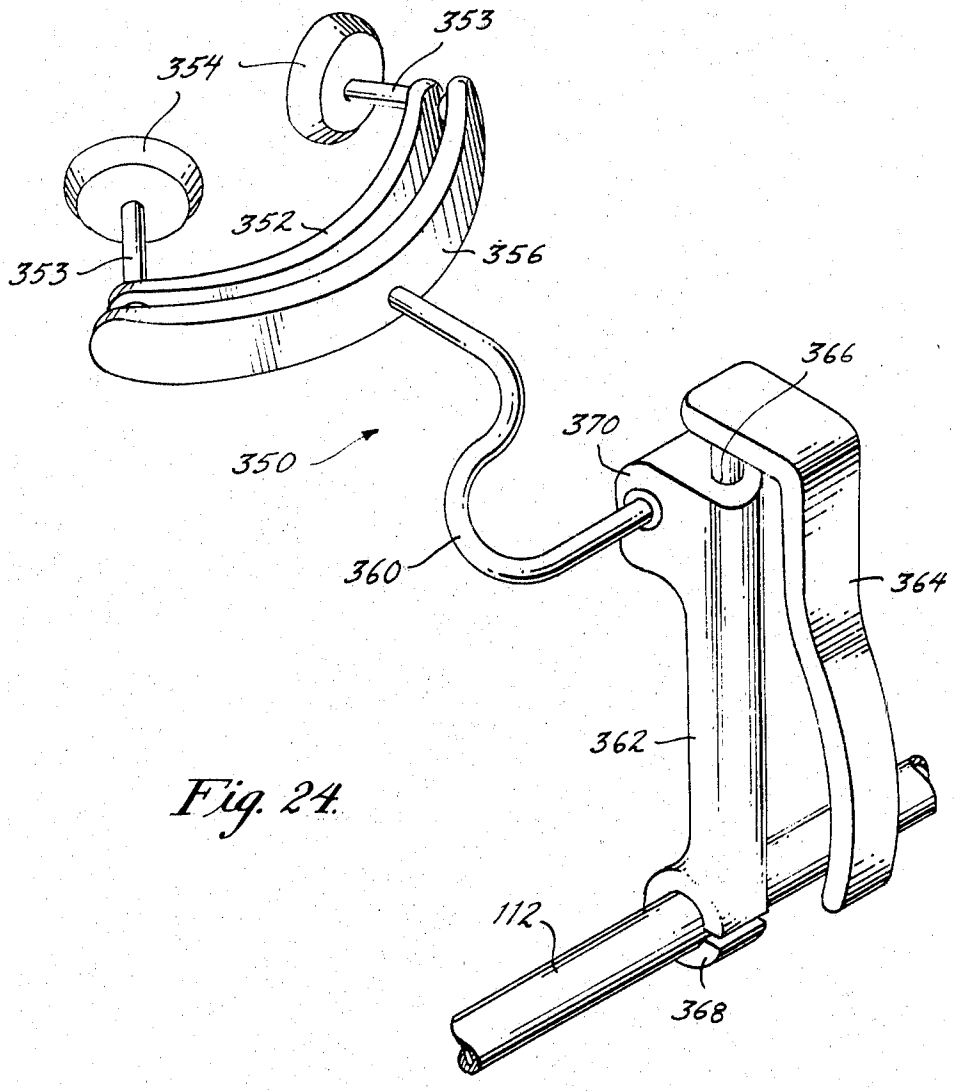


Fig. 24.

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United States Patent Office 3,476,404
Patented Nov. 4, 1969

3,476,404

WHEELCHAIR LIFT

Isadore B. Rachman, Philadelphia, Pa., assignor to Metal Dynamics Corporation, Philadelphia, Pa., a corporation of Pennsylvania

Filed Nov. 8, 1967, Ser. No. 681,437
Int. Cl. B62b 11/00
U.S. Cl. 280—30 10 Claims

ABSTRACT OF THE DISCLOSURE

A wheelchair lift including a horizontal platform with adjustable wheel guides, clamping hooks for fixing the chair on the platform, hydraulic lifting and tilting means, and a headrest adaptable for wheelchairs of all sizes.

