March 24, 1936. F. KOENIGKRAMER ET AL 2,035,321

ADJUSTABLE HOSPITAL LITTER

Filed July 11, 1933 2 Sheets-Sheet 1

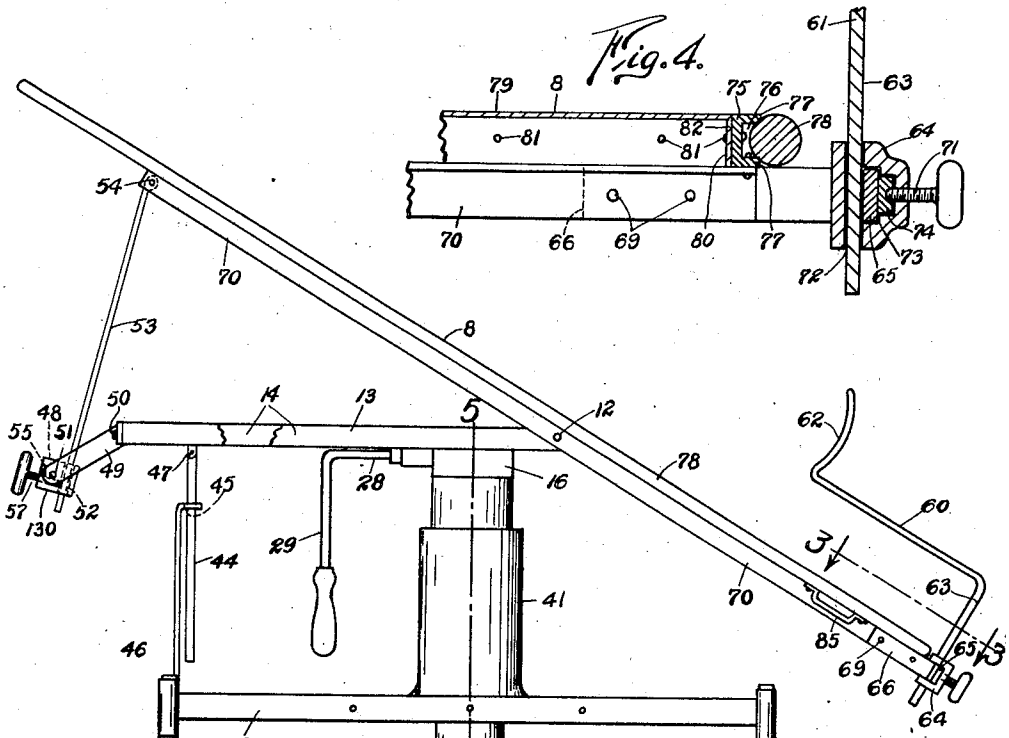


Fig. 1.

Fig. 4.

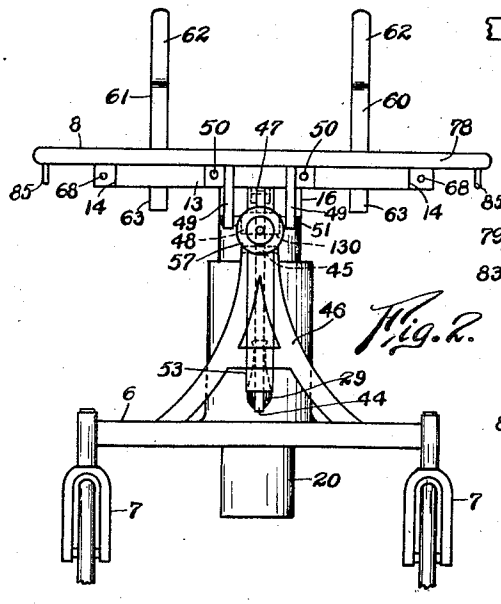


Fig. 2.

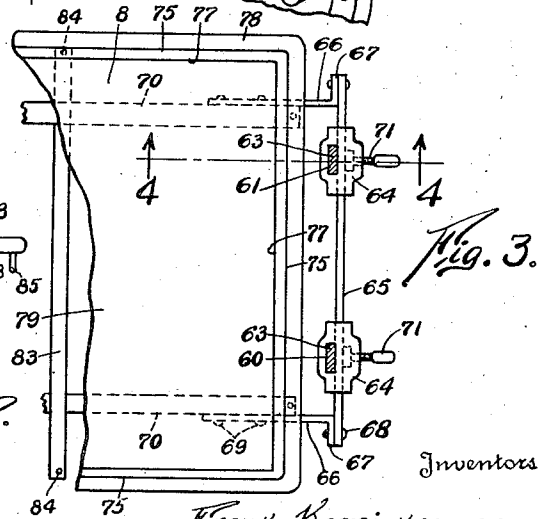


Fig. 3.

