

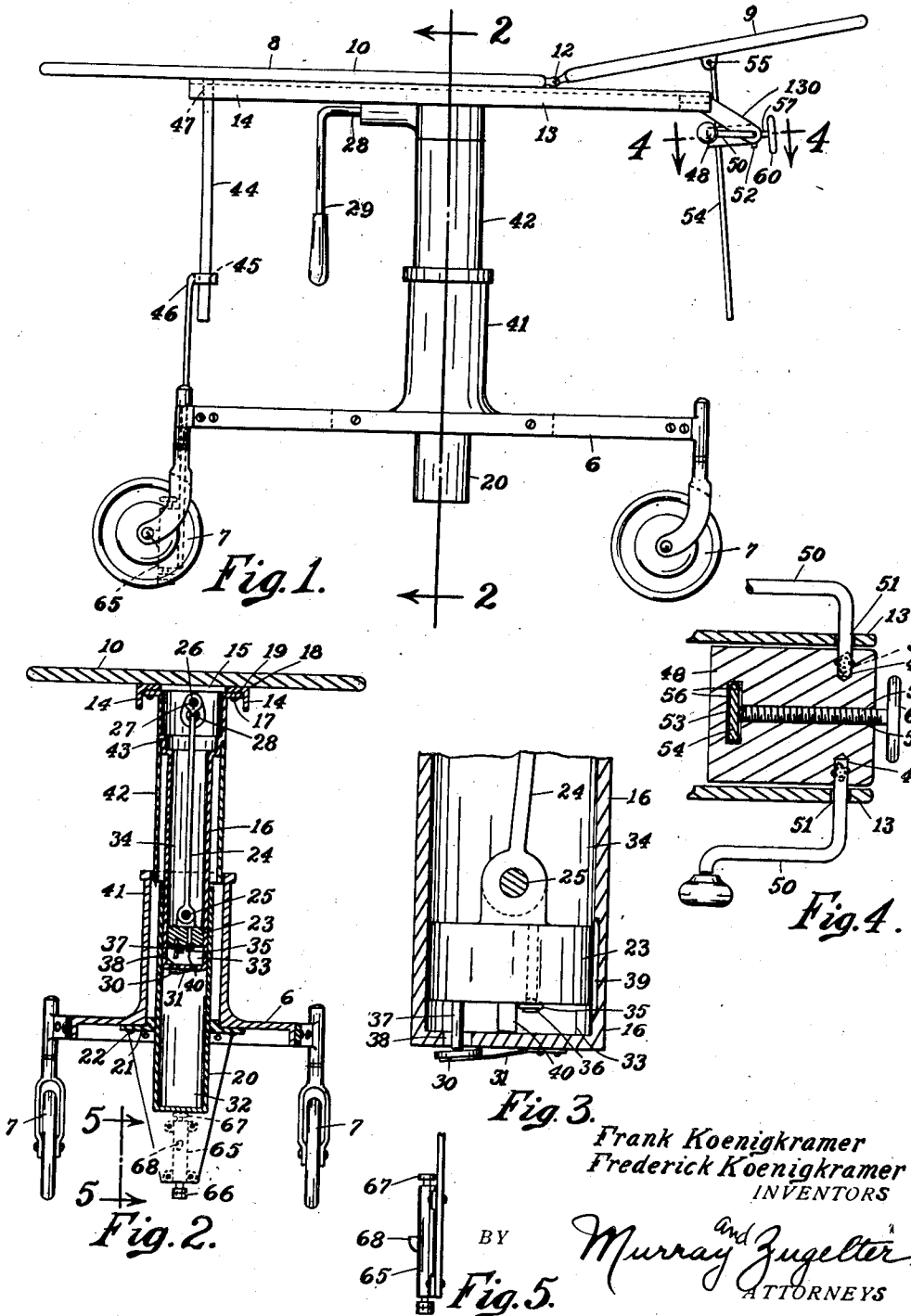
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TRACTIONAL HOSPITAL LITTER OR CARRIAGE

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TRACTIONAL HOSPITAL LITTER OR
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This invention relates to an article of hospital equipment known as a tractional litter or hospital carriage.

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 character stated which may easily be kept in a clean and sanitary condition, 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 the 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 drawing, in which:

Fig. 1 is a side elevational view of a device embodying the invention.

Fig. 2 is a cross-sectional view taken on line 2—2 of Figure 1.

Fig. 3 is an enlarged detail view of a plunger and cooperative secondary cylinder forming part of the invention.

Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a view taken on line 5—5 of Fig. 2.