This invention relates to a wheelchair lift. More particularly, this invention relates to apparatus adapted to engage a wheelchair and thereafter raise it and tilt it so that the patient can be more readily examined.

It has been reported that there are literally hundreds of thousads of non-ambulatory persons in wheelchairs. The transfer of these persons to dental or barber chairs may be hazardous to the patient's health, painful or at best uncomfortable. Yet it is necessary that persons confined to wheelchairs receive many of the services that healthy persons take for granted. Dental care presents a particularly difficult problem. Patients with neurologic disease, poliomyelitis, muscular dystrophy, multiple sclerosis, paraplegia, arthritis, broken bones, those who have had cerebral vascular accidents, and others who may need dental care, cannot be moved easily into a conventional dental chair. If these patients are to be treated in wheelchairs, the dentist must assume a strained and contorted position while rendering dental therapy. This results in extreme fatigue, and hence a reduction in the dentist's ability to render care.

Devices for transferring patients over to a dental chair or the like have been suggested. For example, a trapeze bar has been suspended from the ceiling over the chair. This bar is helpful for patients with strong arms, such as paraplegics, who can lift themselves from their wheelchairs and swing themselves into the dental chair. Elderly patients and many others, however, are not capable of this effort. Thus, lifting devices have to be provided. Lifting devices function well where the patient can be moved, but more often than not, patients confined to wheelchairs are best not moved at all.

As a solution to the problem, it has been suggested that dental chair bases be modified so that a wheelchair can be positioned thereon. The present invention is related to this latter type of device and is an improvement thereon. This invention permits the wheelchair and the patient to be raised, tipped backward, or lowered for the most favorable working position for the dentist, barber or the like, and with the least discomfort and inconvenience to the patient. A headrest adaptable to the wheelchair is provided. Moreover, a sling support for patients with immobilized limbs is provided. The sling support can be used to support medical equipment such as intravenous bottles and drainage bags.

For the purpose of illustrating the invention, there are shown in the drawings forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a side elevational view showing the wheelchair in position on a first embodiment of the present invention.

FIGURE 2 is a plan view of the wheelchair lift.

FIGURE 3 is a perspective view of the wheelchair lift.

FIGURE 4 is an enlarged partial sectional view taken along the line **4—4** in FIGURE 1 showing the pivot area.

FIGURE 5 is an enlarged sectional view taken along the line **5—5** in FIGURE 2 showing the hydraulic cylinder area.

FIGURE 6 is an enlarged sectional view taken along the line **6—6** in FIGURE 2 showing the wheelchair hook area.

FIGURE 7 is a perspective view of a headrest to be used with the wheelchair lift.

FIGURE 8 is an enlarged sectional view taken along the line **8—8** in FIGURE 7.

FIGURE 9 is a fragmentary exploded view in elevation of the portion shown in FIGURE 8.

FIGURE 10 is an enlarged sectional view taken along the line **10—10** in FIGURE 7.

FIGURE 11 is a sectional view taken along the line **11—11** in FIGURE 10.

FIGURE 12 is a perspective view of a sling support.

FIGURE 13 is an enlarged sectional view taken along the line **13—13** in FIGURE 12.

FIGURE 14 is an enlarged sectional view taken along the line **14—14** in FIGURE 13.

FIGURE 15 is an exploded perspective view of an adjustable platform for use with the present invention.

FIGURE 16 is a bottom perspective view of the guide way.

FIGURE 17 is a side elevational view of a second embodiment of the present invention.

FIGURE 18 is a plan view of the second embodiment.

FIGURE 19 is a perspective view of the second embodiment.

FIGURE 20 is a sectional view taken along the line **20—20** in FIGURE 17.

