Sept. 29, 1959 A. S. REICHERT ET AL 2,905,952

PATIENT STRETCHERS

Filed Jan. 20, 1955 4 Sheets-Sheet 1

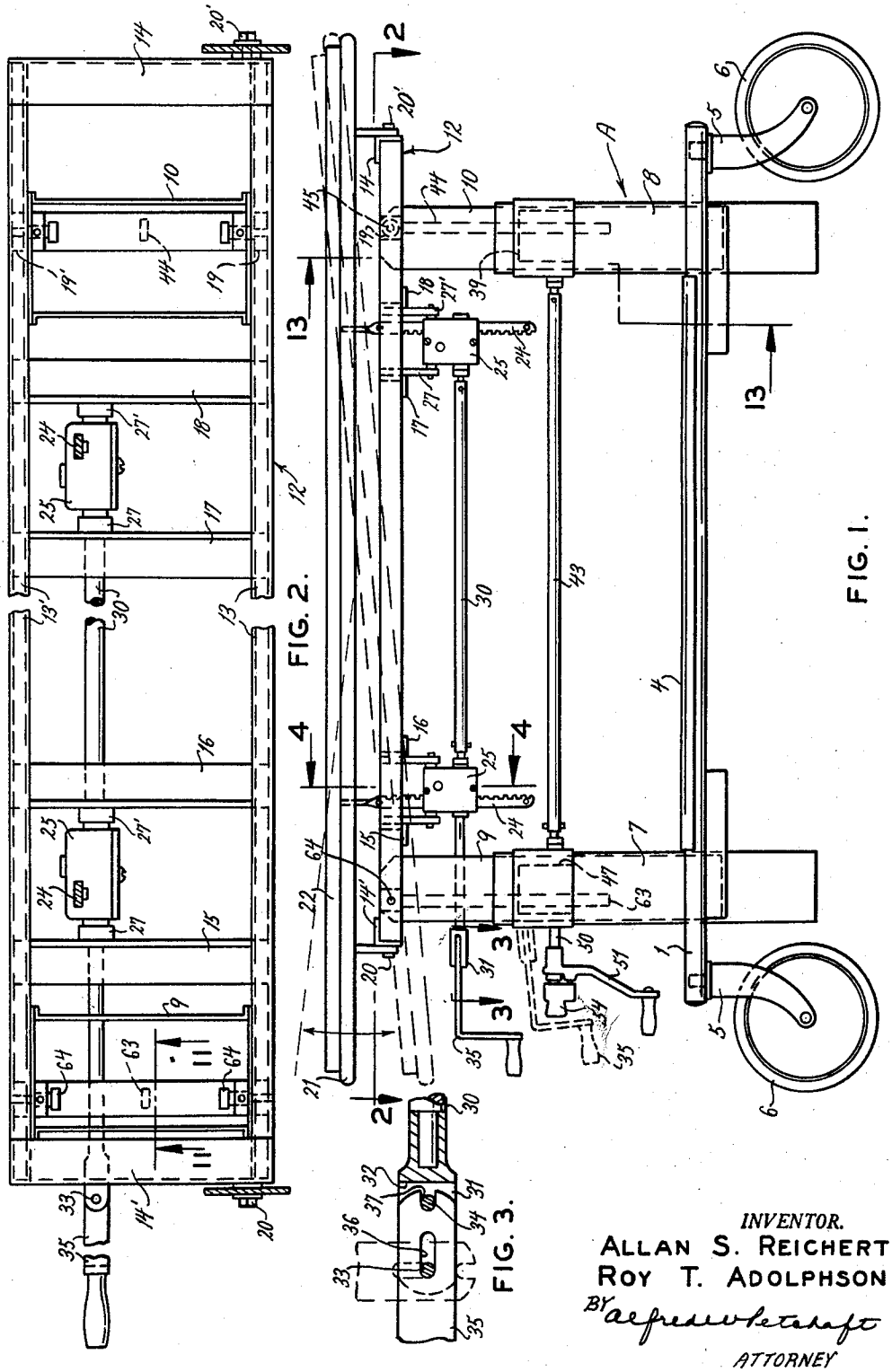


FIG. 1.