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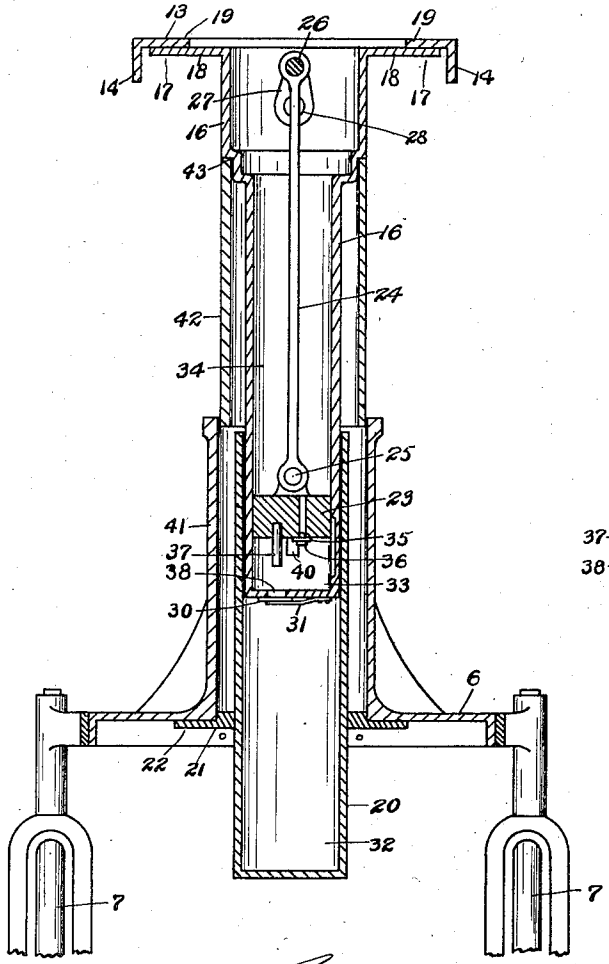


Fig. 5.

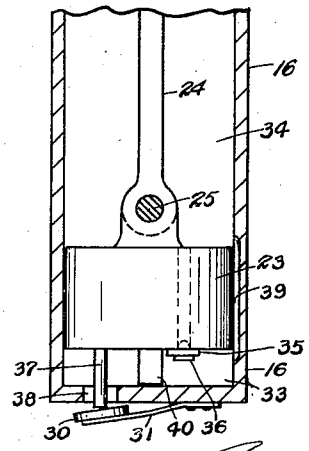


Fig. 6.

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ADJUSTABLE HOSPITAL LITTER

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4 Claims. (Cl. 296—20)

This invention relates to a hospital litter or carriage embodying various improvements for facilitating the handling of patients.

An object of the invention is to provide a form of tractional litter capable of being elevated or lowered by the use of quick-acting, noiseless and simple means which are always under perfect control of the hospital attendant, and whereby the heaviest patients may easily be handled by an attendant having ordinary strength.

Another object is to provide a device of the above stated character in which is embodied means for assisting in the administering of a spinal anaesthesia, or for other purposes requiring or favoring a lowering of the head and shoulders of the patient.

Another object is to provide a device of the character stated which may easily be kept clean and sanitary, and which has but few moving parts, thereby eliminating noise and the need of mechanical repair, greasing, and adjustment.

A further object is to provide for increased comfort of those who require hospital treatment and especially those who require removal to and from a hospital bed or operating table.

The foregoing and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which:

Fig. 1 is an elevational view of the improved litter or hospital carriage, showing the table portion thereof in a tilted position.

Fig. 2 is an end view of the device of Fig. 1, looking at the left end thereof, showing the table portion in the horizontal or normal position.

Fig. 3 is a fragmental cross-sectional view taken on line 3—3 of Fig. 1, showing a shoulder brace arrangement.

Fig. 4 is an enlarged fragmental cross-sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is an enlarged detail view showing in cross-section a plunger and a cooperative secondary cylinder forming part of the invention.