FIGURE 21 is a sectional view taken along the line **21—21** in FIGURE 20.

FIGURE 22 is a sectional view taken along the line **22—22** in FIGURE 1 showing in phantom the pivoting parts at their tilted position.

FIGURE 23 is a sectional view taken along the line **23—23** in FIGURE 21.

FIGURE 24 is a perspective view of a head rest which may be used with the wheelchair lift.

Referring now to the drawings in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a wheelchair lift designated generally as **10**.

A wheelchair **12** is shown positioned on the lift **10**. Wheelchair **12** may be regarded as representative of the many types of wheelchairs presently on the market. Different wheelchairs have different types of designs depending upon the medical function which they are required to support. Wheelchair **12** shown herein includes features which are more or less common to most wheelchairs. Thus, it includes a pair of large rear wheels **14** which are rotatively fixed to the frame **16** and a pair of small diameter front wheels **18** which preferably are of the caster type. The frame **16** is collapsible and includes a fabric type seat **20**. Frame **16** also supports a footrest **22**. The backrest **24** is also preferably made of fabric and extends across the frame **16**. Extending rearwardly from both sides of the backrest **24** are a pair of handles **26** with appropriate handle grips **28**. There is no need to describe the function and operation of the wheelchair **12** since it is well known.

Referring now to FIGURES 2 and 3, the lift **10** includes a horizontal platform **30** which comprises a pair of angle members **32** and **34** positioned with their flanges extending laterally outward. Angle members **32** and **34** are rigidly connected by transverse spacers **36** and **38**

and front plate 40, all of which are welded or otherwise attached to the angle members. The spacing between the upright flanges of angle members 32 and 34 is just slightly less than the inner width between rear wheels 14 of the chair 12. As thus positioned, the angle members 32 and 34 act as a guide way for the wheels whereby the chair may be accurately backed onto the platform 30.

Spaced inwardly of the upright flanges of angle members 32 and 34 is a second pair of angle members 42 and 44 which are fixed as by welding to the plate 40. The upright flanges of angle members 42 and 44 are spaced apart by distance which is just slightly less than the distance between the inner surfaces of the caster wheels 18 on the chair 12. As thus positioned, the angle members 42 and 44 combine with the upright flange of angle members 32 and 34 to provide a guide way for the front wheels 18 and support them when the chair has been backed onto the platform 30.

The positioning of the wheels on the platform 30 is best shown in FIGURE 2 where the rear wheels 14 and front wheels 18 are shown in phantom in their respective guide ways. When the lift is in its lowermost position, the lateral flanges of angle members 32 and 34 and the plate 40 rest upon the floor surface as shown in FIGURE 1. The wheels of chair 12 can be easily backed into the guide ways when the lift is in this position. If desired, the front portion of the guide ways can be provided with an extension which angles downwardly to provide a means to more gently ease the wheels onto the guide ways.

The platform 30 is fixed to a vertical member 46 which comprises a pair of upright plates 48 and 50 that are attached to the angle members 32 and 34 by any conventional method such as a weld. Plates 48 and 50 are connected at their top forward portion by a backing plate 52 which extends between and is fixed to them by a conventional method such as a weld. Blocks 54 and 56 are welded to backing plate 52 at a position where the frame 16 may be brought into abutment with resilient pads 58 and 60 which are attached to the blocks 54 and 56 by an adhesive.

The chair 12 is maintained in position on platform 30 with its frame 16 agains the pads 58 and 60 by engaging the upright tubular portion of the frame 16 which supports the backrest with a pair of hooks 62 and 64. In FIGURE 6, the structure of hook 62 is shown in detail. The structure of hook 64 is identical and hence need not be described. Hook 62 is curved at one end for engaging the frame 16 as shown. The body of the hook 62 extends through a hole 66 in plate 52 and threadedly engages an adjustment knob 68. Hook 64 similarly engages an adjustment knob 70. Knob 68 is rotatively supported on the backing plate 52 by a housing 72 which engages a circular flange 74. The knob 68 is internally threaded for accepting the male threads on hook 62. By rotating the knob 68 in a clockwise direction, the hook 62 is drawn into it and hence caused to pull the frame against the pad 58. By tightening the knobs 68 and 70, the hooks 62 and 64 will fully retain the chair 12 in position on the platform 30.