FIG. 2.

FIG. 3.

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Sept. 29, 1959 A. S. REICHERT ET AL 2,905,952

PATIENT STRETCHERS

Filed Jan. 20, 1955 4 Sheets-Sheet 2

FIG. 4.

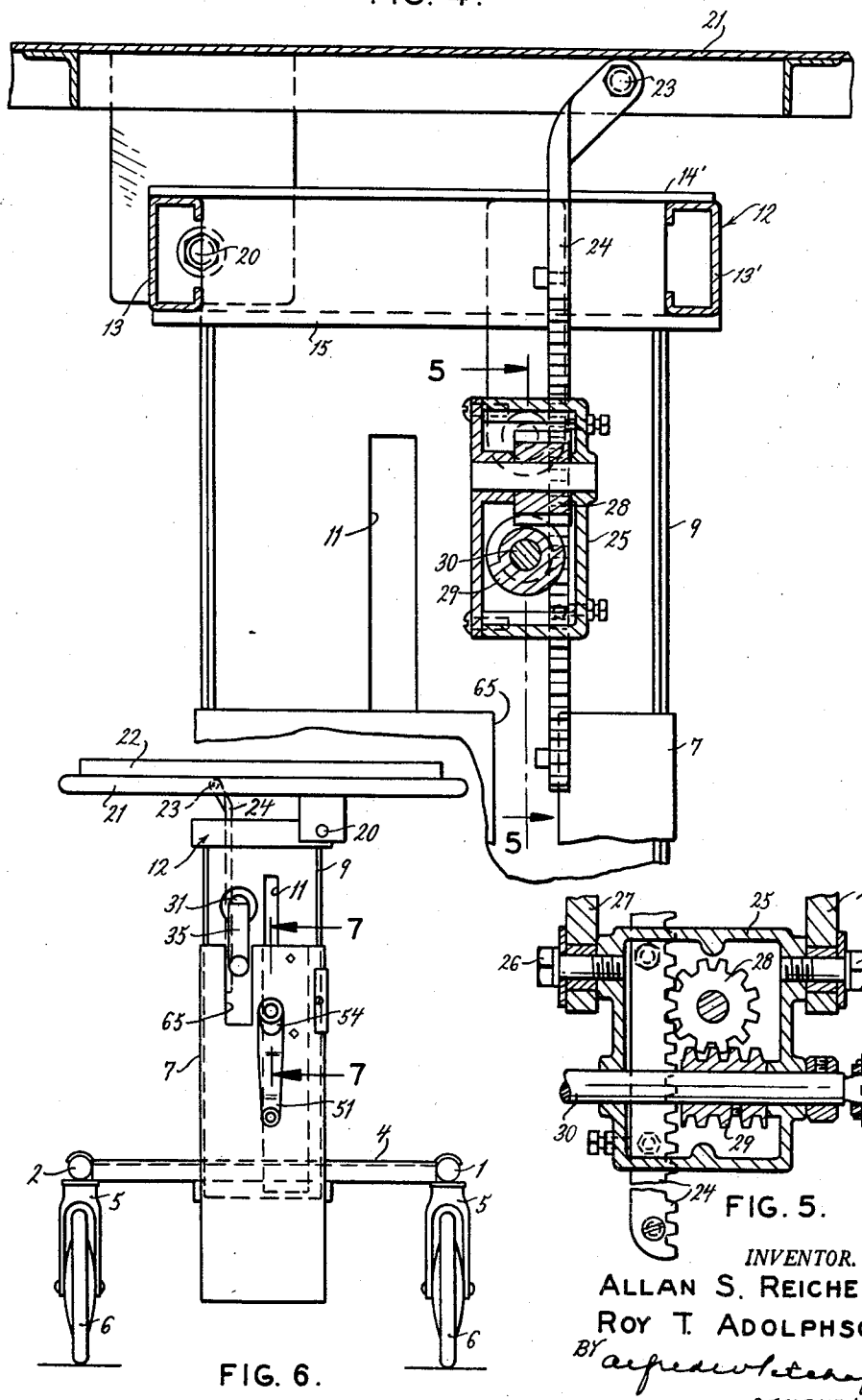


FIG. 6.