In the handling of helpless hospital patients, it is often necessary to remove the patients to or from the beds, the operating or ray treatment tables; and in the majority of hospitals these various beds, tables, and the like, are of various elevations with respect to the floor level. Under such circumstances it is extremely difficult to transfer the patients from one table to another without discomforting, and in some cases further injuring, the patient due to awkward methods or means of handling. Furthermore, it is sometimes desirable to very gently remove the patient from a bed and subsequently incline his body with the head and shoulders lowered, especially in those instances wherein it is necessary to administer an anaesthetic with the patient in an inclined position. By the use of the device of this invention, patients may easily and without the employment of several attendants, be transferred without manual lifting, from one bed to another support or table which may be at a different elevation; and in those instances wherein it is necessary or desirable to lower the head and shoulders of the patient, such may be accomplished without further transferring the patient from the litter or carriage to a third table or support.

Due to the absence of complex mechanical means, the device of the invention is rendered noiseless and easy of operation, and it may be maintained in a clean sanitary condition with but little effort. The device of this invention may be considered an improvement upon the device of our Patent No. 1,981,271 dated November 20, 1934, and it includes, as part of its structure, the hydraulic lift having a novel arrangement of control means therefor which may be manipulated from either side of the device with equal facility. This is a feature which is afforded the ready and unanimous approval of hospital authorities and attendants, because of the fact that removal of patients is oftentimes accomplished in close quarters and under conditions of extreme difficulty. With the improved device however the handling of helpless or seriously injured patients is rendered easy and does not add to the discomfort of the patient. Furthermore, the use of the device obviates some of the handling that would be necessary for properly lowering the head and shoulders of a patient, which is sometimes necessary.

The device comprises in general a chassis 6 provided with a series of wheels or casters 7, one caster being mounted for swivel movement at each corner of the chassis. At 8 is indicated a table portion which is adapted to support a patient, the table portion being pivoted as at 12 upon a vertically adjustable frame or supporting structure 13 for movement to and from the tilted position shown in Fig. 1. Means are provided for maintaining the table portion in adjusted inclined positions, said means comprising a suitable clamping mechanism indicated generally at 130.

The table may be supported upon a suitable framework or supporting structure 13 composed of suitable angle iron members 14 which are se-

cured together in spaced parallelism. At a point substantially below one end of the supporting structure 13, said supporting structure has attached thereto a depending member which will hereinafter be referred to as a vertical secondary cylinder 16. The cylinder may be secured to the supporting structure 14 by any suitable means such as rivets 17 which pass through a flange 18 of the cylinder and the legs 19 of the angle members.

The chassis carries the primary cylinder 20 which slidably but snugly receives the secondary cylinder 16, as is most clearly shown in Fig. 5. The primary cylinder may be fixed to the mid-portion of the chassis by any suitable means, there being shown a flange 21 which is fixed to the primary cylinder and bolted or screwed to the chassis as at 22. In order that a maximum lift for the table portion may be secured, the primary cylinder 20 may be extended downwardly below the plane of the chassis. Both cylinders are adapted to contain a predetermined volume of oil or other fluid which may be forced from one cylinder to the other in such a manner as to effect elevating and lowering of the table portion.

The mechanism for accomplishing the vertical adjustment of the table may comprise a piston or plunger 23 which fits snugly but slidably within the bore of the secondary cylinder 16. A connecting rod 24 has one of its ends pivoted at 25 to the plunger, the other end thereof being pivotally mounted at 26 upon a suitable crank or eccentric 27. The eccentric or crank is fixed upon one end of a rockable shaft 28 the axis of which extends longitudinally of the chassis, and through the wall of the secondary piston 16. To the outer end of the shaft 28 is fixed a suitable actuating member or lever 29 which serves as a pump and release lever for controlling movement of the secondary cylinder. From the foregoing it should readily be understood that rocking the shaft 28 by means of the lever 29 will effect vertical reciprocating movement of the piston or plunger 23 whereby, through the agency of a series of fluid valves, a liquid may be pumped from the cylinder 16 and into the cylinder 20 for elevating the table portion.

Although it is possible to employ various arrangements of fluid valves for accomplishing the displacement of fluid in the cylinders, a simple arrangement thereof will be illustrated and described herein. The valve arrangement may consist of a check valve 30 carried by the bottom of the cylinder 16 and adapted to be urged to a normally closed position by means of a spring or the like 31. As is plainly evident from Fig. 5, a downward movement of the plunger will compress the fluid beneath it so as to open the valve 30 and permit passage of fluid into the chamber 32 of cylinder 20. So long as fluid may pass from the chamber 33 to the chamber 32, the table will be progressively elevated. A proper amount of fluid is maintained within the reservoir 34 above the plunger, and as fluid is displaced from the chamber 33 to chamber 32, the chamber 33 is replenished with fluid by the action of a check valve 35 which affords communication between the chambers 34 and 33 during upward reciprocation of the plunger. The check valve 35 is of usual construction and may be held upon its seat by means of a spring 36.

