

July 1, 1969

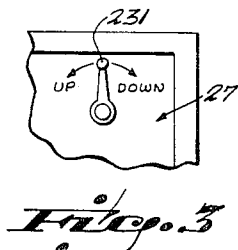
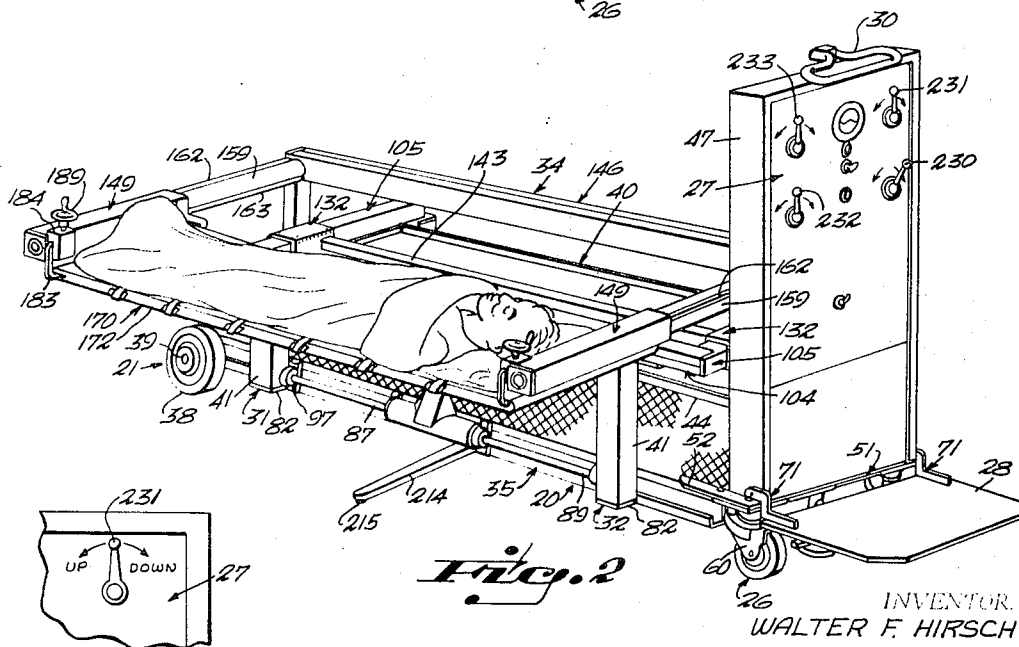
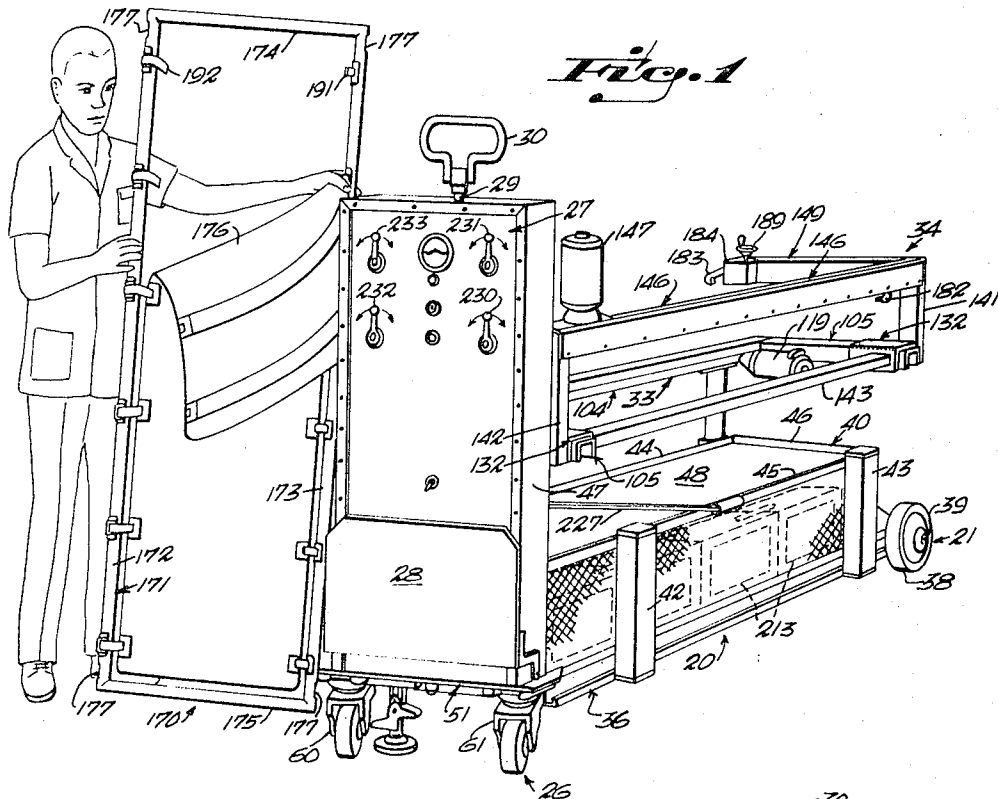
W. F. HIRSCH

3,452,371

HOSPITAL STRETCHER CART

Filed Oct. 16, 1967

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INVENTOR.
WALTER F. HIRSCH

BY *Ernest H. Schmidt*
ATTORNEY.

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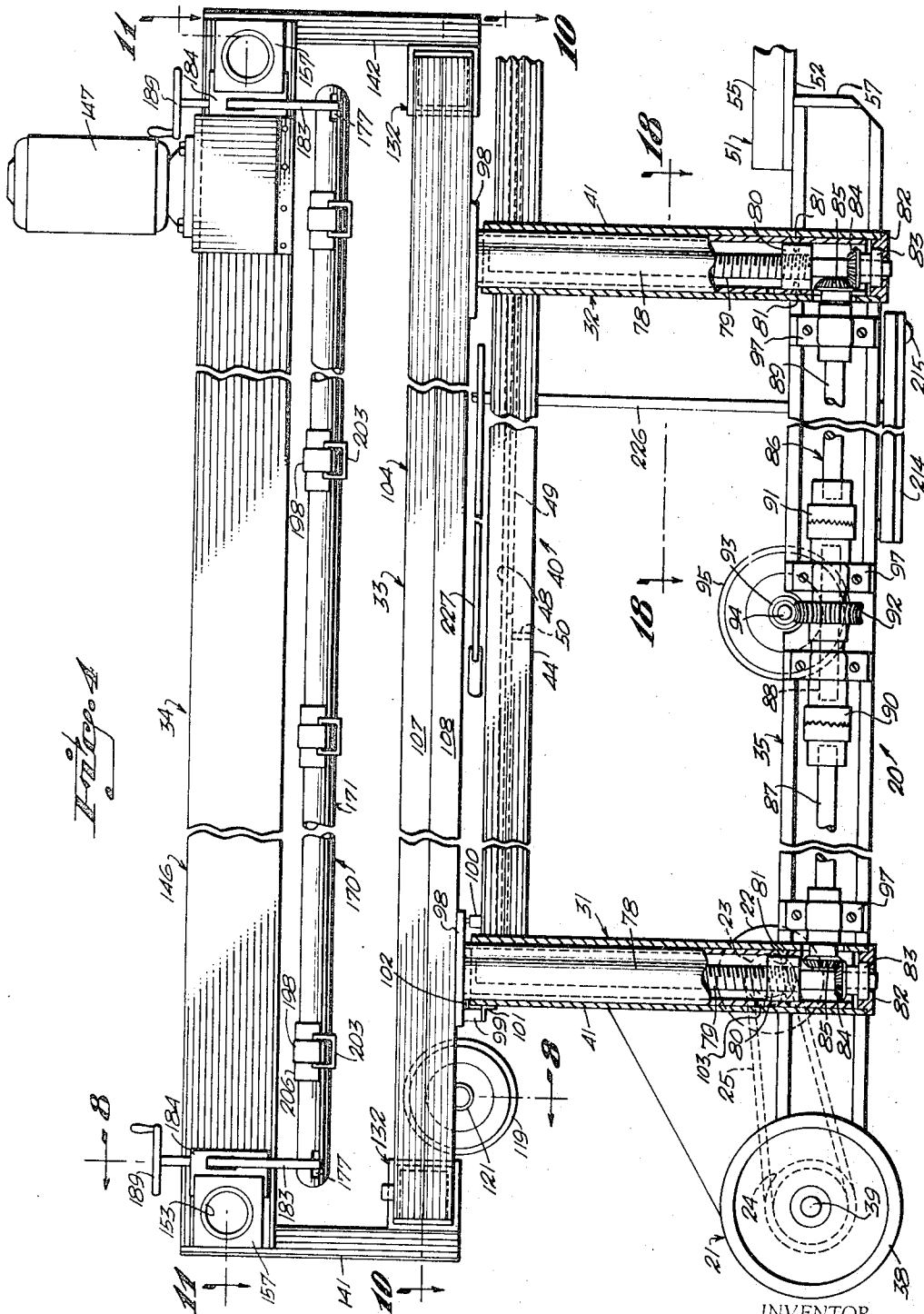
W. F. HIRSCH