FIG. 5.

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PATIENT STRETCHERS

Filed Jan. 20, 1955 4 Sheets-Sheet 3

FIG. 8.

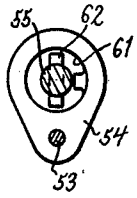


FIG. 7.

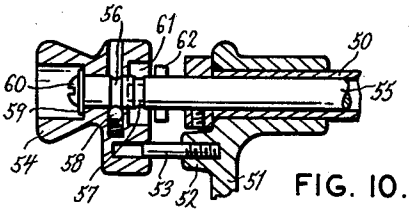


FIG. 10.

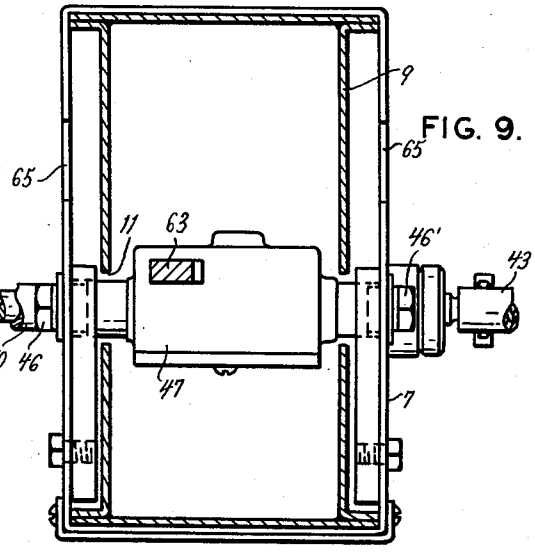


FIG. 9.

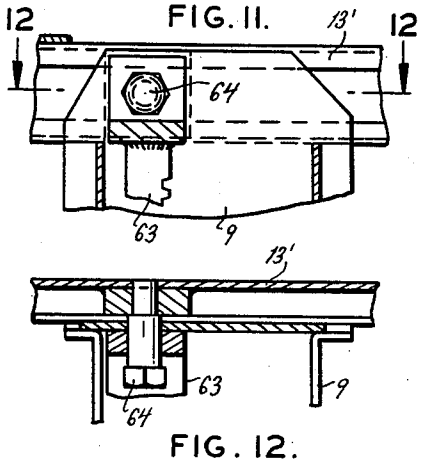


FIG. 12.