When it is necessary to lower the table, the lever 29 may be moved upwardly through a circular arc until it assumes a substantially horizontal position, whereupon the plunger 23 will be lowered sufficiently to project a fluid release member or pin 37 through the valve port 38 for unseating the valve 30 against the resistance of spring 31. Fluid thereupon may flow from chamber 32 to chamber 33, whence it may pass through a suitable chamber or pipe 39 to by-pass the plunger 23 and enter the chamber 34 above the plunger. In order that the valve member 30 may be limited in its movement to the open position, a suitable stop or limit member 40 may be provided intermediate the plunger and the bottom wall of the cylinder 16. As shown in Fig. 6, the abutment 40 may be simply a projecting lug or boss formed integrally with the plunger. It is to be observed that the slot or passage 39 is made slightly longer than the thickness of the plunger, so that when the plunger is disposed at its lower limit of travel, the fluid entering the valve 30 may by-pass into the chamber 34 and thereby permit a slow but continuous lowering of the cylinder 16 and the table supported thereby.

It is important to note that the actuating lever 29 normally is disposed in a vertical plane beneath the table portion at a location midway between the side edges thereof, this arrangement being provided for the purpose of rendering the actuating handle accessible from either side of the carriage. Furthermore, movement of the actuating lever is effected through a circular arc in a vertical plane transversely of the table, and through a distance of approximately one hundred eighty degrees. The relationship of the lever to the crank 27 is such that when the lever is depending in a vertical plane, the crank 27 is disposed at its uppermost limit of travel. Thus, upon each movement of the lever from the vertical toward the horizontal positions, the plunger is actuated for displacing fluid from chamber 33 to chamber 32 whereby to elevate the table. An extreme upward movement of the actuating lever to the substantially horizontal position causes the member 37 to enter the valve opening 38 in the manner disclosed in Fig. 6, whereby to effect displacement of fluid in the opposite direction for lowering the table. It will be noted that the pumping action and the releasing action as well, can be accomplished with equal facility whether the operator is standing at the right or the left side of the carriage.

It will be noted that a protective outer casing or housing 41 surrounds the major portion of cylinder 20, and is spaced sufficiently therefrom to receive a sleeve or covering 42 which may move in the space between the housing and cylinder 20. The sleeve 42 is attached to the cylinder 16 at the location 43, and may be secured in position thereon by the use of screws, rivets, welding or the like.

In order that the table may not rotate relative to the chassis, the under side of the supporting structure 13 is provided with a vertical depending bar or rod 44 which may reciprocate within a guideway 45 that is fixed relative to the chassis. The guideway may be in the form of a slot or opening provided in the upper end of a suitable brace of bracket 46 carried by the chassis. The rod or bar 44 is fixed to the table supporting structure at the location 47.

The means for maintaining the table 8 in the inclined relationship may be constituted of a block or binding member 48 which is supported for slight rocking movement between a pair of brackets 49 which are bolted or otherwise suitably secured to the supporting structure 13 as

at 50. The block is pivoted between said members 49 by means of a pivot or axle 51, and at a distance from the axle there is formed in the block a rectangular opening 52 which receives the rectangular bar or brace 53 one end of which is pivoted to the table at 54. The opening 52 is of such dimensions that the edges thereof will have a binding action on the bar at all times, due to the weight of the block and of the table member 8, which weight acts automatically to bind the bar regardless of the inclination of the table portion. The construction of the clamping device 130 is similar to that disclosed in our previously named Patent No. 1,981,271, and its manner of operation is identical therewith. The handwheeled screw 57 has a mounting within the block so that to prositively clamp the bar relative to the block, the operator may rotate the screw until it binds upon the bar 53. The screw engages a threaded bore 55 in the block, which bore is disposed transversely or at right angles to the bar 53.

The characters 60 and 61 indicate a pair of shoulder braces each of which has a shoulder receiving socket portion 62 disposed substantially in a plane at right angles to the table transversely thereof. Each shoulder brace comprises also a post 63 which may be substantially parallel to or offset from the shoulder receiving socket portion 62, and the post element is adapted to be elevated and lowered, as well as shifted laterally relative to the table.