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WALTER F. HIRSCH

BY *Ernest H. Schmidt*

ATTORNEY.

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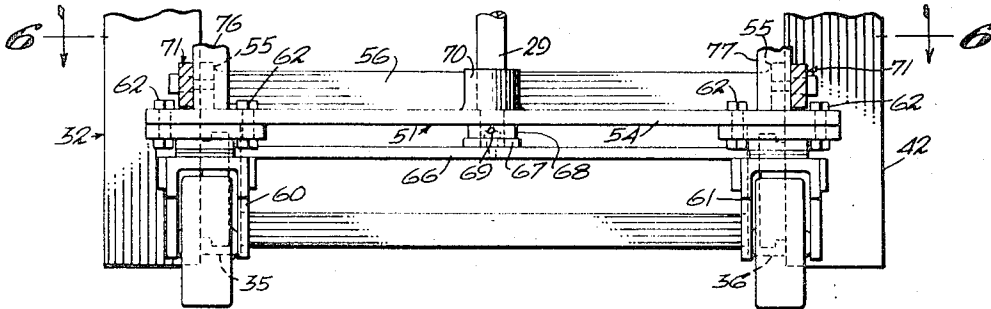


Fig. 5

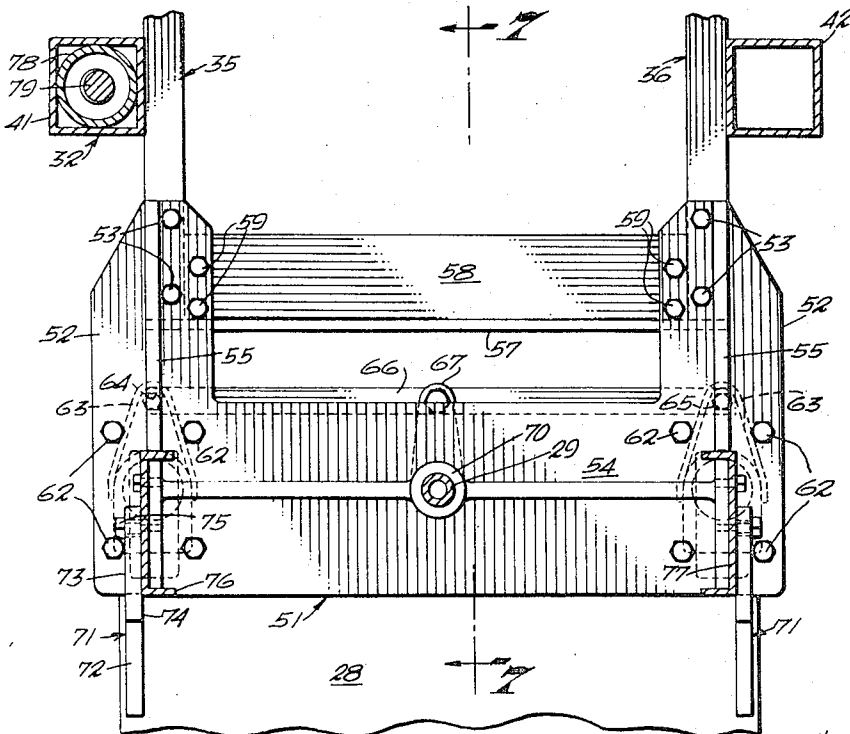


Fig. 6

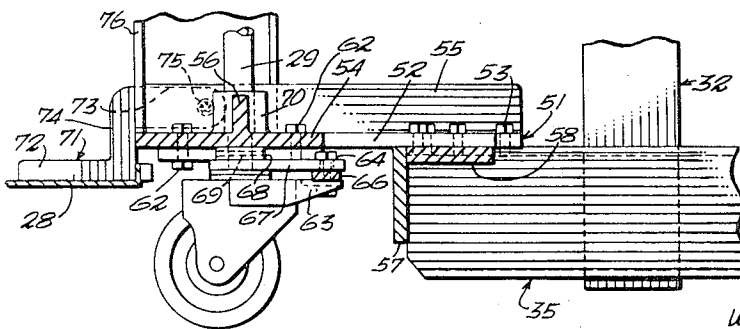


Fig. 7

INVENTOR.
WALTER F. HIRSCH

BY Ernest H. Schmidt

ATTORNEY.