In the handling of helpless hospital patients it is often necessary to remove the patients to or from the beds, or operating or ray treatment tables, and in the majority of hospitals these various beds, tables, and the like are of various elevations above 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. 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 a bed to another support or table which may be at a different elevation. Due to the absence of complex mechanical means, the device of the invention is rendered noiseless and easy in operation, and it may be kept in a clean sanitary condition with but little effort. The improved litter or carriage is provided also with a novel and convenient form of reclining table section which adds to the comfort of the patient and minimizes the work of the hospital attendant.

The device of this invention includes, as part of its structure, an 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 hearty 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 badly injured patients is rendered easy and does not add to the discomfort of the patient.

The device comprises in general a chassis provided with a series of casters 7, one caster being mounted for swivel movement at each corner of the chassis. At 8 is indicated a table portion which preferably is constituted of a plurality of sections, one section 9 of which is pivoted relative to the section 10 as indicated at 12. The section 9 provides a reclining support for a patient's back and head, and is adapted to be maintained in adjusted inclined positions by means of a suitable clamping mechanism indicated generally at 130.

The table sections may be supported upon a suitable framework or supporting structure 13 composed of suitable angle iron members 14 which are secured together in spaced parallelism by means of cross bars 15. At a point substantially midway between the ends 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. 2. 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. 2, 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 bypass 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. 3, 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 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 de-

pending 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. 3, 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 or 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 section 9 in the inclined relationship may be constituted of a block or binding member 48 which is supported for slight rocking movement relative to the supporting members 13. The block 48 has secured within it the innermost ends 49 of a pair of cranks 50 whereby the block may be moved slightly about its pivotal supports 51. The cranks ends may be secured relative to the block by means of set screws or the like 52. At a distance from the axis of the crank ends 49, there is formed in the block a rectangular opening 53 which receives the rectangular bar or brace 54 one end of which is pivoted to the section 9 as at 55. The edges 56 of the opening are readily seen to have a binding action on the bar at all times, due to the weight of the block and the table section 9, which weight acts automatically to bind the bar regardless of the inclination of the table section 9. In order to relieve the binding action, the attendant has merely to lift the block upwardly by means of the handle 50, whereupon the pivoted section 9 may be lowered to a position in parallelism with the fixed table section. In the event that it is desired to positively clamp the bar relative to the block 48, the operator may rotate the screw 57 until it binds upon the bar 54. The screw engages a threaded bore 59 in the block, and it may be provided with a suitable hand-wheel 60.

From the foregoing, it should readily be apparent that we have provided a hospital carriage or portable litter which has but few moving parts, is easily kept in a clean and sanitary condition, and which may be adjusted in various ways with a minimum of effort. 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 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.

In order that the carriage may not inadvertently be moved during transferring of a patient onto or from the carriage, one or more floor stops or anchoring devices 65 may be secured to the chassis and arranged to frictionally contact the floor upon actuation thereof by an attendant. The device 65, in itself, is not a novel device and may be procured on the market. It consists essentially of a vertically movable friction head or button 66 which may be projected toward and upon the floor by the application of a downward force to an actuating button 67. The device includes a clutch (not shown) which holds down the friction head 66 in frictional contact upon the floor, and said clutch may be released, by means of a release trigger device 68, to permit the friction head to move vertically upwardly to an elevated position out of contact with the floor. The elevating movement of the head is accomplished in a well known manner, by means of a suitable spring arrangement.

What is claimed is:

1. A tractional hospital litter comprising in combination a chassis and an elongated table portion for supporting a patient, a primary and a secondary cylinder adapted to contain a fluid, means for mounting the primary cylinder vertically upon the chassis, means for mounting the secondary cylinder vertically upon the table so as to depend therefrom and extend into the primary cylinder in which it has a close sliding fit, a plunger adapted for reciprocatory movement within the secondary cylinder, a rock shaft mounted upon the secondary cylinder for rocking movement in a direction transversely of the table portion, a crank on the rock shaft and a connecting rod pivotally mounted at opposite ends thereof to the crank and the plunger, whereby upon rocking movement of the shaft the plunger will be reciprocated within the secondary cylinder, an actuating lever fixed on the rock shaft so as to be depending vertically downwardly therefrom when the crank and connecting rod are elevated to their highest limit of travel, a check valve for effecting fluid communication between the cylinders when the plunger is lowered by means of the actuating lever, and means holding the valve open when the actuating lever is moved to substantially horizontal positions at opposite sides of the table portion with the plunger lowered.