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PATIENT STRETCHERS

Filed Jan. 20, 1955 4 Sheets-Sheet 4

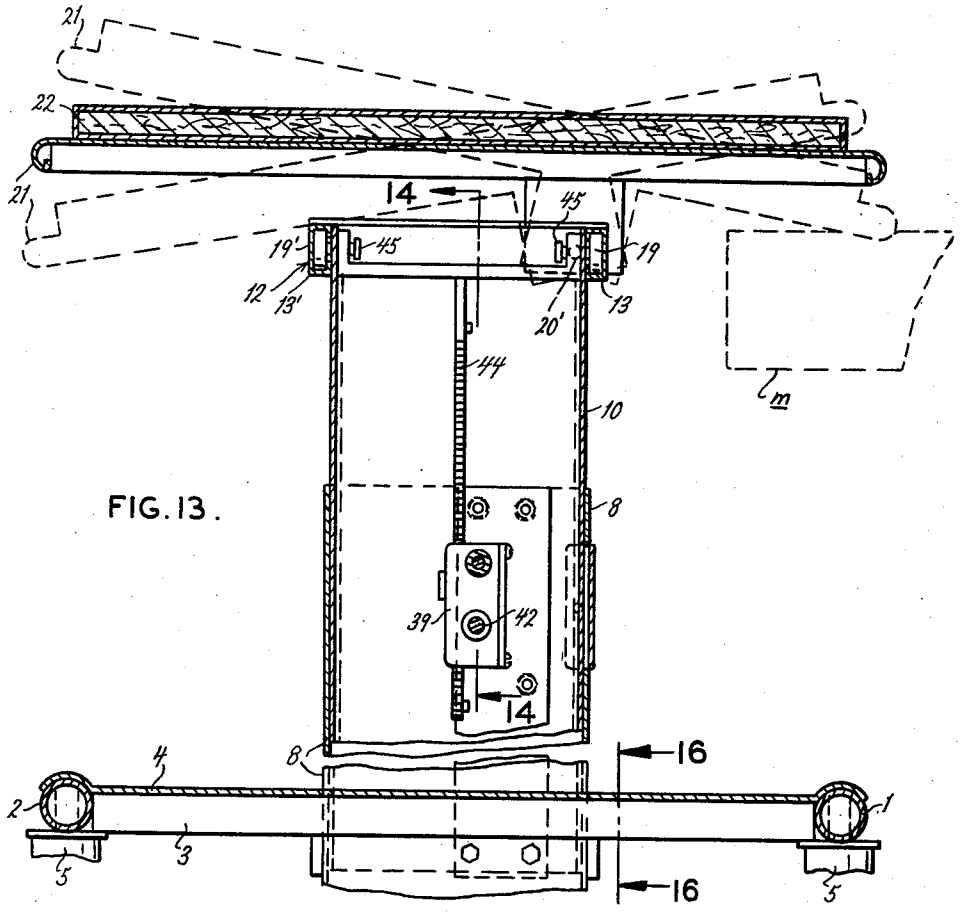


FIG. 13.

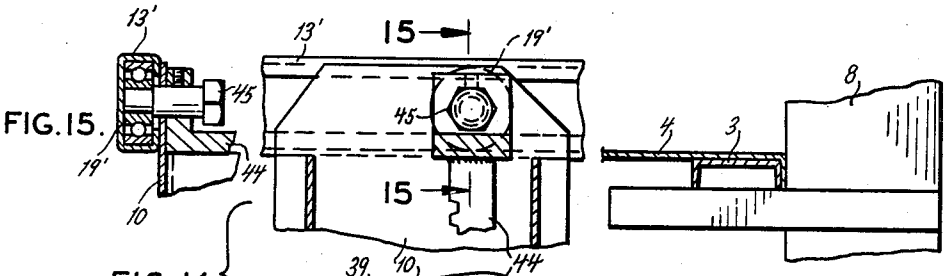


FIG. 15.

FIG. 16.

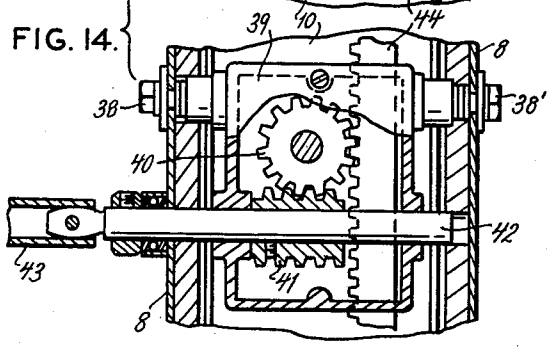


FIG. 14.

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Patented Sept. 29, 1959

2,905,952

PATIENT STRETCHERS

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Application January 20, 1955, Serial No. 482,918

7 Claims. (Cl. 5—86)

This invention relates in general to certain new and useful improvements in hospital equipment and, more particularly, to a patient stretcher adapted for transporting patients from the hospital bed to a surgical operating room, X-ray room, or the like.