July 1, 1969

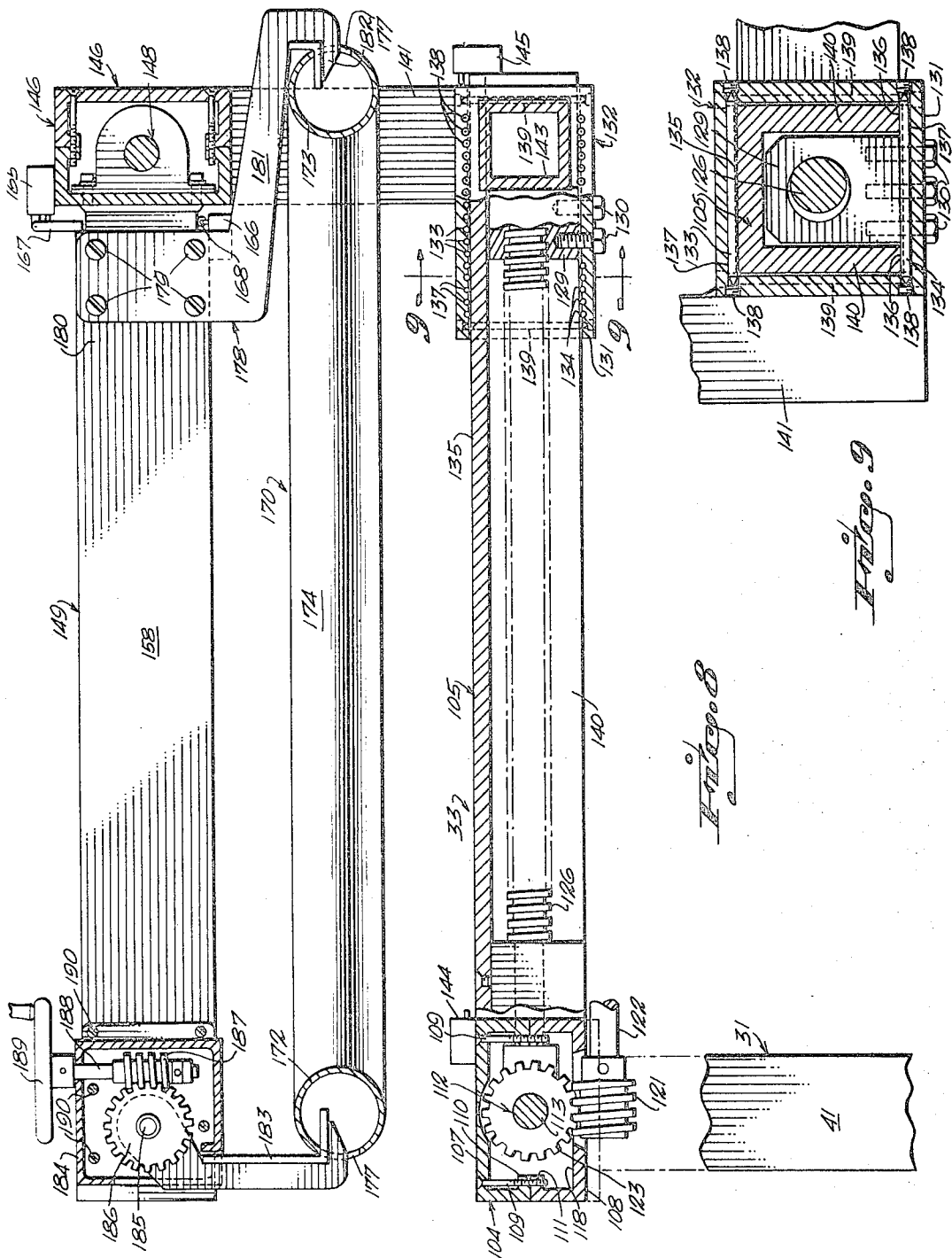
W. F. HIRSCH

3,452,371

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INVENTOR.
WALTER F. HIRSCH

BY Ernest H. Schmidt

ATTORNEY.

July 1, 1969

W. F. HIRSCH

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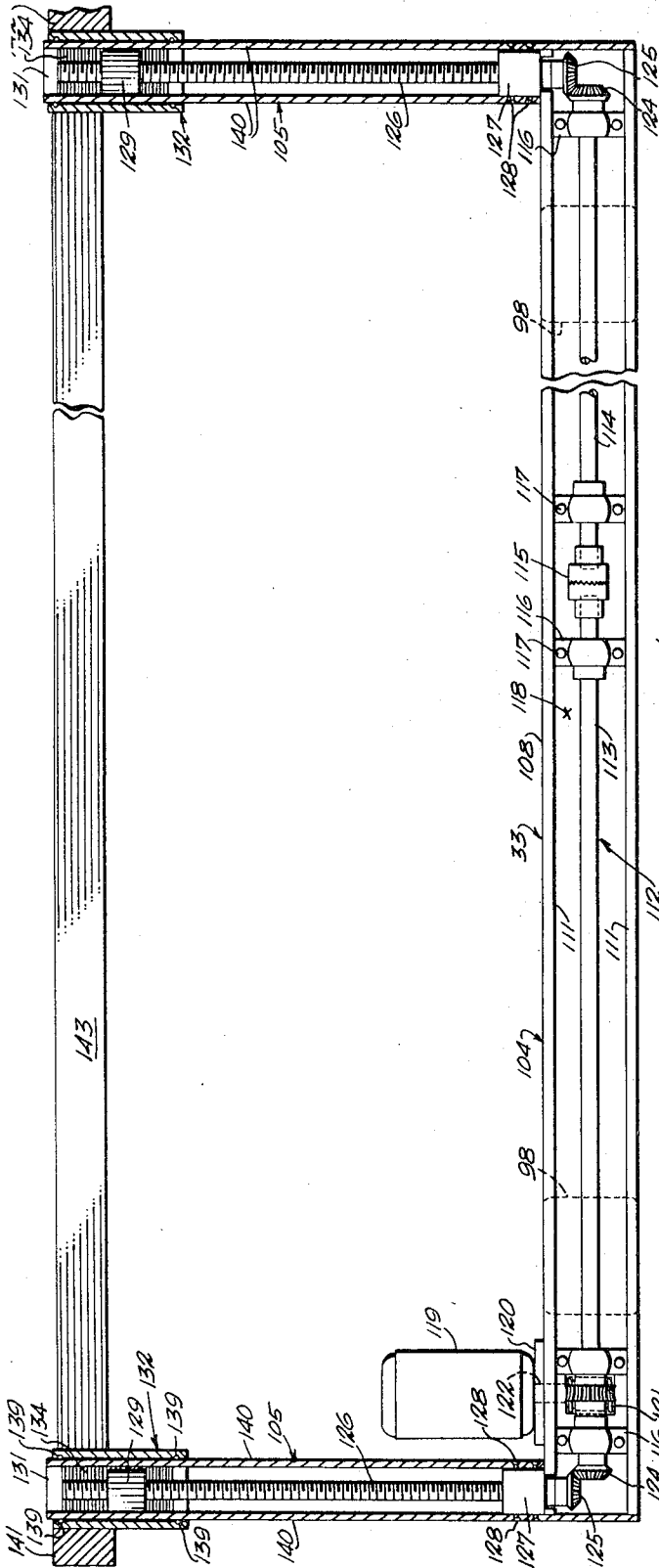


Fig. 9

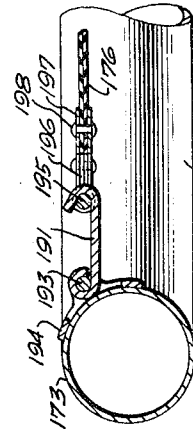


Fig. 10

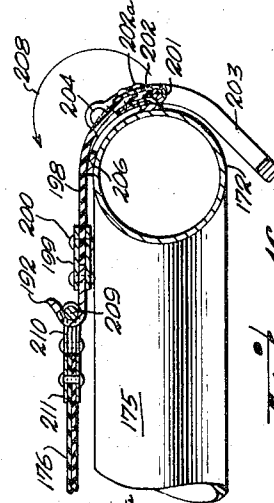


Fig. 11

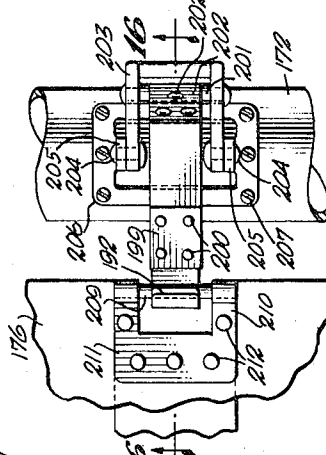


Fig. 12

INVENTOR.
WALTER F. HIRSCH
BY
Ernest H. Schmidt
ATTORNEY.