The entire platform 30 and vertictal member 46 are lifted away from the floor by a conventional elevating mechanism 76. Elevating mechanism 76 may be of the type ordinarily used for dental and barber chairs with all of the superstructure stripped away. Since such lifting mechanisms are well known, there is no necessity to describe them in detail.

In place of the superstructure for a conventional dentist's or barber's chair, a pivot plate 78 is bolted to the lifting mechanism as shown in FIGURES 2 and 4. A pair of threaded openings are provided at either end of the pivot plate 78. Pivot pins 80 and 82 extend through the upright plates 48 and 50 and threadedly engage the pivot plate 78 which is fixed to the elevating mechanism 76. This is the only connection between the vertical member 46 and the elevating mechanism 76. Accordingly, the vertical member 46 and platform 30 can pivot relative to the elevating mechanism 76.

The backing plate 52 rests against the pivot plate 78 when the elevating mechanism is operated to raise the platform 30 and vertical member 46 above the floor, but before they are tilted. The elevating mechanism 76 is operated in the conventional manner as by operating foot pump 84. If desired, foot pump 84 could operate a switch which closes an electrical circuit to an electric motor which in turn drives the pump for applying hydraulic pressure in the elevating mechanism 76. This type of device is also well known and need not be described in detail.

Once the chair 12 has been elevated, it may be tilted by operating the mechanism best shown in FIGURE 5. A bracket 86 is fixed to the pivot plate 78. Bracket 86 includes a portion which extends downwardly at an angle to the vertical and pivotally supports adjacent its distal end the piston rod 90. Hydraulic cylinder 88 is pivotally connected at one end to the triangular block 92. Rod 90 is connected to a piston within the cylinder 88. Hydraulic cylinder 88 and rod 90, which are conventional, also include a lever mechanism 94. Handle 96 is connected to lever 94 and permits the user to apply a pumping action to the cylinder 88. This action causes the rod 90 to extend. Since the bracket 86 is fixed, the extension of rod 90 is translated into a force against block 92 which is fixed to plate 96 that in turn is fixed to backing plate 52. The resultant extension of rod 90 out of cylinder 88 causes the upright plates 48 and 59 to pivot about pins 80 and 82. The chair 12 and plate 96 are represented in their tilted position by a phantom representation. As shown in FIGURE 5, the use of a triangular block 92 allows the cylinder 88 and rod 90 to apply a generally horizontal translational force to the plate 96.

The platform 30 may be returned to its normal horizontal position by turning valve 98 which releases the pressure in cylinder 88. Valve 98 controls the rate at which this pressure is released and hence the rate at which the platform 30 returns to the horizontal. The foot pump 84 may be operated to release the pressure within elevating mechanism 76 to lower the platform 30 until it abuts the floor.

Referring now to FIGURES 7, 8, 9, 10 and 11, there is shown a headrest which may be adjusted to fit any conventional wheelchair having handles 76 or the like extending from the frame 16.

As best shown in FIGURE 7, the headrest consists of a bifurcated member 100 which supports a pair of pads 102 and 104 in any conventional manner such as a ball joint. The bifurcated member 100 is supported on arm 106 which is adjustably clamped to bracket 108 by means of the thumbscrew 110. Bracket 108 is fixed to outer tube 112 by any conventional means such as a weld. As best shown in FIGURE 8, tube 112 is one part of an adjustable tubular support which also includes inner tube 114. Tube 114 telescopically slides within tube 112. So that the tube 114 may be readily inserted into tube 112 and still maintain a good fit, a fiber spacer tube 116 is provided. Spacer tube 116 maintains tube 114 in a coaxial position with respect to tube 112.