In hospitals, it is frequently necessary to move a patient from the hospital bed to the surgical operating room or X-ray room or to some other location within the hopsital in which tests or therapeutic procedures may be carried out. Many such patients are unable to get out of bed and walk or even ride sitting upright in the wheel chair. Therefore, it is necessary for the nurse or orderly to lift the patient onto some type of wheel stretcher for transportation purposes and the transfer of the patient from the bed to the stretcher is very difficult to accomplish without assistance. Similarly, after a surgical operation has been completed and the patient is being returned to the hospital bed for nursing care and convalescence it is equally difficult to move the patient from the stretcher to the bed and frequently the pulling and lifting which is involved is both painful and injurious to the patient.

In addition to this, it has become a widely accepted surgical procedure to keep the patient near the operating room after the surgical operation has been concluded in what is commonly called a "recovery room," so that the patient can come out of the anesthetic and otherwise pass through the first few critical hours after a surgical operation under the watchful eye of the surgeon or other specially trained doctors and nurses capable of dealing with any emergencies. One of the particular difficulties to be guarded against is surgical shock. When shock sets in, it is necessary to tilt the patient longitudinally so that the head is lowered and the feet are elevated. Sometimes it is desirable to tilt the patient in the opposite direction so that the head is elevated and the feet are lowered.

It is, therefore, the primary object of the present invention to provide a wheel stretcher which can be conveniently and quickly located on either side of a conventional hospital bed in such position to facilitate the transfer of the patient to and from the bed onto the stretcher.

It is another object of the present invention to provide a wheel stretcher which can be tilted laterally with respect to a hospital bed to facilitate handling the patient during transfer to and from the bed.

It is an additional object of the present invention to provide a wheel stretcher which can be quickly tilted longitudinally to assume either the Trendelenberg or reverse Trendelenberg positions when the condition of the patient so requires.

It is a further object of the present invention to provide a wheel stretcher which can be vertically adjusted to various different heights above the floor to accommodate various different heights encountered in hospital beds, operating tables, X-ray tables, and therapeutic treatment tables.

It is also an object of the present invention to provide a wheel stretcher of the type stated in which the various

movements and positions can be controlled and adjusted from handles occurring at one end where they are conveniently accessible to the nurse or orderly who is pushing or otherwise handling the stretcher.

With the above and other objects in view, our invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (four sheets)—

Figure 1 is a side elevational view of a wheel stretcher constructed in accordance with and embodying the present invention;

Figures 2, 3 and 4 are fragmentary sectional views taken along lines 2—2, 3—3, and 4—4, respectively, of Figure 1;

Figure 5 is a fragmentary sectional view taken along line 5—5 of Figure 4;

Figure 6 is an end elevational view of the wheel stretcher of the present invention;

Figure 7 is a fragmentary sectional view taken along line 7—7 of Figure 6;

Figures 8 and 9 are fragmentary sectional views taken along lines 8—8 and 9—9, respectively, of Figure 7;

Figure 10 is a fragmentary sectional view of the control knob forming a part of the present invention and illustrating the latter in outwardly shifted or disengaged position;

Figure 11 is a fragmentary sectional view taken along line 11—11 of Figure 2;

Figure 12 is a fragmentary sectional view taken along line 12—12 of Figure 11;

Figure 13 is a fragmentary sectional view taken along line 13—13 of Figure 1;

Figure 14 is a fragmentary sectional view taken along line 14—14 of Figure 13;

Figure 15 is a fragmentary sectional view taken along line 15—15 of Figure 14; and

Figure 16 is a fragmentary sectional view taken along line 16—16 of Figure 13.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates a wheel stretcher comprising a rectangular base frame formed of two spaced parallel rods 1, 2, transversely connected by angle members 3 and provided with a flat covering plate 4 formed preferably of stainless steel or other material. At their opposite or outer ends, each of the rods 1, 2, is provided with freely swiveling caster frames 5, which are, in turn, conventionally provided with rubber tired wheels 6.