July 1, 1969

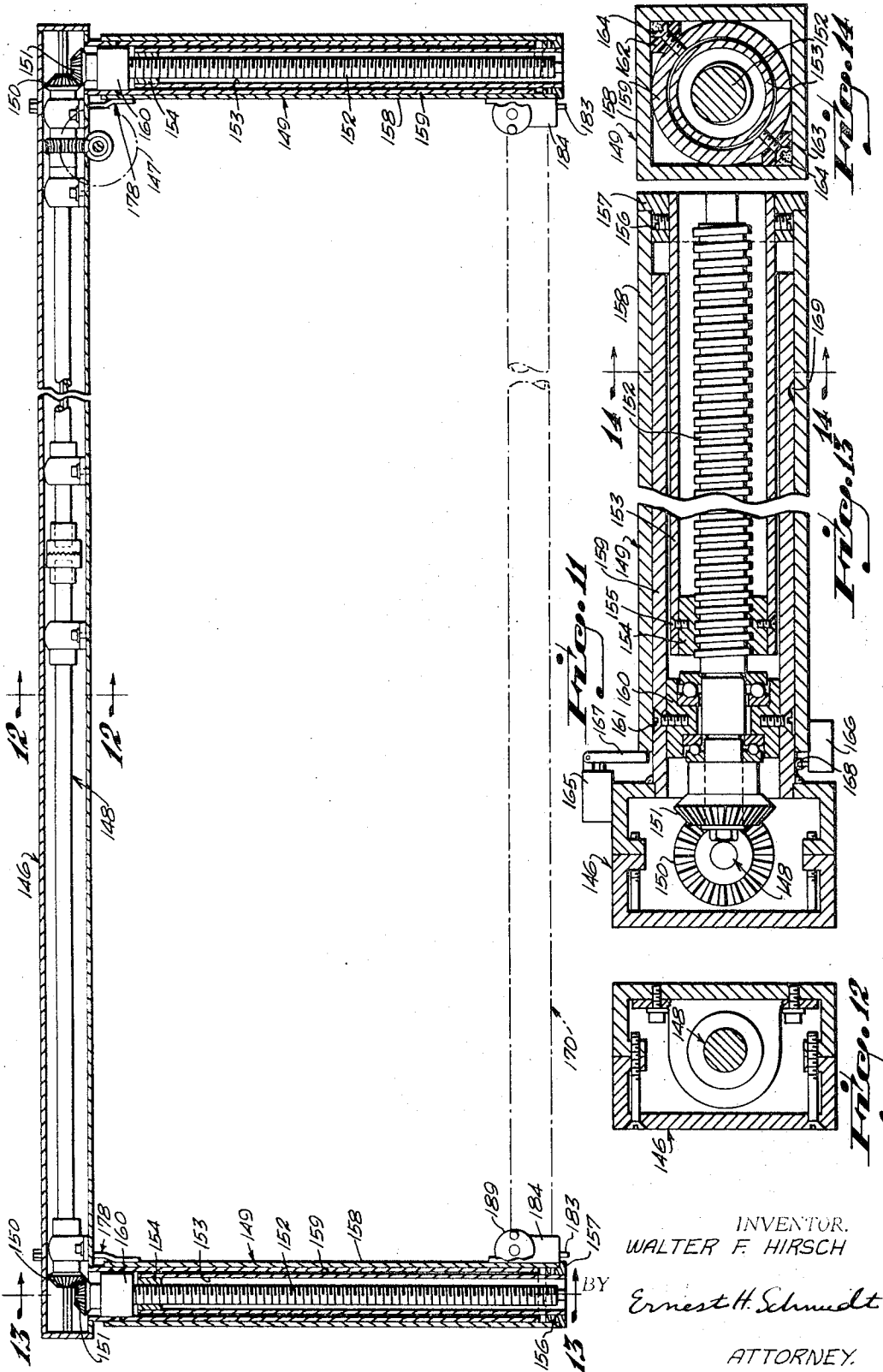
W. F. HIRSCH

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W. F. HIRSCH

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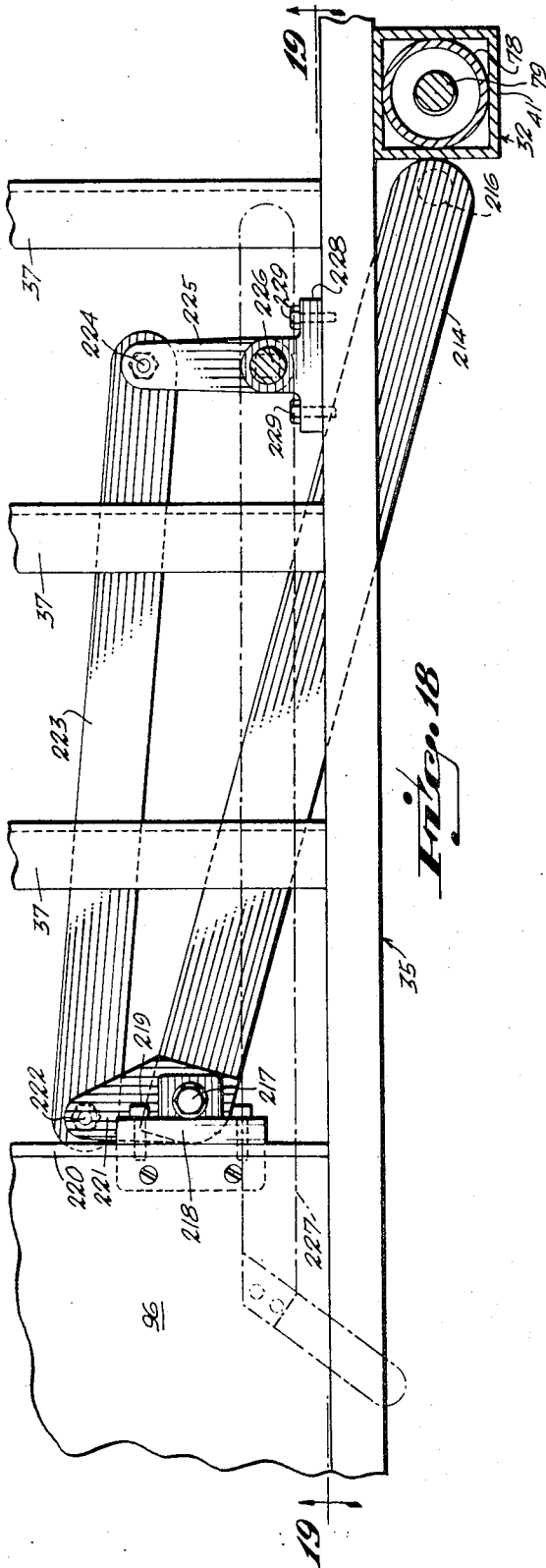
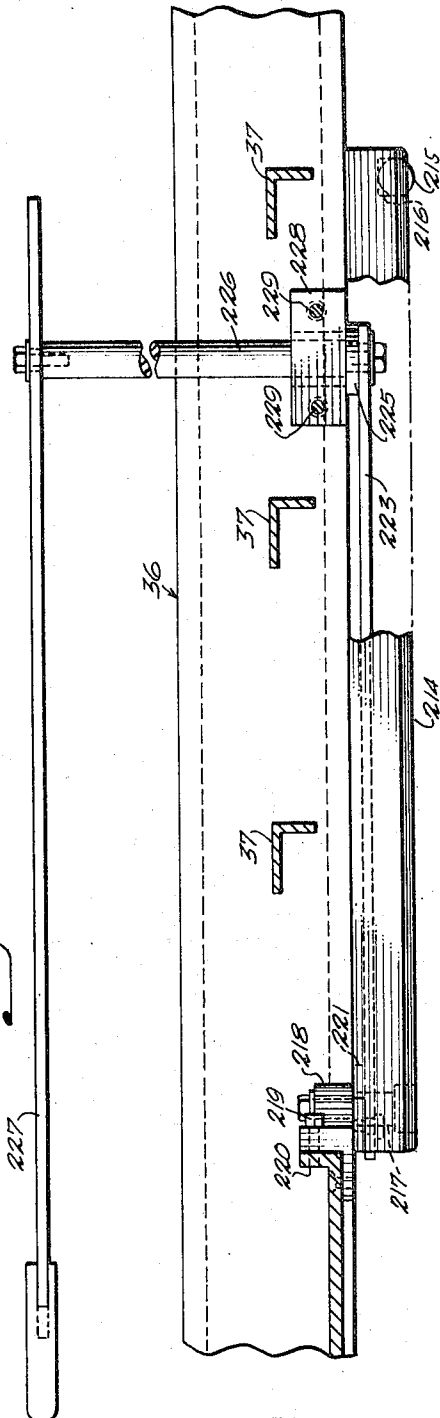


Fig. 18



INVENTOR.
WALTER F. HIRSCH

BY Ernest H. Schmidt

ATTORNEY.