The amount by which tube 114 extends into or out of tube 112 can be fixed by means of sleeve 118 and collar 120. Sleeve 118 is internally threaded and engages cooperating threads 122 on tube 112. Sleeve 118 includes a shoulder 124 which engages collar 120 and draws it down into abutment with the end of tube 112. The end of tube 112 is provided with a bevel 126 which extends inwardly at an angle. Bevel 126 cooperates with collar 120 whose sides converge at an angle which is the same as the bevel 126. Shoulder 124 is also beveled at an angle to cooperate with sides of collar 120. Collar 120 is preferably made of a resilient plastic material, such as polyvinyl chloride. As thus provided, shoulder 124 forces collar 120 into engagement with bevel 126 at the end of tube 112. This in

turn forces the collar **120** into frictional engagement with the tube **114** and retains the same in position.

The distal ends of both tubes **112** and **114** are welded or otherwise fixed to clamping means for engaging the handle grips **28**. Each clamping means includes a cylinder **128** and **131**. Since both cylinders are identical, only the details of cylinder **128** are described in detail by reference to FIGURE 10. As shown, cylinder **128** has an inner diameter which is somewhat larger than the largest diameter of handle grip **28**. Thus, the cylinder slides easily over the handle. Cylinder **128** is clamped in position by means of a bar **130** which is forced against it by thumbscrew **132** which is threadedly engaged in the cylinder **128** as shown. Thumbscrew **132** merely bears against bar **130** and forces it into engagement with handle grip **28**. A similar bar **134** and thumbscrew **136** are provided in cylinder **131**.

Cylinders **128** and **131** are provided with notches **138, 140, 142** and **144**. As shown, each of the bars **130** and **134** are turned inwardly at their ends. The bars **130** and **134** are turned inwardly at their ends so that they overlie the surfaces of cylinders **130** and **131** which prevents the bars from dropping out of the cylinders when the headrest is removed from the wheelchair. The notches **138–140** are positioned in alignment with the thumbscrews **132** and **136** and thus position the bars **130** and **134** so that the screw may bear against them.

It should be apparent from the foregoing that the headrest described herein is universally adaptable for all wheelchairs of the type described herein. This includes most wheelchairs since there is an almost universal use of the pair of handles extending rearwardly from the frame. The use of telescopic tubular parts allows for adjustment for varying widths between the handles.

Referring now to FIGURES 12, 13 and 14, there is shown a sling and apparatus support designated generally as **146**. As shown, the sling support **146** is mounted on the tube **114** for the headrest. As shown, sling support **146** includes a clamping block **148** which comprises fixed jaw **150** and hinged jaw **152** which are provided with opposed transverse recesses for engaging the tube **114**. The jaw **150** is integral with the block **148**. Jaw **152** is hinged to the block **148** by a pin **151** as shown and may be drawn against jaw **150** by tightening thumbscrew **154** which extends through it and threadedly engaged jaw **150**.

As best shown in FIGURE 13, clamping block **148** is bifurcated to provide rigid arms **156** and **158**. Block **148** is also provided with a circular recess **160** into which the sling bracket **162** is fitted. Bracket **162** may be locked into position by tightening thumbscrew **164** which extends through arm **156** and threadedly engages arm **158**. By rotating thumbscrew **164**, the arm **158** is drawn toward arm **156**, thereby reducing the width of the recess between the arms and clamping the bracket **162** in position.

As best shown in FIGURE 12, bracket **162** extends upwardly from block **148** and then downward at an angle of approximately 45° with respect to the vertical. The bracket **162** is provided with a hook **166** at its distal end. This hook may be used to support a sling **168** for a human arm in the manner shown. In the alternative, the bracket **162** may be modified or used as shown to support medical apparatus such as intravenous bottles, drainage bags and the like.