Welded or otherwise rigidly mounted upon the angles 3 and projecting upwardly and downwardly therefrom are vertical box-like posts 7, 8, for slidably supporting box-like columns 9, 10, respectively, the latter being provided in their transverse end faces with vertical clearance slots 11. Pivotally mounted upon the upper end of the column 10 for rocking movement about a transversely extending horizontal axis of rotation is a narrow elongated sub-frame 12 consisting of two longitudinal channels 13, 13', transversely connected at their ends by cross members 14, 14', and intermediate their ends by a series of brace members 15, 16, 17, 18. Near their ends, the channels 13, 13', are shiftably supported by rollers 19, 19', which are operatively mounted in the upper end of the other column 10, all as best seen in Figure 13.

Pivotally mounted on the sub-frame 12 by means of studs 20, 20', for lateral tilting movement about a longitudinally extending horizontal axis which is at right angles to the previously mentioned axis of rotation, is a patient-supporting top member or stretcher-forming panel 21 which is of general rectilinear shape and is

provided with a conventional sponge-rubber pad 22 on which the patient's body is cushioned. As will be seen by reference to Figure 6, the stretcher A in end elevation presents the appearance of a Figure I so that it can be wheeled up to either side of a hospital bed and pushed in so that the wheels on the endboard side will extend underneath the edge of the bed and the stretcher-forming panel or top member 21 will extend over the edge of the mattress. Furthermore, the stretcher-forming panel or top member 21 is elevated above the sub-frame 12 by a sufficient distance so that it may tilt about the studs 20, 20', to any of the positions shown in dotted lines in Figure 13.

Pivotally secured upon the under face of the top member 21 by means of a bolt 23 and extending downwardly therefrom adjacent to the column 9, is a rack bar 24 which projects through a gear box 25 which is rockably mounted by means of studs 26, 26', from depending trunnions 27, 27', which are, in turn, rigidly mounted upon the under side of the sub-frame 12. Journaled within the gear box 25 and engaging the rack bar 24 is a pinion 28 which is also in mesh with a worm 29 which is, in turn, pinned to a shaft 30 extending horizontally between the gear boxes 25 and projecting at one end through the column 9 toward the so-called "head-end" of the stretcher. At its projecting end, the shaft 30 is rigidly provided with an end fitting 31 which is provided with an axial slot 32 having two transversely extending pins 33, 34. Operatively mounted within the slot 32 is a crank handle 35 having an elongated slot 36 shiftably and swingably engaged around the pin 32. The handle 35 is also provided with an open-ended short slot 37 for optional engagement and disengagement with the pin 34, so that the handle 35 may be pulled longitudinally outwardly and swung crosswise to the position shown in dotted lines in Figure 3. When in operative position, that is to say, the position shown in full lines in Figure 3, the handle 35 may be rotated in either direction to shift the rack bars 24 upwardly or downwardly and tilt the top element 21 laterally into any desired position within the overall limits of its movement.

Pivotally mounted within the post 8 by means of studs 38, 38', is a gear box 39 having a pinion 40 and a worm 41, the latter being pinned upon a short shaft 42 projecting outwardly through the gear box 39 and post 8 for pinned engagement within a tubular connecting shaft 43. The pinion 40 also meshes with a vertically shiftable rack bar 44 which extends upwardly and downwardly through the gear box 39 and its upper end is rockably connected to the sub-frame 12 by means of a stud 45.