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HOSPITAL STRETCHER CART

Walter F. Hirsch, 6271 SW. 26th St.,
Miami, Fla. 33155

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Int. Cl. A61g 7/10

U.S. Cl. 5—86

16 Claims

ABSTRACT OF THE DISCLOSURE

A self-propelled stretcher cart for moving patients from place to place in a hospital, including a stretcher carriage assembly movable up and down and in and out with respect to a wheeled supporting framework and having a stretcher frame removably attachable to the stretcher carriage assembly for transport in unison therewith, and further including a flexible support webbing removably attachable within the stretcher frame and adapted to be placed on a bed or table under the patient to enable pick-up by moving the stretcher carriage assembly down over the patient in position for attachment to a stretcher frame fitted to the support webbing.

This invention relates to mobile stretchers of the type used in hospitals, and is directed particularly to a self-propelled hospital cart and stretcher combination having mechanical means for coupling with, lifting and transporting a stretcher with a patient thereon from one place to another with minimum handling and disturbance of the patient.

In many instances, particularly in the case of serious injury caused by automobile accidents, it is of utmost importance that the victim be handled and moved as little as possible, at least until the extent of his injuries can be determined by X-ray examination and diagnosis in the hospital. It is the principal object of this invention to provide a novel and improved hospital transport cart and stretcher combination whereby stretchers carrying patients, after once having been brought into the hospital, can readily be interjoined with a stretcher carriage assembly comprising part of the cart mechanism for transport within the hospital and deposit on beds, operating tables, X-ray and treatment tables, and the like, quickly and with minimal discomfort and physical disturbance of the patient.

It is another object of the invention to provide a hospital cart and stretcher combination of the character above described including a plurality of stretcher members of such size and design as enables them to be used routinely on hospital beds under bedridden patients who must be moved from time to time for treatment in other parts of the hospital, thereby relieving nurses and hospital attendants of the necessity for physically lifting and transporting such patients, a procedure of which, heretofore, has not infrequently resulted in back injury.

A more particular object is to provide a motorized hospital cart of the character described including a power-driven vertically and horizontally-extensible U-shaped stretcher carriage assembly, a rectangular stretcher frame removably attachable with respect to the stretcher carriage assembly for movement in unison therewith, and a stretcher webbing member removably attachable to the stretcher frame, whereby the stretcher carriage assembly can be brought down over a patient lying upon a webbing member and attached to a stretcher frame previously secured to the webbing for lifting and transporting the patient from one place to another.

Still another object of this invention is to provide a hospital cart of the character described which will be simple

in construction, easy to operate, and reliable and long wearing in use.

Other objects, features and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawings. In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

FIG. 1 is a perspective view of the self-propelled hospital cart of the present invention showing particularly the control panel end and the rear end of the cart;

FIG. 2 is a perspective view of the cart showing the control panel end and the front side thereof with its arms in an extended attitude and illustrating a stretcher suspended between the arms with a patient in position thereon;

FIG. 3 is a fragmentary elevational view of a portion of the control panel illustrating a typical control lever;

FIG. 4 is an enlarged fragmentary front elevation of the hospital cart;

FIG. 5 is fragmentary elevation of the steering wheels end of the cart as viewed from the control panel end and with the control panel and foot platform removed;

FIG. 6 is a cross-sectional view taken along the line 6—6 of FIG. 5 and looking in the direction of the arrows;

FIG. 7 is a vertical sectional view taken along the line 7—7 of FIG. 6 and looking in the direction of the arrows;

FIG. 8 is a vertical sectional view taken along the line 8—8 of FIG. 4 and looking in the direction of the arrows;

FIG. 9 is a vertical sectional view taken along the line 9—9 of FIG. 8 and looking in the direction of the arrows;

FIG. 10 is a longitudinal cross-sectional view taken along the line 10—10 of FIG. 4 and looking in the direction of the arrows;

FIG. 11 is a longitudinal cross-sectional view taken along the line 11—11 of FIG. 4 and looking in the direction of the arrows;

FIG. 12 is a vertical sectional view taken along the line 12—12 of FIG. 11 and looking in the direction of the arrows;

FIG. 13 is a longitudinal sectional view taken along the line 13—13 of FIG. 11 and looking in the direction of the arrows;

FIG. 14 is a cross-sectional view taken along the line 14—14 of FIG. 13 and looking in the direction of the arrows;

FIG. 15 is an enlarged fragmentary top plan view illustrating a typical toggle clamp means for removably attaching one side of the stretcher sheet to the stretcher frame;

FIG. 16 is a cross-sectional view taken along the line 16—16 of FIG. 15 and looking in the direction of the arrows;

FIG. 17 is a cross-sectional view similar to FIG. 16 and illustrating a typical attachment means for the stretcher sheet along the opposite side of the stretcher frame;

FIG. 18 is a cross-sectional view taken along the line 18—18 of FIG. 4 and looking in the direction of the arrows; and

FIG. 19 is a vertical sectional view taken along the line 19—19 of FIG. 18 and looking in the direction of the arrows.

Referring now in detail to the drawings, in which like reference numerals designate like or similar parts throughout the various views, and referring particularly to FIGS. 1, 2 and 4, the self-propelled hospital cart of the present

invention includes, generally a carriage frame assembly 20 having a front drive wheel assembly 21 at one end and a reversible motor and speed reducer 22 in driving connection with the front wheels 21 by means of pulleys 23 and 24 and a belt 25. At its other end, the carriage frame assembly 20 includes a steering wheel assembly 26, a control panel 27 and a fold-down platform 28. A vertically-disposed steering rod 29, operably connected to the steering wheel assembly 26, extends upwardly through the control panel housing and carries a steering handle 30 fixed to the upper end thereof, as illustrated in FIGS. 1 and 2.

Generally, the carriage frame assembly 20 has fixed thereto a pair of vertical, upwardly-extending, telescopic legs 31 and 32 for raising and lowering a U-shaped frame 33 fixed to the upper ends of said legs. A doubly-extendable stretcher carriage assembly 34 is carried by the U-shaped frame 33, said carriage assembly being extensible both vertically and horizontally as is hereinafter more particularly described. The carriage frame assembly 20 includes front and rear, longitudinally-extending channel members 35 and 36 in parallel spaced relation and having a plurality of L-shaped braces 37 fixed therebetween in spaced relation along their length as illustrated fragmentarily in FIG. 18. The drive wheel assembly 21 is carried by the channel members 35 and 36 at the forward end thereof, and includes a pair of wheels 38, 38 mounted on a drive shaft 39 extending transversely therebetween and driven by the motor 22 as previously described.

A rectangular frame assembly 40 is fixed, as by welding, to the upper, inner ends of square, tubular outer sleeve members 41, 41 comprising the telescopic legs 31 and 32 as well as to the corresponding distal ends of a pair of square tubular legs 42 and 43 at the rear side of the cart. Legs 42 and 43 are fixed at their lower, inner end portions to the rear channel member 36, FIG. 1. The rectangular frame assembly 40 includes parallel longitudinal members 44 and 45 which are joined by a transverse member 46 at the front end and by the housing 47 of the control panel 27 at the rear end. A filler plate 48 is sized to be snugly received within the rectangular frame 40, FIG. 1, and is fixed therein to inwardly-projecting flanges 49 on the frame members. One or more spaced, transverse braces 50 are fixed between the longitudinal members 44 and 45 against the underside of the plate 48.