Referring now to FIGURES 15 and 16, there is shown a first modification of the present invention wherein the platform and the vertical member may be made adjustable for accepting wheelchairs of varying widths between their wheels. As shown, the platform **172** includes a pair of horizontal base plates **174** and **176** which are joined to a pair of vertical plates. Plates **178** and **180** are pivotally connected to a lifting mechanism in the manner described above. A rear cross member **182** joins the base plates **174** and **176** adjacent their junction with vertical plates **178** and **180**. A forward cross member **184** is joined to the base plates **174** and **176** adjacent the front end of the platform **172**. As shown, the rear cross member **182** is provided with a plurality of notches **186** which preferably are either rectangular or square. The forward cross member **184** is provided with a like number of circular holes **188** which are in front to rear alignment with the notches **186**. Notches **186** and holes **188** cooperate with projections **190** and **192** which extend from the bottom of channel members **194** and **196** as best shown in FIGURE 16. Each of the channel members **194** and **196** is similar in structure. Thus, each forms a guideway for the wheels of the chair as it is rolled onto the platform **172** and locked in position. If desired, the base of the channel members **194** and **196** may be provided with a lip **198** and **200** which extends downwardly toward the floor and provides a means for easing the chair onto the guideways. The projections **190** on the base of each of the channel members **194** and **196** are rectangular or square in cross section depending upon the dimensions of the notches **186**. The projections **192** are circular in cross section. Moreover, the projections **190** and **192** are dimensioned to be slightly smaller than the notches **186** and holes **188**, respectively. In this manner, they fit into the notches **186** and holes **188** which therefore act to retain the channel members **194** and **196** in position on the cross members **182** and **184**. For chairs of lesser width, such as junior wheelchairs for children, the channel members **194** and **196** can be moved together by placing their projections **190** and **192** in the intermediate notches **186** and holes **188**. For standard wheelchairs, the channel members **194** and **196** are positioned with their projections inserted in the outermost notches and holes. Although four notches and holes have been shown in each of the cross members **182** and **184**, those skilled in the art will readily recognize that an additional number may be provided.

Referring now to FIGURES 17–23, there is shown a second embodiment of the present invention designated generally as **210**. The first embodiment of this invention, described above, used as its elevating mechanism a conventional dental or barber chair base **76**. In some instances, such bases may not be available or their great bulk may not be suited to the installation which desires to use this invention. Accordingly, this second embodiment provides a lifting mechanism which may be constructed from other readily available parts. An advantage of this second embodiment is that the lifting mechanism is not nearly so bulky as that used with dental and barber chairs.

As shown, the wheelchair lift **210** includes a horizontal platform **212** for supporting the wheelchair. The platform includes a pair of base plates **214** and **216** which are joined to and extend from vertical plates **218** and **220**. Base plates **214** and **216** are joined by cross members **222** and **224** which are provided with rectangular holes **226** and circular holes **228**, respectively. Rectangular holes **226** and circular holes **228** cooperate with channel members **230** and **232** in the manner described above to provide means for adjusting for wheelchairs of varying width.

The vertical members **218** and **220** are joined by cross plates **234** and **236** which are fixed to them by any conventional means, such as a weld. Cross plate **236** supports a pair of hooks **238** and **240** which are similar to the hooks **62** and **64** described above. The only difference between hooks **238** and **240** and hooks **62** and **64** is that they extend through slots **242** and **244** and their respective thumbscrews **246** and **248** are positioned in elongated housings **250** and **252** which also have slots in them. In this manner, the hooks **238** and **240** can be adjusted to accommodate wheelchairs having varying frame widths.

Pivot arms **254** and **256** are integral with vertical plates **218** and **220** and extend rearwardly as shown in FIGURES 18 and 19. Pivot arms **254** and **256** are pivotally connected to pivot plate **258** by means of pivot pins **260** and **262**. This is the only connection between the

vertical members 218, 220 and the supporting frame 264 for the lifting mechanism. Thus, the vertical members 218, 220 and the platform 212 which is connected to it can pivot about the pins 260, 262 to move any wheelchair supported on the platform to a tilted position. The means for effecting the tilting is described below.