Similarly mounted in the column 9 by means of studs 46, 46', is another gear box 47 having a pinion 48 which meshes with a worm 49, the latter being pinned upon a tubular quill shaft 50, which is journaled in and extends horizontally through the gear box 47 and projects outwardly toward the head-end of the stretcher through the column 9. Rigidly fastened upon the outer end of the quill shaft 50 is a handle 51 having a boss 52 which is provided with a horizontal pin 53 for slidable engagement in a control knob 54 which is shiftably mounted upon an auxiliary shaft 55 which, in turn, extends rotatably through the quill shaft 50 and projects outwardly beyond the opposite face of the post 7 for pin engagement within the tubular connecting shaft 43. The auxiliary shaft 55 is provided with two peripheral grooves 56, 57, for optional engagement with a spring press detent ball 58 so that the control knob 54 may be pulled in and out to one of two alternative positions. The control knob 54 is, furthermore, held on the auxiliary shaft 55 by means of an end-washer 59 and screw 60. In its opposite or inner face the control knob is provided with a diametral slot 61 for optional engagement with a diametral pin 62 fixed in and projecting through the auxiliary shaft 55. Thus, when the control knob 54 is pushed in to the position shown in Figure 7, the pin 62 will be engaged in the slot 61 and the auxiliary shaft 55 will thus be caused to rotate with the quill shaft 50 as the handle 51 is turned. On the other hand, when the control knob is pulled outwardly to the position shown in Figure 10, the pin 62 will be disengaged from the slot 61 and rotation of the handle 51 will only rotate the quill shaft 50. Thus, by appropriate setting of the control knob 54, it is possible to rotate only the quill shaft 50 or to rotate the quill shaft and auxiliary shaft 55 together.

The pinion 48 of the gear box 47 also meshes with a rack bar 63 which projects vertically through the gear box 47 and, at its upper end, is pivotally connected to the sub-frame 12 by means of studs 64. It will also be noted by reference to Figure 6 that one wall of the post 7 is provided with a slot 65 for clearance of the shaft 30.

In use, the stretcher may be wheeled up to and pushed inwardly over the side of a hospital bed and tilted by rotation of the handle 35 so that the inboard edge of the top member 21 will swing downwardly toward the surface of the mattress. In this position, the handle 51 may be rotated with the control knob 54 pushed inwardly in the position shown in Figure 7 so as to lower the entire patient supporting structure and cause it to press downwardly into the mattress *m* slightly, somewhat as shown in dotted lines in Figure 13, thereby holding the stretcher immovably engaged with the bed to a sufficient degree so that it will not slip in any direction as the patient is being transferred from the bed to the top member 21. The laterally tilted angular position of the top member 21, furthermore, materially facilitates sliding the patient up onto the top member 21 or, in the alternative, sliding the patient downwardly onto the bed as the case may be. When the patient has been transferred to the top member 21, it may again be returned to truly horizontal position, as shown in full lines in Figure 13 and elevated by means of appropriate rotation of the handle 35. Thereupon, the handle 51 may be rotated to lift the top member 21 upwardly if desired and the stretcher A may be pushed outwardly away from the bed and thence to the surgical operating room or wherever else in the hospital the patient should be transported.

If it becomes necessary to tilt the top element 21 longitudinally either into forward or reverse Trendelenberg positions, this can be accomplished by pulling the knob 54 outwardly to the position shown in Figure 10. Thereupon, rotation of the handle 51 will only elevate or lower the rack bar 63 and the top element can be longitudinally tilted upwardly or downwardly to the various positions indicated in dotted lines in Figure 1. It should also be noted in this connection that when the top member 21 is either in horizontal position or any one of its longitudinally tilted positions, it may be bodily elevated or lowered merely by pushing the control knob 54 back to its engaged position, that is to say, the position shown in Figure 7, whereupon both of the rack bars 44, 63, will be engaged and will shift upwardly or downwardly when the handle 51 is turned.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the patient stretcher may be made and substituted for those herein shown and described without departing from the nature and principle of our invention.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting move-

ment with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means mounted on said tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, and top means for supporting a patient in prone position, said top means being operatively connected to the two slides so that when the slides are shifted simultaneously the top means will change its vertical position in relation to the base frame while remaining at all times parallel to its initial position but when the slides are shifted independently the top means will tilt lengthwise so that one end is lower than the other end.

2. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means mounted on said tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, and top means for supporting a patient in prone position, said top means being hingedly connected to one slide and slidably and hingedly connected to the other slide so that when the slides are shifted simultaneously the top means will change its vertical position in relation to the base frame while remaining at all times parallel to its initial position but when the slides are shifted independently the top means will tilt lengthwise so that one end is lower than the other end.

3. A wheeled stretcher for transportion of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means mounted on said tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, an intermediate frame hingedly connected to one slide and slidably and hingedly connected to the other slide for longitudinal tilting movement with respect to the base responsive to independent actuation of the slides, and a top member for supporting a patient in prone position, said top member being hingedly mounted on the intermediate frame.

4. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a

pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means located adjacent one transverse end of the top member and being rigidly mounted on the tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, and top means for supporting a patient in prone position, said top means being operatively connected to the two slides so that when the slides are shifted simultaneously the top means will change its vertical position in relation to the base frame while remaining at all times parallel to its initial position but when the slides are shifted independently the top means will tilt lengthwise so that one end is lower than the other end.

5. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means located adjacent one transverse end of the top member and being rigidly mounted on the tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, an intermediate frame hingedly connected to one slide and slidably and hingedly connected to the other slide for longitudinal tilting movement with respect to the base responsive to independent actuation of the slides, a top member for supporting a patient in prone position, said top member being hingedly mounted on the intermediate frame for tilting movement about an axis parallel to the longitudinal center-line of the intermediate frame, and driving means for tilting the top member with respect to the intermediate frame.

6. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, a pair of upright posts rigidly mounted at their lower ends upon the base frame and projecting upwardly therefrom, said posts being located in parallel alignment with each other lengthwise of said frame, a vertical slide operatively mounted on each post and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said post, driving means operatively associated with each post for producing shifting movement of the slide associated with such post, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means located adjacent one transverse end of the top member and being rigidly mounted on the tubular quill shaft, means for optionally locking said crank means and shafting thereby

permitting rotation of the shafting and tubular quill shaft independently or simultaneously, an intermediate frame hingedly connected to one slide and slidably and hingedly connected to the other slide for longitudinal tilting movement with respect to the base responsive to independent actuation of the slides, a top member for supporting a patient in prone position, said top member being hingedly mounted on the intermediate frame for tilting movement about an axis parallel to the longitudinal center-line of the intermediate frame, driving means for tilting the top member with respect to the intermediate frame, and a crank operably connected to the last-mentioned driving means and being located adjacent to one end of the top member.

7. A wheeled stretcher for transportation of patients in hospitals and the like, said stretcher comprising a base frame, wheels operatively mounted on the base frame, first upright support means rigidly mounted upon the base frame adjacent one end thereof and projecting upwardly therefrom, second upright support means rigidly mounted upon the base frame at the other end thereof and projecting upwardly therefrom, said support means being located in substantially parallel alignment with each other, a vertical slide operatively mounted on each support means and projecting at one end upwardly therefrom for upwardly and downwardly shifting movement with respect to said support means, driving means operatively associated with each support means for producing shifting movement of the slide associated with such support means, rotatable shafting adapted to actuate only one of the driving means, a rotatable tubular quill shaft coaxially and slidably mounted on said shafting adapted to actuate only the other of said driving means, crank means mounted on said tubular quill shaft, means for optionally locking said crank means and shafting thereby permitting rotation of the shafting and tubular quill shaft independently or simultaneously, and top means for supporting a patient in prone position, said top means being operatively connected to the two slides so that when the slides are shifted simultaneously the top means will change its vertical position in relation to the base frame while remaining at all times parallel to its initial position but when the slides are shifted independently, the top means will tilt lengthwise so that one end is lower than the other end.

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