The steering wheel assembly 26 at the rear end of the frame assembly 20 is carried by a U-shaped bracket 51 which includes a pair of arm portions 52—52 bolted as at 53 to the top web of each channel member 35 and 36 adjacent their rear ends, (FIGS. 5, 6 and 7). A transverse portion 54 of the U-shaped bracket 51 connects the arm portions 52, 52. Two longitudinal, upstanding, stiffening ribs 55, 55 and a transverse rib 56 further strengthen the U-shaped bracket 51. Additionally, vertical and horizontal transverse members 57 and 58 respectively are fixed as by welding across the rear ends of the channel members 35 and 36. The arms 52, 52 are bolted as at 59 to the member 58.

Pivotal caster wheel units 60 and 61 are bolted to the underside of the U-shaped bracket 51 as at 62, adjacent each side of said bracket, and provide forwardly-extending portions 63, 63 pivotally connected as at 64 and 65 to a tie-rod 66 which, in turn, is centrally pivotally connected to one end of a link 67. The other end of the link 67 includes a boss 68 pinned as at 69 to the lower end of the vertical steering rod 29, which rod is journalled in a boss 70 centrally of the transverse portion 54 and rib 56 of the U-shaped bracket 51. As previously stated, the steering rod 29 extends vertically upwardly and carries a steering control handle 30 fixed to its upper end.

The fold-down platform 28 includes a pair of brackets 71, 71 fixed to each end thereof adjacent its outer edges. Each bracket 71 includes a pair of offset, parallel arms

72 and 73 joined by a vertical portion 74, as seen in FIG. 7. The offset arms 72 and 73 extend outwardly from the vertical portion 74 in opposite directions, the one arm 72 of each bracket 71 being fixed to the platform 28 and the other arm 73 thereof being pivoted as at 75, to a pair of spaced, upwardly, vertically-extending channels 76 and 77 which comprise the frame for the control panel box 47. As best illustrated in FIGS. 1 and 2, the platform 28 may be folded upwardly to an out-of-the-way position (FIG. 1), or downwardly to a horizontal position if the operator desires to ride thereon while driving the cart (FIG. 2).

Referring now to FIG. 4, the vertical, upwardly-extending telescopic legs 31 and 32 are fixed, as by welding, to the front channel member 35; and each leg includes the fixed, outer square tubular member 41 and an inner round tubular member 78 sized for telescopic translation therein by means of an elongated screw 79 axially extending therethrough. A nut 80, fixed by screws 81 in the inner round tubular member 78, is positioned inwardly of the lower end thereof and is in threaded engagement with the screw 79.

The outer square tubular member 41 is provided with a lower end cap 82, fixed thereto as by welding, and carries a thrust bearing 83 therein to receive the counter-turned lower end of the screw 79. A bevel gear 84, fixed to the screw 79 in bearing engagement against the thrust bearing 83, engages a drive bevel gear 85 fixed to a drive shaft indicated generally at 86.

Referring to FIG. 4, the drive shaft 86 is preferably in three parts 87, 88 and 89 for installation purposes and includes two coupling elements 90 and 91. The center drive shaft section carries a worm wheel 92 centrally thereof in engagement with a worm gear 93 fixed to the shaft 94 of a reversible motor and speed reducer assembly 95, mounted on a platform 96 fixed to and spanning the frame channels 35 and 36, as seen fragmentarily in FIG. 18. The drive shaft 86 extends longitudinally along the front face of the frame channel 35 and is journalled in pillow blocks 97 fixed to said channel.

As seen in FIG. 4, the three section drive shaft 86 and coupling assembly spans the distance between the two telescopic legs 31 and 32 and carries a bevel gear 85 on each end in driving engagement with the telescopic leg screws 79 in the manner just described for vertical translation of the inner round tubular member 78 relative to the outer square tubular member 41. It is to be noted that screws 79 have right and left-hand screw threads, respectively, to effect upward and downward movement in unison.

The upper end of each round tubular member 78 carries a rectangular plate 98 fixed, as by welding, thereacross, said plate, in turn, being fixed, as by welding, to the underside of the U-shaped frame 33. A pair of limit switches 99 and 100 are provided to limit upward and downward movement, respectively, of the telescopic legs, switch 99 being fixed to an L-bracket 101 adjacent the upper end of one telescopic leg 31. The switch actuator 102 of switch 99 normally bears on the outer surface of the inner round tubular leg member 78, in which position the associated switch is closed to energize a circuit driving the motor 95 in one direction, and an opening 103 adjacent the lower end thereof is provided in alignment with the actuator 102 to break electrical contact at the upper limit of travel of the leg member 78. The other limit switch 100 is mounted on the longitudinal frame member 44 and is engaged by the plate 98 at the downward limit position thereof to break electrical contact.

The doubly-extendable carriage assembly 34 is carried by the U-shaped frame 33, which frame is composed of a longitudinal beam assembly 104 and two transverse, inverted, U-shaped arms 105, 105 fixed to and extending rearwardly from the distal ends of the longitudinal beam assembly 104. As best illustrated in FIG. 8, the longitudinal beam assembly 104 is composed of two opposed,

generally channel-shaped members 107 and 108 fixed together by a plurality of spaced screws 109 along their lengths, the screws extending downwardly through the upper inverted channel along and adjacent both edges thereof and threadably engaging inwardly-turned abutting flange portions 110 and 111.

A drive shaft assembly 112 is enclosed within the longitudinal chamber formed in the opposed channel members 107 and 108, said drive shaft assembly being composed of shaft sections 113 and 114 joined by a coupler 115 and journalled in pillow blocks 116 fixed as by bolts 117 to the bottom wall 118 of channel 108. A reversible motor and speed reducer assembly 119 mounted as at 120 to the inside of the lower channel 108, adjacent one end thereof, is in driving connection with the drive shaft assembly 112 by means of a worm gear 121, fixed to the motor drive shaft 122, in driving engagement with the worm wheel 123, fixed to the drive shaft 112.

Each of the ends of the drive shaft assembly 112 carries a bevel gear 124 in driving engagement with a bevel gear 125 fixed to one end of a screw shaft 126 extending axially through each one of the transverse arms 105. The screw shaft 126 is retained in position by a thrust bearing assembly 127 fixed in place in the inverted channel 105, immediately adjacent the bevel gear 125, by screws 128.

As best illustrated in FIGS. 8, 9 and 10, each screw shaft 126, one right-hand and one left-hand, threadably engages a nut 129 fixed as by bolts 130 to the inner face of the bottom wall 131 of a square tubular bearing assembly 132 which is adapted to traverse a transverse arm 105. Each bearing assembly 132 includes upper and lower groups of needle bearings 133 and 134 along the inner faces of its upper and lower walls, respectively, for bearing engagement with the top wall 135 and the two bottom edges 136, 136 of the inverted U-shaped arm 105. The needle bearings are retained in place in appropriate bores 137 by means of set screws 138, 138 at each end thereof. A pair of vertical needle bearings 139, 139 along the inner faces of the side walls of each bearing assembly 132 are similarly held in place and engage the outer surface of the side walls 140, 140 of the inverted, U-shaped arm 105. Thus, when the motor 119 is energized, the bearing assemblies are caused to traverse the transverse arms 105 by means of the drive shaft, screw and nut assemblies just described.

The doubly-extendable carriage assembly 34 is carried by the bearing assemblies 132 by means of upwardly-extending arms 141 and 142 fixed, as by welding, to said bearing assemblies, said bearing assemblies being rigidly joined by a longitudinal strut 143. As best seen in FIG. 8, a pair of limit switches 144 and 145 in the energization circuit of the motor 119 limit movement in both directions by breaking electrical contact when contacted by the forward or rear edges, respectively, of bearing assembly 132.