As best described by reference to FIGURES 20, 21, 22 and 23, the frame 264 comprises a pair of uprights 266 and 268 which are joined to pivot plate 258 by any conventional means such as a weld. Upright 266 supports two rotatable guide rollers 270 and 272. Upright 268 supports two rotatable guide rollers 274 and 276. Guide rollers 270, 272 extend inwardly toward guide rollers 274, 276 and are engaged in guide tracks 278 and 280. Guide tracks 278 and 280 are preferably channel members which are closed at their bottom end by plates 282 and 284 which act as stops for the rollers 272 and 276. Tracks 278 and 280 are open at their upper ends thus permitting the rollers 270 and 274 to move out of them if it is necessary to elevate the platform 212 to a high position.

Pivot plate 258 is bolted to an escutcheon plate 286 by means of bolts 290. Plate 286 is fixed to the end of piston rod 292 which in turn is connected to a piston within the hydraulic cylinder 294. The opposite end of cylinder 294 is connected to rotatable plate 296 which cooperates with bearing race 298 and roller bearing 300 to permit the entire frame 264 to rotate. Tracks 278 and 280 are also fixed to plate 296 as well as to cylinder 294 by the struts 302 and 304. Since the entire frame 264 is supported on plate 296 and frame 296 also supports the platform 212 by means of vertical plates 218 and 220, the entire lift mechanism can be rotated the full 360°. Bearing race 298 is fixed to a floor plate 306 which is of sufficient diameter to provide stability to the entire wheelchair lift 210.

Hydraulic cylinder 294 may be of any conventional type having a sufficient length to raise the platform 212 to the maximum required amount. It is operated by pumping lever 310. The pumping action causes piston rod 292 to extend from the cylinder and lift the pivot plate 258 and hence the entire frame 260.

A second hydraulic cylinder 312 is provided for tilting the platform 212. Cylinder 312 is pivotally fixed at one end to the arm 314 which in turn is welded to the hydraulic cylinder 294. The piston rod 316 extends from cylinder 312 and is pivotably connected to the cross plate 234. As the platform is elevated, the cylinder 312 and rod 316 rotate about the pivot 318 as best shown by the phantom representation in FIGURE 22. The piston attached to rod 316 within the cylinder 312 must be positioned so that it is free to move as the platform is elevated. This permits the rod 316 to shorten or lengthen its extension from cylinder 312 due to the decrease and increase in radius as the platform is raised and lowered. Once the platform has been raised to the desired height, the lever 320 may be operated to cause the piston rod 316 to extend under pressure thereby forcing the pivot arms 254 and 256 to rotate about the pins 260 and 262.

Appropriate valves are provided on the cylinders 294 and 312 to release the hydraulic pressure and thereby lower the platform 212 at any desired rate.

Referring now to FIGURE 24, there is shown a head rest 350 which may be adjusted to fit any conventional wheelchair having handles 76 or the like extending from the frame 16. The head rest is mounted on the tube 112 which is shown with more particularity in FIGURE 8. Thus, the tube 112 cooperates with the tube 114 to support the head rest 350.

The head rest comprises a curved member 352 which supports a pair of pads 354 that are mounted by rods 353. The curved member 352 is mounted in a conventional manner to pivot in the vertical direction with respect to the support 356. Support 356 is fixed to arm 360 which is pivotally held in the clamping bar 362. Clamping bar 362 includes a conventional clamping mechanism in the form of pivotable handle 364 which controls connecting rod 366. By raising handle 364, the connecting rod opens the clamp 368 and clamp 370. In this way the support bar 362 can be rotated about the tube 112 or the arm 360 rotated with respect to the bar 362. The split clamp for the tube 112 is designated 368 and the split clamp for the arm 360 is designated 370.