As will readily be observed by referring to Fig. 3, the posts 63 are supported at right angles to the plane of the table, by means of a pair of slides 64 which may be adjusted along a bar or support 65 that extends along the extreme end of the table. The bar 65 may have any suitable mounting upon the table portion, and for this purpose there is shown a pair of angle brackets 66 each of which has a turned end 67 which is riveted as at 68 to an end of the bar 65. Each angle bracket may be riveted or otherwise suitably secured as at 69, to the longitudinal angle irons 70 which constitute the table portion. Each of the slides or guides 64 includes a screw or the like 71 whereby said slides or guides are fixed relative to the bar 65 and to the posts 63. As is most clearly indicated in Fig. 4, each slide or guide 64 is provided with a passageway 72 for the post, and a transverse offset passageway 73 for the bar 65. The passageways are communicative, so that by tightening the screw 71 a plate or block 74 will bear upon the bar 65, which bar in turn will bear upon the post 63 whereby to bind the various elements 63 and 64, 65 and 74 together and thereby preclude relative movement of these parts. By means of the foregoing construction, it is possible to adjust the shoulder braces toward and from the plane of the table, and also laterally of the table along the bar 65.

Attention is directed to the fact that the table portion is constituted of a substantially rectangular frame made up of U-shaped members 75 so as to provide a circumferential groove 76 between the outwardly extending legs 77. The channel or space between said legs is adapted to receive a large ring or length 78 of rubber or other suitable material which will serve as a buffer or molding designed to preclude injury to the patient or to the furnishings of a building in which the litter is used. In accordance with Fig. 4 the table portion includes a large sheet of metal or the like 79 having downwardly turned sides and ends 80 which may be spot-welded, riveted, or otherwise secured as at 81 to the inner faces 82 of the channel or U-shaped members 75. At intervals along the length of the table, the sheet metal top 79 may be reinforced by means of cross-braces preferably in the shape of angle irons, one of which is indicated at 83 in Fig. 3. The cross-pieces or braces may be bolted, riveted, or otherwise secured to members 75, as indicated at 84. If desired, suitable handles 85 may be secured to the members 75 at opposite sides of the table, to facilitate tilting and righting of the table. The longitudinal members 14 which form part of the frame structure 13, support the pivots 12, and the pivots 12 are so located between the ends of the table 8 that the weight of an ordinary person will be substantially equally distributed between the pivots and each end of the table.

From the foregoing it should readily be apparent that we have provided a hospital carriage or portable litter which may be adjusted in various ways to most easily handle a patient without unnecessary movement of the patient. The device has the further advantage that its movements may be controlled from either side of the table with equal facility. The elevating and lowering action, as well as the tilting action is smooth and noiseless, and there is no elaborate mechanism to be greased and maintained in adjustment, wherefore the device is particularly adapted for hospital use.

What is claimed is:

1. A hospital litter comprising in combination a tractional chassis, a post, means for mounting said post substantially centrally of the chassis, a substantially horizontal frame having longitudinal side members, said frame having a pivot end and an extending opposite end, means for mounting the pivot end of the frame upon the post with said opposite end overhanging one end of the tractional chassis, thereby disposing the pivot end near the central part of said chassis, a patient-supporting table pivotally mounted substantially at its middle portion upon the pivot end of the frame, adjacent to the post, to render approximately half of the table length capable of being supported flatly upon the frame, and means for maintaining the table in adjusted positions about the pivotal mountings thereof at various inclinations to the plane of the frame.

2. A tractional hospital litter or carriage comprising in combination a wheeled chassis, a lift mounted upon the chassis substantially centrally of the chassis, a supporting frame, and a table for supporting a patient, the supporting frame having opposite ends, means for mounting one end of the frame upon the lift substantially at right angles thereto, and means for pivotally mounting the table at approximately its midpoint, upon that end of the supporting frame which is attached to the lift.

3. A tractional hospital litter or carriage comprising in combination a wheeled chassis, a lift mounted for elevation and rotation upon the chassis substantially centrally of the chassis, a supporting frame, and a rigid table for supporting a patient, the supporting frame having opposite ends, means for mounting one end of the frame upon the lift so that rotation of the lift results in rotation of the frame, means for pivotally mounting the table at approximately its midpoint, upon that end of the supporting frame which is attached to the lift, and means connected with the opposite end of the frame for maintaining the table at various degrees of inclination relative to the supporting frame.

4. A tractional hospital litter or carriage comprising in combination a wheeled chassis, a pedestal mounted in an upright position upon the chassis substantially centrally thereof, a substantially horizontal supporting frame having one end thereof fixed upon the pedestal and the opposite end overhanging an end of the chassis, and a patient supporting table pivoted at substantially its mid-point upon the first mentioned end of the supporting frame and adapted to rest flatwise upon the overhanging end of the supporting frame.

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