Spanning the upper ends of the upwardly-extending arms 141 and 142, and fixed thereto, is a longitudinal beam assembly 146. Since the longitudinal beam assembly 146 is similar in all respects to beam assembly 104, with the exception that it is turned 90° with respect thereto about its longitudinal axis, it will not be described herein in detail. A reversible motor and speed reducer assembly 147 and a drive shaft assembly 148, also similar to the assemblies 112 and 119 in construction and mounting, operate a pair of transversely-extendable arms 149, 149. It should be noted that the top channel member of the beam assembly 104 and the back channel member of beam assembly 146 are readily removable by removing the screws 109 for service thereof.

The drive shaft assembly 148 carries a bevel gear 150 fixed to each end thereof in engagement with bevel gears 151 fixed to the ends of screw shafts 152 extending axially through the transversely-extendable arms 149. Each arm 149 includes an inner round tubular member 153 having a nut 154 fixed in the rear end thereof by screws 155, 75

said nut threadably engaging the screw shaft 152 for in and out actuation of said tubular member. At its front end, the tubular member 153 is fixed, as by set screws 156, to a cap 157 which, in turn, is fixed, as by welding, to one end of an outer square tubular member 158 of arm 149. An intermediate round tubular member 159 slidably carries the inner and outer tube assembly for in and out translation therealong when the screw shaft is actuated by the associated motor and drive shaft assemblies as just described. A thrust bearing assembly 160 is fixed, as by screws 161, in the intermediate tubular member 159 against the bevel gear 151 to hold the screw shaft in place therein. The outer square tubular members are held against rotation relative to the intermediate round tubular member by the provision of two longitudinal corner bearing strips 162 and 163, FIG. 14, preferably of nylon or the like, which are fixed along their lengths to the intermediate tubular member by countersunk screws 164. A pair of limit switches 165 and 166, FIG. 13, are utilized to limit in and out travel of the square tubular members 158, by appropriately controlling the energization of the associated motor, limit switch 165 limiting inward movement thereof by contact of switch actuating arm 167 with the rear edge of said square tube, and switch 166 providing an actuating arm and roller 168 which drops into a detent 169 at the outer limit of travel of said square tubular member.

A stretcher 170 is suspended between the pair of square tubular members 158, 158 and comprises, generally, a rectangular frame 171 having longitudinal side rails 172 and 173, transverse end rails 174 and 175, and a webbing 176 suspended therebetween. Each side rail 172 and 173 includes an outwardly-facing aperture 177 adjacent each transverse end rail 174 and 175. Referring to FIG. 8, a bracket 178 is fixed, as by screws 179, to an inside vertical wall 180 of each of the square tubular members 149 at the rear end thereof, and provides a rearwardly-extending arm portion 181 and a downwardly and forwardly-projecting hook portion 182 to engage into an aperture 177 in the longitudinal rails 173. Each aperture 177 in the front longitudinal rail 172 is engaged by an adjustable hook arm 183 which extends upwardly into a box member 184 where it is pivotally journaled on a stub shaft 185 and carries a worm wheel 186 fixed thereto in engagement with a worm gear 187 fixed to a vertically-disposed shaft 188. A hand wheel 189 is fixed to the upper outwardly-extending end of the shaft for manual actuation thereof. The box and hook arm assemblies 184, 183 are fixed, as by screws 190, to the inner faces 180 of one each of the square tubular members 149 at their outer ends.

In operation, the hand wheels 189 will be turned to pivot the hook arm 183 outwardly and the stretcher frame will be inserted in place by manually passing the apertures 177 in the rear rail 173 into engagement with the hooks 182. The hand wheels 189 will then be manually operated to swing the hook arms 183 inwardly into engagement with the apertures 177 in the front rails 172. As the worm wheel and gear are self-locking, the stretcher frame will be held firmly in place.

The stretcher webbing 176 may be made of any practical strong, flexible material or fabric, and is preferably perforated. It is held in place in the frame by a plurality of hooks 191 spaced along the rear longitudinal stretcher rail 173 and a like number of similarly spaced toggle-actuated hooks 192 along the front longitudinal stretcher rail 172. The hooks 191 are pivotally attached to pins 193 carried in brackets 194 fixed, as by welding, screws or the like to the rear rail 173, and engage cross pins 195 spanning the arms 196 of a metal yoke 197 fixed, as by rivets 198, to the webbing 176 (see FIG. 17).

The hooks 192 along the front rail 172 are fixed to flexible straps 198 by means of metal plates 199 and rivets 200, FIGS. 15 and 16. The other end of each strap is

fixed to a cross pin 201 by means of a metal clamp plate 202 and rivets 202a. The cross pin 201 spans the throat of a yoke-shaped latch 203 forwardly of the pivots 204, 204, which operably attach the latch 203 to upstanding lugs 205, 205 of a bracket 206 fixed to the rail 172 by screws 207. The webbing 176 is put in place in the stretcher frame 171 by manually engaging each pin 195 in a hook 191 along the back rail 173. Each yoke-shaped latch will then be pivoted upwardly about its pivot 204, as indicated by the arrow 208, to engage its hook 192 with a pin 209 spanning the arms 210 of a metal yoke 211 attached to the webbing 176, by means of rivets 212, along the front edge of the webbing. The yoke-shaped toggle latch 203 will then be turned downwardly to the position illustrated in FIG. 16 to draw the webbing 176 taut and lock it firmly in place.

As seen in FIG. 1, the compartment between the frame assembly 20 and the rectangular frame 40, in addition to housing the motor and speed reducer 95, also provides space for four storage batteries 213 which are preferably positioned in a line across the back side of the cart to provide stability thereto when the stretcher frame is extended outwardly to the front side to pick up a patient from a bed, operating table or the like or to deposit a patient after transport. As the combined weight of the batteries is in the order of 450 lbs, there is no possibility of the weight of a patient, extended from the front side, overbalancing the cart. However, an added safety feature is provided in the form of an extendable stabilizing leg 214, FIGS. 2, 18 and 19. The leg 214 is positioned between the channel rails 35 and 36 and the floor, and includes a ball 215 engaged in a recess 216 in the underside thereof adjacent the outer end. The other end of the leg 214 is pivoted, as at 217, in a bracket 218 fixed by screws 219 to an upstanding side flange 220 of the motor mount platform 96. An arm 221 extending toward the back side from the pivot end of the leg 214 is pivoted, as at 222, to a link 223 which extends toward the rear end of the cart and is, in turn, pivoted, as at 224 to an arm 225 fixed to the lower end of a vertically-extending rod 226 projecting upwardly above the plate 48 to carry an elongated operating handle 227 fixed thereto. The lower end of rod 226 is pivotally journaled in a bracket 228, fixed by bolts 229 to the inside face of frame channel member 35. When the handle 227 is turned clockwise from the broken-line representation thereof, as seen in FIG. 18, the stabilizing leg 214 will be swung outwardly to the position shown in FIG. 2, with the ball 215 in engagement with the floor.