2. A tractional hospital litter comprising in combination a chassis and an elongated table portion for supporting a patient, a primary and a secondary cylinder adapted to contain a fluid, means for mounting the primary cylinder vertically upon the chassis, means for mounting the secondary cylinder vertically upon the table so as to depend therefrom and extend into the primary cylinder in which it has a close sliding fit, a plunger adapted for reciprocatory movement within the secondary cylinder, a rock shaft mounted upon the secondary cylinder for rocking movement in a direction transversely of the table portion, a crank on the rock shaft and a connecting rod pivotally mounted at opposite ends thereof to the crank and the plunger, whereby upon rocking movement of the shaft the plunger will be reciprocated within the secondary cylinder, an actuating lever fixed on the rock shaft so as to be depending vertically downwardly therefrom when the crank and connecting rod are

elevated to their highest limit of travel, a check valve for effecting fluid communication between the cylinders when the plunger is lowered by means of the actuating lever, means holding the valve open when the actuating lever is moved to substantially horizontal positions at opposite sides of the table portion with the plunger lowered, means for replenishing fluid to the secondary cylinder upon each reciprocation of the plunger, and means for precluding rotation of the secondary cylinder relative to the chassis.

3. A tractional hospital litter comprising in combination a chassis and an elongated table portion for supporting a patient, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, a normally vertical depending operating lever pivoted relative to the lift so as to be movable transversely of the table portion through an arc of approximately one hundred eighty degrees, from a substantially horizontal position at one side of the table portion to a substantially horizontal position at the opposite side of the table portion, a plunger and a relief valve associated with the lift, and means cooperating to open the relief valve when the operating lever is disposed in either one of the substantially horizontal positions, the actuation of the plunger to elevate the table portion being accomplished by the lever intermediate said horizontal positions and the normal vertical position of the lever, thereby rendering the lift operative from opposite sides of the table portion with equal facility.

4. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, a pivoted operating lever associated with the hydraulic lift and normally disposed vertically, a plunger and a relief valve associated with the lift, and means cooperating to open the relief valve when the operating lever is pivotally moved to a substantially horizontal position, the actuation of the plunger to elevate the table portion being accomplished intermediate said horizontal position and the normal vertical position of the operating lever, thereby rendering the lift operative from opposite sides of the table portion with equal facility.

5. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, said table portion having longitudinal side edges, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, and an operating member for the hydraulic lift, said member being normally disposed in a vertical position below the table portion substantially midway between the limits of the side edges of the table portion, to be equally accessible from both sides of the table portion relative to the tractional chassis.

6. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, a lift means associated with the chassis and the table portion for varying the elevation of the table portion, a single actuating member for the lift means, a mounting means for said single actuating member arranged for permitting swinging of the actuating member from a normal vertical position to two substantially horizontal positions at either side of the normal vertical position, means associated with the lift means for elevating the table portion

upon movement of the actuating member between the vertical position and either one of the horizontal positions, and means operating to lower the table portion upon disposition of the actuating member to one or the other of the horizontal positions.

7. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, and an operating member for the hydraulic lift being attached to and movable with the table portion, and arranged to be equally accessible from both sides of the table portion relative to the tractional chassis.

8. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, and a single operating member for the hydraulic lift said member being attached to and movable with the table portion and being normally disposed in a vertical position below the table portion and suspended in such manner as to be equally accessible from both sides of the table portion relative to the tractional chassis.

9. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, said table portion having longitudinal side edges, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, an operating lever associated with the hydraulic lift and mounted for movement from a normal vertical position to either of two substantially horizontal positions at which the lever is disposed adjacent to the side edges of the table portion, a plunger and a relief valve associated with the lift, means cooperating to open the relief valve when the operating lever is moved to either one of the substantially horizontal positions, the actuation of the plunger to elevate the table portion being accomplished intermediate either of said horizontal positions and the normal vertical position of the operating lever, thereby rendering the lift operative from opposite sides of the table portion with equal facility.

10. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, said table having longitudinal side edges, an hydraulic lift associated with the chassis and table portion for varying the elevation of the table portion, an operating lever associated with the hydraulic lift and mounted for movement with and transversely of the table portion from a normal vertical position below the table portion to either one of two substantially horizontal positions at which the lever is disposed adjacent the side edges of the table portion, a plunger and a relief valve associated with the lift, means cooperating to open the relief valve when the operating lever is moved to either one of the substantially horizontal positions, the actuation of the plunger to elevate the table portion being accomplished intermediate either of said horizontal positions and the normal vertical position of the operating lever, thereby rendering the lift operative from opposite sides of the table portion with equal facility.

11. A tractional hospital litter comprising in combination a chassis and a table portion for supporting a patient, a lift means associated with the chassis and table portion for varying the elevation of the table portion, and an operating member for the lift means, said member being attached to and movable with the table portion, and arranged to be equally accessible from both sides of the table portion relative to the tractional chassis.

12. A tractional hospital litter comprising in combination a tractional chassis and a table portion for supporting a patient, a lift means associated with the chassis and table portion for varying the elevation of the table portion, an operating member for the lift means, said member being attached to and movable with the table portion, and arranged to be equally accessible from both sides of the table portion relative to the tractional chassis, and means operating upon movement of said member to positions adjacent to either side of the table portion, to lower the lift means and the table portion supported thereby.

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