I claim:

1. A wheelchair lift comprising a normally horizontal platform having guide ways or receiving wheelchair wheels, a normally vertical member fixed to said platform and extending upwardly from it, clamps positioned on said vertical member, said clamps including means to engage a wheelchair and fix it in position on said platform, hydraulic means for raising said platform and vertical member, said vertical member being pivotably connected to said hydraulic means, further hydraulic means for tilting said platform and vertical member about said pivotable connection to a position where said platform and vertical member define an acute angle with the horizontal and vertical respectively, said hydraulic means for tilting said platform including a hydraulic cylinder and reciprocable piston with a rod extending therefrom, one end of said cylinder and piston being connected to said hydraulic means for raising said platform and vertical member, the opposite end of said cylinder and piston being connected to said vertical member.

2. A wheelchair lift in accordance with claim 1 wherein said guide ways include at least a pair of channels, means on said channels for engaging them with said platform, a plurality of spaced means on said platform for cooperating with said channel engagement means, said cooperating means being spaced so that the distance between said channels may be adjusted to accept wheelchairs of different widths.

3. A wheelchair lift in accordance with claim 1 wherein each of said clamps includes a hook positioned to engage a vertical portion of the wheelchair and threaded means for drawing said hook towards said vertical member.

4. A wheelchair lift in accordance with claim 1 wherein said hydraulic means for raising said platform and vertical member comprises vertical guide means, said guide means including a pair of upright channels and guide rollers positioned in said channels, said guide rollers being fixed to supports, said supports being pivotally connected to said vertical member.

5. A wheelchair lift in accordance with claim 1 wherein each of said clamps includes a hook positioned to engage a vertical portion of the wheelchair and threaded means for drawing said hook towards said vertical member.

6. A wheelchair lift comprising a wheelchair having wheels, a normally horizontal platform having guide ways for receiving the wheels of said wheelchair and supporting the wheelchair thereon, a normally vertical member fixed to said platform and extending upwardly from it, clamps positioned on said vertical member, said clamps including means engaging the wheelchair and fixing it in position on said platform, hydraulic means for raising said platform and vertical member, said vertical member being pivotably connected to said hydraulic means, hydraulic means for tilting said platform and vertical member about said pivotable connection to a position where said platform and vertical member define an acute angle with the horizontal and vertical respectively, a head rest, means supporting said head rest on said wheelchair, said supporting means including an extensible arm, clamps fixed at either end of said arm, each of said arm clamps including a hollow cylinder opened at at least one end for receiving a handle on said wheelchair, and means to frictionally engage said cylinders with said handle.

7. A wheelchair lift in accordance with claim 6 wherein said means to frictionally engage said cylinders with said handle includes a flat, elongated bar within said cylinder, and screw means for forcing said bar against said handle.

8. A wheelchair lift in accordance with claim 6 wherein a sling mount is fixed to said arm.

9. A wheelchair lift in accordance with claim 6 including an apparatus support mounted on said wheelchair, said apparatus support including a bracket terminating in a distal hook and from which a sling may be supported.

10. A wheelchair lift comprising a normally horizontal platform having spaced parallel guide ways for receiving wheelchair wheels, a normally vertical member fixed to said platform and extending upwardly from it, clamps on said vertical member between vertical planes containing said guide ways, said clamps including means to engage a wheelchair and fix it in position on said platform, first hydraulic means for raising said platform and vertical member, said hydraulic means including a pivot plate fixedly secured to a portion of said hydraulic means, said vertical member being pivotably connected to the ends of said pivot plate, and a second hydraulic means for tilting said platform and vertical member about said pivotable connection, said second hydraulic means including a cylinder and piston rod, said cylinder being pivotably connected to one of said first hydraulic means and vertical member, said piston rod being connected to the other of said first hydraulic means and vertical member.

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