As seen in FIGS. 1 and 2, the control panel 27 includes four operating levers, levers 230, 231, 232 and 233 all of which have an off position, a straight up position, and two operating positions. Each lever automatically returns to off when it is released. The lever 230 operates the transport drive motor 22 in a forward and reverse direction, the lever 231 operates the motor 85 to raise or lower the U-shaped carriage 33. The lever 232 operates the motor 119 to drive the bearing assemblies 132 in and out, and the lever 233 operates the motor 147 to drive the extendable arms 149 in and out. Since the energizing circuitry including the operating levers, batteries and electric motors comprising the hospital cart are well known in themselves, and form no part of this invention, it is not deemed necessary that it be further described herein. It will be understood that the stretcher webbing member 142 is of such size and of such character that a plurality of them can be used routinely throughout a hospital in making up beds to be occupied by incapacitated regular or emergency patients, thereby achieving maximum use of the cart service. In such use, the stretcher webbing 176 will be placed beneath the sheet on the bed before it is occupied by a patient, and when it is desired to move a patient from the bed, the cart will be driven up beside the bed with the frame 33 and carriage 34 in an upward and inward position. The switch levers 232 and 233 will

then be sequentially operated (or they may be simultaneously operated) to move the carriage 34 outwardly by driving the bearing assemblies 132 outwardly along arms 105, 105 and the square tubular arms 149, 149 outwardly along the intermediate round tubes 159 to extend the stretcher frame carried thereby, in the manner previously described, over the bed. The carriage will then be lowered until the stretcher frame 171 surrounds the patient, after which the webbing 176 can be hooked in place on the stretcher frame, as described above, and the carriage raised and retracted. The cart can then be driven to any desired location in the hospital, being small enough to fit into ordinary passenger elevators, for deposit of the patient on an operating table, another bed or the like, by reversing the above-described procedure.

It will further be understood that the above-described webbing and stretcher frame assemblies used in combination with the cart are well adapted to use separately as stretchers or litters for delivering accident victims and other incapacitated persons to a hospital.

While I have illustrated and described herein only one form in which my invention can conveniently be embodied in practice, it is to be understood that this form is presented by way of example only and not in a limiting sense.

What I claim is new and desire to secure by Letters Patent is:

1. A hospital stretcher cart comprising, in combination, a rectangular carriage assembly, wheel means for rolling said carriage assembly along the floor, a generally rectangular, U-shaped frame member disposed in spaced, parallel relation above said U-shaped frame member, said U-shaped frame member comprising a first longitudinal member and a first pair of arm members extending outwardly of said longitudinal member from each end thereof, means for moving said U-shaped frame member vertically between upper and lower limit positions with respect to said carriage assembly, a stretcher carriage assembly arranged vertically above said U-shaped frame member, said stretcher carriage assembly comprising a second longitudinal member and a second pair of arm members extending outwardly of said second longitudinal member from each end thereof, said second pair of arm members being arranged in spaced, parallel relation above said first pair of arm members and extending in the opposite direction with respect thereto, mechanism slidably supporting said stretcher carriage assembly with respect to said U-shaped member for transverse motion thereof between a position directly above said U-shaped frame member and a position to one side of said U-shaped frame member and said carriage assembly, a rigid, unitary rectangular stretcher frame, a flexible webbing member, means for removably attaching said webbing member within said stretcher frame for peripheral support thereof, and means for releasably attaching said stretcher frame between said second pair of arm members of said stretcher carriage assembly.

2. A hospital stretcher cart as defined in claim 1 wherein said means for moving said U-shaped frame member with respect to said carriage assembly comprises a pair of vertically-extensible telescopic legs, each leg comprising outer and inner tubular members, one each of said tubular members being secured at one end to said carriage assembly and the other end of each of said tubular members being secured to opposite end portions of said U-shaped frame member.

3. A hospital stretcher cart as defined in claim 1 wherein said means for removably attaching said webbing member within said stretcher frame comprises a plurality of interconnectable hook mechanisms spaced along each side of said stretcher frame and said webbing member, the hook members along one side of said stretcher frame including toggle mechanism operative to stretch said webbing member between the sides of said stretcher frame.

4. A hospital stretcher cart as defined in claim 1 wherein said releasable attaching means comprises a pair of tubular members telescopically arranged over one each of said second pair of arm members and movable axially with respect thereto between inner and outer limit positions.

5. A hospital stretcher cart as defined in claim 4 wherein said releasable attaching means further comprises a first pair of stretcher hook members fixed to one each of said tubular members at the inner ends thereof, and a second pair of hook members pivotally affixed to one each of said tubular members at the outer ends thereof, said first and second pairs of hook members being operable to fit into first and second pairs of apertures in inner and outer side portions, respectively, of said stretcher frame.

6. A hospital stretcher cart as defined in claim 5 including manually-controlled crank means for pivotally moving said second pair of hook members into and out of interhooking engagement, selectively, with associated ones of said stretcher frame apertures.

7. A hospital stretcher cart as defined in claim 4 including a first electric drive means for said wheel means, a second electric drive means for said vertically-movable U-shaped frame member, third electric drive means for said stretcher carriage supporting mechanism, and a fourth electric drive means for said axially-movable tubular members.

8. A hospital stretcher cart as defined in claim 1 wherein said stretcher carriage assembly slidable support mechanism comprises a pair of tubular bearing assemblies slidably arranged, one each, over said first pairs of arm members, a pair of vertical arms extending upwardly of one each of said tubular bearing assemblies, the upper ends of said vertically-extending arms being attached to one end each of the inner ends of said second longitudinal member.

9. A hospital stretcher cart as defined in claim 8 wherein said first pair of arm members are of inverted U-shape and substantially rectangular in cross-section, and wherein said tubular bearing assemblies each comprises a square tubular member circumjacent one each of said first pair of arm members, and first and second groups of needle bearings transversely arranged with respect to and adjacent upper and lower surface portions of said first pair of arm members and rotatably disposed in transverse bores within upper and lower inner wall portions of said square tubular member.

10. A hospital stretcher cart as defined in claim 9 and further including pairs of inner and outer needle bearings rotatably disposed in inner and outer vertically-extending bores in opposite side wall portions of each of said square tubular members.

11. A hospital stretcher cart as defined in claim 5 wherein said stretcher carriage assembly slidable support mechanism comprises a pair of tubular bearing assemblies slidably arranged, one each, over said first pairs of

arm members, a pair of vertical arms extending upwardly of one each of said tubular bearing assemblies, the upper ends of said vertically-extending arms being attached to one end each of the inner ends of said second longitudinal member.

12. A hospital stretcher cart as defined in claim 11 wherein said first pair of arm members are of inverted U-shape and substantially rectangular in cross-section, and wherein said tubular bearing assemblies each comprises a square tubular member circumjacent one each of said first pair of arm members, and first and second groups of needle bearings transversely arranged with respect to and adjacent upper and lower surface portions of said first pair of arm members and rotatably disposed in transverse bores within upper and lower inner wall portions of said square tubular member.

13. A hospital stretcher cart as defined in claim 12 and further including pairs of inner and outer needle bearings rotatably disposed in inner and outer vertically-extending bores in opposite side wall portions of each of said square tubular members.

14. A hospital stretcher cart as defined in claim 13 including a first electric drive means for said wheel means, a second electric drive means for said vertically-movable U-shaped frame member, a third electric drive means for said stretcher carriage supporting mechanism, and a fourth electric drive means for said axially-movable tubular members.

15. A hospital stretcher cart as defined in claim 14 including electrical energizing means comprising a plurality of storage batteries, said storage batteries being carried on said carriage assembly along the other side thereof for counterbalancing the rotational moment of said carriage assembly when in its sidewardly extended position.

16. A hospital stretcher cart as defined in claim 15 including a stabilizing leg pivotally secured to said carriage assembly and movable between inner and outer positions with respect thereto, said support leg when in said outer position being adapted to contact the floor at a position outwardly removed from said one side of said carriage assembly.

References Cited

UNITED STATES PATENTS

2,668,301	2/1954	Brouillette	5—89 X
2,854,673	10/1958	Ramsey	5—86
3,045,256	7/1962	Scher	5—63
3,099,020	7/1963	Garfield et al.	5—81
3,168,688	2/1965	Roggenkamp	180—65 X
3,298,042	1/1967	Danielson	5—86 X

CASIMIR A. NUNBERG, *Primary Examiner*.

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5—81; 180—65